



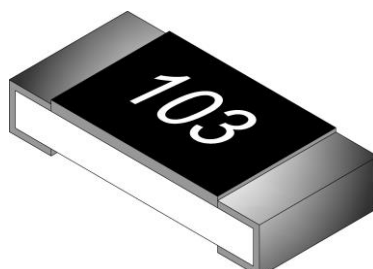
ST Series Anti Sulfur Chip Resistor Product Specifications

Document No. S-10-12-14-15

Released Date 2025/04/17

Page No. 1/9

■ Anti-Sulfur Chip Resistor — ST Series



■ Application

- Industrial Control, System Sensor, Netcom Station
- Navigation Equipment
- Measuring Instrument
- Telecommunication Equipment, Railway Semaphore System

■ Features

- Small Size and Light Weight
- Reliability, High Quality
- Excellent Resistance to Vulcanization (ASTM-B-809-95 & ANSI/EIA-977 Specification)

■ Parts Number Explanation

Example:

ST	0603	J	10R0	P	05	Z
Product Type	Size (Inch)	Resistor Tolerance	Resistor Value	Package	Quantity	Optional
ST	0201 0402 0603 0805 1206 1210 1812 2010 2512	D : $\pm 0.5\%$ F : $\pm 1\%$ J : $\pm 5\%$	0R=0R00 1R=1R00 10R=10R0 100R=100R 1K=1K00 1M=1M00	P : Paper Taping (0603~1210) Q : Paper Taping (0201, 0402) E : Embossed Taping	04 : 4000PCS 05 : 5000PCS 10 : 10000PCS 20 : 20000PCS 40 : 40000PCS 50 : 50000PCS	Z : 60°C A : 105°C (With AEC-Q200 compatible)



ST Series Anti Sulfur Chip Resistor Product Specifications

Document No. S-10-12-14-15

Released Date 2025/04/17

Page No. 2/9

■ Standard Electrical Specification

Type \ Item	Rated Power at 70°C	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/°C)	Resistance Range		
	Standard				D(±0.5%)	F(±1%)	J(±5%)
ST0201	0.05W	25V	50V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST0402	0.063 W	50V	100V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST0603	0.1 W	75V	150V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST0805	0.125 W	150V	300V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST1206	0.25 W	200V	400V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST1210	0.5 W	200V	400V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST1812	0.75 W	200V	400V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST2010	0.75 W	200V	400V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
ST2512	1 W	200V	400V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range : -55°C ~ +155°C.

Type	0201	0402	0603	0805	1206	1210	1812	2010	2512
Jumper Resistance Value	50mΩ Max								
Jumper Rated Current	0.5A	1A		2A					
Max.Over Load Current <1 second and 1 times	1A	3A		10A					



ST Series Anti Sulfur Chip Resistor Product Specifications

Document No. S-10-12-14-15

Released Date 2025/04/17

Page No. 3/9

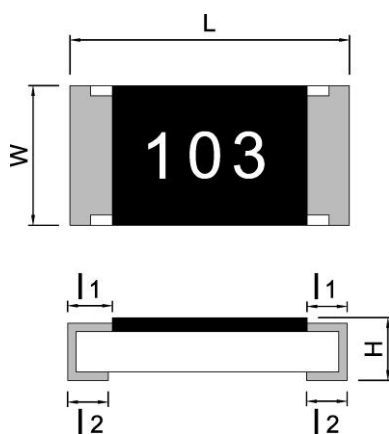
● High Ohm Chip Resistor

■ Standard Electrical Specifications

Item Type	Rated Power at 70°C	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/°C)	Resistance Range	
					F(±1%)	J(±5%)
ST0402	0.063 W	50V	100V	±200	10.1 MΩ	10.1 MΩ
ST0603	0.1 W	75V	150V			
ST0805	0.125 W	150V	300V			
ST1206	0.25 W	200V	400V		~	~
ST1210	0.5 W				30 MΩ	30 MΩ
ST2010	0.75 W					
ST2512	1 W					

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range : -55°C ~ +155°C.

