

GIUNTA ESECUTIVA

DELIBERAZIONE N. 11001

La Giunta Esecutiva dell'Istituto Nazionale di Fisica Nucleare, riunita in Roma il giorno 15.03.2016,

- vista la nota del 22.02.2016, con la quale il Dr. Amedeo Staiano, Direttore della Sezione di Torino, chiede l'autorizzazione ad affidare alla Società IMEC di Leuven (Belgio), il contratto per la fornitura di un prototipo di circuito integrato per la lettura di rivelatori a pixel ibridi, nell'ambito del contratto conto terzi tra la Waters-Micromass e l'INFN;
- preso atto che le funzioni del Responsabile Unico del Procedimento sono espletate dal Dr. Angelo Rivetti, dipendente INFN;
- vista la relazione del Dr. Angelo Rivetti del 22.02.2016, allegata alla presente deliberazione come parte integrante e sostanziale, nella quale sono illustrati i motivi per i quali la Società IMEC, in qualità di unica società autorizzata a distribuire in Italia prodotti con la tecnologia UMC 110 nm AE richiesta, è l'unica in grado di effettuare la fornitura in oggetto;
- visti il Capitolato tecnico e le Condizioni contrattuali, predisposti dal Responsabile Unico del Procedimento, allegati alla presente deliberazione come parti integranti e sostanziali;
- vista l'offerta economica n. 160224_UMC_INFN_Torinopiumpm_11A1 del 24.02.2016, presentata dalla Società IMEC di Leuven (Belgio), allegata alla presente deliberazione come parte integrante e sostanziale;
- considerato che la presente fornitura non è prevista in Consip S.p.A. e nel MEPA, come attestato dal Responsabile Unico del Procedimento nella nota sopra citata;
- preso atto che per la fornitura in oggetto è prevista una spesa di USD 189.741,40, valutati in € 175.000,00, oltre IVA 22%, per un totale di € 213.500,00, che troverà copertura nel Bilancio dell'Istituto - Sezione di Torino - Esperimento WATERS - capitolo U.1.03.01.02.008 (Strumenti tecnico-specialistici non sanitari) a seguito del versamento dell'importo della fattura emessa che sarà accertato nel mese di marzo 2016;
- visto l'art. 57 comma 2 lettera b) del d.lgs. n. 163/06 e s.m.i.;
- vista, inoltre, la richiesta del Direttore della Sezione di Torino di esonerare la Società IMEC dal prestare la garanzia fideiussoria, ai sensi dell'art. 99 co. 2 del Regolamento di Amministrazione, Finanza e Contabilità dell'INFN;
- considerato che alla procedura in argomento è stato attribuito - dall'Autorità Nazionale Anticorruzione (ANAC) - il Codice di Identificazione Gara (CIG) n. 6598973CC7;
- visto lo schema di contratto da stipulare con la Società IMEC di Leuven (Belgio);

- visto l'articolo 14 co. 5 dello Statuto dell'INFN, secondo cui la Giunta Esecutiva delibera in materia di contratti per lavori, forniture e servizi e prestazioni d'opera e professionali che esulano dalla competenza dei Direttori delle Strutture.

D E L I B E R A

1. Di approvare l'affidamento alla Società IMEC di Leuven (Belgio) del contratto per la fornitura di un prototipo di circuito integrato per la lettura di rivelatori a pixel ibridi, per un importo di € 213.500,00, IVA inclusa.
2. Di autorizzare l'esonero della Società dalla costituzione della garanzia fideiussoria, come richiesto dal Direttore della Struttura proponente.
3. Di imputare la spesa di cui al punto precedente nel Bilancio dell'Istituto - Sezione di Torino - così come indicato in narrativa.
4. Di subordinare l'adempimento di cui al punto 1 al parere di congruità da parte di una Commissione tecnica composta da:
 - Dott. Gianni Mazza - Presidente
 - Dott. Gianfranco Dalla Betta
 - Dott. Giulio della Casa
5. I componenti della Commissione sono designati quali incaricati del trattamento dei dati personali con riferimento ai soli dati e per le finalità connesse alle attività ad essi affidate.
6. Di autorizzare il Presidente dell'Istituto a formalizzare con propria disposizione, in caso di parere positivo della Commissione, l'adempimento di cui al punto 1.
7. Di subordinare la stipula del contratto all'accertamento dell'insussistenza a carico del privato contraente, delle cause di divieto, sospensione, o decadenza di cui all'art. 67 del d.lgs. n. 159/2011 e s.m.i..

Torino, 22 Febbraio 2016

Dott. Amedeo Staiano
Direttore della Sezione di Torino dell'INFN
Via Pietro Giuria, 1

Torino

Oggetto: autorizzazione ordine per produzione prototipo progetto WHIN.

