

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
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EPAS ID: PAT6182417

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
RUDOLPH TECHNOLOGIES, INC.	04/30/2020
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	ONTO INNOVATION INC.
<b>Street Address:</b>	16 JONSPIN ROAD
<b>City:</b>	WILMINGTON
<b>State/Country:</b>	MASSACHUSETTS
<b>Postal Code:</b>	01887
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	11104093
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>	
<b>Phone:</b>	+442075506869
<b>Email:</b>	ngheita@anaqua.com
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<b>Address Line 1:</b>	184 SHEPHERDS BUSH ROAD
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<b>NAME OF SUBMITTER:</b>	NESREEN GHEITA
<b>SIGNATURE:</b>	/Nesreen Gheita/
<b>DATE SIGNED:</b>	07/02/2020
This document serves as an Oath/Declaration (37 CFR 1.63).	
<b>Total Attachments: 78</b>	
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## PATENT ASSIGNMENT AGREEMENT

THIS PATENT ASSIGNMENT AGREEMENT (this "Patent Assignment") is made by and between **Rudolph Technologies, Inc.**, a Delaware corporation having an address at One Rudolph Road, Hackettstown, New Jersey 07840 ("Assignor"), and **Onto Innovation Inc.**, a Delaware corporation having a principal place of business at 16 Jonspin Road, Wilmington, MA 01887 ("Assignee").

WHEREAS, Assignor is a predecessor to and a wholly owned subsidiary of Assignee, and Assignor is the owner of the inventions, patent applications, and issued patents (collectively, "Patent Rights") identified on Exhibit A hereto and the inventions claimed therein as well as any and all patents and patent applications that directly or indirectly claim priority and/or form a basis for priority of the Patent Rights as well as any and all inventions, patent applications, and patents that inventors have an obligation to assign to Assignor, but which have not yet been assigned yet (collectively, the "Acquired Patents").

WHEREAS, Assignor has agreed to sell, assign, transfer and deliver to Assignee all of the Assignor's right, title and interest in, to and under the Acquired Patents and the inventions disclosed in the Acquired Patents, free and clear of all liens.

**NOW THEREFORE**, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Assignor and Assignee hereby agree as follows:

**1. ASSIGNMENT.** The Assignor does hereby sell, assign, transfer and deliver to Assignee, its assigns and successors, and Assignee hereby accepts, all of Assignor's right, title and interest in, to and under the Acquired Patents, the inventions disclosed in the Acquired Patents and in and to all letters patent and other Patent Rights of the United States of America and all other jurisdictions which may or shall be granted on said inventions, or any parts thereof, or any divisionals, continuations, continuations in part, continuing prosecution applications, request for continuing examinations, reexaminations, extensions, re-registrations, reissue or other applications based in whole or in part on said inventions or Acquired Patents, all rights to apply in any or all countries of the world for patents, certificates of invention, utility models, industrial design protections, design patent protections, or other governmental grants or issuances related to any of the Patents, the right to claim priority under the Paris Convention, the right to enter national and regional phases in respect of International patent applications (PCT applications) and the right to recover for past, present or future infringement or misappropriation with respect to any of the foregoing, including all rights to sue for past, present and future infringement thereof; all income, royalties, and damages hereafter due or payable to Assignor with respect to the Acquired Patents, including without limitation, damages and payments for past or future infringements. Assignor authorizes and requests the appropriate patent offices to issue to Assignee any patents that may be granted in accordance with this Patent Assignment.

**2. COVENANT.** Assignor covenants that Assignor has the right to enter into this Patent Assignment and further agrees, without further consideration, to provide Assignee with reasonable cooperation and assistance at Assignee's request and expense to execute papers that may be necessary or desirable for obtaining, maintaining, renewing, sustaining, or enforcing the

Acquired Patents, and for perfecting, recording, and maintaining the title of the Assignee to the Acquired Patents.

3. **COUNTERPARTS.** This Patent Assignment may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument.

4. **GOVERNING LAW.** This Patent Assignment, and any subsequent amendments or modifications to this Patent Assignment, shall be governed by and construed in accordance with the laws of the State of Delaware, without regard to its or any other jurisdiction's conflict of laws, rules or principles.

**[Signature Page Immediately Follows]**

RUDOLPH TECHNOLOGIES, INC.

APRIL 30, 2020  
Date

Robert A. Koch  
Signature

Robert A. Koch  
Printed Name

Vice President & General Counsel  
Title

Signed for and on behalf of Onto Innovation Inc. confirming acceptance of the assignment.

ONTO INNOVATION INC.

APRIL 30, 2020  
Date

Robert A. Koch  
Signature

Robert A. Koch  
Printed Name

Vice President & General Counsel  
Title

## Exhibit A

Publication Numbe	Application Numbe	Source	Title	Priority Date	File Date
US4830443	US06/697796	US Grants	Three-dimensional volumetric sensor	5/31/1984	2/4/1985
US5018803	US07/274860	US Grants	Three-dimensional volumetric sensor	2/4/1985	11/22/1988
US4682894	US06/714253	US Grants	Calibration of three-dimensional space	3/21/1985	3/21/1985
US4652749	US06/714484	US Grants	Optical coordinate measuring system with dual path reflecting means	3/21/1985	3/21/1985
US4689480	US06/727366	US Grants	Arrangement for improved scanned 3-d measurement	4/25/1985	4/25/1985
US4822163	US06/879203	US Grants	Tracking vision sensor	6/26/1986	6/26/1986
US4854698	US07/105592	US Grants	3-d measurement via multiple gating	10/5/1987	10/5/1987
USRE33836	US07/573400	US Grants	Apparatus and method for making large area electronic devices, such as flat panel displays and the like, using correlated, aligned dual optical systems	10/22/1987	8/24/1990
US4769680	US07/111427	US Grants	Apparatus and method for making large area electronic devices, such as flat panel displays and the like, using correlated, aligned dual optical systems	10/22/1987	10/22/1987
WO8907246	WO1989US00382	WO Application	Optical amplifier and method for amplifying optical polarization state change effects	2/3/1988	2/3/1989
AU3183989	AU19890031839	AU Application	Optical amplifier and method for amplifying optical polarization state change effects	2/3/1988	2/3/1989
US4855792	US07/193887	US Grants	Optical alignment system for use in photolithography and having reduced reflectance errors	5/13/1988	5/13/1988
US4991968	US07/221641	US Grants	Three dimensional object surface determination with automatic sensor control	7/20/1988	7/20/1988
US5028799	US07/445121	US Grants	Method and apparatus for three dimensional object surface determination using co-planar data from multiple sensors	8/1/1988	11/30/1989
US4925308	US07/230443	US Grants	Calibration of three-dimensional space	8/9/1988	8/9/1988
US4918374	US07/254269	US Grants	Method and apparatus for inspecting integrated circuit probe cards	10/5/1988	10/5/1988

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US5508629	US07/689294	US Grants	Method and apparatus for inspecting integrated circuit probe cards	10/5/1988	4/22/1991
US5060371	US07/487434	US Grants	Method of making probe cards	10/5/1988	3/1/1990
US4967370	US07/260862	US Grants	Robot and sensor error determination system	10/21/1988	10/21/1988
US4999785	US07/296481	US Grants	Method and apparatus for evaluating defects of an object	1/12/1989	1/12/1989
US4991772	US07/538689	US Grants	Multiple air-stream sealant control	1/30/1989	6/15/1990
US5166752	US07/640100	US Grants	Simultaneous multiple angle/multiple wavelength ellipsometer and method	1/11/1990	1/11/1990
US5118192	US07/551150	US Grants	System for 3-d inspection of objects	7/11/1990	7/11/1990
WO9212404	WO1992US00280	WO Application	Simultaneous multiple angle/multiple wavelength ellipsometer and method	1/11/1991	1/10/1992
JPH06504845	JP19920504542	JP Applications	Inter-multiprocessor exclusive control system	1/11/1991	1/10/1992
DE69226514	DE1992626514	DE Grants	Simultaneous in many cases - angle / in many cases - wavelengths an ellipsometer and method	1/11/1991	1/10/1992
EP0566657	EP19920904023	EP Grants	Simultaneous multiple angle/multiple wavelength ellipsometer and method	1/11/1991	1/10/1992
DE69226514	DE1992626514T	DE Grants	Simultaneous in many cases - angle / in many cases - wavelengths an ellipsometer and method	1/11/1991	1/10/1992
EP0566657	EP19920904023	EP Applications	Simultaneous multiple angle/multiple wavelength ellipsometer and method	1/11/1991	1/10/1992
AT169400	AT19920904023T	AT Grants	Gleichzeitiges vielfach-winkel/vielfach-wellenlängen ellipsometer und methode	1/11/1991	1/10/1992
CA2099491	CA19922099491	CA Applications	Simultaneous multiple angle/multiple wavelength ellipsometer and method	1/11/1991	1/10/1992
KR100203345	KR19930702082	KR Grants	Simultaneous multiple angle/multiple wavelength ellipsometer and method	1/11/1991	7/10/1993
JP3360822	JP19920504542	JP Grants	Simultaneous multi-angle / multi-wavelength elliptical polarizer and method	1/11/1991	1/10/1992
KR930703594	KR19930702082	KR Applications	Simultaneous multi-angle / multi-wavelength ellipsometry and measurement method	1/11/1991	7/10/1993
US5216259	US07/698133	US Grants	Apparatus and method for improved determination of the spatial location of object surface points	5/10/1991	5/10/1991

US5463227	US07/903524	US Grants	Method for obtaining three-dimensional data from multiple parts or devices in a multi-pocketed tray	6/24/1992	6/24/1992
			Method for obtaining three-dimensional data from semiconductor devices in a row/column array and control of manufacturing of same with data to eliminate manufacturing errors	6/24/1992	6/7/1995
US5600150	US08/476212	US Grants	Apparatus and method for obtaining three-dimensional data from objects in a contiguous array	6/24/1992	9/25/1995
US5818061	US08/533170	US Grants	Method for obtaining three-dimensional data from multiple parts or devices in a multi-pocketed tray	6/24/1992	7/28/1992
US5371375	US07/921317	US Grants	Apparatus for obtaining three-dimensional data from multiple parts or devices in a multi-pocketed tray	6/24/1992	8/12/1995
US5691544	US08/709189	US Grants	Machine vision for adaptive laser beam steering	7/28/1992	10/6/1994
US5576948	US08/319415	US Grants	Horizontal vibrator method for orienting articles	11/25/1992	11/25/1992
US5263567	US07/981835	US Grants	Context independent fusion of range and intensity imagery	12/21/1992	12/21/1992
US5349378	US07/993393	US Grants	System for inspecting pin grid arrays	12/9/1993	5/18/1995
US5648853	US08/444258	US Grants	Apparatus and method for aligning and measuring misregistration	1/21/1994	2/16/1996
US5696835	US08/603026	US Grants	Apparatus and method for image processing in symbolic space	1/21/1994	1/21/1994
US5515453	US08/186750	US Grants	Reticle alignment system for use in lithography	4/18/1994	4/18/1994
US6320644	US08/228889	US Grants	Reticle alignment system for use in lithography	4/18/1994	11/20/2001
US6483572	US09/989097	US Grants	Reticle alignment system for use in lithography	4/18/1994	11/20/2001
US20020085189	US09/989097	US Applications	Method for coplanarity inspection of package or substrate warpage for ball grid arrays, column arrays, and similar structures	6/3/1994	6/3/1994
US5465152	US08/253989	US Grants	Segmented position sensing detector for reducing non-uniformly distributed stray light from a spot image	9/22/1994	9/22/1994
US5554858	US08/310841	US Grants	Multichannel position sensing detector	9/22/1994	9/5/1996
US5723869	US08/707637	US Grants	Platen for use with lithographic stages and method of making same	10/3/1994	8/22/1997
US5828142	US08/918704	US Grants			

US6014461	US08/998315	US Grants	Apparatus and method for automatic knowledge-based object identification	11/30/1994	12/24/1997
US6487307	US09/262603	US Grants	System and method of optically inspecting structures on an object	11/30/1994	3/4/1999
WO9624034	WO1996US01495	WO Application	Method for improving optical measurement of rough samples in ellipsometry and reflectometry	2/2/1995	2/1/1996
US5677758	US08/386266	US Grants	Lithography system using dual substrate stages	2/9/1995	2/9/1995
US5691810	US08/435821	US Grants	Dual-bed scanner with reduced transport time	5/5/1995	5/5/1995
US5668630	US08/671065	US Grants	Dual-bed scanner with reduced transport time	5/5/1995	6/27/1996
US5793051	US08/700581	US Grants	Method for obtaining three-dimensional data from semiconductor devices in a row/column array and control of manufacturing of same with data to eliminate manufacturing errors	6/7/1995	8/12/1996
US5790242	US08/509534	US Grants	Chromatic optical ranging sensor	7/31/1995	7/31/1995
US5991004	US08/627892	US Grants	Lens focus shift sensor	4/3/1996	4/3/1996
US6091846	US08/867156	US Grants	Method and system for anomaly detection	5/31/1996	5/30/1997
US6205239	US08/866553	US Grants	System and method for circuit repair	5/31/1996	5/30/1997
US6292582	US08/867154	US Grants	Method and system for identifying defects in a semiconductor	5/31/1996	5/30/1997
US6246787	US08/866771	US Grants	System and method for knowledgebase generation and management	5/31/1996	5/30/1997
US6483938	US09/519678	US Grants	System and method for classifying an anomaly	5/31/1996	3/6/2000
US5831443	US08/658659	US Grants	Probe card array check plate with transition zones	6/5/1996	6/5/1996
US5859924	US08/680342	US Grants	Method and system for measuring object features	7/12/1996	7/12/1996
US5739913	US08/693469	US Grants	Non-contact edge detector	8/2/1996	8/2/1996
US6075883	US08/748040	US Grants	Method and system for imaging an object or pattern	11/12/1996	11/12/1996
US6603874	US09/518559	US Grants	Method and system for imaging an object or pattern	11/12/1996	3/3/2000
US20030215127	US10/387940	US Application	Method and system for imaging an object or pattern	11/12/1996	3/12/2003
US6028664	US08/833217	US Grants	Method and system for establishing a common reference point on a semiconductor wafer inspected by two or more scanning mechanisms	1/29/1997	4/14/1997

US6246788	US09/074301	US Grants	System and method of optically inspecting manufactured devices	5/30/1997	5/6/1998
US6292260	US09/338880	US Grants	System and method of optically inspecting surface structures on an object	7/3/1997	6/23/1999
US6293408	US09/142338	US Grants	Inspection handler apparatus and method	7/16/1997	9/27/1999
USRE38880	US10/122372	US Grants	Inspection handler apparatus and method	7/16/1997	9/27/1999
US6335757	US08/922026	US Grants	Ccd imaging device for high speed profiling	9/2/1997	9/2/1997
US6885400	US09/522819	US Grants	Ccd imaging device and method for high speed profiling	9/2/1997	3/10/2000
EP1023574	EP19980941191	EP Grants	High speed profiling with ccd capturing profile lines per frame period	9/2/1997	9/1/1998
EP1023574	EP19980941191	EP Applications	Interline transfer ccd driven with enhanced frame transfer frequency for high speed profiling	9/2/1997	9/1/1998
DE69816320	DE1998616320T	DE Grants	Profile measurement at high speed by ccd, which picks up profile lines per frame period	9/2/1997	9/1/1998
US6031225	US09/019479	US Grants	System and method for selective scanning of an object or pattern including scan correction	2/5/1998	2/5/1998
US6525827	US09/760615	US Grants	Method and system for imaging an object with a plurality of optical beams	6/10/1998	1/16/2001
US6181472	US09/095367	US Grants	Method and system for imaging an object with a plurality of optical beams	6/10/1998	6/10/1998
US20010021026	US09/760615	US Applications	Method and system for imaging an object with a plurality of optical beams	6/10/1998	1/16/2001
EP1095305	EP19990955545	EP Applications	Method and system for imaging an object with a plurality of optical beams	6/10/1998	6/9/1999
US6324298	US09/352564	US Grants	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	7/13/1999
US6937753	US09/561570	US Grants	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	4/29/2000
US6826298	US09/562273	US Grants	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	4/29/2000
US7729528	US10/915666	US Grants	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	8/10/2004

US20120087569	US13/273645	US Applications	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	10/14/2011
US20100239157	US12/789829	US Applications	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	5/28/2010
EP1112550	EP19990934136	EP Grants	An automated wafer defect inspection system and a process of performing such inspection	7/15/1998	7/15/1999
US20160223470	US15/093130	US Applications	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	4/7/2016
US9337071	US12/789829	US Grants	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	5/28/2010
US9464992	US15/093130	US Grants	Automated wafer defect inspection system and a process of performing such inspection	7/15/1998	4/7/2016
EP1112550	EP19990934136	EP Applications	An automated wafer defect inspection system and a process of performing such inspection	7/15/1998	7/15/1999
US6256097	US09/478795	US Grants	Ellipsometer and ellipsometry method	1/8/1999	1/7/2000
US6710798	US09/265105	US Grants	Methods and apparatus for determining the relative positions of probe tips on a printed circuit board probe card	3/9/1999	3/9/1999
DE20004439	DE2000204439U	DE Grants	Probes cards examination system for determining the relative position of the probe tips	3/9/1999	3/9/2000
US6252981	US09/270607	US Grants	System and method for selection of a reference die	3/17/1999	3/17/1999
US6414477	US09/327106	US Grants	Method for optimizing probe card analysis and scrub mark analysis data	6/7/1999	6/7/1999
US6621262	US10/191039	US Grants	Method for optimizing probe card analysis and scrub mark analysis data	6/7/1999	7/2/2002
US20020171414	US10/191039	US Applications	Method for optimizing probe card analysis and scrub mark analysis data	6/7/1999	7/2/2002
DE60017016	DE2000617016T	DE Grants	Data optimization procedure for probe card analysis and reamed mark analysis	6/7/1999	6/7/2000
DE60032953	DE2000632953	DE Grants	Data optimization procedure for probe card analysis and reamed mark analysis	6/7/1999	6/7/2000
US6291816	US09/327817	US Grants	System and method for measuring object features with coordinated two and three dimensional imaging	6/8/1999	6/8/1999

US6864871	US09/693044	US Grants	Active-matrix liquid crystal display apparatus and method for driving the same and for manufacturing the same	10/20/1999	10/20/2000
US6813376	US09/697807	US Grants	System and method for detecting defects on a structure-bearing surface using optical inspection	10/29/1999	10/27/2000
US7039228	US09/444034	US Grants	System and method for three-dimensional surface inspection	11/19/1999	11/19/1999
US6470229	US09/458185	US Grants	Semiconductor yield management system and method	12/8/1999	12/8/1999
USRE42481	US10/972115	US Grants	Semiconductor yield management system and method	12/8/1999	10/22/2004
EP1247079	EP20010932496	EP Applications	Ellipsometer and ellipsometry method	1/7/2000	1/8/2001
WO0153786	WO2001US00504	WO Applicator	Ellipsometer and ellipsometry method	1/7/2000	1/8/2001
US6407810	US09/522540	US Grants	Imaging system	3/10/2000	3/10/2000
US6744913	US09/551106	US Grants	System and method for locating image features	4/18/2000	4/18/2000
US20020191832	US10/224919	US Applications	System and method for locating irregular edges in image data	6/13/2000	8/21/2002
US6459807	US09/592641	US Grants	System and method for locating irregular edges in image data	6/13/2000	6/13/2000
US7046837	US10/224919	US Grants	System and method for locating irregular edges in image data	6/13/2000	8/21/2002
US6765666	US09/631509	US Grants	System and method for inspecting bumped wafers	8/3/2000	8/3/2000
US6621582	US09/750996	US Grants	Optical metrology system and method employing laser-server supplying laser energy to distributed slave metrology heads	9/11/2000	12/29/2000
US20020030825	US09/750996	US Applications	metrology heads	9/11/2000	12/29/2000
WO223118	WO2001US42102	WO Applicator	Optical metrology system and method employing laser-server supplying laser energy to distributed slave metrology heads	9/11/2000	9/11/2001
AU9326601	AU20010093266	AU Application	Optical metrology system and method employing laser-server supplying laser energy to distributed slave metrology heads	9/11/2000	9/11/2001

US6731383	US09/952537	US Grants	Confocal 3d inspection system and process	9/12/2000	9/12/2001
US20020191178	US09/952537	US Application:	Confocal 3d inspection system and process	9/12/2000	9/12/2001
US20040227504	US10/788670	US Application:	Method of applying the analysis of scrub mark morphology and location to the evaluation and correction of semiconductor testing, analysis, and manufacture	10/30/2000	2/27/2004
US20060244438	US11/479822	US Application:	Method of applying the analysis of scrub mark morphology and location to the evaluation and correction of semiconductor testing, analysis, and manufacture	10/30/2000	6/29/2006
US7102368	US10/788670	US Grants	Method of applying the analysis of scrub mark morphology and location to the evaluation and correction of semiconductor testing, analysis, and manufacture	10/30/2000	2/27/2004
US7750622	US11/479822	US Grants	Method of applying the analysis of scrub mark morphology and location to the evaluation and correction of semiconductor testing, analysis and manufacture	10/30/2000	6/29/2006
US20100305897	US12/828344	US Application:	Method of applying the analysis of scrub mark morphology and location to the evaluation and correction of semiconductor testing, analysis, and manufacture	10/30/2000	7/1/2010
US8198906	US12/828344	US Grants	Method of applying the analysis of scrub mark morphology and location to the evaluation and correction of semiconductor testing, analysis, and manufacture	10/30/2000	7/1/2010
US6519045	US09/772901	US Grants	Method and apparatus for measuring very thin dielectric film thickness and creating a stable measurement environment	1/31/2001	1/31/2001
US20020102748	US09/772901	US Application:	Method and apparatus for measuring very thin dielectric film thickness and creating a stable measurement environment	1/31/2001	1/31/2001
US6870609	US10/073613	US Grants	Confocal 3d inspection system and process	2/9/2001	2/11/2002
US20030052346	US10/073613	US Application:	Confocal 3d inspection system and process	2/9/2001	2/11/2002

US6504618	US10/092866	US Grants	Method and apparatus for decreasing thermal loading and roughness sensitivity in a photoacoustic film thickness measurement system	3/21/2001	3/6/2002
US20020135784	US10/092866	US Applications	Method and apparatus for decreasing thermal loading and roughness sensitivity in a photoacoustic film thickness measurement system	3/21/2001	3/6/2002
EP1381825	EP20020721330	EP Applications	Method and apparatus for decreasing thermal loading and roughness sensitivity in a photoacoustic film thickness measurement system	3/21/2001	3/8/2002
WO02077568	WO2002US07231	WO Applicator	Method and apparatus for decreasing thermal loading and roughness sensitivity in a photoacoustic film thickness measurement system	3/21/2001	3/8/2002
US20020140930	US10/094119	US Applications	System and method for performing optical inspection utilizing diffracted light	3/27/2001	3/8/2002
US6864971	US10/094119	US Grants	System and method for performing optical inspection utilizing diffracted light	3/27/2001	3/8/2002
US7002689	US10/105829	US Grants	Optically-based method and apparatus for detecting and characterizing surface pits in a metal film during chemical mechanical polish	4/12/2001	3/25/2002
US20020151127	US10/105829	US Applications	Optically-based method and apparatus for detecting and characterizing surface pits in a metal film during chemical mechanical polish	4/12/2001	3/25/2002
US7006221	US10/193769	US Grants	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	7/10/2002
US20030076497	US10/193769	US Applications	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	7/10/2002
US7050178	US10/194169	US Grants	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
US20060126057	US11/343717	US Applications	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	1/30/2006
US20030020929	US10/194169	US Applications	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002

