

<b>PATENT ASSIGNMENT COVER SHEET</b>
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Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT5672063

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT

**CONVEYING PARTY DATA**

Name	Execution Date
THE AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH	11/08/2017

**RECEIVING PARTY DATA**

<b>Name:</b>	ADVANCED MICRO FOUNDRY PTE. LTD.
<b>Street Address:</b>	80 RAFFLES PLACE #58-01 UOB PLAZA
<b>City:</b>	SINGAPORE
<b>State/Country:</b>	SINGAPORE
<b>Postal Code:</b>	048624

**PROPERTY NUMBERS Total: 21**

Property Type	Number
Patent Number:	8319302
Patent Number:	8532440
Patent Number:	9087936
Patent Number:	9917127
Patent Number:	9425341
Patent Number:	9666736
Patent Number:	9880404
Patent Number:	9581545
Patent Number:	9134553
Patent Number:	9329415
Patent Number:	9335263
Patent Number:	9915787
Patent Number:	9136672
Patent Number:	10048453
Patent Number:	10133145
Patent Number:	9110314
Patent Number:	9002163
Patent Number:	9046494
Patent Number:	8362494
Patent Number:	8404133

PATENT

Property Type	Number
Patent Number:	8227178

**CORRESPONDENCE DATA**

**Fax Number:** (202)857-6395

*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.*

**Phone:** 202-857-6000

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**Correspondent Name:** ARENT FOX LLP

**Address Line 1:** 1717 K STREET, NW

**Address Line 4:** WASHINGTON, D.C. 20006-5344

**ATTORNEY DOCKET NUMBER:** 039707.00000

**NAME OF SUBMITTER:** WILBURN L. CHESSER

**SIGNATURE:** /Wilburn L. Chesser/

**DATE SIGNED:** 08/16/2019

**Total Attachments: 13**

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## INTELLECTUAL PROPERTY ASSIGNMENT AGREEMENT

THIS INTELLECTUAL PROPERTY ASSIGNMENT AGREEMENT dated 8 Nov 2017 (the "**Effective Date**") is made

BETWEEN:

- (a) **THE AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH**, a body corporate established pursuant to the Agency for Science Technology and Research Act (Cap 5A) having its address at 1 Fusionopolis Way, #20-10 Connexis North Tower, Singapore 138632 ("**A\*STAR**") of the first part;
- (b) **EXPLOIT TECHNOLOGIES PTE LTD** (Registration No. 199503187D), a company incorporated in Singapore having its address 1 Fusionopolis Way, #19-10 Connexis North Tower, Singapore 138632 ("**ETPL**") of the second part; and
- (c) **ADVANCED MICRO FOUNDRY PTE. LTD.** (Registration No. 201720322R), a company incorporated in Singapore and having its place of business at 80 Raffles Place #58-01 UOB Plaza, Singapore 048624 (hereinafter referred to as "**Company**") of the second part.

### RECITALS

- (1) A\*STAR is the proprietor of the Technologies as defined below.
- (2) ETPL is a wholly owned subsidiary and the commercialisation arm of A\*STAR and its Affiliates. ETPL has the right to grant licences in respect of the Technologies.
- (3) A\*STAR agrees to assign all its rights, title and interests in and to the Technologies to the Company on the terms of this Agreement.

IT IS AGREED as follows:

### 1. Definitions

In this Agreement, the following words shall have the following meanings:

**"Affiliate"** means: (i) an organisation, which directly or indirectly controls any Party; or (ii) an organisation, which is directly or indirectly controlled by any Party; or (iii) an organisation, which is controlled, directly or indirectly, by the ultimate parent of any Party. For purposes of this Clause, control is defined as owning fifty percent (50%) or more of the voting stock of Company or having otherwise the power to govern the financial and the operating policies or to appoint the management of an organisation. In respect of A\*STAR and ETPL, the term "Affiliate" means A\*STAR or ETPL (as the case may be), IME and any research centre or institute funded or managed by A\*STAR.

