ASJ *Towards Excellence in Quality, Service & Innovation*

DATA SHEET

Thick Film Chip Resistor Array (Reverse Flat Type)

YCN Series

1% TO 5%, TCR ±200 TO ±400

SIZE: 052V/054V

Product Specification – March 14, 2016 V.1

1. SCOPE

1.1 This specification specifies fixed thick film chip resistor array (flat terminations) for use in electronic equipment. In case there are discrepancies in specifications between this specification and the Customer's specifications, the latter shall precede.

2. PART NUMBERING SYSTEM

Part Numbering is made in accordance with the following system:

YCN	052	V	-	XXXX	-	J	K

Type	Size (Configuration)	Terminal Type	Nominal Resistance			Resistance Tolerance	Packaging
Thick Film Chip Resistor Array Flat Type	052-0201 x 2 054-0201 x 4	V-Reverse Flat Type	Resistors	3-Digit	E24 Series 2.2Ω=2R2 100Ω=101 JUMPER=000	F=±1% J=±5%	K=10,000 pcs Lead Free Y=20,000 pcs Lead Free
				4-Digit	E96 Series 10.2Ω=10R2 10KΩ=1002 JUMPER=0000		

3. RATING

3.1 Rated Power

3.1.1 Resistor Rated Power

Type	Rated Power at 70°C	Max.Working Voltage	Max.Overload Voltage	JUMPER(0Ω) Rated Current	JUMPER(0Ω) Resistance Value
YCN052V (0201x2)	1/32 W	12.5V	25V	0.5A	50mΩ Max
YCN054V (0201x4)	1/32 W	12.5V	25V	0.5A	50mΩ Max

3.2 Power Derating Characteristics

Rated Power shall be the load power corresponding to nominal wattage suitable for continuous use at 70°C ambient temperatures. In case the ambient temperature exceeds 70°C, reduce the load power in accordance with Derating curve in Fig. 1.

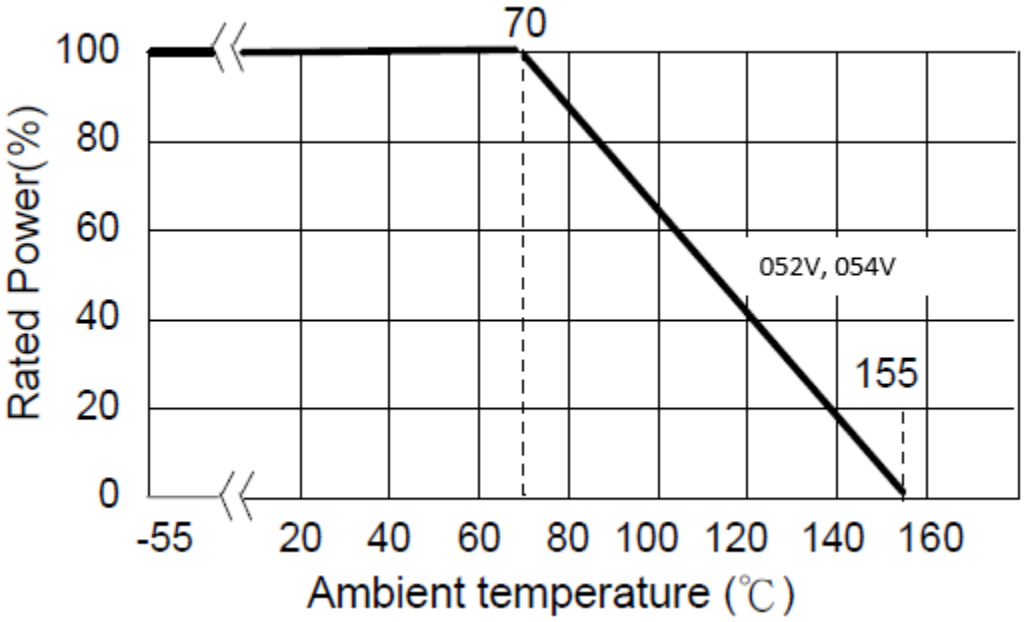


Fig.1 Power Derating Characteristics

3.3 Standard Atmospheric Condition

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient Temperature = + 5°C to +35°C

Relative Humidity = < 85% RH

Air Pressure = 86 kPa to 106kPa

If there may be any doubt about the results, measurement shall be made within the following limits:

