A S J

DATA SHEET
General Purpose Thick Film Chip Resistor
CR Series

1% TO 5%, TCR -200 TO +600

SIZE: 01005/0201/0402/0603/0805/1206/1210/2010/2512

RoHs Compliant

GENERAL PURPOSE THICK FILM CHIP RESISTOR

CR Series

1.   SCOPE

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

1.2   The products for 01005,0201, 0402, 0603, 0805, 1206, 1210, 2010 and 2512 are tested and passed based on the test conditions and methods defined in AEC-Q200.

2.   PART NUMBERING SYSTEM

Part Numbering is made in accordance with the following system:

CR	10	-	XXXX	-	F	K
Type	**Size(Inch/mm)**		**Nominal Resistance**		**Resistance Tolerance**	**Packaging**
General Purpose Thick Film Chip Resistors	03 (01005/0402) 05 (0201/0603) 10 (0402/1005) 16 (0603/1608) 21 (0805/2012) 32 (1206/3216) 40 (1210/3225) 50 (2010/5025) 63 (2512/6432)		Resistors 3-Digit E24 Series 2.2Ω=2R2 100Ω=101 / 4-Digit E96 Series 10.2Ω=10R2 10KΩ=1002 / Jumper 000 - 5% 0000 - 1%		F=±1% G=±2% J=±5% Z=Zero Ohm	E=4,000 pcs Lead Free L=5,000 pcs Lead Free K=10,000 pcs Lead Free Y=20,000 pcs Lead Free *N=50,000 pcs Lead Free **S=15,000 pcs Lead Free Remark : *applicable for CR10(0402/1005) and CR05(0201/0603) **applicable for CR03(01005/0402)

3.   RATING

3.1   Rated Power

3.1.1   Zero Ohm Jumper Rated Power

	Rated Current	Maximum Working Current	Maximum Overload Current	Dielectric Withstanding Voltage	Resistance Tolerance
CR03	0.5A	-	-	-	< 50m Ω
CR05	0.5A	0.5A	2A	300V	< 50m Ω
CR10	1A	1A	2.5A	300V	< 50m Ω
CR16	2A	2A	5A	300V	< 50m Ω
CR21	2A	2A	5A	500V	< 50m Ω
CR32	2A	2A	5A	500V	< 50m Ω
CR40	2A	2A	5A	500V	< 50m Ω
CR50	2A	2A	5A	500V	< 50m Ω
CR63	3A	3A	15A	500V	< 50m Ω

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3.1.2   Resistor Rated Power

	Rated Power	Maximum Working Voltage	Maximum Overload Voltage	Maximum Intermittent Overload Voltage	Dielectric Withstanding Voltage
CR03	1/32	15V	30V	-	-
CR05	1/20W	25V	50V	50V	50V
CR10	1/16W	50V	100V	100V	300V
CR16	1/10W	50V	100V	100V	300V
CR21	1/8W	150V	300V	300V	500V
CR32	1/4W	200V	400V	400V	500V
CR40	1/2W	200V	400V	400V	500V
CR50	3/4W	200V	400V	400V	500V
CR63	1W	200V	400V	400V	500V