■ Type Dimension



Type	L	W	H	l ₁	l ₂
ST0201	0.60 ± 0.03	0.30 ± 0.03	0.23 ± 0.05	0.15 ± 0.05	0.15 ± 0.05
ST0402	1.00 ± 0.05	0.50 ± 0.05	0.30 ± 0.05	0.15 ± 0.10	0.20 ± 0.10
ST0603	1.60 ± 0.10	0.80 ± 0.10	0.40 ± 0.10	0.30 ± 0.20	0.30 ± 0.10
ST0805	2.00 ± 0.10	1.25 ± 0.10	0.50 ± 0.15	0.30 ± 0.15	0.40 ± 0.15
ST1206	3.05 ± 0.10	1.60 ± 0.10	0.55 ± 0.15	0.40 ± 0.20	0.50 ± 0.20
ST1210	3.05 ± 0.10	2.50 ± 0.15	0.55 ± 0.15	0.50 ± 0.20	0.50 ± 0.20
ST1812	4.50 ± 0.10	3.10 ± 0.15	0.55 ± 0.05	0.55 ± 0.20	0.70 ± 0.20
ST2010	5.00 ± 0.20	2.50 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20
ST2512	6.30 ± 0.20	3.20 ± 0.15	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20



ST Series Anti Sulfur Chip Resistor Product Specifications

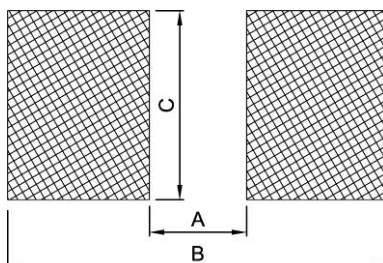
Document No. S-10-12-14-15

Released Date 2025/04/17

Page No. 4/9

● General Information

■ Recommend Land Pattern Design



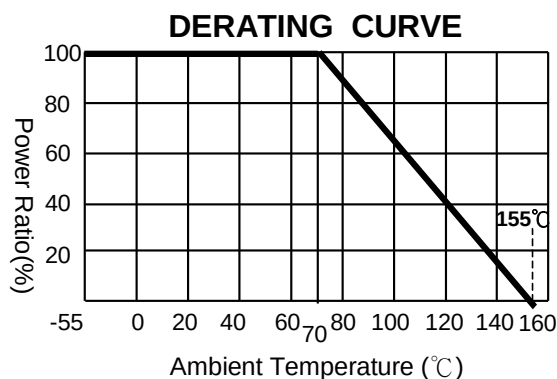
■ Dimension

Unit: mm

Item \ Type	0201	0402	0603	0805	1206	1210	1812	2010	2512
A	0.25	0.60	0.80	1.30	2.20	2.00	3.11	3.80	4.90
B	0.85	1.60	2.40	2.90	4.20	4.40	5.91	6.60	8.10
C	0.35	0.70	1.00	1.40	1.70	2.70	3.00	2.70	3.40

■ Performance Characteristics

■ Power Derating Curve



Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70°C.

For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.

■ Voltage Rating or Current Rating

Resistance Range: $\geq 1\Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E(RCWV) = \sqrt{P \times R}$$

E=Rated voltage(V)

P=Power rating(W)

R=Nominal resistance(Ω)