Ambient Temperature= 20 ± 2°C

Relative Humidity = 60 to 70% RH

Air Pressure = 86 kPa to 106kPa

3.4 Operating Temperature Range -55°C to +155°C

3.5 Storage Temperature Range -5°C to + 40°C

3.6 Flammability Rating Tested in accordance to UL-94, V-0

3.7 Moisture Sensitivity Level Rating: Level 1

3.8 Product Assurance ASJ resistors shall warranty 24 months from the date of shipment.

3.9 ASJ resistors are RoHS compliance in accordance to RoHS Directive 2011/65/EU.

3.10 Resistance, Resistance Tolerance and Temperature Coefficient of Resistance.

Type	Rated Power At 70°C	T.C.R (ppm/°C)	Resistance Range F(±1%), J(±5%) E-96, E-24	JUMPER(0Ω) Rated Current	JUMPER(0Ω) Resistance Value	Operating Temperature Range
YCN052V (0201x2)	1/32 W	±400 -200	10Ω ≤ R ≤ 100Ω	0.5A	50mΩ Max	-55°C ~ + 155°C
		±250	100Ω < R ≤ 1MΩ			
YCN054V (0201x4)	1/32 W	±400 -200	10Ω ≤ R ≤ 100Ω	0.5A	50mΩ Max	
		±250	100Ω < R ≤ 1MΩ			

3.11 Rated Voltage

The rated voltage is calculated from the rated power and nominal resistance by the following formula:

$$E = \sqrt{P.R}$$

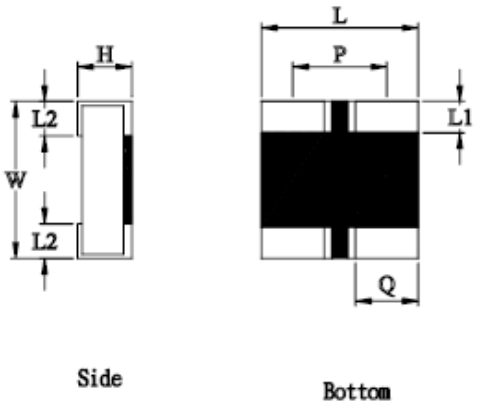
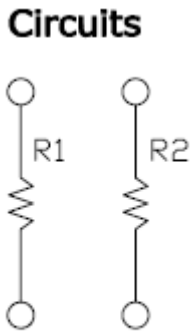
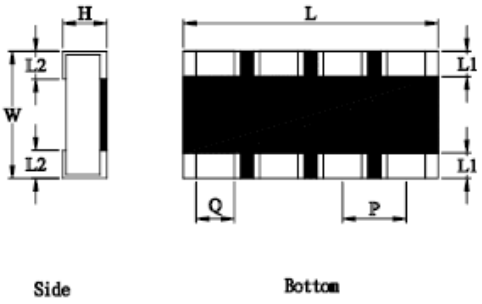
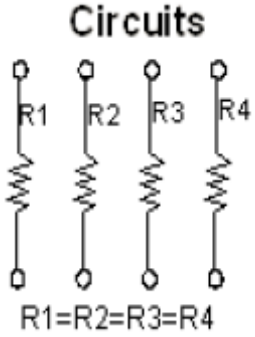
Where E : Rated Voltage (V)
P : Rated Power (W)
R : Nominal Resistance (Ω)

In case the value calculated by the formula exceeds the maximum working voltage given in Section 3.1.1, the maximum working voltage in Section 3.1.1 shall be regarded as the rated voltage.

3.12 Document review period: every 3 months

4. DIMENSIONS

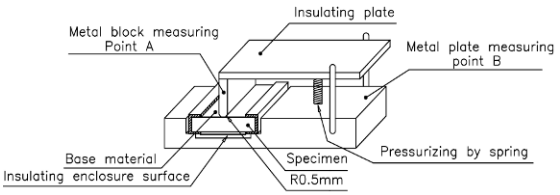
4.1 Dimensions

Type	Circuit	
YCN052V		
YCN054V		

Unit : Inches(Millimeters)