Caro Direttore,

A fine 2013 è stato firmato un contratto conto terzi tra la Waters-Micromass e l'Istituto Nazionale di Fisica Nucleare per la realizzazione di un circuito integrato per la lettura di rivelatori a pixel ibridi. La scelta di una tecnologia in cui produrre un chip deve essere fatta al momento in cui si inizia l'attività e non quando il circuito deve andare in produzione, in quanto tutto il lavoro di progettazione dipende in modo imprescindibile dalla conoscenza del comportamento dettagliato dei transistors, che cambia molto da un processo tecnologico all'altro.

Sulla base delle esigenze tecniche del partner industriale, che finanzia per intero il costo del progetto, ed in accordo con esso, la tecnologia UMC 110 nm AE. Questa tecnologia, infatti, offre l'utilizzo di otto livelli di metallo per le interconnessioni, tre tipi di transistor che consentono di ottimizzare le prestazioni circuitali ed è quindi **l'unica in grado di fornirci il prototipo con le caratteristiche tecniche richieste a fronte del budget che il partner industriale ci mette a disposizione**. Tale selezione è avvenuta contestualmente alla fase negoziale con il partner industriale ed è divenuta elemento essenziale del contratto sottoscritto.

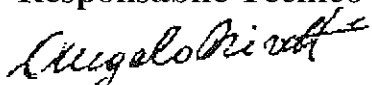
Il progetto del chip, condotto presso i laboratori della Sezione di Torino, è ora terminato ed occorre dunque passare alla realizzazione di un primo prototipo. A causa dei limitati volumi in gioco, non è possibile interagire direttamente con la fonderia, (la UMC, con quartier generale a Taiwan), ma occorre procedere attraverso la IMEC, che agisce in qualità di agente monomandatario per la UMC in Europa ed è quindi **l'unica in grado di farci accedere alla tecnologia suindicata**.

Affinché il prototipo possa andare in produzione e l'INFN riesca così ad onorare in pieno gli impegni sottoscritti, ti prego di sottoporre agli organi direttivi dell'INFN l'approvazione per questo acquisto. Ritengo infine che il prezzo offerto dalla IMEC, pari a \$ 194.000,00, sia assolutamente congruo per l'esecuzione di questo tipo di prestazione.

Con i migliori saluti

Angelo Rivetti

Responsabile Tecnico del Progetto



WHIN ASIC FABRICATION

TECNICAL ANNEX



WHIN ASIC FABRICATION

TECHNICAL ANNEX

WHIN ASIC FABRICATION

TECNICAL ANNEX

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1. OVERVIEW

The WHIN ASIC is a front-end ASIC for readout of hybrid pixel detectors. The chip consists of an array of 32 x 32 independent channels and End of Column (EoC) logic that collects the data from the channels and grants the interface with the outside world. The channels are connected to the sensing elements with bump bonding pads, while the periphery of the chip contains two rows of staggered wire bonding pad for the digital data transmission and the power supply connection. The chip has been designed by a team of the INFN Section in Torino. The design group is the only responsible for the technical choices made in the implementation of the ASIC. The ASIC must be produced in a dedicated engineering run. The masks will not be shared with any other customer. The reticle will host two instances of the same design, a full size chip containing 32 pixels per column, and a smaller chips, containing only 4 pixels per column, for test and debugging purposes.

2. FABRICATION TECHNOLOGY

The ASIC will be fabricated in the UMC 110 nm AE technology, with 8 level of metals. The thickest possible metal allowed by the process will be used as the top metal for power supply distribution. The fabrication process can not be changed without previous written consent of INFN. The design must be fabricated according to the design database provided by INFN in gds2 format.

3. NUMBER OF WAFERS

A minimum number of six good wafers will be produced in the run. All the wafers produced will be property of INFN and will be delivered to INFN without any extra cost associated to the mask fabrication.

4. WAFER POST-PROCESSING

The wafers need to be post-pressed to grant the required chip thickness and the under-bump metallization deposition. The contractor will detail in the offer the costs associated to such procedure, as described in detailed in paragraph 5 and 6.

5. WAFER THINNING AND DICING

The backside of the wafers will be thinned down to a thickness of 625 micrometers. The wafers will be diced to extract the individual chips according to the industrial standard practice. The cost of grinding and dicing must be explicitly quoted in the offer

6. UNDER-BUMP DEPOSITION

The surface of the bump bonding pads must be prepared for bump bonding deposition, by depositing Nichel-Gold layers with the following thickness:

- Nichel: 5 micrometers
- Gold: 0.05 micrometers

No deposition of bump bonding pads is required. Wire bonding pads must be masked so that they do not receive any extra processing.

