

## Test Report

No. : CE/2020/70218

Date : 2020/07/07

Page : 1 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

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

Sample Submitted By : AVX HONG KONG LTD. (TAIWAN BRANCH)  
 Sample Description : LF Cu-Sn I.a  
 Style/Item No. : TANTALUM DIVISION  
 Sample Receiving Date : 2020/07/01  
 Testing Period : 2020/07/01 to 2020/07/07

Test Requested : 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).

Test Result(s) : Please refer to following pages.

*Troy Chang*  
 Troy Chang / Manager - Tech  
 Signed for and behalf of  
 SGS TAIWAN LTD.  
 Chemical Laboratory - Taipei



PIN CODE: 000C8B4F

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

# Test Report

No. : CE/2020/70218

Date : 2020/07/07

Page : 2 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

## Test Result(s)

PART NAME No.1 : PLATING LAYER OF SILVER COLORED METAL  
PART NAME No.2 : BASE MATERIAL OF SILVER COLORED METAL  
PART NAME No.3 : SILVER COLORED METAL (INCLUDING THE PLATING LAYER)

Test Item(s)	Unit	Method	MDL	Result		
				No.1	No.2	No.3
Cadmium (Cd)	mg/kg	IEC 62321-5 (2013) application of modified digestion by surface etching and performed by ICP-OES.	2	n.d.	---	---
Lead (Pb)	mg/kg		2	88.9	---	---
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.	---	---
Cadmium (Cd)	mg/kg	With reference to IEC 62321-5 (2013) and performed by ICP-OES.	2	---	n.d.	---
Lead (Pb)	mg/kg		2	---	14.1	---
Mercury (Hg)	mg/kg	With reference to IEC 62321-4:2013+AMD1:2017 and performed by ICP-OES.	2	---	n.d.	---
Hexavalent Chromium Cr(VI)(#2)	µg/cm <sup>2</sup>	With reference to IEC 62321-7-1 (2015) and performed by UV-VIS.	0.10	n.d.	n.d.	---
<b>Sum of PBBs</b>	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	---	---	n.d.
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.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

# Test Report

No. : CE/2020/70218

Date : 2020/07/07

Page : 3 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

Test Item(s)	Unit	Method	MDL	Result		
				No.1	No.2	No.3
Sum of PBDEs	mg/kg	With reference to IEC 62321-6 (2015) and performed by GC/MS.	-	---	---	n.d.
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.
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.
DBP (Dibutyl phthalate) (CAS No.: 84-74-2)	mg/kg		50	---	---	n.d.
DEHP (Di- (2-ethylhexyl) phthalate) (CAS No.: 117-81-7)	mg/kg		50	---	---	n.d.
DIBP (Di-isobutyl phthalate) (CAS No.: 84-69-5)	mg/kg		50	---	---	n.d.

## Note :

1. mg/kg = ppm ; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected = below MDL
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  $\mu\text{g}/\text{cm}^2$ .  
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  $\mu\text{g}/\text{cm}^2$ ).  
The coating is considered a non-Cr(VI) based coating
  - c. The result between 0.10  $\mu\text{g}/\text{cm}^2$  and 0.13  $\mu\text{g}/\text{cm}^2$  is considered to be inconclusive - unavoidable coating variations may influence the determination.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