ST Series Anti Sulfur Chip Resistor Product Specifications

Document No.	S-10-12-14-15
Released Date	2025/04/17
Page No.	5/9

● Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS-C-5201-1 4.8 IEC-60115-1 4.8	At 25°C / -55°C and 25°C / +155°C, 25°C is the reference temperature	As Spec
Short Time Overload	JIS-C-5201-1 4.13 IEC-60115-1 4.13	2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds. Jumper: Over Load Current for 5 seconds 0201=1A 0402/0603=2.5A 0805/1206/1210/1812/2010/2512=5A	1% and below : $\pm(1.0\%+0.05\Omega)$ 2%、5% : $\pm(2.0\%+0.10\Omega)$ Jumper : Max 0.05 Ω after test
Leaching	JIS-C-5201-1 4.18 IEC-60068-2-58 8.2.1	260 $\pm$ 5°C for 30 seconds.	Individual leaching area $\leq$ 5% Total leaching area $\leq$ 10%
Resistance to Soldering Heat	JIS-C-5201-1 4.18 IEC-60115-1 4.18	260 $\pm$ 5°C for 10 seconds.	1% and below : $\pm(0.5\%+0.05\Omega)$ 2%、5% : $\pm(1.0\%+0.05\Omega)$
Rapid Change of Temperature	JIS-C-5201-1 4.19 IEC-60115-1 4.19	-55°C to +155°C, 5 cycles	1% and below : $\pm(0.5\%+0.05\Omega)$ 2%、5% : $\pm(1.0\%+0.10\Omega)$
Resistance to Solvent	JIS-C-5201-1 4.29	The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secs. Then the resistor is left in the room for 48 hrs.	1% and below : $\pm(0.5\%+0.05\Omega)$ 2%、5% : $\pm(0.5\%+0.05\Omega)$ Jumper : Max 0.05 Ω after test
Damp Heat with Load	JIS-C-5201-1 4.24 IEC-60115-1 4.24	40 $\pm$ 2°C, 90~95% R.H. RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" .	1% and below : $\pm(1.0\%+0.05\Omega)$ 2%、5% : $\pm(2.0\%+0.05\Omega)$ Value <1 Ω : $\pm(2.0\%+0.05\Omega)$ Jumper : Max 0.1 Ω after test
Load Life (Endurance)	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1	70 $\pm$ 2°C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF" .	1% and below : $\pm(1.0\%+0.05\Omega)$ 2%、5% : $\pm(3.0\%+0.10\Omega)$ Value <1 Ω : $\pm(3.0\%+0.10\Omega)$ Jumper : Max 0.1 Ω after test
Insulation Resistance	JIS-C-5201-1 4.6 IEC-60115-1 4.6	Apply 100VDC for 1 minute.	$\geq$ 10G Ω
Bending Strength	JIS-C-5201-1 4.33 IEC-60115-1 4.33	Bending once for 5 seconds D : 0201、0402、0603、0805=5mm 1206、1210、1812=3mm 2010、2512=2mm	1% and below : $\pm(1.0\%+0.05\Omega)$ 2%、5% : $\pm(1.0\%+0.05\Omega)$
Sulfur Test	ASTM-B-809-95 ANSI/EIA-977	60 $\pm$ 2°C, no rating power for 1000 hrs	ΔR : $\pm(1.0\%+0.05\Omega)$
		105 $\pm$ 2°C, no rating power for 1000 hrs	ΔR : $\pm(2.0\%+0.05\Omega)$

● Reliability Test and Requirement For Parts Number ST..A

Test Item	Test Method	Procedure	Requirements
Biased Humidity	MIL-STD-202 Method 103	1,000 hours; 85°C / 85% RH, 10% of operating power. Measurement at 24 $\pm$ 4 hours after test conclusion.	1 Ω $\leq$ R $\leq$ 10M : $\pm(3.0\%+0.05\Omega)$ 1M Ω $\leq$ R $\leq$ 10M : $\pm(5.0\%+0.05\Omega)$ Jumper : Max 0.1 Ω after test

