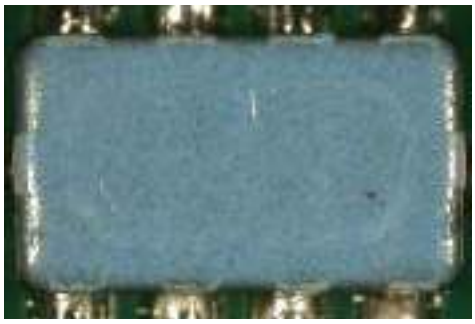
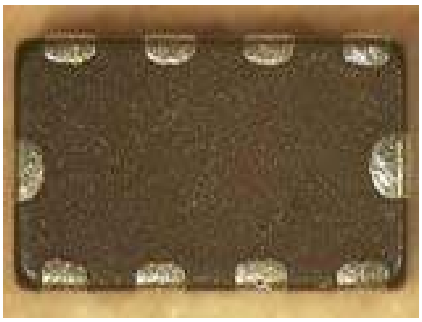
APPROVAL SHEET

Product Name : MULTYLAYER CHIP EMI_ESD FILTER
Part No. : AVRC 18S 05Q 015 100R

Top view	Bottom view
	

Rev Date : 2005. 10. 10.

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R & D	QM	SALES

Contents

1. Reversion History

Date	Content	Rev. no	Page
2004.05.02	Initial Version	0	
2005.10.10	The format modification to standardization	1	All page

2. Parts description

2.1 Introduction

This product is a multi-functioned filter for EMI/ESD protection with C-R-C structure of type Π, and mainly uses it to interrupt EMI noise at the end of camera and LCD, and uses to protect ESD of high voltage. Especially, it shows its excellent reduction characteristics of over 20dB at the 800 ~ 3,000GHz band in the receiving base band of terminal.

2.2 Features

* R-C type 4 channels array filter
* 0508 size
* IEC 61000-4-2 (ESD) Level #4, IEC 61000-4-4 (EFT) Level #4. MSL Level #1
* Multilayer laminated structure

3. Applications

3.1 Basic Theory

R-C filter of Π type passes low frequency signal, and operates with mechanism by reducing high frequency signal according to frequency characteristics of low pass filter.

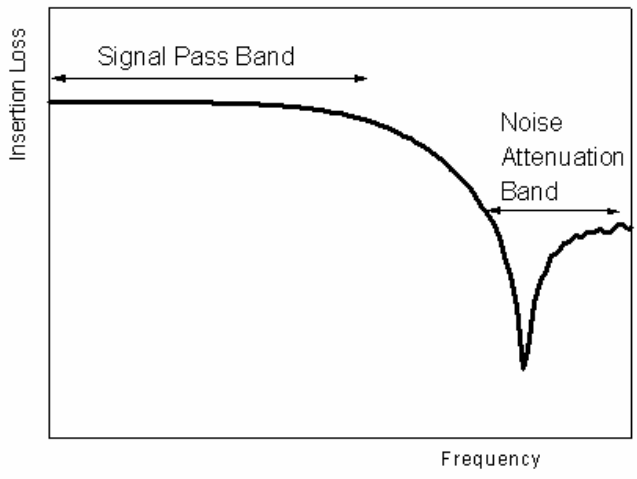
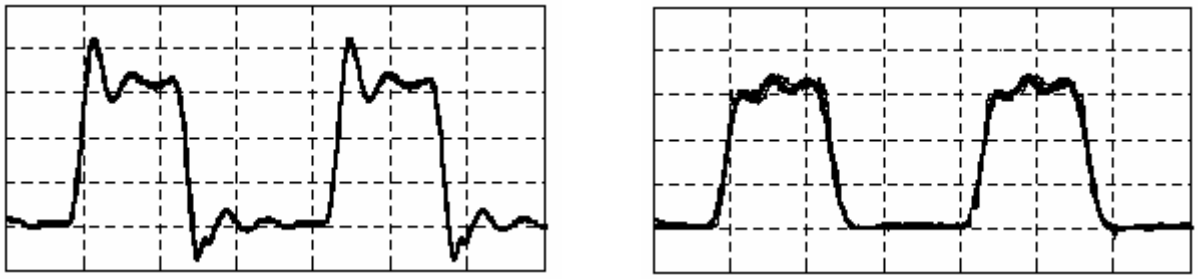


Fig 1 General frequency characteristics of low pass filter.

Using such characteristics, it uses wide range of all fields such as removing high frequency spurious, control of harmonic distortion, and detecting signal, as well as using for eliminating low frequency ripple at the power supply source. This product uses to remove noise of data line which is causing mal-function for other different types of circuits as figure 2.



(a) Data signal including noise (b) Data signal without noise by filter

Fig. 2 Comparing data signal before & after applying filter.

3.2 Main application

* Possible to apply variously for elimination of high frequency noise, and protection of ESD.
* Intercept noise generating from control line and data line of LCD & Camera module.
* Interrupt ESD flowing into the LCD and camera module.

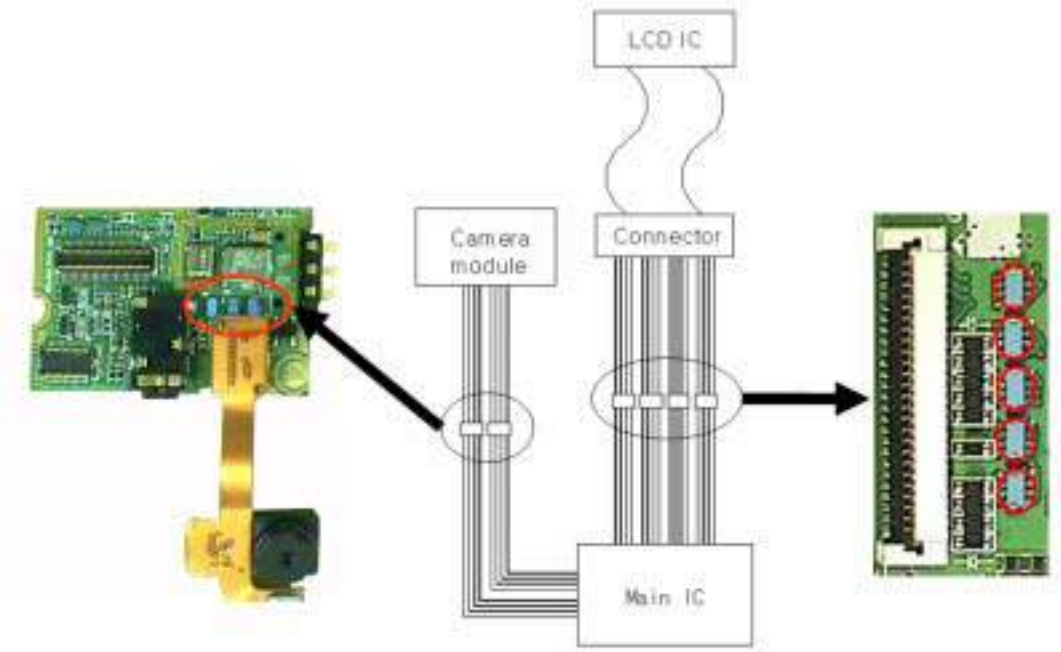


Fig. 3 Application example for cellular phone

4. Model and Lot description system

Model :

AVRC	18	S	05	Q	015	100R
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) : Series name : R-C Type EMI_ESD filter
(2) : Maximum continuous working voltage – Vdc
(3) : Varistor voltage tolerance- "S" : special order
(4) : Chip Size, 05 : 0508 (1.25 x 2.00 mm)
(5) : Configuration, Q : Quad array (4 elements)
(6) : Capacitance, 015 : C1+C2 = 7.5pF+7.5pF = 15pF
(7) : Typical Resistanace, 100R means 100 ± 30 Ω.

Lot :

X	000	X	X	00	X	00	XX0
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

(1) : Display casting facility
(2) : Ceramic Tape product #
(3) : Display printing and stacking facility
(4) : Display Product Type – P : Mass Production
(5) : Produced year
(6) : Produced Month ex) A : Jan. , B:Feb. …
(7) : Produced date
(8) : Amotech Internal code

5. Specifications

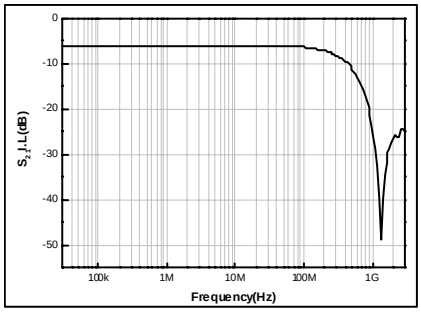
5.1 Electrical characteristics

Part No.	Vdc(1)	Varistor voltage (Vn) @1mA DC	Rdc R series between I/O (2)	Rdc tolerance	Cp (@ 1MHz, V_{rms}=0.5V) C1+C2	Cp tolerance	IR (@3V DC)	Cut-off Frequency (-3dB)	Minimum -20dB ATT. Band
	(V)	(V)	(Ω)	(%)	(pF)	(%)	(MΩ)	MHz	MHz
AVRC 18S 05Q 015 100R	18	30±6	100	±30	7.5+7.5	±30	> 10	400	1100~3000

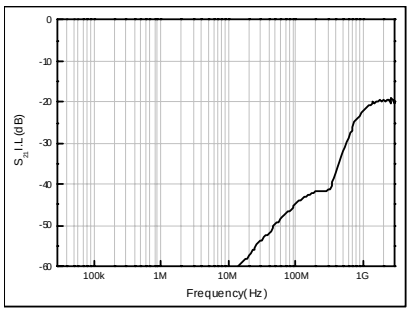
(1) Maximum continuous DC working voltage

(2) Series resistance between input and output

-Typical filter performance



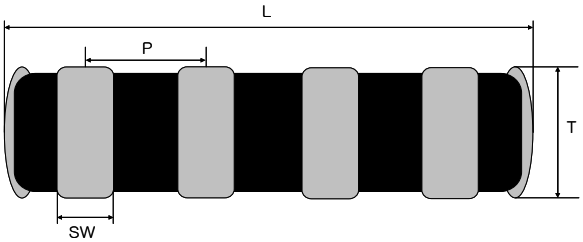
S21 parameter

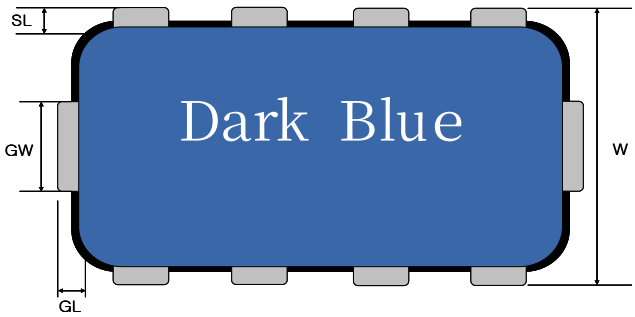


Cross-talk

5.2 Mechanical characteristics

- Appearance and dimension



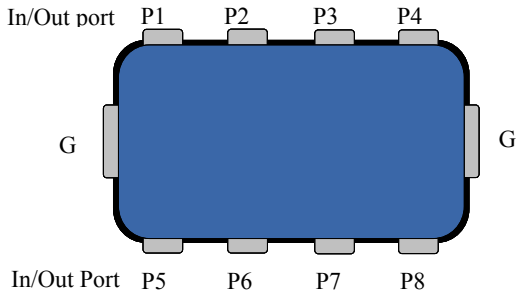


Unit : mm

	L	W	T	GL	GW	SL	SW	P
Size	2.05±0.10	1.25±0.10	0.55±0.10	0.25±0.10	0.30±0.10	0.25±0.10	0.25±0.10	0.50±0.10

5.3 Measurement method

5.3.1 Pin Index



Item	Measuring Point	Condition	Equipment
Vn	CH 1 : P1(or P5) - G port CH 2 : P2(or P6) - G port CH 3 : P3(or P7) - G port CH 4 : P4(or P8) - G port	1mA DC source	Source meter
IR		3V DC	Source meter
Cp		0.5Vrms @1MHz	LCR meter (Capacitance meter)
Rdc	CH 1 : P1 - P5 CH 2 : P2 - P6 CH 3 : P3 - P7 CH 4 : P4 - P8	-	Source meter

5.3.2 Example of Cp, Rdc, IR, Vn measurement.

A) Cp Measurement Procedure (LCR meter – Model name : Agilent 4284A)

1. Turn on the tester.

2. Press Meas_Setup button.

3. Move the arrow and enter the following value :

- FUNC : Cp-D

- FREQ : 1 MHZ

- LEVEL : 500mV

4. Using a high frequency probe, measure P1-G, P2-G, P3-G, P4-G orderly.

B) Rdc Measuring Procedure (Standard source meter – Model name : Keithley 2000)

1. Turn “OFF” the power, then “ON”.

2. Press ‘Ω’ of MEAS section

3. Turn “ON” the “ON/OFF” switch of OUTPUT.

4. Using PIN probe, measure the displayed value from P1-P5, P2-P6. P3-P7, P4-P8 orderly.

C) IR Measuring Procedure (Standard source meter – Model name : Keithley 2000)

1. Turn ‘OFF’ the power, and then turn ‘ON’.

2. Press ‘Ω’ of MEAS section.

3. Press ‘Ω’ of CONFIG section

4. Select SOURCE, press ENTER, select MANUAL, press ENTER, and then press EXIT to go to MAIN MENU.

5. Press ‘V’ button of Source section.

6. Press CONFIG button first, then press TRIG button.

7. Select ‘ARM-LAYER’, press ENTER, Select ‘ARM-IN’, press ENTER, select MANUAL, press ENTER button.

8. Press twice consecutively ‘EXIT’ button to go to Main Menu.

9. Press ‘CONFIG’ button again, and press ‘ON-OFF’ button.

10. Select ‘AUTO-OFF’, press ‘ENTER’, and select ‘ENABLE’, press ‘ENTER’ button, and select ‘ALWAYS’, and then press ‘ENTER’.