US7522272	US11/881079	US Grants	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	7/24/2007
WO03008939	WO2002US22223	WO Application	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	7/12/2002
CN1555479	CN20028008032	CN Application	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
US7253887	US11/343717	US Grants	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	1/30/2006
US20070268478	US11/881079	US Application	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	7/24/2007
AU2002341544	AU20020341544	AU Application	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
EP1417450	EP20020775693	EP Application	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
CN100565099	CN20028008032	CN Grants	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
US7705974	US12/381477	US Grants	Metrology system with spectroscopic ellipsometer and photoacoustic measurements	7/13/2001	3/11/2009
WO03006918	WO2002US22222	WO Application	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
EP1417450	EP20020775693	EP Grants	Method and apparatus for increasing signal to noise ratio in a photoacoustic film thickness measurement system	7/13/2001	7/12/2002
US6773935	US10/196741	US Grants	Confocal 3d inspection system and process	7/16/2001	7/16/2002
US6970287	US10/196735	US Grants	Confocal 3d inspection system and process	7/16/2001	7/16/2002
US20030027367	US10/196741	US Application	Confocal 3d inspection system and process	7/16/2001	7/16/2002
US20030055592	US09/952848	US Application	System and method for analyzing error information from a semiconductor fabrication process	9/14/2001	9/14/2001

US6768961	US09/952848	US Grants	System and method for analyzing error information from a semiconductor fabrication process	9/14/2001	9/14/2001
US6934031	US09/963638	US Grants	Methods and apparatus for determining optical constants of semiconductors and dielectrics with interband states	9/27/2001	9/27/2001
US20030073254	US09/963638	US Applications	Methods and apparatus for determining optical constants of semiconductors and dielectrics with interband states	9/27/2001	9/27/2001
US7024031	US10/035592	US Grants	System and method for inspection using off-angle lighting	10/23/2001	10/23/2001
US7206442	US10/298391	US Grants	Optical inspection method utilizing ultraviolet light	11/16/2001	11/18/2002
US20040090634	US10/467438	US Applications	System and method for inspection using white light interferometry	12/5/2001	12/8/2003
US7158235	US10/467438	US Grants	System and method for inspection using white light interferometry	12/5/2001	12/8/2003
US6643006	US10/016996	US Grants	Method and system for reviewing a semiconductor wafer using at least one defect sampling condition	12/13/2001	12/13/2001
US7231081	US10/323720	US Grants	Stereoscopic three-dimensional metrology system and method	12/28/2001	12/18/2002
US20030142862	US10/323720	US Applications	Stereoscopic three-dimensional metrology system and method	12/28/2001	12/18/2002
US20030138139	US10/323696	US Applications	Dual-axis scanning system and method	12/28/2001	12/18/2002
US7634128	US11/751617	US Grants	Stereoscopic three-dimensional metrology system and method	12/28/2001	5/21/2007
US7634129	US10/323696	US Grants	Dual-axis scanning system and method	12/28/2001	12/18/2002
US20070269103	US11/751617	US Applications	Stereoscopic three-dimensional metrology system and method	12/28/2001	5/21/2007
JP2010038923	JP20090213805	JP Applications	Stereoscopic three-dimensional measurement system and method	12/28/2001	9/15/2009
AT464535	AT20020806181T	AT Grants	Stereoscopic three-dimensional metrology system and method	12/28/2001	12/18/2002
US6847443	US10/322582	US Grants	System and method for multi-wavelength, narrow-bandwidth detection of surface defects	1/17/2002	12/18/2002

US6886423	US10/397326	US Grants	Scalable, automated metrology system and method of making the system	3/27/2002	3/27/2003
US20040040380	US10/397326	US Applications	Scalable, automated metrology system and method of making the system	3/27/2002	3/27/2003
US20030221042	US10/423475	US Applications	Data grabber with switched fabric interface	4/25/2002	4/25/2003
US7111095	US10/423475	US Grants	Data transfer device with data frame grabber with switched fabric interface wherein data is distributed across network over virtual lane	4/25/2002	4/25/2003
US7192173	US10/622847	US Grants	Optical throughput condenser	7/18/2002	7/18/2003
US7170075	US10/622848	US Grants	Inspection tool with a 3d point sensor to develop a focus map	7/18/2002	7/18/2003
US20040057135	US10/622847	US Applications	Optical throughput condenser	7/18/2002	7/18/2003
US20040056173	US10/622848	US Applications	Inspection tool with a 3d point sensor to develop a focus map	7/18/2002	7/18/2003
US7012631	US10/244608	US Grants	Absolute position determination for a ccd-based acquisition unit	9/17/2002	9/17/2002
US20040051810	US10/244608	US Applications	Absolute position determination for a ccd-based acquisition unit	9/17/2002	9/17/2002
EP1549905	EP20030797124	EP Grants	Height determination of the profile of a moving object using a plurality of ccd arrays	9/17/2002	9/17/2003
EP1549905	EP20030797124	EP Applications	Height determination of the profile of a moving object using a plurality of ccd arrays	9/17/2002	9/17/2003
US7629993	US10/262173	US Grants	Automated wafer defect inspection system using backside illumination	9/30/2002	9/30/2002
US20040061779	US10/262173	US Applications	Automated wafer defect inspection system using backside illumination	9/30/2002	9/30/2002
US6842866	US10/281398	US Grants	Method and system for analyzing bitmap test data	10/25/2002	10/25/2002
US20040083407	US10/281398	US Applications	Method and system for analyzing bitmap test data	10/25/2002	10/25/2002
US7019841	US10/742254	US Grants	System and method for inspecting a component using interferometry	12/19/2002	12/19/2003
US20040227953	US10/742254	US Applications	System and method for inspection using white light interferometry	12/19/2002	12/19/2003
US6710864	US10/382669	US Grants	Concentricity measuring instrument for a fiberoptic cable end	3/5/2003	3/5/2003

US20040223661	US10/800420	US Applications: coordinate system mapping	System and method of non-linear grid fitting and coordinate system mapping	3/14/2003	3/12/2004
US7170307	US10/799575	US Grants	System and method of mitigating effects of component deflection in a probe card analyzer	3/14/2003	3/12/2004
US20110089965	US12/862375	US Applications:	Probe card analysis system and method	3/14/2003	8/24/2010
US20040222808	US10/801944	US Applications:	System and method of measuring probe float	3/14/2003	3/15/2004
US8428393	US10/800420	US Grants	System and method of non-linear grid fitting and coordinate system mapping	3/14/2003	3/12/2004
US20100321056	US12/637858	US Applications:	System and method of measuring probe float	3/14/2003	12/15/2009
US20140021970	US13/921057	US Applications:	Probe card analysis system and method	3/14/2003	6/18/2013
US7385409	US11/609881	US Grants	System and method of mitigating effects of component deflection in a probe card analyzer	3/14/2003	12/12/2006
US7960981	US12/547118	US Grants	Apparatus for obtaining planarity measurements with respect to a probe card analysis system	3/14/2003	8/25/2009
US6986211	US10/801925	US Grants	System and method of planar positioning	3/14/2003	3/15/2004
US7579853	US12/136693	US Grants	Apparatus for obtaining planarity measurements with respect to a probe card analysis system	3/14/2003	6/10/2008
US20040227533	US10/799575	US Applications:	deflection in a probe card analyzer	3/14/2003	3/12/2004
US7373275	US10/800421	US Grants	System and method of point matching measured positions to template positions	3/14/2003	3/12/2004
US20050011080	US10/801925	US Applications:	System and method of planar positioning	3/14/2003	3/15/2004
US7633306	US10/801944	US Grants	System and method of measuring probe float	3/14/2003	3/15/2004
US20040225472	US10/800421	US Applications:	to template positions	3/14/2003	3/12/2004
US20070103181	US11/609881	US Applications:	deflection in a probe card analyzer	3/14/2003	12/12/2006
US20120150475	US13/159819	US Applications:	Apparatus for obtaining planarity measurements with respect to a probe card analysis system	3/14/2003	6/14/2011
US8466703	US12/862375	US Grants	Probe card analysis system and method	3/14/2003	8/24/2010
EP1604218	EP20040720500	EP Applications:	Method of mitigating effects of component deflection in a probe card analyzer	3/14/2003	3/12/2004
US20080238464	US12/136693	US Applications:	deflection in a probe card analyzer	3/14/2003	6/10/2008

Apparatus for obtaining planarity measurements with

US20100073019	US12/547118	US Applications: respect to a probe card analysis system	3/14/2003	8/25/2009
US8089292	US12/637858	US Grants System and method of measuring probe float	3/14/2003	12/15/2009
US9638782	US13/921057	US Grants Probe card analysis system and method	3/14/2003	6/18/2013
US20070057164	US11/522060	US Applications: Scheimpflug normalizer	7/2/2003	1/18/2006
US7461961	US11/740569	US Grants Fiber optic darkfield ring light	7/11/2003	4/26/2007
US7220034	US10/888302	US Grants Fiber optic darkfield ring light	7/11/2003	7/9/2004
US20050007792	US10/888302	US Applications: Fiber optic darkfield ring light	7/11/2003	7/9/2004
US20050013474	US10/890692	US Applications: Edge normal process	7/14/2003	7/14/2004
US6947588	US10/890692	US Grants Edge normal process	7/14/2003	7/14/2004
US20050036671	US10/890762	US Applications: Edge inspection	7/14/2003	7/14/2004
US20050013476	US10/890933	US Applications: Photoresist edge bead removal measurement	7/14/2003	7/14/2004
US7197178	US10/890933	US Grants Photoresist edge bead removal measurement	7/14/2003	7/14/2004
US20050041850	US10/890734	US Applications: Product setup sharing for multiple inspection systems	7/14/2003	7/14/2004
US7340087	US10/890762	US Grants Edge inspection	7/14/2003	7/14/2004
US7366344	US11/331619	US Grants Edge normal process	7/14/2003	1/13/2006
US20060115142	US11/331619	US Applications: Edge normal process	7/14/2003	1/13/2006
US8045788	US10/890734	US Grants Product setup sharing for multiple inspection systems	7/14/2003	7/14/2004
US7684611	US11/676140	US Grants Photoresist edge bead removal measurement	7/14/2003	2/16/2007
US7706599	US12/036679	US Grants Edge normal process	7/14/2003	2/25/2008
US20120257952	US13/352160	US Applications: Substrate handler	7/14/2003	1/17/2012
US7589783	US10/890862	US Grants Camera and illumination matching for inspection system	7/14/2003	7/14/2004
US7316938	US10/891278	US Grants Adjustable film frame aligner	7/14/2003	7/14/2004
US7822260	US12/042052	US Grants Edge inspection	7/14/2003	3/4/2008
US20050012229	US10/891278	US Applications: Adjustable film frame aligner	7/14/2003	7/14/2004
US20080204756	US12/036679	US Applications: Edge normal process	7/14/2003	2/25/2008
US8097966	US11/742355	US Grants Adjustable film frame aligner	7/14/2003	4/30/2007
US20050052530	US10/890862	US Applications: Camera and illumination matching for inspection system	7/14/2003	7/14/2004
US20080002877	US11/676140	US Applications: Photoresist edge bead removal measurement	7/14/2003	2/16/2007
US8698327	US13/352160	US Grants Substrate handler	7/14/2003	1/17/2012

US20140314535	US14/253502	US Application: Substrate handler	7/14/2003	4/15/2014
US9437467	US14/253502	US Grants Substrate handler	7/14/2003	4/15/2014
US7196300	US11/179047	US Grants Dynamic focusing method and apparatus	7/18/2003	7/11/2005
US7321108	US11/625640	US Grants Dynamic focusing method and apparatus	7/18/2003	1/22/2007
US20050098264	US10/966125	Molecular airborne contaminants (macs) film removal and US Application: wafer surface sustaining system and method	10/14/2003	10/14/2004
WO2005038877	WO2004US34175	Molecular airborne contaminants (macs) removal and WO Application: wafer surface sustaining system and method	10/14/2003	10/14/2004
US20050264777	US10/856700	US Application: High speed lithography machine and method	5/28/2004	5/28/2004
US7385671	US10/856700	US Grants High speed lithography machine and method	5/28/2004	5/28/2004
EP1751623	EP20050753949	EP Grants High speed lithography machine and method	5/28/2004	5/23/2005
EP1751623	EP20050753949	EP Application: High speed lithography machine and method	5/28/2004	5/23/2005
US20050276595	US11/146301	US Application: System for generating camera triggers	6/7/2004	6/6/2005
US7813638	US11/146301	US Grants System for generating camera triggers	6/7/2004	6/6/2005
US7703823	US11/179058	US Grants Wafer holding mechanism	7/12/2004	7/11/2005
US8130372	US12/722780	US Grants Wafer holding mechanism	7/12/2004	3/12/2010
US20090073429	US12/276065	US Application: Illuminator for darkfield inspection	7/12/2004	11/21/2008
US7724358	US12/276065	US Grants Illuminator for darkfield inspection	7/12/2004	11/21/2008
US20060046396	US11/179058	US Application: Wafer holding mechanism	7/12/2004	7/11/2005
US7019845	US10/960351	Measuring elastic moduli of dielectric thin films using an US Grants optical metrology system	10/6/2004	10/6/2004
US20060072120	US10/960351	Measuring elastic moduli of dielectric thin films using an US Application: optical metrology system	10/6/2004	10/6/2004
WO2006041493	WO2004US33405	Measuring elastic moduli of dielectric thin films using an WO Application: optical metrology system	10/6/2004	10/7/2004
EP1817542	EP20040794682	Measuring elastic moduli of dielectric thin films using an EP Application: optical metrology system	10/6/2004	10/7/2004
EP1817542	EP20040794682	Measuring elastic modulus of dielectric thin films using an optical metrology system	10/6/2004	10/7/2004
JP2008516229	JP20070535661	Measurement of elastic modulus of dielectric thin film JP Application: using optical measurement system	10/6/2004	10/7/2004
JP4918634	JP20070535661	Measurement of elastic modulus of dielectric thin film JP Grants using optical measurement system	10/6/2004	10/7/2004

US20080281566	US12/150676	US Applications: Semiconductor yield management system and method	10/28/2004	4/29/2008
US8380472	US12/150676	US Grants Semiconductor yield management system and method	10/28/2004	4/29/2008
US20060132801	US11/274677	US Applications: Laser triangulation method for measurement of highly reflective solder balls	11/12/2004	11/14/2005
US7359068	US11/274677	US Grants Laser triangulation method for measurement of highly reflective solder balls	11/12/2004	11/14/2005
US20060109483	US11/261284	US Applications: Trench measurement system employing a chromatic confocal height sensor and a microscope	11/24/2004	10/28/2005
US7477401	US11/261284	US Grants Trench measurement system employing a chromatic confocal height sensor and a microscope	11/24/2004	10/28/2005
US20060142971	US11/296645	US Applications: All surface data for use in substrate inspection	12/8/2004	12/7/2005
US7593565	US11/296645	US Grants All surface data for use in substrate inspection	12/8/2004	12/7/2005
US7835566	US12/555837	US Grants All surface data for use in substrate inspection	12/8/2004	9/9/2009
US20100067779	US12/555837	US Applications: All surface data for use in substrate inspection	12/8/2004	9/9/2009
US20060199287	US11/201279	US Applications: Method and system for defect detection	3/4/2005	8/10/2005
US7539583	US11/201279	US Grants Method and system for defect detection	3/4/2005	8/10/2005
US20060227342	US11/104093	US Applications: Dual photo-acoustic and resistivity measurement system	4/11/2005	4/11/2005
US7372584	US11/104093	US Grants Dual photo-acoustic and resistivity measurement system	4/11/2005	4/11/2005
JP2008537781	JP20080505351	JP Applications Dual photoacoustic and resistance measurement system	4/11/2005	3/22/2006
WO2006110282	WO2006US10616	WO Applicator Dual photo-acoustic and resistivity measurement system	4/11/2005	3/22/2006
EP1869430	EP20060739420	EP Applications: Dual photo-acoustic and resistivity measurement system	4/11/2005	3/22/2006
US20060256916	US11/129282	US Applications: Combined ultra-fast x-ray and optical system for thin film measurements	5/13/2005	5/13/2005
WO2006124475	WO2006US18148	WO Applicator Combined ultra-fast x-ray and optical system for thin film measurements	5/13/2005	5/10/2006
US20100012855	US11/921354	US Applications: Wafer scanning	6/3/2005	6/2/2006
WO2006132998	WO2006US21531	WO Applicator Wafer scanning	6/3/2005	6/2/2006

US8190952	US12/728629	US Grants	Bitmap cluster analysis of defects in integrated circuits	6/23/2005	3/22/2010
US20070011509	US11/166960	US Application	Bitmap cluster analysis of defects in integrated circuits	6/23/2005	6/23/2005
US7685481	US11/166960	US Grants	Bitmap cluster analysis of defects in integrated circuits	6/23/2005	6/23/2005
US20100235690	US12/728629	US Application	Bitmap cluster analysis of defects in integrated circuits	6/23/2005	3/22/2010
WO2007035472	WO2006US36010	WO Application	Scheimpflug normalizer	9/15/2005	9/15/2006
US7738113	US11/978881	US Grants	Wafer measurement system and apparatus	9/29/2005	10/29/2007
DE102006050834	DE20061050834	DE Application	Micrometer and submicrometer surface height measuring apparatus for semiconductor fabrication, has spectrometer analyzing wavelength composition of light returning through coupler, and microscope providing over view of surface	10/28/2005	10/27/2006
US20070158535	US11/622537	US Application	Color imaging using monochrome imagers	1/12/2006	1/12/2007
US20070177417	US11/668457	US Application	High-speed capacitor leakage measurement systems and methods	1/27/2006	1/29/2007
US7663382	US11/668457	US Grants	High-speed capacitor leakage measurement systems and methods	1/27/2006	1/29/2007
US20100194406	US12/628741	US Application	High-speed capacitor leakage measurement systems and methods	1/27/2006	12/1/2009
KR20090016656	KR20087020918	KR Application	High-speed capacitor leakage measurement systems and methods	1/27/2006	1/29/2007
KR101319155	KR20087020918	KR Grants	High-speed capacitor leakage measurement systems and methods	1/27/2006	1/29/2007
US20090161094	US12/296026	US Application	Wafer bevel inspection mechanism	4/3/2006	4/3/2007
TW200802666	TW20070111909	TW Application	Wafer bevel inspection mechanism	4/3/2006	4/3/2007
WO2007120491	WO2007US08122	WO Application	Wafer bevel inspection mechanism	4/3/2006	4/3/2007
CN101467023	CN2007820601	CN Application	Wafer bevel inspection mechanism	4/3/2006	4/3/2007
CN101467023	CN2007820601	CN Grants	Wafer bevel inspection mechanism	4/3/2006	4/3/2007
US20070247622	US11/678407	US Application	Polarization imaging	4/21/2006	2/23/2007
US7586607	US11/678407	US Grants	Polarization imaging	4/21/2006	2/23/2007



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WO2008008817	WO2007US73231	WO Applicator Edge inspection and metrology	7/11/2006	7/11/2007
US20100086197	US12/571801	US Application: Wafer edge inspection and metrology	7/11/2006	10/1/2009
TW1460413	TW20070125147	Method and apparatus of measuring characters of a sample and non-transitory computer-readable medium	7/11/2006	7/11/2007
TW1466206	TW20070125249	Edge inspection and metrology	7/11/2006	7/11/2007
JP5033875	JP20090519649	Edge inspection and measurement	7/11/2006	7/11/2007
US20080021665	US11/781047	US Application: Focusing method and apparatus	7/20/2006	7/20/2007
US20110268348	US13/180080	US Application: Focusing method and apparatus	7/20/2006	7/11/2011
US8204298	US13/180080	Focusing method and apparatus	7/20/2006	7/11/2011
US20090279090	US12/309749	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2006	7/27/2007
US8139232	US12/309749	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2006	7/27/2007
TW200821571	TW20070127393	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2006	7/27/2007
WO2008013909	WO2007US16842	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2006	7/27/2007
TW1429896	TW20070127393	Ellipsometric metrology tool and method of monitoring a fabrication process	7/27/2006	7/27/2007
TW200839916	TW20070133919	TW Application Polarization imaging	9/12/2006	9/11/2007
WO2008033779	WO2007US78063	WO Application Polarization imaging	9/12/2006	9/10/2007
KR20090060435	KR20097007455	KR Application: Polarization imaging	9/12/2006	4/10/2009
JP2010503862	JP20090528415	JP Applications Polarization imaging	9/12/2006	9/10/2007
US20080165357	US11/936671	Method and system for providing a high definition triangulation system	11/7/2006	11/7/2007
US20100277717	US12/609175	Method and system for providing a high definition triangulation system	11/7/2006	10/30/2009

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US7616328	US11/936671	US Grants	Method and system for providing a high definition triangulation system	11/7/2006	11/7/2007
US20080197865	US11/960597	US Applications	Probe card analysis system and method	12/19/2006	12/19/2007
US7782071	US11/960597	US Grants	Probe card analysis system and method	12/19/2006	12/19/2007
WO2008079307	WO2007US26099	WO Application	Probe card analysis system and method	12/19/2006	12/19/2007
KR20090091236	KR20097014976	KR Application	Probe card analysis system and method	12/19/2006	12/19/2007
US20080189582	US11/701700	US Applications	Analysis techniques for multi-level memory	2/2/2007	2/2/2007
US7954018	US11/701700	US Grants	Analysis techniques for multi-level memory	2/2/2007	2/2/2007
US20110054659	US12/527981	US Applications	Wafer fabrication monitoring systems and methods, including edge bead removal processing	2/23/2007	2/25/2008
US8492178	US12/527981	US Grants	Method of monitoring fabrication processing including edge bead removal processing	2/23/2007	2/25/2008
TW200845259	TW20080106463	TW Application	Wafer fabrication monitoring systems and methods, including edge bead removal processing	2/23/2007	2/25/2008
WO2008103994	WO2008US54913	WO Application	Wafer fabrication monitoring systems and methods, including edge bead removal processing	2/23/2007	2/25/2008
JP2010519772	JP20090551059	JP Applications	Wafer manufacturing monitoring system and method including an edge bead removal process	2/23/2007	2/25/2008
TW429002	TW20080106463	TW Grants	Wafer fabrication monitoring systems and methods, including edge bead removal processing	2/23/2007	2/25/2008
JP5318784	JP20090551059	JP Grants	Wafer manufacturing monitoring system and method including an edge bead removal process	2/23/2007	2/25/2008
US8312772	US12/449837	US Grants	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/28/2008
US20100281981	US12/449837	US Applications	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/28/2008
TW2009000678	TW20080106935	TW Application	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/29/2008
JP2010520616	JP20090551728	JP Applications	Characterization of metal parts of samples that may be subjected to erosion using picosecond ultrasound	2/28/2007	2/28/2008

