AVX CORPORATION
A KYOCERA GROUP COMPANY

Revised 14 May 2015

INTERNATIONAL RoHS DECLARATIONS

per 2011/65/EU as amended.

Listed on tabs below by product line is a compliance status report with regard to restricted materials as defined by the European Union, China, and Korea. On each page, the products are listed by AVX part numbers.

No Deca-BDE, PFOS, PFOA, nor ODCs are used in any AVX products.

All AVX products are considered as "articles" under REACH
and are in compliance with SVHC reporting requirements.
AVX standard letter on REACH is found at:
http://www.avx.com/docs/catalogs/AVX_REACH_Statement.pdf

An official declaration for China and Korea appears at the bottom of this page.

Some, but not all, Kyocera Electronic Devices are listed here. For a complete listing, please visit:
http://global.kyocera.com/prdct/electro/rohs.html
or for connectors:
http://www.kyocera-elco.com/prdct/list.html

Please forward any questions and material declaration requests to: avxrohs@avx.com

Each tab uses the format below.

ALL COLUMNS
Y = Compliant
N = Not Compliant
None = No Exemption claimed

CHINA RoHS COLUMNS ONLY
Y = Meets China RoHS
N = Fails China RoHS for Lead only

HALOGENS
Y if Cl,Br <900ppm
and Cl+Br <1500ppm
per homogenous

(Part number position)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_

COLUMN HEADINGS

COMPLIANT TO EU RoHS?	EU RoHS EXEMPTION? (#)	COMPLIANT TO CHINA RoHS?	COMPLIANT TO KOREA RoHS?	Sn/Pb TERMINATION?	HALOGENS < 900/1500 ppm?

Tabs at the bottom of this sheet are in the following order:
Click on the item below and you will be taken to the same tab.

We have chosen to use the AVX part number as the key identifier so customers can readily determine the compliance status of our many products. Within a part number are critical characters in specific part number positions (1 through 20) which show whether a product is green or is not green. Using these lists will allow our valued Chinese customers to properly categorize their assembly as it travels along the supply chain to the end consumer.

Declaration Format

AVX product families which meet China RoHS using no EU exemptions can be identified by a small version of the "e" logo in the margin. Use of this logo means that homogenous materials in the product contain less than 0.1% Pb, Hg, Cr(VI), PBBs, PBDEs and less than 0.01% Cd.

Disclosure Table

有毒有害物质或元素					
铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
O	O	O	O	O	O

O 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。
X 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。
企业可在此处,根据实际情况对上表中打“×”的技术原因进行进一步说明。)

Among AVX products, the only restricted material that may be found is lead (Pb). If Pb is contained in the product above allowed levels, even if permitted under EU exemptions, the Disclosure Table below will apply to any such product.

Disclosure Table

有毒有害物质或元素					
铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
X	O	O	O	O	O

O 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006 标准规定的限量要求以下。
X 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T11363-2006 标准规定的限量要求。
企业可在此处,根据实际情况对上表中打“×”的技术原因进行进一步说明。)

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KOREA RoHS

Or The Act for Resource of Recycling of Electrical/Electronic Products and Automobiles (ARREA)

Declaration of Compliance with Restriction on the Use of Hazardous Substances

AVX CORPORATION

A KYOCERA GROUP COMPANY

TANTALUMS

Listed below by manufacturer part number sequence is a compliance status report with regard to restricted materials as defined by the European Union, China, and Korea. Halogen content is also noted.

Pb-Free soldering systems are compatible with SnPb soldering systems

Please forward any questions and material declaration requests to: avxrohs@avxus.com

TANTALUM CHIPS - RoHS COMPLIANT

[1]EU RoHS compliant as standard product since 31 December 2000
[2]EU RoHS compliant as standard product since 31 December 2002
[3]EU RoHS compliant as standard product since 31 December 2003
[4]EU RoHS compliant as standard product since 31 December 2004
[5]EU RoHS compliant as standard product since 31 December 2005
[6]EU RoHS compliant as standard product since 30 September 2007
[7]EU RoHS compliant as standard product since 31 July 2008
[8]EU RoHS compliant as standard product since 30 November 2008