11. Press once ‘EXIT’ button to go to the Main Menu

12. Set the value of Vsrc as 3V after press EDIT.

13. Using PIN probe, measure P1-G, P2-G, P3-G, P4-G orderly, and press TRIG to measure again.

D) Vn Measuring Procedure (Standard source meter – Model name : Keithley 2000)

1. Turn ‘OFF’ the power, and then turn ‘ON’.

2. Press ‘V’ of ‘I’ MEAS section of SOURCE area.

3. Press CONFIG button first, then press TRIG button.

4. Select ‘ARM-LAYER’, press ENTER, Select ‘ARM-IN’, press ENTER, select MANUAL, press ENTER button.

5. Press twice consecutively ‘EXIT’ button to go to Main Menu.

6. Press ‘CONFIG’ button again, and press ‘ON/OFF’ button.

7. Select ‘AUTO-OFF’, press ‘ENTER’, and select ‘ENABLE’, press ‘ENTER’ button, and select ‘ALWAYS’,

and then press ‘ENTER’.

8. Press once ‘EXIT’ button to go to the Main Menu

9. Press blue color of ‘EDIT’ button from the far left to set the values for

Isrc = 1 ㎃, and Cmpl = 110V.

10. Using PIN probe, measure P1-G, P2-G, P3-G, P4-G orderly, and press TRIG to measure again.

5.3.3 Example of Cut-Off frequency, -20 dB Att. Band measurement.

1. Reflow or hand soldering chip to equip on the PCB for measurement.

2. Connect a network analyzer detect port into the SMA connector of input/output terminal of product.

3. Connect 50ohm terminal into the input/output terminals except for detection input/output terminal.

4. Detect frequency band of under –20dB, –3dB frequency, and insertion loss (Ex. Marker 1) using network analyzer marker function.

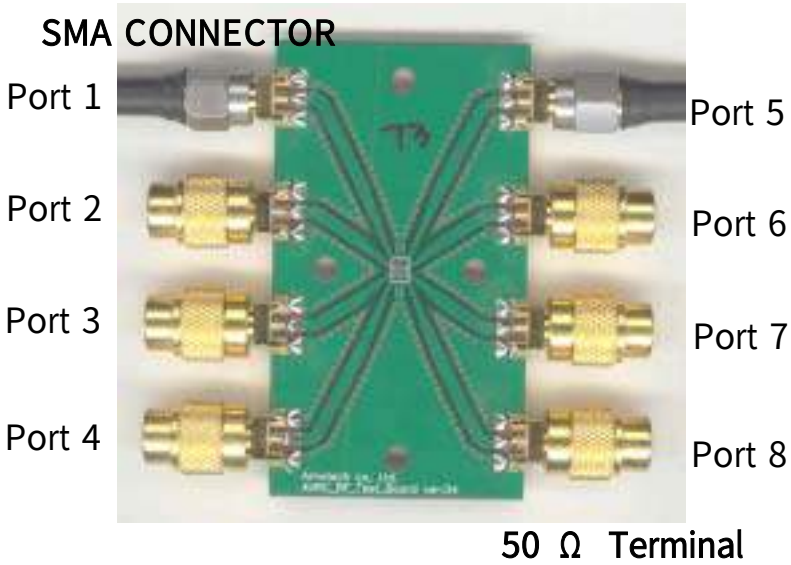
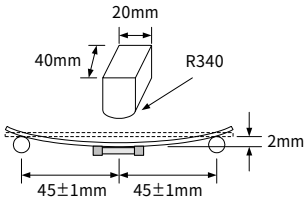
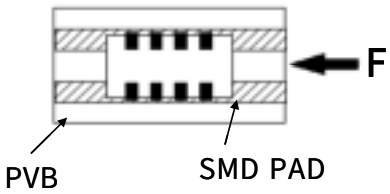


Fig. 4 Test Board for Filter performance

6. Reliabilities and Test conditions

Parameter	Test	Test methods and remarks	Test requirement
Environmental reliability	ESD C=150 pF, R=330Ω	IEC 61000-4-2 1. ESD Level : ±8KV(Contact) , Interval : 1sec 2. Mode : Contact discharge(Level 4) 3. Method : Both 5 times in positive/negative direction	1. d|Vn|/Vn≤15% 2. No visible Damage.
	Thermal Shock	Condition for 1 cycle 1 step : Min. –40℃, 30±3 min. 2 step : Max. +125℃, 30±3 min. Number of cycles : 30 times Place for 48±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.
	Low temp. resistance	1. Temp. : -40 ± 5℃ 2. time : 1000 ± 24 hrs 3. Place for 24±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.
	High temp. resistance	1. Temp : +125 ± 5℃ 2. Time : 1000 ± 24 hrs 3. Place for 24±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.
	Heat resistance	1. Temp. : +85 ± 5℃ 2. Time : 1000 ± 48 hrs 3. Applied voltage : Vdc 4. Place for 24±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.
	High Temp. & Humidity resistance	1. Temp. : +85 ± 5℃ 2. Humidity : 85 ± 5 % RH. 3. Time : 1000 ± 24 hrs 4. Applied voltage : Vdc 5. Place for 24±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.
	PCT (Pressure cooker test)	1. Temp : +121 ± 2℃ 2. Humidity : 100% RH. 3. Atmosphere : 2 atm 4. Time : 60 hrs 5. Place for 24±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.
	Humidity Test	1. Temp. : +60 ± 5℃ 2. Humidity : 90 ± 5 % RH. 3. Time : 1000 ± 48 hrs 4. Place for 24±2hrs at room temp. condition, then measure	1. d|Vn|/Vn≤10% 2. No visible Damage.

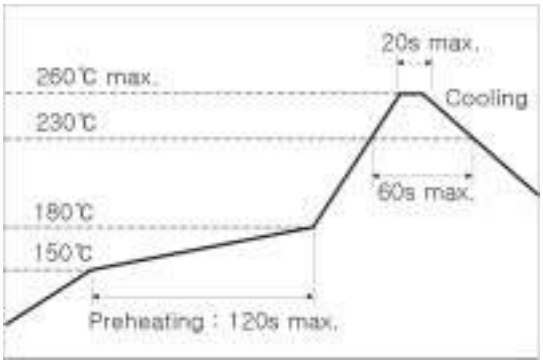
Parameter	Test	Test methods and remarks	Test requirement
Mechanical Reliability	Solderability	1. Test Machine : Solder Bath 2. Temp. : 230±5℃ 3. Time : 2s	At least 95% of terminal electrode is covered by new solder
	Resistance to soldering heat	1. Test Machine : Solder Bath 2. Temp. : 260 ± 5℃ 3. Time : 10±0.5s	1. d｜Vn｜/Vn≤10% 2. No visible Damage.
	Bending strength	1. Wrap: 2 mm 2. Speed: 0.5 mm/sec 3. Duration: 10sec  4. The measurement shall be made with board in the bent position	1. d｜Vn｜/Vn≤10% 2. No visible Damage.
	Adhesive strength	1. Applied force on SMD chip by fracture from PCB  	1. Strength>1.6 Kgf (10N) 2. No visible Damage.

7. Soldering Condition

7.1 Soldering condition

A. Lead Free Solder paste

Solder paste : Sn/Ag/Cu = 96.5/3.0/0.5



- Our chip varistors are designed for reflow soldering only. Do not use flow soldering.
- Use non-activated flux (Cl content 0.2% max.).
- Follow the recommended soldering conditions to avoid varistor damage.

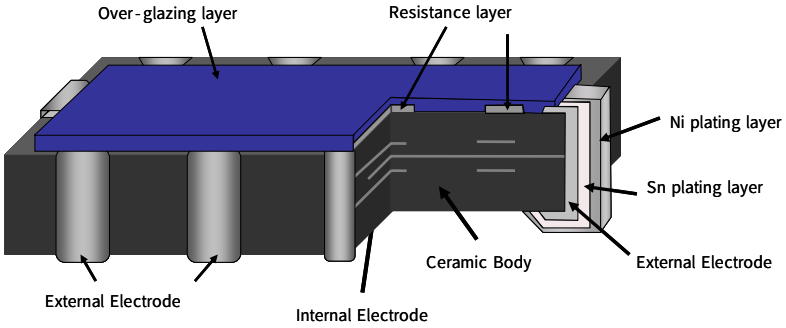
7.2 PCB pattern design condition (recommended)

(Unit : mm)

SIZE	A	B	C	D	E	F	G	H	I
2012 (0805)	0.3	0.42	0.5	1.17	0.55	0.25	0.4	0.35	2

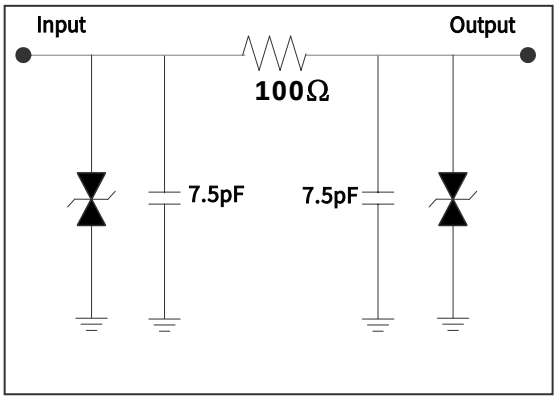
8. Structure and Materials

8.1 Structure and materials specification



Body	ZnO Based Ceramics
Internal electrode	Ag – Pd
External electrode	Ag – Ni– Sn
Plate layer	Ni ＞ 1 ㎛, Sn ＞ 2 ㎛
Resistance layer	RuO_2 - Glass- Ag
Overglazing Layer	Epoxy

8.2 Equivalent circuit



9. Cautions

1. Storage environment : -5~40℃ temperature, 70% humidity (MSL Level 1)

2. Do not use in high temperature/high humidity and a corrosive atmosphere like sulfide, chloride gas which could damage the solderability.

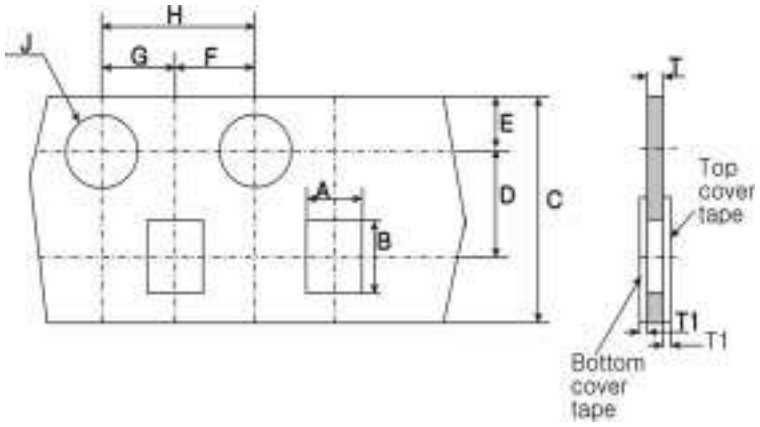
3. Do not expose varistor to mechanical shock to avoid crack.

4. Use chips within 6 months. If over 6 months, check solderability before use.

10. Packaging specification

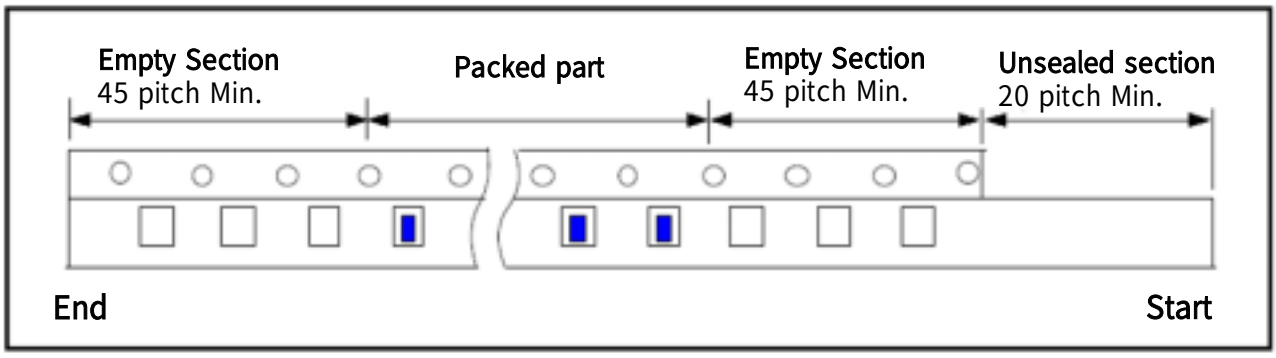
10.1 Carrier tape Specification

10.1.1 Size



	A	B	C	D	E	F	G	H	J	T	T1
Spec.	1.550	2.30	8.00	3.50	1.75	2.00	2.00	4.00	1.55	0.68	0.1
Tolerance	±0.05	±0.05	±0.10	±0.05	±0.05	±0.05	±0.05	±0.10	±0.03	±0.10	Max.