JP5055385	JP20090551728	JP Grants	Characterization of metal parts of samples that may be subjected to erosion using picosecond ultrasound	2/28/2007	2/28/2008
WO2008106199	WO2008US02649	WO Application	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/28/2008
TW1449894	TW20080106935	TW Grants	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/29/2008
KR20100014612	KR20097020148	KR Application	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/28/2008
KR101455777	KR20097020148	KR Grants	Characterization with picosecond ultrasonics of metal portions of samples potentially subject to erosion	2/28/2007	2/28/2008
US20110037492	US12/600153	US Application	Wafer probe test and inspection system	5/15/2007	5/15/2008
JP2010527515	JP20100508586	JP Application	Wafer probe test and inspection system	5/15/2007	5/15/2008
JP5450391	JP20100508586	JP Grants	Wafer probe test and inspection system	5/15/2007	5/15/2008
US20120268744	US13/423866	US Application	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2007	3/19/2012
US8699027	US13/423866	US Grants	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2007	3/19/2012
US20140375983	US14/251945	US Application	Multiple measurement techniques including focused beam scatterometry for characterization of samples	7/27/2007	4/14/2014
US20090196489	US12/362683	US Application	High resolution edge inspection	1/30/2008	1/30/2009
TW201000888	TW20090103246	TW Application	High resolution edge inspection	1/30/2008	2/2/2009
WO2009097494	WO2009US32571	WO Application	High resolution edge inspection	1/30/2008	1/30/2009
SG188094	SG20130007521	SG Application	High resolution edge inspection	1/30/2008	1/30/2009
US8426223	US13/062852	US Grants	Wafer edge inspection	9/8/2008	9/8/2009
US20110263049	US13/062852	US Application	Wafer edge inspection	9/8/2008	9/8/2009
TW201029084	TW20090130087	TW Application	Wafer edge inspection	9/8/2008	9/7/2009

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WO2010028353	WO2009US56208	WO Applicator	Wafer edge inspection	9/8/2008	9/8/2009
CN202256129	CN20099100581U	CN Grants	Chip marginal check system	9/8/2008	9/8/2009
US20140063799	US13/868710	US Applications	Wafer edge inspection	9/8/2008	4/23/2013
US9062859	US13/868710	US Grants	Wafer edge inspection illumination system	9/8/2008	4/23/2013
TW1512865	TW20090130087	TW Grants	Wafer edge inspection	9/8/2008	9/7/2009
US20100061620	US12/556910	US Applications	Probe mark inspection	9/11/2008	9/10/2009
US8358831	US12/556910	US Grants	Probe mark inspection	9/11/2008	9/10/2009
WO2010030773	WO2009US56505	WO Applications	Probe mark inspection	9/11/2008	9/10/2009
SG193874	SG20130067939	SG Applications	Probe mark inspection	9/11/2008	9/10/2009
TW201101400	TW20100104791	TW Application	Polarization imaging	2/18/2009	2/12/2010
KR20110118820	KR20117021587	KR Applications	Polarization imaging	2/18/2009	2/17/2010
WO2010096407	WO2010US24358	WO Applications	Polarization imaging	2/18/2009	2/17/2010
SG173755	SG20110059540	SG Applications	Polarization imaging	2/18/2009	2/17/2010
KR101600128	KR20117021587	KR Grants	Polarization imaging	2/18/2009	2/17/2010
TW1521624	TW20100104791	TW Grants	Polarization imaging	2/18/2009	2/12/2010
US20120189189	US13/265670	US Applications	Optical inspection optimization	4/23/2009	4/22/2010
WO2010124081	WO2010US32044	WO Applications	Optical inspection optimization	4/23/2009	4/22/2010
TW201108125	TW20100112967	TW Applications	Optical inspection optimization	4/23/2009	4/23/2010
SG175097	SG20110072899	SG Applications	Optical inspection optimization	4/23/2009	4/22/2010
US20110292375	US13/134716	US Applications	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	6/15/2011
US20100321671	US12/456781	US Applications	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	6/23/2009
US20140110582	US14/145497	US Applications	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	12/31/2013
US8649016	US13/134716	US Grants	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	6/15/2011
US20160238378	US15/142864	US Applications	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	4/29/2016
EP2446468	EP20100792434	EP Applications	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	6/14/2010
SG10201502024U	SG10201502024U	SG Applications	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	6/14/2010

US9587932	US15/142864	US Grants	System for directly measuring the depth of a high aspect ratio etched feature on a wafer	6/23/2009	4/29/2016
US20120309116	US13/500692	US Application	Substrate analysis using surface acoustic wave metrology	10/9/2009	10/8/2010
WO2011044473	WO2010US51996	WO Application	Substrate analysis using surface acoustic wave metrology	10/9/2009	10/8/2010
US9041931	US13/500692	US Grants	Substrate analysis using surface acoustic wave metrology	10/9/2009	10/8/2010
TW1494557	TW20100134579	TW Grants	Substrate analysis using surface acoustic wave metrology	10/9/2009	10/11/2010
TW201140025	TW20100134579	TW Application	Substrate analysis using surface acoustic wave metrology	10/9/2009	10/11/2010
US20120287263	US13/510135	US Application	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
WO2011060401	WO2010US56785	WO Application	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
CN102782482	CN2010852920	CN Application	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
KR20120085916	KR20127015809	KR Application	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
TW201140038	TW20100139380	TW Application	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
TW1482961	TW20100139380	TW Grants	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
TW201520541	TW20150105024	TW Application	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
TW1567381	TW20150105024	TW Grants	Infrared inspection of bonded substrates	11/16/2009	11/16/2010
US9684052	US14/298539	US Grants	Method of measuring and assessing a probe card with an inspection device	4/23/2010	6/6/2014
US20120098563	US13/093456	US Application	Inspection device with vertically moveable assembly	4/23/2010	4/25/2011
US8729917	US13/093456	US Grants	Inspection device with vertically moveable assembly	4/23/2010	4/25/2011
US20150054534	US14/298539	US Application	Method of measuring and assessing a probe card with an inspection device	4/23/2010	6/6/2014
US20170276758	US15/622246	US Application	Method of measuring and assessing a probe card with an inspection device	4/23/2010	6/14/2017
TW201213814	TW20110114066	TW Application	Inspection device with vertically moveable assembly	4/23/2010	4/22/2011
US20140253166	US14/282565	US Application	Inspection device with vertically moveable assembly	4/23/2010	5/20/2014

TW1507692	TW20110114066	TW Grants	Inspection device with vertically moveable assembly	4/23/2010	4/22/2011
US9535089	US14/282565	US Grants	Inspection device with vertically moveable assembly	4/23/2010	5/20/2014
WO2012006221	WO2011US42656	WO Applicator	Scratch detection method and apparatus	7/3/2010	6/30/2011
TW201224442	TW20110123354	TW Application	Scratch detection method and apparatus	7/3/2010	7/1/2011
US20130216122	US13/806360	US Application	Scratch detection method and apparatus	7/3/2010	6/30/2011
US9406115	US13/806360	US Grants	Scratch detection method and apparatus	7/3/2010	6/30/2011
TW1564556	TW20110123354	TW Grants	Scratch detection method and apparatus	7/3/2010	7/1/2011
US20120015460	US12/837941	US Application	System and method for estimating field curvature	7/16/2010	7/16/2010
US8395783	US12/837950	US Grants	System metrology core	7/16/2010	7/16/2010
US20120015461	US12/837950	US Application	System metrology core	7/16/2010	7/16/2010
EP2593837	EP20110743166	EP Grants	Projection system with metrology	7/16/2010	7/7/2011
EP2593837	EP20110743166	EP Application	Projection system with metrology	7/16/2010	7/7/2011
US8760624	US12/837941	US Grants	System and method for estimating field curvature	7/16/2010	7/16/2010
SG10201505017P	SG10201505017P	SG Application	Projection system with metrology	7/16/2010	7/7/2011
US20130330154	US13/825769	US Application	Support for semiconductor substrate	9/24/2010	9/26/2011
US9401299	US13/825769	US Grants	Support for semiconductor substrate	9/24/2010	9/26/2011
WO2012040705	WO2011US53263	WO Applicator	Support for semiconductor substrate	9/24/2010	9/26/2011
US9140601	US13/982109	US Grants	Position sensitive detection optimization	1/28/2011	1/27/2012
WO2012103440	WO2012US22911	WO Applicator	Position sensitive detection optimization	1/28/2011	1/27/2012
TW201239335	TW20121102839	TW Application	Position sensitive detection optimization	1/28/2011	1/30/2012
SG192203	SG20130057682	SG Application	Position sensitive detection optimization	1/28/2011	1/27/2012
EP2668477	EP20120739797	EP Application	Position sensitive detection optimization	1/28/2011	1/27/2012
US20140103188	US13/982109	US Application	Position sensitive detection optimization	1/28/2011	1/27/2012
TW1548869	TW20121102839	TW Grants	Method and apparatus for optimizing signal to noise ratio in an optical sensor, and sensor adjustment mechanism	1/28/2011	1/30/2012
WO2012135513	WO2012US31235	WO Applicator	Method of manufacturing semiconductor devices	3/31/2011	3/29/2012
TW201308461	TW20120111400	TW Application	Method of manufacturing semiconductor devices	3/31/2011	3/30/2012
TW1564981	TW20120111400	TW Grants	Method of manufacturing semiconductor devices	3/31/2011	3/30/2012
US20120257207	US13/066219	US Application	Wafer shape thickness and trench measurement	4/8/2011	4/8/2011
US9714825	US13/066219	US Grants	Wafer shape thickness and trench measurement	4/8/2011	4/8/2011
TW201314831	TW20110134632	TW Application	Support for semiconductor substrate	9/24/2011	9/26/2011

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TW1553771	TW20110134632	TW Grants	Support for semiconductor substrate	9/24/2011	9/26/2011
US9113091	US13/930520	US Grants	High speed autofocus system	10/17/2011	6/28/2013
US20140104409	US13/930520	US Applications	High speed autofocus system	10/17/2011	6/28/2013
US20130100276	US13/651583	US Applications	High speed autofocus system	10/17/2011	10/15/2012
EP2769206	EP20120841130	EP Applications	High speed autofocus system	10/17/2011	10/17/2012
US9402036	US13/651583	US Grants	Scanning operation with concurrent focus and inspection	10/17/2011	10/15/2012
US20160352997	US15/209218	US Applications	High speed autofocus system	10/17/2011	7/13/2016
US10412311	US15/209218	US Grants	Focus adjustment for surface part inspection	10/17/2011	7/13/2016
AU2012326276	AU20120326276	AU Application	High speed autofocus system	10/17/2011	10/17/2012
AU2012326276	AU20120326276	AU Grants	High speed autofocus system	10/17/2011	10/17/2012
SG10201607779Q	SG20161007779Q	SG Applications	High speed autofocus system	10/17/2011	10/17/2012
TW1580948	TW20121138266	TW Grants	Method and apparatus for inspecting a part	10/17/2011	10/17/2012
MY164072	MY2014PI01130	MY Grants	High speed autofocus system	10/17/2011	10/17/2012
US20140368635	US14/367564	US Applications	On-axis focus sensor and method	12/23/2011	12/20/2012
US9594230	US14/367564	US Grants	On-axis focus sensor and method	12/23/2011	12/20/2012
WO2013096660	WO2012U571030	WO Application	On-axis focus sensor and method	12/23/2011	12/20/2012
TW201341754	TW20120149308	TW Application	On-axis focus sensor and method	12/23/2011	12/22/2012
Optical system for inspection of semiconductor devices, methods of capturing images of a semiconductor substrate with the same, and calibrating a position of the same					
TW1585360	TW20120149308	TW Grants	with the same, and calibrating a position of the same	12/23/2011	12/22/2012
US20130209211	US13/723618	US Applications	Wafer inversion mechanism	12/27/2011	12/21/2012
US9431282	US13/723618	US Grants	Wafer inversion mechanism	12/27/2011	12/21/2012
SG11201408664Y	SG11201408664Y	SG Applications	Flying sensor head	6/29/2012	6/27/2013
US20150323320	US14/409756	US Applications	Flying sensor head	6/29/2012	6/27/2013
US9772183	US14/409756	US Grants	Flying sensor head	6/29/2012	6/27/2013
WO2014004873	WO2013US48256	WO Application	Flying sensor head	6/29/2012	6/27/2013
TW201411113	TW20130123264	TW Application	Flying sensor head	6/29/2012	6/28/2013
TW1625514	TW20130123264	TW Grants	Optical system and flying sensor head	6/29/2012	6/28/2013
KR20150046009	KR20157002211	KR Applications	Flying sensor head	6/29/2012	6/27/2013
US20150253256	US14/432045	US Applications	Inspection of substrates using calibration and imaging	9/28/2012	9/27/2013

WO2014052811	WO2013US62272	WO Applicator	Inspection of substrates using calibration and imaging	9/28/2012	9/27/2013
US9664625	US14/432045	US Grants	Inspection of substrates using calibration and imaging	9/28/2012	9/27/2013
TW201428274	TW20132135080	TW Application	Inspection of substrates using calibration and imaging	9/28/2012	9/27/2013
SG11201502436S	SG20151102436S	SG Application	Inspection of substrates using calibration and imaging	9/28/2012	9/27/2013
TW1597491	TW20132135080	TW Grants	Optical system, wafer inspection systems and methods for optical inspection	9/28/2012	9/27/2013
WO2014055582	WO2013US62955	WO Applicator	Multiple-blade device for substrate edge protection during photolithography	10/5/2012	10/2/2013
US20150234281	US14/433194	US Application	Blade for substrate edge protection during photolithography	10/5/2012	10/2/2013
WO2014055585	WO2013US62958	WO Applicator	Blade for substrate edge protection during photolithography	10/5/2012	10/2/2013
US20150277239	US14/433233	US Application	Multiple-blade device for substrate edge protection during photolithography	10/5/2012	10/2/2013
US20150309425	US14/432912	US Application	Planar motor system with increased efficiency	10/5/2012	9/27/2013
US9625832	US14/432912	US Grants	Planar motor system with increased efficiency	10/5/2012	9/27/2013
WO2014055335	WO2013US62099	WO Applicator	Planar motor system with increased efficiency	10/5/2012	9/27/2013
TW201429124	TW20130136033	TW Application	Planar motor system with increased efficiency	10/5/2012	10/4/2013
TW201430502	TW20130136031	TW Application	Multiple-blade device for substrate edge protection during photolithography	10/5/2012	10/4/2013
TW201430503	TW20130136032	TW Application	Single-blade device for substrate edge protection during photolithography	10/5/2012	10/4/2013
EP2904455	EP20130774337	EP Application	Planar motor system with increased efficiency	10/5/2012	9/27/2013
EP2904456	EP20130774915	EP Application	Multiple-blade device for substrate edge protection during photolithography	10/5/2012	10/2/2013
EP2904457	EP20130776905	EP Application	Blade for substrate edge protection during photolithography	10/5/2012	10/2/2013
TW1610520	TW20130136033	TW Grants	Planar motor system with increased efficiency	10/5/2012	10/4/2013
US8659308	US13/647554	US Grants	Selective overtravel during electrical test of probe cards	10/9/2012	10/9/2012

US20150371886	US14/758718	US Application: Edge grip substrate handler	1/4/2013	12/20/2013
US9460953	US14/758718	US Grants Edge grip substrate handler	1/4/2013	12/20/2013
WO2014107351	WO2013US77102	WO Applicator Edge grip substrate handler	1/4/2013	12/20/2013
KR20150141934	KR20157022758	KR Application: Characterizing tsv microfabrication process and products	1/23/2013	1/23/2014
WO2014116878	WO2014US12827	WO Applicator Characterizing tsv microfabrication process and products	1/23/2013	1/23/2014
SG11201505661X	SGX11201505661	SG Application: Characterizing tsv microfabrication process and products	1/23/2013	1/23/2014
CN105051485	CN2014817566	CN Application: Characterizing tsv microfabrication process and products	1/23/2013	1/23/2014
US20150362314	US14/762613	US Application: products thereof Method of characterizing microfabrication process and	1/23/2013	1/23/2014
US9952041	US14/762613	US Grants Assessing alignment of top and bottom ends of tsvs and characterizing microfabrication process	1/23/2013	1/23/2014
CN105051485	CN2014817566	CN Grants Characterize tsv micro manufacturing processes and products thereof	1/23/2013	1/23/2014
US20160042987	US14/775133	US Application: Flexible handling system for semiconductor substrates	3/15/2013	3/17/2014
US20140320635	US14/213451	US Application: processes System and method of characterizing micro-fabrication	3/15/2013	3/14/2014
US9658169	US14/213451	US Grants System and method of characterizing micro-fabrication processes	3/15/2013	3/14/2014
US20170254757	US15/601239	US Application: processes System and method of characterizing micro-fabrication	3/15/2013	5/22/2017
US10024804	US15/601239	US Grants System and method of characterizing micro-fabrication processes	3/15/2013	5/22/2017
WO2014145456	WO2014US30224	WO Applicator Flexible handling system for semiconductor substrates	3/15/2013	3/17/2014
WO2014149213	WO2014US14890	WO Applicator Optical acoustic substrate assessment system and method	3/15/2013	2/5/2014
TW201439532	TW20140103917	TW Application Optical acoustic substrate assessment system and method	3/15/2013	2/6/2014

DE112014001440	DE20141101440T	DE	Application: Flexible handling system for semiconductor substrates	3/15/2013	3/17/2014
SG11201507587Q	SG11201507587Q	SG	Application: Optical acoustic substrate assessment system and method	3/15/2013	2/5/2014
CN105453243	CN2014825735	CN	Application: Optical acoustic substrate assessment system and method	3/15/2013	2/5/2014
CN105453243	CN2014825735	CN	Grants Optoacoustic substrate assessment system and method	3/15/2013	2/5/2014
TW1623746	TW20140103917	TW	Grants Optical acoustic substrate assessment system and method	3/15/2013	2/6/2014
CN108565205	CN20181216175	CN	Application: Optoacoustic substrate assessment system and method	3/15/2013	2/5/2014
US20170045463	US15/305380	US	Application: Volumetric substrate scanner	4/21/2014	4/21/2015
WO2015164325	WO2015US26801	WO	Applicator Volumetric substrate scanner	4/21/2014	4/21/2015
TW201602552	TW20150112586	TW	Application Volumetric substrate scanner	4/21/2014	4/20/2015
DE112015001901	DE20151101901T	DE	Application: Volumetric substrate scanner	4/21/2014	4/21/2015
JP2017518485	JP20160563832	JP	Applications Stereoscopic substrate scanning machine	4/21/2014	4/21/2015
KR20170016444	KR20177000253	KR	Application: inspection device Method of measuring and assessing a probe card with an	6/6/2014	6/5/2015
WO2015188093	WO2015US34470	WO	Applicator inspection device Method of measuring and assessing a probe card with an	6/6/2014	6/5/2015
TW201617625	TW20150118319	TW	Application inspection device Method of measuring and assessing a probe card with an	6/6/2014	6/5/2015
TW1655439	TW20150118319	TW	Grants inspection device Method of measuring and assessing a probe card with an	6/6/2014	6/5/2015
JP2017518493	JP20160567990	JP	Applications an inspection device Method for measuring and evaluating a probe card using	6/6/2014	6/5/2015
US9991176	US15/515126	US	Grants Non-destructive acoustic metrology for void detection	9/29/2014	9/29/2015
TW201618208	TW20150132117	TW	Application Non destructive acoustic metrology for void detection	9/29/2014	9/30/2015
US20170221778	US15/515126	US	Application: Non-destructive acoustic metrology for void detection	9/29/2014	9/29/2015
US20160101445	US14/881847	US	Application: Calibration of semiconductor metrology systems	10/13/2014	10/13/2015

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US10173249	US14/881847	US Grants	Calibration of semiconductor metrology systems	10/13/2014	10/13/2015
US20160148831	US14/944839	US Application	Method and apparatus to assist the processing of deformed substrates	11/24/2014	11/18/2015
US10014228	US14/944839	US Grants	Method and apparatus to assist the processing of deformed substrates	11/24/2014	11/18/2015
US20170141004	US15/346278	US Application	Opto-acoustic metrology of signal attenuating structures	11/12/2015	11/8/2016
US10209300	US15/346278	US Grants	Opto-acoustic metrology of signal attenuating structures	11/12/2015	11/8/2016
SG11201805283U	SG20181105283U	SG Application	Wafer singulation process control	12/30/2015	12/23/2016
WO2017117051	WO2016US68519	WO Application	Wafer singulation process control	12/30/2015	12/23/2016
TW201737303	TW20165143386	TW Application	Wafer singulation process control	12/30/2015	12/27/2016
KR20180089543	KR20187021613	KR Application	Wafer singulation process control	12/30/2015	12/23/2016
CN108701650	CN201680080297	CN Application	Wafer dicing process controls	12/30/2015	12/23/2016
EP3398204	EP20160882467	EP Application	Wafer singulation process control	12/30/2015	12/23/2016
US20190019728	US16/067748	US Application	Wafer singulation process control	12/30/2015	12/23/2016
JP2019500754	JP20180532444	JP Application	Wafer singulation process control	12/30/2015	12/23/2016
US20180173984	US15/850869	US Application	Substrate handling and identification mechanism	12/21/2016	12/21/2017
US20180275063	US15/933362	US Application	Semiconductor device inspection of metallic discontinuities	3/22/2017	3/22/2018
US20180277452	US15/933366	US Application	Inspection of substrates	3/22/2017	3/22/2018
US10553504	US15/933366	US Grants	Inspection of substrates	3/22/2017	3/22/2018
WO2018227031	WO2018US36573	WO Application	Wafer inspection system including a laser triangulation sensor	6/8/2017	6/8/2018
TW201903926	TW20187119848	TW Application	Wafer inspection system including a laser triangulation sensor	6/8/2017	6/8/2018
CN110720135	CN201880037993	CN Application	Wafer inspection system including laser triangulation sensor	6/8/2017	6/8/2018
WO2019067834	WO2018US53300	WO Application	Wafer-level package assembly handling	9/28/2017	9/28/2018
TW201923932	TW20180134104	TW Application	Wafer-level package assembly handling	9/28/2017	9/27/2018
WO2019067809	WO2018US53254	WO Application	System and method for optimizing a lithography exposure process	9/29/2017	9/28/2018
WO2019067221	WO2018US50788	WO Application	High resolution stage positioner	9/29/2017	9/13/2018
CN109585350	CN201811067603	CN Application	High-res stage locator	9/29/2017	9/13/2018

