

## Test Report

No. XMNEC1500332903

Date: 05 May 2015

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FORMOSA MICROSEMI CO.,LTD

5F,NO.208,SEC.3,CHUNG-YANG RD,TUCHENG DISTRICT,NEW TAIPEI CITY,TAIWAN

The following sample(s) was/were submitted and identified on behalf of the clients as : DIODE

SGS Job No. : XM16092908EC - XM

Client Ref. Info. : SEE REMARK

Date of Sample Received : 22 Apr 2015

Testing Period : 22 Apr 2015 - 29 Apr 2015

Test Requested : Selected test(s) as requested by client.

Test Method : Please refer to next page(s).

Test Results : Please refer to next page(s).

Conclusion : Based on the performed tests on selected part of submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) comply with the limits in RoHS Directive 2011/65/EU Annex II; recasting 2002/95/EC.

Signed for and on behalf of  
SGS-CSTC Standards Technical Services Co., Ltd. Xiamen Branch



Michael Tso  
Approved Signatory



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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	XMN15-003329.001	Black body w/ gray printing
SN2	XMN15-003329.002	Silvery plating on pins
SN3	XMN15-003329.003	Copper-colored metal pins(after removed silvery plating)

Remarks :

- (1) 1 mg/kg = 0.0001%
- (2) MDL = Method Detection Limit
- (3) ND = Not Detected ( < MDL )
- (4) "-" = Not Regulated

**RoHS Directive 2011/65/EU**

- Test Method :
- (1)With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.
  - (2)With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.
  - (3)With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.
  - (4)With reference to IEC 62321:2008, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.
  - (5)With reference to IEC 62321:2008, determination of PBBs and PBDEs by GC-MS.

Test Item(s)	Limit	Unit	MDL	001
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	19983▲
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	2	ND
Sum of PBBs	1,000	mg/kg	-	ND
Monobromobiphenyl	-	mg/kg	5	ND
Dibromobiphenyl	-	mg/kg	5	ND
Tribromobiphenyl	-	mg/kg	5	ND
Tetrabromobiphenyl	-	mg/kg	5	ND
Pentabromobiphenyl	-	mg/kg	5	ND
Hexabromobiphenyl	-	mg/kg	5	ND
Heptabromobiphenyl	-	mg/kg	5	ND
Octabromobiphenyl	-	mg/kg	5	ND
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND



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Test Item(s)	Limit	Unit	MDL	001
Monobromodiphenyl ether	-	mg/kg	5	ND
Dibromodiphenyl ether	-	mg/kg	5	ND
Tribromodiphenyl ether	-	mg/kg	5	ND
Tetrabromodiphenyl ether	-	mg/kg	5	ND
Pentabromodiphenyl ether	-	mg/kg	5	ND
Hexabromodiphenyl ether	-	mg/kg	5	ND
Heptabromodiphenyl ether	-	mg/kg	5	ND
Octabromodiphenyl ether	-	mg/kg	5	ND
Nonabromodiphenyl ether	-	mg/kg	5	ND
Decabromodiphenyl ether	-	mg/kg	5	ND

Notes :

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II.

### RoHS Directive 2011/65/EU

Test Method : (1)With reference to IEC 62321-5:2013, determination of Cadmium by ICP-OES.  
 (2)With reference to IEC 62321-5:2013, determination of Lead by ICP-OES.  
 (3)With reference to IEC 62321-4:2013, determination of Mercury by ICP-OES.  
 (3) Determination of Hexavalent Chromium by spot test/ UV-Vis with reference to IEC 62321:2008

Test Item(s)	Limit	Unit	MDL	002	003
Cadmium (Cd)	100	mg/kg	10	ND	
Lead (Pb)	1,000	mg/kg	10	45	
Mercury (Hg)	1,000	mg/kg	10	ND	
Cadmium (Cd)	100	mg/kg	2		ND
Lead (Pb)	1,000	mg/kg	2		6
Mercury (Hg)	1,000	mg/kg	2		ND
Hexavalent Chromium (CrVI)	-	-	◇	Negative	Negative

Notes :

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II  
 (2)◇Spot-test:  
 Negative = Absence of CrVI coating, Positive = Presence of CrVI coating;  
 (The tested sample should be further verified by boiling-water-extraction method if the spot test result is Negative or cannot be confirmed.)  
 ◇Boiling-water-extraction:  
 Negative = Absence of CrVI coating  
 Positive = Presence of CrVI coating; the detected concentration in boiling-water-extraction solution is equal or greater than 0.02 mg/kg with 50 cm2 sample surface area.



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Information on storage conditions and production date of the tested sample is unavailable and thus results of Cr(VI) represent status of the sample at the time of testing.