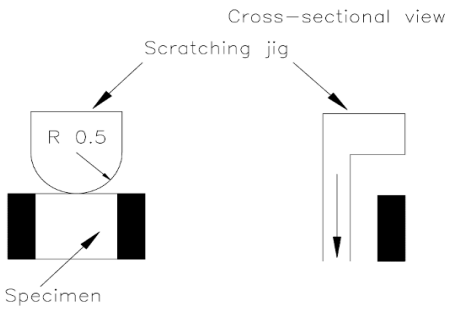
Type	Dimension Inches (Millimeters)						
	L	W	H	L_1	L_2	P	Q
YCN052V	0.031±0.002 (0.80±0.05)	0.024±0.002 (0.60±0.05)	0.009±0.004 (0.23±0.10)	0.0079+0.002 -0.004 (0.20+0.05 -0.10)	0.004+0.004 -0.002 (0.10+0.10 -0.05)	0.02±0.002 (0.50±0.05)	0.0079±0.004 (0.20±0.10)
YCN054V	0.055±0.002 (1.40±0.05)	0.024±0.002 (0.60±0.05)	0.009±0.004 (0.23±0.10)	0.0079+0.002 -0.004 (0.20+0.05 -0.10)	0.004+0.004 -0.002 (0.10+0.10 -0.05)	0.0157±0.002 (0.40±0.05)	0.0079±0.004 (0.20±0.10)

5. ELECTRICAL CHARACTERISTICS AND TEST CONDITIONS

CHARACTERISTICS		RESISTANCE SPECIFICATION		TESTING CONDITIONS
		Jumper	Resistance	
1	Temperature Coefficient of Resistance	Refer Clause 3.10		***JIS C 5201-1 4.8*** TCR(ppm/^{0}C) = $\frac{(R2-R1)}{R1\ (T2-T1)}$ x 10^6 R1: Resistance at room temperature R2: Resistance at -55ºC or +125ºC T1: Room temperature T2: Temperature -55ºC or +125ºC
2	Short Time Overload	< 50mΩ	2%, 5%: ±(2.0% +0.10Ω)	***JIS C 5201-1 4.13*** Applied 2.5 times rated voltage for 5 seconds and release the lead for about 30 minutes, then measure its resistance variance rate. (Rated voltage refer to clause 3.8 - Resistance, Resistance Tolerance and Temperature Coefficient of Resistance)
		No evidence of mechanical damage		
3	Insulation Resistance	≥10^9Ω		***JIS C 5201-1 4.6*** Put the resistor in the fixture, add 100 VDC in +, - terminal for 60 sec then measured the insulation resistance between electrodes and insulating enclosure or between electrodes and base material. 
4	Dielectric Withstand Voltage	No short or burned on the appearance.		***JIS C 5201-1 4.7*** Put the resistor in the fixture, add 300 VAC in +, - terminal for 60 sec.
5	Noise Level	Note: Not applicable for Zero ohm		***JIS C 5201-1 4.12*** Resistance / Noise R <100Ω : ≦ -10db (0.32 uV/V) 100Ω ≦R <1KΩ : ≦ 0db (1.0 uV/V) 1KΩ ≦R <10KΩ : ≦ 10db (3.2 uV/V) 10KΩ ≦R <100KΩ : ≦ 15db (5.6 uV/V) 100KΩ ≦R <1MΩ : ≦ 20db (10 uV/V) 1MΩ ≦R : ≦ 30db (32 uV/V)

6	Resistance to Soldering Heat	< 50mΩ	Test item 1: (1) Variance rate on resistance ΔR%= ±(1.0%+0.05Ω) (2).No evidence of electrode damage. No side conductive peeling off.	***JIS C 5201-1 4.18*** • Test method 1 (Solder pot test): The tested resistor be immersed into molten solder of 260+5/-0ºC for 30 seconds. Then the resistor is left in the room for 1 hour.
		No evidence of electrode damage. No sides conductive peel off.		
7	Solderability	Test item 1: Solder coverage over 95%		***JIS C 5201-1 4.17*** Preconditioning: Put the tested resistor in the apparatus of PCT, at a temperature of 105ºC, humidity of 100% RH, and pressure of 1.22x 10^5 Pa for duration of 4 hours. Then after left the tested resistor in room temperature for 2 hours or more. Test method: • Test item 1 (solder pot test): The resistor be immersed into solder pot in temperature 235± 5ºC for 2 sec, then the resistor is left as placed under microscope to observed its solder area.
8	Resistance to Solvent	< 50mΩ	YCN052:± (1.0%+0.05Ω) Other:± (0.5%+0.05Ω)	***JIS C 5201-1 4.29*** The tested resistor be immersed into isorophyl alcohol of 20~25ºC for 5 minutes, then the resistor is left in the room for 48 hr, then measure its resistance variance rate.
		No evidence of mechanical damage, no overcoating and Sn layer by leaching.		