Patent No.	IPC Class.	Applicant	Inventor	Title	Pub. No.	Pub. Date
TW201915981	TW20180134488	TW Application process		System and method for optimizing a lithography exposure	9/29/2017	9/28/2018
TW201916239	TW20180132213	TW Application High resolution stage positioner			9/29/2017	9/13/2018
CN109581823	CN201811139174	CN Application: manufacture process		System and method for optimizing lithographic exposure	9/29/2017	9/28/2018
WO2019090315	WO2018US59404	WO Applicator inspection		Laser triangulation sensor system and method for wafer	11/6/2017	11/6/2018
TW201925720	TW20180139314	TW Application inspection		Laser triangulation sensor system and method for wafer	11/6/2017	11/6/2018
WO2019133457	WO2018US66991	WO Applicator Conformal stage			12/28/2017	12/21/2018
WO2019133579	WO2018US67467	WO Applicator Separated axis lithographic tool			12/28/2017	12/26/2018
CN109976101	CN201811598227	CN Application: Split shaft lithography tool			12/28/2017	12/26/2018
TW201931031	TW20187147128	TW Application Separated axis lithographic tool			12/28/2017	12/26/2018
TW201939170	TW20187146432	TW Application Conformal stage			12/28/2017	12/21/2018
CN110018617	CN201811570247	CN Application: Comply with board			12/28/2017	12/21/2018

Title	Coun	Filing Date	Publication [	Publication #	Internal Reference	Serial #
Apparatus and Method for Making Large Area Electronic Devices, Such as Flat Panel Displays and the Like, Using Correlated, Aligned Dual Optical Systems	US	10/22/1987	9/6/1988	4769680	RTP-1851-01-US	07/111427
Optical Alignment System for Use in Photolithography and Having Reduced Reflectance Errors	US	5/13/1988	8/8/1989	4855792	RTP-1852-01-US	07/193887
Method and Apparatus for Inspecting Integrated Circuit Probe Cards	US	10/5/1988	4/17/1990	4918374	RTP-847-01-US	07/254269
Method of Making Probe Cards	US	3/1/1990	10/29/1991	5060371	RTP-848-01-US	07/487434
Apparatus and Method for Making Large Area Electronic Devices, Such as Flat Panel Displays and the Like, Using Correlated, Aligned Dual Optical Systems	US	8/24/1990	3/3/1992	RE33836	RTP-1851-02-US	07/573400
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	US	1/11/1991	11/24/1992	5166752	RTP-1135-01-US	07/640100
Method and Apparatus for Inspecting Integrated Circuit Probe Cards	US	4/22/1991	4/16/1996	5508629	RTP-473-03-US	07/689294
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	DE	1/10/1992	8/5/1998	69226514.7	RTP-1135-01-DE	92904023.6
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	EP	1/10/1992	8/5/1998	566657	RTP-1135-01-EP	EP19920904023
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	FR	1/10/1992	8/5/1998	566657	RTP-1135-01-FR	92904023.6
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	GB	1/10/1992	8/5/1998	566657	RTP-1135-01-GB	92904023.6
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	JP	1/10/1992	10/18/2002	3360822	RTP-1135-01-JP	504542/1992
Simultaneous Multiple Angle-Multiple Wavelength Ellipsometer and Method	KR	1/10/1992	3/23/1999	203345	RTP-1135-01-KR	93-702082
Method for Obtaining Three-Dimensional Data from Multiple Parts or Devices in a Multi-Pocketed Tray	US	6/24/1992	10/31/1995	5463227	RTP-1654	07/903524
Method for Obtaining Three-Dimensional Data from Multiple Parts or Devices in a Multi-Pocketed Tray	US	7/28/1992	12/6/1994	5371375	RTP-1653	07/921317
Horizontal Vibrator Method for Orienting Articles	US	11/25/1992	11/23/1993	5263567	RTP-1652	07/981835

Method And Apparatus for Generating a Sequence of Steps for Use by a Factory	US	3/29/1993	10/3/2000	6128542	RTP-1508-01-US	08/038577
Signal Intercept System and Method	US	7/23/1993	8/13/1996	5546398	RTP-431-01-US	08/096665
Multi-Variable Statistical Process Controller For Discrete Manufacturing	US	9/20/1993	4/18/1995	5408405	RTP-1505-01-US	08/124083
Ice Detector	WO	10/20/1993			RTP-845-01-WO	WO1993US10035
Method for Obtaining Three-Dimensional Data from Multiple Devices in a Multi-Pocketed Tray	KR	10/21/1993	7/23/2001	10-0304453	RTP-828-01-KR	10-1993-0021889
Apparatus for Obtaining Three-Dimensional Data From Multiple Parts or Devices in a Multipocketed Tray	KR	11/5/1993	11/15/2000	281160	RTP-826-01-KR	93-23357
Method for Steering Laser Beam	KR	11/5/1993	7/30/2001	10-0305375	RTP-827-01-KR	10-1993-0023356
Apparatus and Method for Image Processing in Symbolic Space	US	1/21/1994	5/7/1996	5515453	RTP-430-01-US	08/186750
System and Method for Recognizing Visual Indicia	US	1/21/1994	9/3/1996	5553168	RTP-432-01-US	08/185610
Use Of Spatial Models For Simultaneous Control Of Various Non-Uniformity Metrics	US	2/24/1994	8/13/1996	5546312	RTP-1506-01-US	08/201302
Use of Spatial Models for Simultaneous Control of Various Non-Uniformity Metrics	US	2/24/1994	8/13/1996	5546312	RTP-1659-01-US	08/201302
Computer-Aided Manufacturing Support Method and System for Specifying Relationships and Dependencies Between Process Type Components	US	2/27/1994	12/17/1996	5586039	RTP-1660-01-US	08/395023
Method and Apparatus for Generating a Sequence of Steps for Use by a Factory	JP	3/28/1994			RTP-1508-01-JP	57657/94
Reticle Alignment System for Use in Lithography	US	4/18/1994	11/20/2001	6320644	RTP-1853-01-US	08/228889
Micropolarimeter, Microsensor System and Method of Characterizing Thin Films	US	6/28/1994	3/26/1996	5502567	RTP-1850-01-US	08/268149
Focusing Light Source with Flexible Mount for Multiple Light Emitting Elements	US	7/20/1994	12/3/1996	5580163	RTP-116-00-US	08/277952
Segmented Position Sensing Detector for Reducing Non-Uniformly Distributed Stray Light from a Spot Image	US	9/22/1994	9/10/1996	5554858	RTP-823-01-US	08/310841
Lithographic System Using Dual Substrate Stages	US	2/9/1995	10/14/1997	5677758	RTP-1855-01-US	08/386266

Computer-Aided Manufacturing Support Method and System for Specifying Relationships and Dependencies Between Process Type Components	US	2/27/1995	12/17/1996	5586039	RTP-1507-01-US	08/395023
Dual-Bed Scanner with Reduced Transport Time System for Inspecting PIN Grid Arrays	US	5/5/1995	11/25/1997	5691810	RTP-839-01-US	08/435821
Method for Obtaining Three-Dimensional Data from Semiconductor Devices	US	5/18/1995	7/15/1997	5648853	RTP-832-01-US	08/444258
Chromatic Optical Ranging Sensor	US	6/7/1995	2/4/1997	5600150	RTP-841-01-US	08/476212
Method for Obtaining Three-Dimensional Data from Semiconductor Devices	US	7/31/1995	8/4/1998	5790242	RTP-846-01-US	08/509534
Ultrafast Optical Technique for the Characterization of Altered Materials	US	8/12/1995	11/25/1997	5691544	RTP-843-01-US	08/709189
Method for Obtaining Three-Dimensional Data from Semiconductor Devices	US	8/25/1995	1/6/1998	5706094	RTP-1001-01-US	08/519666
Apparatus and Method for Characterizing Thin Film and Interfaces Using an Optical Heat Generator and Detector	US	9/25/1995	10/6/1998	5818061	RTP-842-01-US	08/533170
Improved Optical Stress Generator and Detector	US	1/22/1996			RTP-1002-00-US	60/010295
Apparatus and Method for Aligning and Measuring Registration	US	1/23/1996			RTP-999-00-US	60/010543
Apparatus and Method for Recognizing Visual Indicia	US	2/16/1996	12/9/1997	5696835	RTP-433-01-US	08/603026
Lens Focus Shift Sensor	US	2/16/1996	12/30/1997	5703969	RTP-434-01-US	08/602998
Optical Method for Determining the Mechanical Properties of a Material	US	4/3/1996	11/23/1999	5991004	RTP-1856-01-US	08/627892
Optical Method for Determining the Mechanical Properties of a Material	US	4/26/1996			RTP-1004-00-US	60/017481
Probe Card Check Plate with Transition Zones	US	5/8/1996			RTP-1004-01-US	60/017391
Dual-Bed Scanner with Reduced Transport Time Method and System for Measuring Object Features	US	6/5/1996	11/3/1998	5831443	RTP-849-01-US	08/658659
Chromatic Optical Ranging Sensor	US	6/27/1996	9/16/1997	5668630	RTP-857-01-US	08/671065
Chromatic Optical Ranging Sensor	US	7/12/1996	1/12/1999	5859924	RTP-815-01-US	08/680342
Chromatic Optical Ranging Sensor	DK	7/20/1996	8/4/1998	762143	RTP-846-01-DK	96111721.5
Chromatic Optical Ranging Sensor	EP	7/20/1996	10/4/2000	762143	RTP-846-01-EP	EP19960111721
Chromatic Optical Ranging Sensor	FR	7/20/1996	10/4/2000	762143	RTP-846-01-FR	96 111 721.5
Chromatic Optical Ranging Sensor	DE	7/20/1996	10/4/2000	762143	RTP-846-01-DE	96111721.5

Chromatic Optical Ranging Sensor	IT	7/20/1996	10/4/2000	762143	RTP-846-01-IT	96111721.5
Chromatic Optical Ranging Sensor	NL	7/20/1996	10/4/2000	762143	RTP-846-01-NL	96111721.5
Chromatic Optical Ranging Sensor	UK	7/20/1996	10/4/2000	762143	RTP-846-01-UK	96111721.5
Ultrafast Optical Technique for the Characterization of Altered Materials	JP	7/26/1996			RTP-1001-01-JP	8-533597
Ultrafast Optical Technique for the Characterization of Altered Materials	KR	7/26/1996	7/30/2004	443856	RTP-1001-01-KR	1998-701407
Ultrafast Optical Technique for the Characterization of Altered Materials	WO	7/26/1996			RTP-1001-01-WO	WO1996US12331
Non-Contact Edge Detector	US	8/2/1996	4/14/1998	5739913	RTP-1857-01-US	08/693469
Improved Optical Stress Generator and Detector Method for Obtaining Three-Dimensional Data from Semiconductor Devices	US	8/6/1996	5/5/1998	5748318	RTP-999-01-US	08/689287
Multichannel Position Sensing Detector	US	8/12/1996	8/11/1998	5793051	RTP-844-01-US	08/700581
Method and System for Imaging an Object or Pattern	US	9/5/1996	3/3/1998	5723869	RTP-830-01-US	08/707637
Improved Optical Stress Generator and Detector	US	11/12/1996	6/13/2000	6075883	RTP-816-01-US	08/748040
Improved Optical Stress Generator and Detector	DE	12/31/1996	5/12/2011	19681741	RTP-999-01-DE	19681741.2
Improved Optical Stress Generator and Detector	JP	12/31/1996	10/23/2009	4393585	RTP-999-01-JP	9-526852
Improved Optical Stress Generator and Detector	WO	12/31/1996			RTP-999-01-WO	WO1996US20917
Apparatus and Method for Characterizing Thin Film and Interfaces Using an Optical Heat Generator and Detector	US	1/21/1997	5/5/1998	5748317	RTP-1002-01-US	08/786706
Optical Method for Determining the Mechanical Properties of a Material	US	2/28/1997	12/1/1998	5844684	RTP-1004-03-US	08/808632
Optical Method for Determining the Mechanical Properties of a Material	DE	4/10/1997	10/18/2007	19781728	RTP-1004-01-DE	19781728.9
Optical Method for Determining the Mechanical Properties of a Material	JP	4/10/1997	10/12/2007	4025369	RTP-1004-01-JP	9-538910
Optical Method for Determining the Mechanical Properties of a Material	WO	4/10/1997			RTP-1004-01-WO	WO1997US05956
Method and System for Establishing a Common Reference Point on a Semiconductor Wafer Inspected by Two or More Scanning Mechanisms	US	4/14/1997	2/22/2000	6028664	RTP-122-00-US	08/833217
Method and System for Identifying Defects in a Semiconductor	US	5/30/1997	9/18/2001	6292582	RTP-440-01-US	08/867154

System and Method for Circuit Repair	US	5/30/1997	3/20/2001	6205239	RTP-436-01-US	08/866553
System and Method for Knowledge-Based Generation and Management	US	5/30/1997	6/12/2001	6246787	RTP-437-01-US	08/866771
System and Method for Semiconductor Anomaly Detection	US	5/30/1997	7/18/2000	6091846	RTP-435-01-US	08/867156
Method and System for Measuring Object Features	IE	6/19/1997	8/2/2006	979386	RTP-815-01-IE	97931329.3
Method and System for Measuring Object Features	BE	6/19/1997	8/2/2006	979386	RTP-815-01-BE	97931329.3
Method and System for Measuring Object Features	EP	6/19/1997	8/2/2006	EP0979386	RTP-815-01-EP	EP19970931329
Method and System for Measuring Object Features	IT	6/19/1997	8/2/2006	979386	RTP-815-01-IT	97931329.3
Method and System for Measuring Object Features	UK	6/19/1997	8/2/2006	979386	RTP-815-01-UK	97931329.3
Method and Apparatus for Automatic Inspection of Two Dimensional and Three Dimensional Criteria of Objects	US	6/30/1997			RTP-098-00-PRO	60/051239
Optical Method for the Determination of Stress in Thin Films	US	7/30/1997	1/26/1999	5864393	RTP-1005-01-US	08/902695
Platen for Use with Lithographic Stages and Method of Making Same	US	8/22/1997	10/27/1998	5828142	RTP-1854-01-US	08/918704
CCD Imaging Device for High Speed Profiling	US	9/2/1997	1/1/2002	6335757	RTP-811-01-US	08/922026
Ultrafast Optical Technique for the Characterization of Altered Materials	US	9/5/1997	12/28/1999	6008906	RTP-1001-02-US	08/924792
Improved Optical Stress Generator and Detector	US	10/17/1997	9/28/1999	5959735	RTP-999-02-US	08/954347
Method and System for Imaging	NL	11/7/1997	9/17/2003	1016028	RTP-816-01-NL	97946611.71.
Method and System for Imaging an Object or Pattern	CA	11/7/1997	5/29/2007	2271492	RTP-816-01-CA	2271492
Method and System for Imaging an Object or Pattern	DE	11/7/1997	9/17/2003	69725021	RTP-816-01-DE	97946611.7
Method and System for Imaging an Object or Pattern	EP	11/7/1997	9/17/2003	EP1016028	RTP-816-01-EP	EP19970946611
Method and System for Imaging an Object or Pattern	FR	11/7/1997	9/17/2003	1016028	RTP-816-01-FR	97946611.7
Method and System for Imaging an Object or Pattern	IT	11/7/1997	9/17/2003	1016028	RTP-816-01-IT	97946611.7
Method and System for Imaging an Object or Pattern	SP	11/7/1997	9/17/2003	97946611	RTP-816-01-SP	97946611.7
Method and System for Imaging an Object or Pattern	IE	11/7/1997	9/17/2003	1016028	RTP-816-06-IE	97946611.7
Method and System for Imaging an Object or Pattern	UK	11/7/1997	9/17/2003	1016028	RTP-816-07-UK	97946611.7
Method and System for Imaging an Object or Pattern	BE	11/7/1997	9/17/2003	1016028	RTP-816-01-BE	97946611.7
Apparatus and Method for Automatic Knowledge-Based Object Identification	US	12/24/1997	1/11/2000	6014461	RTP-450-01-US	08/998315

System and Method for Selective Scanning of an Object or Pattern including Scan Correction	US	2/5/1998	2/29/2000	6031225	RTP-826-01-US	09/019479
System and Method of Optically Inspecting Manufactured Devices	US	5/6/1998	6/12/2001	6246788	RTP-438-01-US	09/074301
Method and System for Measuring Object Features	US	6/10/1998	1/30/2001	6181472	RTP-824-01-US	09/095367
Method and Apparatus for Automatic Inspection of Two Dimensional and Three Dimensional Criteria of Objects	WO	6/26/1998			RTP-098-00-WO	WO1998US13303
Optical Method for the Determination of Stress in Thin Films	WO	7/2/1998			RTP-1005-01-WO	WO2098US13742
Apparatus and Method for Measurement of the Mechanical Properties and Electromigration of Thin Films	US	7/7/1998	2/15/2000	6025918	RTP-1006-01-US	09/111456
Apparatus and Method for the Determination of Grain Size in Thin Films	US	7/7/1998	3/14/2000	6038026	RTP-996-01-US	09/110886
Ultrafast Optical Technique for the Characterization of Altered Materials	DE	7/13/1998	1/29/2009	19882660	RTP-1001-01-DE	19882660.5
Ultrafast Optical Technique for the Characterization of Altered Materials	JP	7/13/1998			RTP-1001-02-JP	Not Available
Ultrafast Optical Technique for the Characterization of Altered Materials	WO	7/13/1998			RTP-1001-02-WO	WO1998US14180
Inspection Handler Apparatus and Method	SG	7/15/1998	12/19/2001	70418	RTP-831-01-SG	200000203-0
Ultrafast Optical Technique for the Characterization of Altered Materials	TW	7/21/1998	12/6/2001	138570	RTP-1001-01-TW	87111831
Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	DE	9/1/1998	5/13/2004	DE69816320	RTP-811-01-DE	19980941191
Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	JP	9/1/1998	2/20/2009	4259749	RTP-811-01-JP	2000-508957
Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	KR	9/1/1998	3/27/2006	10-0566731	RTP-811-01-KR	2000-7002211
Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	SG	9/1/1998	4/30/2004	71416	RTP-811-01-SG	200001084-3
Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	FR	9/1/1998	8/2/2000	1023574	RTP-811-01-FR	19980941191

Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	IE	9/1/1998	8/2/2000	1023574	RTP-811-01-IE	19980941191
Interline Transfer CCD Driven with Enhanced Frame Transfer Frequency for High Speed Profiling	UK	9/1/1998	8/2/2000	1023574	RTP-811-01-UK	19980941191
System and Method of Optically Inspecting Structures on an Object	US	3/4/1999	11/26/2002	6487307	RTP-442-01-US	09/262603
Method and Apparatus for Determining Relative Positions of Probe Tips on a Printed Circuit Board	US	3/9/1999	3/23/2004	6710798	RTP-809-01-US	09/265105
System and Method for Selection of a Reference Die	US	3/17/1999	6/26/2001	6252981	RTP-099-01-US	09/270607
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis	US	6/7/1999	7/2/2002	6414477	RTP-851-01-US	09/327106
System and Method for Measuring Object Features with Coordinated Two and Three Dimensional Imaging	US	6/8/1999	9/18/2001	6291816	RTP-819-01-US	09/327817
Method and System for Imaging an Object with a Plurality of Optical Beams	EP	6/9/1999			RTP-818-01-EP	EP19990955545
Method and System for Imaging an Object with a Plurality of Optical Beams	KR	6/9/1999	4/4/2007	706135	RTP-818-01-KR	10-2000-7014009
Method and System for Imaging an Object with a Plurality of Optical Beams	HK	6/9/1999			RTP-818-01-HK	1106007.7
System and Method of Optically Inspecting Surface Structures on an Object	US	6/23/1999	9/18/2001	6292260	RTP-439-01-US	09/338880
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	7/13/1999	11/27/2001	6324298	RTP-037-00-US	09/352564
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	WO	7/15/1999			RTP-037-00-WO	WO1999US16244
Automated Wafer Defect Inspection System	EP	7/15/1999		EP1112550	RTP-037-00-EP	EP19990934136
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	JP	7/15/1999			RTP-037-00-JP	2000-560537
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	SG	7/15/1999	2/28/2006	78693	RTP-037-00-SG	200100341-7
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	JP	7/15/1999			RTP-037-01-JP	2009-218183
Automated Wafer Defect Inspection System	FR	7/15/1999		EP1112550	RTP-037-00-FR	

**PATENT**

**REEL: 053117 FRAME: 0584**

Automated Wafer Defect Inspection System	AT	7/15/1999	EP1112550	RTP-037-00-AT	AT531075T
Automated Wafer Defect Inspection System	DE	7/15/1999	EP1112550	RTP-037-00-DE	DE69943820.9
Automated Wafer Defect Inspection System	GB	7/15/1999	EP1112550	RTP-037-00-GB	
Improved Optical Stress Generator and Detector	US	8/24/1999	1/16/2001 6175416	RTP-999-03-US	09/382251
Ultrafast Optical Technique for the Characterization of Altered Materials	US	8/30/1999	4/3/2001 6211961	RTP-1001-03-US	09/385175
Method for Testing a Surface and Scanner to Analyze Surfaces	DE	9/8/1999	12/15/2005 1156321B	RTP-1960-01-DE	69922844
System and Method for Data Format Translation	US	9/15/1999		RTP-448-01-US	09/369282
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	9/23/1999	11/27/2001 6321601	RTP-1008-01-US	09/404939
System and Method for Three-Dimensional Surface Inspection	US	11/19/1999	5/2/2006 7039228	RTP-443-01-US	09/444034
Semiconductor Yield Management System and Method	US	12/8/1999	10/22/2002 6470229	RTP-1572-01-US	09/458185
Optical Method for the Determination of Grain Orientation in Films	US	12/13/1999	11/13/2001 6317216	RTP-1007-01-US	09/459701
Chromatic Optical Ranging Sensor	EP	12/29/1999		RTP-846-02-EP	EP19990126196
Chromatic Optical Ranging Sensor	FR	12/29/1999		RTP-846-02-FR	99126196.7
Chromatic Optical Ranging Sensor	UK	12/29/1999		RTP-846-02-UK	99126196.7
Ellipsometer and Ellipsometry Method	US	1/7/2000	7/3/2001 6256097	RTP-1133-01-US	09/478795
Micropolarimeter	US	2/3/2000	7/31/2001 6268915	RTP-1815-01-US	09/485111
Apparatus and Method for Measurement of the Mechanical Properties and Electromigration of Thin Films	US	2/10/2000	3/27/2001 6208418	RTP-1006-02-US	09/501943
Improved Optical Stress Generator and Detector	US	2/23/2000	8/7/2001 6271921	RTP-999-04-US	09/511719
Improved Optical Stress Generator and Detector	US	2/23/2000	3/27/2001 6208421	RTP-999-05-US	09/512141
Method and System for Imaging an Object or Pattern	US	3/3/2000	8/5/2003 6603874	RTP-816-02-US	09/518559
System and Method for Classifying Anomaly	US	3/6/2000	11/19/2002 6483938	RTP-441-01-US	09/519678
Method and Apparatus for Determining Relative Positions of Probe Tips on a Printed Circuit Board Probe Card	DE	3/9/2000	10/5/2000 DE20004439	RTP-809-01-DE	20004439.7
CCD Imaging Device and Method for High Speed Profiling	US	3/10/2000	4/26/2005 6885400	RTP-812-01-US	09/522819

