PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT7979991

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	PATENT SECURITY AGREEMENT (TERM LOAN)

CONVEYING PARTY DATA

Name	Execution Date
TELEPHONICS CORPORATION	05/30/2023
TTM TECHNOLOGIES, INC.	05/30/2023
TTM TECHNOLOGIES NORTH AMERICA, LLC	05/30/2023

RECEIVING PARTY DATA

Name:	JPMORGAN CHASE BANK, N.A., AS ADMINISTRATIVE AGENT
Street Address:	10 S. DEARBORN
Internal Address:	FLOOR L2
City:	CHICAGO
State/Country:	ILLINOIS
Postal Code:	60603

PROPERTY NUMBERS Total: 150

Property Type	Number
Patent Number:	11493622
Patent Number:	7642951
Patent Number:	7701383
Patent Number:	7705770
Patent Number:	8232907
Patent Number:	9948292
Patent Number:	10128834
Patent Number:	10591609
Patent Number:	10757809
Patent Number:	10849228
Patent Number:	11280914
Patent Number:	11320528
Patent Number:	9532465
Patent Number:	7005937
Patent Number:	7005942
Patent Number:	7061315
Patent Number:	7605672

Property Type	Number
Patent Number:	7646261
Patent Number:	7728694
Patent Number:	8044749
Patent Number:	8183952
Patent Number:	8519251
Patent Number:	8547186
Patent Number:	8638181
Patent Number:	8860529
Patent Number:	8896373
Patent Number:	8969733
Patent Number:	9035715
Patent Number:	9064622
Patent Number:	9178257
Patent Number:	9209511
Patent Number:	9214715
Patent Number:	9350062
Patent Number:	9450572
Patent Number:	9614694
Patent Number:	9634635
Patent Number:	9929456
Patent Number:	6713792
Patent Number:	6784851
Patent Number:	6784852
Patent Number:	10403950
Patent Number:	10535912
Patent Number:	10581399
Patent Number:	11158920
Patent Number:	10772193
Patent Number:	10980127
Patent Number:	11277909
Patent Number:	11362407
Patent Number:	11406008
Patent Number:	6848840
Patent Number:	6694068
Patent Number:	6594435
Patent Number:	6782181
Patent Number:	6818115
Patent Number:	6834131

Property Type	Number
Patent Number:	8444770
Patent Number:	7240313
Patent Number:	9526184
Patent Number:	6976793
Patent Number:	6809269
Patent Number:	6815837
Patent Number:	6872894
Patent Number:	6992896
Patent Number:	7025607
Patent Number:	7087846
Patent Number:	7078816
Patent Number:	7109732
Patent Number:	7145221
Patent Number:	7157646
Patent Number:	7161810
Patent Number:	7209368
Patent Number:	7211470
Patent Number:	7270845
Patent Number:	7292055
Patent Number:	7307022
Patent Number:	7334323
Patent Number:	7342183
Patent Number:	7343674
Patent Number:	7416996
Patent Number:	7442879
Patent Number:	7470990
Patent Number:	7508076
Patent Number:	7511518
Patent Number:	7523545
Patent Number:	7547577
Patent Number:	7595454
Patent Number:	7596863
Patent Number:	7646098
Patent Number:	7665207
Patent Number:	7679005
Patent Number:	7712210
Patent Number:	7738249
Patent Number:	7791897

Property Type	Number
Patent Number:	7803688
Patent Number:	7856706
Patent Number:	7875811
Patent Number:	8020292
Patent Number:	8156645
Patent Number:	8198551
Patent Number:	8240031
Patent Number:	8245392
Patent Number:	8250751
Patent Number:	8445094
Patent Number:	8453322
Patent Number:	8499440
Patent Number:	8510941
Patent Number:	8536459
Patent Number:	8567053
Patent Number:	8863379
Patent Number:	8950063
Patent Number:	9012811
Patent Number:	9485876
Patent Number:	9756724
Patent Number:	9913382
Patent Number:	7087441
Patent Number:	7129732
Patent Number:	7157647
Patent Number:	7176383
Patent Number:	7211289
Patent Number:	7416972
Patent Number:	7687722
Patent Number:	7800916
Patent Number:	8063315
Patent Number:	8084863
Patent Number:	8144480
Patent Number:	6900392
Patent Number:	7071423
Patent Number:	7348677
Patent Number:	7541058
Patent Number:	9736948
Application Number:	17121853

Property Type	Number
Application Number:	17543891
Application Number:	17511333
Application Number:	17939786
Application Number:	17053554
Application Number:	17092080
Application Number:	17162773
Application Number:	17191480
Application Number:	17225491
Application Number:	17543512
Application Number:	17965680
Application Number:	17492389
Application Number:	17725371
Application Number:	17590420
Application Number:	63449520
Application Number:	18121355
Application Number:	63452736
Application Number:	63476539
Application Number:	63499857
Application Number:	63460554

CORRESPONDENCE DATA

Fax Number: (212)455-2502

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.