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.
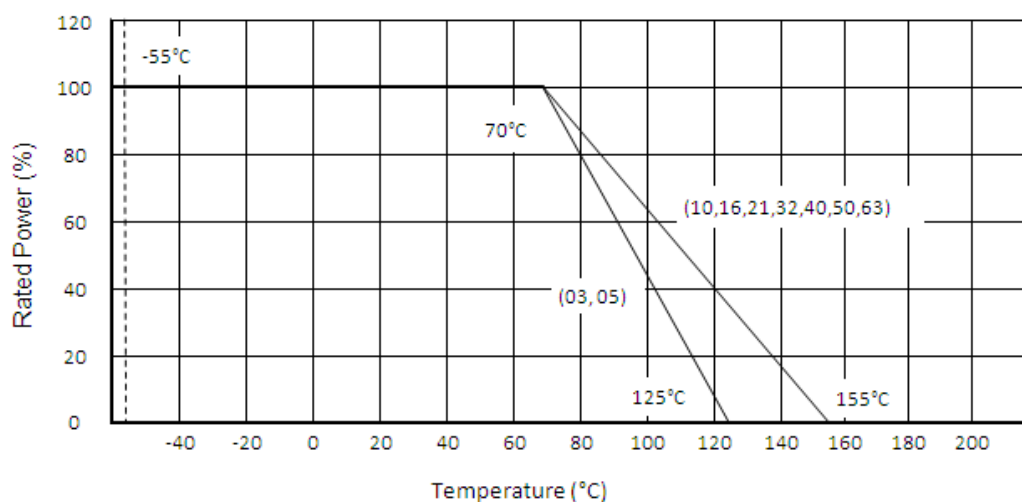

Fig.1 Power Derating Characteristics

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

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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 (except 0201& 01005 is -55°C to +125°C)

3.4   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 resistor 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.

Table 1	Resistance Range		
	F (± 1%) E-96 E-24	G (± 2%) E-24	J(± 5%) E-24
CR03 (01005)	1Ω to 1MΩ	1Ω to 1MΩ	1Ω to 1MΩ
CR05 (0201)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR10 (0402)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR16 (0603)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR21 (0805)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR32 (1206)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR40 (1210)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR50 (2010)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
CR63 (2512)	1Ω to 10MΩ	1Ω to 10MΩ	1Ω to 10MΩ
Temperature Coefficient Resistance (TCR)	1%, 2%, & 5% (01005 only)	$1Ω ≤ R < 10Ω$ $10Ω ≤ R <1MΩ$	-200ppm/°C to +600ppm/°C ± 250ppm/°C
	1%, & 5% (0201 only)	$1Ω ≤ R < 10Ω$ $10Ω ≤ R <10MΩ$	-200ppm/°C to +400ppm/°C ± 200ppm/°C
	1% (For all std product type)	$1Ω ≤ R <10Ω$ $10Ω≤ R <1MΩ$ $1MΩ≤ R ≤10MΩ$	± 200ppm/°C ± 100ppm/°C ± 200ppm/°C
	2% & 5% (For all std product type)	$1Ω ≤ R < 10Ω$ $10Ω ≤ R < 1MΩ$ $1MΩ ≤ R ≤10MΩ$	± 200ppm/°C ± 100ppm/°C ± 200ppm/°C
	Special TCR available on request (For all product type)	$1Ω≤ R <10Ω$	± 100ppm/°C

Zero Ohm Jumper < 0.05Ω (Z, 1% & 5%)

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 3.1.2, the maximum working voltage in Section 3.1.2 shall be regarded as the rated voltage.

3.12   All product, product specifications and data are subject to change without notice to improve reliability, function or design or otherwise.

4.   MARKING ON PRODUCT

The nominal resistance shall be marked on the surface of each resistor

Part Number	Color	Marking on Product
CR03 (01005)	-	No marking
CR05 (0201)	-	No marking
CR10 (0402)	-	No marking
CR16 (0603)	Light Yellow	1) Tolerance : ± 1.0% (F) ° Four Numerals Marking (E96 Series) ° 0603 Three Characters Marking based on E-96 marking standard.
CR21 (0805)	Light Yellow	
CR32 (1206)	Light Yellow	2) Tolerance; ± 2.0% (G), ±5.0% (J) Three Numerals Marking
CR40 (1210)	Light Yellow	3) Zero ohm jumper resistor The marking used shall be 0
CR50 (2010)	Light Yellow	
CR63 (2512)	Light Yellow	

4.1   Numeric Numbering

4.1.1   5% Tolerance: ***Three Numerals Marking***

First 2 digits are significant figures; third digit is number of zeros. Letter R is decimal point.