<table>
<tr>
<td>9</td>
<td>Joint strength of solder</td>
<td>< 50mΩ</td>
<td>Test item 1:
1. Δ R%=± (1.0%+0.05Ω)
2. No evidence of mechanical damage.
No terminals peel off.</td>
<td>JIS C 5201-1 4.32
Preconditioning:
Put the tested resistor in the apparatus of PCT, at a temperature of 105ºC, humidity of 100% RH, and pressure of 1.22x 10^5 Pa for a duration of 4 hours. Then after left the tested resistor in room temperature for 2 hours or more.
Test method:
• Test item 1 (Adhesion):
A static load using a R0.5 scratch tool shall be applied on the core of the arrow and held for 10 seconds and under load measure its resistance variance rate.

1. YCN052=5N load
 
</td>
</tr>
<tr>
<td>10</td>
<td>Resistance to Dry Heat</td>
<td colspan="2">0.5%, 1% : ±(1.0% + 0.05Ω)

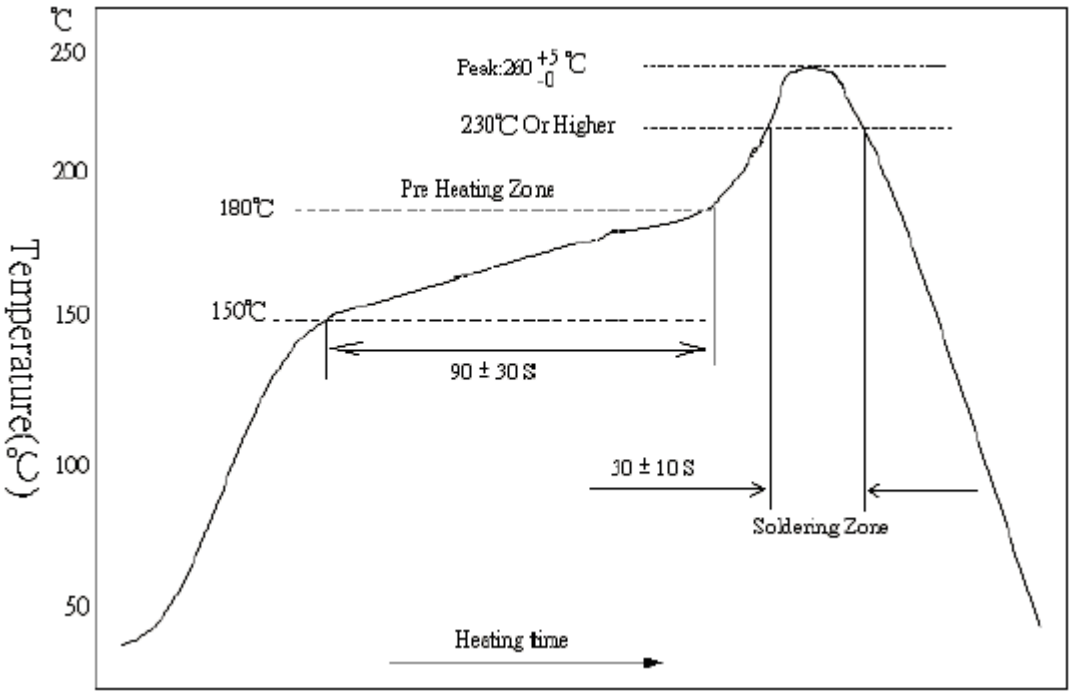
No evidence of mechanical damage.</td>
<td>JIS C 5201-1 4.25
Put the tested resistors in chamber under temperature 155± 5 ºC for 96± 4 hours. Then leaving in room temperature for 60 minutes, and measure its resistance variance rate.</td>
</tr>
<tr>
<td>11</td>
<td>Thermal Shock</td>
<td>< 50mΩ</td>
<td>±(1.0% + 0.05Ω)

No evidence of mechanical damage.</td>
<td>MIL-STD 202 Method 107
Put the tested resistor in the thermal shock chamber under the temperature cycle which shown in the following table shall be repeated 300 times consecutively. Then leaving the tested resistor in the room temperature for 1 hour, and measure its resistance variance rate.
<table>
<tr><th></th><th>Testing condition</th></tr>
<tr><td>Lowest temperature</td><td>-55± 5ºC</td></tr>
<tr><td>Highest temperature</td><td>125± 5ºC</td></tr>
<tr><td>Temperature-retaining time</td><td>15 minutes each</td></tr>
</table></td>
</tr>
</table>