Imaging System Apparatus and Method for the Determination of Grain Size in Thin Films	US	3/10/2000	6/18/2002	6407810	RTP-825-01-US	09/522540
System and Method for Selection of a Reference Die	US	3/13/2000	2/20/2001	6191855	RTP-996-02-US	09/524034
System and Method for Selection of a Reference Die	EP	3/17/2000			RTP-099-00-EP	EP20000918027
System and Method for Selection of a Reference Die	KR	3/17/2000	5/28/2010	10-1060428	RTP-099-00-KR	10-01-7011789
System and Method for Selection of a Reference Die	SG	3/17/2000			RTP-099-00-SG	200105328-9
System and Method for Selection of a Reference Die	WO	3/17/2000			RTP-099-00-WO	WO2000US06979
System and Method for Selection of a Reference Die	JP	3/17/2000	5/28/2010	4520046	RTP-099-00-JP	2000-605956
Modular Substrate Measurement System	US	4/13/2000	7/16/2002	6420864	RTP-1812-01-US	09/548773
System and Method for Locating Image Features	US	4/18/2000	6/1/2004	6744913	RTP-100-00-US	09/551106
Wafer Like Substrate Handler	US	4/24/2000			RTP-066-00-US	60/199278
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/29/2000			RTP-063-00-US	09/562262
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/29/2000			RTP-065-00-US	09/562271
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/29/2000			RTP-068-00-US	09/562272
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/29/2000			RTP-070-00-US	09/462263
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/29/2000	8/30/2005	6937753	RTP-064-00-US	09/561570
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/29/2000	11/30/2004	6826298	RTP-069-01-US	09/562273
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis	EP	6/7/2000	12/29/2004	EP1061381	RTP-851-01-EP	EP20000112260
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis	FR	6/7/2000	12/29/2004	1061381	RTP-851-01-FR	112260.5
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis	EP	6/7/2000	1/10/2007	EP1519200	RTP-851-02-EP	EP20040030715
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis	AT	6/7/2000	1/10/2007	1519200	RTP-851-01-AT	0 4030715.9
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis Data	IT	6/7/2000	1/10/2007	1519200	RTP-851-01-IT	0 4030715.9

Method for Optimizing Probe Card Analysis and Scrub Mark Analysis Data	JP	6/7/2000	5/12/2006	3800394	RTP-851-01-JP	2000-210553
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis Data	DE	6/7/2000	12/29/2004	60017016	RTP-851-01-DE	112260.5
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis Data	IE	6/7/2000	12/29/2004	1061381	RTP-851-01-IE	112260.5
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis Data	UK	6/7/2000	12/29/2004	1061381	RTP-851-01-UK	112260.5
System and Method for Measuring Object Features with Coordinated Two and Three Dimensional Imaging	CA	6/7/2000			RTP-819-01-CA	2375741
System and Method for Measuring Object Features with Coordinated Two and Three Dimensional Imaging	EP	6/7/2000			RTP-819-01-EP	EP20000936499
System and Method for Measuring Object Features with Coordinated Two and Three Dimensional Imaging	KR	6/7/2000	3/26/2007	702071	RTP-819-01-KR	10-2001-7015830
System and Method for Measuring Object Features with Coordinated Two and Three Dimensional Imaging	SG	6/7/2000	3/31/2004	85551	RTP-819-01-SG	200107697-5
System and Method for Locating Irregular Edges in Image Data	US	6/13/2000	10/1/2002	6459807	RTP-101-01-US	09/592641
System and Method for Inspecting Bumped Wafers	US	8/3/2000	7/20/2004	6765666	RTP-102-00-US	09/631509
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	EP	8/23/2000	10/15/2014	EP1242785	RTP-1008-01-EP	EP20000955841
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	WO	8/23/2000			RTP-1008-01-WO	WO2000US23059
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	KR	8/23/2000	10/25/2006	10-0641271	RTP-1008-02-KR	2002-7003782
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	FR	8/23/2000	10/15/2014	1242785	RTP-1008-01-FR	955841.2
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	DE	8/23/2000	10/15/2014	60048754.7	RTP-1008-01-DE	955841.2

Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	GB	8/23/2000	10/15/2014	1242785	RTP-1008-01-GB	955841.2
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	IE	8/23/2000	10/15/2014	1242785	RTP-1008-01-IE	955841.2
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	NL	8/23/2000	10/15/2014	1242785	RTP-1008-01-NL	955841.2
Optical Metrology System and Method Employing Laser-Server Supplying Laser Energy to Distributed Slave Metrology Heads	US	9/11/2000			RTP-998-00-US	60/231611
System and Method for Detecting Defects on a Structure-Bearing Surface Using Optical Inspection	US	10/27/2000	11/2/2004	6813376	RTP-444-01-US	09/697807
Method of Applying the Analysis of Scrub Mark Morphology and Location to the Evaluation and Correction of Semiconductor Testing Analysis and Manufacture	US	10/30/2000			RTP-783-01-PRO	60/244432
Optical Method for the Determination of Grain Orientation in Films	WO	12/6/2000			RTP-1007-01-WO	WO2000US42789
Optical Method For The Determination Of Grain Orientation In Films	EP	12/6/2000	4/6/2016	1247069	RTP-1007-02-EP	EP20000992924
Optical Method For The Determination Of Grain Orientation In Films	DE	12/6/2000	4/6/2016	1247069	RTP-1007-02-DE	
Optical Method For The Determination Of Grain Orientation In Films	FR	12/6/2000	4/6/2016	1247069B	RTP-1007-02-FR	992924.1
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	12/29/2000			RTP-072-00-US	09/751632
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	12/29/2000			RTP-073-00-US	09/751854
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	12/29/2000			RTP-074-00-US	09/751851
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	12/29/2000			RTP-075-00-US	09/752755
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	12/29/2000			RTP-076-00-US	09/751643

Optical Metrology System and Method Employing Laser-Server Supplying Laser Energy to Distributed Slave Metrology Heads	US	12/29/2000	9/16/2003	6621582	RTP-998-01-US	09/750996
Ellipsometer and Ellipsometry Method	EP	1/8/2001			RTP-1133-01-EP	EP20010932496
Ellipsometer and Ellipsometry Method	WO	1/8/2001			RTP-1133-01-WO	WO2001US00504
Method and System for Measuring Object Features	US	1/16/2001	2/25/2003	6525827	RTP-824-02-US	09/760615
Method and Apparatus for Measuring Very Thin Dielectric Film Thickness and Creating a Stable Measurement Environment	US	1/31/2001	2/11/2003	6519045	RTP-1134-01-US	09/772901
Imaging System	KR	3/7/2001	12/22/2008	10-0876471	RTP-825-01-KR	10-2002-7011882
Imaging System	CA	3/7/2001			RTP-825-01-CA	2402632
Imaging System	EP	3/7/2001			RTP-825-01-EP	EP20010913348
Method and Apparatus for Decreasing Thermal Loading and Roughness Sensitivity in a Photoacoustic Film Thickness Measurement System	US	3/21/2001			RTP-1003-00-US	60/277818
Optically-Based Method and Apparatus for Detecting and Characterizing Surface Pits in Metal Film During Chemical Mechanical Polishing	US	4/12/2001			RTP-997-00-US	60/283508
System and Method for Locating Image Features	WO	4/17/2001			RTP-100-00-WO	WO2001US12503
System and Method for Locating Image Features	TW	4/17/2001	8/21/2005	I238522	RTP-100-00-TW	90109190
Inspection Plates for Die Storage Packs	US	4/24/2001			RTP-084-00-US	09/841623
System and Method for Selection of a Reference Die	US	5/3/2001			RTP-099-02-US	09/848479
Improved Optical Stress Generator and Detector System and Method for Inspection Using White Light Interferometry	US	5/3/2001	6/4/2002	6400449	RTP-999-06-US	09/848144
Method for inspection of an analyzed surface and surface scanning analyzer	WO	5/12/2001			RTP-105-00-WO	WO2001US43178
System and Method for Locating Irregular Edges in Image Data	US	5/30/2001	10/14/2003	6633372	RTP-1960-01-US	09/866725
Method and Apparatus for Decreasing Thermal Loading and Roughness Sensitivity in a Photoacoustic Film Thickness Measuring System.	WO	6/7/2001			RTP-101-00-WO	WO2001US24492
Metrology System With Spectroscopic Ellipsometer and Photoacoustic Measurements	US	7/13/2001			RTP-1100-00-US	60/305226
	US	7/13/2001			RTP-1101-01-PRO	60/305227

Method and Apparatus for Optimizing Signal to Ration in a Photoacoustic Metrology System Using an Adjustable Pulse Repetition Rate Laser, Pulse Energy Beam Dither and Spot Size Adjustment	US	7/13/2001	RTP-1102-00-US	60/305183
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	US	7/13/2001	RTP-1103-00-US	60/305175
Confocal 3D Inspection and Process	US	7/16/2001	RTP-080-00-PRO	60/305823
Confocal 3D Inspection and Process	US	7/16/2001	RTP-081-00-PRO	60/305730
Confocal 3D Inspection and Process	US	7/16/2001	RTP-082-00-PRO	60/305729
Dual Metrology System Including Spectroscopic Ellipsometer and Photoacoustic Film Thickness Measurement System	US	7/17/2001	RTP-1104-00-US	60/306120
Confocal 3D Inspection and Process	US	8/1/2001	RTP-083-00-PRO	60/309292
System and Method for Inspecting Bumped Wafers	WO	8/3/2001	RTP-102-00-WO	WO2001US24492
System and Method for Inspection Bumped Wafers	TW	8/3/2001	RTP-102-00-TW	90119032
Optical Metrology System and Method Employing Laser-Server Supplying Laser Energy to Distributed Slave Metrology Heads	WO	9/11/2001	RTP-998-01-WO	WO2001US42102
Confocal 3D Inspection and Process	US	9/12/2001	RTP-071-00-US	09/952537
System and Method for Analyzing Error Information from a Semiconductor Fabrication Process	US	9/14/2001	RTP-1573-01-US	09/952848
Methods and Apparatus for Determining Optical Constants of Semiconductors and Dielectrics with Interband States	US	9/27/2001	RTP-1136-01-US	09/963638
System and Method for Inspecting Components	US	9/28/2001	RTP-103-00-US	09/966712
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	10/1/2001	RTP-1008-03-US	09/969336
System and Method for Inspection Using Off-Angle Lighting	US	10/23/2001	RTP-104-00-US	10/035592
Method of Applying the Analysis of Scrub Mark Morphology and Location to the Evaluation and Correction of Semiconductor Testing Analysis and Manufacture	US	10/27/2001	RTP-783-04-US	10/046559

Optical Method for the Determination of Grain Orientation in Films	US	11/5/2001	5/13/2003	6563591	RTP-1007-03-US	10/012985
Reticle Alignment System for Use in Lithography	US	11/20/2001	11/19/2002	6483572	RTP-1853-02-US	09/989097
System and Method for Inspection Using White Light Interferometry	CN	12/5/2001			RTP-105-00-CN	1923945.5
System and Method for Inspection Using White Light Interferometry	EP	12/5/2001			RTP-105-00-EP	EP20010995118
Method and System for Reviewing a Semiconductor Wafer Using at Least One Defect Sampling Condition	US	12/13/2001	11/4/2003	6643006	RTP-123-00-US	10/016996
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	US	12/28/2001			RTP-852-00-PRO	60/346447
Dual-Axis Scanning for the Localization of Objects in Three-Dimensional Space	US	12/28/2001			RTP-853-00-PRO	60/346313
Measurement Arrangement	TW	1/18/2002	1/1/2007	1270157	RTP-1813-01-TW	91100775
Optical Comparator Method for CD Measurement	US	1/30/2002			RTP-1137-00-US	60/352285
Confocal 3D Inspection and Process	US	2/11/2002			RTP-078-00-US	10/073426
Confocal 3D Inspection and Process	US	2/11/2002			RTP-079-00-US	10/073656
Confocal 3D inspection system and process	US	2/11/2002	3/22/2005	6870609	RTP-077-00-US	10/073613
Method And Apparatus For Decreasing Thermal Loading And Roughness Sensitivity In A Photoacoustic Film Thickness Measurement System	US	3/6/2002	1/7/2003	6504618	RTP-1003-01-US	10/092866
System and Method for Performing Optical Inspection Using Diffracted Light	US	3/8/2002	3/8/2005	6864971	RTP-445-01-US	10/094119
Method And Apparatus For Decreasing Thermal Loading And Roughness Sensitivity In A Photoacoustic Film Thickness Measurement System	EP	3/8/2002			RTP-1003-01-EP	EP20020721330
Method And Apparatus For Decreasing Thermal Loading And Roughness Sensitivity In A Photoacoustic Film Thickness Measurement System	WO	3/8/2002			RTP-1003-01-WO	WO2002US07231
Optical Comparator Method for CD Measurement	US	3/8/2002			RTP-1138-00-US	60/362444
Optically-Based Method and Apparatus for Detecting and Characterizing Surface Pits in Metal Film During Chemical Mechanical Polishing	US	3/25/2002	2/21/2006	7002689	RTP-997-01-US	10/105829
Matrix Metrology Dual Meta Pulse	US	3/27/2002			RTP-1139-00-US	60/367511

Measurement Module	DE	4/11/2002	11/20/2003	10217028	RTP-1816-01-DE	10217028
Measuring Module	US	4/11/2002	9/28/2004	6798513	RTP-1817-01-US	10/120641
Measurement Box with Module for Measuring Wafer Characteristics	US	4/11/2002	5/10/2005	6891609	RTP-1819-01-US	10/120639
Inspection Handler Apparatus and Method	US	4/12/2002	11/22/2005	RE38880	RTP-831-01-US	10/122372
Standalone Frame Grabber with Infiniband Interface	US	4/24/2002			RTP-053-00-PRO	60/375321
Acquiring Image Data from Cameras onto InfiniBand Network Fabric	US	4/25/2002			RTP-055-00-PRO	60/375366
CMOS Sensor with Built-in Infini Band	US	4/25/2002			RTP-051-00-PRO	60/375528
Enhanced Frame Grabber with Infiniband Network Fabric	US	4/25/2002			RTP-054-00-PRO	60/375488
Infiniband as a Data Backgone for Inspection Tools	US	4/25/2002			RTP-056-00-PRO	60/735365
Line Scan or Area Scan Camera with InfiniBand Interface	US	4/25/2002			RTP-052-00-PRO	60/375319
Method for Optimizing Probe Card Analysis and Scrub Mark Analysis	US	7/2/2002	9/16/2003	6621262	RTP-851-02-US	10/191039
Metrology System With Spectroscopic Ellipsometer and Photoacoustic Measurements	US	7/10/2002	2/28/2006	7006221	RTP-1101-01-US	10/193769
Metrology System With Spectroscopic Ellipsometer and Photoacoustic Measurements	WO	7/12/2002			RTP-1101-01-WO	WO2002US22223
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	CN	7/12/2002	12/2/2009	ZL02818032	RTP-1103-01-CN	2818032.1
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	EP	7/12/2002	12/27/2017	EP1417450B	RTP-1103-01-EP	EP20020775693
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	US	7/12/2002	5/23/2006	7050178	RTP-1103-01-US	10/194169
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	WO	7/12/2002			RTP-1103-01-WO	WO2002US22222

Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	FR	7/12/2002	12/27/2017	EP1417450	RTP-1103-01-FR	EP02775693.1
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	DE	7/12/2002	12/27/2017	EP1417450	RTP-1103-01-DE	EP02775693.1
Confocal 3D Inspection and Process	US	7/16/2002			RTP-038-00-US	10/196349
Confocal 3D Inspection and Process	EP	7/16/2002			RTP-040-00-EP	EP20020750076
Confocal 3D Inspection and Process	WO	7/16/2002			RTP-040-00-WO	WO2002US22546
Confocal 3D Inspection and Process	US	7/16/2002			RTP-042-01-US	10/196335
Confocal 3D Inspection and Process	US	7/16/2002	4/19/2005	6882415	RTP-043-00-US	10/187295
Confocal 3D Inspection and Process	US	7/16/2002	8/10/2004	6773935	RTP-041-00-US	10/196741
Confocal 3D Inspection and Process	US	7/16/2002	11/29/2005	6970287	RTP-044-00-US	10/196735
Adjustable Wafer Alignment Arm	US	7/18/2002			RTP-050-00-PRO	60/397356
Inspection Tool with a 3D Point Sensor to Develop a Focus Map	US	7/18/2002			RTP-047-00-PRO	60/397355
Inspection Tool with Partial Framing Camera	US	7/18/2002			RTP-045-00-PRO	60/397327
Inspection Tool with Partial Framing-Windowing Camera	US	7/18/2002			RTP-046-00-PRO	60/397328
Throughput Condenser	US	7/18/2002			RTP-049-00-PRO	60/397514
Wafer Staging Platform	US	7/18/2002			RTP-048-00-PRO	60/397430
System and Method for Locating Irregular Edges in Image Data	US	8/21/2002	5/16/2006	7046837	RTP-101-02-US	10/224919
Device for Measuring Surface Defects	US	9/9/2002	10/11/2005	6954267	RTP-1817-02-US	10/237909
Imaging System	SG	9/10/2002	3/31/2005	91703	RTP-825-01-SG	200205584-6
Absolute Position Determination for a CCD-Based Acquisition Unit	US	9/17/2002	3/14/2006	7012631	RTP-813-01-US	10/244608
System and Method for Inspecting Components	TW	9/27/2002			RTP-103-00-TW	91122375
System and Method for Inspecting Components	WO	9/27/2002			RTP-103-00-WO	WO2002US30629
Automated Wafer Defect Inspection System Using Backside Illumination	US	9/30/2002	12/8/2009	7629993	RTP-062-00-US	10/262173
End Effector Alignment Tool for Substrate Handling System	US	9/30/2002	11/23/2005	6820349	RTP-061-00-US	10/262479

Imaging System Using Theta-Theta Coordinate State and Continuous Image Rotation to Compensate for Stage Rotation	US	9/30/2002				RTP-059-00-PRO	60/414983
Laser Alignment Tool	US	9/30/2002				RTP-060-00-US	10/262478
System and Method for Inspection Using Off-Angle Lighting Modular Substrate Measurement System	WO	10/11/2002				RTP-104-00-WO	WO2002US32531
	US	10/11/2002	4/18/2006	7030401		RTP-1812-02-US	10/257776
System and Method for Inspection Using Off-Angle Lighting Method and System for Analyzing Bitmap Test Data	TW	10/16/2002				RTP-104-00-TW	91123845
System and Method for Bump Height Measurement Optical Inspection Method Utilizing Ultraviolet Light System and Method for Inspection Using White Light Interferometry	US	10/25/2002	1/11/2005	6842866		RTP-124-00-US	10/281398
	US	11/5/2002				RTP-106-00-US	10/288062
	US	11/18/2002	4/17/2007	7206442		RTP-446-01-US	10/298391
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	TW	11/28/2002				RTP-105-00-TW	91134653
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	EP	12/18/2002	4/14/2010	1466137		RTP-852-01-EP	EP20020806181
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	JP	12/18/2002	1/6/2012	4896373		RTP-852-01-JP	2003-558422
Dual-Axis Scanning System and Method	US	12/18/2002	6/12/2007	7231081		RTP-852-01-US	10/323720
Stereoscopic Three-Dimensional Metrology System and Method	US	12/18/2002	12/15/2009	7634129		RTP-853-01-US	10/323696
System and Method for Multi-Wavelength Narrow-Bandwidth Detection and Analysis of Surface Defects	WO	12/18/2002				RTP-852-01-WO	WO2002US40610
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	US	12/18/2002	1/25/2005	6847443		RTP-447-01-US	10/322582
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	FR	12/18/2002	4/14/2010	1466137		RTP-852-01-FR	2806181
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	DE	12/18/2002	4/14/2010	EP1466137		RTP-852-01-DE	
System and Method for Inspection Using White Light Interferometry	NL	12/18/2002	4/14/2010	1466137		RTP-852-01-NL	
Method and System for Imaging an Object or Pattern	US	12/19/2002				RTP-107-00-PRO	60/434926
	US	3/12/2003				RTP-816-03-US	10/387940

Mitigating the Effects of Probe Card Fixture and Metrology Base Deflection in a Probe Card Analyzer	US	3/13/2003		RTP-803-01-PRO	60/454574
A Method of Measuring Probe Float for Probe Card Technologies Achieving Free Limited Vertical Motion	US	3/14/2003		RTP-482-01-PRO	60/456572
An Approach for Non-Linear Grid Fitting and Coordinate System Mapping	US	3/14/2003		RTP-484-01-PRO	60/454581
Method of Fast Robust Rigid Point Matching of Probes to Template Positions	US	3/14/2003		RTP-854-01-PRO	60/545541
Method of Planar Positioning	US	3/14/2003		RTP-850-01-PRO	60/454559
Scalable automated metrology system and method of making the system	US	3/27/2003	5/3/2005 6886423	RTP-1139-01-US	10/397326
Data Grabber with Switched Fabric Interface	WO	4/25/2003		RTP-053-00-WO	WO2003US12880
Data Grabber with Switched Fabric Interface	US	4/25/2003	9/19/2006 7111095	RTP-053-00-US	10/423475
Sensor with Switched Fabric Interface	US	4/25/2003		RTP-051-00-US	10/423470
Switched Fabric Based Inspection System	WO	4/25/2003		RTP-051-00-WO	WO2003US12879
Switched Fabric Based Inspection System	US	4/25/2003		RTP-056-00-US	10/424143
Switched Fabric Based Inspection System	WO	4/25/2003		RTP-056-00-WO	WO2003US12785
Adjustable Film Frame Aligner	US	7/14/2003		RTP-086-00-PRO	60/487151
Camera and Illumination Matching for Inspection System	US	7/14/2003		RTP-088-00-PRO	60/486949
Edge Inspection	US	7/14/2003		RTP-090-00-PRO	60/486953
Edge Normal Process	US	7/14/2003		RTP-092-00-PRO	60/486942
Inspection and Metrology Module Cluster Tool	US	7/14/2003		RTP-091-00-PRO	60/486944
Photoresist Edge Bead Removal Measurement	US	7/14/2003		RTP-087-00-PRO	60/486950
Product Setup Sharing for Multiple Inspection Systems	US	7/14/2003		RTP-089-00-PRO	60/487152
Adjustable Wafer Alignment Arm	US	7/18/2003		RTP-050-00-US	10/622850
Inspection Tool with a 3D Point Sensor to Develop a Focus Map	US	7/18/2003	1/30/2007 7170075	RTP-047-01-US	10/622848
Inspection Tool with Partial Framing Camera	US	7/18/2003		RTP-045-00-US	10/623283
Inspection Tool with Partial Framing-Windowing Camera	US	7/18/2003		RTP-046-00-US	10/623282
Optical Throughput Condenser	US	7/18/2003	3/20/2007 7192173	RTP-049-00-US	10/622847
Wafer Staging Platform	US	7/18/2003	6/12/2007 7230441	RTP-048-00-US	10/622849