The cost of the under-bump deposition must be explicitly quoted in the offer.

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7. WARRANTIES

To be considered good wafers, wafers must pass the routine screening performed by UMC to grant that the transistor parameters are within the specs provided by the simulation models, including those that accounts for the process variability. As the chip is an INFN concept, the contractor and foundry do not bear any extra liability once the wafers are delivered in specs.

8. DELIVERY TERMS

A processing term of 15 weeks maximum is assumed for the wafers, including the post-processing for under-bump deposition and dicing. The expected delivery term must be quoted in the offer. The contractor will promptly notify INFN of the delays and justify the reason of the delay. Failure of fulfilling the contract within 24 weeks from the reception of the final production data base may lead to the cancellation of the contract.

9. PAYMENT TERMS

The invoice may be issued after the delivery of the dry run and its acceptance by INFN. Payment will be done by electronic wire transfer only and in a way that keep it traceable by the relevant regulating authorities. In particular, the payment shall be traceable according to the Italian law n. 136/2010 and its following amendments.

10. PERSONS RESPONSIBLE FOR THE CONTRACT

The person responsible of this procedure (RUP) is Angelo Rivetti - email: rivetti@to.infn.it

Torino, February 18, 2016

Angelo Rivetti
WHIN project leader for INFN

Imec
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Kapeldreef 75
B-3001 HEVERLEE
BELGIUM

28.2.16
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ASPIRE. INVENT. ACHIEVE.



INFN TERMS AND CONDITIONS

1. VALIDITY OF THE OFFER

The offer must be valid for at least 90 days from the date it is issued.

2. DELIVERY

The material must be delivered to the following address:

**INFN - Sezione di Torino - Via Pietro Giuria 1
10125 - Torino - ITALY**

3. CONTRACT ASSIGNMENT

IMEC is responsible of the execution of the contract, as detailed in the technical annex, and will not assign this responsibility to other companies without previous agreement of INFN. Any contract assignment not fulfilling this condition shall be invalid.

4. CONTRACTOR DUTIES

IMEC is committed to observe the rules and regulations it is bound to by the national regulations of the country it is headquartered in terms of salaries, pension funds, healthcare and job safety.

5. NON SOLICITATION

For a three years term, IMEC will not offer any job or other kind of paid contracts to INFN employees that have the responsibility to choose the contractor and assign the contract. The persons responsible for the contract are listed in the technical annex.

6. PAYMENT TERMS

INFN will pay within **30 (thirty)** days from the reception of the invoice. Payment will be done by electronic wire transfer only. The invoice may be issued after the dry run delivery and its acceptance by the INFN responsible of the contract.

7. CONTRACT TERMINATION

INFN may terminate the contract informing IMEC with a written notice at least **20 (twenty)** days before the contract termination date. INFN is however bound to pay all the expenses incurred by IMEC for the execution of the contract till the date of the contract termination. In case IMEC is not able to fulfill the contract it will refund INFN of the money already paid for the contract execution.

8. WARRANTIES

Warranties conditions are detailed in the technical annex

9. JURISDICTION

The court of Rome shall have jurisdiction in case of dispute relative to the supply of goods and payments.

10. DATA PROTECTION

Any personal data and technical information that need to be exchanged by the parties during the execution of the contract are deemed to be confidential and will be used for the unique purpose of fulfilling the contract.

Imec
imec iClink
Kapeldreef 75
B-1001 HEVERLEE
BELGIUM
26.2.16
P. Melisse



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IMEC
Kapeldreef 75
B-3001 Belgium



INFN
Sezione di Torino
Via P. Giuria 1
10125 Torino
Angelo Rivetti

Ref No.: 160224_UMC_INFNTorino_piumpm_110AL
Feb 24, 2016

Dear Mr Rivetti,

Wrt your CIG code 6598973CC7.

IMEC is pleased to provide the following budgetary price quotation to support your project "WHIN" on full maskset wafer in UMC 110nm Aluminum Mixed Signal technology on 8" wafers.

Delivery to: INFN Sezione Torino – Via P. Giuria 1 – 10125 Torino

This pricing is effective for 1st acknowledged delivery date on and after 24 February 2016.