**"Agreement"** means this Intellectual Property Assignment Agreement.

**"Completion"** means date of completion of the Pre-Series A investment round in the Company.

**"Encumbrances"** means licences of Section B Technologies which have been granted by ETPL to third parties before Completion, as specified in Schedule 1.

"**IME**" means the Institute of Microelectronics, an Affiliate of A\*STAR and ETPL.

"**Improvements**" means any and all new versions of, changes, modifications, additions, alterations, enhancements, improvements, upgrades and development to the Technologies, of which an unlicensed use of the same would infringe on or be an unauthorised use of the Technologies.

"**Know-How**" means the know-how identified in Schedule 1.

"**Party**" means Company, A\*STAR or ETPL; and "Parties" means Company, A\*STAR and ETPL collectively.

"**Patents**" means the patent(s) and patent application(s) identified in the attached Schedule 1.

"**Technologies**" means the Section A Technologies, Section B Technologies and Section C Technologies collectively.

"**Section A Technologies**" means the Patents and Know How specified in Section A of Schedule 1.

"**Section B Technologies**" means the Patents and Know How specified in Section B of Schedule 1. Section B Technologies are subject to Encumbrances, as specified in Schedule 1.

"**Section C Technologies**" means the Patents and Know How specified in Section C of Schedule 1. Section C Technologies are each jointly owned by A\*STAR and a third party, as specified in Schedule 1.

## 2. Assignment of Section A Technologies

2.1 In consideration of the payment by Company in accordance with Clause 7, A\*STAR hereby assigns and transfers to the Company absolutely all its rights, title and interests in the Section A Technologies, and in and to all and any inventions disclosed in the Section A Technologies, including:

- (a) the absolute entitlement to any registrations granted pursuant to any of the applications comprised in the Patents in Section A;
- (b) the right to bring, make, oppose, defend, appeal proceedings, claims or actions and obtain relief (and to retain any damages recovered) in respect of any infringement, or any other cause of action arising from ownership, of any of the Section A Technologies whether occurring before, on, or after the date of this Agreement;
- (c) all divisional, continuation and continuation-in-part patent applications filed in respect of the Patents in Section A or any part thereof or any part thereof;
- (d) any and all patent or patents on the Section A Technologies that may be granted anywhere in the world;
- (e) the right to apply for, prosecute and obtain patent or other similar forms of protection throughout the world, including but not limited to any divisional, continuation or continuation-in-part patent applications, in respect of the

Section A Technologies to the intent that the grant of any patents or similar protection shall be in the name of and vest in the Company; and

- (f) the right to make any new application or applications in respect of any part or parts of the subject matter of any application or specification filed in connection with the Section A Technologies and the right to claim priority from the Patents in Section A or part thereof anywhere in the world.

- 2.2 The Company hereby grants to ETPL and its Affiliates, a perpetual, irrevocable, non-exclusive, royalty-free licence to use the Section A Technologies solely for their internal, non-commercial use and/or internal research and development use. The Company shall procure that any assignee of the Section A Technologies shall continue to grant to ETPL and its Affiliates such licence specified in this clause.

### **3. Licence and Assignment of Section B Technologies**

- 3.1 In consideration of the payment by the Company in accordance with Clause 7, A\*STAR shall assign to Company all its rights, title and interests in the Section B Technologies, and in and to all and any inventions disclosed in the Section B Technologies, on the same terms as the Section A Technologies, and subject to the receipt of third party consents as may be necessary. ETPL shall use reasonable efforts to procure such third party consents and complete the assignment as soon as possible, but in any case no later than twelve (12) months after Completion.

- 3.2 Until such third party consents are obtained (and the Section B Technologies are assigned from A\*STAR to Company), ETPL hereby grants to Company (subject to existing Encumbrances) an exclusive, worldwide, non-transferable, fully paid up and revocable (only under the provisions of Clause 10.2) licence to use such relevant part of the Section B Technologies to use, develop, make, have made, manufacture, distribute, market, import, export, sell and have sold products and to develop Improvements.

- 3.3 If such third party consents for the novation of Encumbrances in respect of Section B Technologies are not obtained, ETPL shall continue granting the licence under Clause 3.2 until such time that the Section B Technologies may be assigned without infringement of any obligation of ETPL.