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Address Line 1: 425 LEXINGTON AVENUE
Address Line 4: NEW YORK, NEW YORK 10017

ATTORNEY DOCKET NUMBER:	509265/1879
NAME OF SUBMITTER:	J. JASON MULL
SIGNATURE:	/J. Jason Mull/
DATE SIGNED:	05/30/2023

Total Attachments: 18
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PATENT SECURITY AGREEMENT

This PATENT SECURITY AGREEMENT, dated as of May 30, 2023 (as amended, supplemented or otherwise modified from time to time, the "Patent Security Agreement"), is made by each of the signatories hereto (collectively, the "Grantors") in favor of JPMorgan Chase Bank, N.A., as administrative agent (in such capacity, the "Administrative Agent") for the Secured Parties (as defined in the Guarantee and Collateral Agreement referred to below).

WHEREAS, TTM Technologies, Inc., a Delaware corporation (the "Borrower") has entered into the Amended and Restated Term Loan Credit Agreement, dated as of May 30, 2023 (as amended, supplemented or otherwise modified from time to time, the "Credit Agreement"), among the Borrower, the several banks and other financial institutions or entities from time to time parties thereto (the "Lenders"), certain other parties and the Administrative Agent;

WHEREAS, in connection with the Credit Agreement the Grantors have entered into the Amended and Restated Term Loan Guarantee and Collateral Agreement, dated as of May 30, 2023 in favor of the Administrative Agent for the benefit of the Secured Parties (as amended, supplemented or otherwise modified from time to time, the "Guarantee and Collateral Agreement"); and

WHEREAS, under the terms of the Guarantee and Collateral Agreement, the Grantors have granted a security interest in certain property, including, without limitation, certain Intellectual Property of the Grantors to the Administrative Agent for the ratable benefit of the Secured Parties.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, each Grantor agrees as follows:

SECTION 1. Definitions. Unless otherwise defined herein or the context otherwise requires, terms used in this Patent Security Agreement, including its preamble and recitals, have the meanings provided or provided by reference in the Credit Agreement or the Guarantee and Collateral Agreement, as applicable.

SECTION 2. Grant of Security. Each Grantor hereby pledges and grants to the Administrative Agent for the ratable benefit of the Secured Parties a continuing security interest in and to all of such Grantor's right, title and interest in the Patents listed on Schedule A, as collateral security for the prompt and complete payment and performance when due (whether at the stated maturity, by acceleration or otherwise) of such Grantor's Obligations.

SECTION 3. Recordation. This Patent Security Agreement has been executed and delivered by Grantor for the purpose of recording the grant of security interest herein with the United States Patent and Trademark Office. Each Grantor authorizes and requests that the Commissioner for Patents record this Patent Security Agreement.

SECTION 4. Execution in Counterparts. This Patent Security Agreement may be executed in counterparts (and by different parties hereto on different counterparts), each of which shall constitute an original, but all of which when taken together shall constitute a single contract. Delivery of an executed counterpart of a signature page of this Patent Security Agreement by telecopy or electronic transmission shall be effective as delivery of a manually executed counterpart of this Patent Security Agreement.

SECTION 5. Governing Law. This Patent Security Agreement shall be construed in accordance with and governed by the law of the State of New York.

SECTION 6. Conflict Provision. This Patent Security Agreement has been entered into in conjunction with the provisions of the Guarantee and Collateral Agreement and the Credit Agreement. The rights and remedies of each party hereto with respect to the security interest granted herein are without prejudice to and are in addition to those set forth in the Guarantee and Collateral Agreement and the Credit Agreement, all terms and provisions of which are incorporated herein by reference. In the event that any provisions of this Patent Security Agreement are in conflict with the Guarantee and Collateral Agreement or the Credit Agreement, the provisions of the Guarantee and Collateral Agreement or the Credit Agreement, as applicable, shall govern.

IN WITNESS WHEREOF, the undersigned have caused this Patent Security Agreement to be duly executed and delivered as of the date first above written.