10.1.2 Chip Locations



10.1.3 Materials

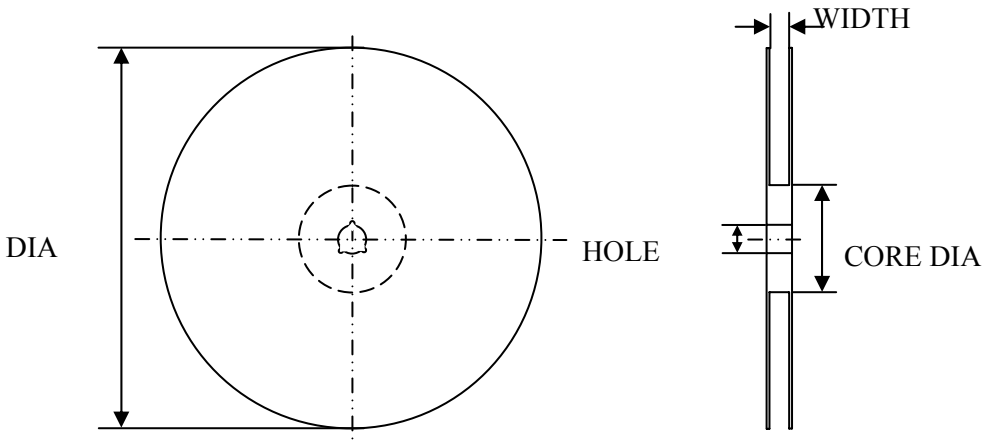
1) Paper carrier tape : Laminated virgin pulp

2) Top tape : Polyester film

3) Bottom tape : Adhesive coated paper

10.2 Reel Specification

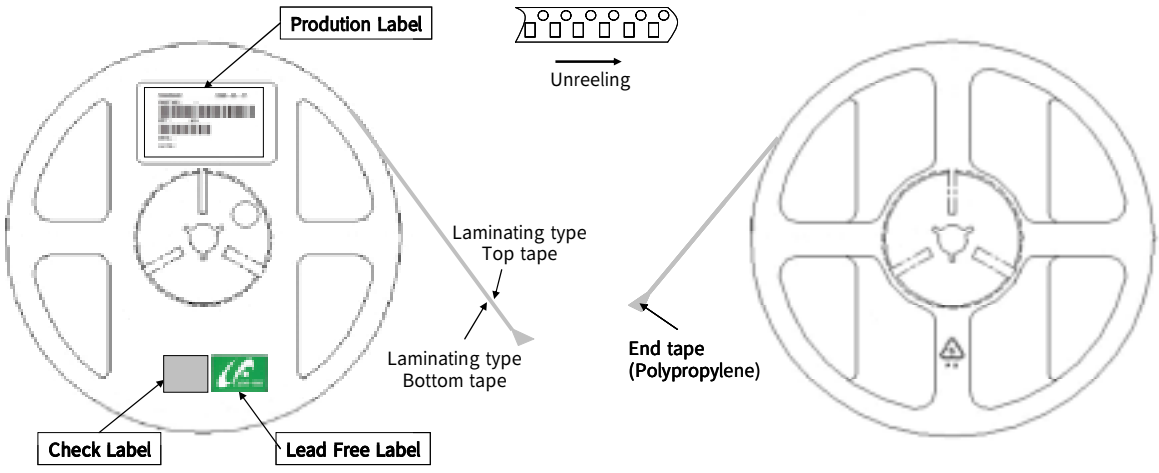
10.2.1 Size



Unit : mm

ITEM	DIA	WIDTH	CORE DIA	HOLE
SIZE	178.0±0.5	9.0±0.5	60.0±1.0	13.2±0.3

10.2.2 Label adherence and winding direction



10.2.3 Material

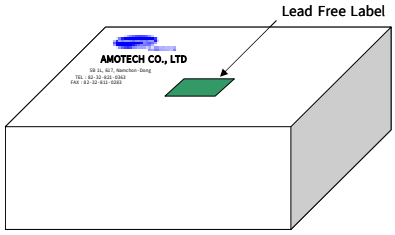
1) Plastic reel : GPPS (General Purpose Poly Styrene) resin

10.3 Box packaging Specification

10.3.1 Small Box

Size : 85 (W) x 85 (D) x 65 (T) (mm)

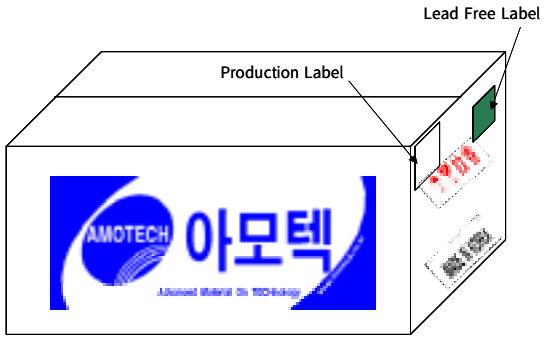
Quantity : 5 reel (4,000 ea/reel × 5 reel = 20,000 ea)



10.3.2 Medium Box

Size : 200 (W) x 375 (D) x 205 (T) (mm)

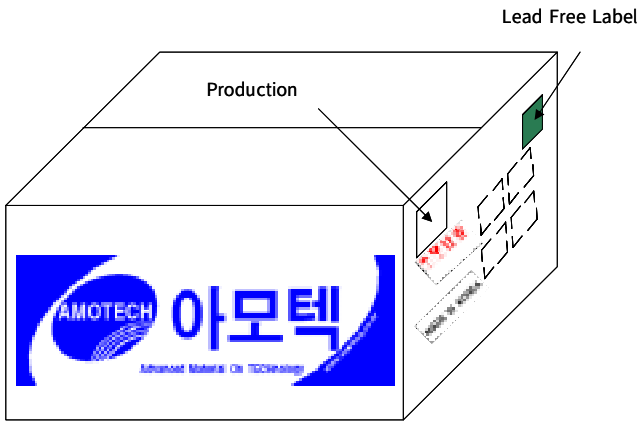
Quantity : 5 small boxes(20,000 ea/ small boxes × 5 small boxes ＝ 100,000 ea)



10.3.3 Large Box

Size : 375 (W) x 390 (D) x 205 (T) (mm)

Quantity : 10 small boxes (20,000 ea/ small boxes ×10 small boxes ＝ 200,000 ea)



A. Reliability Test Reports

Reliability Test Report

Model No.: AVRC 18S 05Q 015 100R
Lot No. : W217CP04G23DB

2005. 8. 23

AMOTECH CO., LTD AMECS DIVISION

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

1. ESD Test

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	ESD		
Products Name	R-Varistor	Tested Conditions	8KV, 150pF, 330Ω, 10time
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	ESD Simulator
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 17	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 4. 22						2005. 4. 22							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	15%↓	15%↓	20↓	20↓	10↑	70-130
1	29.65	29.90	0.022	0.014	3401	94	28.23	27.57	-4.79	-7.79	13.022	1.282	365	94
2	29.34	29.66	0.007	0.073	1199	101	27.98	27.15	-4.64	-8.46	12.710	1.230	373	101
3	29.75	30.39	0.017	0.015	6147	96	27.91	27.88	-6.18	-8.26	6.382	0.595	866	96
4	29.05	29.22	0.065	0.072	2045	94	26.94	27.22	-7.26	-6.84	29.465	1.960	121	94
5	29.65	30.07	0.003	0.035	6650	97	28.87	27.89	-2.63	-7.25	2.080	0.481	2977	97
6	28.98	29.53	0.043	0.055	4477	103	28.02	27.40	-3.31	-7.21	4.344	0.636	1200	103
7	29.02	29.27	0.039	0.053	13668	104	27.83	27.15	-4.10	-7.24	5.902	0.661	1186	104
8	29.66	30.10	0.040	0.021	28892	95	29.03	28.44	-2.12	-5.51	2.246	0.474	3610	95
9	30.59	30.45	0.054	0.089	4929	100	28.02	28.80	-8.40	-5.42	16.287	2.085	308	100
10	30.16	30.56	0.080	0.087	4484	99	28.64	28.66	-5.04	-6.22	7.987	1.375	660	99
11	30.67	30.84	0.065	0.070	7737	92	28.60	28.95	-6.75	-6.13	13.886	1.736	670	92
12	30.95	31.04	0.044	0.111	6107	95	28.30	29.09	-8.56	-6.28	46.389	4.157	111	95
13	30.12	30.40	0.007	0.013	21780	93	29.29	28.73	-2.76	-5.49	3.566	0.558	1288	93
14	29.65	29.75	0.006	0.065	20799	100	28.92	27.83	-2.46	-6.45	4.819	0.619	800	100
15	29.81	30.22	0.008	0.003	8622	96	28.54	27.70	-4.26	-8.34	6.798	0.944	600	96
16	30.26	30.44	0.041	0.015	12074	92	29.21	28.49	-3.47	-6.41	5.599	0.692	968	92
17	29.94	30.47	0.048	0.017	20922	90	28.92	28.62	-3.41	-6.07	5.217	0.802	805	90
18	29.49	30.01	0.060	0.019	6795	93	28.52	27.68	-3.29	-7.76	6.103	0.897	794	93
19	30.04	30.55	0.000	0.001	7913	93	29.28	28.38	-2.53	-7.10	4.136	0.573	1237	93
20	30.32	30.96	0.001	0.043	3088	89	29.66	28.82	-2.18	-6.91	2.652	0.389	2323	89
21	29.77	30.45	0.136	0.125	7314	83	27.02	27.76	-9.24	-8.83	70.456	3.743	64	83
22	29.36	29.72	0.087	0.102	5570	89	27.75	28.10	-5.48	-5.45	12.492	1.637	454	89
23	29.43	29.57	0.085	0.095	5069	97	27.05	27.95	-8.09	-5.48	22.077	2.666	202	97
24	30.78	30.82	0.026	0.044	2948	92	28.20	28.89	-8.38	-6.26	16.179	2.155	320	92
25	29.74	29.99	0.001	0.069	10798	98	28.81	28.04	-3.13	-6.50	8.148	0.965	494	98
26	29.77	30.23	0.012	0.043	10651	97	29.11	27.89	-2.22	-7.74	2.880	0.592	1541	97
27	29.25	29.77	0.031	0.009	8825	91	28.79	27.64	-1.57	-7.15	2.032	0.458	2649	91
28	30.25	30.80	0.046	0.045	6603	86	27.15	28.47	-10.25	-7.56	8.813	0.532	705	86
29	29.34	29.77	0.040	0.048	8201	98	28.58	27.97	-2.59	-6.05	6.261	1.111	862	98
30	30.14	30.66	0.014	0.004	12972	93	29.72	28.58	-1.39	-6.78	1.427	0.305	2750	93
31	29.94	30.90	0.008	0.048	17750	99	29.33	28.73	-2.04	-7.02	1.857	0.361	2383	99
32	30.27	30.75	0.049	0.018	2645	94	29.40	28.59	-2.87	-7.02	2.681	0.522	804	94
33	29.47	29.00	0.038	0.234	8619	102	27.64	27.73	-6.21	-4.38	34.703	2.146	116	102
34	29.06	29.58	0.052	0.015	7505	107	27.93	27.96	-3.89	-5.48	3.063	0.617	1837	107
35	29.85	30.53	0.010	0.059	94312	100	29.12	28.02	-2.45	-8.22	2.558	0.457	2927	100
36	29.80	30.54	0.015	0.021	874	98	29.04	28.12	-2.55	-7.92	4.628	0.741	632	98
37	30.07	30.79	0.045	0.010	3048	91	29.10	28.81	-3.23	-6.43	3.572	0.652	1487	91
38	29.58	30.17	0.008	0.021	18926	100	28.79	27.89	-2.67	-7.56	5.660	0.796	614	100
39	29.87	30.50	0.055	0.009	122873	107	28.94	28.26	-3.11	-7.34	6.183	0.712	596	107
40	30.44	30.65	0.005	0.010	2912	97	29.82	28.94	-2.04	-5.58	2.559	0.480	2040	97
Min	28.98	29.00	0.000	0.001	874	83	26.94	27.15	-10.25	-8.83	1.427	0.305	64	83
Max	30.95	31.04	0.136	0.234	122873	107	29.82	29.09	-1.39	-4.38	70.456	4.157	3610	107
Avg	29.83	30.23	0.035	0.048	13754	96	28.55	28.17	-4.29	-6.80	10.445	1.095	1118	96
STD	0.49	0.52	0.030	0.045	23164	5	0.76	0.54	2.39	1.02	13.610	0.887	921	5
PpK														

Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	ESD		
Products Name	R-Varistor	Tested Conditions	8KV, 150pF, 330Ω, 10time
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	ESD Simulator
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 17	Tested by	QA Dept. Han Ga Na

Date	Initial						Final						
	2005. 4. 22						2005. 4. 22						
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	15%↓	15%↓	20↓	20↓	10↑	70-130
41	29.70	29.87	0.005	0.014	11333	105	28.68	27.86	-3.43	-6.73	5.893	0.856	711	105
42	30.00	30.83	0.005	0.016	12022	106	29.58	28.44	-1.40	-7.75	1.548	0.379	6735	106
43	29.36	30.46	0.060	0.024	6736	108	28.43	28.27	-3.17	-7.19	3.663	0.530	1474	108
44	30.37	30.75	0.046	0.052	8255	100	29.67	28.69	-2.30	-6.70	3.780	0.511	1453	100
45	29.57	30.39	0.037	0.058	10002	104	27.05	28.21	-8.52	-7.17	8.547	0.521	1396	104
46	29.46	29.85	0.005	0.002	9082	107	28.96	27.75	-1.70	-7.04	0.876	0.253	1558	107
47	28.80	29.49	0.007	0.044	14031	106	26.73	27.30	-7.19	-7.43	9.686	0.623	565	106
48	29.61	30.82	0.066	0.035	14369	97	27.67	29.05	-6.55	-5.74	4.665	0.366	327	97
49	30.14	30.37	0.029	0.044	12063	95	29.35	29.45	-2.62	-3.03	3.083	0.571	1619	95
50	29.28	29.95	0.014	0.065	14395	101	28.44	27.90	-2.87	-6.84	6.625	1.026	991	101
51	29.85	30.40	0.045	0.005	7122	91	28.66	27.58	-3.99	-9.28	8.558	0.821	598	91
52	30.08	30.50	0.062	0.073	9436	88	28.52	28.33	-5.19	-7.11	12.174	0.970	291	88
53	28.41	28.82	0.089	0.086	6844	82	25.56	26.19	-10.03	-9.13	50.208	2.301	76	82
54	29.34	30.02	0.058	0.012	11284	82	28.60	27.62	-2.52	-7.99	2.909	0.530	1164	82
55	29.57	30.11	0.040	0.037	15303	81	29.12	28.00	-1.52	-7.01	1.572	0.366	1102	81
56	29.62	29.94	0.004	0.065	10329	80	28.92	28.50	-2.36	-4.81	3.859	0.603	603	80
57	29.47	29.62	0.025	0.023	11149	86	27.73	28.26	-5.90	-4.59	5.094	0.708	1397	86
58	29.66	30.12	0.006	0.043	5865	87	29.31	28.37	-1.18	-5.81	1.153	0.330	2907	87
59	29.20	29.66	0.321	0.077	6960	86	28.63	27.90	-1.95	-5.93	3.761	0.472	961	86
60	29.41	29.87	0.064	0.066	9801	81	28.46	27.61	-3.23	-7.57	6.063	0.825	543	81
61	29.09	29.36	0.048	0.013	17175	80	28.12	27.78	-3.33	-5.38	9.423	0.967	480	80
62	28.99	29.61	0.051	0.004	9349	90	28.26	27.44	-2.52	-7.33	3.943	0.663	697	90
63	28.93	29.51	0.046	0.055	15566	89	28.15	27.27	-2.70	-7.59	3.842	0.554	1717	89
64	28.69	28.99	0.072	0.027	26860	83	27.29	27.09	-4.88	-6.55	11.734	1.410	451	83
65	29.27	29.39	0.014	0.022	6447	96	28.37	27.91	-3.07	-5.04	6.172	1.137	809	96
66	29.39	30.01	0.044	0.017	10656	104	28.63	27.71	-2.59	-7.66	3.082	0.610	1582	104
67	30.02	30.66	0.014	0.057	18645	104	29.37	28.71	-2.17	-6.36	2.149	0.374	8314	104
68	29.29	29.81	0.010	0.071	4921	100	26.13	27.80	-10.79	-6.74	25.202	1.254	175	100
69	30.91	31.56	0.055	0.002	10412	96	30.17	29.46	-2.39	-6.65	1.704	0.342	1994	96
70	30.00	30.39	0.008	0.003	13132	102	29.17	28.16	-2.77	-7.34	4.427	0.507	1298	102
71	29.21	29.84	0.043	0.051	5393	104	28.00	27.84	-4.14	-6.70	10.767	1.152	473	104
72	29.51	30.56	0.027	0.040	2137	96	28.31	28.65	-4.07	-6.25	5.257	0.639	778	96
73	29.51	29.82	0.041	0.035	8256	97	26.30	27.65	-10.88	-7.28	54.464	3.371	51	97
74	29.24	29.87	0.060	0.013	14814	102	28.32	28.51	-3.15	-4.55	2.512	0.421	8783	102
75	29.66	29.99	0.007	0.041	6534	103	28.78	27.98	-2.97	-6.70	4.045	0.515	1142	103
76	29.94	30.30	0.003	0.003	7637	97	29.21	28.37	-2.44	-6.37	3.254	0.591	1981	97
77	29.66	30.07	0.058	0.017	31611	94	28.97	28.20	-2.33	-6.22	4.437	0.643	901	94
78	29.55	30.13	0.034	0.027	16124	101	28.92	27.86	-2.13	-7.53	1.725	0.348	1869	101
79	28.84	29.45	0.006	0.044	8221	97	27.87	27.45	-3.36	-6.79	4.752	0.644	1232	97
80	29.29	29.45	0.027	0.051	6232	100	27.85	27.97	-4.92	-5.03	8.909	0.792	541	100
Min	28.41	28.82	0.003	0.002	2137	80	25.56	26.19	-10.88	-9.28	0.876	0.253	51	80
Max	30.91	31.56	0.321	0.086	31611	108	30.17	29.46	-1.18	-3.03	54.464	3.371	8783	108
Avg	29.50	30.02	0.041	0.036	11163	95	28.36	28.03	-3.88	-6.62	7.888	0.762	1543	95
STD	0.47	0.54	0.051	0.024	5641	9	0.98	0.61	2.49	1.21	11.208	0.566	1957	9
PpK														

Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

2. Thermal Shock Test

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Thermal shock		
Products Name	R-Varistor	Tested Conditions	(-40°C/30min, 125°C/30min) X 30times
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Thermal shock Chamber
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 18 ~ 2005. 8. 19	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 8. 18						2005. 8. 19							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	26.46	27.51	0.025	0.029	1086	101	28.41	28.74	**7.37**	**4.47**	0.037	0.024	1374	101
2	27.07	27.81	0.004	0.063	1183	104	27.88	27.69	**2.99**	**-0.43**	0.022	0.038	1540	102
3	26.80	26.79	0.067	0.048	977	104	28.68	28.17	**7.01**	**5.15**	0.004	0.019	1401	102
4	25.85	27.23	0.038	0.034	1405	101	28.06	28.12	**8.55**	**3.27**	0.055	0.023	1039	101
5	26.98	27.47	0.004	0.014	1318	98	27.97	27.52	**3.67**	**0.18**	0.031	0.069	1373	106
6	25.89	26.05	0.039	0.067	1189	83	27.83	26.76	**7.49**	**2.73**	0.061	0.039	1225	103
7	26.31	27.12	0.071	0.046	1428	104	27.83	27.61	**5.78**	**1.81**	0.048	0.044	1028	100
8	26.48	27.35	0.041	0.012	1308	99	28.37	27.73	**7.14**	**1.39**	0.038	0.062	1153	102
9	27.04	27.33	0.071	0.037	1346	105	27.42	26.51	**1.41**	**-3.00**	0.000	0.008	1500	93
10	25.78	26.52	0.011	0.022	1004	102	24.81	24.61	**-3.76**	**-7.20**	0.029	0.031	1377	94
11	25.59	26.40	0.064	0.018	795	106	26.38	26.01	**3.09**	**-1.48**	0.057	0.086	1141	95
12	25.89	26.31	0.042	0.014	1229	101	27.59	27.46	**6.57**	**4.37**	0.014	0.091	940	92
13	26.71	27.10	0.005	0.066	1376	107	26.26	26.06	**-1.68**	**-3.84**	0.069	0.000	1291	98
14	25.66	26.63	0.058	0.009	1475	93	25.99	25.95	**1.29**	**-2.55**	0.020	0.013	1202	92
15	25.48	26.43	0.003	0.037	1259	107	26.42	25.93	**3.69**	**-1.89**	0.106	0.179	916	104
16	27.20	27.93	0.081	0.055	943	102	26.83	27.16	**-1.36**	**-2.76**	0.053	0.069	1010	99
17	26.96	27.65	0.036	0.065	1258	89	26.92	26.45	**-0.15**	**-4.34**	0.034	0.024	1282	97
18	25.92	26.89	0.049	0.011	1276	102	27.00	26.78	**4.17**	**-0.41**	0.041	0.039	1361	99
19	26.53	27.31	0.019	0.066	1347	100	27.07	26.51	**2.04**	**-2.93**	0.052	0.047	1086	97
20	25.39	26.99	0.009	0.043	1044	94	27.19	27.15	**7.09**	**0.59**	0.048	0.082	925	102
21	26.41	27.10	0.018	0.031	1198	99	27.15	26.91	**2.80**	**-0.70**	0.023	0.023	1260	97
22	26.63	26.97	0.073	0.040	988	96	26.91	26.84	**1.05**	**-0.48**	0.004	0.054	1158	106
23	25.80	26.68	0.085	0.024	1539	107	27.58	27.06	**6.90**	**1.42**	0.097	0.021	1351	97
24	27.11	27.30	0.019	0.002	1308	100	26.79	27.01	**-1.18**	**-1.06**	0.000	0.038	900	104
25	27.33	28.45	0.022	0.034	1243	98	26.65	26.72	**-2.49**	**-6.08**	0.030	0.009	1179	97
26	25.64	26.13	0.011	0.064	1322	107	26.16	25.89	**2.03**	**-0.92**	0.024	0.059	1318	102
27	27.38	28.35	0.096	0.121	992	88	26.21	26.31	**-4.27**	**-7.20**	0.065	0.022	1080	100
28	27.66	28.17	0.039	0.069	1015	106	26.44	26.21	**-4.41**	**-6.96**	0.057	0.005	1338	92
29	26.41	27.39	0.029	0.008	1181	102	26.31	26.04	**-0.38**	**-4.93**	0.028	0.014	1348	99
30	25.22	26.24	0.002	0.024	982	109	26.58	25.87	**5.39**	**-1.41**	0.003	0.058	898	90
31	26.64	27.73	0.033	0.026	952	106	25.82	25.60	**-3.08**	**-7.68**	0.011	0.009	1658	103
32	27.15	27.59	0.032	0.041	1172	94	26.74	26.76	**-1.51**	**-3.01**	0.009	0.003	1283	100
33	25.41	26.78	0.061	0.035	867	100	26.39	26.06	**3.86**	**-2.69**	0.031	0.037	1521	99
34	25.22	26.59	0.048	0.065	1302	102	26.58	26.49	**5.39**	**-0.38**	0.010	0.024	986	97
35	25.35	26.35	0.054	0.000	1498	108	26.88	26.90	**6.04**	**2.09**	0.006	0.031	1325	93
36	25.20	26.22	0.012	0.018	1061	96	26.23	26.43	**4.09**	**0.80**	0.032	0.053	1390	96
37	24.50	24.98	0.009	0.051	1596	96	26.62	26.40	**8.65**	**5.68**	0.036	0.046	1073	96
38	24.54	25.89	0.044	0.006	969	98	26.02	25.01	**6.03**	**-3.40**	0.052	0.007	1251	98
39	25.65	26.23	0.005	0.010	1156	94	25.06	24.94	**-2.30**	**-4.92**	0.051	0.016	1037	102
40	26.86	27.19	0.022	0.029	976	99	26.13	26.41	**-2.72**	**-2.87**	0.027	0.058	1064	96
Min	**24.50**	**24.98**	**0.002**	**0.000**	**795**	**83**	**24.81**	**24.61**	**-4.41**	**-7.68**	**0.000**	**0.000**	**898**	**90**
Max	**27.66**	**28.45**	**0.096**	**0.121**	**1596**	**109**	**28.68**	**28.74**	**8.65**	**5.68**	**0.106**	**0.179**	**1658**	**106**
Avg	**26.20**	**26.98**	**0.036**	**0.036**	**1189**	**100**	**26.85**	**26.62**	**2.56**	**-1.29**	**0.035**	**0.039**	**1215**	**99**
STD	**0.80**	**0.72**	**0.026**	**0.025**	**196**	**6**	**0.86**	**0.87**	**3.94**	**3.48**	**0.025**	**0.033**	**194**	**4**
PpK														

Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

3. Low Temperature Storage Test

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Low Temperature		
Products Name	R-Varistor	Tested Conditions	-40±5°C,1000hrs
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Low Temp. Chamber
Lot No.	W217CP04G23DB		
Tested Period	2005. 6. 25 ~ 2005. 8. 16	Tested by	QA Dept. Han Ga Na

Date	Initial	Final
	2005. 6. 25 (t=0)	2005. 8. 16 (t=1000hrs)

Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	ΔPVn	ΔN-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	28.12	28.32	0.023	0.021	1187	96	27.07	27.38	-3.73	-3.32	0.029	0.044	1027	92
2	27.14	27.19	0.016	0.071	1283	98	26.25	26.77	-3.28	-1.54	0.026	0.078	1191	100
3	27.28	27.45	0.014	0.065	824	96	26.50	26.89	-2.86	-2.04	0.009	0.065	707	104
4	27.10	27.48	0.047	0.012	1153	94	26.96	27.22	-0.52	-0.95	0.006	0.071	1034	99
5	27.55	27.17	0.010	0.004	1138	95	27.74	27.85	0.69	2.50	0.023	0.047	1432	98
6	25.49	26.11	0.003	0.005	840	105	27.20	27.33	6.71	4.67	0.029	0.055	1134	90
7	26.60	26.84	0.203	0.166	1536	88	27.53	27.84	3.50	3.73	0.195	0.180	709	105
8	26.06	26.44	0.061	0.059	1063	90	27.47	27.64	5.41	4.54	0.046	0.040	957	105
9	26.39	26.23	0.064	0.038	906	97	26.61	26.94	0.83	2.71	0.026	0.107	1594	103
10	26.68	27.10	0.027	0.071	1125	97	25.85	26.28	-3.11	-3.03	0.064	0.021	866	93
11	27.09	27.26	0.018	0.038	1062	108	26.90	26.96	-0.70	-1.10	0.014	0.047	1374	97
12	27.35	27.44	0.028	0.319	1282	103	27.12	27.48	-0.84	0.15	0.033	0.363	1447	92
13	28.67	28.85	0.011	0.039	1245	102	27.44	27.72	-4.29	-3.92	0.018	0.053	1023	97
14	27.13	27.49	0.039	0.030	1133	107	26.95	26.97	-0.66	-1.89	0.044	0.048	1265	103
15	27.64	27.88	0.060	0.017	911	107	27.05	27.57	-2.13	-1.11	0.023	0.027	1080	96
16	28.30	28.47	0.024	0.069	1149	95	28.53	28.85	0.81	1.33	0.044	0.025	1094	110
17	25.95	26.11	0.019	0.073	1036	94	27.62	27.94	6.44	7.01	0.053	0.027	1125	114
18	26.15	26.47	0.007	0.055	1103	102	27.39	27.83	4.74	5.14	0.018	0.009	1216	95
19	26.03	26.34	0.002	0.070	1240	105	26.90	27.27	3.34	3.53	0.023	0.082	1090	100
20	24.81	24.89	0.096	0.012	1754	95	27.03	27.25	8.95	9.48	0.094	0.022	1422	97
21	27.10	27.17	0.035	0.037	1480	107	27.15	27.44	0.18	0.99	0.025	0.073	899	97
22	26.81	27.08	0.009	0.069	1296	94	26.43	26.97	-1.42	-0.41	0.003	0.009	1223	87
23	26.03	26.13	0.021	0.073	1129	91	26.82	27.24	3.03	4.25	0.027	0.080	1128	103
24	26.77	26.98	0.035	0.051	1186	99	26.39	26.74	-1.42	-0.89	0.042	0.011	888	98
25	27.36	27.55	0.005	0.133	1100	107	27.57	27.80	0.77	0.91	0.087	0.045	980	105
26	27.64	27.96	0.034	0.028	1380	102	27.64	27.71	0.00	-0.89	0.056	0.011	1154	104
27	27.57	27.93	0.017	0.065	1080	101	27.86	28.21	1.05	1.00	0.059	0.011	991	103
28	27.62	27.95	0.201	0.031	1566	98	27.17	27.33	-1.63	-2.22	0.106	0.057	939	96
29	27.76	27.99	0.068	0.036	1096	98	27.42	27.60	-1.22	-1.39	0.037	0.074	1261	103
30	27.49	27.68	0.018	0.061	1326	93	27.04	27.43	-1.64	-0.90	0.061	0.013	1467	98
31	26.89	27.17	0.108	0.095	826	101	27.16	27.25	1.00	0.29	0.012	0.039	1142	100
32	27.28	27.50	0.075	0.026	1034	105	27.06	27.20	-0.81	-1.09	0.037	0.020	1295	95
33	26.30	26.73	0.018	0.039	1097	111	28.03	28.32	6.58	5.95	0.012	0.072	1325	98
34	26.64	26.87	0.012	0.030	1011	99	27.89	28.32	4.69	5.40	0.075	0.031	1082	98
35	26.06	26.26	0.041	0.038	1180	94	27.65	27.92	6.10	6.32	0.029	0.044	1278	99
36	26.14	26.53	0.042	0.085	660	93	27.48	27.72	5.13	4.49	0.073	0.039	1081	110
37	27.20	27.58	0.053	0.015	1278	103	27.00	26.87	-0.74	-2.57	0.043	0.066	999	97
38	25.92	25.82	0.052	0.056	939	101	26.94	27.25	3.94	5.54	0.104	0.064	1245	96
39	27.41	27.55	0.058	0.023	1035	118	27.25	27.47	-0.58	-0.29	0.029	0.070	1075	95
40	27.04	26.94	0.003	0.105	1444	93	27.17	27.43	0.48	1.82	0.024	0.110	1177	103
41	25.93	26.14	0.041	0.026	1277	102	26.67	27.14	2.85	3.83	0.050	0.064	1441	98
42	26.34	26.55	0.012	0.037	1217	86	26.65	26.85	1.18	1.13	0.005	0.041	1163	103
43	25.67	25.87	0.056	0.015	1040	102	27.52	27.79	7.21	7.42	0.058	0.037	1540	95
44	26.21	26.29	0.066	0.052	1387	101	27.72	28.09	5.76	6.85	0.060	0.049	1444	105
45	26.21	25.99	0.062	0.059	1309	102	27.02	27.29	3.09	5.00	0.038	0.069	1485	103
46	26.23	26.30	0.183	0.011	1320	96	26.77	27.00	2.06	2.66	0.171	0.014	1236	100
47	25.33	25.34	0.076	0.457	1440	106	26.86	27.28	6.04	7.66	0.076	0.316	950	104
48	26.80	26.49	0.016	0.069	1132	103	25.93	26.14	-3.25	-1.32	0.046	0.081	1277	99
49	26.66	26.86	0.274	0.080	1327	95	26.33	26.56	-1.24	-1.12	0.267	0.019	1412	97
50	27.14	27.17	0.038	0.026	1247	99	26.73	26.87	-1.51	-1.10	0.075	0.033	1155	98
51	27.79	28.06	0.145	0.020	1251	91	26.26	26.02	-5.51	-7.27	0.268	0.014	1267	101
52	28.01	28.31	0.029	0.008	1438	107	27.67	27.92	-1.21	-1.38	0.013	0.028	1342	95
Min	24.81	24.89	0.002	0.004	660	86	25.85	26.02	-5.51	-7.27	0.003	0.009	707	87
Max	28.67	28.85	0.274	0.457	1754	118	28.53	28.85	8.95	9.48	0.268	0.363	1594	114
Avg	26.82	27.01	0.051	0.061	1183	99	27.10	27.37	1.12	1.43	0.055	0.060	1176	99
STD	0.81	0.83	0.057	0.075	206	6	0.54	0.55	3.45	3.59	0.057	0.065	204	5
PpK														