# Test Report

No. : CE/2020/70218

Date : 2020/07/07

Page : 4 of 9

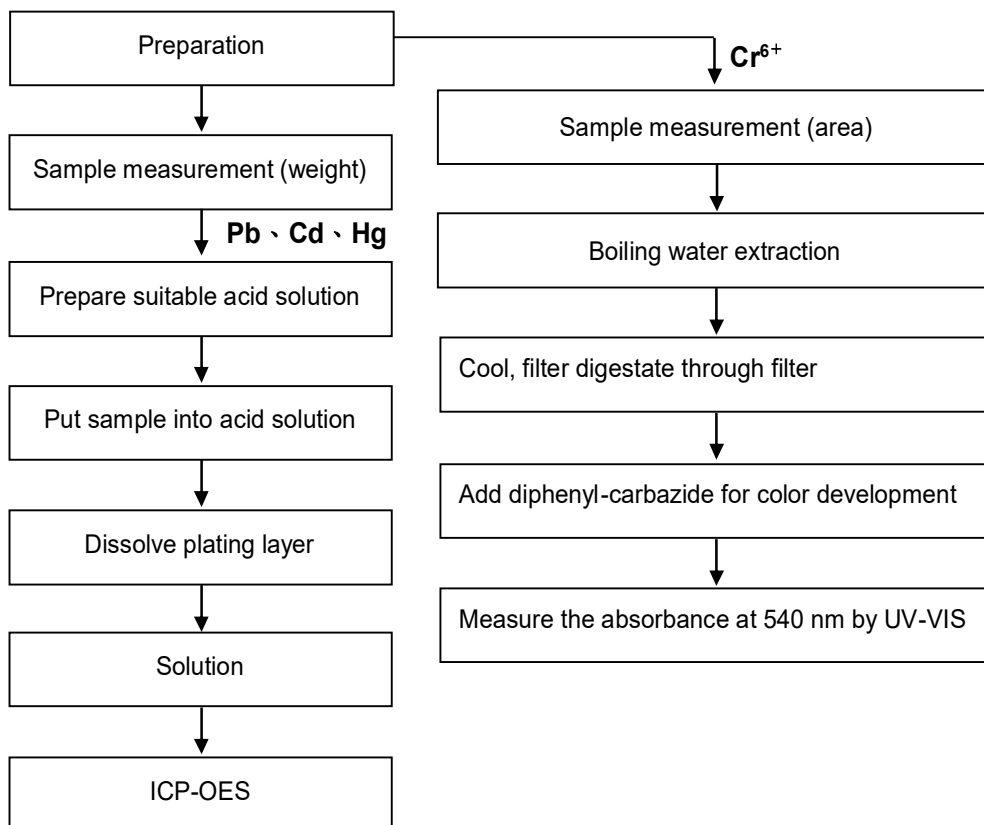
AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

No.1

## 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. (Cr<sup>6+</sup> test method excluded )



## Test Report

No. : CE/2020/70218

Date : 2020/07/07

Page : 5 of 9

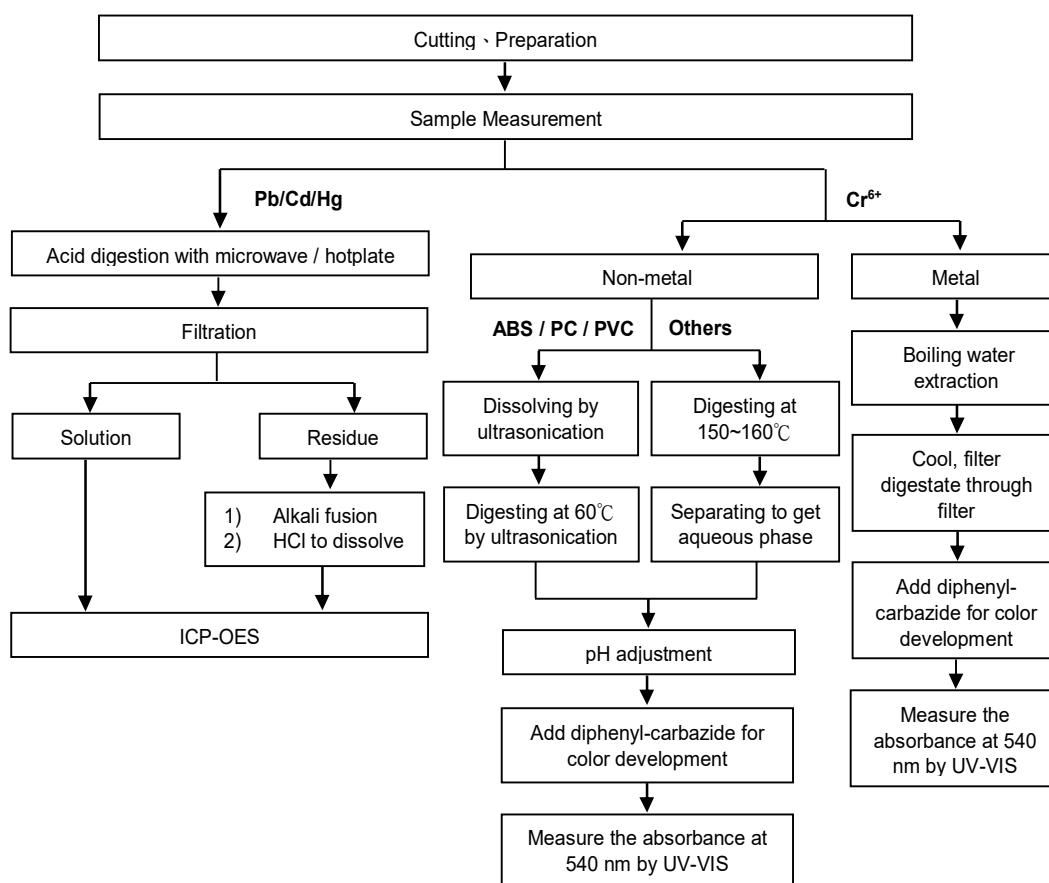
AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