(1) The maximum permissible limit is quoted from the directive 2011/65/EU, Annex II

**Elementary Analysis**

Test Method : With reference to US EPA Method 3052:1996, analysis was performed by ICP-OES.

Test Item(s)	Unit	MDL	001
Arsenic (As)	mg/kg	10	ND
Antimony (Sb)	mg/kg	10	ND
Phosphorus (P)	mg/kg	20	2531

**Perfluorooctane Sulfonates ( PFOS) and Perfluorooctanoic Acid ( PFOA)**

Test Method : With reference to US EPA Method 3550C:2007, analysis was performed by HPLC-MS.

Test Item(s)	CAS NO.	Unit	MDL	002
Perfluorooctane Sulfonates (PFOS) and related Acid, Metal	1763-23-1	µg/m <sup>2</sup>	1.0	ND
Perfluorooctanoic Acid (PFOA)	335-67-1	µg/m <sup>2</sup>	1.0	ND

Notes :

For reference: commission regulation (EU) No 757/2010 amending regulation (EC) No 850/2004:

(1) For the purposes of this entry, Article 4(1) (b) shall apply to concentrations of PFOS equal to or below 10 mg/kg (0,001 % by weight) when it occurs in substances or in preparations.

(2) For the purposes of this entry, Article 4(1) (b) shall apply to concentrations of PFOS in semi-finished products or articles, or parts thereof, if the concentration of PFOS is lower than 0,1 % by weight calculated with reference to the mass of structurally or micro-structurally distinct parts that contain PFOS or, for textiles or other coated materials, if the amount of PFOS is lower than 1µg /m2 of the coated material.

**Hexabromocyclododecane (HBCDD)**

Test Method : Determination of HBCDD by GC-MS based on IEC 62321:2008.

Test Item(s)	Unit	MDL	001
Hexabromocyclododecane (HBCDD)	mg/kg	10	ND



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**Phthalate**

Test Method : Determination of phthalates by GC-MS based on EN 14372:2004.

<u>Test Item(s)</u>	<u>CAS NO.</u>	<u>Unit</u>	<u>MDL</u>	<u>001</u>
Dibutyl Phthalate (DBP)	84-74-2	% (w/w)	0.003	ND
Benzylbutyl Phthalate (BBP)	85-68-7	% (w/w)	0.003	ND
Bis-(2-ethylhexyl) Phthalate (DEHP)	117-81-7	% (w/w)	0.003	ND
Diisobutyl Phthalate (DIBP)	84-69-5	% (w/w)	0.003	ND
Diisononyl Phthalate (DINP)	28553-12-0 / 68515-48-0	% (w/w)	0.010	ND
Di-n-octyl Phthalate (DNOP)	117-84-0	% (w/w)	0.003	ND
Diisodecyl Phthalate (DIDP)	26761-40-0 / 68515-49-1	% (w/w)	0.010	ND

Notes :

- (1) Reference Information: Directive 2011/65/EU recasting RoHS directive 2002/95/EC: Bis (2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP) and Dibutyl phthalate (DBP) are considered as a priority for risk evaluation and substance restriction.

Remark1: Results shown were conducted by SGS Guang zhou chemical lab.

Remark\*: According to the declaration from the client, Lead (Pb) in No.001 is exempted by EU RoHS directive 2011/65/EU based on [ANNEX III 7(a)]: Lead in high melting temperature type solders (i.e. lead-based alloys containing 85 % by weight or more lead).



