SIGMA MICROELECTRONICS CO.,LTD.

ROOM 407,TOWER-B,INNOVATION SCIENCE & TECHNOLOGY PLAZA,TIAN AN CYBERPARK,FU TIAN,SHENZHEN
CHINA

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

SGS Job No. :	CP17-038892 - SZ
Model No. :	SOP8L
Client Ref. Info. :	Please see REMARK
Lot No. :	A180284.1
Date of Sample Received :	12 Jul 2017
Testing Period :	12 Jul 2017 - 19 Jul 2017
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 submitted sample(s), the results of Lead, Mercury, Cadmium, Hexavalent chromium, Polybrominated biphenyls (PBBs), Polybrominated diphenyl ethers (PBDEs) and Phthalates such as Bis(2-ethylhexyl) phthalate (DEHP) , Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP) , and Diisobutyl phthalate (DIBP) comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.

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

Nana

Nana Zhang
Approved Signatory

SGS-CSTC Standards Technical Services Co., Ltd. Guangzhou Branch Testing Center Chemical Laboratory.

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Test Results :

Test Part Description :

Specimen No.	SGS Sample ID	Description
SN1	CAN17-133788.002	Black plastic w/ brown printing
SN2	CAN17-133788.003	Silvery metal pin
SN3	CAN17-133788.004	Copper-color metal w/ silvery backing & chip

Remarks :

(1) 1 mg/kg = 1 ppm = 0.0001%

(2) MDL = Method Detection Limit

(3) ND = Not Detected (< MDL)

(4) "-" = Not Regulated

RoHS Directive (EU) 2015/863 amending Annex II to 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 62321-7-2:2017, determination of Hexavalent Chromium by Colorimetric Method using UV-Vis and/or with reference to IEC 62321-5:2013, determination of Chromium by ICP-OES.
(5)With reference to IEC 62321-6:2015, determination of PBBs and PBDEs by GC-MS.
(6)With reference to IEC 62321-8:2017, determination of phthalates by GC-MS.

Test Item(s)	Limit	Unit	MDL	*002*
Cadmium (Cd)	100	mg/kg	2	ND
Lead (Pb)	1,000	mg/kg	2	ND
Mercury (Hg)	1,000	mg/kg	2	ND
Hexavalent Chromium (CrVI)	1,000	mg/kg	8	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

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Test Item(s)	Limit	Unit	MDL	*002*
Nonabromobiphenyl	-	mg/kg	5	ND
Decabromobiphenyl	-	mg/kg	5	ND
Sum of PBDEs	1,000	mg/kg	-	ND
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
Dibutyl phthalate (DBP)	1000	mg/kg	50	ND
Butyl benzyl phthalate (BBP)	1000	mg/kg	50	ND
Bis (2-ethylhexyl) phthalate (DEHP)	1000	mg/kg	50	ND
Diisobutyl Phthalates (DIBP)	1000	mg/kg	50	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.IEC 62321 series is equivalent to EN 62321 series http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25.

(2) The result of Hexavalent Chromium (Cr(VI)) is "ND" as the result of Chromium (Cr) is "ND", and confirmation test of Hexavalent Chromium (Cr(VI)) is not required.

(3) If the Chromium (Cr) content is greater than the MDL of Hexavalent Chromium (Cr(VI)). And confirmation test of Hexavalent Chromium (Cr(VI)) is required.

RoHS Directive (EU) 2015/863 amending Annex II to 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 62321-7-1:2015 , determination of Hexavalent Chromium by Colorimetric Method using UV-Vis.

Test Item(s)	Limit	Unit	MDL	*003*	*004*
Cadmium (Cd)	100	mg/kg	2	ND	ND
Lead (Pb)	1,000	mg/kg	2	12	8
Mercury (Hg)	1,000	mg/kg	2	ND	ND

Test Item(s)	Limit	Unit	MDL	*003*	*004*
Hexavalent Chromium (Cr(VI))▾	-	μg/cm²	0.10	ND	ND

Notes :

(1) The maximum permissible limit is quoted from RoHS Directive (EU) 2015/863.
IEC 62321 series is equivalent to EN 62321 series
http://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101::::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(2) ▾= a. The sample is positive for CrVI if the CrVI concentration is greater than 0.13 μg/cm2. The sample coating is considered to contain CrVI

b. The sample is negative for CrVI if CrVI is ND (concentration less than 0.10 μg/cm2). The coating is considered a non-CrVI based coating

c. The result between 0.10 μg/cm2 and 0.13 μg/cm2 is considered to be inconclusive - unavoidable coating variations may influence the determination