No.2

### Analytical flow chart of Heavy Metal

These samples were dissolved totally by pre-conditioning method according to below flow chart. (Cr<sup>6+</sup> test method excluded)



# Test Report

No. : CE/2020/70218

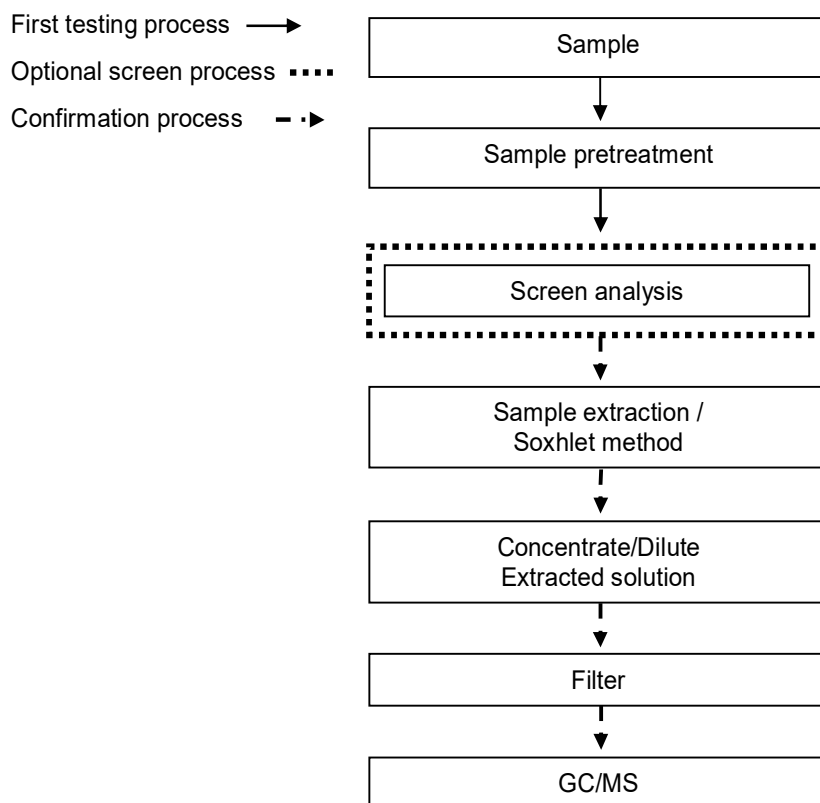
Date : 2020/07/07

Page : 6 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

## Analytical flow chart – PBB / PBDE



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

# Test Report

No. : CE/2020/70218

Date : 2020/07/07

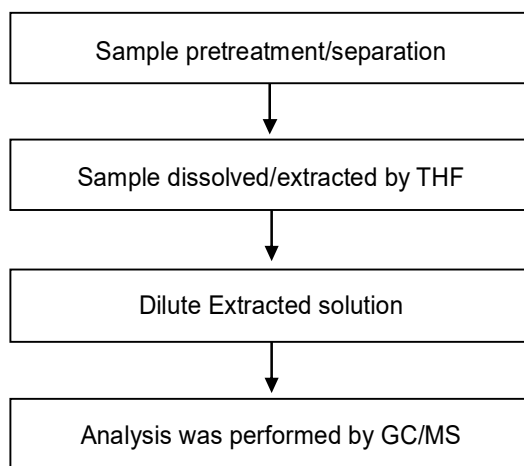
Page : 7 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