TELEPHONICS CORPORATION,
as Grantor

By: _____
Name: Todd B. Schull
Title: Executive Vice President

TTM TECHNOLOGIES, INC,
as Grantor

By: _____
Name: Todd B. Schull
Title: Executive Vice President and
Chief Financial Officer

TTM TECHNOLOGIES NORTH AMERICA, LLC,
as Grantor

By: _____
Name: Todd B. Schull
Title: Vice President

JPMORGAN CHASE BANK, N.A.,
as Administrative Agent

By: _____
Name: Anna Araya
Title: Executive Director

SCHEDULE A

United States Patents and Patent Applications

Title	Patent No.	App. No.	Owner	Country
Compact radar with x band long-distance weather monitoring & w band high-resolution obstacle imaging for landing in a degraded visual environment	11,493,622	16/270,046	TELEPHONICS CORPORATION	U.S.
Dual channel spatially adaptive CFAR	7,642,951	11/273,717	TELEPHONICS CORPORATION	U.S.
A method for detecting a target	7,701,383	11/397,303	TELEPHONICS CORPORATION	U.S.
System and method for suppressing iff responses in the sidelobes and backlobes of iff interrogator antennas	7,705,770	11/183,569	TELEPHONICS CORPORATION	U.S.
Step frequency high resolution radar	8,232,907	11/209,336	TELEPHONICS CORPORATION	U.S.
Bidirectional integrated cmos switch	9,948,292	14/538,062	TELEPHONICS CORPORATION	U.S.
Bidirectional integrated CMOS switch	10,128,834	15/918,156	TELEPHONICS CORPORATION	U.S.
System and method for providing accurate position location information to military forces in a disadvantaged signal environment	10,591,609	15/866,849	TELEPHONICS CORPORATION	U.S.
Air-cooled heat exchanger and thermal arrangement for stacked electronics	10,757,809	16/203,999	TELEPHONICS CORPORATION	U.S.
Air-cooled heat exchanger and thermal arrangement for stacked electronics	10,849,228	16/922,201	TELEPHONICS CORPORATION	U.S.
System and Method for Providing Accurate Position Location Information to Military Forces in a Disadvantaged Signal Environment	11,280,914	16/808,581	TELEPHONICS CORPORATION	U.S.
Monopulse secondary surveillance radar system	11,320,528	17/088,768	TELEPHONICS CORPORATION	U.S.

Title	Patent No.	App. No.	Owner	Country
Monopulse secondary surveillance radar system		17/121,853	TELEPHONICS CORPORATION	U.S.
Aesa true dual beam full range, full doppler spectrum imaging while scanning radar system		17/543.891	TELEPHONICS CORPORATION	U.S.
METHOD OF FABRICATING A PRINTED CIRCUIT BOARD INTERCONNECT ASSEMBLY	9,532,465	13/852,947	TTM TECHNOLOGIES, INC.	U.S.
CIRCULATOR AND METHOD OF MANUFACTURE	7,005,937	10/445,766	TTM TECHNOLOGIES, INC.	U.S.
NON-SWITCHING ADAPTABLE 4-WAY POWER SPLITTER/COMBINER	7,005,942	10/719,817	TTM TECHNOLOGIES, INC.	U.S.
AUXILIARY AMPLIFIER NETWORK	7,061,315	10/862,800	TTM TECHNOLOGIES, INC.	U.S.
INVERTED STYLE BALUN WITH DC ISOLATED DIFFERENTIAL PORTS	7,605,672	11/668,682	TTM TECHNOLOGIES, INC.	U.S.
VERTICAL INTER-DIGITAL COUPLER	7,646,261	11/419,091	TTM TECHNOLOGIES, INC.	U.S.
SURFACE MOUNT STRIPLINE DEVICES HAVING CERAMIC AND SOFT BOARD HYBRID MATERIALS	7,728,694	11/829,420	TTM TECHNOLOGIES, INC.	U.S.
COUPLER DEVICE	8,044,749	12/392,649	TTM TECHNOLOGIES, INC.	U.S.
SURFACE MOUNTABLE CIRCULATOR	8,183,952	12/759,891	TTM TECHNOLOGIES, INC.	U.S.
MAGNETIC INSTRUMENT PICKUP	8,519,251	12/915,987	TTM TECHNOLOGIES, INC.	U.S.
COMPACT BALUN	8,547,186	12/543,295	TTM TECHNOLOGIES, INC.	U.S.
WIDEBAND BALUN USING RE-ENTRANT COUPLED LINES AND FERRITE MATERIAL	8,638,181	13/212,643	TTM TECHNOLOGIES, INC.	U.S.
IMPEDANCE TRANSFORMING COUPLER	8,860,529	13/229,254	TTM TECHNOLOGIES, INC.	U.S.