Price Quotation (Currency USD - USDollar)

Wafer Manufacturing

UMC L110AE 1P8M 1.2V/2.5V Mixed Signal process, 8 Inch Triple Well MIM Cap HS, SP, LL devices 40kA top metal		
NRE: Mask Set	143,210 USD	set
NRE: Pilot / Engineering Wafer lot - 8 inch Lot based charge	22,545 USD	12 w frs/lot
Tapeout fee for the commercial usage of foundry sponsored Faraday Libraries	5,000 USD	Single usage
Miscellaneous		
Probecard wafers, 8"	250 USD	per wafer

250x12=3000 €

Notes	<ul style="list-style-type: none"> (*) For the fabrication of a design with industrial purpose, a one time tapeout fee per product will apply for the usage of the Faraday foundry sponsored libraries on Europractice runs. Tapeout by non-academic institutes are always considered as commercial. Not applicable at re-tapeout in any form. (*) Upon receipt of this quotation customers should inform imec on the usage of Faraday IP inside the tapeout. Customer should inform the imec team on a regular basis about the tapeout plan to ensure a smooth tapeout preparation.
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	<ul style="list-style-type: none"> • An engineering lot of 12 wafers (the pilot lot) is started with the maskset. 6 wafers are guaranteed to pass all quality and electrical tests. Nevertheless all good wafers are delivered. In practice this is between 10 and 12 wafers • The engineering lot charge is lot based and will be invoiced - and needs to be paid - before wafer start. • All pilot wafers that travel till the end run in a HOT lot processing scheme. (upon availability) • Engineering wafers set on HOLD will continue at normal cycle time schedule when released. Wafers can only be released with a minimum quantity of 3 wafers. • Engineering lot lead time from final GDS-in to wafer delivery: Schedule to be confirmed after mask approval and wafer start. • For engineering lots all good wafers are delivered. The charge is lot based, and will be invoiced at the time of the first delivery of any amount of wafers. • End customer needs to provide transport courier and account number to arrange shipping 	
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Backend operations 1

Quotation: AN2388-01/2016/PSLWBSB2GBP-SH
 Passivation, Wafer Bumping, Solder Balling SB², Solder Ball Attached by Ultra-SB²

<p>1. Passivation</p> <p>1.1 Passivation – Photomask: Design and manufacturing of a 9" photomask (please provide GDS file) Non-recurring engineering (NRE), once per wafer type</p>	<p>\$ 5,175.00</p>
<p>1.2 Passivation – Machine Setup: Each per shipment and wafer type</p>	<p>\$ 552.00</p>
<p>1.3 Passivation Photo Resist - Process 1-25 wafers. (8 Inch)</p>	<p>Per wafer \$ 122.00</p>

122x12=1464 €

<p>2. Wafer Bumping – electroless Ni/Au UBM</p> <p>2.1 Wafer Bumping – electroless Ni/Au UBM – Process Setup: Electroless Ni/Au under bump metallization Setup price (nonrecurring engineering), once per wafer type</p> <p>Please note that PacTech requires one (1) extra clearly identified wafer for the electroless Ni/Au UBM Wafer Bumping Setup, (per wafer size or die type). Setup wafers will stay with PacTech unless otherwise instructed by the customer. Setup wafers are generally not suitable for any subsequent production as they may not be processed completely. In case of setup wafers still being suitable, the customer will be charged for the return of such setup wafers.</p>	<p>\$ 3,795.00</p>
<p>2.2 Wafer Bumping – electroless Ni/Au UBM (5µm Ni / 0.05µm Au) – Process: 1-25 wafers (8 Inch)</p>	<p>Per wafer \$ 140.00</p>

140x12=1680 €

The minimum order value for electroless Ni/Au wafer bumping is 3.030,00 EUR.
 The minimum order value per shipment, especially partial shipments in frame contracts is also 3,030 EUR

Backend operations 2

Setup for grinding and sawing, 8", 625 Mils	\$ 690.00
Wafer grind and saw, per wafer	per wafer \$ 138.00
Pick an dplace into waffle pack, including waffle packs* (* Upon availability of suitable waffle packs)	per die \$ 0.58

138x12=1656 €
0,58x140x12=974,40 €

Notes	<ul style="list-style-type: none"> IMEC and its suppliers cannot be held liable for the eventual loss of wafers due to the engineering operations that will be executed.
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Terms and conditions :