## Analytical flow chart - Phthalate

【Test method: IEC 62321-8】



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

## Test Report

No. : CE/2020/70218

Date : 2020/07/07

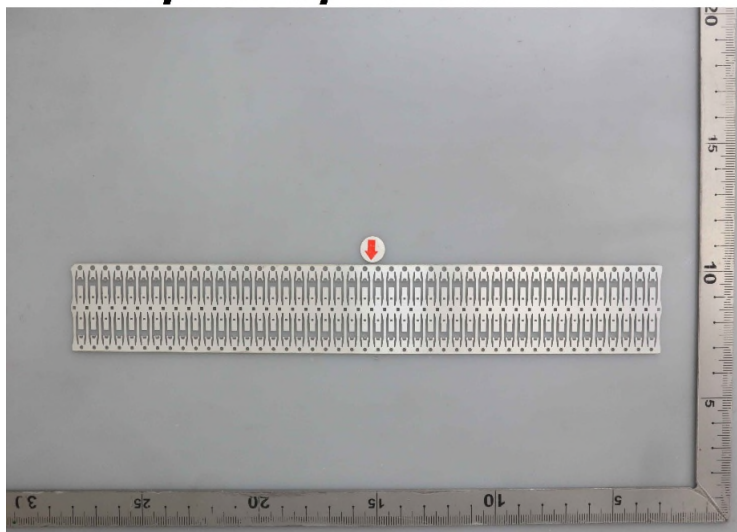
Page : 8 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

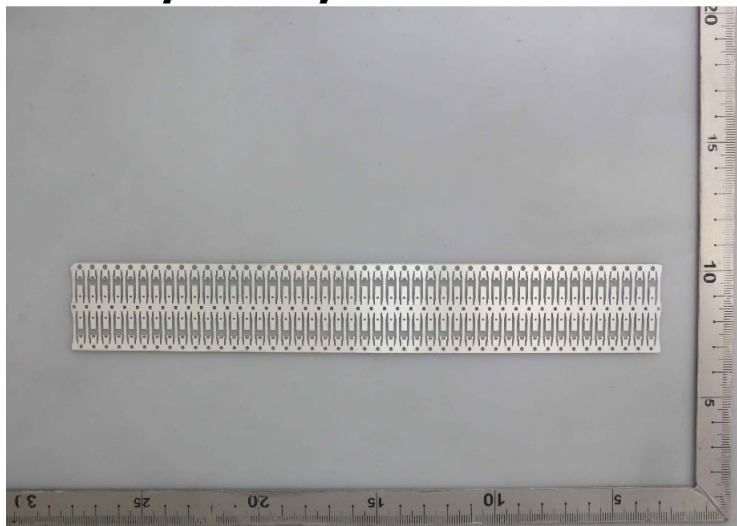
7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

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

### CE/2020/70218 NO.1



### CE/2020/70218 NO.2



This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.



## Test Report

No. : CE/2020/70218

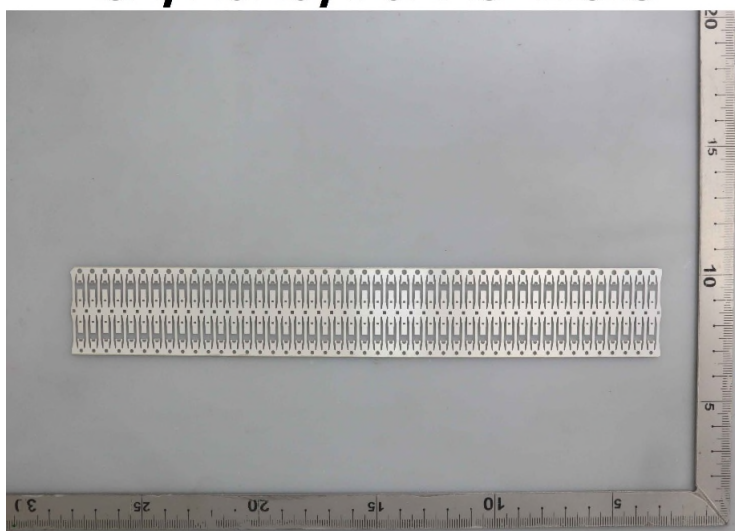
Date : 2020/07/07

Page : 9 of 9

AVX HONG KONG LTD. (TAIWAN BRANCH)

7F, NO. 56, LANE 258, RUIGUANG ROAD, NEIHU DISTRICT, TAIPEI CITY 11491, TAIWAN (R.O.C.)

### CE/2020/70218 NO.3



**\*\* End of Report \*\***

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <https://twap.sgs.com/Terms-and-Conditions.html> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <https://twap.sgs.com/Terms-and-Conditions.html>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of client's instruction, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced, except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.