

Test Report

No. : KA/2020/71982A-01

Date : 2020/10/19

Page: 1 of 12

ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

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

Sample Description : Pd PLATING LAYER
Sample Receiving Date : 2020/07/22
Testing Period : 2020/07/22 to 2020/07/29


Test Requested : (1) As specified by client, with reference to RoHS 2011/65/EU Annex II and amending Directive (EU) 2015/863 to determine Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP contents in the submitted sample(s).

(2) Please refer to next pages for the other item(s).

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

Conclusion : (1) Based on the performed tests on submitted sample(s), the test results of Cadmium, Lead, Mercury, Cr(VI), PBBs, PBDEs, DBP, BBP, DEHP, DIBP comply with the limits as set by RoHS Directive (EU) 2015/863 amending Annex II to Directive 2011/65/EU.


Ray Chang Ph.D. / Manager
Signed for and on behalf of
SGS Taiwan Limited
Chemical Laboratory-Kaohsiung



PIN CODE: 9B192B41

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Test Report

No. : KA/2020/71982A-01

Date : 2020/10/19

Page: 2 of 12

ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Test Result(s)

PART NAME NO.1 : PLATING LAYER OF SILVER COLORED METAL

PART NAME NO.2 : SILVER/RED COPPER COLORED METAL SHEET (INCLUDING THE PLATING LAYER)

Test Item (s)	Unit	Method	MDL	Result		Limit
				No.1	No.2	
Cadmium (Cd)	mg/kg	IEC 62321-5: 2013 application of modified digestion by surface etching and performed by ICP-OES.	2	n.d.	---	100
Lead (Pb)	mg/kg		2	n.d.	---	1000
Mercury (Hg)	mg/kg	IEC 62321-4:2013+AMD1:2017 application of modified digestion by surface etching and performed by ICP-OES.	2	n.d.	---	1000
Hexavalent Chromium Cr(VI)(#2)	µg/cm ²	With reference to IEC 62321-7-1:2015 and performed by UV-VIS.	0.10	n.d.	---	-
Sum of PBBs	mg/kg	With reference to IEC 62321-6:2015 and performed by GC/MS.	-	---	n.d.	1000
Monobromobiphenyl	mg/kg		5	---	n.d.	-
Dibromobiphenyl	mg/kg		5	---	n.d.	-
Tribromobiphenyl	mg/kg		5	---	n.d.	-
Tetrabromobiphenyl	mg/kg		5	---	n.d.	-
Pentabromobiphenyl	mg/kg		5	---	n.d.	-
Hexabromobiphenyl	mg/kg		5	---	n.d.	-
Heptabromobiphenyl	mg/kg		5	---	n.d.	-
Octabromobiphenyl	mg/kg		5	---	n.d.	-
Nonabromobiphenyl	mg/kg		5	---	n.d.	-
Decabromobiphenyl	mg/kg		5	---	n.d.	-
Sum of PBDEs	mg/kg		-	---	n.d.	1000
Monobromodiphenyl ether	mg/kg		5	---	n.d.	-
Dibromodiphenyl ether	mg/kg		5	---	n.d.	-
Tribromodiphenyl ether	mg/kg	5	---	n.d.	-	
Tetrabromodiphenyl ether	mg/kg	5	---	n.d.	-	
Pentabromodiphenyl ether	mg/kg	5	---	n.d.	-	
Hexabromodiphenyl ether	mg/kg	5	---	n.d.	-	
Heptabromodiphenyl ether	mg/kg	5	---	n.d.	-	
Octabromodiphenyl ether	mg/kg	5	---	n.d.	-	
Nonabromodiphenyl ether	mg/kg	5	---	n.d.	-	
Decabromodiphenyl ether	mg/kg	5	---	n.d.	-	