<table>
<tr><td rowspan="2">12</td><td rowspan="2">Loading Life in Moisture</td><td>< 50mΩ</td><td>±(3.0% + 0.10Ω)</td><td rowspan="2">JIS C 5201-1 4.24
Put the tested resistor in chamber under temperature 40± 2ºC, relative humidity 90~95% and load the rated voltage for 90 minutes on, 30 minutes off, total 1000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate.</td></tr>
<tr><td colspan="2">No evidence of mechanical damage.</td></tr>
<tr><td rowspan="2">13</td><td rowspan="2">Load Life</td><td>< 50mΩ</td><td>±(3.0% + 0.10Ω)</td><td rowspan="2">JIS C 5201-1 4.25
Put the tested resistor in chamber under temperature 70± 2ºC and load the rated voltage for 90 minutes on, 30 minutes off, total 1000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate.</td></tr>
<tr><td colspan="2">No evidence of mechanical damage, no short or burned on the appearance.</td></tr>
<tr><td rowspan="2">14</td><td rowspan="2">Low Temperature Operation</td><td>< 50mΩ</td><td>±(1.0% + 0.05Ω)</td><td rowspan="2">MIL-R-55342D 4.7.4
Put the tested resistor in the chamber at room temperature 25ºC. Decreasing the temperature to -55ºC and keep the temperature at -55ºC for 1 hour. Then load the rated voltage for 45 minutes on, and 15 minute off. Then leaving the tested resistor in room temperature for 8± 1 hour, and measure its resistance variance rate.</td></tr>
<tr><td colspan="2">No evidence of mechanical damage.</td></tr>
<tr><td>15</td><td>Whisker Test</td><td colspan="2">Max. 50μ m</td><td>• Test item 1 (Thermal Shock test):
<table><tr><td>Minimum storage temperature</td><td>-55+0/-102ºC</td></tr><tr><td>Maximum storage temperature</td><td>85+10/-0ºC</td></tr><tr><td>Temperature-retaining time</td><td>10 min.</td></tr><tr><td>Number of temperature cycles</td><td>1,500</td></tr></table>• Inspection:
Inspect for whisker formation on specimens that underwent the acceleration test specified in sub clause 4.2, with a magnifier (stereomicroscope) of about 40 or higher magnification. If judgment is hard in this method, use a scanning electron microscope (SEM) of about 1,000 or higher magnification.
By JEDEC Standard NO.22A121 class 2.</td></tr>
</table>

6. Soldering Profile

6.1 Lead Free Reflow Soldering Profile



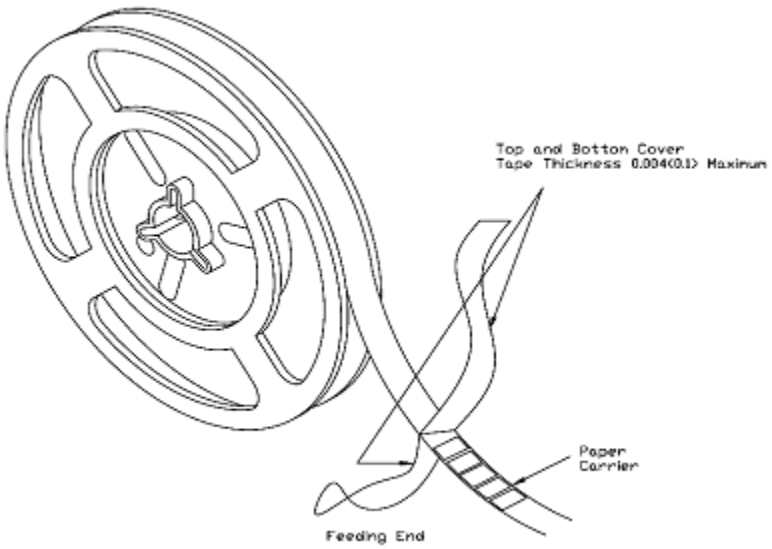
Remark: The peak temperature of soldering heat is 260 +5/-0 ºC for 10 seconds.