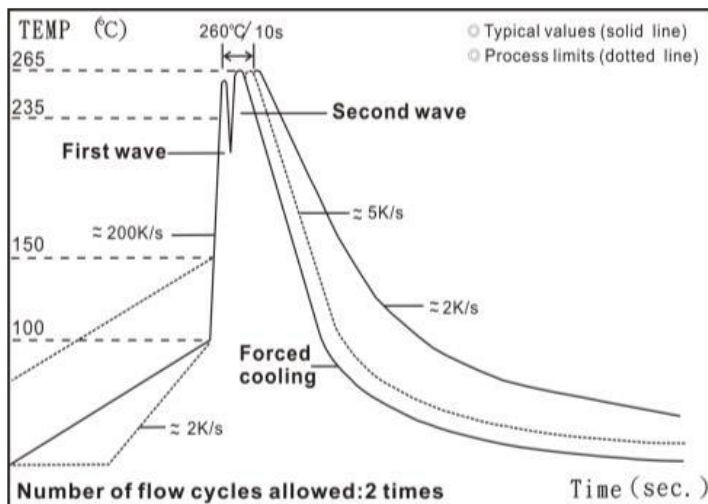


ST Series Anti Sulfur Chip Resistor Product Specifications

Document No.	S-10-12-14-15
Released Date	2025/04/17
Page No.	6/9

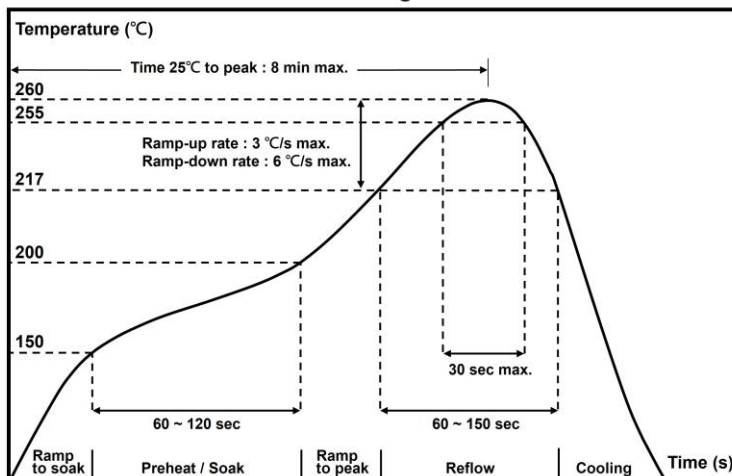
■ Recommended Customer Soldering Parameters

■ Wave solder Temperature condition



■ Solder reflow Temperature condition

Reflow Soldering Profile



■ Rework temperature (hot air equipment) : 350°C, 3~5seconds

■ Recommended reflow methods

IR, vapor phase oven, hot air oven

If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements



ST Series Anti Sulfur Chip Resistor Product Specifications

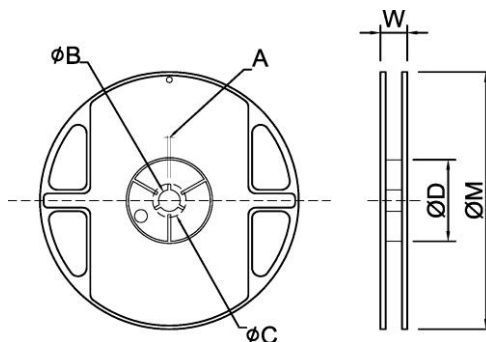
Document No. S-10-12-14-15

Released Date 2025/04/17

Page No. 7/9

■ Appendix For SMD Chip Resistor

● Packaging Information

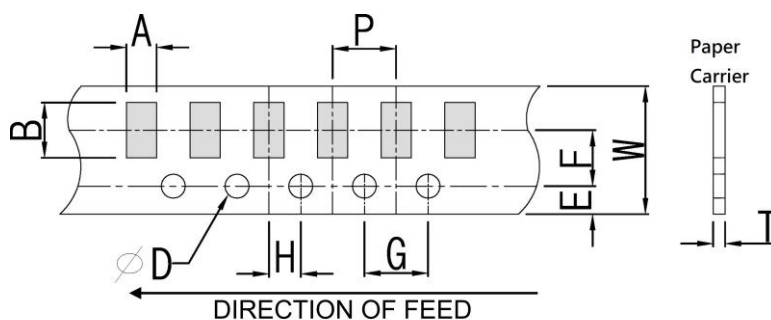


■ Dimension

Unit: mm

Type	Size		A	ΦB	ΦC	ΦD	W	ΦM
0201 0402	7"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
0402	13"	40K/50K Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	330±2.0
0603/0805 1206/1210	7"	5K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
0603/0805/1206	10"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	254±2.0
	13"	20K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	330±2.0
1812 2010/2512	7"	4K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	16.0±2.0	178±2.0

■ Tapping Specification



■ Dimension

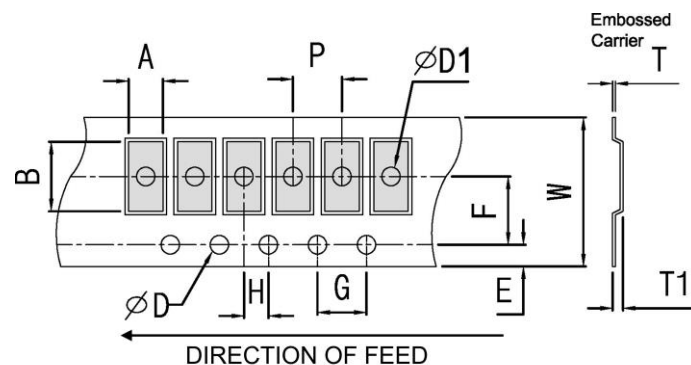
Unit: mm

Packaging	Type	A	B	W	E	F	G	H	T	ϕD	P
Paper Type	0201	0.38±0.02	0.68±0.02	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.42±0.02	1.50 +0.10 -0	2.0±0.1
	0402	0.70±0.1	1.20±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.45±0.1		
	0603	1.05±0.2	1.80±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.60±0.1		
	0805	1.55±0.2	2.30±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		
	1206	1.90±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		
	1210	2.85±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		4.0±0.1