- 3.4 During the duration of any exclusive licence granted by ETPL to the Company under Clause 3.2, the Company hereby grants to ETPL and its Affiliates, an irrevocable, non-exclusive, worldwide, royalty-free right to use such relevant part of the Section B Technologies solely for their internal, non-commercial use and/or internal research and development use.

### **4. Licence and Assignment of Section C Technologies**

- 4.1 In consideration of the payment by the Company in accordance with Clause 7, A\*STAR shall assign to Company all its rights, title and interests in the Section C Technologies, and in and to all and any inventions disclosed in the Section C Technologies, on the same terms as the Section A Technologies, subject to the receipt of consent from the other joint owners as may be necessary. ETPL shall use reasonable efforts to procure such joint owner's consent and complete the assignment as soon as possible, but in any case no later than twelve (12) months after Completion.

- 4.2 Until such joint owner's consents are obtained and the Section C Technologies are assigned from A\*STAR to Company, ETPL hereby grants to Company a non-exclusive, irrevocable, worldwide, non-transferable and fully paid up licence to use such relevant part of the Section C Technologies to use, develop, make, have made, manufacture, distribute, market, import, export, sell and have sold products and to develop Improvements.
- 4.3 If such joint owner's consent for the assignment of Section C Technologies are not obtained, ETPL shall continue to grant the licence under Clause 4.2.

**5 Perfection and Recordal**

- 5.1 The Company shall be responsible for executing and lodging all documents, and doing all acts required to effect the recordal of the transfer of the Technologies and the Agreement with the relevant registries or authorities at the cost and expense of the Company.
- 5.2 Upon the Company's written request, A\*STAR shall provide reasonable assistance to the Company, as appropriate, at the Company's cost and expense, to execute all requisite documentation reasonably required for the purpose of effecting and perfecting the transfer and recordal of the Technologies pursuant to this Agreement. A\*STAR shall seek the Company's prior approval if A\*STAR is required to pay any third party any costs, fees or expenses in order to comply with its obligations to provide reasonable assistance to the Company under this Clause. All such costs, fees or expenses approved by the Company shall be promptly and fully reimbursed to A\*STAR.

**6 Release of A\*STAR and ETPL**

- 6.1 Save where expressly provided otherwise in this Agreement, with effect from the Effective Date, the Company hereby releases and discharges A\*STAR and ETPL from all further and prospective liability, obligation, cost and expense in connection with the Section A Technologies. In particular, the Company shall bear all costs and expenses relating to the preparation, filing, prosecution and maintenance of the Section A Technologies arising on or after the Effective Date and where A\*STAR or its agents, sub-contractors, or assigns or any A\*STAR Affiliate have borne such costs and expenses with prior written approval from the Company on or after the Effective Date, the Company shall forthwith reimburse A\*STAR fully such costs and expenses.
- 6.2 Clause 6.1 shall apply mutatis mutandis with respect to Section B Technologies and Section C Technologies from the date such Technologies are assigned from A\*STAR to Company.

**7 Consideration and Financial Provisions**

The Parties agree that in consideration for the assignment and licence of the Technologies granted under this Agreement, Company shall on Completion pay to IME US\$1.00 (the adequacy and sufficiency of which is confirmed by the Parties).

**8 Exclusions and Liability Provisions**

- 8.1 Save as specified herein, the Technologies are assigned or licensed (as the case may be) on an "as-is" basis.