Remarks	Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

4. High Temperature Storage Test

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	High Temperature		
Products Name	R-Varistor	Tested Conditions	125±5°C, 1000hrs
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	High Temp. Chamber
Lot No.	W217CP04G23DB		
Tested Period	2005. 6. 25 ~ 2005. 8. 16	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 6. 25 (t=0)						2005. 8. 16 (t=1000hrs)							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	26.97	26.78	0.039	0.012	1035	106	28.31	28.54	**4.97**	**6.57**	0.061	0.003	1303	97
2	26.94	26.27	0.030	0.034	1463	97	27.65	27.81	**2.64**	**5.86**	0.017	0.047	1199	95
3	26.93	26.93	0.039	0.039	1315	101	26.78	26.84	**-0.56**	**-0.33**	0.017	0.042	811	111
4	27.04	26.19	0.003	0.026	1374	103	28.42	28.78	**5.10**	**9.89**	0.047	0.036	1368	94
5	26.59	26.99	0.035	0.181	1216	94	28.67	28.63	**7.82**	**6.08**	0.045	0.045	1218	99
6	26.79	27.22	0.045	0.024	1159	99	28.11	28.36	**4.93**	**4.19**	0.080	0.023	1223	93
7	26.01	26.14	0.043	0.023	1325	105	27.98	28.29	**7.57**	**8.22**	0.039	0.097	1241	111
8	26.55	26.68	0.015	0.012	1006	101	28.82	28.88	**8.55**	**8.25**	0.070	0.087	1350	100
9	26.46	26.47	0.066	0.017	1216	111	26.40	26.45	**-0.23**	**-0.08**	0.048	0.076	1339	105
10	26.79	27.15	0.028	0.066	1404	100	25.79	25.57	**-3.73**	**-5.82**	0.036	0.028	1249	103
11	27.70	27.86	0.022	0.053	1004	103	25.85	26.26	**-6.68**	**-5.74**	0.014	0.056	1247	114
12	27.22	27.50	0.099	0.069	992	93	26.48	26.74	**-2.72**	**-2.76**	0.171	0.072	1130	106
13	26.64	27.06	0.174	0.070	1077	104	27.20	27.25	**2.10**	**0.70**	0.223	0.051	1202	99
14	26.46	26.67	0.070	0.222	1309	95	26.38	26.82	**-0.30**	**0.56**	0.070	0.233	984	98
15	26.32	26.50	0.048	0.031	1496	101	26.89	27.17	**2.17**	**2.53**	0.038	0.081	989	98
16	27.19	27.45	0.022	0.081	1126	99	26.47	26.65	**-2.65**	**-2.91**	0.033	0.045	1479	105
17	28.08	28.33	0.085	0.079	1389	97	26.77	26.56	**-4.67**	**-6.25**	0.001	0.070	999	102
18	27.26	27.26	0.056	0.034	962	104	26.26	26.38	**-3.67**	**-3.23**	0.039	0.039	1278	96
19	27.85	27.45	0.006	0.053	1295	99	27.44	27.79	**-1.47**	**1.24**	0.064	0.088	1341	103
20	27.12	27.00	0.022	0.067	790	93	26.96	26.90	**-0.59**	**-0.37**	0.007	0.088	1614	95
21	27.02	27.31	0.052	0.034	1415	102	27.48	27.85	**1.70**	**1.98**	0.052	0.046	1187	99
22	27.34	27.77	0.044	0.019	1397	98	27.07	27.63	**-0.99**	**-0.50**	0.061	0.014	910	108
23	26.43	26.76	0.013	0.032	937	100	26.91	27.07	**1.82**	**1.16**	0.063	0.046	1610	99
24	26.85	27.21	0.062	0.052	1391	91	27.53	27.78	**2.53**	**2.09**	0.000	0.020	938	100
25	27.46	27.83	0.010	0.109	710	99	27.42	27.72	**-0.15**	**-0.40**	0.069	0.018	858	107
26	27.78	28.08	0.048	0.033	1364	100	27.33	27.46	**-1.62**	**-2.21**	0.038	0.053	1294	100
27	25.91	26.36	0.057	0.057	1076	100	25.98	26.08	**0.27**	**-1.06**	0.034	0.028	1235	99
28	27.16	27.60	0.058	0.006	1005	103	26.10	26.28	**-3.90**	**-4.78**	0.056	0.071	1041	84
29	27.11	27.49	0.041	0.015	1438	103	26.73	27.15	**-1.40**	**-1.24**	0.002	0.065	1153	99
30	24.14	24.06	0.065	0.062	1454	97	26.06	26.27	**7.95**	**9.19**	0.039	0.012	1249	104
31	27.10	27.34	0.006	0.048	1437	97	26.56	26.88	**-1.99**	**-1.68**	0.046	0.018	1224	107
32	26.67	27.05	0.065	0.025	1078	102	27.28	27.54	**2.29**	**1.81**	0.037	0.054	1685	105
33	26.23	26.49	0.045	0.022	955	104	28.14	28.50	**7.28**	**7.59**	0.040	0.089	1295	109
34	26.41	26.84	0.099	0.029	1070	95	27.87	28.16	**5.53**	**4.92**	0.037	0.055	975	104
35	26.41	26.73	0.013	0.037	1272	104	27.82	28.16	**5.34**	**5.35**	0.048	0.070	1386	98
36	26.40	26.56	0.077	0.010	1226	104	28.66	28.81	**8.56**	**8.47**	0.023	0.016	1373	99
37	25.27	26.39	0.057	0.001	1123	94	27.68	27.95	**9.54**	**5.91**	0.049	0.018	1152	106
38	27.46	27.10	0.050	0.151	1309	94	27.67	27.85	**0.76**	**2.77**	0.064	0.176	989	98
39	26.22	25.94	0.017	0.025	1161	102	27.46	27.70	**4.73**	**6.78**	0.023	0.019	1042	96
40	27.38	26.55	0.060	0.016	1195	93	27.52	27.77	**0.51**	**4.60**	0.035	0.079	1489	101
41	27.23	27.61	0.038	0.065	1334	100	27.47	27.91	**0.88**	**1.09**	0.000	0.023	1082	98
42	26.59	26.97	0.049	0.021	1649	110	27.16	27.46	**2.14**	**1.82**	0.023	0.048	947	103
43	27.31	27.82	0.037	0.025	1392	99	26.63	26.40	**-2.49**	**-5.10**	0.070	0.076	1371	102
44	26.86	27.09	0.005	0.016	923	100	27.50	27.72	**2.38**	**2.33**	0.058	0.009	968	96
45	26.43	26.25	0.053	0.033	1252	107	27.70	28.01	**4.81**	**6.70**	0.029	0.024	763	103
46	26.56	26.92	0.062	0.054	979	93	28.81	29.17	**8.47**	**8.36**	0.008	0.004	1084	106
47	26.28	26.55	0.098	0.016	999	93	28.07	29.08	**6.81**	**9.53**	0.042	0.068	740	102
48	26.11	26.52	0.020	0.060	1283	108	28.48	28.81	**9.08**	**8.63**	0.023	0.045	1116	101
49	28.64	28.94	0.013	0.011	907	95	28.28	28.16	**-1.26**	**-2.70**	0.057	0.008	1486	100
50	28.53	28.80	0.070	0.006	1295	106	28.03	28.35	**-1.75**	**-1.56**	0.026	0.075	1107	101
51	27.33	27.55	0.020	0.040	1077	93	28.06	28.43	**2.67**	**3.19**	0.030	0.001	964	95
52	28.63	29.05	0.035	0.038	882	92	29.08	29.29	**1.57**	**0.83**	0.061	0.064	997	87
Min	**24.14**	**24.06**	**0.003**	**0.001**	**710**	**91**	**25.79**	**25.57**	-6.68	-6.25	**0.000**	**0.001**	**740**	**84**
Max	**28.64**	**29.05**	**0.174**	**0.222**	**1649**	**111**	**29.08**	**29.29**	**9.54**	**9.89**	**0.223**	**0.233**	**1685**	**114**
Avg	**26.89**	**27.07**	**0.046**	**0.045**	**1191**	**100**	**27.39**	**27.62**	**1.94**	**2.12**	**0.045**	**0.052**	**1178**	**101**
STD	**0.78**	**0.82**	**0.031**	**0.042**	**205**	**5**	**0.84**	**0.91**	**4.11**	**4.50**	**0.037**	**0.041**	**217**	**6**
PpK														