6.2 Soldering Iron: Temperature 350ºC±10ºC, dwell time shall be less than 3 sec.

7. TAPING

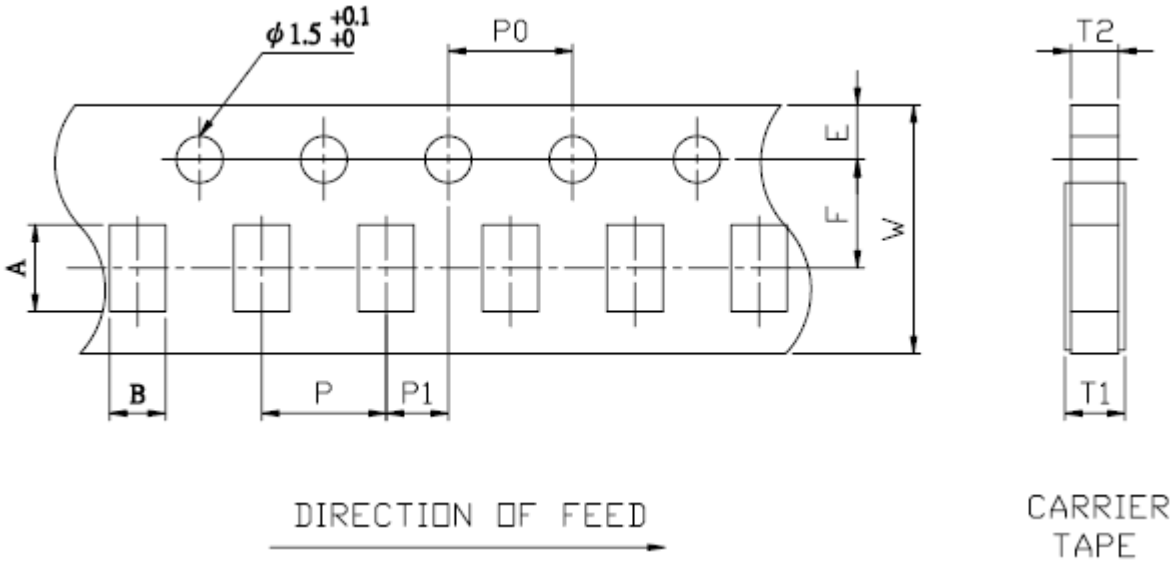
7.1 Structure of Taping

Paper Carrier



7.2 Dimension

7.2.1 Dimension of Punched Paper Tape Carrier System



Remark: Pitch tolerance over any 10 pitches of Po is ± 0.2 mm

Inches (Millimeters)						
Dimensions	**A**	**B**	**W**	**E**	**F**	**P**
YCN052V	0.035 ± 0.004	0.028 ± 0.004	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	0.079 ± 0.004
(0201 x 2)	(0.9 ± 0.1)	(0.7 ± 0.1)	(8.0 ± 0.2)	(1.75 ± 0.1)	(3.5 ± 0.05)	(2.0 ± 0.1)
YCN054V	0.063 ± 0.004	0.030 ± 0.004	0.315 ± 0.008	0.069 ± 0.004	0.138 ± 0.002	0.079 ± 0.004
(0201 x 4)	(1.6 ± 0.1)	(0.75 ± 0.05)	(8.0 ± 0.2)	(1.75 ± 0.1)	(3.5 ± 0.05)	(2.0 ± 0.1)

Inches (Millimeters)					
Dimensions	**P1**	**P0**	**10x P0**	**T2**	**T1**
YCN052V	0.079 ± 0.002	0.157 ± 0.002	1.575 ± 0.007	0.012 ± 0.002	0.016 ± 0.002
(0201 x 2)	(2.0 ± 0.05)	(4.0 ± 0.05)	(40.00 ±0.20)	(0.30 ± 0.05)	(0.40 ± 0.05)
YCN054V	0.079 ± 0.002	0.157 ± 0.002	1.575 ± 0.007	0.012 ± 0.002	0.016 ± 0.002
(0201 x 4)	(2.0 ± 0.05)	(4.0 ± 0.05)	(40.00 ±0.20)	(0.30 ± 0.05)	(0.40 ± 0.05)