ST Series Anti Sulfur Chip Resistor Product Specifications

Document No.	S-10-12-14-15
Released Date	2025/04/17
Page No.	8/9



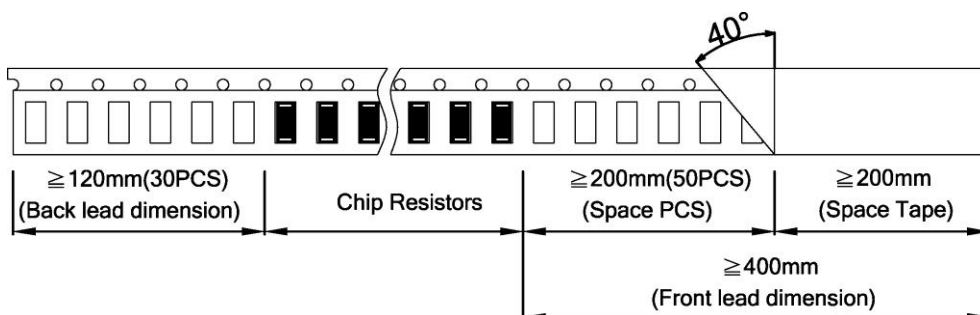
■ Dimension

Unit: mm

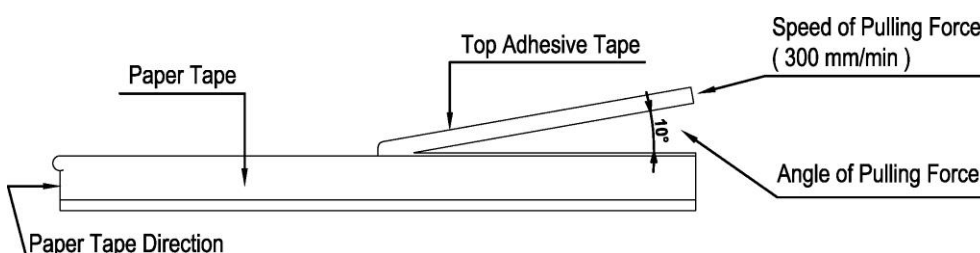
Packaging	Type	A	B	W	E	F	G	H	T	ØD	ØD1	T1	P
Embossed Type	2010	2.80±0.20	5.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10	1.50 +0.10 -0	1.50±0.10	0.85±0.15	4.0±0.1
	2512	3.40±0.20	6.70±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10		1.50±0.10	0.85±0.15	
	1812	3.30±0.20	4.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10		1.50±0.10	0.85±0.15	

■ Packing Material Data/Storage Data

■ Front & Back Lead Dimension



■ Top Adhesive Peel Off Strength : 10~70g



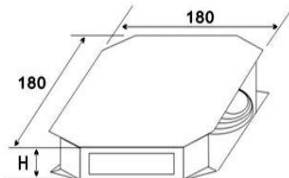


ST Series Anti Sulfur Chip Resistor Product Specifications

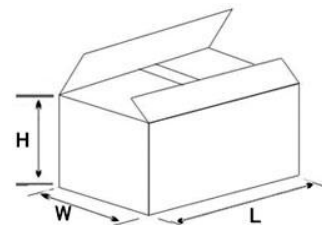
Document No.	S-10-12-14-15
Released Date	2025/04/17
Page No.	9/9

■ Package

Inner Box Size	
Reel	Size H(mm)
1	13
2	24
3	36
5	60
10	113



External Box Size			
Contain (Kpcs)	Length (mm)	Width (mm)	Height (mm)
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200



■ Storage Data :

Storage time at the environment temp: $25\pm5^{\circ}\text{C}$ & humidity: $60\pm20\%$ is valid for two years.

■ Product Testing Method:

Our products are tested with our company's tapping & testing equipments by using four-feet probe to touch at the back of both electrodes. Supposed different testing points or methods are requested, please advise beforehand and customized-made production is available.