- 8.2 A\*STAR hereby represents, warrants and undertakes to the Company that as at the Effective Date:
- (a) it holds all rights, title and interests in the Technologies, and any inventions disclosed in the Technologies, that are being assigned or licenced (as the case may be) to the Company under this Agreement;
  - (b) the Technologies are free from any security interest, option, mortgage, charge or lien; and
  - (c) the list of Technologies specified in Schedule 1 is complete and accurate.
- 8.3 ETPL hereby represents, warrants and undertakes to the Company that all application, registration and renewal fees in respect of each of the Patents arising prior to the Effective Date have been or will be paid.
- 8.4 ETPL represents that as of the Effective Date it has not received any written notice from a third party:
- (a) that the use of the Technologies infringes the intellectual property rights of any third party; and
  - (b) challenging the ownership of the Technologies.
- 8.5 Save where expressly provided otherwise in this Agreement, A\*STAR and/or ETPL make no other representations, conditions or warranties, either express or implied with respect to the Technologies and all other warranties or representations by A\*STAR and/or ETPL are disclaimed to the fullest extent permitted by statute, law or otherwise.
- 8.3 Nothing in this Agreement shall be construed as an obligation by A\*STAR and/or ETPL to bring or prosecute or defend actions or suits by or against third parties for infringement of patents, copyrights, trade-marks, industrial designs or other intellectual property, whether in connection with the Technologies or otherwise.
- 8.4 Save for death or personal injury caused by negligence, A\*STAR, ETPL and/or their Affiliates shall not be liable for any indirect, consequential, incidental or special (and whether arising out of contract or tort) loss which the Company suffers arising from any defect, error, fault or failure to perform with respect to the Technologies.
- 8.5 Company agrees to assume all responsibility and liability for any loss, damages, costs, expenses or other claim for compensation arising from any use and/or development of the Technologies, including any third party intellectual property infringement claims, save where such liability is caused by the breaches of Clauses 8.2 and 8.3, gross negligence or willful misconduct by A\*STAR, ETPL and/or their Affiliates.

## **9 Use of Name**

Save for the purpose of disclosing the existence of this Agreement, including the title and the identification of the Parties, no Party shall use the name, trademark or logo of any other Party or those of their Affiliates or any variation thereof, without the prior written consent of that other Party.

## **10 Term and Termination**

- 10.1 This Agreement shall commence on the Effective Date.
- 10.2 ETPL shall be entitled to terminate the licence granted under Clause 3.2 forthwith by giving written notice to Company if:
- 10.2.1. an encumbrancer takes possession, or a receiver is appointed, of any of the

property or assets of Company; or

10.2.2. Company makes any voluntary arrangement with its creditors; or

10.2.3. Company goes into liquidation (except for the purpose of amalgamation or reconstruction and so that the resulting company effectively agrees to be bound by or assume the obligations imposed on Company under this Agreement); or

10.2.4. Company ceases to carry on business.

10.3 Termination of the licence under Clause 10.2 shall be without prejudice to any other right or remedy a Party may be entitled to hereunder or at law and shall not affect any accrued rights or liabilities of either Party nor the coming into or continuance in force of any provision hereof which is expressly or by implication intended to come into or continue in force on or after such termination.

## **11 Notices**

11.1 Any notice or other information required or authorised by this Agreement to be given by any Party to the other shall be given by delivering it by hand, sending it by pre-paid courier or express service; or sending it by facsimile transmission or similar means of communication; in all cases to the other party at the address first written above.

11.2 Any notice or other information sent by facsimile transmission or similar means of communication shall be deemed to have been duly given on the date of transmission, provided that a confirming copy of it is delivered by hand, sent it by pre-paid courier or express service to the other Party at the address first written above within twenty-four (24) hours after transmission.

## **12 Miscellaneous**

12.1 This Agreement shall be governed by the laws of Singapore (excluding its conflicts of laws principles).

12.2 Any dispute among the Parties arising out of or in connection with this Agreement including any question regarding its existence, validity or termination or in the performance thereof shall be referred to and finally resolved by mutually binding arbitration administered by the Singapore International Arbitration Centre ("**SIAC**") in accordance with the Arbitration Rules of the Singapore International Arbitration Centre ("**SIAC Rules**") for the time being in force, which rules are deemed to be incorporated by reference in this clause. The seat of the arbitration shall be Singapore. The Tribunal shall consist of one arbitrator. The language of the arbitration shall be English. The procedural law governing such arbitration shall be the law of Singapore.

12.3 Nothing in this Agreement shall create, or be deemed to create, a partnership, or the relationship of principal and agent, between or among the Parties.