1. Delivery Term: EX WORKS-IMEC.
2. Payment Terms:
 - Mask NRE, Pilot wafer Lot, Tapeout fee: 100% down payment – cash with order
 - Backend operations 1 and 2 ; Upon invoice at delivery, 30 days net.
 - Production wafers : Net 30 days after invoicing for the amount of the installed credit line. These payment terms are subject to IMEC and UMC quarterly finance review and agreement. In case the customers' quarterly financial data does not allow to install a credit line, payment terms of production wafers are cash with order.
3. Any purchase order based in whole or in part on this Quote shall also be subject to UMC's general terms and conditions of purchase and sale whereby all the liabilities of IMEC as BUYER of UMEC will be passed over to your company. By placing a purchase order, the customer has accepted Terms and Conditions as described in this Quotation, and no new terms and conditions from either customer and IMEC will be accepted, including terms and conditions from the customer's purchase order, without a specific written consent signed by both the customer and IMEC pertaining to any new terms and conditions.
4. Validity: This quotation is valid for 60 days based on the date of issue.
5. This quotation is confidential
6. IMEC can only accept purchase order if it is addressed to IMEC, Kapeldreef 75, B-3001 Leuven, Belgium and attention to Europractice Service (P. Malisse).
7. This quotation does not constitute any manufacturing capacity commitment. Capacity reservation is subject to a separate communication between customer and IMEC.
8. The above Quotation is issued by IMEC solely to provide pricing regarding the technology and devices described in this Quotation.
9. The prices set forth herein are net of any and all taxes and duties. Customer shall pay all applicable taxes and duties regardless of whether or not they are itemized on the invoice(s).
10. Unless otherwise specified in this Quotation, this Quotation supersedes and replaces any and all prior quotations for the technologies, devices, services and materials described in this Quotation.

UMC and IMEC have offered you a favorite quote and we are looking forward to work with you on your future projects,

Yours

Paul Malisse
 Imec IC link
 Business Development Manager
 IMEC, Kapeldreef 75, B-3001 Leuven, Belgium
 Tel : +32 16 28127 - E-mail : Paul.Malisse@imec.be

Copy of UMC's Terms and conditions for purchase and sale



UMC WAFER FOUNDRY STANDARD TERMS AND CONDITIONS

1. ACCEPTANCE OF TERMS

UMC Group (USA) or UMC (Europe) BV, or UMC Japan, or United Microelectronics Corporation, whichever actually sells services or goods to Buyer ("Seller" or "UMC"), and Buyer (i) accept these terms as essential to their relationship governing provision of foundry services to be performed by United Microelectronics Corporation, or ROC Corporation or its affiliate ("Manufacturer") (collectively, these terms, all foundry agreements, and all written quotations (if any) are referred to as "Agreements") and (ii) confirm acceptance of these terms by Buyer's failure to return wafers and/or to reject wafers (collectively "goods") within five (5) days of delivery.

2. DELIVERY

2.1 Delivery will be made Free Carrier (Incoterms 2000), Manufacturer's plant to a carrier designated in writing by Buyer or, if Buyer fails to designate a carrier, to a carrier designated by Seller.

2.2 Title to the goods will pass to Buyer upon pickup at Seller's dock by carrier.

2.3 At wafer-out dates are subject to timely receipt by Seller or Manufacturer of fully-approved mask sets and fully-completed purchase orders.

2.4 Seller shall make reasonable efforts to achieve on-time wafer-outs. Subject to this and Seller's written commitments for wafer starts, SELLER SHALL NOT BE LIABLE FOR ANY DELAYS OR FAILURES TO MEET DATES.

2.5 Buyer and Seller agree that, except as specifically stated in an agreement manually signed by officers of both, or pursuant to orders accepted in writing by Seller, Buyer has no obligation to purchase and Seller has no obligation to accept Buyer's orders or to continue offering services or products. There are no implied obligations (whether arising from any law or otherwise) or creating any ongoing obligations to buy or sell.

3. TERMS OF PAYMENT & CREDIT

3.1 Unless otherwise agreed, full payment shall be made in New Taiwan Dollars and/or U.S. Dollars (as stated in the invoice) within 30 days of delivery or, if Buyer is located in Asia, by the last day of the first calendar month following the month of delivery.

3.2 Seller reserves the right to change credit terms at any time in its sole discretion.

3.3 Buyer will issue written purchase orders by the 15th day of the calendar month for wafer outs in the calendar month two months hence, or by such other time as is specified by Seller in writing, and guarantees prompt payment of all obligations accrued pursuant to purchase orders.

3.4 Regardless of anything to the contrary, Buyer understands that Manufacturer generally needs to start more than the numbers of wafers ordered by Buyer in order to guarantee at the time of wafer start the quantities of wafers so ordered which will yield within the agreed specifications. Accordingly, Buyer will accept quantity variations (and pay according to the agreed pricing) up to as much as ten percent (10%) above the quantities stated in Buyer's purchase order(s).

4. PRICE, CYCLE TIMES, QUALIFICATION, PILOT RUNS, HOT LOTS, PRODUCTION

Unless otherwise agreed in writing, Wafer Price, Wafer Cycle Time, Qualification, Pilot Runs, Hot Lots, and Production Runs will be exclusively as stated in Seller's Foundry Procedures and/or Seller's written quotation for the goods involved.