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Test Report

No. : KA/2020/71982A-01

Date : 2020/10/19

Page: 3 of 12

ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Test Item (s)	Unit	Method	MDL	Result		Limit
				No.1	No.2	
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	1000
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	1000
BBP (Butyl Benzyl phthalate) (CAS No.: 85-68-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	1000
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	1000
DNOP (Di-n-octyl phthalate) (CAS No.: 117-84-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	-
DINP (Di-isononyl phthalate) (CAS No.: 28553-12-0, 68515-48-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	-
DIDP (Di-isodecyl phthalate) (CAS No.: 26761-40-0, 68515-49-1)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	-
DNHP (Di-n-hexyl phthalate) (CAS No.: 84-75-3)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	-
DNPP(Di-n-pentyl phthalate) (CAS No.: 131-18-0)	mg/kg	With reference to IEC 62321-8:2017. Analysis was performed by GC/MS.	50	---	n.d.	-
Antimony (Sb)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	---	n.d.	-
Beryllium (Be)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	---	n.d.	-
Arsenic (As)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	---	n.d.	-
Phosphorus (P)	mg/kg	With reference to US EPA 3052: 1996. Analysis was performed by ICP-OES.	2	---	n.d.	-
Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified (α - HBCDD, β - HBCDD, γ - HBCDD) (CAS No.: 25637-99-4 and 3194- 55-6 (134237-51-7, 134237-50-6, 134237-52-8))	mg/kg	With reference to IEC 62321: 2008. Analysis was performed by GC/MS.	5	---	n.d.	-

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Test Report

No. : KA/2020/71982A-01

Date : 2020/10/19

Page: 4 of 12

ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Test Item (s)	Unit	Method	MDL	Result		Limit
				No.1	No.2	
PFOA and its salts (CAS No.: 335-67-1 and its salts)	mg/kg	With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MSMS.	0.01	---	n.d.	-
PFOS and its salts (CAS No.: 1763-23-1 and its salts)	mg/kg	With reference to CEN/TS 15968 (2010). Analysis was performed by LC/MSMS.	0.01	---	n.d.	-
Halogen						
Halogen-Fluorine (F) (CAS No.: 14762-94-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	---	n.d.	-
Halogen-Chlorine (Cl) (CAS No.: 22537-15-1)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	---	n.d.	-
Halogen-Bromine (Br) (CAS No.: 10097-32-2)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	---	n.d.	-
Halogen-Iodine (I) (CAS No.: 14362-44-8)	mg/kg	With reference to BS EN 14582:2016. Analysis was performed by IC.	50	---	n.d.	-

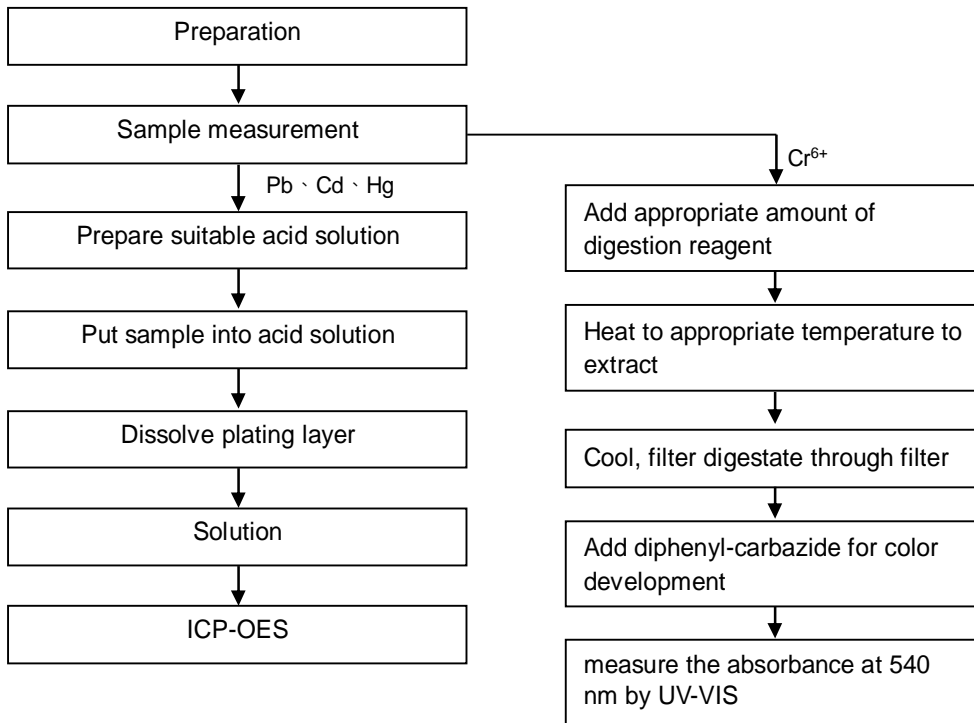
Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. n.d. = Not Detected
3. MDL = Method Detection Limit
4. " - " = Not Regulated
5. " --- " = Not Conducted
6. (#2) =
 - a. The sample is positive for Cr(VI) if the Cr(VI) concentration is greater than 0.13 µg/cm². The sample coating is considered to contain Cr(VI)
 - b. The sample is negative for Cr(VI) if Cr(VI) is n.d. (concentration less than 0.10 µg/cm²). The coating is considered a non-Cr(VI) 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.
7. PFOS and its salts including CAS No.: 29081-56-9, 2795-39-3, 29457-72-5, 70225-14-8, 56773-42-3, 251099-16-8, 307-35-7.
8. PFOA and its salts including CAS No.: 3825-26-1, 335-95-5, 2395-00-8, 335-93-3, 335-66-0.
9. The statement of compliance conformity is based on comparison of testing results and limits.
10. This is the additional test report of KA/2020/71982 which was issued on 2020/10/19.

