# TEST REPORT

**LAB NO. : (6620)254-1091**
**DATE : September 15, 2020**


Applicant:
**VISHAY SEMICONDUCTOR SHANGHAI CO., LTD**
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Date of Submission: 2020-09-10
Test Period: 2020-09-10 to 2020-09-15
Sample Mode: Sample Presentation
BV EE Ref. No.: /

| | | | |
|---|---|---|---|
| Sample Description : | Sample(s) received is(are) stated to be:<br>Lead frame | | |
| Manufacturer: | / | Buyer: | / |
| Style No(s): | Lead frame | PO No.: | / |
| Country of Origin: | / | Country of Destination: | Oversea Country |

Test Item(s): Details see page 2

**SUMMARY OF TEST RESULTS**

| **TEST REQUESTED** | **CONCLUSION** | REMARK |
|---|---|---|
| Total Beryllium Content | - | See Result |
| Heavy Metals, Flame Retardants, Phthalate Content - European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendments & As Applicant's requirement | PASS | |

**REMARK**
If there are questions or concerns on this report, please contact the following persons:

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**BUREAU VERITAS**
**CONSUMER PRODUCTS SERVICES DIVISION (SHANGHAI)**

Laboratory Test Location:
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PREPARED BY : Liza

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**Sample Description Assigned by Laboratory:**

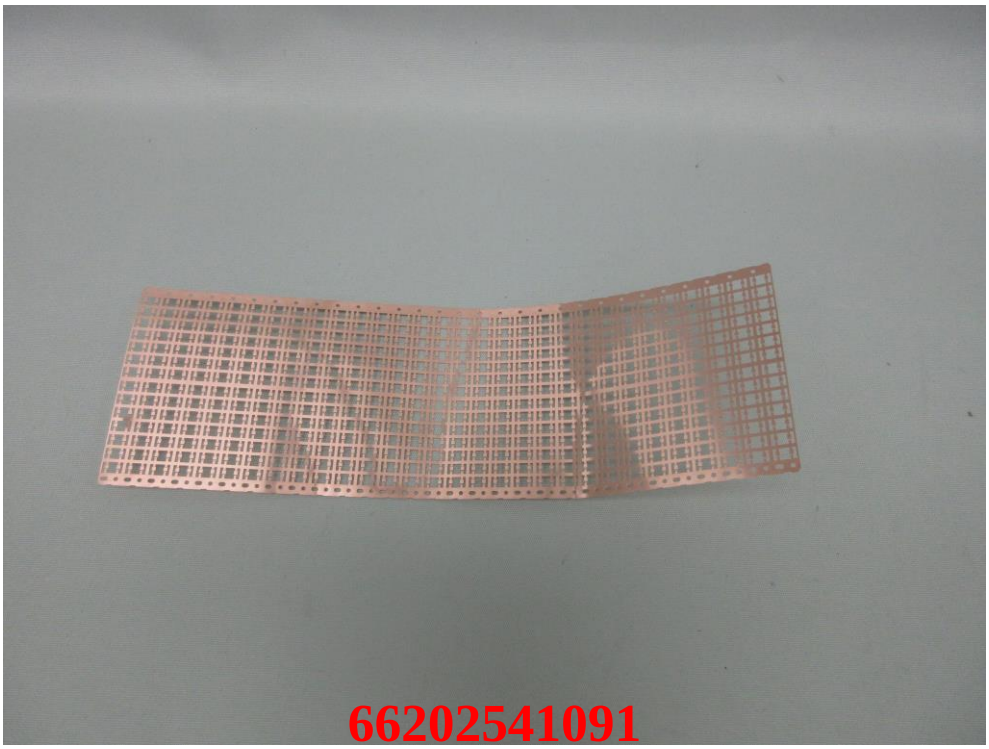
| Test Item | Description |
|---|---|
| 1 | Metal |

Note:

g = gram(s)
mcg = microgram(s)
mg/kg = milligram per kilogram
mg/L = milligram per litre
g/kg = gram(s) per kilogram
MDL = Method Detection Limit
ND = Not Detected (< MDL)
EX = Exempted

% = percentage
1 mg/kg = 0.0001%
"<" = less than
">" = Greater than
Req. = Requirement
"-" = Not Regulated
NA = Not applicable

## Photo of the Submitted Sample



## TEST RESULT

### I.Total Beryllium Content

Test methods: The sample is comminuted and digested with acid mixtures, then analyzed by ICP-AES technique

| Parameter | Unit | MDL | Result |
|---|---|---|---|
| | | | 1 |
| Beryllium (Be) | mg/kg | 10 | ND |

## TEST RESULT

**II. Heavy Metals, Flame Retardants, Phthalate Content - European Parliament and Council Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) with its Amendments & As Applicant's requirement**

Test Method : See Appendix.