5. NON-DISCLOSURE, CONFIDENTIALITY OF DESIGN & OWNERSHIP OF PROCESS

5.1 Unless otherwise agreed in writing, the terms of Seller's Reciprocal Non-Disclosure Agreement are expressly incorporated herein.

5.2 Unless otherwise expressly agreed in writing to the contrary, Seller will treat any and all masks and databases provided by Buyer as confidential, provided however that, notwithstanding the foregoing or anything else, for any third party IP contained in Buyer's design where the provision of such IP was facilitated by UMC, Buyer authorizes UMC to provide information related to the manufacture of Buyer's products in UMC fabs to vendors of such IP on a confidential basis as reasonably required under UMC's agreements with such IP vendors.

5.3 Regardless of anything to the contrary, nothing in this Agreement shall limit or restrict either party from using and/or implementing in the ordinary course of its business any and all processes, recipes, and manufacturing, fabrication, assembly and test techniques, and related improvements ("process technology") provided, derived and/or developed in whole or in part by or on behalf of that party, and neither party shall be limited or restricted with respect to any such process technology unless clearly stated to the contrary in a writing signed by an officer of the party to be restricted identifying the specific information in precise detail.

6. CHANGE NOTICES, ESD PROCEDURES, RELIABILITY & QUALITY AND RMA

Change Notices, ESD Procedures and Reliability and Quality and Return Material Authorization shall be as stated in Seller's Foundry Procedures, or in another writing signed by Seller and Buyer.

7. LIMITED WARRANTY

7.1 Seller warrants goods delivered after final qualification shall be processed (i) using the masks (or duplicates of them) which were used for qualification, (ii) within the tolerances stated in Seller's applicable process specifications, and (iii) in compliance with applicable Wafer Acceptance Criteria agreed to in a writing signed by Seller and Buyer.

7.2 Goods which have been subject to abuse, misuse, accident, alteration, neglect, conditions outside specification, electromagnetic effects, radiation-induced damage, unauthorized repair or improper application are not covered by any warranty, nor is any warranty extended as to ordinary wear and tear or damages resulting from environmental, normal lifetime or externally induced degradation.

7.3 Seller shall not be responsible for defects or claims caused by acts not performed by or on behalf of Seller or Manufacturer, or by design or application; or by combination of goods with other things.

7.4 Goods are not intended for use in, and no warranty is made with respect to, applications where failure to perform can reasonably be expected to result in significant injury (including, without limitation, navigation, weapons, aviation or nuclear equipment, or for surgical implant or to support or sustain life) and Buyer will indemnify, defend, and hold harmless Seller from all claims, damages and liabilities arising out of any such matters.

7.5 To the extent that any goods fail to meet the applicable warranties and/or requirements due to reasons for which Seller and/or Manufacturer is responsible, Seller shall either (i) replace such goods without charge, or (ii) refund the payments made to Seller for such goods, at within sixty (60) calendar days of Seller's receipt of written notice from Buyer of such non-conformity. The parties will discuss in good faith which of these two remedies is the most appropriate; provided however that if they cannot agree, Seller may choose in its sole discretion between the two remedies, and provided further that all goods for which refund and/or replacement is sought and all claims shall be handled pursuant to Seller's return policy and procedures.

7.6 This Section 7 is the only warranty by or on behalf of Seller or Manufacturer and may not be modified or amended except in writing signed by an authorized officer of Seller and by Buyer. Buyer is not relying upon any warranty or representation except for those specifically stated here or in such a signed writing.

7.7 Buyer is not relying on any statements or information in Seller or Manufacturer's literature, and Buyer will test all parts and applications under extended field and laboratory conditions and to ensure reasonable margins over a range of conditions, including for warranty life and to provide guard bands extending beyond normally expected conditions as appropriate. Notwithstanding any cross-reference or statements of compatibility, functionality, interchangeability, and the like, Seller-provided goods, circuits, embedded devices and processes may differ from similar goods, circuits, devices and processes from other vendors in performance, function or operation, or as to matters, ranges and conditions not stated in and/or outside Seller's written specifications; and Buyer agrees that Seller makes no warranties and is not responsible for such things. All reusable IP, including that listed in Seller's Intellectual Property Catalog, and including but not limited to blocks, libraries, tools, and documentation thereto, is loaned to Buyer by the individual IP vendors and not by Seller, and in any event Seller and Manufacturer make no warranty in connection with such IP. Buyer is not relying on any statements or information provided by Seller or Manufacturer in connection with such IP, and Buyer will fully verify at IP as appropriate and be responsible to ensure that such IP is compatible and suitable for Buyer's intended purpose and applications.