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

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REMARK:

ESOP8L：SGD1011、SGD2021、SGD2021(4)、SGD2023、SGD2023(5A)、
SGD2021E、SGD5132EC、SGD5142EC
ESOP16L：SGD5011EB、SGD5011EB(WBS)
SOP8L：SGL8022K、SGL8022W、SGL8022S、SGL8023W、SGL8012W、
SGL8022WS、SGL8022WS(WXH)、SG8T040P(WXH)、SGD5020
SOP16L：SG8F050P、SG8F050P(WXH)、SG8F060P、SG8F060P(WXH)、
SG8T080P、SG8T080P(WXH)、SG8065L、SG8065L(WXH)
DIP8L：SGL8022K、SGL8022W、SGL8022S、SGL8023W、SGL8012W、
SGL8022WS、SGL8022WS(WXH)、SG8T040P(WXH)、SGL8012W
DIP16L：SG8F060P、SG8F060P(WXH)
SOP20L：MX84530
SSOP28L：SG8F7341、SG8F7581、SGD5012、SGD5012(WXH)
TSSOP20L：SGT002
TSSOP24L：SG8F080P、SG8F080P(WXH)、SG8T120P、
SG8T120P(WXH)、SGD5024TA
TSSOP28L：SG8F120P
SOT23-6L：SGD5131SB(SA2)、SGD5131SC(SC2)、SGD5141SC(SC1)、
SGD5141SC(WBS)
SOT89-5L：SGD1011、SGD1211
DFN6L：SGD5141DC(DC1)
DFN8L：SGD5132DC(DC2)、SGD5142DC(DC1)
QFN32L：SG8F7341
LQFP32L：SG8F7341
LQFP48L：SG8F160P、SG8F6402、SG8F7581、SG8UP5393
LQFP64L：SG8F7581
SDIP8L：MX8650A、MX8733B、MX8735
SDIP12L：MX8732A、MX8861、MX8862
SDIP16L：MX8871、MX8871A、MX8875、MX8872、MX8876、MX8876A

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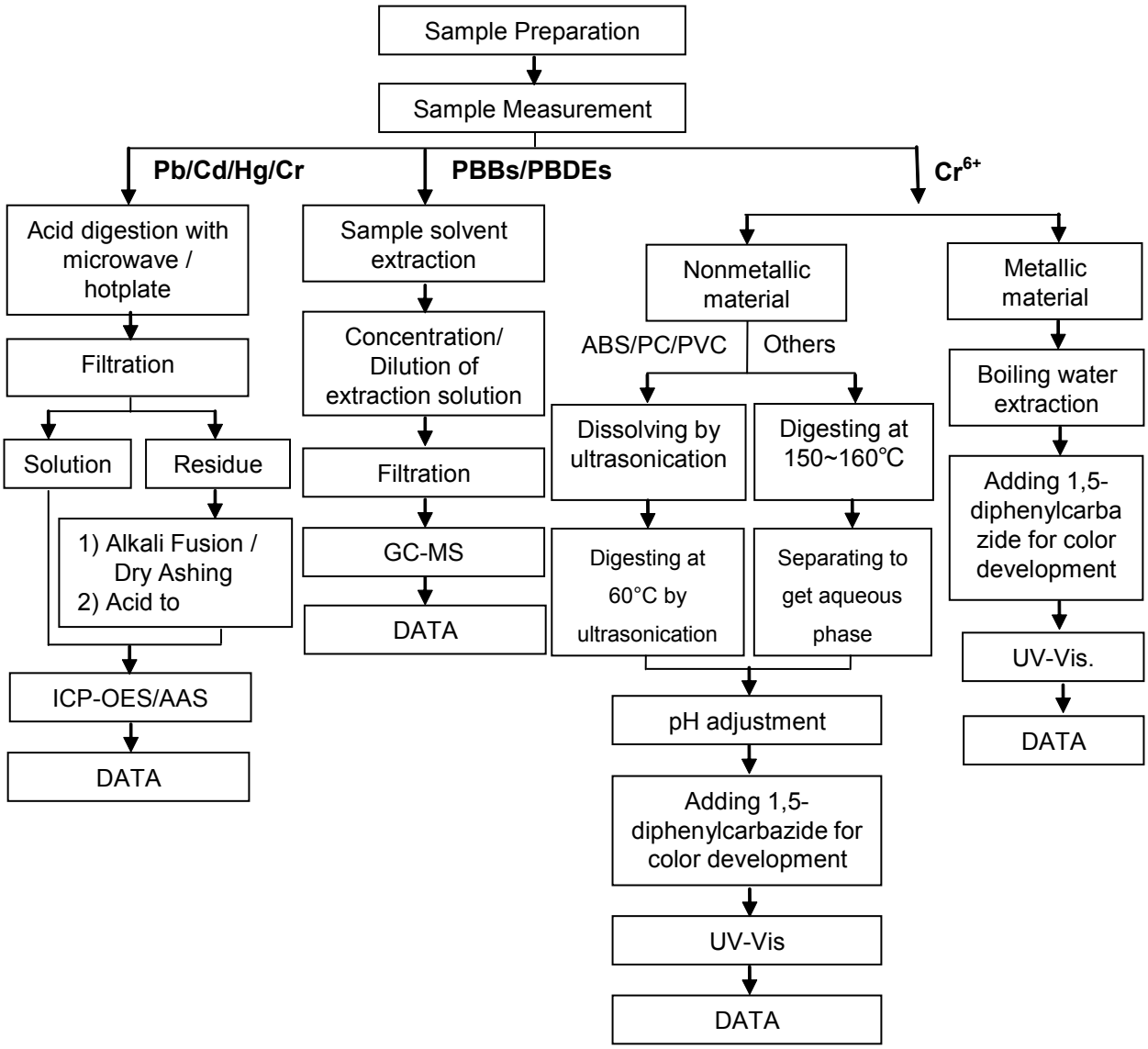
ATTACHMENTS