ALL COLUMNS
Y = Compliant
N = Not Compliant
None = No Exemption claimed

CHINA RoHS COLUMNS ONLY
Y = Meets China RoHS
N = Fails China RoHS for Lead only

COLUMN HEADINGS

HALOGENS
Y if Cl,Br <900ppm and Cl+Br <1500ppm per homogenous material

PART NUMBER POSITION																					COMPLIANT TO	EU RoHS	COMPLIANT TO	COMPLIANT TO	HALOGENS	Sn/Pb
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	MSL	EU RoHS?	EXEMPTION? (#)	CHINA RoHS?	KOREA RoHS?	< 900/1500 ppm?	TERMINATION?
T	A	C	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1	Y[1]	None	Y	Y	Y	N
T	A	J	_	_	_	_	_	_	_	_	+	_	_	_	_	_	_	_	_	1	Y[2]	None	Y	Y	Y	N
T	A	W	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1	Y[6]	None	Y	Y	Y	N
T	A	Z	_	_	_	_	_	_	_	_	_	_	_	_	_	^	_	_	_	1	Y[4]	None	Y	Y	Y	N
T	B	C	_	_	_	_	_	_	_	_	_	_	_	_	_	^	_	_	_	1	Y[4]	None	Y	Y	Y	N
T	B	J	_	_	_	_	_	_	_	_	_	_	_	_	_	^	_	_	_	1	Y[4]	None	Y	Y	Y	N
T	B	M	_	_	_	_	_	_	_	_	_	_	_	_	_	^	_	_	_	3	Y[4]	None	Y	Y	Y	N
T	B	W	_	_	_	_	_	_	_	_	_	_	_	_	_	^	_	_	_	1	Y[5]	None	Y	Y	Y	N
T	C	J	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3	Y[3]	None	Y	Y	Y	N
T	C	M	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3	Y[8]	None	Y	Y	Y	N
T	C	N	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3	Y[8]	None	Y	Y	Y	N
T	H	J	_	_	_	_	_	_	_	_	+	_	_	_	_	_	_	_	_	1	Y[3]	None	Y	Y	N	N
T	L	C	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3	Y[4]	None	Y	Y	Y	N
T	L	J	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3	Y[3]	None	Y	Y	Y	N
T	L	N	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	3	Y[7]	None	Y	Y	Y	N
T	M	C	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1	Y[3]	None	Y	Y	Y	N
T	P	C	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1	Y[2]	None	Y	Y	Y	N
T	P	M	_	_	_	_	_	_	_	_	+	_	_	_	_	_	_	_	_	3	Y[3]	None	Y	Y	Y	N
T	P	S	_	_	_	_	_	_	_	_	+	_	_	_	_	_	_	_	_	1	Y[2]	None	Y	Y	Y	N
T	R	J	_	_	_	_	_	_	_	_	+	_	_	_	_	_	_	_	_	1	Y[3]	None	Y	Y	Y	N

"+" can be A, B, R, S, Y or P "^" can be 7 or 9

CWR with gold termination (B) have been EU RoHS compliant as standard product since inception.

C	W	R	_	_	_	B	_	_	_	_	_	_	_	_	_	_	_	_	_	1	Y	None	Y	Y	Y	N

TANTALUM CHIPS - NON-RoHS COMPLIANT

																				MSL						
T	A	J	_	_	_	_	_	_	_	_	#	_	_	_	_	_	_	_	_	1°	N	None	N	N	Y	Y
T	A	Z	_	_	_	_	_	_	_	_		_	_	_	_	*	_	_	_	1	N	None	N	N	Y	Y
T	B	C	_	_	_	_	_	_	_	_		_	_	_	_	*	_	_	_	1	N	None	N	N	Y	Y
T	B	J	_	_	_	_	_	_	_	_		_	_	_	_	*	_	_	_	1	N	None	N	N	Y	Y
T	B	M	_	_	_	_	_	_	_	_		_	_	_	_	*	_	_	_	3	N	None	N	N	Y	Y
T	H	J	_	_	_	_	_	_	_	_	#	_	_	_	_	_	_	_	_	1°	N	None	N	N	N	Y
T	P	M	_	_	_	_	_	_	_	_	#	_	_	_	_	_	_	_	_	3	N	None	N	N	Y	Y
T	P	S	_	_	_	_	_	_	_	_	#	_	_	_	_	_	_	_	_	1°	N	None	N	N	Y	Y
T	R	J	_	_	_	_	_	_	_	_	#	_	_	_	_	_	_	_	_	1°	N	None	N	N	Y	Y

"#" can be H or K "*" can be 0 or 8

"°" codes with dry pack special option are MSL3

C	W	R	_	_	_	+	_	_	_	_	_	_	_	_	_	_	_	_	_	1	N	None	N	N	Y	Y

"+" can be C, H, or K

PART NUMBER POSITION																			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

LEADED TANTALUM

T	A	P	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_		Y[4]	None	Y	Y	N*	N
T	E	P	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_		N	None	N	N	N*	Y

*To be halogen free by 12/31/2010

WET TANTALUM

T	W	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_		N	None	N	N	Y	Y

AVX CORPORATION
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OxiCap® and Niobium Oxide Capacitors

Listed below by manufacturer part number sequence is a compliance status report with regard to restricted materials as defined by the European Union, China, and Korea. Halogen content is also noted.