7.3 Packaging

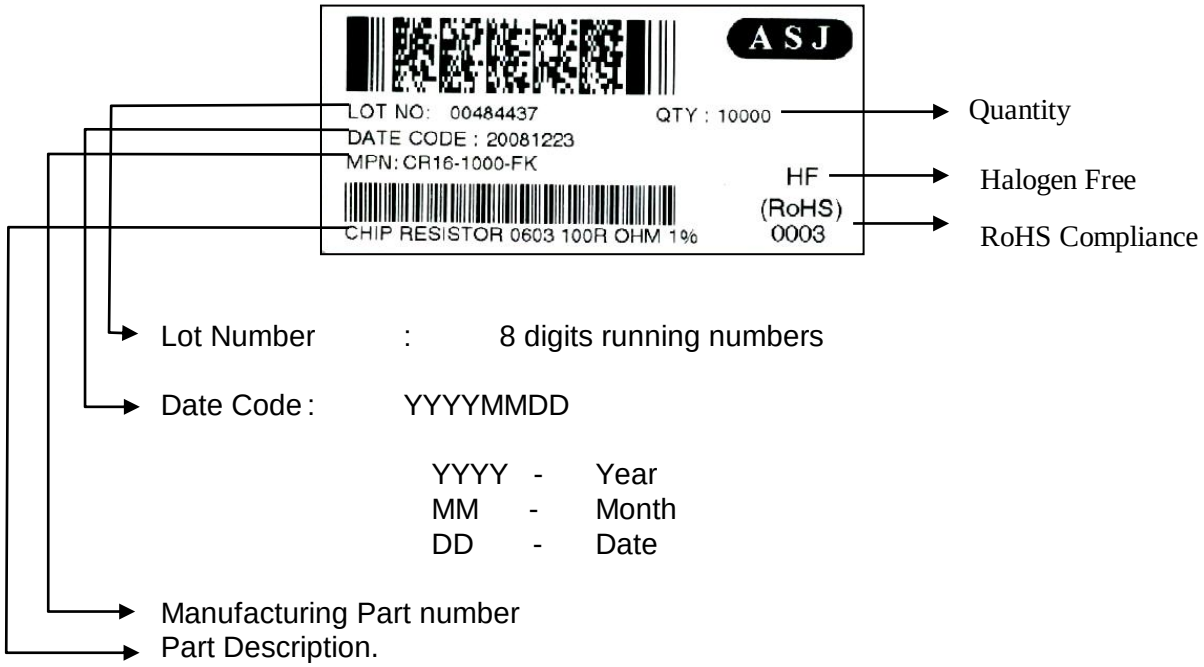
7.3.1 Taping

7.3.2 Quantity – Tape and Reels

Array & Networks	
Reels (Diameter A)	**Component / Reel**
	Paper Carrier
	YCN052 (2mm Pitch)
7" (178 ± 2.0mm)	10,000
10" (254 ± 2.0mm)	20,000