12.4 The express terms of this Agreement are in lieu of all warranties, conditions, terms, undertakings and obligations implied by statute, common law, custom, trade usage, course of dealing or otherwise, all of which are hereby excluded to the fullest extent permitted by law.



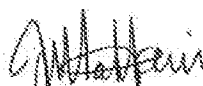
- 12.5 If any provision of this Agreement is held by any court or other competent authority to be invalid or unenforceable, in whole or in part, the other provisions of this Agreement and the remainder of the affected provision shall continue to be valid.
- 12.6 A person who is not a Party to this Agreement has no right under the Contracts (Rights of Third Parties) Act (Cap. 53B) to enforce any terms and conditions of this Agreement.

IN WITNESS OF WHICH this Agreement has been executed as follows

**ADVANCED MICRO FOUNDRY PTE.  
LTD.**

**AGENCY FOR SCIENCE, TECHNOLOGY  
AND RESEARCH**

By:



\_\_\_\_\_  
Jacinta Mahtani  
Director

By:



\_\_\_\_\_  
Suresh Sachi  
Deputy Managing Director and General  
Counsel

In the presence of:

In the presence of:



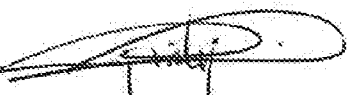
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Patricia Choy  
Legal Counsel  
Legal



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Patricia Choy  
Legal Counsel  
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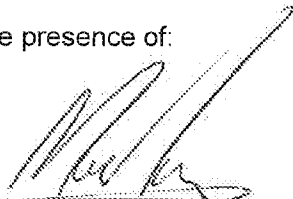
**EXPLOIT TECHNOLOGIES PTE LTD**

By:



\_\_\_\_\_  
Philip Lim  
Chief Executive Officer

In the presence of:



\_\_\_\_\_  
Leong Mun Yuen  
Senior Vice President

SCHEDULE 1TechnologiesSection A Technologies:

## (1) Patents and Patents applications

No	Application Number	Grant Number	Patent Title	Country	ETPL Ref. No.
1	JP (2010-519892), SG (201000452-1), US (12/672,369)	JP (4871413), SG (158572), US (8362494)	An electro-optic device and a method for manufacturing the same; US Title - Electro-optic device with novel insulating structure and a method for manufacturing the same	JP, SG, US	IME/P/04631/02/ JP, IME/P/04631/03/ SG, IME/P/04631/04/ US
2	SG (201000453-9)	SG (158573)	A semiconductor arrangement and a method for manufacturing the same	SG	IME/P/04619/03/ SG
3	US (12/665,876)	US (8319302)	A wafer arrangement and a method for manufacturing the wafer arrangement	US	IME/P/04632/02/ US
4	SG (201206154-5), US (13/634,364)	SG (183409), US (9134553)	Optical Modulator and Method for Manufacturing the Same	SG, US	IME/P/05846/02/ SG, IME/P/05846/03/ US
5	US (13/623,353), SG (10201502164T)	US (9335263), SG (10201502164T)	Optical Circuit for Sensing a Biological Entity in a Fluid and Method of Configuring the Same	US, SG	IME/P/06788/02/ US, IME/P/06788/03/ SG
6	SG (201300949-3), US (13/760,235)	SG (193092), US (9087936)	Semiconductor	SG, US	IME/P/07050/01/ SG,