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Flow Chart of Stripping method for metal analysis

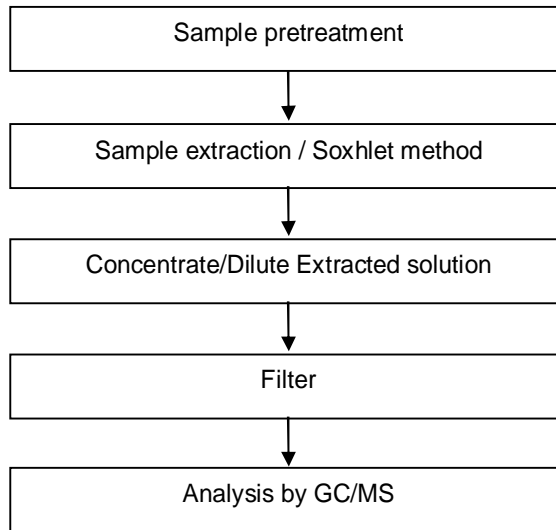
The plating layer of samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr⁶⁺ test method excluded)



ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

PBB/PBDE analytical FLOW CHART



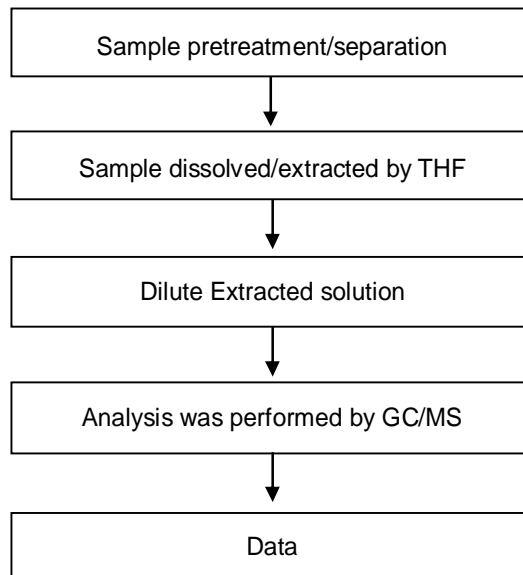
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ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Analytical flow chart of phthalate content