Method and System for Imaging	IE	7/23/2003	10/11/2006	1359534	RTP-816-01-IE	3077317
Method and System for Imaging an Object or Pattern	UK	7/23/2003	10/11/2006	1359534	RTP-816-01-UK	3077317
Method and System for Imaging an Object or Pattern	EP	7/23/2003	10/11/2006	EP1359534	RTP-816-05-EP	EP20030077317
Measurement Configuration Including a Vehicle and Method for Performing Measurements with the Measurement Configuration at Various Locations	US	8/11/2003	8/30/2005	6935201	RTP-1813-01-US	10/638599
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	CA	9/17/2003	1/11/2011	2499631	RTP-813-01-CA	2499631
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	EP	9/17/2003	9/6/2013	1549905	RTP-813-01-EP	EP20030797124
Molecular Airborne Contaminants (MACs) Film Removal and Wafer Surface Sustaining System and Method	US	10/14/2003			RTP-1108-00-US	60/511209
Method and System for Analyzing Bitmap Test Data	WO	10/27/2003			RTP-124-00-WO	WO2003US33796
Confocal 3D Inspection and Process	US	10/30/2003			RTP-042-02-US	10/696871
System and Method for Bump Height Measurement	WO	11/5/2003			RTP-106-00-WO	WO2003US35128
System and Method for Inspection Using White Light Interferometry	US	12/4/2003	1/2/2007	7158235	RTP-105-00-US	10/467438
System and Method for Inspection Using White Light Interferometry	WO	12/19/2003			RTP-107-00-WO	WO2003US40513
System and Method for Inspection Using White Light Interferometry	US	12/19/2003	3/28/2006	7019841	RTP-107-00-US	10/742254
Confocal 3D Inspection and Process	JP	1/16/2004			RTP-040-00-JP	2003-514236
Method of Performing Optical Measurement on a Sample	EP	1/29/2004			RTP-1131-01-EP	EP20040706394
Method of Performing Optical Measurement on a Sample	JP	1/29/2004	7/30/2010	4555900	RTP-1131-02-JP	2006-502763
Method of Applying the Analysis of Scrub Mark Morphology and Location to the Evaluation and Correction of Semiconductor Testing Analysis and Manufacture	US	2/27/2004	9/5/2006	7102368	RTP-783-02-US	10/788670
System and Method of Matching Measured Positions to Template Positions	US	3/12/2004	5/13/2008	7373275	RTP-854-01-US	10/800421

System and Method of Mitigating Effects of Component Deflection in a Probe Card Analyzer	WO	3/12/2004			RTP-803-05-WO	WO2004US07818
System and Method of Mitigating Effects of Component Deflection in a Probe Card Analyzer	US	3/12/2004	1/30/2007	7170307	RTP-803-02-US	10/799575
System and Method of Mitigating Effects of Components	EP	3/12/2004			RTP-803-06-EP	EP20040720500
System and Method of Mitigating Effects of Components	JP	3/12/2004	9/21/2012	5089166	RTP-803-07-JP	2006-507186
System and Method of Mitigating Effects of Components	KR	3/12/2004	10/12/2011	10-1074901	RTP-803-08-KR	10-2005-7017162
System and Method of Mitigating Effects of Components	SG	3/12/2004	10/31/2006	115073	RTP-803-09-SG	200505869-8
Coordinate System Mapping	US	3/12/2004	4/23/2013	8428393	RTP-484-02-US	10/800420
System and Method of Measuring Probe Float	US	3/15/2004	12/15/2009	7633306	RTP-482-02-US	10/801944
System and Method of Planar Positioning	US	3/15/2004	1/17/2006	6986211	RTP-850-01-US	10/801925
USE OF INFINIBAND LINKED IMAGE PROCESSING DATA CENTER	US	4/25/2004			RTP-2069-01-PRO	60/375517
High Speed Lithography Machine and Method	US	5/28/2004	6/10/2008	7385671	RTP-1858-01-US	10/856700
System and Method for Inspection Using White Light Interferometry	JP	6/4/2004			RTP-105-00-JP	JP-2003-558426
System and Method for Inspection Using White Light Interferometry	KR	6/4/2004			RTP-105-00-KR	10-2004-7008630
System for Generating Camera Triggers	US	6/7/2004			RTP-094-00-PRO	60/577544
Fiber Optic Darkfield Ring Light	US	7/9/2004	5/22/2007	7220034	RTP-085-00-US	10/888302
Automatic Course Alignment for Wafer Based on Corner Finding	US	7/12/2004			RTP-110-00-PRO	60/587247
Compact Large Format Low Angle Darkfield Illuminator	US	7/12/2004			RTP-109-00-PRO	60/587206
Dual Chip Camera	US	7/12/2004			RTP-111-00-PRO	60/587116
PentaPrism and Flexure Focusing Mechanism	US	7/12/2004			RTP-112-00-PRO	60/587302
Wafer Backside Inspection	US	7/12/2004			RTP-113-00-PRO	60/587216
Wafer Clamping	US	7/12/2004			RTP-115-00-PRO	60/587571
Wafer Sag Mapping and Tracking	US	7/12/2004			RTP-114-00-PRO	60/587570

Adjustable Film Frame Aligner	US	7/14/2004	1/8/2008	7316938	RTP-086-00-US	10/891278
Camera and Illumination Matching for Inspection System	US	7/14/2004	9/15/2009	7589783	RTP-088-00-US	10/890862
Edge Inspection	US	7/14/2004	3/4/2008	7340087	RTP-090-00-US	10/890762
Edge Normal Process	WO	7/14/2004			RTP-090-00-WO	WO2004US22401
Edge Normal Process	US	7/14/2004	9/20/2005	6947588	RTP-092-01-US	10/890692
Edge Normal Process	KR	7/14/2004	8/23/2011	10-1060428	RTP-090-00-KR	10-2006-7000874
Inspection and Metrology Module Cluster Tool	US	7/14/2004			RTP-091-00-US	10/890761
Inspection Metrology Module Cluster Tool with Multi-Tool Manager	WO	7/14/2004			RTP-091-00-WO	WO2004US22591
Multi-Tool Manager	US	7/14/2004			RTP-108-00-US	10/890928
Photoresist Edge Bead Removal Measurement	WO	7/14/2004			RTP-087-00-WO	WO2004US22448
Photoresist Edge Bead Removal Measurement	US	7/14/2004	3/27/2007	7197178	RTP-087-00-US	10/890933
Product Setup Sharing for Multiple Inspection Systems	US	7/14/2004	10/25/2011	8045788	RTP-089-00-US	10/890734
Holding Device for Disk-Shaped Objects	DE	7/27/2004	8/30/2007	1.02E+11	RTP-1814-01-DE	1.02004E+11
Holding Device for Disk-Shaped Objects	US	8/6/2004	10/23/2007	7284760	RTP-1814-01-US	10/913891
Holding Device for Disk-Shaped Objects	JP	8/9/2004	11/6/2009	4401894	RTP-1814-01-JP	2004-232027
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	8/10/2004	6/1/2010	7729528	RTP-069-02-US	10/915666
Advanced Laser Triangulation (A)	US	10/4/2004			RTP-117-00-PRO	60/615936
Advanced Laser Triangulation (B)	US	10/4/2004			RTP-118-00-PRO	60/615626
Rotary Stage Laser Triangulation Sensor Scanning	US	10/4/2004			RTP-119-00-PRO	60/615770
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	US	10/6/2004	3/28/2006	7019845	RTP-1109-01-US	10/960351
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	EP	10/7/2004	4/13/2016	1817542	RTP-1109-01-EP	EP20040794682
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	JP	10/7/2004	2/10/2012	4918634	RTP-1109-01-JP	2007-535661
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	WO	10/7/2004			RTP-1109-01-WO	WO2004US33405
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	DE	10/7/2004	4/13/2016	6.02E+11	RTP-1109-01-DE	4794682.7

Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	FR	10/7/2004	4/13/2016	1817542	RTP-1109-01-FR	4794682.7
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	IE	10/7/2004	4/13/2016	1817542	RTP-1109-01-IE	4794682.7
Measuring Elastic Moduli of Dielectric Thin Films Using an Optical Metrology System	NL	10/7/2004	4/13/2016	1817542	RTP-1109-01-NL	4794682.7
Molecular Airborne Contaminants (MACs) Film Removal and Wafer Surface Sustaining System and Method	US	10/14/2004			RTP-1108-01-US	10/966125
Molecular Airborne Contaminants (MACs) Film Removal and Wafer Surface Sustaining System and Method	WO	10/14/2004			RTP-1108-01-WO	WO2004US34175
Semiconductor Yield Management System and Method	US	10/22/2004	6/21/2011	RE42481	RTP-1572-02-US	10/972115
Method of Performing Optical Measurement on a Sample	US	11/24/2004	5/6/2008	7369234	RTP-1131-01-US	10/995520
All Surface Inspection	US	12/8/2004			RTP-121-00-PRO	60/634159
Gripper for holding and positioning a disc- or plate-shaped object and method for holding and positioning a disc- or plate-shaped object	DE	1/4/2005	5/20/2009	1.02E+11	RTP-1818-01-DE	102005000665
Dual Photo-Acoustic and Resistivity Measurement System	US	4/11/2005	5/13/2008	7372584	RTP-1107-01-US	US11/104093
System and Method for Bump Height Measurement	KR	5/6/2005			RTP-106-00-KR	10-2005-7008071
Combined Ultra-Fast X-Ray and Optical System for Thin Film Measurements	US	5/13/2005			RTP-1110-01-US	11/129282
High Speed Lithography Machine and Method	WO	5/23/2005			RTP-1858-01-WO	WO2005US018160
High Speed Lithography Machine and Method	EP	5/23/2005	7/19/2017	1751623	RTP-1858-01-EP	5753949.6
High Speed Lithography Machine and Method	JP	5/23/2005	1/24/2014	5463004	RTP-1858-01-JP	2007515252
High Speed Lithography Machine and Method	BE	5/23/2005	7/19/2017	1751623	RTP-1858-01-BE	5753949.6
High Speed Lithography Machine and Method	BE	5/23/2005	7/19/2017	1751623	RTP-1858-01-FR	5753949.6
High Speed Lithography Machine and Method	LU	5/23/2005	7/19/2017	1751623	RTP-1858-01-LU	5753949.6
High Speed Lithography Machine and Method	LU	5/23/2005	7/19/2017	1751623	RTP-1858-01-NL	5753949.6
Wafer Scanning	US	6/3/2005			RTP-1113-00-PRO	60/687274
System for Generating Camera Triggers	US	6/6/2005	10/12/2010	7813638	RTP-094-00-US	11/146301

Bitmap Cluster Analysis of Defects in Integrated Circuits System and Method for Bump Height Measurement	US	6/23/2005	3/23/2010	7685481	RTP-1574-01-US	11/166960
Camera Module for an Optical Inspection System and Related Method of Use	CN	7/5/2005			RTP-106-00-CN	200380000000
Dynamic Focusing Method and Apparatus	US	7/11/2005			RTP-111-00-US	11/179019
Illuminator for Darkfield Inspection	US	7/11/2005	3/27/2007	7196300	RTP-112-00-US	11/179047
Wafer Holding Mechanism	US	7/11/2005			RTP-109-00-US	11/179010
Camera Module for an Optical Inspection System and Related Method of Use	US	7/11/2005	4/27/2010	7703823	RTP-115-00-US	11/179058
Camera Module for an Optical Inspection System and Related Method of Use	JP	7/12/2005			RTP-111-00-JP	2005-203712
Dynamic Focusing Method and Apparatus	TW	7/12/2005			RTP-111-00-TW	94123596
Dynamic Focusing Method and Apparatus	JP	7/12/2005	4/27/2012	4981272	RTP-112-00-JP	2005-203715
Illuminator for Darkfield Inspection	TW	7/12/2005	1/11/2014	1422896	RTP-112-00-TW	94123600
Illuminator for Darkfield Inspection	JP	7/12/2005	5/20/2011	4744215	RTP-109-00-JP	2005-203720
Wafer Holding Mechanism	TW	7/12/2005	12/11/2012	1379104	RTP-109-00-TW	94123601
Method and System for Defect Inspection	TW	7/12/2005	5/1/2013	1395284	RTP-115-00-TW	94123598
Scheimpflug Normalizer	US	8/10/2005	5/26/2009	7539583	RTP-449-01-US	11/201279
Imaging System Using Theta-Theta Coordinate State and Continuous Image Rotation to Compensate for Stage Rotation	US	9/15/2005			RTP-125-00-PRO	60/717675
Advanced Laser Triangulation and Rotary Stage	US	9/30/2005			RTP-059-00-US	10/675807
Trench Measurement System Employing a Chromatic Confocal Height Sensor and a Microscope	US	10/4/2005			RTP-120-00-US	11/243177
Wafer Holding Mechanism	US	10/28/2005	1/13/2009	7477401	RTP-1912-00-US	11/261284
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	JP	11/12/2005			RTP-115-00-JP	2005-2013706
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	CA	11/14/2005	6/22/2006	2587245	RTP-814-02-CA	2587245
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	SG	11/14/2005	7/31/2008	132233	RTP-814-02-SG	200703345-9
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	WO	11/14/2005			RTP-814-02-WO	WO2005US41768
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	US	11/14/2005	4/15/2008	7359068	RTP-814-01-US	11/274677

All Surface Data for Use in Substrate Inspection	US	12/7/2005	9/22/2009	7593565	RTP-121-00-US	11/296645
All Surface Data for Use in Substrate Inspection	CN	12/8/2005	5/12/2010	101198963	RTP-121-00-CN	2.0058E+11
All Surface Data for Use in Substrate Inspection	TW	12/8/2005			RTP-121-00-TW	94143428
All Surface Data for Use in Substrate Inspection	WO	12/8/2005			RTP-121-00-WO	WO2005US44300
Edge Normal Process	JP	1/11/2006	3/16/2012	4949024	RTP-090-00-JP	2006-520266
Color Imaging Using Monochrome Imagers	US	1/12/2006			RTP-126-00-PRO	60/758522
Edge Normal Process	US	1/13/2006	4/29/2008	7366344	RTP-092-02-US	11/331619
High-Speed Capacitor Leakage Measurement Systems and Methods	US	1/27/2006			RTP-485-01-PRO	60/762967
Metrology System With Spectroscopic Ellipsometer and Photoacoustic Measurements	US	1/30/2006	8/7/2007	7253887	RTP-1101-02-US	11/343717
Advanced Laser Triangulation and Rotary Stage	US	2/10/2006			RTP-120-01-US	11/351645
Dual Photo-Acoustic and Resistivity Measurement System	EP	3/22/2006			RTP-1107-01-EP	EP20060739420
Dual Photo-Acoustic and Resistivity Measurement System	JP	3/22/2006			RTP-1107-01-JP	2008-505351
Dual Photo-Acoustic and Resistivity Measurement System	WO	3/22/2006			RTP-1107-01-WO	WO2006US10616
Wafer Bevel Inspection Mechanism	US	4/3/2006			RTP-472-01-PRO	60/788642
System and Method for Three-Dimensional Surface Inspection	US	4/6/2006			RTP-443-02-US	11/399702
Polarization Imaging	US	4/21/2006			RTP-804-01-PRO	60/793858
Reflective Objective	US	4/25/2006			RTP-093-00-US	11/411217
Combined Ultra-Fast X-Ray and Optical System for Thin Film Measurements	WO	5/10/2006			RTP-1110-01-WO	WO2006US18148
Structure Model Description and Use for Scatterometry-Based Semiconductor Manufacturing Process Metrology	US	5/15/2006			RTP-1124-00-US	60/800897
Wafer Scanning	WO	6/2/2006			RTP-1113-01-WO	WO2006US21531
Multi-Function Metrology Tool	US	6/7/2006			RTP-457-00-PRO	60/811522
Multi-Function Metrology Tool	US	6/7/2006			RTP-1132-00-US	60/811522

Method of Applying the Analysis of Scrub Mark Morphology and Location to the Evaluation and Correction of Semiconductor Testing Analysis and Manufacture	US	6/29/2006	7/6/2010	7750622	RTP-783-03-US	11/479822
Edge Inspection and Metrology	US	7/11/2006			RTP-797-01-PRO	60/820015
Combination Ellipsometry and Optical Stress Generation and Detection	US	7/11/2006			RTP-1125-00-US	60/830209
Method of Designing Optical Systems	US	7/20/2006			RTP-827-01-PRO	60/832196
Multiple Measurement Techniques Including Focused Beam Scatterometry for Characterization of Samples	US	7/27/2006			RTP-1123-00-US	60/834259
Polarization Imaging	US	9/12/2006			RTP-804-02-PRO	60/844297
Scheimpflug Normalizer	WO	9/15/2006			RTP-125-00-WO	WO2006US36010
Scheimpflug Normalizer	TW	9/15/2006			RTP-125-00-TW	95134325
Scheimpflug Normalizer	US	9/15/2006			RTP-125-00-US	11/522060
Data Grabber with Switched Fabric Interface	US	9/18/2006			RTP-053-03-US	11/523791
Wafer Edge Inspection and Metrology	US	9/22/2006	11/10/2009	7616804	RTP-797-01-US	11/525530
Holding and rotating device for contact-sensitive planar objects	DE	9/28/2006	8/12/2010	1.02E+11	RTP-1820-01-DE	102006045866
Information Storage and Detection by Scatterometry	US	10/5/2006			RTP-1126-00-US	60/850229
Method of Controlling an Inspection Process	US	10/10/2006			RTP-828-01-PRO	60/828855
Trench Measurement System Employing a Chromatic Confocal Height Sensor and a Microscope	DE	10/27/2006	5/26/2011	1.02E+11	RTP-1912-00-DE	DE102006050834
Method and System for Providing a High Definition Triangulation System	US	11/7/2006			RTP-822-01-PRO	60/857715
Picosecond Ultrasonic System Incorporating an Optical Cavity	US	11/21/2006			RTP-1000-00-US	60/860261
Improved Optical Stress Generator and Detector	JP	11/22/2006	12/24/2010	4653723	RTP-999-02-JP	2006-316245
System and Method of Mitigating Effects of Component Deflection in a Probe Card Analyzer	US	12/12/2006	6/10/2008	7385409	RTP-803-03-US	11/609881
Probe Card Analysis System and Method	US	12/19/2006			RTP-805-01-PRO	60/870832
Color Imaging Using Monochrome Imagers	US	1/12/2007			RTP-126-00-US	11/622537
Dynamic Focusing Method and Apparatus	US	1/22/2007	1/22/2008	7321108	RTP-112-01-US	11/625640

High-Speed Capacitor Leakage Measurement Systems and Methods	SG	1/27/2007	2/28/2011	144602	RTP-485-01-SG	200805479-3
High-Speed Capacitor Leakage Measurement Systems and Methods	US	1/29/2007	2/16/2010	7663382	RTP-485-02-US	11/668457
High-Speed Capacitor Leakage Measurement Systems and Methods	KR	1/29/2007	10/10/2013	10-1319155	RTP-485-01-KR	10-2008-7020918
High-Speed Capacitor Leakage Measurement Systems and Methods	WO	1/29/2007			RTP-485-01-WO	WO2007US02976
Inspection Tool with a 3D Point Sensor to Develop a Focus Map	US	1/29/2007			RTP-047-03-US	11/668296
Analysis Techniques for Multi-Level Memory	US	2/2/2007	5/31/2011	7954018	RTP-1577-01-US	11/701700
Photoresist Edge Bead Removal Measurement	US	2/16/2007	3/23/2010	7684611	RTP-087-01-US	11/676140
Polarization Imaging	US	2/23/2007	9/8/2009	7586607	RTP-804-01-US	11/678407
Use of Automated Edge Bead Removal Metrology Inspection to Optimize the Edge Bead Process	US	2/23/2007			RTP-514-01-PRO	60/891289
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	US	2/28/2007			RTP-1128-00-PRO	60/904120
Characterizing CMP Processes with Picosecond Ultrasonic Metrology	US	2/28/2007			RTP-1129-00-US	60/904119
System for Verifying Device Integrity	US	3/5/2007			RTP-1130-00-US	60/905256
Wafer Bevel Inspection Mechanism	WO	4/3/2007			RTP-472-01-WO	WO2007US08122
Wafer Bevel Inspection Mechanism	CN	4/3/2007	8/17/2011	ZL20078002C	RTP-472-02-CN	200780000000
Wafer Bevel Inspection Mechanism	TW	4/3/2007			RTP-472-02-TW	96111909
Fiber Optic Darkfield Ring Light	US	4/26/2007	12/9/2008	7461961	RTP-085-01-US	11/740569
Adjustable Film Frame Aligner	US	4/30/2007	1/17/2012	8097966	RTP-086-01-US	11/742355
An Excursion Monitoring System	US	5/4/2007			RTP-513-01-PRO	60/916097
Structure Model Description and Use for Scatterometry-Based Semiconductor Manufacturing Process Metrology	WO	5/14/2007			RTP-1124-01-WO	WO2007US11586
Wafer Probe Test and Inspection System	US	5/15/2007			RTP-810-01-PRO	60/938142
Structure Model Description and Use for Scatterometry-Based Semiconductor Manufacturing Process Metrology	TW	5/15/2007	4/21/2015	I482227	RTP-1124-01-TW	96117157

Stereoscopic Three-Dimensional Metrology System and Method	US	5/21/2007	12/15/2009	7634128	RTP-852-02-US	11/751617
Combination Ellipsometry and Optical Stress Generation and Detection	WO	7/9/2007			RTP-1125-01-WO	WO2007US15286
Edge Inspection and Metrology	JP	7/11/2007	7/6/2012	5033875	RTP-797-01-JP	2009-519649
Edge Inspection and Metrology	TW	7/11/2007	12/21/2014	I466206	RTP-797-01-TW	96125249
Edge Inspection and Metrology	WO	7/11/2007			RTP-797-01-WO	WO2007US73231
Method And Apparatus Of Measuring Characters Of A Sample And Non-Transitory Computer-Readable Medium	TW	7/11/2007	11/11/2014	I460413	RTP-1125-01-TW	96125147
Focusing Method and Apparatus	US	7/20/2007			RTP-827-01-US	11/781047
Metrology System With Spectroscopic Ellipsometer and Photoacoustic Measurements	US	7/24/2007	4/21/2009	7522272	RTP-1101-03-US	11/881079
Multiple Measurement Techniques Including Focused Beam Scatterometry for Characterization of Samples	TW	7/27/2007	3/3/2014	I429896	RTP-1123-01-TW	96127393
Multiple Measurement Techniques Including Focused Beam Scatterometry for Characterization of Samples	WO	7/27/2007			RTP-1123-01-WO	WO2007US16842
Polarization Imaging	JP	9/10/2007			RTP-804-01-JP	2009-528415
Polarization Imaging	KR	9/10/2007			RTP-804-01-KR	10-2009-7007455
Polarization Imaging	WO	9/10/2007			RTP-804-01-WO	WO2007US78063
Polarization Imaging	TW	9/11/2007			RTP-804-01-TW	96133919
Measuring System and Measuring Device for Wafer	JP	9/26/2007			RTP-1913-00-JP	JP20070276957
Wafer Measurement System and Apparatus	US	10/29/2007	6/15/2010	7738113	RTP-1915-00-US	11/978881
Method and System for Providing a High Definition Triangulation System	US	11/7/2007	11/10/2009	7616328	RTP-822-01-US	11/936671
Picosecond Ultrasonic System Incorporating an Optical Cavity	WO	11/19/2007			RTP-1000-01-WO	WO2007US24125
Probe Card Analysis System and Method	WO	12/19/2007			RTP-805-02-WO	WO2007US26099
Probe Card Analysis System and Method	KR	12/19/2007	4/24/2015	10-1516828	RTP-805-02-KR	10-2009-7014976
Probe Card Analysis System and Method	SG	12/19/2007	12/30/2011	153462	RTP-805-02-SG	200904209-4
Probe Card Analysis System and Method	US	12/19/2007	8/24/2010	7782071	RTP-805-02-US	11/960597
High Resolution Edge Inspection	US	1/30/2008			RTP-458-01-PRO	61/024810