No	Application Number	Grant Number	Patent Title	Country	ETPL Ref. No.
			Photomultiplier Device		IME/P/07050/02/US
7	SG (201308210-2), US (14/071,820)	SG (201308210-2), US (9329415)	Method for Forming an Optical Modulator	SG, US	IME/P/07135/01/SG, IME/P/07135/02/US
8	SG (11201504831U), US (14/760,524)	-	Optical Alignment Structure and Method of Determining Alignment Information	SG, US (PENDING)	IME/P/07399/02/SG, IME/P/07399/03/US
9	SG (11201502670W), US (14/434,399)	SG (11201502670W), US (9581545)	Optical Sensing System and Methods of Determining a Change in a Refractive Index in an Optical Sensing System	SG, US	IME/P/07489/02/SG, IME/P/07489/03/US
10	SG (201308801-8), US (14/090,543)	SG (201308801-8), US (9136672)	Optical Light Source	SG, US	IME/P/07481/01/SG, IME/P/07481/02/US
11	SG (201307537-9), US (14/048,379)	SG (201307537-9), US (9425341)	P-i-n Photodiode; US Title - P-i-n Photodiode with Dopant Diffusion Barrier Layer	SG, US	IME/P/07511/01/SG, IME/P/07511/02/US
12	SG (11201505416Q), US (14/761,382)	US (9666736)	Photodetector Arrangement	US	IME/P/07567/02/SG, IME/P/07567/03/US
13	SG (11201601260P), US (14/915,760)	-	Optical Coupling Device, Photonic Integrated Circuit, and Method of Forming an Optical Coupling Device	SG, US (PENDING)	IME/P/08077/02/SG, IME/P/08077/03/US

No	Application Number	Grant Number	Patent Title	Country	ETPL Ref. No.
14	SG (11201610438R), US (15/318,822)	-	Pixel Arrangement	SG, US (PENDING)	IME/P/08369/02/SG, IME/P/08369/03/US
15	SG (11201705838Y), US (15/544,442)	-	Optical Device and Method of Controlling the Same	SG, US (PENDING)	IME/P/08765/02/SG, IME/P/08765/03/US
16	PCT/SG2017/050469	-	An integrated optical phased array with cascaded phase shifting architecture for continuous beam steering		IME/P/10150/00/SG

## (2) Know-Hows

No.	Title	ETPL Reference
1	1*32 Optical Splitter based on SiON	-
2	A Method For Fabrication of On-Chip Turning Mirror	IME/Z/07519
3	Double Etched Waveguides on Thick Silicon-on-insulator Platform	IME/Z/08135
4	Fabrication of Spot Size Converter with Multiple Etching Steps on Thick Silicon-on-insulator Platform	IME/Z/08136
5	A method to fabricate a PN diode-based thermal resistor with low leakage current in 1.5 μm SOI platform	IME/Z/08258
6	Design and Processing Know-how for Silicon Photonics Integrated Circuit Chips	IME/Z/08540
7	Design and Fabrication of the Avalanche Photo Detector	-
8	CMOS-compatible high efficiency focus waveguide grating coupler with silicon overlay	IME/Z/09325
9	Laser Diode Assembly on Silicon Photonics	IME/Z/09157
10	Coupling of Optical Fiber to On-chip Silicon Waveguide via Passive Alignment with Silicon V-groove and Suspended Oxide Edge Coupler	IME/Z/09158
11	Lateral Light source integration on silicon photonic circuit	IME/Z/09702
12	Dry Etching to Form Si Recess for Ge Selective Epitaxial Growth	IME/Z/08883
13	High Quality of Selective Epitaxial Germanium Film on Silicon for Photo detector by RP CVD	IME/Z/08719
14	High Compressive Stress PECVD Silicon Nitride	IME/Z/08655
15	Deep Trench for Fiber/Si Nano-Structure Edge Coupling at Low Optical Coupling Loss	IME/Z/08538
16	Effect of Transition Step in Bosch Process for High Aspect Ratio Si Etch	IME/Z/08882
17	Low Stress PECVD TEOS-Based Silicon Oxide	IME/Z/09005
18	Silicon surface pre-treatment prior to EPITAXY	IME/Z/09448
19	High Tensile Stress PECVD Silicon Nitride at 400°C	IME/Z/09444
20	PECVD Silicon Oxynitrides with Tunable Refractive Indices	IME/Z/09769