| - | Unit | MDL | Maximum Allowable Limit (Req.) | Result |
|---|---|---|---|---|
| **Test Item** | - | - | - | **1** |
| **Parameter** | - | - | - | - |
| Lead (Pb) | mg/kg | 2 | 1000 | 10.6 |
| Cadmium (Cd) | mg/kg | 2 | 100 | ND |
| Mercury (Hg) | mg/kg | 2 | 1000 | ND |
| Chromium VI (Cr VI) | mg/kg | - | Negative | Negative |
| MonoBB | mg/kg | 5 | | ND |
| DiBB | mg/kg | 5 | | ND |
| TriBB | mg/kg | 5 | | ND |
| TetraBB | mg/kg | 5 | | ND |
| PentaBB | mg/kg | 5 | | ND |
| HexaBB | mg/kg | 5 | | ND |
| HeptaBB | mg/kg | 5 | | ND |
| OctaBB | mg/kg | 5 | | ND |
| NonaBB | mg/kg | 5 | | ND |
| DecaBB | mg/kg | 5 | | ND |
| Sum of PBBs | mg/kg | - | 1000 | ND |
| MonoBDE | mg/kg | 5 | | ND |
| DiBDE | mg/kg | 5 | | ND |
| TriBDE | mg/kg | 5 | | ND |
| TetraBDE | mg/kg | 5 | | ND |
| PentaBDE | mg/kg | 5 | | ND |
| HexaBDE | mg/kg | 5 | | ND |
| HeptaBDE | mg/kg | 5 | | ND |
| OctaBDE | mg/kg | 5 | | ND |
| NonaBDE | mg/kg | 5 | | ND |
| DecaBDE | mg/kg | 5 | | ND |
| Sum of PBDEs | mg/kg | - | 1000 | ND |
| Dibutyl phthalate (DBP) | mg/kg | 50 | 1000 | ND |
| Butyl benzyl phthalate (BBP) | mg/kg | 50 | 1000 | ND |
| Di-2-ethylhexyl phthalate (DEHP) | mg/kg | 50 | 1000 | ND |
| Diisobuty phthalate (DIBP) | mg/kg | 50 | 1000 | ND |
| **Conclusion** | - | - | - | PASS |

Remark:

- The list of analytes is summarized in table of Appendix.
- Result(s) of Cr VI for metallic material(s) was (were) expressed in term of positive and negative. Negative means the absence of Cr VI on the tested areas and the result(s) was (were) regarded as in compliance with European Parliament and Council Directive 2011/65/EU, Article 4(1). While, positive means the presence of Cr VI on tested areas and the result(s) was (were) regarded as in conflict with European Parliament and Council Directive 2011/65/EU, Article 4(1).
- According to European Parliament and Council Directive 2011/65/EU, Article 5 "Adaptation of the Annexes to scientific and technical progress", exemption(s) should be granted to the materials and components of Test Item(s) in the lists in Annexes III and IV of this directive.

END

## APPENDIX

| **List of Analytes and their Corresponding Test Methods [ European Parliament and Council Directive 2011/65/EU ] :** | | |
|---|---|---|
| No. | Name of Analytes | Test Method(s) |
| 1 | Lead (Pb) | With reference to IEC 62321-5: 2013. |
| 2 | Cadmium (Cd) | |
| 3 | Mercury (Hg) | With reference to IEC 62321-4: 2013+AMD1: 2017 CSV. |
| 4 | Chromium VI (Cr VI) | Metal:<br>With reference to IEC 62321-7-1:2015.<br>Polymers & Electronics:<br>With reference to IEC 62321-7-2: 2017. |
| 5 | Polybromobiphenyls (PBBs)<br>- Bromobiphenyl (MonoBB)<br>- Dibromobiphenyl (DiBB)<br>- Tribromobiphenyl (TriBB)<br>- Tetrabromobiphenyl (TetraBB)<br>- Pentabromobiphenyl (PentaBB)<br>- Hexabromobiphenyl (HexaBB)<br>- Heptabromobiphenyl (HeptaBB)<br>- Octabromobiphenyl (OctaBB)<br>- Nonabromobiphenyl (NonaBB)<br>- Decabromobiphenyl (DecaBB) | With reference to IEC 62321-6:2015. |
| 6 | Polybromodiphenyl ethers (PBDEs)<br>- Bromodiphenyl ether (MonoBDE)<br>- Dibromodiphenyl ether (DiBDE)<br>- Tribromodiphenyl ether (TriBDE)<br>- Tetrabromodiphenyl ether (TetraBDE)<br>- Pentabromodiphenyl ether (PentaBDE)<br>- Hexabromodiphenyl ether (HexaBDE)<br>- Heptabromodiphenyl ether (HeptaBDE)<br>- Octabromodiphenyl ether (OctaBDE)<br>- Nonabromodiphenyl ether (NonaBDE)<br>- Decabromodiphenyl ether (DecaBDE) | |
| 7 | Dibutyl phthalate (DBP)<br>Butyl benzyl phthalate (BBP)<br>Di-2-ethylhexyl phthalate (DEHP)<br>Diisobuty phthalate (DIBP) | Reference to IEC 62321-8: 2017. |