Example

Nominal Resistance	Marking	Remarks
1 Ω	1R0	$1 \times 10^0 = 1$
10 Ω	100	$10 \times 10^0 = 1\,0$
100 Ω	101	$10 \times 10^1 = 1\,00$
4.7K Ω	472	$47 \times 10^2 = 47\,00$
47K Ω	473	$47 \times 10^3 = 47\,000$
470K Ω	474	$47 \times 10^4 = 47\,0000$
4.7M Ω	475	$47 \times 10^5 = 47\,00000$

4.1.2   1% Tolerance : ***Four Numerals Marking***

First 3 digits are significant figures; fourth digit is number of zeros.

Examples:

Nominal Resistance	Marking	Remarks
1 Ω	1R00	$1 \times 10^0 = 1$
10 Ω	10R0	$10 \times 10^0 = 10$
100 Ω	1000	$100 \times 10^0 = 100$
4.7K Ω	4701	$470 \times 10^1 = 470\,0$
47K Ω	4702	$470 \times 10^2 = 470\,00$
470K Ω	4703	$470 \times 10^3 = 470\,000$
1M Ω	1004	$100 \times 10^4 = 100\,0000$

4.1.3   0603 1% Tolerance: ***Three Character E-96 Marking Standard.***

The first 2 digits for the 3 digits E-96 part marking standard, (Refer Table 2 & 3).

The third character is a letter multiplier:

Nominal resistance	Marking	Remark
33.2 Ω	51 X	332×10^{-1} Ω
150 Ω	18 A	150×10^0 Ω
4.99K Ω	68 B	499×10^1 Ω
1 0.2K Ω	02 C	102×10^2 Ω
100K Ω	01 D	100×10^3 Ω

4.1.3.1 EIA-96 Marking Scheme

<u>Table 2 Significant figures</u>

Significant Figures	Symbol	Significant Figures	Symbol	Significant Figures	Symbol	Significant Figures	Symbol
100	01	178	25	316	49	562	73
102	02	182	26	324	50	576	74
105	03	187	27	332	51	590	75
107	04	191	28	340	52	604	76
110	05	196	29	348	53	619	77
113	06	200	30	357	54	634	78
115	07	205	31	365	55	649	79
118	08	210	32	374	56	665	80
121	09	215	33	383	57	681	81
124	10	221	34	392	58	698	82
127	11	226	35	402	59	715	83
130	12	232	36	412	60	732	84
133	13	237	37	422	61	750	85
137	14	243	38	432	62	768	86
140	15	249	39	442	63	787	87
143	16	255	40	453	64	806	88
147	17	261	41	464	65	825	89
150	18	267	42	475	66	845	90
154	19	274	43	487	67	866	91
158	20	280	44	499	68	887	92
162	21	287	45	511	69	909	93
165	22	294	46	523	70	931	94
169	23	301	47	536	71	953	95
174	24	309	48	549	72	976	96

<u>Table 3 Multiplier</u>

Symbol	Multiplier	Symbol	Multiplier
A	10^0	G	10^6
B	10^1	H	10^7
C	10^2	X	10^{-1}
D	10^3	Y	10^{-2}
E	10^4		
F	10^5		