No.	Title	ETPL Referen
21	Method of Optical Device Bonding on silicon photonic substrate	IME/Z/09829
22	A Dual-band Antenna for WIFI/WIMAX Applications	IME/Z/07403
23	Surface enhanced Raman scattering for higher performance and better manufacturability	IME/Z/07645
24	Design and process know-how of integrated steerable optical transmitter for LIDAR on silicon nitride platform	IME/Z/09703
25	CMOS-compatible AlN electro-optic phase modulator for visible and near-infrared wavelengths application.	IME/Z/09820
26	A Scheme to realize high-efficiency coupling between cleaved single mode fiber and Si waveguide across the C band	IME/Z/09943
27	A method of low-loss AlN waveguide fabrication	IME/Z/10000
28	Design and method to enhance bonding accuracy of light source hybrid integration	IME/Z/10002
29	Low Refractive Index PECVD Silicon Nitride	IME/Z/10329

**Section B Technologies:**

**(1) Solely Owned Patents**

No.	Application Number	Grant Number	Patent Title	Count ry	ETPL Ref. No.	Encumbrances
1	SG (201204468-1), US (13/517,377)	SG (181770), US (9002163)	Optical Converter and Method of Manufacturing the Same	SG, US	IME/P/05677/0 1/SG, IME/P/05677/0 2/US	Licensed to OCP Asia Inc
2	US (13/339,238), SG (1020140362 9T)	US (9110314), SG (10201403629T)	Optical Modulator and a Method of Forming the Same	SG, US	IME/P/06385/0 2/US, IME/P/06385/0 3/SG	Licensed to OCP Asia Inc
3	US (13/338,693), SG (1020140362 6P)	US (9046494), SG (10201403626P)	Optical Sensing System and a Method of Determining a Change in an Effective Refractive Index of a Resonator of an Optical Sensing System	SG, US	IME/P/06391/0 2/US, IME/P/06391/0 3/SG	Licensed to One BioMed Pte Ltd

**(2) Know-Hows**

No.	Title	ETPL Refce N	Encumbrances
1	A Method of Improving Si Modulators for Shorter Wavelength Applications (eg. 1.3um)	IME/Z/08481	Licensed to OCP Asia Inc
2	IME's Design and Processing Know-How to Facilitate Design and Prototyping of Photonics IC	--	Licensed to Canadian Microelectronics Corporation
3	Silicon Photonics Design Structure and Processes for Manufacturability in a CMOS Foundry	IME/Z/09441	Licensed to (a)Macom Technology Solutions; (b)NTT Electronics Corporation; (c)Alcatel-Lucent USA Inc; and (d) OCP Asia Inc
4	A Ge Photo detector and approach of forming the same-	--	Licensed to Macom Technology Solutions

**Section C Technologies:**

**(1) Patents and Patents applications**

No	Application Number	Grant Number	Patent Title	Country	ETPL Ref. No.	Joint Owner
1	US (12/547,115), JP (2010-509591), CN (20090161036.5), SG (201200280-4)	US (8404133), JP (4820917), CN (ZL200980161036.5), SG (177663)	Manufacturing Method of Planar Optical Waveguide Device with Grating; US Title - Manufacturing Method of Planar Optical Waveguide Device with Grating Structure	US, JP, CN, SG	IME/P/05654 /01/US, IME/P/05654 /02/JP, IME/P/05654 /03/CN, IME/P/05654 /04/SG,	Fujikura Ltd
2	US (12/547,146), JP (2010-509592), CN (20090161034.6), SG (201200245-7)	US (8227178), JP (4820918), CN (ZL200980161034.6), SG (177642)	Manufacturing Method of Planar Optical Waveguide Device with Grating; US Title - Manufacturing Method of Planar Optical Waveguide Device with	US, JP, CN, SG	IME/P/05655 /01/US, IME/P/05655 /02/JP, IME/P/05655 /03/CN, IME/P/05655 /04/SG	Fujikura Ltd

No	Application Number	Grant Number	Patent Title	Country	ETPL Ref. No.	Joint Owner
			Grating Structure			
3	SG (201001336-5), US (13/036,244)	SG (173939), US (8532440)	Silicon Based Electro Optic Device	SG, US	IME/P/05973 /00/SG, IME/P/05973 /02/US	NEC Corporation
4	SG (11201608209S), US (15/284,971)		Optical Waveguide Device and Method of Manufacturing the Same	SG, US (PENDING)	IME/P/08500 /01/SG, IME/P/08500 /02/US	Fujikura Ltd