Edge Normal Process	US	2/25/2008	4/27/2010	7706599	RTP-092-03-US	12/0366679
Wafer Fabrication Monitoring Systems and Methods Including Edge Bead Removal Processing	WO	2/25/2008			RTP-514-01-WO	WO2008US54913
Wafer Fabrication Monitoring Systems and Methods Including Edge Bead Removal Processing	JP	2/25/2008	7/19/2013	5318784	RTP-514-01-JP	2009-551059
Wafer Fabrication Monitoring Systems and Methods Including Edge Bead Removal Processing	SG	2/25/2008	11/30/2012	154870	RTP-514-01-SG	200905581-5
Wafer Fabrication Monitoring Systems and Methods Including Edge Bead Removal Processing	TW	2/25/2008	3/1/2014	1429002	RTP-514-01-TW	97106463
Characterization of Sub-50 nm Line Array Structures with Angle-Resolved Multiple Wavelength Scatterometry Optimized Multiple Wavelength Incidence Angle Ellipsometry for OCD Applications	US	2/25/2008			RTP-1140-00-US	61/067175
Characterization of the Poly Gate ACI Structure with Laser Based Angle Resolved Multiple Wavelength Scatterometry Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	2/25/2008			RTP-1141-00-US	61/067193
Characterization of the Poly Gate ACI Structure with Laser Based Angle Resolved Multiple Wavelength Scatterometry Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	2/28/2008	3/17/2009	7505154	RTP-1142-00-US	61/067208
Characterization of the Poly Gate ACI Structure with Laser Based Angle Resolved Multiple Wavelength Scatterometry Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	2/28/2008			RTP-1008-04-US	12/072841
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	WO	2/28/2008			RTP-1128-01-WO	WO2008US02649
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	TW	2/29/2008	8/21/2014	1449894	RTP-1128-01-TW	97106935
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	US	3/4/2008	10/26/2010	7822260	RTP-090-01-US	12/042052
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	US	4/1/2008			RTP-814-02-US	12/080421
Inspection System and Method for the Optical Analysis of Edges of Objects, Especially Wafer Edges	DE	4/14/2008	9/9/2010	1.02E+11	RTP-1821-01-DE	102008001171
Classification Device and Method for the Classification of Surface Defects Especially on Wafer Surfaces	DE	4/14/2008	3/25/2010	1.02E+11	RTP-1822-01-DE	102008001173

Inspection System and Method for the Optical Analysis of the Surfaces of Objects, Especially Wafer Surfaces	DE	4/14/2008	3/14/2013	1.02E+11	RTP-1823-01-DE	102008001174
Semiconductor Yield Management System and Method	US	4/29/2008	2/19/2013	8380472	RTP-1575-01-US	12/150676
Method of Performing Optical Measurement on a Sample	US	5/5/2008			RTP-1131-02-US	12/151431
Wafer Probe Test and Inspection System	WO	5/15/2008			RTP-810-01-WO	WO2008US63779
Wafer Probe Test and Inspection System	KR	5/15/2008			RTP-810-01-KR	10-2009-7026186
System and Method of Mitigating Effects of Component Deflection in a Probe Card Analyzer	US	6/10/2008	8/25/2009	7579853	RTP-803-04-US	12/136693
Inspection apparatus and method for the optical examination of object surfaces, in particular of a wafer robot	DE	8/8/2008	8/25/2011	1.02E+11	RTP-1824-01-DE	102008041135
Edge Inspection Narrative	US	9/8/2008			RTP-820-01-PRO	61/095207
Probe Mark Inspection	US	9/11/2008			RTP-821-01-PRO	61/096182
Wafer Bevel Inspection Mechanism	US	10/3/2008			RTP-472-01-US	12/296026
Illuminator for Darkfield Inspection	US	11/21/2008	5/25/2010	7724358	RTP-109-01-US	12/276065
Combination Ellipsometry and Optical Stress Generation and Detection	US	1/9/2009	3/8/2011	7903238	RTP-1125-01-US	12/309166
High Resolution Edge Inspection	WO	1/30/2009			RTP-458-01-WO	WO2009US32571
High Resolution Edge Inspection	US	1/30/2009			RTP-458-01-US	12/362683
High Resolution Edge Inspection	SG	1/30/2009			RTP-458-01-SG	201005497-1
Inspection Device and Inspection Method for the Optical Examination of Object Surfaces Particularly of Wafer Surfaces	DE	1/30/2009	4/7/2011	1.02E+11	RTP-1826-01-DE	102009000528
High Resolution Edge Inspection	SG	1/30/2009			RTP-458-02-SG	201300752-1
High Resolution Edge Inspection	TW	2/2/2009			RTP-458-01-TW	98103246
Critical Dimension Measurement and Monitoring	US	2/18/2009			RTP-791-01-PRO	61/153594
Wafer Alignment and Inspection	US	2/24/2009			RTP-786-01-PRO	61/155030
Metrology System With Spectroscopic Ellipsometer and Photoacoustic Measurements	US	3/11/2009	4/27/2010	7705974	RTP-1101-04-US	12/381477
Optical Method for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	3/13/2009	8/24/2010	7782471	RTP-1008-05-US	12/381640

Optical Inspection Optimization	US	4/23/2009		RTP-829-01-PRO	61/172077
Picosecond Ultrasonic System Incorporating an Optical Cavity	KR	6/18/2009	5/9/2014 I395908	RTP-1000-01-KR	2009-7012658
Structure Model Description and Use for Scatterometry-Based Semiconductor Manufacturing Process Metrology	US	6/26/2009		RTP-1124-01-US	12/227387
Multiple Measurement Techniques Including Focused Beam Scatterometry for Characterization of Samples	US	7/7/2009	3/20/2012 8139232	RTP-1123-01-US	12/309749
Holding and Turning Device for Touch-Sensitive Flat Objects	US	8/5/2009	5/21/2013 8444126	RTP-1820-01-US	12/311371
Inspection Device and Method for Optical Investigation of Object Surfaces, in Particular Wafer Edges	EP	8/6/2009		RTP-1825-01-EP	WO2009EP60254
Inspection Device and Method for Optical Investigation of Object Surfaces in Particular Wafer Edges	DE	8/6/2009	3/13/2014 1.12E+11	RTP-1825-01-DE	112009000000
Use of Automated Edge Bead Removal Metrology Inspection to Optimize the Edge Bead Process	US	8/20/2009	7/23/2013 8492178	RTP-514-01-US	12/527981
An Apparatus for Obtaining Planarity Measurements with Respect to a Probe Card Analysis System	US	8/25/2009	6/14/2011 7960981	RTP-803-05-US	12/547118
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	JP	8/27/2009	8/3/2012 5055385	RTP-1128-01-JP	2009-551728
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	US	8/27/2009	11/20/2012 8312772	RTP-1128-01-US	12/449837
Polarization Imaging	US	9/1/2009		RTP-804-02-US	12/551702
Edge Inspection Narrative	TW	9/7/2009	12/11/2015 I512865	RTP-820-01-TW	98130087
Wafer Edge Inspection	WO	9/8/2009		RTP-820-01-WO	WO2009US56208
All Surface Data for Use in Substrate Inspection	US	9/9/2009	11/16/2010 7835566	RTP-121-01-US	12/555837
Probe Mark Inspection	WO	9/10/2009		RTP-821-01-WO	WO2009US56505
Probe Mark Inspection	US	9/10/2009	1/22/2013 8358831	RTP-821-02-US	12/556910

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Camera and Illumination Matching for Inspection System	US	9/15/2009		RTP-088-03-US	12/559586
Characterization with Picosecond Ultrasonics of Metal Portions of Samples Potentially Subject to Erosion	KR	9/25/2009	10/22/2014	10-1455777	2009-7020148
Wafer Edge Inspection and Metrology	US	10/1/2009	1/4/2011	7865010	12/571801
Wafer Scanning	US	10/5/2009		RTP-1113-01-US	11/921354
Surface Acoustic Wave Metrology	US	10/9/2009		RTP-1146-00-US	61/278646
Method and System for Providing a High Definition Triangulation System	US	10/30/2009		RTP-822-02-US	12/609175
Automated Wafer Defect Inspection System Using Backside Illumination	US	11/2/2009		RTP-062-01-US	12/610850
Wafer Probe Test and Inspection System	US	11/13/2009		RTP-801-01-US	12/600153
Infrared Inspection of Bonded Substrates	US	11/16/2009		RTP-858-01-PRO	61/261737
High-Speed Capacitor Leakage Measurement Systems and Methods	US	12/1/2009		RTP-485-03-US	12/628741
Dual-Axis Scanning System and Method	US	12/15/2009		RTP-853-02-US	12/637881
Stereoscopic Three-Dimensional Metrology System and Method	US	12/15/2009		RTP-852-04-US	12/637871
System and Method of Measuring Probe Float	US	12/15/2009	1/3/2012	8089292	12/637858
Apparatus for Stereoscopic Three-Dimensional Optical Metrology	JP	12/18/2009		RTP-852-02-JP	2009-213805
Wafer Probe Test and Inspection System	JP	1/15/2010	1/10/2014	5450391	
Inspection Device and Inspection Method for the Optical Examination of Object Surfaces Particularly of Wafer Surfaces	US	1/27/2010	10/16/2012	8289509	12/657744
Polarization Imaging	TW	2/12/2010	2/11/2016	I521624	96125249
Polarization Imaging	WO	2/17/2010			WO2010US24358
Picosecond Ultrasonic System Incorporating an Optical Cavity	US	2/26/2010	9/17/2013	8537363	12/312692
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	JP	3/1/2010			2010-106007
Wafer Holding Mechanism	US	3/12/2010	3/6/2012	8130372	12/722780

Bitmap Cluster Analysis of Defects in Integrated Circuits	US	3/22/2010	5/29/2012	8190952	RTP-1574-02-US	12/728629
Optical Inspection Optimization	WO	4/22/2010			RTP-829-01-WO	WO2010US32044
Inspection Device with Vertically Moveable Assembly	US	4/23/2010			RTP-1528-01-PRO	61/327220
Optical Inspection Optimization	TW	4/23/2010			RTP-829-01-TW	99112967
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	5/28/2010	5/10/2016	9337071	RTP-069-03-US	12/789829
System for Directly Measuring Depth of High Aspect Ratio Etched Feature on Wafer	CN	6/14/2010	4/20/2016	ZL 20108002	RTP-1911-00-CN	CN2010828092
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	EP	6/14/2010			RTP-1911-00-EP	EP20100792434
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	KR	6/14/2010	12/28/2017	10-1815325	RTP-1911-00-KR	KR20117030904
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	SG	6/14/2010	3/18/2015	176973	RTP-1911-00-SG	SG201109571
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	WO	6/14/2010			RTP-1911-00-WO	WO2010US01699
Method of Applying the Analysis of Scrub Mark Morphology	US	7/1/2010	6/12/2012	8198906	RTP-783-05-US	12/828344
Scratch Detection Method and Apparatus	US	7/3/2010			RTP-1570-01-PRO	61/361386
System Metrology Core	US	7/16/2010	3/12/2013	8395783	RTP-1859-01-US	12/837950
System and Method for Estimating Field Curvature	US	7/16/2010	6/24/2014	8760624	RTP-1859-02-US	12/837941
Optical Method and System for the Characterization of Laterally-Patterned Samples in Integrated Circuits	US	8/11/2010	2/22/2011	7894070	RTP-1008-06-US	12/854425
Probe Card Analysis System and Method	US	8/24/2010	6/18/2013	8466703	RTP-1609-01-US	12/862375
Support for Semiconductor Substrate	US	9/24/2010			RTP-1610-01-PRO	61/386271
Surface Acoustic Wave Metrology	WO	10/8/2010			RTP-1146-01-WO	WO2010US51996
Surface Acoustic Wave Metrology	TW	10/11/2010	8/1/2015	I494557	RTP-1146-01-TW	99134579
Infrared Inspection of Bonded Substrates	WO	11/16/2010			RTP-858-02-WO	WO2010US056785
Infrared Inspection of Bonded Substrates	TW	11/16/2010	5/1/2015	I482961	RTP-858-02-TW	99139380
All Surface Data for Use in Substrate Inspection	US	11/16/2010			RTP-121-02-US	12/947265
Infrared Inspection of Bonded Substrates	TW	11/16/2010	1/21/2017	I567381	RTP-858-03-TW	104105024

Method and System for Providing a High Definition Triangulation System	TW	11/16/2010	1/21/2017	I567381	RTP-822-02-TW	104105024
Wafer Edge Inspection and Metrology	US	12/17/2010	5/8/2012	8175372	RTP-797-03-US	12/971722
Position Sensitive Detection Optimization	US	1/28/2011			RTP-1509-01-PRO	61/462154
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	JP	2/3/2011			RTP-037-03-JP	2011-022049
Reflective Objective	US	2/22/2011			RTP-093-01-US	13/032428
Wafer Edge Inspection	US	3/6/2011	4/23/2013	8426223	RTP-820-01-US	13/062852
Probe Mark Inspection	SG	3/10/2011			RTP-821-01-SG	201101738-1
Auto Compensation of Bare-to-Pattern Wafer Alignment Errors	US	3/31/2011			RTP-1661-01-PRO	61/470456
Wafer Shape Thickness and Trench Measurement	US	4/8/2011	7/25/2017	9714825	RTP-1916-00-US	13/066219
Inspection Device with Vertically Moveable Assembly	TW	4/22/2011	11/11/2015	I507692	RTP-1528-02-TW	100114066
Inspection Device with Vertically Moveable Assembly	US	4/25/2011	5/20/2014	8729917	RTP-1528-02-US	13/093456
Wafer Edge Inspection	CN	5/6/2011	5/30/2012	ZL20099010C	RTP-820-01-CN	200990000000
An Apparatus for Obtaining Planarity Measurements with Respect to a Probe Card Analysis System	US	6/14/2011			RTP-803-06-US	13/159819
1d Line Structure Modeling System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	US	6/15/2011	2/11/2014		RTP-1911-00-US	12/456781
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	US	6/15/2011	2/11/2014	8649016	RTP-1911-01-US	13/134716
Scratch Detection Method and Apparatus	WO	6/30/2011			RTP-1570-02-WO	WO2011US042656
Scratch Detection Method and Apparatus	TW	7/1/2011	1/1/2017	I564556	RTP-1570-02-TW	100123354
Projection System with Metrology	WO	7/7/2011			RTP-1859-01-WO	WO2011US043121
Projection System with Metrology	EP	7/7/2011	6/18/2014	2593837	RTP-1859-01-EP	EP20110743166
Projection System with Metrology	KR	7/7/2011	11/16/2016	10-1678362	RTP-1859-01-KR	10-2013-7003887
Projection System with Metrology	SG	7/7/2011	8/3/2015	187095	RTP-1859-01-SG	201300335-5
Projection System with Metrology	NL	7/7/2011	6/18/2014	EP2593837	RTP-1859-01-NL	EP11743166.8
Projection System with Metrology	DE	7/7/2011	6/18/2014	60 2011 007	RTP-1859-01-DE	EP11743166
Projection System with Metrology	FR	7/7/2011	6/18/2014	EP2593837	RTP-1859-01-FR	EP11743166
Projection System with Metrology	PT	7/7/2011	7/28/2014	EP2593837	RTP-1859-01-PT	117431668

Projection System with Metrology	SG	7/7/2011	8/24/2017	201300335-5	RTP-1859-02-SG	10201505017P
Focusing Method and Apparatus	US	7/11/2011	6/19/2012	8204298	RTP-827-02-US	13/180080
Critical Dimension Measurement And Monitoring	US	8/18/2011	12/31/2013	8620063	RTP-791-01-US	13/202251
Polarization Imaging	SG	8/18/2011			RTP-791-02-SG	PCT/US2010/024358
See-Through-Silicon Application Studies Based on Traditional Silicon Based Imager	US	8/18/2011			RTP-1745-01-PRO	61/525022
Method for Measuring Wafer Overburden	US	9/9/2011			RTP-1913-00-US	13/199783
Polarization Imaging	KR	9/16/2011	2/26/2016	10-1600128	RTP-791-02-KR	10-2011-7021587
Product Setup Sharing for Multiple Inspection Systems	US	9/21/2011			RTP-089-01-US	13/238161
Support for Semiconductor Substrate	WO	9/26/2011			RTP-1610-02-WO	WO2011US053263
Support for Semiconductor Substrate	TW	9/26/2011	10/11/2016	I553771	RTP-1610-02-TW	100134632
Optical Inspection Optimization	SG	10/6/2011	4/14/2014	175097	RTP-829-01-SG	201107289-9
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	10/14/2011			RTP-069-04-US	13/273645
Optical Inspection Optimization	US	10/21/2011			RTP-829-01-US	13/265670
Substrate Handler	US	12/7/2011			RTP-1782-01-PRO	61/567634
On Axis Focus Sensor and Method	US	12/23/2011			RTP-1781-01-PRO	61/580028
Wafer Inversion Mechanism	US	12/27/2011			RTP-1690-01-PRO	61/580641
Substrate Handler	US	1/17/2012	4/15/2014	8698327	RTP-1782-01-US	13/352160
Position Sensitive Detection Optimization	WO	1/27/2012			RTP-1509-01-WO	PCT/US2012022911
Position Sensitive Detection Optimization	SG	1/27/2012	3/21/2016	192203	RTP-1509-01-SG	2013057682
Position Sensitive Detection Optimization	EP	1/27/2012			RTP-1509-01-EP	12739797.4
Position Sensitive Detection Optimization	TW	1/30/2012	9/11/2016	I548869	RTP-1509-01-TW	101102839
Multiple Measurement Techniques Including Focused Beam Scatterometry for Characterization of Samples	US	3/19/2012	4/15/2014	8699027	RTP-1123-02-US	13/423866
Auto Compensation of Bare-to-Pattern Wafer Alignment Errors	WO	3/29/2012			RTP-1661-01-WO	WO2012US031235
Auto Compensation of Bare-to-Pattern Wafer Alignment Errors	TW	3/30/2012	1/1/2017	I564981	RTP-1661-01-TW	101111400
System and Method for Measuring the Position or Location of a Laser Scribe	US	3/30/2012			RTP-1914-00-US	61/618450
Surface Acoustic Wave Metrology	US	4/12/2012	5/26/2015	9041931	RTP-1146-01-US	13/500692

Wafer Edge Inspection and Metrology	US	5/8/2012	8/26/2014	8818074	RTP-797-04-US	13/466506
Infrared Inspection of Bonded Substrates	SG	5/15/2012	2/25/2015	180854	RTP-858-02-SG	PCT/US2010/056785
Infrared Inspection of Bonded Substrates	US	5/16/2012			RTP-858-02-US	13/510135
Infrared Inspection of Bonded Substrates	CN	6/12/2012			RTP-858-02-CN	201080000000
Infrared Inspection of Bonded Substrates	KR	6/18/2012			RTP-858-02-KR	10-1012-7015809
Flying Metrology Sensor Head	US	6/29/2012			RTP-1792-01-PRO	61/666362
Wafer Holding Mechanism	TW	7/20/2012	4/21/2013	1394227	RTP-115-01-TW	101126267
Simultaneous Inspection of Opposite Sides of Semiconductor Wafer	US	9/28/2012			RTP-1835-01-PRO	61/707662
System and Method for Carrying an Object Through Use of a Frameless Motor	US	10/5/2012			RTP-1860-01-PRO	61/710529
A Wafer Edge Protection (WEP) System with Programmable Protection Width	US	10/5/2012			RTP-1861-01-PRO	61/710494
Selective Overtravel During Electrical Test of Probe Cards	US	10/9/2012	3/25/2014	8659308	RTP-1800-01-US	13/647554
Method for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	US	10/16/2012			RTP-1917-00-US	13/652798
Method for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	US	10/16/2012			RTP-1917-01-US	13/652829
High Speed Autofocus System	TW	10/17/2012	5/1/2017	1580948	RTP-2034-01-TW	101138266
High Speed Autofocus System	WO	10/17/2012			RTP-2034-01-WO	PCT US2012/060480
High Speed Autofocus System	SG	10/17/2012			RTP-2034-02-SG	10201607779Q
Wafer Edge Protection System with Programmable Protection Width	US	12/4/2012			RTP-1897-01-PRO	61/733374
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	JP	12/19/2012			RTP-037-04-JP	2012-276774
On Axis Focus Sensor and Method	WO	12/20/2012			RTP-1781-02-WO	WO2012US71030
Scratch Detection Method and Apparatus	US	12/21/2012	8/2/2016	9406115	RTP-1570-01-US	13/806360
Wafer Inversion Mechanism	US	12/21/2012	8/30/2016	9431282	RTP-1690-01-US	13/723618
On Axis Focus Sensor and Method	TW	12/22/2012	6/1/2017	1585360	RTP-1781-02-TW	101149308
Edge Grip Substrate Handler	US	1/4/2013			RTP-1841-01-US	61/748965
Method of Characterizing Microfabrication Process and Products Thereof	US	1/23/2013			RTP-1882-01-PRO	61/755923
Opto-Acoustic Assessment of 3D Structures	US	3/15/2013			RTP-1836-01-PRO	61/799089