【Test method: IEC 62321-8】



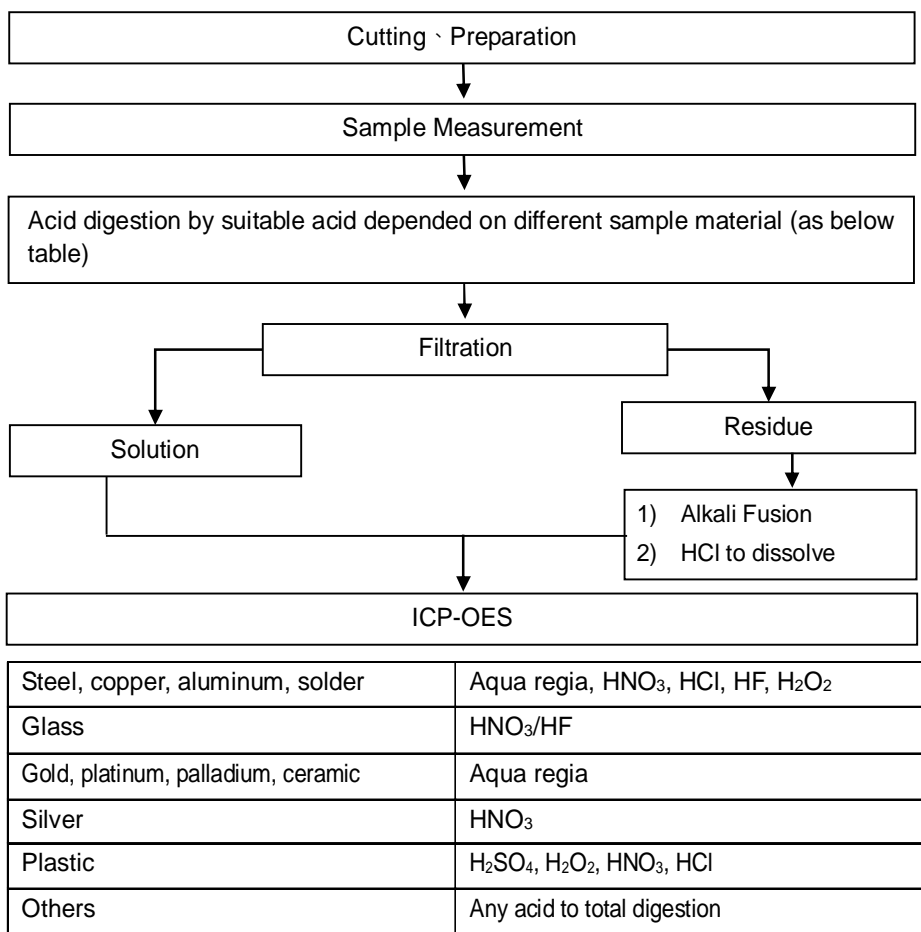
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ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Flow Chart of digestion for the elements analysis performed by ICP-OES

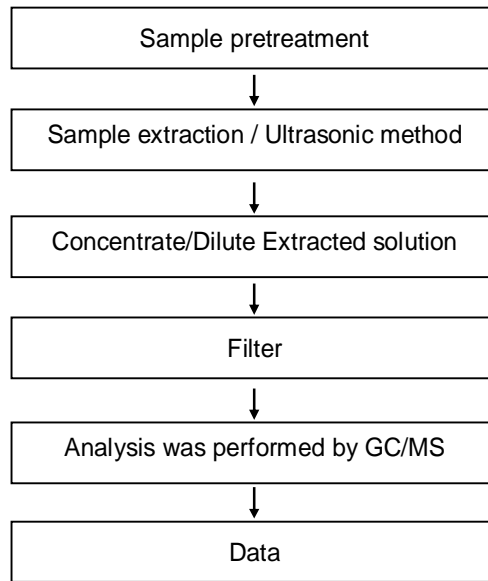
These samples were dissolved totally by pre-conditioning method according to below flow chart.



ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

HBCDD analytical flow chart

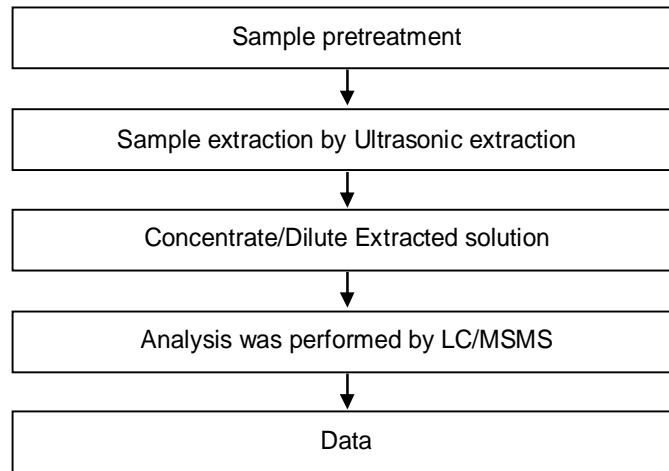


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ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Analytical flow chart - PFOA/PFOS