Pb/Cd/Hg/Cr^{6+}/PBBs/PBDEs Testing Flow Chart

1) Name of the person who made testing: Edith Zhang / Sunny Hu
2) Name of the person in charge of testing: Bella Wang / Qiong Liu
3) These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr^{6+} and PBBs/PBDEs test method excluded).



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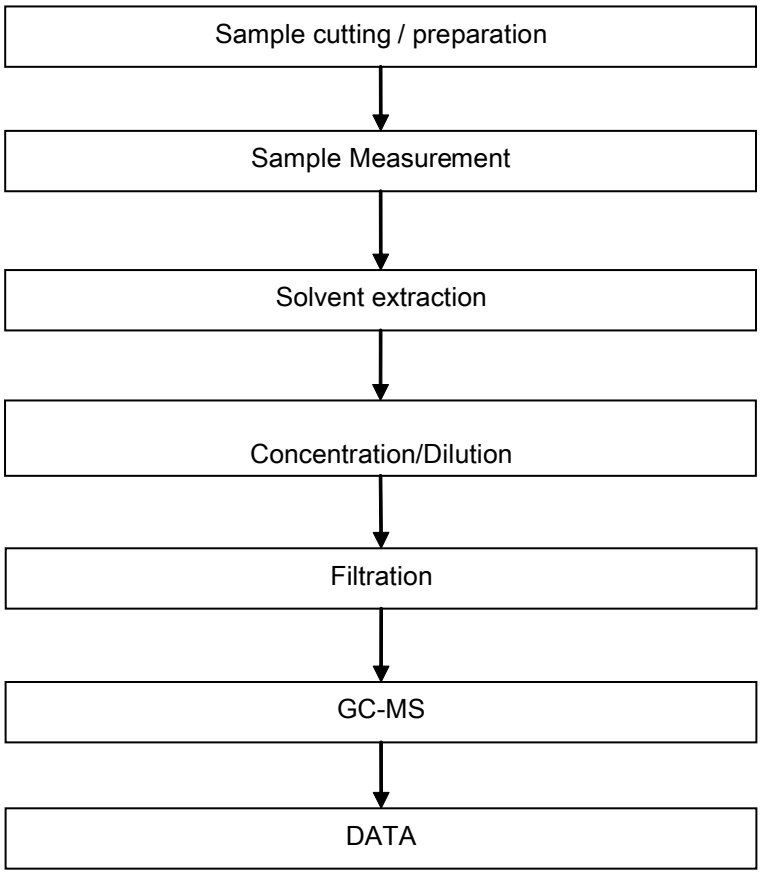
ATTACHMENTS