7.8 EXCEPT AS PROVIDED ABOVE, SELLER AND MANUFACTURER MAKE NO WARRANTIES OR CONDITIONS, EXPRESSLY IMPLIED, OR STATUTORY, AND EXPRESSLY EXCLUDES

ANY WARRANTY OR CONDITION OF MERCHANTABILITY, NONINFRINGEMENT, OR FITNESS FOR A PARTICULAR PURPOSE OR APPLICATION.

7.9 REGARDLESS OF CAUSE OR REASON FOR DAMAGE (WHETHER ACCIDENT, NEGLIGENCE, OR OTHERWISE) SELLER SHALL HAVE NO LIABILITY (DIRECT, CONSEQUENTIAL OR OTHER) FOR, IN CONNECTION WITH OR ARISING FROM PROPERTY FURNISHED FOR USE AT OR LEFT AT SELLER; and delivering or entrusting property to Seller, Buyer expressly confirms this limitation. Notwithstanding this limitation, Seller will replace, or pay the reasonable reworking costs to replace, masks damaged or destroyed as a result of Seller's or Manufacturer's negligence or fault.

Upon written request sent to the billing address listed on Buyer's latest dated purchase order, Buyer will promptly take possession of any and all property of Buyer, and should Buyer fail to do so within thirty days of such request, Seller may destroy or reclaim such property without liability.

8. LIMITATION OF LIABILITY

8.1 Neither party will be liable for any loss, damage or claim resulting from causes beyond its reasonable control, including but not limited to, war, fire, delay caused by others, material shortages, force majeure, or labor conditions; and in the event of such a condition(s), the date(s) for Seller's performance will be extended for a period equal to any resulting delay.

8.2 SELLER'S AND MANUFACTURER'S LIABILITY ARISING OUT OF ANY QUOTATION, ANY AGREEMENT, ANY BREACH THEREOF, OR ANY GOODS OR SERVICES WILL BE LIMITED TO REFUND OF THE PURCHASE PRICE OR REPLACEMENT OF PURCHASED GOODS (RETURNED TO UMC FREIGHT PREPAID), OR IN THE EVENT OF A FAILURE OR BREACH BY SELLER REGARDING DELIVERY, AN AMOUNT EQUAL TO THE TOTAL PURCHASE PRICE OF THE GOODS THAT HAVE NOT BEEN DELIVERED DUE TO SUCH FAILURE.

8.3 AS A SEPARATE LIMITATION, IN NO EVENT WILL SELLER OR MANUFACTURER BE LIABLE (i) FOR COSTS OF SUBSTITUTE GOODS, (ii) FOR ANY SPECIAL, CONSEQUENTIAL, PUNITIVE, EXEMPLARY, ENHANCED, INCIDENTAL OR INDIRECT DAMAGES, OR (iii) FOR LOSS OF USE, OPPORTUNITY, MARKET POTENTIAL, GOODWILL AND/OR PROFIT ON ANY THEORY (CONTRACT, TORT, FROM THIRD PARTY CLAIMS OR OTHERWISE). THESE LIMITATIONS SHALL APPLY NOTWITHSTANDING ANY FAILURE OF ESSENTIAL PURPOSE OR OF ANY FAILURE OR INADEQUACY OF ANY REMEDY. THIS AGREEMENT STATES THE ONLY AND EXCLUSIVE REMEDY FOR ANY AND ALL CLAIMS MADE AGAINST SELLER AND/OR MANUFACTURER UNDER ANY AGREEMENT AND/OR WITH RESPECT TO (a) WAFERS, SERVICES AND/OR PRODUCTS; (b) ANY ACT OR OMISSION; AND/OR (c) THE RELATIONSHIP CREATED BY THIS AGREEMENT OR BUYER'S ORDERS.

8.4 No action or proceeding may be commenced by either party against the other, whether for breach, indemnification, contribution or otherwise, more than one year after delivery of the goods to the carrier; and no claim may be brought unless the non-claiming party has first been given commercially reasonable notice, a full written explanation of all pertinent details (including copies of all materials), and a good faith opportunity to resolve the matter.

8.5 BUYER EXPRESSLY AGREES TO THE LIMITATIONS OF SECTIONS 5, 7, 8 AND 9 AND TO THEIR REASONABLENESS.

8.6 The exclusions and limitations of Sections 5, 7, 8 and 9 will survive the termination of the applicable Agreements, and shall apply notwithstanding any claim of a failure of any one or more remedies to accomplish their purpose, and THE PARTIES EXPRESSLY WAIVE AND RELINQUISH ANY CONTRACT RIGHTS UNDER ANY AGREEMENT, AND/OR LAW, DECISION, CUSTOM OR PRACTICE.