Remarks	Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

5. Heat resistance

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Heat resistance						Tested Conditions	85±5°C, 5.5Vdc, 1000hrs						
Products Name	R-Varistor						Tested Equipment & Instrument	High Temp. Chamber						
Model No.	AVRC 18S 05Q 015 100R													
Lot No.	W217CP04G23DB													
Tested Period	2005. 6. 25 ~ 2005. 8. 16						Tested by	QA Dept. Han Ga Na						
Date	Initial							Final						
	2005. 6. 25 (t=0)							2005. 8. 16 (t=1000hrs)						
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	25.72	25.87	0.020	0.022	1154	98	27.55	27.73	**7.12**	**7.19**	0.056	0.017	1194	103
2	27.03	26.63	0.020	0.012	1081	103	27.58	27.94	**2.03**	**4.92**	0.004	0.009	1202	99
3	27.92	27.70	0.064	0.046	1223	94	27.33	27.60	**-2.11**	**-0.36**	0.079	0.076	1350	102
4	27.83	27.41	0.010	0.045	1002	94	26.79	26.91	**-3.74**	**-1.82**	0.028	0.016	1173	97
5	27.45	27.40	0.046	0.066	1323	96	26.00	26.18	**-5.28**	**-4.45**	0.036	0.071	1106	97
6	27.19	26.27	0.005	0.074	980	101	25.87	26.14	**-4.85**	**-0.49**	0.001	0.104	1403	98
7	27.25	27.59	0.046	0.019	1015	102	25.58	26.10	**-6.13**	**-5.40**	0.035	0.039	921	103
8	27.41	26.75	0.020	0.035	1372	100	26.54	26.98	**-3.17**	**0.86**	0.062	0.006	925	96
9	26.99	26.73	0.048	0.014	1018	108	26.73	27.03	**-0.96**	**1.12**	0.025	0.065	1188	99
10	26.72	25.51	0.008	0.000	751	107	26.87	27.19	**0.56**	**6.59**	0.066	0.028	999	107
11	27.06	26.41	0.140	0.053	1064	98	27.17	27.35	**0.41**	**3.56**	0.023	0.038	1127	104
12	26.82	26.64	0.017	0.015	1247	97	27.77	27.87	**3.54**	**4.62**	0.073	0.015	1310	95
13	27.02	27.53	0.058	0.061	1297	108	26.47	27.05	**-2.04**	**-1.74**	0.033	0.062	1156	99
14	27.22	26.91	0.023	0.102	1310	109	27.28	27.62	**0.22**	**2.64**	0.010	0.093	1073	100
15	27.64	27.52	0.008	0.050	1004	108	27.21	27.42	**-1.56**	**-0.36**	0.018	0.025	1265	103
16	27.22	26.91	0.040	0.016	990	95	27.00	27.28	**-0.81**	**1.37**	0.004	0.012	1419	99
17	27.24	27.09	0.038	0.020	1121	92	26.64	26.90	**-2.20**	**-0.70**	0.062	0.073	1243	98
18	27.28	26.84	0.034	0.003	1246	102	26.62	26.94	**-2.42**	**0.37**	0.024	0.031	1052	100
19	27.26	27.52	0.025	0.023	1010	100	26.76	26.95	**-1.83**	**-2.07**	0.025	0.012	1220	103
20	27.75	27.72	0.067	0.015	991	97	26.20	26.48	**-5.59**	**-4.47**	0.005	0.016	1285	95
21	27.01	26.69	0.025	0.091	1642	107	25.99	26.12	**-3.78**	**-2.14**	0.032	0.089	1041	100
22	27.84	27.29	0.029	0.026	1310	98	26.53	26.78	**-4.71**	**-1.87**	0.016	0.004	1130	107
23	27.07	27.11	0.050	0.055	1014	110	26.83	27.11	**-0.89**	**0.00**	0.044	0.040	1106	95
24	28.04	28.22	0.047	0.024	782	109	26.45	26.36	**-5.67**	**-6.59**	0.029	0.018	1406	98
25	27.50	27.81	0.034	0.065	1187	100	25.88	26.64	**-5.89**	**-4.21**	0.022	0.013	1327	102
26	28.16	27.62	0.028	0.014	1322	105	26.39	27.06	**-6.29**	**-2.03**	0.030	0.037	1425	97
27	27.43	27.08	0.046	0.030	1421	94	26.55	26.62	**-3.21**	**-1.70**	0.011	0.051	1659	107
28	27.90	27.34	0.003	0.048	804	99	26.24	26.50	**-5.95**	**-3.07**	0.056	0.004	1607	102
29	27.10	27.12	0.017	0.016	1133	95	26.53	26.44	**-2.10**	**-2.51**	0.047	0.019	1177	103
30	26.64	25.75	0.039	0.004	1489	106	26.47	26.97	**-0.64**	**4.74**	0.055	0.037	947	99
31	26.81	27.00	0.023	0.054	1071	94	28.23	28.27	**5.30**	**4.70**	0.034	0.052	1177	95
32	26.80	27.23	0.034	0.033	1028	97	28.43	28.68	**6.08**	**5.33**	0.015	0.054	997	104
33	28.53	28.48	0.121	0.048	1064	102	27.79	28.19	**-2.59**	**-1.02**	0.116	0.018	1322	101
34	28.53	27.79	0.040	0.008	965	106	28.31	28.54	**-0.77**	**2.70**	0.051	0.039	1164	103
35	27.65	27.32	0.015	0.056	985	105	26.15	26.56	**-5.42**	**-2.78**	0.047	0.030	1368	102
36	27.24	27.52	0.037	0.026	1117	101	26.21	26.36	**-3.78**	**-4.22**	0.044	0.014	1164	105
37	26.65	26.91	0.053	0.000	1109	91	26.13	26.39	**-1.95**	**-1.93**	0.044	0.060	914	107
38	27.36	26.89	0.080	0.051	1126	99	25.93	26.42	**-5.23**	**-1.75**	0.017	0.062	1338	96
39	27.55	26.69	0.013	0.023	1273	101	27.49	27.26	**-0.22**	**2.14**	0.046	0.001	989	96
40	25.19	25.03	0.039	0.052	1182	102	27.63	27.05	**9.69**	**8.07**	0.006	0.058	1354	102
41	26.32	26.86	0.049	0.034	1161	94	25.52	25.71	**-3.04**	**-4.28**	0.039	0.007	1245	98
42	25.14	26.41	0.051	0.038	976	95	26.44	26.72	**5.17**	**1.17**	0.012	0.018	910	95
43	25.17	25.85	0.017	0.007	1561	101	26.77	27.29	**6.36**	**5.57**	0.036	0.005	1435	104
44	25.16	26.24	0.038	0.024	1256	94	26.22	26.67	**4.21**	**1.64**	0.029	0.010	1402	93
45	27.96	28.97	0.011	0.019	1033	108	26.28	26.40	**-6.01**	**-8.87**	0.051	0.055	1219	95
46	27.26	28.28	0.045	0.025	1199	101	26.49	26.73	**-2.82**	**-5.48**	0.033	0.053	837	102
47	26.90	27.60	0.043	0.018	896	101	26.50	26.87	**-1.49**	**-2.64**	0.035	0.040	1415	105
48	25.52	26.02	0.030	0.014	1238	97	26.83	26.99	**5.13**	**3.73**	0.011	0.029	1395	97
49	26.07	26.45	0.022	0.014	1276	101	26.85	27.23	**2.99**	**2.95**	0.059	0.030	1580	93
50	25.04	25.75	0.039	0.044	952	104	27.11	27.46	**8.27**	**6.64**	0.017	0.009	1224	100
51	25.26	25.84	0.024	0.030	1350	110	26.68	26.91	**5.62**	**4.14**	0.048	0.053	1233	99
52	26.19	26.90	0.028	0.024	1391	92	26.51	26.55	**1.22**	**-1.30**	0.002	0.020	1103	100
Min	**25.04**	**25.03**	**0.003**	**0.000**	**751**	**91**	**25.52**	**25.71**	-6.29	-8.87	**0.001**	**0.001**	**837**	**93**
Max	**28.53**	**28.97**	**0.140**	**0.102**	**1642**	**110**	**28.43**	**28.68**	9.69	8.07	**0.116**	**0.104**	**1659**	**107**
Avg	**26.98**	**26.98**	**0.037**	**0.033**	**1144**	**101**	**26.74**	**26.99**	-0.79	0.12	**0.035**	**0.035**	**1216**	**100**
STD	**0.89**	**0.78**	**0.025**	**0.023**	**189**	**5**	**0.67**	**0.63**	**4.24**	**3.90**	**0.023**	**0.026**	**186**	**4**
PpK														

Remarks	Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

6. High Temp and High Humidity Test with Load

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	High Temp & Humidity Test with Load		
Products Name	R-Varistor	Tested Conditions	85±5°C, 85±5% RH, 5.5Vdc, 1000hrs
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Temp & Humidity Chamber
Lot No.	W217CP04G23DB		
Tested Period	2005. 6. 25 ~ 2005. 8. 16	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 6. 25 (t=0)						2005. 8. 16 (t=1000hrs)							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	28.68	28.10	0.037	0.029	1256	101	27.34	27.57	-4.67	-1.89	0.058	0.023	1130	100
2	28.48	28.74	0.112	0.065	901	102	27.70	27.83	-2.74	-3.17	0.015	0.057	1212	98
3	28.08	28.18	0.032	0.037	1343	99	26.87	27.52	-4.31	-2.34	0.042	0.030	1277	82
4	28.20	28.48	0.033	0.015	1245	108	28.26	28.66	0.21	0.63	0.050	0.044	1216	99
5	25.91	25.98	0.010	0.030	1348	98	28.06	28.30	8.30	8.93	0.015	0.032	1083	106
6	26.29	26.41	0.051	0.030	1174	99	28.18	28.38	7.19	7.46	0.042	0.007	1507	101
7	26.63	26.86	0.018	0.031	1409	107	27.66	27.91	3.87	3.91	0.071	0.041	1264	105
8	27.61	27.94	0.009	0.019	1119	96	28.48	28.57	3.15	2.25	0.065	0.015	980	109
9	29.55	29.70	0.327	0.154	997	94	27.34	27.13	-7.48	-8.65	0.183	0.184	1009	97
10	28.97	29.19	0.048	0.030	1006	102	27.07	27.34	-6.56	-6.34	0.026	0.042	708	97
11	29.36	29.64	0.045	0.037	862	98	27.14	27.05	-7.56	-8.74	0.011	0.037	1234	97
12	29.40	29.61	0.046	0.046	1330	101	28.98	28.48	-1.43	-3.82	0.002	0.004	1059	106
13	27.04	27.23	0.020	0.025	1406	109	27.90	28.60	3.18	5.03	0.024	0.078	1249	104
14	26.47	26.68	0.043	0.044	1292	91	27.61	27.99	4.31	4.91	0.004	0.014	641	101
15	26.67	26.98	0.076	0.031	1102	92	26.97	27.66	1.12	2.52	0.080	0.039	1098	104
16	26.11	26.04	0.032	0.008	1083	102	26.67	27.21	2.14	4.49	0.068	0.016	1147	97
17	27.45	27.57	0.049	0.019	775	99	26.47	26.89	-3.57	-2.47	0.029	0.033	1031	106
18	26.90	27.11	0.020	0.029	1447	101	27.04	27.80	0.52	2.55	0.048	0.008	1159	103
19	27.29	27.50	0.068	0.085	1282	102	26.52	26.44	-2.82	-3.85	0.015	0.079	938	106
20	27.27	27.65	0.026	0.036	1631	95	26.88	27.07	-1.43	-2.10	0.003	0.057	1264	93
21	26.73	26.90	0.732	0.081	1404	102	26.58	26.77	-0.56	-0.48	0.378	0.024	1408	96
22	27.26	27.11	0.000	0.062	1244	94	27.66	27.64	1.47	1.95	0.021	0.066	1238	99
23	27.14	27.62	0.087	0.219	1452	94	27.05	27.28	-0.33	-1.23	0.018	0.255	1363	99
24	26.10	26.34	0.002	0.141	1000	101	26.76	27.27	2.53	3.53	0.057	0.056	1196	104
25	26.68	27.09	0.032	0.025	1457	93	25.22	25.16	-5.47	-7.12	0.056	0.033	1184	100
26	26.72	27.05	0.033	0.042	1164	105	25.90	26.37	-3.07	-2.51	0.031	0.040	849	102
27	27.15	27.25	0.063	0.045	1633	103	27.25	27.72	0.37	1.72	0.015	0.085	1129	98
28	28.12	28.26	0.008	0.023	964	108	26.62	26.41	-5.33	-6.55	0.007	0.020	1533	109
29	28.34	28.41	0.007	0.018	1113	98	25.87	26.66	-8.72	-6.16	0.043	0.064	833	94
30	27.53	27.76	0.006	0.016	683	99	27.00	27.58	-1.93	-0.65	0.056	0.038	1283	95
31	27.23	27.35	0.054	0.033	1298	101	27.71	28.40	1.76	3.84	0.031	0.063	963	98
32	27.68	27.83	0.013	0.040	1083	92	27.45	27.53	-0.83	-1.08	0.061	0.025	1171	100
33	26.42	26.71	0.034	0.027	1676	99	27.31	27.70	3.37	3.71	0.018	0.008	1295	102
34	26.91	27.14	0.053	0.044	815	94	27.68	27.95	2.86	2.98	0.031	0.018	1287	99
35	26.77	27.07	0.024	0.051	1309	98	27.51	27.68	2.76	2.25	0.028	0.009	1307	95
36	28.29	28.53	0.043	0.047	1047	105	27.30	28.19	-3.50	-1.19	0.017	0.002	1264	97
37	27.98	28.38	0.026	0.016	1334	93	28.15	28.18	0.61	-0.70	0.045	0.052	1431	105
38	28.29	28.30	0.009	0.027	1292	99	27.22	26.76	-3.78	-5.44	0.029	0.075	1287	101
39	27.94	28.21	0.007	0.033	954	106	29.02	29.25	3.87	3.69	0.067	0.031	1461	96
40	28.07	28.21	0.042	0.071	1142	97	27.66	27.65	-1.46	-1.99	0.022	0.042	1319	88
41	28.37	28.61	0.011	0.070	1054	99	26.94	27.16	-5.04	-5.07	0.040	0.081	1223	97
42	28.15	28.22	0.051	0.056	1435	100	26.53	26.50	-5.75	-6.09	0.024	0.038	1038	98
43	27.13	27.23	0.008	0.008	1153	98	26.77	27.03	-1.33	-0.73	0.058	0.066	1227	101
44	27.45	27.74	0.046	0.014	1174	102	27.01	26.77	-1.60	-3.50	0.033	0.032	1165	90
45	27.79	27.99	0.050	0.002	1067	98	27.13	27.21	-2.37	-2.79	0.004	0.068	1090	102
46	27.65	27.91	0.002	0.013	793	90	27.87	27.60	0.80	-1.11	0.042	0.064	1155	96
47	28.09	28.35	0.014	0.009	1014	93	27.11	26.83	-3.49	-5.36	0.028	0.004	1446	104
48	27.73	28.02	0.056	0.066	1534	103	27.73	27.16	0.00	-3.07	0.059	0.071	1184	104
49	27.75	28.00	0.016	0.072	975	96	28.04	27.92	1.05	-0.29	0.020	0.012	1331	112
50	27.50	27.69	0.052	0.001	892	96	29.38	28.91	6.84	4.41	0.032	0.062	1595	106
51	26.81	26.98	0.039	0.026	1175	94	27.80	27.54	3.69	2.08	0.023	0.029	1079	96
52	26.65	27.00	0.012	0.011	1150	100	28.17	28.32	5.70	4.89	0.031	0.062	1561	104
Min	25.91	25.98	0.000	0.001	683	90	25.22	25.16	-8.72	-8.74	0.002	0.002	641	82
Max	29.55	29.70	0.732	0.219	1676	109	29.38	29.25	8.30	8.93	0.378	0.255	1595	112
Avg	27.52	27.71	0.053	0.042	1182	99	27.36	27.53	-0.49	-0.55	0.044	0.047	1194	100
STD	0.87	0.86	0.107	0.039	230	5	0.78	0.76	3.97	4.19	0.055	0.043	198	5
PpK														