Title	Patent No.	App. No.	Owner	Country
WIDEBAND DOHERTY AMPLIFIER NETWORK	8,896,373	13/792,275	TTM TECHNOLOGIES, INC.	U.S.
HIGH POWER RF CIRCUIT	8,969,733	14/041,155	TTM TECHNOLOGIES, INC.	U.S.
COMPACT BROADBAND IMPEDANCE TRANSFORMER	9,035,715	13/782,279	TTM TECHNOLOGIES, INC.	U.S.
RF RESISTOR WITH LOSSY TRACES	9,064,622	13/800,765	TTM TECHNOLOGIES, INC.	U.S.
FIRST AND SECOND MICROSTRIP NETWORKS STACKED IN AN INVERTED ARRANGEMENT TO EACH OTHER USING AN INTEGRATED SUPPORT AND SHIELDING STRUCTURE	9,178,257	13/803,975	TTM TECHNOLOGIES, INC.	U.S.
DOHERTY POWER AMPLIFIER NETWORK	9,209,511	13/652,042	TTM TECHNOLOGIES, INC.	U.S.
HYBRID COUPLER DEVICE HAVING PLURAL TRANSMISSION LINE STRUCTURES WITH UNWOUND-REWOUND GEOMETRY	9,214,715	13/840,137	TTM TECHNOLOGIES, INC.	U.S.
STRESS RELIEVED HIGH POWER RF CIRCUIT	9,350,062	14/457,653	TTM TECHNOLOGIES, INC.	U.S.
SELF-CASCADABLE PHASE SHIFTER	9,450,572	14/571,323	TTM TECHNOLOGIES, INC.	U.S.
WIDEBAND RF DEVICE	9,614,694	14/803,529	TTM TECHNOLOGIES, INC.	U.S.
RF ATTENUATOR DEVICE AND SYSTEM	9,634,635	14/836,079	TTM TECHNOLOGIES, INC.	U.S.
RF TERMINATION	9,929,456	15/062,362	TTM TECHNOLOGIES, INC.	U.S.
INTEGRATED CIRCUIT HEAT SINK DEVICE INCLUDING THROUGH HOLE TO FACILITATE COMMUNICATION	10/060,563	6,713,792	TTM TECHNOLOGIES, INC.	U.S.
QUADRIFILAR ANTENNA SERIAL FEED	10/207,582	6,784,851	TTM TECHNOLOGIES, INC.	U.S.

Title	Patent No.	App. No.	Owner	Country
MULTIPORT SERIAL FEED DEVICE	10/272,324	6,784,852	TTM TECHNOLOGIES, INC.	U.S.
SYSTEMS AND METHODS FOR REMOVING UNDESIRED METAL WITHIN VIAS FROM PRINTED CIRCUIT BOARDS	17/511,333		TTM TECHNOLOGIES, INC.	U.S.
FORMING WAVEGUIDES AND HEAT TRANSFER ELEMENTS IN PRINTED CIRCUIT BOARDS	17/939,786		TTM TECHNOLOGIES, INC.	U.S.
CIRCULATOR WITH MODIFIED BIAS TO PREVENT HIGHER ORDER MODES	10,403,950	15/415,219	TTM TECHNOLOGIES, INC.	U.S.
WIDEBAND GYSEL POWER DIVIDER	10,535,912	15/672,611	TTM TECHNOLOGIES, INC.	U.S.
IMPEDANCE MATCHING COMPONENT	10,581,399	15/220,940	TTM TECHNOLOGIES, INC.	U.S.
HIGH POWERED RF PART FOR IMPROVED MANUFACTURABILITY	11,158,920	15/486,361	TTM TECHNOLOGIES, INC.	U.S.
WIDEBAND TERMINATION FOR HIGH POWER APPLICATIONS	10,772,193	16/705,703	TTM TECHNOLOGIES, INC.	U.S.
METHODS FOR FABRICATING PRINTED CIRCUIT BOARD ASSEMBLIES WITH HIGH DENSITY VIA ARRAY	10,980,127	16/435,174	TTM TECHNOLOGIES, INC.	U.S.
THREE-DIMENSIONAL CIRCUIT ASSEMBLY WITH COMPOSITE BONDED ENCAPSULATION	11,277,909	17/006,316	TTM TECHNOLOGIES, INC.	U.S.
DIRECTIONAL COUPLERS WITH DC INSULATED INPUT AND OUTPUT PORTS	11,362,407	16/805,519	TTM TECHNOLOGIES, INC.	U.S.
WIDEBAND TERMINATION FOR HIGH POWER APPLICATIONS	11,406,008	16/999,969	TTM TECHNOLOGIES, INC.	U.S.
HIGH-DENSITY OPTICAL WAVEGUIDE STRUCTURE AND PRINTED CIRCUIT BOARD AND PREPARATION METHOD THEREOF		17/053,554	TTM TECHNOLOGIES, INC.	U.S.
SYSTEMS AND METHODS FOR REMOVING UNDESIRED METAL		17/092,080	TTM TECHNOLOGIES, INC.	U.S.