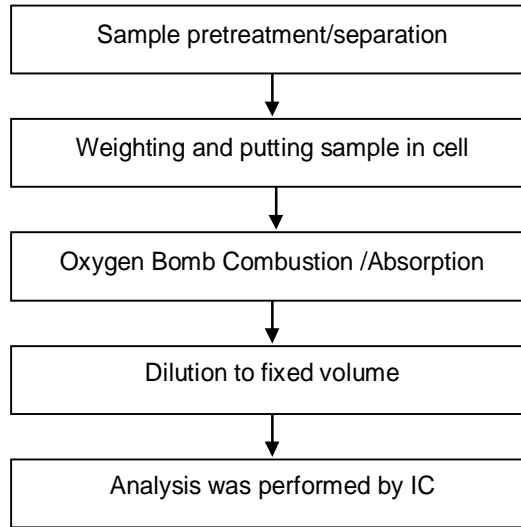


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ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

534 JALAN KELULI 3 KAWASASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

Analytical flow chart of Halogen



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Test Report

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Date : 2020/10/19

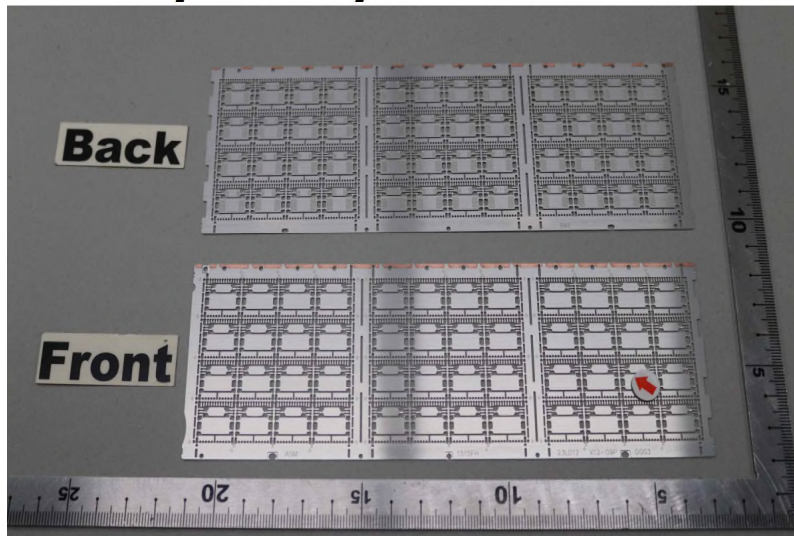
Page: 12 of 12

ADVANCED ASSEMBLY MATERIALS(M) SDN BHD

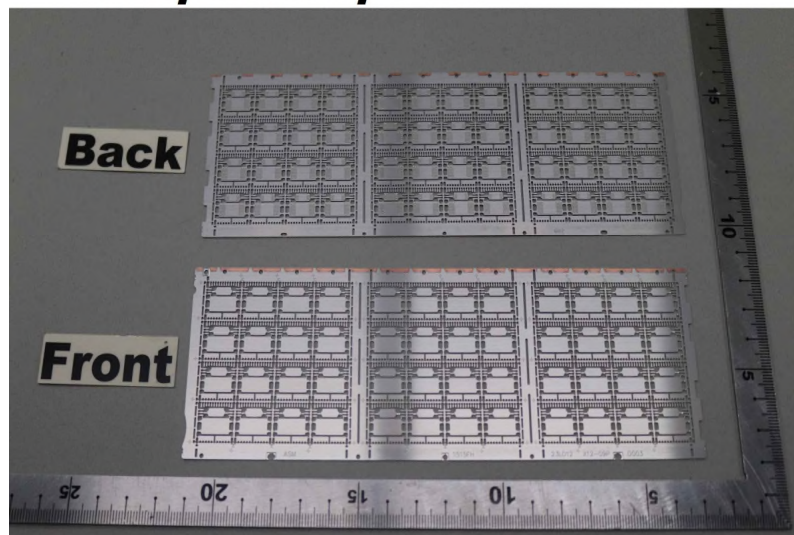
534 JALAN KELULI 3 KAWASAN PERINDUSTRIAN PASIR GUDANG 81700 PASIR GUDANG JOHOR

* The tested sample / part is marked by an arrow if it's shown on the photo. *

KA/2020/71982 NO.1



KA/2020/71982 NO.2



** End of Report **

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