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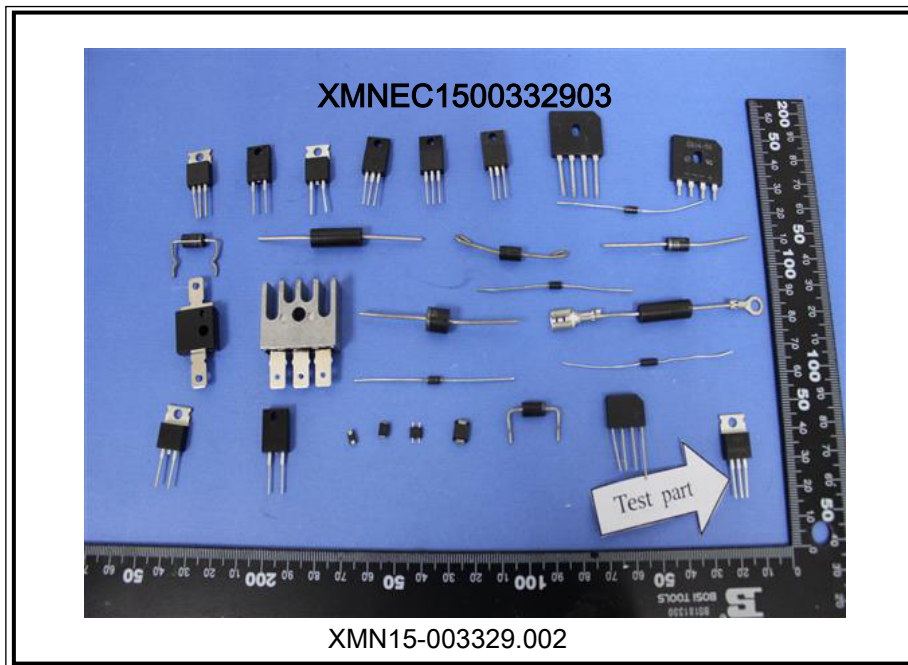
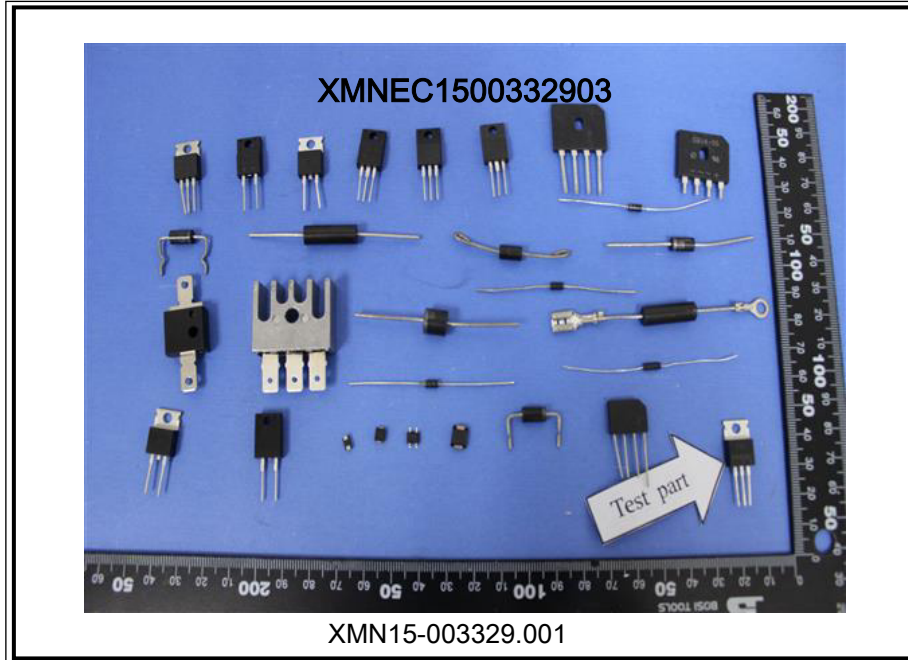
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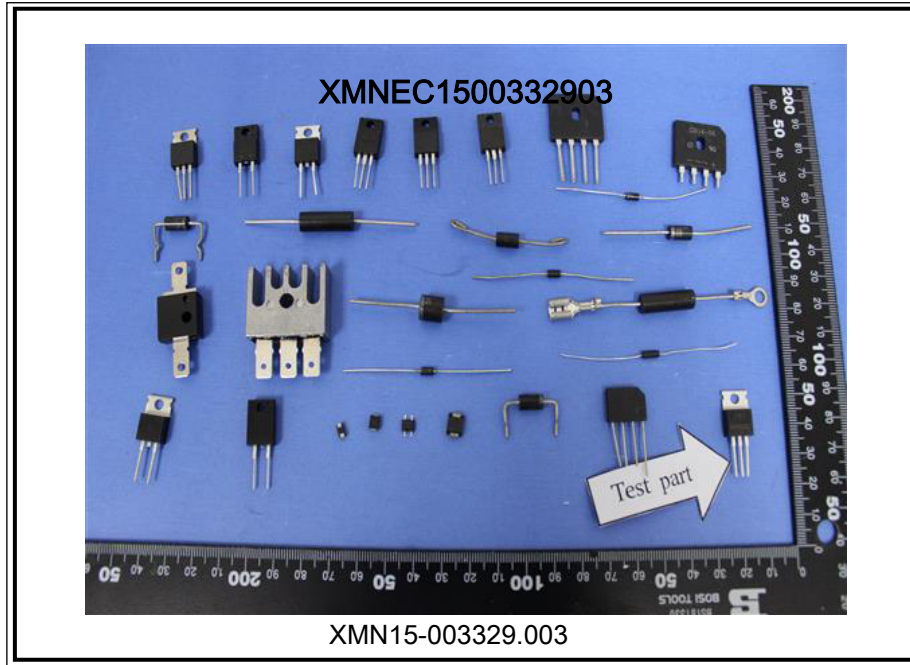
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