Title	Patent No.	App. No.	Owner	Country
WITHIN VIAS FROM PRINTED CIRCUIT BOARDS				
METHOD OF MANUFACTURING PRINTED CIRCUIT BOARD ASSEMBLIES WITH ENGINEERED THERMAL PATHS		17/162,773	TTM TECHNOLOGIES, INC.	U.S.
VACUUM NOZZLE ASSEMBLY FOR VACUUM-ASSISTED DRIVER		17/191,480	TTM TECHNOLOGIES, INC.	U.S.
METHODS FOR FABRICATING PRINTED CIRCUIT BOARD ASSEMBLIES WITH HIGH DENSITY VIA ARRAY		17/225,491	TTM TECHNOLOGIES, INC.	U.S.
DEVICES AND METHODS FOR FORMING ENGINEERED THERMAL PATHS OF PRINTED CIRCUIT BOARDS BY USE OF REMOVABLE LAYERS		17/543,512	TTM TECHNOLOGIES, INC.	U.S.
CIRCULATOR DESIGN AND METHODS OF FABRICATING THE CIRCULATOR		17/965,680	TTM TECHNOLOGIES, INC.	U.S.
HIGH POWERED RF PART FOR IMPROVED MANUFACTURABILITY		17/492,389	TTM TECHNOLOGIES, INC.	U.S.
HIGH POWERED RF PART FOR IMPROVED MANUFACTURABILITY		17/725,371	TTM TECHNOLOGIES, INC.	U.S.
NEAR-HERMETIC PACKAGE WITH FLEXIBLE SIGNAL INPUT AND OUTPUT		17/590,420	TTM TECHNOLOGIES, INC.	U.S.
SYSTEM AND METHODS FOR PASSIVE ALIGNMENTS OF LIGHT TRANSMITTING OR RECEIVING DEVICES TO PLANAR WAVEGUIDES		63/449,520	TTM TECHNOLOGIES, INC.	U.S.
FIBER OPTIC CIRCUIT BOARD CONNECTOR	6,848,840	10/051,418	TTM TECHNOLOGIES, INC.	U.S.
PCB EMBEDDED AND SURFACE MOUNTED OPTICAL DISTRIBUTION SYSTEMS	6,694,068	09/992,810	TTM TECHNOLOGIES, INC.	U.S.
BENDING AN OPTICAL FIBER INTO A BACKPLANE	6,594,435	10/179,756	TTM TECHNOLOGIES, INC.	U.S.
BENDING AN OPTICAL FIBER INTO A BACKPLANE	6,782,181	10/618,786	TTM TECHNOLOGIES, INC.	U.S.
HDI ELECTROLYTIC PLATING SYSTEM	6,818,115	10/273,820	TTM TECHNOLOGIES, INC.	U.S.