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Substrate Assessment System and Method	US	3/15/2013				RTP-1837-01-PRO	61/799448
Characterization of Micro-fabrication Processes	US	3/15/2013				RTP-1838-01-PRO	61/800331
High Resolution Modeling and Inspection of Objects	US	3/15/2013				RTP-1842-01-PRO	61/800601
Flexible Handling System for Semiconductor Semiconductor Substrates	US	3/15/2013				RTP-1890-01-PRO	61/799726
Support for Semiconductor Substrate	US	4/22/2013	7/26/2016	9401299		RTP-1610-02-US	13/825769
Wafer Edge Inspection	US	4/23/2013	6/23/2015	9062859		RTP-820-02-US	13/868710
Probe Card Analysis System and Method	US	6/18/2013	5/2/2017	9638782		RTP-1609-02-US	13/921057
Flying Metrology Sensor Head	WO	6/27/2013				RTP-1792-01-WO	WO2013US48256
Flying Metrology Sensor Head	KR	6/27/2013				RTP-1792-01-KR	1.02016E+12
Flying Metrology Sensor Head	SG	6/27/2013	7/5/2016	1120140866		RTP-1792-01-SG	11201408664Y
Flying Metrology Sensor Head	TW	6/28/2013	6/1/2018	TWI625514B		RTP-1792-01-TW	102123264
High Speed Autofocus System	US	6/28/2013	8/18/2015	9113091		RTP-2034-02-US	13/930520
Use of Automated Edge Bead Removal Metrology Inspection to Optimize the Edge Bead Process	US	7/23/2013				RTP-514-02-US	13/949111
Probe Position Detection	US	8/26/2013				RTP-1909-01-PRO	61/869924
Probe Mark Inspection	SG	9/10/2013	9/4/2015	193874		RTP-821-02-SG	201306793-9
Planar Motor System With Increased Efficiency	WO	9/27/2013				RTP-1860-02-WO	WO2013US62099
Simultaneous Inspection of Opposite Sides of Semiconductor Wafer	WO	9/27/2013				RTP-1835-02-WO	WO2013US62272
Simultaneous Inspection of Opposite Sides of Semiconductor Wafer	TW	9/27/2013	9/1/2017	I597491		RTP-1835-02-TW	102135080
Planar Motor System With Increased Efficiency	US	9/27/2013	4/18/2017	9625832		RTP-1897-02-US	14/432912
Wafer Edge Protection System with Programmable Protection Width	WO	10/2/2013				RTP-1897-01-WO	WO2013US62958
MULTIPLE-BLADE DEVICE FOR SUBSTRATE EDGE PROTECTION DURING PHOTOLITHOGRAPHY	WO	10/2/2013				RTP-1861-01-WO	WO2013US62955
Planar Motor System With Increased Efficiency	TW	10/4/2013	1/1/2018	I610520		RTP-1860-02-TW	102136033
Wafer Edge Protection System with Programmable Protection Width	TW	10/4/2013				RTP-1897-01-TW	1024220000000
A Wafer Edge Protection (WEP) System with Programmable Protection Width	TW	10/4/2013				RTP-1861-01-TW	1024220000000
Holding and rotating device for flat objects	DE	10/8/2013				RTP-1939-01-DE	102013000000
Position Sensitive Detection Optimization	US	11/20/2013	9/22/2015	9140601		RTP-1509-01-US	13/982109

Edge Grip Substrate Handler	WO	12/20/2013	RTP-1841-01-WO	WO2013US77102
Critical Dimension Measurement And Monitoring System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	US	12/31/2013	RTP-791-02-US	14/145201
Method of Characterizing Microfabrication Process and Products Thereof	US	12/31/2013	RTP-1911-02-US	14/145497
Substrate Assessment System and Method	WO	1/23/2014	RTP-1882-01-WO	WO2014US12827
Substrate Assessment System and Method	WO	2/5/2014	RTP-1837-01-WO	WO2014US14890
Substrate Assessment System and Method	CN	2/5/2014	RTP-1837-01-CN	CN201480025735.8
Substrate Assessment System and Method	SG	2/5/2014	1120150758; RTP-1837-01-SG	11201507587Q
Substrate Assessment System and Method	TW	2/6/2014	5/11/2018 TWI623746B RTP-1837-01-TW	103103917
Non-Destructive Acoustic Metrology for Void Detection	TW	2/6/2014	RTP-2084-01-TW	104132117
Characterization of Micro-fabrication Processes	US	3/14/2014	RTP-1838-02-US	14/213451
Flexible Handling System for Semiconductor Substrates	WO	3/17/2014	RTP-1890-01-WO	PCT/US2014/030224
Multiple Measurement Techniques Including Focused Beam Scatterometry for Characterization of Samples	US	4/14/2014	RTP-1123-03-US	14/251945
Substrate Handler	US	4/15/2014	RTP-1782-02-US	14/253502
High Speed Autofocus System	CA	4/16/2014	RTP-2034-01-CA	2852677
High Speed Autofocus System	MY	4/16/2014	RTP-2034-01-MY	MYPI2014001130
High Speed Autofocus System	AU	4/17/2014	RTP-2034-01-AU	2012326276
High Speed Autofocus System	JP	4/17/2014	RTP-2034-01-JP	2014-537158
High Speed Autofocus System	SG	4/17/2014	RTP-2034-01-SG	SG11201401596S
Volumetric Substrate Scanner	US	4/21/2014	RTP-1962-01-PRO	61/982197
High Speed Autofocus System	EP	5/14/2014	RTP-2034-01-EP	12841130.3
High Speed Autofocus System	KR	5/16/2014	RTP-2034-01-KR	2014-7013216
Inspection Device with Vertically Moveable Assembly	US	5/20/2014	RTP-1528-03-US	14/282565
Inspection Device with Vertically Moveable Assembly	WO	6/5/2014	RTP-1528-01-WO	PCT/US2015/034470
Inspection Device with Vertically Moveable Assembly	US	6/6/2014	RTP-1528-04-US	14/298539
High Speed Autofocus System	CN	6/11/2014	RTP-2034-01-CN	201280000000

On Axis Focus Sensor and Method	US	7/17/2014	3/14/2017	9594230	RTP-1781-02-US	14/367564
NONDESTRUCTIVE ACOUSTIC METROLOGY FOR VOID DETECTION IN TSVs	US	9/29/2014			RTP-1976-01-PRO	62/056773
Ultrasonic Chuck	WO	10/6/2014			RTP-1939-01-WO	WO2014EP71307
Ultrasonic Chuck	TW	10/8/2014			RTP-1939-01-TW	103135090
Improved Calibration of Semiconductor Metrology Systems	US	10/13/2014			RTP-1974-01-PRO	62/063232
VIA CHARACTERIZATION SYSTEM AND METHODS	US	10/31/2014			RTP-1977-01-PRO	62/072892
Method and Apparatus to Assist the Processing of Deformed Substrate	US	11/24/2014			RTP-1982-01-PRO	62/083577
Flying Metrology Sensor Head	US	12/19/2014	9/26/2017	9772183	RTP-1792-01-US	14/409756
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	SG	3/17/2015	5/22/2019	1020150202	RTP-1911-01-SG	10201502024U
Stereoscopic Inspection of Substrates	US	3/23/2015			RTP-2008-01-PRO	61/136932
Simultaneous Inspection of Opposite Sides of Semiconductor Wafer	US	3/27/2015	5/30/2017	9664625	RTP-1835-02-US	14/432045
MULTIPLE-BLADE DEVICE FOR SUBSTRATE EDGE PROTECTION DURING PHOTOLITHOGRAPHY	US	4/2/2015			RTP-1861-01-US	14/433233
Wafer Edge Protection System with Programmable Protection Width	US	4/2/2015			RTP-1897-01-US	14/433194
Volumetric Substrate Scanner	TW	4/20/2015			RTP-1962-01-TW	104112586
Volumetric Substrate Scanner	WO	4/21/2015			RTP-1962-01-WO	WO2015US26801
Simultaneous Inspection of Opposite Sides of Semiconductor Wafer	SG	4/27/2015	7/4/2017		RTP-1835-02-SG	112015024365
Wafer Edge Protection System with Programmable Protection Width	EP	4/28/2015			RTP-1897-01-EP	13776905.5
MULTIPLE-BLADE DEVICE FOR SUBSTRATE EDGE PROTECTION DURING PHOTOLITHOGRAPHY	EP	4/28/2015			RTP-1861-01-EP	13774915.6
Planar Motor System With Increased Efficiency	EP	4/28/2015			RTP-1860-02-EP	13774337.3
OPTICAL SYSTEM AND METHODS FOR THE DETERMINATION OF STRESS IN A SUBSTRATE	WO	5/28/2015			RTP-2041-01-WO	PCT/US2015/033022
Optical System and Methods for the Determination of Stress in a Substrate	WO	5/28/2015			RTP-2041-01-TW	104117197

Optical System and Methods for the Determination of Stress in a Substrate	US	5/28/2015	RTP-2041-01-US	15/313897
Inspection Device with Vertically Moveable Assembly	TW	6/5/2015	RTP-1528-03-TW	104118319
Inspection Device with Vertically Moveable Assembly Wavefront Modification for Improved Interferometric Measurement	JP	6/5/2015	RTP-1528-01-JP	2016-567990
Edge Grip Substrate Handler	US	6/30/2015	RTP-1963-01-PRO	62/187181
Method of Characterizing Microfabrication Process and Products Thereof	US	6/30/2015	RTP-1841-02-US	14/758718
VIA CHARACTERIZATION SYSTEM AND METHODS	SG	7/21/2015	RTP-1882-01-SG	11201505661X
Method of Characterizing Microfabrication Process and Products Thereof	US	7/22/2015	RTP-1977-01-US	
Method of Characterizing Microfabrication Process and Products Thereof	US	7/22/2015	RTP-1882-02-US	14/762613
Flexible Handling System for Semiconductor Semiconductor Substrates	KR	8/21/2015	RTP-1882-01-KR	10-2015-7022758
Substrate Assessment System and Method	US	9/11/2015	RTP-1890-01-US	14/775133
Flexible Handling System for Semiconductor Semiconductor Substrates	US	9/15/2015	RTP-1837-01-US	14/776953
Position Sensitive Detection Optimization	DE	9/15/2015	RTP-1890-01-DE	112014000000
Method of Characterizing Microfabrication Process and Products Thereof	US	9/21/2015	RTP-1509-02-US	14/860671
NON-DESTRUCTIVE ACOUSTIC METROLOGY FOR VOID DETECTION	CN	9/22/2015	RTP-1882-01-CN	201480000000
Improved Calibration of Semiconductor Metrology Systems High Speed Autofocus System	SG	9/29/2015	RTP-2084-01-SG	11201702573V
OPTO-ACOUSTIC METROLOGY OF SIGNAL ATTENUATING STRUCTURES	US	10/13/2015	RTP-1974-01-US	14/881847
Method and Apparatus to Assist the Processing of Deformed Substrate	US	10/15/2015	RTP-2034-01-US	13/651583
Wafer Singulation Process Control	US	11/12/2015	RTP-2042-01-US	62/254587
	US	11/18/2015	RTP-1982-01-US	14/944839
	US	12/30/2015	RTP-2040-01-PRO	62/272876

Compact Handling System	US	3/31/2016			RTP-2049-01-PRO	62/316462
Automated Wafer Defect Inspection System and a Process of Performing Such Inspection	US	4/7/2016	10/11/2016	9464992	RTP-069-05-US	15/093130
Ultrasonic Chuck	US	4/8/2016			RTP-1939-01-US	15/028,175
System for Directly Measuring the Depth of a High Aspect Ratio Etched Feature on a Wafer	US	4/29/2016	3/7/2017	9587932	RTP-1911-03-US	15/142864
Projection System with Metrology	KR	5/12/2016	2/14/2017	10-1708198	RTP-1859-02-KR	10-2016-7012562
Training System for Automatic Defect Classification	US	6/30/2016			RTP-2050-01-PRO	62357360
High Speed Autofocus System	US	7/13/2016	9/9/2019	10412311	RTP-2034-03-US	15/209218
Volumetric Substrate Scanner	JP	10/18/2016			RTP-1962-01-JP	2016-563832
Volumetric Substrate Scanner	US	10/20/2016			RTP-1962-01-US	15/305380
OPTO-ACOUSTIC METROLOGY OF SIGNAL ATTENUATING STRUCTURES	US	11/8/2016	2/19/2019	10209300	RTP-2042-02-US	15/346278
Volumetric Substrate Scanner	DE	11/23/2016			RTP-1962-01-DE	1.12015E+11
Optical System and Methods for the Determination of Stress in a Substrate	CN	12/7/2016			RTP-2041-01-EP	15798838.7
SUBSTRATE HANDLING AND IDENTIFICATION MECHANISM	US	12/21/2016			RTP-2074-01-PRO	62/437326
Wafer Singulation Process Control	SG	12/23/2016			RTP-2040-01-SG	11201805283U
Wafer Singulation Process Control	WO	12/23/2016			RTP-2040-01-WO	PCT/US2016/068519
Wafer Singulation Process Control	TW	12/27/2016			RTP-2040-01-TW	105143386
Optical System and Methods for the Determination of Stress in a Substrate	CN	12/29/2016			RTP-2041-01-CN	201580035568.X
Inspection Device with Vertically Moveable Assembly	KR	1/4/2017			RTP-1528-01-KR	10-2017-7000253
Inspection of Substrates	US	3/22/2017			RTP-2082-01-PRO	62475020
SEMICONDUCTOR DEVICE INSPECTION OF METALLIC DISCONTINUITIES	US	3/22/2017			RTP-2083-01-PRO	62474970
NON-DESTRUCTIVE ACOUSTIC METROLOGY FOR VOID DETECTION	US	3/28/2017	6/5/2018	9991176	RTP-2084-01-US	15/515126
Probe Card Analysis System and Method	US	5/2/2017			RTP-1609-03-US	15/584742
Characterization of Micro-fabrication Processes	US	5/22/2017	7/17/2018	10024804	RTP-1838-03-US	15/601239
Simultaneous Inspection of Opposite Sides of Semiconductor Wafer	US	5/30/2017			RTP-1835-03-US	15/608,339

WAFER INSPECTION SYSTEM INCLUDING A LASER TRIANGULATION SENSOR	US	6/8/2017		RTP-2085-01-PRO	62/516701
Inspection Device with Vertically Moveable Assembly Panel Handling	US	6/14/2017		RTP-1528-05-US	15/622246
High Resolution Stage Positioner System and Method for Optimizing a Lithography Exposure Process	US	9/28/2017		RTP-2086	62/564400
Laser Triangulation Calibration	US	9/29/2017		RTP-2097-01-PRO	62/565951
	US	9/29/2017		RTP-2098-01-PRO	62/565940
	US	11/6/2017		RTP-2099-01-PRO	62/582290
SUBSTRATE HANDLING AND IDENTIFICATION MECHANISM Separated Axis Lithographic Tool Conformal Stage	US	12/21/2017		RTP-2074-01-US	15/850869
	US	12/28/2017		RTP-2105-01-PRO	62/611210
	US	12/28/2017		RTP-2106-01-PRO	62/611200
SEMICONDUCTOR DEVICE INSPECTION OF METALLIC DISCONTINUITIES	US	3/22/2018	11/5/2019	RTP-2083-01-US	15/933362
Inspection of Substrates Asset Type: Patent Asset Status: Expired Serial No.: 62475020 Filing Date: 3/22/2017 Pat/Reg No.: Issue Date:	US	3/22/2018	2/4/2020	RTP-2082-01-US	15/933,366
Customizable Illumination For Inspection WAFER INSPECTION SYSTEM INCLUDING A LASER	US	3/30/2018		RTP-2108-01-PRO	62/650888
TRIANGULATION SENSOR	WO	6/8/2018		RTP-2085-01-WO	PCT/US18/36573
WAFER INSPECTION SYSTEM INCLUDING A LASER TRIANGULATION SENSOR	TW	6/8/2018		RTP-2085-01-TW	107119848
Method and Apparatus to Assist the Processing of Deformed Substrate	US	6/11/2018		RTP-1982-02-US	16/004972
Wafer Singulation Process Control	JP	6/20/2018		RTP-2040-01-JP	2018-532444
Wafer Singulation Process Control	US	7/2/2018		RTP-2040-01-US	16/067748
Wafer Singulation Process Control	EP	7/4/2018		RTP-2040-01-EP	16882467
Wafer Singulation Process Control	KR	7/26/2018		RTP-2040-01-KR	10-2018-7021613
Wafer Singulation Process Control	CN	7/27/2018		RTP-2040-01-CN	WO2017/117051
System and Method for Optimizing a Lithography Exposure Process	TW	8/28/2018		RTP-2098-01-TW	107134488
High Resolution Stage Positioner	CN	9/13/2018		RTP-2097-01-CN	
High Resolution Stage Positioner	TW	9/13/2018		RTP-2097-01-TW	

High Resolution Stage Positioner	WO	9/13/2018	RTP-2097-01-WO	PCT/US18/50788
Wafer-Panel Stage		9/24/2018	RTP-2133-01-PRO	62/735,241
POSITIONING SYSTEM FOR SUBSTRATE INSPECTION	US	9/24/2018	RTP-2147-01-PRO	62/735241
System and Method for Optimizing a Lithography Exposure Process	CN	9/28/2018	RTP-2098-01-CN	201811000000
System and Method for Optimizing a Lithography Exposure Process	WO	9/28/2018	RTP-2098-01-WO	
Probe Assessment Methodology	US	9/28/2018	RTP-2146-01-PRO	62/739149
WAFER-LEVEL PACKAGE ASSEMBLY HANDLING	WO	9/28/2018	RTP-2086-01-WO	PCT/US18/53300
WAFER-LEVEL PACKAGE ASSEMBLY HANDLING	TW	10/11/2018	RTP-2086-01-TW	TW107134104
Laser Triangulation Calibration	WO	11/6/2018	RTP-2099-01-WO	PCT/US2018/059404
Laser Triangulation Calibration	TW	11/6/2018	RTP-2099-01-TW	107139314
Conformal Stage	CN	12/21/2018	RTP-2106-01-CN	201811570247.1
Conformal Stage	TW	12/21/2018	RTP-2106-01-TW	107146432
Conformal Stage	WO	12/21/2018	RTP-2106-01-WO	PCT/US2018/066991
Separated Axis Lithographic Tool	CN	12/26/2018	RTP-2105-01-CN	201812000000
Separated Axis Lithographic Tool	TW	12/26/2018	RTP-2105-01-TW	107147128
Separated Axis Lithographic Tool	WO	12/26/2018	RTP-2105-01-WO	PCT/US2018/067467
WAFER CRACK DETECTION	US	1/16/2019	RTP-2157-01-PRO	62/792956
Opto-Acoustic Measurement Depth Control	US	5/23/2019	RTP-2164-01-PRO	62/851929
NON-DESTRUCTIVE INSPECTION AND MANUFACTURING METROLOGY SYSTEMS AND METHODS	US	5/23/2019	RTP-2200-01-PRO	62/851905
WAFER INSPECTION SYSTEM INCLUDING A LASER TRIANGULATION SENSOR	SG	11/27/2019	RTP-2085-01-SG	11201911246X
WAFER INSPECTION SYSTEM INCLUDING A LASER TRIANGULATION SENSOR	US	12/6/2019	RTP-2085-01-US	16/620,317
WAFER CRACK DETECTION	US	1/16/2020	RTP-2157-01-PCT	PCT/US20/13890
WAFER CRACK DETECTION	US	1/16/2020	RTP-2157-01-US1	16/744,621
Extended Theta and Mag Correction in Lithography	US	2/21/2020	RTP-2201-01-PRO	62/979,635
Confocal 3D Inspection and Process	US		RTP-077-00-PRO	60/268114
Universal Handler	US		RTP-095-00-US	
Film Frame Handling Station	US		RTP-096-00-US	
Universal Handler	US		RTP-097-00-PRO	

**PATENT**

**REEL: 053117 FRAME: 0619**

Fiber Optic Darkfield Ring Light	US	RTP-085-00-PRO	60/486502
Probe Mark Inspection	JP	RTP-821-01-JP	
Focusing Method and Apparatus	WO	RTP-827-01-WO	
Focusing Method and Apparatus	TW	RTP-827-01-TW	
Focus Calibration	US	RTP-1773	
Soft Lens Edge Inspection	US	RTP-831	
Confocal Edge Bead Inspect	US	RTP-832	
Photogrammetry	US	RTP-833	
Wafer or Like Substrate Handler	US	RTP-067-00-US	09/841617
Wafer Alignment and Inspection	WO	RTP-786-02-WO	
Separation of Thermal Wave Induced Displacements and Themoreflectance Variations		RTP-1532	
Optical Path Length Modulation System	US	RTP-1536-00-PRO	
Modified Optical Generator and Detector of Stress Pulses		RTP-1537-00-PRO	
Method and Apparatus for Increasing Signal to Noise Ratio in a Photoacoustic Film Thickness Measurement System	KR	RTP-1103-00-KR	
Method and Apparatus for Enhanced Thin Film Measurements		RTP-1538-00-PRO	
Characterizing Cmp Processes with Picosecond Ultrasonic Metrology	TW	RTP-1129-01-TW	
Characterizing Cmp Processes with Picosecond Ultrasonic Metrology		RTP-1129-01-WO	
Multi-Function Metrology Tool		RTP-1132-01-US	
Combined Ultra-Fast X-Ray and Optical System for Thin Film Measurements	US	RTP-1552	
Small-Spot, High-Throughput Spectroscopic Modulation Ellipsometer	US	RTP-1553	
System and Method of Mitigating Effects of Component Deflection In a Probe Card Analyzer	US	RTP-803-10-US	
Automated Wafer Defect Inspection System	BE	RTP-037-00-BE	EP1112550
A Laser Triangulation Method for Measurement of Highly Reflective Solder Balls	US	RTP-814-00-PRO	60/627581

See-Through-Silicon Application Studies Based on Traditional Silicon Based Imager	US			RTP-1745-02-US	
See-Through-Silicon Application Studies Based on Traditional Silicon Based Imager	WO			RTP-1745-02-WO	
See-Through-Silicon Application Studies Based on Traditional Silicon Based Imager	US			RTP-1745-02-TW	
High Resolution Edge Inspection	KR			RTP-458-01-KR	
Opto-Acoustic Assessment of Pillar Structures				RTP-1888-01-PRO	
Concentricity Measuring Instrument for a Fiberoptic Cable End	US	3/23/2004	6710864	RTP-1918-00-US	10/3826669
Location of Probes in Probe Card Inspection	US			RTP-1774-01-PRO	
IR Alignment Module	US			RTP-1935-01-PRO	
High Order Fitting to Reduce Pick and Place Shear	US			RTP-1942-01-PRO	
General IP Matters				RTP-1944-00	
Signal Filtering and Alignment by Pattern Matching	US			RTP-1946-01-PRO	
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	AT		AT E 639 779	RTP-813-01-AT	
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	BE		1 549 905	RTP-813-01-BE	
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	FR		1 549 905	RTP-813-01-FR	
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	DE		603 45 260.4	RTP-813-01-DE	
Height Determination of the Profile of a Moving Object Using a Plurality of CCD Arrays	IT		1 549 905	RTP-813-01-IT	
Scratch Detection Method and Apparatus	CN			RTP-1570-02-CN	
Scratch Detection Method and Apparatus	DE			RTP-1570-02-DE	
Optical Method For The Determination Of Grain Orientation In Films	IE	4/6/2016	1247069	RTP-1007-02-IE	
Optical Method For The Determination Of Grain Orientation In Films	NL	4/6/2016	1247069	RTP-1007-02-NL	
Lens Stress Correction and Calibration				RTP-2080-01-PRO	
High Speed Lithography Machine and Method Stage With Regional Planarity	EP	8/31/2017	1751623	RTP-1858-01-DE	60 2005 052 370.7
				RTP-2106-02-US	

Wafer Shape Thickness and Trench Measurement	US	RTP-1916-01-US
Pit Discrimination	US	RTP-2114-01-PRO
Back Light for Optical Inspection	US	RTP-2116-01-PRO
Improved Inspection Focus		RTP-2176-01-PRO
High Speed Autofocus System Using Intelligent Image Analysis to Determine Optimal Focus	KR	RTP-2034-02-KR
WAFER INSPECTION SYSTEM INCLUDING A LASER TRIANGULATION SENSOR	CN	RTP-2085-01-CN P19JM1WN00921US