7.3.3 Identification

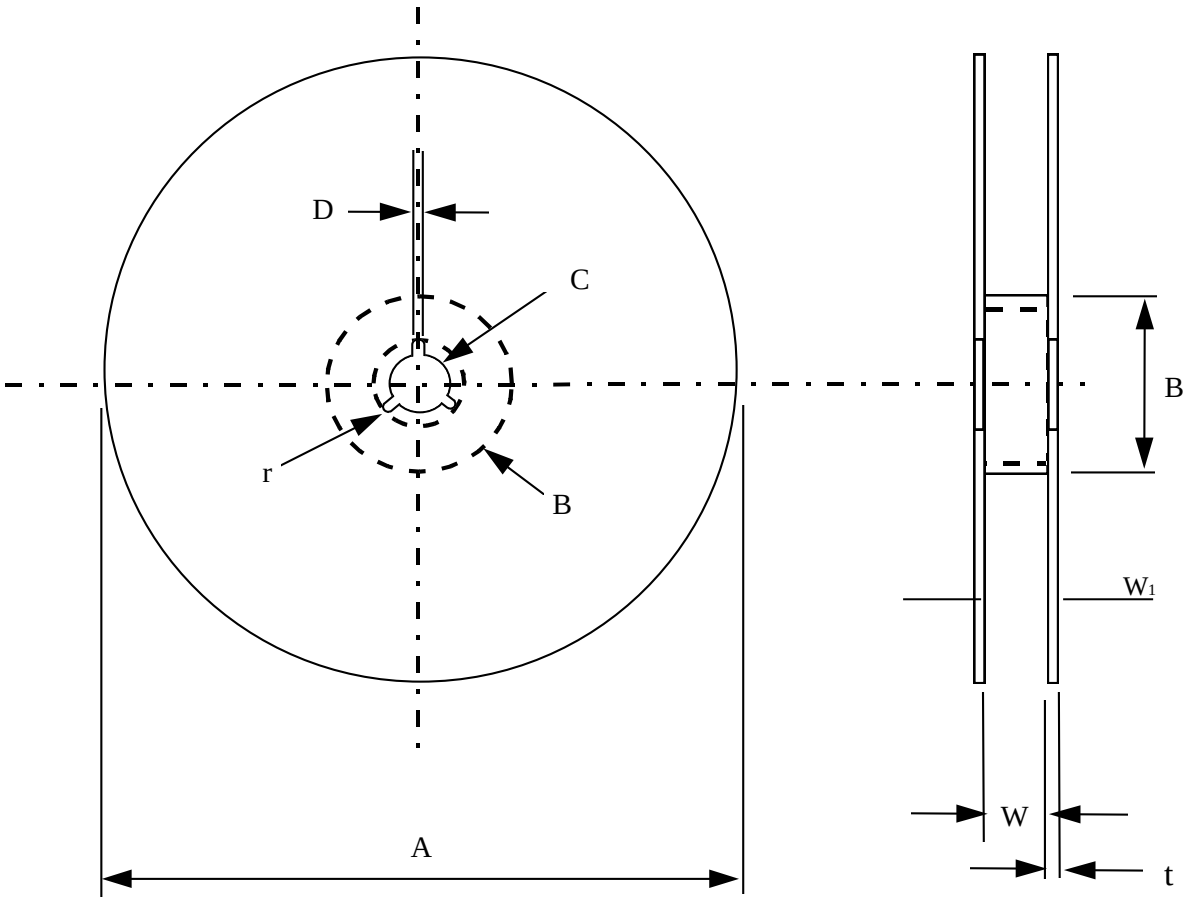
Production label that indicates the 8 digits lot number, product type, resistance value and tolerance shall be pasted on the surface of each reel.



7.3.4 Packaging Reel Box

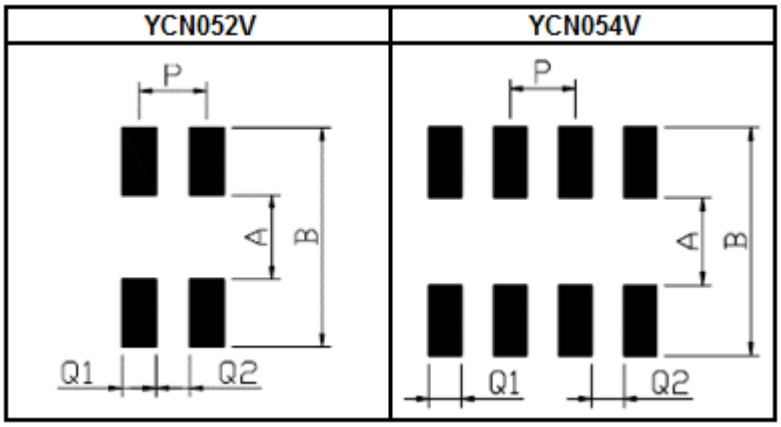
Dimension	Reel Box	Number of Reels
185 × 60 × 186 mm	25K Box	5
185 × 120 × 186 mm	50K Box	10

7.3.5 Reel Dimensions



Model	A	B	C	D	W	W_1	t	r
7"Reel (5K) (except 0402 10K)	ϕ178±2.0	ϕ80min	13± 0.2	ϕ2.0± 0.5	11± 0.1	14.4 max	1.0± 0.1	1.0
10"Reel (10K)	ϕ254±2.0	ϕ60min	13± 0.2	ϕ2.0± 0.5	11± 1.0	14.4 max	1.5± 0.1	1.0
13"Reel (20K, 50K)	ϕ330±2.0	ϕ60min	13± 0.2	ϕ2.0± 0.5	11± 1.0	14.4 max	2.1± 0.1	-

8. SURFACE MOUNT LAND PATTERNS



Product (Type)	Land Dimensions - Inches (mm)				
	A	B	P	Q1	Q2
YCN052V (0201x2)	0.012 (0.3)	0.035 (0.9)	0.02 (0.5)	0.012 (0.3)	0.012 (0.3)
YCN054V (0201x4)	0.012 (0.3)	0.035 (0.9)	0.016 (0.4)	0.008 (0.2)	0.008 (0.2)

9. REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version. 1	MARCH 14,2016		Initial Release