Title	Patent No.	App. No.	Owner	Country
SYSTEM AND METHOD FOR INTEGRATING OPTICAL LAYERS IN A PCB FOR INTER-BOARD COMMUNICATIONS	6,834,131	10/179,758	TTM TECHNOLOGIES, INC.	U.S.
SYSTEM FOR CLEANING COMPONENTS FOR FILLING HOLES IN A PRINTED CIRCUIT BOARD WITH A FLUID FILL MATERIAL	8,444,770	12/494,240	TTM TECHNOLOGIES, INC.	U.S.
METHOD FOR ANALYZING MATERIAL DENSITY VARIATIONS ON A MULTI-LAYER PRINTED CIRCUIT BOARD	7,240,313	10/609,068	TTM TECHNOLOGIES, INC.	U.S.
CIRCUIT BOARD MULTI-FUNCTIONAL HOLE SYSTEM AND METHOD	9,526,184	13/537,361	TTM TECHNOLOGIES, INC.	U.S.
FIBER OPTIC CIRCUIT CONNECTOR	6,976,793	10/825,980	TTM TECHNOLOGIES, INC.	U.S.
SHIELDED SIGNAL VIAS IN PRINTED CIRCUIT BOARDS FOR HIGH FREQUENCY AND BROADBAND SIGNALS		18/121,355	TTM TECHNOLOGIES, INC.	U.S.
FOLDED CIRCULATOR DEVICE WITH COUPLING ELEMENTS AND FLEX CONNECTIONS FOR INTERCONNECT AND METHODS OF FABRICATING THE CIRCULATOR DEVICE		63/452,736	TTM TECHNOLOGIES, INC.	U.S.
HIGH POWERED RF PART FOR IMPROVED MANUFACTURABILITY		17/492,389	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
HIGH POWERED RF PART FOR IMPROVED MANUFACTURABILITY		17/725,371	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
SYSTEMS AND METHODS FOR BALUNS OPTIMIZED FOR WIDEBAND BALANCED PROPERTIES		63/476,539	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
SEMI-FLEX FLY-OVER OR FLY-UNDER OPTICAL WAVEGUIDES WITH PRINTED CIRCUIT BOARDS		63/499,857	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
CIRCUITIZED SUBSTRATE ASSEMBLY AND METHOD OF MAKING SAME	6,809,269	10/322,527	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
ELECTRONIC PACKAGE WITH STRENGTHENED CONDUCTIVE PAD	6,815,837	10/423,877	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
INFORMATION HANDLING SYSTEM UTILIZING CIRCUITIZED SUBSTRATE	6,872,894	10/379,575	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
STACKED CHIP ELECTRONIC PACKAGE HAVING LAMINATE CARRIER AND METHOD OF MAKING SAME	6,992,896	10/661,616	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CAPACITOR MATERIAL WITH METAL COMPONENT FOR USE IN CIRCUITIZED SUBSTRATES, CIRCUITIZED SUBSTRATE UTILIZING SAME, METHOD OF MAKING SAID CIRCUITIZED SUBSTRATE, AND INFORMATION HANDLING SYSTEM UTILIZING SAID CIRCUITIZED SUBSTRATE	7,025,607	11/031,074	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
PINNED ELECTRONIC PACKAGE WITH STRENGTHENED CONDUCTIVE PAD	7,087,846	10/423,972	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE	7,078,816	10/812,890	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
ELECTRONIC COMPONENT TEST APPARATUS	7,109,732	10/630,722	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
LOW MOISTURE ABSORPTIVE CIRCUITIZED SUBSTRATE, METHOD OF MAKING SAME, ELECTRICAL ASSEMBLY UTILIZING SAME, AND INFORMATION HANDLING SYSTEM UTILIZING SAME	7,145,221	10/920,235	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH SPLIT CONDUCTIVE LAYER, METHOD OF MAKING SAME, ELECTRICAL ASSEMBLY	7,157,646	10/882,167	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
UTILIZING SAME, AND INFORMATION HANDLING SYSTEM UTILIZING SAME				
STACKED CHIP ELECTRONIC PACKAGE HAVING LAMINATE CARRIER AND METHOD OF MAKING SAME	7,161,810	11/238,960	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH SIGNAL WIRE SHIELDING, ELETRICAL ASSEMBLY UTILIZING SAME AND METHOD OF MAKING	7,209,368	10/790,747	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD AND APPARATUS FOR DEPOSITING CONDUCTIVE PASTE IN CIRCUITIZED SUBSTRATE OPENINGS	7,211,470	11/216,133	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
DIELECTRIC COMPOSITION FOR FORMING DIELECTRIC LAYER FOR USE IN CIRCUITIZED SUBSTRATES	7,270,845	10/812,889	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
INTERPOSER FOR USE WITH TEST APPARATUS	7,292,055	11/110,901	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF TREATING CONDUCTIVE LAYER FOR USE IN A CIRCUITIZED SUBSTRATE AND METHOD OF MAKING SAID SUBSTRATE HAVING SAID CONDUCTIVE LAYER AS PART THEREOF	7,307,022	11/327,493	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING MULTILAYERED CIRCUITIZED SUBSTRATE ASSEMBLY HAVING SINTERED PASTE CONNECTIONS	7,334,323	11/177,413	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH SINTERED PASTE CONNECTIONS, MULTILAYERED SUBSTRATE ASSEMBLY, ELETRICAL ASSEMBLY AND INFORMATION HANDLING SYSTEM UTILIZING SAME	7,342,183	11/177,442	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