Please forward any questions and material declaration requests to: avxrohs@avxus.com

ALL COLUMNS
Y = Compliant
N = Not Compliant
None = No Exemption claimed

CHINA RoHS COLUMNS ONLY
Y = Meets China RoHS
N = Fails China RoHS for Lead onl

HALOGENS
Y if Cl,Br <900ppm
and Cl+Br <1500ppm
per homogenous
material

OxiCap® (NIOBIUM OXIDE)

***EU RoHS compliant as standard product since 31 December 2000**

COLUMN HEADINGS

PART NUMBER POSITION																				MSL	COMPLIANT TO EU RoHS?	EU RoHS EXEMPTION? (#)	COMPLIANT TO CHINA RoHS?	COMPLIANT TO KOREA RoHS?	HALOGENS < 900/1500 ppm?	Sn/Pb TERMINATION?
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20							
N	B	S	_	_	_	_	_	_	_	_	_	_	_	_	_	7	_	_	_	1	Y*	None	Y	Y	Y	N
N	B	M	_	_	_	_	_	_	_	_	_	_	_	_	_	7	_	_	_	1	Y*	None	Y	Y	Y	N
N	O	J	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1°	Y*	None	Y	Y	Y	N
N	O	S	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1°	Y*	None	Y	Y	Y	N
N	O	M	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1°	Y*	None	Y	Y	Y	N
N	L	J	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1°	Y*	None	Y	Y	Y	N
N	P	V	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	_	1°	Y*	None	Y	Y	Y	N

"1°" except for case sizes D, E, X, Y, V or codes with dry pack special option which are MSL 3

NIOBIUM OXIDE NON-RoHS COMPLIANT

N	B	S	_	_	_	_	_	_	_	_	_	_	_	_	_	8	_	_	_	1	N	None	N	N	Y	Y

AVX CORPORATION
A KYOCERA GROUP COMPANY

CONNECTORS

Listed below by manufacturer part number sequence is a compliance status report with regard to restricted materials as defined by the European Union, China, and Korea. Halogen content is also noted.

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ALL COLUMNS
Y = Compliant
N = Not Compliant
None = No Exemption claimed

CHINA RoHS COLUMNS ONLY
Y = Meets China RoHS
N = Fails China RoHS for Lead only

HALOGENS
Y if Cl,Br <900ppm and Cl+Br <1500ppm per homogenous material

CONNECTORS

***EU RoHS compliant as standard product since 31 December 2004**

COLUMN HEADINGS

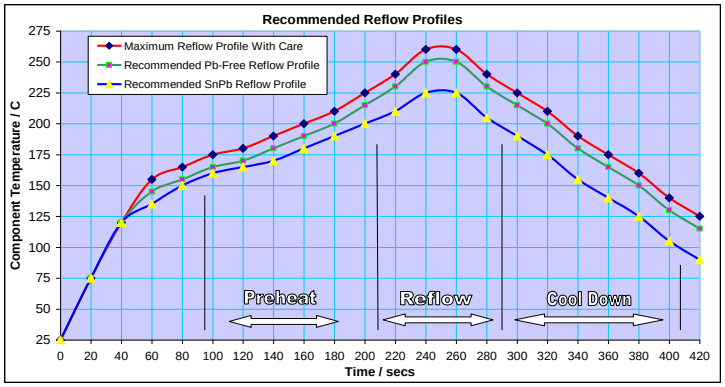
PART NUMBER POSITION																				COMPLIANT TO EU RoHS?	EU RoHS EXEMPTION? (#)	COMPLIANT TO CHINA RoHS?	COMPLIANT TO KOREA RoHS?	HALOGENS < 900/1500 ppm?	Sn/Pb TERMINATION?
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20						
_	_	2	4	2	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	2	5	2	1	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	2	5	2	5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	6	3	3	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	7	0	0	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	7	0	2	2	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	7	0	2	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	7	0	2	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	7	0	3	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	0	1	6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	0	2	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	0	2	6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	2	1	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	2	1	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	2	2	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
1	0	8	2	8	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
2	0	8	2	8	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	2	8	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
0	0	8	2	9	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
0	0	8	2	9	1	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
0	0	8	2	9	2	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
0	0	8	2	9	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N