Remarks	Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

7. PCT

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	PCT		
Products Name	R-Varistor	Tested Conditions	121±5°C, 100±5% RH, 2atm, 60hrs
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Hast Chamber
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 11 ~ 2005. 8. 13	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 8. 11						2005. 8. 13							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	27.16	27.46	0.034	0.044	1397	95	26.97	27.36	-0.70	-0.36	0.076	0.078	1261	98
2	26.86	27.37	0.039	0.069	1034	101	26.95	27.34	0.34	-0.11	0.002	0.043	1539	105
3	26.18	26.31	0.052	0.064	1506	100	26.82	27.23	2.44	3.50	0.042	0.074	1200	102
4	26.67	26.59	0.047	0.045	1076	95	26.77	27.04	0.37	1.69	0.037	0.037	1288	99
5	26.18	26.34	0.087	0.012	1586	98	26.72	26.73	2.06	1.48	0.081	0.016	1228	99
6	26.56	26.95	0.045	0.059	908	104	26.54	27.08	-0.08	0.48	0.033	0.025	1442	100
7	25.79	26.05	0.063	0.010	1173	98	26.95	27.20	4.50	4.41	0.054	0.014	1359	107
8	26.55	26.93	0.032	0.069	1096	96	26.31	26.12	-0.90	-3.01	0.004	0.063	1429	102
9	26.29	27.06	0.032	0.057	1213	97	26.50	27.04	0.80	-0.07	0.040	0.035	909	99
10	26.95	27.37	0.073	0.022	1240	96	26.88	27.05	-0.26	-1.17	0.006	0.009	1081	100
11	26.96	27.02	0.013	0.071	1017	96	26.68	27.17	-1.04	0.56	0.064	0.042	1252	93
12	27.52	27.75	0.027	0.057	1568	105	26.37	26.72	-4.18	-3.71	0.067	0.009	813	101
13	26.48	26.47	0.066	0.030	1462	98	28.72	28.96	8.46	9.41	0.074	0.007	1233	94
14	26.78	26.17	0.007	0.050	1015	107	28.37	28.70	5.94	9.67	0.038	0.032	1004	110
15	26.01	26.56	0.042	0.004	1173	109	28.39	28.58	9.15	7.61	0.044	0.059	1130	105
16	26.22	26.98	0.036	0.024	1005	113	28.51	28.90	8.73	7.12	0.061	0.050	1148	96
17	26.93	27.30	0.021	0.018	1346	108	27.46	27.58	1.97	1.03	0.061	0.014	1089	103
18	27.29	27.46	0.041	0.016	1220	110	27.45	27.99	0.59	1.93	0.149	0.097	1220	101
19	26.45	26.61	0.044	0.011	1079	103	27.31	27.74	3.25	4.25	0.162	0.030	1536	106
20	25.96	26.12	0.014	0.056	1511	102	26.95	27.37	3.81	4.79	0.128	0.123	1131	106
21	26.46	26.72	0.089	0.006	1418	110	28.63	28.76	8.20	7.63	0.022	0.083	1332	101
22	26.52	26.55	0.017	0.058	821	98	28.35	28.56	6.90	7.57	0.083	0.107	845	107
23	27.22	27.69	0.093	0.047	1188	104	28.19	28.25	3.56	2.02	0.152	0.137	1082	96
24	27.07	27.35	0.140	0.040	1302	99	28.41	28.72	4.95	5.01	0.193	0.276	863	102
25	28.14	28.38	0.005	0.074	1246	98	27.56	27.90	-2.06	-1.69	0.147	0.047	1231	105
26	28.56	28.60	0.058	0.018	1149	95	26.88	27.12	-5.88	-5.17	0.240	0.178	1375	101
27	27.71	27.79	0.025	0.127	1327	101	26.05	26.45	-5.99	-4.82	0.033	0.184	1178	98
28	28.49	28.69	0.079	0.044	1049	103	27.04	27.47	-5.09	-4.25	0.031	0.028	1407	108
29	27.26	27.92	0.035	0.062	889	92	27.83	27.94	2.09	0.07	0.126	0.181	1346	101
30	26.33	26.75	0.021	0.092	1335	96	27.06	27.66	2.77	3.40	0.077	0.130	1012	102
31	25.96	26.05	0.149	0.057	1095	98	28.02	28.35	7.94	8.83	0.187	0.140	1526	102
32	26.05	26.22	0.032	0.078	1216	99	27.67	27.91	6.22	6.45	0.164	0.109	1186	98
33	26.57	26.90	0.007	0.020	1209	100	27.23	27.82	2.48	3.42	0.083	0.020	1091	107
34	27.29	27.58	0.021	0.006	1317	105	26.18	26.60	-4.07	-3.55	0.008	0.005	1170	102
35	27.02	27.47	0.051	0.052	1146	97	26.95	27.16	-0.26	-1.13	0.006	0.030	1274	88
36	26.55	26.84	0.005	0.017	1294	99	26.87	27.21	1.21	1.38	0.039	0.023	741	109
37	26.39	26.56	0.043	0.031	1435	94	26.29	27.38	-0.38	3.09	0.070	0.008	1246	103
38	26.01	26.19	0.062	0.005	1161	92	26.78	27.38	2.96	4.54	0.038	0.017	1092	93
39	26.37	26.48	0.014	0.064	1181	97	26.99	27.17	2.35	2.61	0.021	0.033	1748	103
40	27.07	27.24	0.060	0.026	911	92	27.40	27.81	1.22	2.09	0.001	0.018	1464	95
Min	25.79	26.05	0.005	0.004	821	92	26.05	26.12	-5.99	-5.17	0.001	0.005	741	88
Max	28.56	28.69	0.149	0.127	1586	113	28.72	28.96	9.15	9.67	0.240	0.276	1748	110
Avg	26.77	27.02	0.046	0.043	1208	100	27.25	27.59	1.86	2.17	0.074	0.065	1212	101
STD	0.66	0.69	0.033	0.028	190	5	0.74	0.71	3.97	4.00	0.060	0.062	215	5
PpK														

Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

8. Humidity Test

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Humidity test		
Products Name	R-Varistor	Tested Conditions	60±5°C, 90±5% RH, 1000hrs
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Temp & Humidity Chamber
Lot No.	W217CP04G23DB		
Tested Period	2005. 6. 25 ~ 2005. 8. 16	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 6. 25 (t=0)						2005. 8. 16 (t=1000hrs)							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	26.59	26.70	0.107	0.505	883	101	27.28	27.69	2.59	3.71	0.178	0.491	1111	97
2	26.32	26.73	0.045	0.014	1008	106	28.43	28.77	8.02	7.63	0.063	0.068	994	98
3	26.97	27.11	0.094	0.005	1251	99	27.65	28.04	2.52	3.43	0.101	0.054	1298	103
4	27.09	27.63	0.064	0.007	839	104	28.18	28.64	4.02	3.66	0.024	0.031	961	99
5	27.75	28.55	0.086	0.069	965	107	27.31	27.52	-1.59	-3.61	0.118	0.014	738	102
6	27.32	27.81	0.053	0.029	1231	103	26.03	26.28	-4.72	-5.50	0.064	0.045	1430	97
7	27.66	28.44	0.069	0.028	965	93	26.28	27.00	-4.99	-5.06	0.061	0.064	1432	92
8	28.70	29.19	0.025	0.057	1180	107	26.69	27.25	-7.00	-6.65	0.022	0.021	1173	92
9	25.11	25.90	0.013	0.054	1450	97	26.15	26.49	4.14	2.28	0.048	0.067	756	102
10	25.72	26.14	0.094	0.175	1005	104	25.66	25.71	-0.23	-1.64	0.171	0.212	1263	92
11	25.95	26.77	0.005	0.025	1165	108	26.11	26.26	0.62	-1.91	0.026	0.086	1270	94
12	27.53	27.65	0.194	0.037	1222	97	26.34	26.68	-4.32	-3.51	0.267	0.018	1605	91
13	27.75	27.86	0.032	0.093	1210	104	27.19	27.65	-2.02	-0.75	0.012	0.010	1209	100
14	27.44	27.63	0.047	0.047	938	100	27.73	28.10	1.06	1.70	0.025	0.006	1414	102
15	27.80	28.10	0.063	0.026	1056	106	26.41	26.62	-5.00	-5.27	0.051	0.080	1557	93
16	28.51	28.97	0.030	0.037	1041	99	27.46	27.73	-3.68	-4.28	0.081	0.105	940	105
17	27.23	27.32	0.034	0.041	977	105	28.66	29.33	5.25	7.36	0.007	0.050	776	100
18	26.57	26.81	0.021	0.023	1237	98	28.26	28.91	6.36	7.83	0.062	0.069	1449	96
19	26.58	26.78	0.052	0.043	1261	101	28.31	28.88	6.51	7.84	0.019	0.036	1429	96
20	26.37	26.63	0.049	0.028	1066	102	28.30	28.52	7.32	7.10	0.012	0.063	1189	104
21	26.12	26.92	0.002	0.060	1398	102	27.55	27.84	5.47	3.42	0.066	0.020	1344	102
22	25.42	26.16	0.012	0.016	1012	92	27.31	27.45	7.44	4.93	0.024	0.015	1240	100
23	26.02	26.55	0.014	0.020	1239	108	27.21	27.57	4.57	3.84	0.043	0.062	1418	99
24	26.60	26.92	0.018	0.025	1406	98	26.55	26.97	-0.19	0.19	0.017	0.066	1148	97
25	26.54	27.08	0.026	0.067	1285	104	26.93	26.72	1.47	-1.33	0.066	0.028	1409	101
26	26.65	26.74	0.007	0.005	1152	108	25.99	26.16	-2.48	-2.17	0.026	0.073	1179	103
27	26.60	26.87	0.020	0.024	1066	89	26.56	26.57	-0.15	-1.12	0.044	0.073	1181	99
28	27.13	27.30	0.055	0.021	1800	107	26.89	27.03	-0.88	-0.99	0.030	0.082	932	91
29	26.22	26.74	0.026	0.024	1045	98	26.94	27.00	2.75	0.97	0.066	0.022	1342	103
30	26.28	26.78	0.052	0.026	1452	102	26.47	26.45	0.72	-1.23	0.054	0.034	1277	107
31	25.45	26.60	0.058	0.036	1572	93	26.87	27.24	5.58	2.41	0.098	0.069	1417	96
32	26.98	27.27	0.004	0.058	1170	103	26.79	26.98	-0.70	-1.06	0.041	0.006	942	98
33	26.91	27.76	0.025	0.004	914	99	28.16	28.38	4.65	2.23	0.028	0.029	1197	102
34	26.54	26.97	0.029	0.141	1519	105	26.50	26.71	-0.15	-0.96	0.080	0.137	1286	101
35	25.77	26.89	0.007	0.083	1352	105	27.37	27.66	6.21	2.86	0.033	0.037	1433	103
36	26.08	27.52	0.055	0.127	1182	101	27.08	27.37	3.83	-0.55	0.077	0.066	1256	106
37	29.00	29.48	0.021	0.038	1163	92	27.35	27.72	-5.69	-5.97	0.081	0.039	1245	99
38	28.82	29.34	0.143	0.008	962	101	26.85	27.27	-6.84	-7.06	0.135	0.080	1339	91
39	27.50	27.86	0.082	0.069	1297	96	27.05	27.50	-1.64	-1.29	0.081	0.009	1265	99
40	29.03	29.61	0.018	0.065	1278	98	26.51	26.79	-8.68	-9.52	0.027	0.035	932	98
41	27.14	27.57	0.061	0.011	1212	103	27.34	27.53	0.74	-0.15	0.033	0.019	1096	99
42	26.69	27.13	0.023	0.029	1066	95	27.08	27.46	1.46	1.22	0.026	0.041	1004	98
43	26.75	26.92	0.048	0.037	1309	105	27.64	27.94	3.33	3.79	0.017	0.050	1012	92
44	26.71	27.01	0.054	0.010	1350	90	27.40	27.70	2.58	2.55	0.007	0.020	1175	98
45	26.73	26.73	0.027	0.012	1154	101	27.34	27.75	2.28	3.82	0.047	0.034	1592	105
46	26.16	26.33	0.008	0.004	1456	92	27.86	28.15	6.50	6.91	0.002	0.020	1007	99
47	26.92	27.33	0.070	0.015	1029	107	27.86	28.26	3.49	3.40	0.033	0.038	1049	99
48	25.99	26.31	0.537	0.479	1713	106	27.64	27.96	6.35	6.27	0.250	0.474	1483	101
49	27.28	27.09	0.030	0.006	1384	104	29.01	28.99	6.34	7.01	0.037	0.038	1383	99
50	26.82	26.24	0.033	0.020	994	97	28.19	28.76	5.11	9.60	0.034	0.039	1218	95
51	26.70	26.96	0.001	0.020	936	99	28.69	28.79	7.45	6.79	0.021	0.071	1028	98
52	26.94	27.11	0.061	0.053	954	103	27.88	27.84	3.49	2.69	0.046	0.026	1252	100
Min	25.11	25.90	0.001	0.004	839	89	25.66	25.71	-8.68	-9.52	0.002	0.006	738	91
Max	29.03	29.61	0.537	0.505	1800	108	29.01	29.33	8.02	9.60	0.267	0.491	1605	107
Avg	26.87	27.28	0.054	0.057	1188	101	27.26	27.55	1.52	1.07	0.059	0.066	1213	99
STD	0.88	0.87	0.077	0.095	212	5	0.78	0.84	4.33	4.52	0.055	0.091	211	4
PpK														

Remarks	Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

9. Solderability

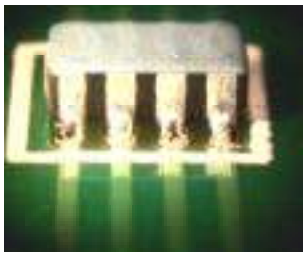
Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Reflow		
Products Name	R-Varistor	Tested Conditions	260±5°C, 10±0.5s
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Reflow Sodering Machine
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 19	Tested by	QA Dept. Han Ga Na

1	95%up	
2	95%up	
3	95%up	
4	95%up	
5	95%up	
6	95%up	
7	95%up	
8	95%up	
9	95%up	
10	95%up	
11	95%up	
12	95%up	
13	95%up	
14	95%up	
15	95%up	
16	95%up	
17	95%up	
18	95%up	
19	95%up	
20	95%up	

Shape



Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

10. Resistance to soldering heat

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Resistance to soldering heat		
Products Name	R-Varistor	Tested Conditions	260±5°C, 10±0.5s
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Solder barh
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 19	Tested by	QA Dept. Han Ga Na