METHOD OF MAKING CIRCUITIZED SUBSTRATE ASSEMBLY	7,343,674	11/349,998	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE	7,416,996	11/349,990	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH SINTERED PASTE CONNECTIONS, MULTILAYERED SUBSTRATE ASSEMBLY, ELETRICAL ASSEMBLY AND INFORMATION HANDLING SYSTEM UTILIZING SAME	7,442,879	11/244,180	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE	7,470,990	11/086,323	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
INFORMATION HANDLING SYSTEM INCLUDING A CIRCUITIZED SUBSTRATE HAVING A DIELECTRIC LAYER WITHOUT CONTINUOUS FIBERS	7,508,076	11/350,777	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING AN INTERPOSER	7,511,518	11/902,976	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHODS OF MANUFACTURING PRINTED CIRCUIT BOARDS WITH STACKED MICRO VIAS	7,523,545	11/706,473	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING CIRCUITIZED SUBSTRATE WITH SOLDER PASTE CONNECTIONS	7,547,577	11/598,647	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING A CIRCUITIZED SUBSTRATE WITH ENHANCED CIRCUITRY AND ELECTRICAL ASSEMBLY UTILIZING SAID SUBSTRATE	7,595,454	11/590,888	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF PROVIDING A PRINTED CIRCUIT BOARD WITH AN EDGE CONNECTION PORTION AND/OR A PLURALITY OF CAVITIES THEREIN	7,596,863	11/652,633	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
MULTILAYERED CIRCUITIZED SUBSTRATE WITH P-ARAMID DIELECTRIC LAYERS AND METHOD OF MAKING SAME	7,646,098	12/081,042	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING A MULTI-CHIP ELECTRONIC PACKAGE HAVING LAMINATE CARRIER	7,665,207	11/455,183	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH SHIELDED SIGNAL LINES AND PLATED-THRU-HOLES AND METHOD OF MAKING SAME, AND ELECTRICAL ASSEMBLY AND INFORMATION HANDLING SYSTEM UTILIZING SAME	7,679,005	11/401,401	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF PROVIDING A PRINTED CIRCUIT BOARD WITH AN EDGE CONNECTION PORTION	7,712,210	11/808,140	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH INTERNAL COOLING STRUCTURE AND ELECTRICAL ASSEMBLY UTILIZING SAME	7,738,249	11/976,468	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
MULTI-LAYER EMBEDDED CAPACITANCE AND RESISTANCE SUBSTRATE CORE	7,791,897	12/283,146	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CAPACITIVE SUBSTRATE	7,803,688	12/380,616	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHODS OF MANUFACTURING PRINTED CIRCUIT BOARDS WITH STACKED MICRO VIAS	7,856,706	12/381,925	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
HIGH SPEED INTERPOSER	7,875,811	12/010,335	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHODS OF MANUFACTURING PRINTED CIRCUIT BOARDS	8,020,292	12/772,086	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MANUFACTURING A MULTILAYER PRINTED WIRING BOARD WITH COPPER WRAP PLATED HOLE	8,156,645	12/157,021	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
POWER CORE FOR USE IN CIRCUITIZED SUBSTRATE AND METHOD OF MAKING SAME	8,198,551	12/782,187	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
A METHOD OF JOINING A SEMICONDUCTOR DEVICE/CHIP TO A PRINTED WIRING BOARD	8,240,031	12/837,640	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING HIGH DENSITY INTERPOSER AND ELECTRONIC PACKAGE UTILIZING SAME	8,245,392	12/592,734	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MANUFACTURING A PRINTED CIRCUIT BOARD	8,250,751	12/070,811	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH DIELECTRIC LAYER HAVING DIELECTRIC COMPOSITION NOT INCLUDING OCNTINUOUS OR SEMI-CONTINUOUS FIBERS	8,445,094	11/896,786	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
MANUFACTURING METHODS OF MULTILAYER PRINTED CIRCUIT BOARD HAVING STACKED VIA	8,453,322	12/539,172	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