0	0	8	3	8	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
0	0	8	3	8	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
0	0	8	3	9	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
_	_	8	4	0	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	4	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	4	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	5	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	5	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	5	6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	5	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	5	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	5	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	6	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	7	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	7	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	8	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	8	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	8	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	4	8	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	8	5	5	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	Y	N
_	_	8	5	7	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	Y	N

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	COMPLIANT TO EU RoHS?	EU RoHS EXEMPTION? (#)	COMPLIANT TO CHINA RoHS?	COMPLIANT TO KOREA RoHS?	HALOGENS < 900 ppm?	Sn/Pb TERMINATION?
_	_	9	1	2	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	5	1	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
_	_	9	1	5	2	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
_	_	9	1	5	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
_	_	9	1	5	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	5	5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	N
_	_	9	1	5	6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	Y(6c)	N	Y	N	N
1	0	9	1	5	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
2	0	9	1	5	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
0	0	9	1	5	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	Y	Y
_	_	9	1	5	9	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	1	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	2	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	3	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	4	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	6	8	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	7	0	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	7	5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	7	6	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	7	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	8	1	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	1	8	5	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y
_	_	9	2	5	7	_	_	_	_	_	_	_	_	_	_	_	_	_	_	Y*	None	Y	Y	N	Y

Recommended Soldering Profiles

Reflow Solder Profiles:



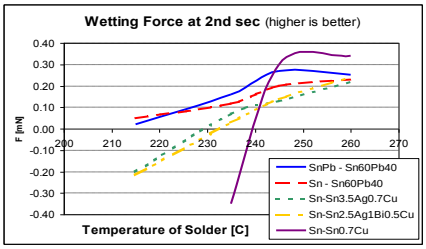
AVX RoHS compliant products utilize termination finishes (e.g.Sn or SnAg) that are compatible with all Pb-Free soldering systems and are fully reverse compatible with SnPb soldering systems. A recommended SnPb profile is shown for comparison; for Pb-Free soldering, IPC / JEDECJ-STD-020C may be referenced. The upper line in the chart shows the maximum envelope to which products are qualified (typically 3x reflow cycles at 260ºC max). The center line gives the recommended profile for optimum wettability and soldering in Pb-Free Systems.

Preheat:

The pre-heat stabilizes the part and reduces the temperature differential prior to reflow. The initial ramp to 125ºC may be rapid, but from that point (2-3)ºC / sec is recommended to allow ceramic parts to heat uniformly and plastic encapsulated parts to stabilize through the glass transition temperature of the body (~ 180ºC).

Reflow:

In the reflow phase, the maximum recommended time > 230ºC is 40secs. Time at peak reflow is 10secs max.; optimum reflow is achieved at 250ºC, (see wetting balance chart opposite) but products are qualified to 260ºC max. Please reference individual product datasheets for maximum limits.



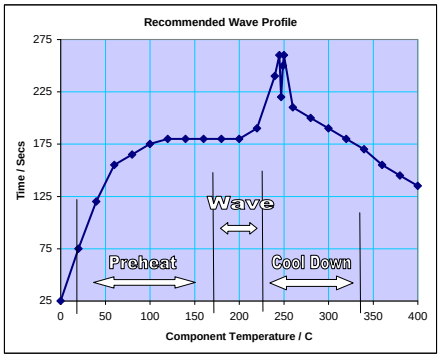
Cool Down:

Cool down should not be forced and 6ºC / sec is recommended. A slow cool down will result in a finer grain structure of the reflow solder in the solder fillet.

IMPORTANT NOTE: Typical Pb-Free reflow solders have a more dull and grainy appearance compared to traditional SnPb. Elevating the reflow temperature will not change this, but extending the cool down can help improve the visual appearance of the joint.

Wave Solder Profiles:

For wave solder, there is no change in the recommended wave profile; all standard Pb-Free (SnCu / SnCuAg) systems operate at the same 260ºC max recommended for SnPb systems.



Preheat:

This is more important for wave solder ; a higher temperature preheat will reduce the thermal shock to SMD parts that are immersed (please consult individual product data sheets for SMD parts that are suited to wave solder). SMD parts should ideally be heated from the bottom-Side prior to wave. PTH (Pin through hole) parts on the topside should not be separately heated.

Wave:

250ºC – 260ºC recommended for optimum solderability.

Cool Down:

As with reflow solder, cool down should not be forced and 6ºC / sec is recommended. Any air knives at the end of the 2nd wave should be heated.