Date	Initial						Final							
	2005. 8. 19						2005. 8. 19							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	26.79	27.66	0.031	0.038	1106	104	28.55	28.52	6.57	3.11	0.063	0.048	1568	89
2	25.49	26.36	0.040	0.016	842	103	27.45	27.83	7.69	5.58	0.023	0.027	1010	98
3	25.40	25.63	0.002	0.035	1320	97	27.42	27.42	7.95	6.98	0.068	0.066	1072	96
4	26.52	26.68	0.032	0.033	1332	105	27.44	27.30	3.47	2.32	0.012	0.041	1107	102
5	27.33	27.41	0.005	0.014	1226	103	25.61	26.16	-6.29	-4.56	0.004	0.070	918	104
6	27.40	27.51	0.002	0.007	1320	97	25.79	25.81	-5.88	-6.18	0.085	0.026	1165	103
7	27.05	27.49	0.018	0.010	1074	108	26.14	25.50	-3.36	-7.24	0.012	0.055	1708	96
8	27.10	27.73	0.045	0.045	1337	101	26.62	25.86	-1.77	-6.74	0.049	0.022	1084	104
9	25.60	26.43	0.001	0.013	1195	101	27.02	26.55	5.55	0.45	0.033	0.031	803	101
10	25.97	26.22	0.000	0.006	906	101	27.66	27.44	6.51	4.65	0.040	0.018	1317	101
11	26.60	27.12	0.018	0.009	1138	102	26.90	26.96	1.13	-0.59	0.001	0.034	1023	97
12	27.09	28.06	0.049	0.002	1311	99	27.86	26.63	2.84	-5.10	0.069	0.053	1304	102
13	28.26	27.95	0.018	0.017	1205	99	27.67	26.90	-2.09	-3.76	0.009	0.007	1312	101
14	27.15	27.91	0.018	0.042	1470	103	26.30	26.64	-3.13	-4.55	0.050	0.037	1467	104
15	25.79	27.07	0.019	0.013	983	87	26.99	26.45	4.65	-2.29	0.035	0.042	1473	94
16	26.77	28.37	0.030	0.014	1235	101	27.54	27.63	2.88	-2.61	0.048	0.015	1083	101
17	27.71	28.21	0.016	0.055	1089	94	28.19	28.42	1.73	0.74	0.017	0.019	1104	102
18	26.87	27.57	0.004	0.003	1301	102	28.33	27.22	5.43	-1.27	0.078	0.025	1129	95
19	25.55	26.59	0.009	0.016	1583	106	26.90	26.81	5.28	0.83	0.020	0.000	975	105
20	26.68	27.59	0.019	0.001	1372	98	28.38	27.88	6.37	1.05	0.065	0.009	919	102
21	28.89	28.96	0.040	0.041	1069	104	28.14	28.47	-2.60	-1.69	0.039	0.062	933	89
22	26.85	27.50	0.033	0.036	1055	94	27.79	26.82	3.50	-2.47	0.016	0.057	1037	98
23	28.37	28.98	0.030	0.044	858	98	27.62	27.60	-2.64	-4.76	0.030	0.049	1443	100
24	28.42	28.53	0.003	0.078	1399	103	28.47	28.09	0.18	-1.54	0.022	0.112	874	104
25	27.32	28.50	0.030	0.021	1318	98	27.23	27.42	-0.33	-3.79	0.034	0.029	1253	96
26	28.29	28.80	0.007	0.033	1262	101	27.16	26.99	-3.99	-6.28	0.001	0.065	1287	103
27	28.12	28.88	0.027	0.039	1204	96	27.04	27.87	-3.84	-3.50	0.036	0.008	1020	103
28	29.43	29.95	0.021	0.017	1044	97	27.94	28.21	-5.06	-5.81	0.055	0.022	1142	98
29	27.22	27.85	0.032	0.403	1175	97	27.31	27.50	0.33	-1.26	0.054	0.038	1203	99
30	25.49	26.61	0.032	0.014	1095	105	26.98	27.22	5.85	2.29	0.020	0.027	1056	95
31	26.03	26.70	0.000	0.039	1306	97	26.36	26.74	1.27	0.15	0.046	0.022	1460	103
32	25.36	26.17	0.019	0.014	1587	99	27.19	27.23	7.22	4.05	0.001	0.025	1287	92
33	27.99	27.56	0.017	0.032	1336	96	30.01	29.71	7.22	7.80	0.019	0.018	1031	107
34	28.81	28.08	0.020	0.020	1318	101	29.78	29.83	3.37	6.23	0.007	0.051	1351	102
35	27.75	28.24	0.038	0.008	937	101	29.72	28.92	7.10	2.41	0.032	0.102	1041	103
36	27.82	28.15	0.044	0.063	1115	100	28.61	27.94	2.84	-0.75	0.011	0.022	1407	99
37	26.51	26.61	0.018	0.049	1322	99	28.32	28.00	6.83	5.22	0.030	0.012	1047	84
38	26.02	27.23	0.040	0.038	1392	110	28.28	28.42	8.69	4.37	0.017	0.032	1329	94
39	26.95	27.67	0.005	0.049	1383	104	27.52	27.38	2.12	-1.05	0.031	0.011	1270	93
40	27.90	28.75	0.005	0.051	1175	102	28.36	28.61	1.65	-0.49	0.020	0.053	1217	89
Min	25.36	25.63	0.000	0.001	842	87	25.61	25.50	-6.29	-7.24	0.001	0.000	803	84
Max	29.43	29.95	0.049	0.403	1587	110	30.01	29.83	8.69	7.80	0.085	0.112	1708	107
Avg	27.07	27.63	0.021	0.037	1217	100	27.61	27.47	2.13	-0.50	0.033	0.037	1181	99
STD	1.06	0.93	0.014	0.062	178	4	0.99	0.97	4.34	4.09	0.022	0.024	205	5
PpK														

Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

11. Bending Strength

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Bending strength						Tested Conditions	Warp:2mm, Speed:0.5mm/s, 10s						
Products Name	R-Varistor						Tested Equipment & Instrument	INSTRON						
Model No.	AVRC 18S 05Q 015 100R													
Lot No.	W217CP04G23DB													
Tested Period	2005. 8. 12						Tested by	QA Dept. Han Ga Na						
Date	Initial						Final							
	2005. 8. 12						2005. 8. 12							
Item	P-Vn(V)	N-Vn(V)	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC	P-Vn(V)	N-Vn(V)	△PVn	△N-Vn	P-IL(μA)	N-IL(μA)	IR(MΩ)	RDC
SPEC	24~36	24~36	20↓	20↓	10↑	70-130	24~36	24~36	10%↓	10%↓	20↓	20↓	10↑	70-130
1	27.53	27.60	0.008	0.024	1106	105	25.96	26.03	-5.70	-5.69	0.002	0.006	1076	100
2	27.01	27.25	0.003	0.040	1065	99	26.84	27.07	-0.63	-0.66	0.020	0.051	995	103
3	26.95	27.01	1.044	0.022	1001	97	26.26	26.57	-2.56	-1.63	1.264	0.004	979	96
4	27.26	27.28	0.034	0.008	987	103	26.99	27.27	-0.99	-0.04	0.044	0.018	1083	108
5	27.52	27.71	0.008	0.033	1480	93	27.69	28.06	0.62	1.26	0.016	0.019	1193	108
6	27.60	27.89	0.008	0.047	1375	93	26.92	26.93	-2.46	-3.44	0.006	0.035	1395	98
7	27.41	27.80	0.002	0.029	932	99	27.25	27.63	-0.58	-0.61	0.024	0.041	1473	108
8	28.18	28.59	0.026	0.009	1208	92	27.21	27.51	-3.44	-3.78	0.033	0.014	901	104
9	27.93	28.22	0.018	0.032	1469	95	26.98	27.39	-3.40	-2.94	0.010	0.040	1332	102
10	27.26	27.45	0.033	0.008	1184	100	27.19	27.52	-0.26	0.26	0.017	0.015	1108	99
11	27.72	27.93	0.024	0.047	1202	87	27.05	27.27	-2.42	-2.36	0.026	0.015	1069	101
12	26.41	26.87	0.045	0.018	1442	100	26.71	26.77	1.14	-0.37	0.034	0.018	1056	113
13	27.00	27.26	0.108	0.126	1253	100	29.19	29.44	8.11	8.00	0.089	0.187	1063	100
14	26.95	27.31	0.034	0.020	1403	105	27.90	28.12	3.53	2.97	0.042	0.006	1245	94
15	26.52	26.57	0.020	0.014	1425	90	28.78	29.01	8.52	9.18	0.015	0.007	1445	98
16	28.36	28.72	0.009	0.023	1132	98	28.60	28.45	0.85	-0.94	0.041	0.035	1052	102
17	28.21	28.49	0.053	0.014	1096	93	26.90	27.33	-4.64	-4.07	0.012	0.028	849	96
18	26.90	27.20	0.044	0.011	1007	102	27.13	27.71	0.86	1.88	0.025	0.001	1131	91
19	28.36	28.65	0.013	0.016	988	101	26.77	27.02	-5.61	-5.69	0.019	0.028	952	99
20	26.16	26.08	0.007	0.020	877	103	27.08	27.35	3.52	4.87	0.055	0.028	936	101
21	26.27	26.72	0.032	0.041	1350	96	27.48	27.62	4.61	3.37	0.020	0.050	1506	100
22	26.48	26.45	0.061	0.043	1379	97	26.16	26.44	-1.21	-0.04	0.020	0.007	986	102
23	26.77	27.05	0.013	0.022	764	97	26.78	27.05	0.04	0.00	0.020	0.023	1208	103
24	26.93	27.16	0.032	0.010	1452	97	27.17	27.48	0.89	1.18	0.019	0.035	972	102
25	26.93	27.12	0.000	0.007	1644	104	27.20	27.28	1.00	0.59	0.048	0.052	1522	103
26	26.62	26.74	0.036	0.001	1283	104	26.68	26.88	0.23	0.52	0.011	0.050	891	106
27	27.19	27.47	0.012	0.023	906	108	26.18	26.25	-3.71	-4.44	0.019	0.013	1120	91
28	27.40	27.70	0.027	0.015	1082	94	26.47	27.11	-3.39	-2.13	0.044	0.041	1359	95
29	27.02	27.35	0.014	0.023	1366	108	26.42	26.82	-2.22	-1.94	0.043	0.029	1316	99
30	26.56	27.06	0.031	0.019	1132	105	27.03	27.32	1.77	0.96	0.004	0.005	963	94
31	27.19	27.59	0.009	0.008	1038	101	26.80	27.27	-1.43	-1.16	0.021	0.009	870	90
32	27.12	27.32	0.006	0.009	1549	102	26.36	26.68	-2.80	-2.34	0.008	0.015	1323	105
33	25.90	26.26	0.009	0.039	919	101	27.27	27.74	5.29	5.64	0.041	0.016	1251	98
34	26.40	26.69	0.003	0.045	1276	110	27.12	27.35	2.73	2.47	0.045	0.053	1095	93
35	26.17	25.96	0.012	0.131	1319	104	26.77	27.25	2.29	4.97	0.059	0.192	1227	101
36	26.52	26.53	0.090	0.006	977	102	27.26	27.63	2.79	4.15	0.051	0.010	1329	101
37	26.31	26.90	0.027	0.010	1196	99	27.62	27.85	4.98	3.53	0.025	0.048	1649	92
38	26.69	27.20	0.172	0.036	1435	93	27.63	27.85	3.52	2.39	0.138	0.054	1222	95
39	26.34	26.63	0.046	0.122	946	102	27.71	28.07	5.20	5.41	0.073	0.093	1560	100
40	26.30	26.16	0.002	0.012	1011	97	28.12	28.33	6.92	8.30	0.041	0.018	1623	103
Min	25.90	25.96	0.000	0.001	764	87	25.96	26.03	-5.70	-5.69	0.002	0.001	849	90
Max	28.36	28.72	1.044	0.131	1644	110	29.19	29.44	8.52	9.18	1.264	0.192	1649	113
Avg	27.01	27.25	0.054	0.030	1191	99	27.14	27.42	0.55	0.69	0.064	0.035	1183	100
STD	0.64	0.69	0.164	0.031	216	5	0.69	0.68	3.62	3.71	0.196	0.041	220	5
PpK														
Remarks														

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

12. Adhesive Strength

Reliability Test Data Sheet

결재	작성	검토	승인
	/	/	/

Test Item	Adhesive strength		
Products Name	R-Varistor	Tested Conditions	Strength>1.6kgf
Model No.	AVRC 18S 05Q 015 100R	Tested Equipment & Instrument	Adhesive strength Gage
Lot No.	W217CP04G23DB		
Tested Period	2005. 8. 10	Tested by	QA Dept. Han Ga Na

Item	[Kgf]
SPEC	1.6↑
1	3.15
2	2.57
3	2.86
4	2.55
5	2.32
6	2.92
7	3.35
8	3.41
9	3.21
10	3.44
Min	2.32
Max	3.44
Avg	2.98
STD	0.40
PpK	

Remarks

Judgements

AMT-D-041(A4) ㈜ AMOTECH AMECS 2004-08-17(REV.0)

B. Hazardous Substances Inspection Report

SGS Testing Korea Co., Ltd.

#18-34, Sanbon-dong, Gunpo-city, Kyunggi-do, Korea 435-040
Tel : 031) 428-5765~8, Fax: 031) 427-2374, InterNet>http://www.sgslab.co.kr

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AMOTECH
617, Namchon-dong, Namdong-gu,
Incheon, Korea

The following merchandise was submitted and identified by the client as : -

Type of Product	:	Chip Varistor
SGS File No.	:	G-49/2005-1486/3
Materials	:	Ceramic
Style / Item No.	:	R-C Type EMI-ESD Filter
Sample Receiving Date	:	Apr. 07, 2005
Test Performing Date	:	Apr. 08, 2005
Test Performed	:	SGS Testing Korea tested the sample which was selected by applicant with following result.
Test Results	:	For further details, please refer to following page.

SGS Testing Korea Co., Ltd.

Jae S. Han

KHJ/hjp

Jason Han / Director

SGS Testing Korea Co., Ltd.
#18-34, Sanbon-dong, Gunpo-city, Kyunggi-do, Korea 435-040
Tel : 031) 428-5765~6, Fax: 031) 427-2374, InterNet>http://www.sgslab.co.kr

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Heavy Metal

Test Items	Unit	Test Method	MDL	Results
Cadmium (Cd)	mg/kg	USEPA 3050B, ICP-AES	0.5	n. d.
Lead (Pb)	mg/kg	USEPA 3050B, ICP-AES	5	40
Mercury (Hg)	mg/kg	USEPA 3052, ICP-AES	2	n. d.
Hexavalent Chromium (Cr VI)	mg/kg	USEPA 3060A, UV-vis	1	n. d.

Flame Retardants

Test Items	Unit	Test Method	MDL	Results
Polybrominated Biphenyls (PBBs)	-	-	-	-
Bromobiphenyl	mg/kg	With reference to USEPA 3540C. Analysis was performed by GC/MS..	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.
Decabromobiphenyl	mg/kg		5	n. d.
Polybrominated Diphenyl Ethers (PBDEs)	-	-	-	-
Bromodiphenyl ether	mg/kg	With reference to USEPA 3540C. Analysis was performed by GC/MS.	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.

Note : n. d. = Not detected
MDL = Method Detection Limit

********** End **********