9. INDEMNIFICATION & COOPERATION

9.1 Seller will defend and/or settle all suits against Buyer to the extent based on any claim that any processes (as performed by Seller with respect to goods) infringe any R.O.C., Canadian, Japanese, European Community and/or U.S. patent, copyright, trade secret or trademark provided, however, that Buyer (i) gives immediate written notice to Seller, (ii) permits Seller to defend, and (iii) gives Seller all needed information, assistance, and authority.

9.2 However, neither Seller nor manufacturer will be responsible for infringements resulting from anything not manufactured entirely by or on behalf of Seller, or from any combination with things or materials not furnished by Seller, or for any claim due in whole or in part to any act, omission, design and/or specification of Buyer.

9.3 THIS SECTION 9 STATES SELLER'S AND MANUFACTURER'S ENTIRE LIABILITY AND OBLIGATION WITH RESPECT TO INTELLECTUAL PROPERTY INFRINGEMENT OR CLAIMS THEREFOR AND IS EXPRESSLY SUBJECT TO SECTION 8. Except as to claims Seller is obligated to defend, BUYER WILL INDEMNIFY, DEFEND AND HOLD HARMLESS SELLER AND MANUFACTURER FROM ALL CLAIMS, COSTS, LOSSES, AND DAMAGES (INCLUDING REASONABLE ATTORNEYS' FEES) AGAINST AND/OR ARISING OUT OF GOODS AND/OR SERVICES.

9.4 Without limiting any other terms, Buyer guarantees that production and sales of goods pursuant to Buyer's specifications and/or designs will not infringe, misappropriate or violate any applicable R.O.C., Canadian, Japanese, European Community and/or U.S. copyright, trademark, patent, trade secret, mask work, or other rights of third parties. In the event Buyer is a party to any infringement or misappropriation action or dispute, (i) Seller may, at its sole option, immediately terminate and/or suspend performance, and (ii) Buyer shall be fully and solely responsible, and will defend, indemnify and hold Seller harmless from any and all damages, losses and costs (including Seller's reasonable attorneys fees) from and against any claim of breach of Buyer's guarantee in this paragraph.

9.5 Seller and Buyer will cooperate with respect to intellectual property rights of third parties relating to goods and/or services as stated in Seller's Foundry Procedures.

10. TERMINATION & DISPUTE RESOLUTION

10.1 Cancellation and/or termination of the Agreements and/or any order for goods shall not be permitted except strictly pursuant and subject to Seller's Foundry Procedures.

10.2 Buyer and Seller shall cooperate and attempt in good faith to resolve any and all disputes arising out of and/or relating to any Agreement and/or goods as described in Seller's Foundry Procedures.

10.3 All disputes relating to and/or arising out of any Agreement and/or goods which cannot be so resolved will be decided exclusively by binding arbitration under procedures which ensure efficient and speedy resolution. The specific procedures concerning such arbitrations shall be pursuant to the Rules for International Arbitrations under the American Arbitration Association, as described in more detail in Seller's Foundry Procedures.

10.4 Notwithstanding anything to the contrary, any party may apply to any court of competent jurisdiction for interim injunctive relief with respect to irreparable harm which cannot be avoided and/or compensated by such arbitration proceedings, without breach of this Section 10 and without any abridgment of the powers of the arbitrator.

11. NO OTHER WARRANTY OR REPRESENTATION

These terms and conditions (and the Agreements) are the entire agreement between Seller and Buyer with respect to foundry, fabrication, semiconductors, design support and goods, there are no other agreements concerning such subject matter, and no addition, deletion or modification shall be binding on Seller unless expressly agreed to in a writing signed by an officer of Seller. Seller objects to and rejects any and all changes, contrary or additional terms (whether in completed forms or otherwise) except as expressly accepted in a writing agreed by an officer of Seller.

12. MISCELLANEOUS

12.1 All foundry arrangements involving Seller and all performance and disputes arising out of and/or relating to such matters and/or any Goods involved will be governed by the laws of the Netherlands with respect to sales made in Europe; by the laws of the ROC with respect to sales made in Asia; or by the laws of California with respect to sales made elsewhere, all without reference to conflicts of laws principles, and/or any contrary provision, including without limitation the U.N. Convention on Contracts for the International Sale of Goods.

12.2 The parties will comply with all applicable restrictions and requirements of applicable law, including without limitation those relating to labor, employment, environment, and export control. Buyer agrees at its sole expense to comply with all applicable laws in connection with the purchase, use or sale of the Goods, unless it may 2006.doc