Phthalates Testing Flow Chart

1) Name of the person who made testing: Sunny Hu
2) Name of the person in charge of testing: Qiong Liu



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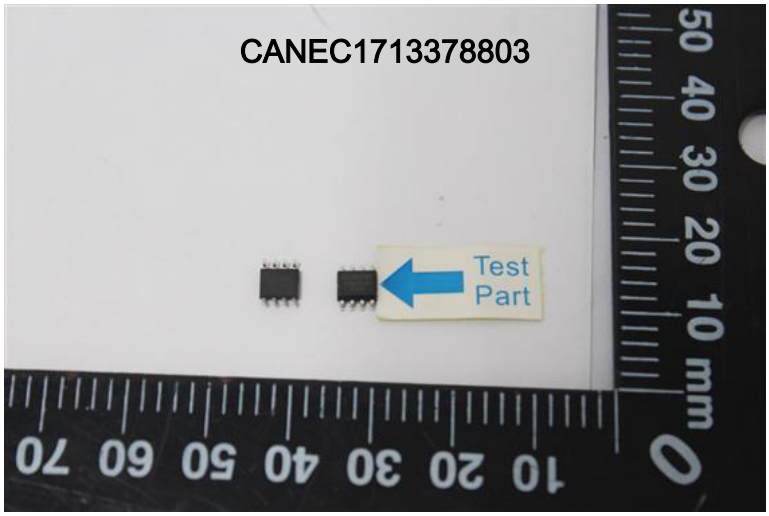
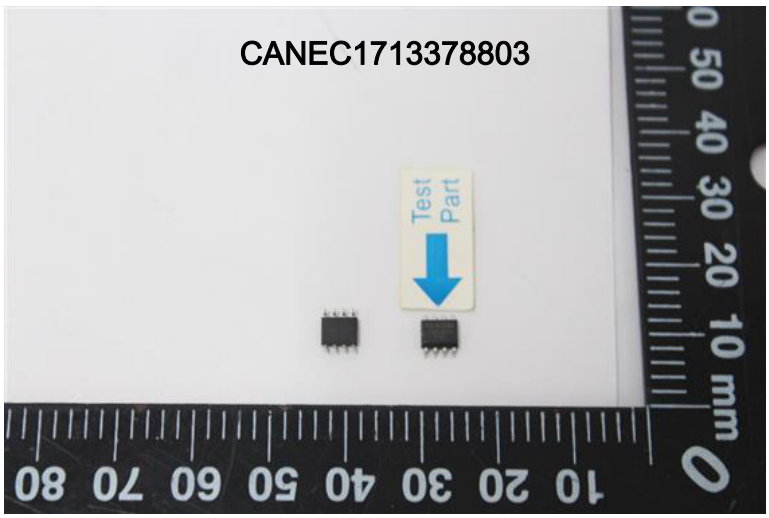
Sample photo:



CAN17-133788.002



CAN17-133788.003

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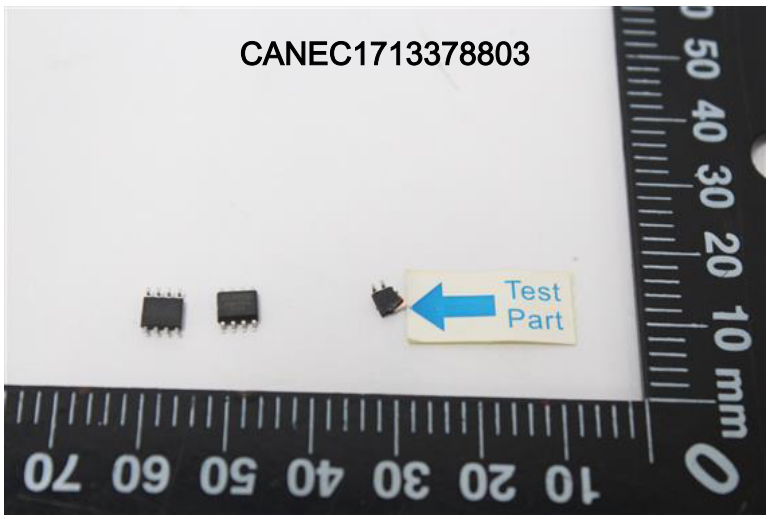

CAN17-133788.004

SGS authenticate the photo on original report only

*** End of Report ***

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