HALOGEN-FREE CIRCUITIZED SUBSTRATE WITH REDUCED THERMAL EXPANSION, METHOD OF MAKING SAME, MULTILAYERED SUBSTRATE STRUCTURE UTILIZING SAME, AND INFORMATION HANDLING SYSTEM UTILIZING	8,499,440	12/380,618	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHODS OF MANUFACTURING A PRINTED WIRING BOARD HAVING COPPER WRAP PLATED HOLE	8,510,941	13/399,995	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CORELESS LAYER BUILDUP STRUCTURE WITH LGA	8,536,459	12/764,994	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHODS OF MANUFACTURING PRINTED CIRCUIT BOARDS	8,567,053	13/153,254	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
Methods of manufacturing printed circuit boards using parallel processes to interconnect with subassemblies	8,863,379	13/206,414	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
Methods of manufacturing printed circuit boards with stacked micro vias	8,950,063	12/938,265	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
Printed circuit board with embedded heater	9,012,811	13/482,702	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
Methods of manufacturing printed circuit boards with stacked micro vias	9,485,876	14/518,434	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH SINTERED PASTE CONNECTIONS, MULTILAYERED SUBSTRATE ASSEMBLY, ELETRICAL ASSEMBLY AND INFORMATION HANDLING SYSTEM UTILIZING SAME	9,756,724	13/252,256	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD FOR ANCHORING A CONDUCTIVE CAP ON A FILLED VIA IN A PRINTED CIRCUIT BOARD AND PRINTED CIRCUIT BOARD WITH AN ANCHORED CONDUCTIVE CAP	9,913,382	14/694,756	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING A CIRCUITIZED SUBSTRATE HAVING A PLURALITY OF SOLDER CONNECTION SITES THEREON	7,087,441	10/968,929	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
SUBSTRATE TEST APPARATUS AND METHOD OF TESTING SUBSTRATES	7,129,732	11/281,456	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH FILLED ISOLATION BORDER, METHOD OF MAKING SAME, ELECTRICAL ASSEMBLY UTILIZING SAME, AND INFORMATION HANDLING SYSTEM UTILIZING SAME	7,157,647	10/882,170	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
PRINTED CIRCUIT BOARD WITH LOW CROSS-TALK NOISE	7,176,383	10/740,398	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
Method of making multilayered printed circuit board with filled conductive holes	7,211,289	10/737,974	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
METHOD OF MAKING SAME LOW MOISTURE ABSORPTIVE CIRCUITIZED SUBSTRAVE WITH REDUCED THERMAL EXPANSION	7,416,972	11/730,942	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
HALOGEN-FREE CIRCUITIZED SUBSTRATE WITH REDUCED THERMAL EXPANSION, METHOD OF MAKING SAME, MULTILAYERED SUBSTRATE STRUCTURE UTILIZING SAME, AND INFORMATION HANDLING SYSTEM UTILIZING	7,687,722	11/541,776	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH INTERNAL STACKED SEMICONDUCTOR CHIPS, METHOD OF MAKING SAME, ELECTRICAL ASSEMBLY UTILIZING SAME AND INFORMATION HANDLING SYSTEM UTILIZING SAME	7,800,916	11/783,306	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH CONDUCTIVE PASTE, ELECTRICAL ASSEMBLY INCLUDING SAID CIRCUITIZED SUBSTRATE AND METHOD OF MAKING SAID SUBSTRATE	8,063,315	11/802,434	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE WITH CONTINUOUS THERMOPLASTIC SUPPORT FILM DIELECTRIC LAYERS	8,084,863	12/081,051	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
MULTI-LAYER EMBEDDED CAPACITANCE AND RESISTANCE SUBSTRATE CORE	8,144,480	12/720,849	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
INFORMATION HANDLING SYSTEM UTILIZING CIRCUITIZED SUBSTRATE	6,900,392	10/933,260	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
CIRCUITIZED SUBSTRATE ASSEMBLY AND METHOD OF MAKING SAME	7,071,423	10/915,483	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF PROVIDING PRINTED CIRCUIT BOARD WITH CONDUCTIVE HOLES AND BOARD RESULTING THEREFROM	7,348,677	11/397,713	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.
METHOD OF MAKING CIRCUITIZED SUBSTRATE WITH INTERNAL OPTICAL PATHWAY	7,541,058	11/907,006	TTM TECHNOLOGIES NORTH AMERICA, LLC	U.S.

Title	Patent No.	App. No.	Owner	Country
SYSTEMS AND METHODS OF MANUFACTURING PRINTED CIRCUIT BOARDS USING BLIND AND INTERNAL MICRO VIAS TO COUPLE SUBASSEMBLIES	9,736,948	14/065,047	TTM TECHNOLOGIES, INC.	U.S.
FAST SWITCHING, ULTRA-LOW POWER AND COMPACT VARACTOR DRIVER		63/460,554	TTM Technologies North America, LLC	U.S.