5. DIMENSIONS, CONSTRUCTIONS AND MATERIALS

5.1 Dimensions
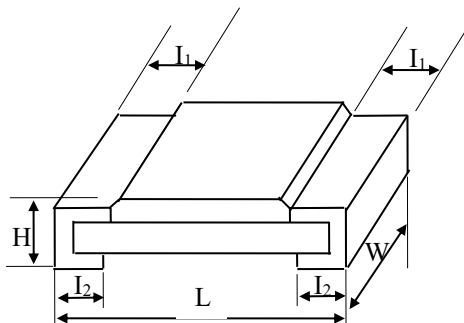
Unit: Inches (Millimeters)

CODE	L	W	H	I_1	I_2
CR03 (01005)	0.016±0.001 (0.40±0.02)	0.008±0.001 (0.20±0.02)	0.005±0.001 (0.13±0.02)	0.004±0.001 (0.10±0.03)	0.004±0.001 (0.10±0.03)
CR05 (0201)	0.024±0.001 (0.60±0.03)	0.012±0.001 (0.30±0.03)	0.009±0.001 (0.23±0.03)	0.006±0.002 (0.15±0.05)	0.006±0.002 (0.15±0.05)
CR10 (0402)	0.040±0.004 (1.00±0.10)	0.020±0.002 (0.50±0.05)	0.014±0.002 (0.35±0.05)	0.008±0.004 (0.20±0.10)	0.010±0.004 (0.25±0.10)
CR16 (0603)	0.063±0.004 (1.60±0.10)	0.031±0.004 (0.80±0.10)	0.018±0.004 (0.45±0.10)	0.012±0.008 (0.30±0.20)	0.012±0.008 (0.30±0.20)
CR21 (0805)	0.079±0.006 (2.00±0.15)	0.049±0.004 (1.25±0.10)	0.020±0.004 (0.50±0.10)	0.016±0.008 (0.40±0.20)	0.016±0.008 (0.40±0.20)
CR32 (1206)	0.122±0.004 (3.10±0.10)	0.063±0.006 (1.60±0.15)	0.022±0.002 (0.55±0.05)	0.020±0.010 (0.50±0.25)	0.020±0.010 (0.50±0.25)
CR40 (1210)	0.120±0.004 (3.05±0.10)	0.100±0.004 (2.55±0.10)	0.022±0.004 (0.55±0.10)	0.020±0.008 (0.50±0.20)	0.020±0.008 (0.50±0.20)
CR50 (2010)	0.200±0.008 (5.00±0.20)	0.098±0.008 (2.50±0.20)	0.022±0.004 (0.55±0.10)	0.024±0.008 (0.60±0.20)	0.024±0.008 (0.60±0.20)
CR63 (2512)	0.250±0.008 (6.30±0.20)	0.126±0.008 (3.20±0.20)	0.022±0.004 (0.55±0.10)	0.024±0.008 (0.60±0.20)	0.024±0.008 (0.60±0.20)

6. ELECTRICAL CHARACTERISTICS AND TEST CONDITIONS

CHARACTERISTICS		SPECIFICATIONS		TESTING CONDITIONS
		Zero Ohm	**Resistance**	
1	Resistance Value	≤ 50 mΩ For 5% (Z)	Resistance accuracy being fully relies with respect to tolerance of resistor.	**JIS C 5201-1 4.5** Application time to be within 5 secs . Applied Voltage for resistance measurement :
				<10Ω 0.1V / 10 ~ 99Ω 0.3V / 100 ~ 999 1.0V / 1k ~ 9.9k 3.0 V / 10k ~ 99.9k 10.0 V / 100k ~ 999k 25.0 V / 1M & Over 50.0 V
2	Resistance Temperature Coefficient	NA	Refer Section 3.8 Table 1	**MIL-STD-202 Method 304** Measure R at $t_o = 25^0$C and after 45 minutes measure R at $t=125^0$C. *Calculation :* $TCR(ppm/°C) = \dfrac{R - R_0}{R_0(t - t_0)} x10^6$
3	Short Time Overload	≤ 50 mΩ For 5% tolerance resistor	0.1%, 0.5%, 1%: $\pm(1.0\%+0.05Ω)$ 2%, 5%: $\pm(2.0\%+0.10Ω)$	**JIS C 5201-1 4.13** Apply at 2.5 times rated voltage for 5 seconds. Applied voltage shall not exceed maximum overload voltage or current.
4	Insulation Resistance	> 10G Ω		**JIS C 5201-1 4.6** Apply (100 ±15) Vdc for 1 minute. Measured the insulation resistance between electrodes and insulating enclosure or between electrodes and base.

5	Intermittent Overload	$\leq 100m\Omega$ For 5% tolerance resistor	$\pm(5\%+0.1\Omega)$ for 1% & 5% tolerance resistor	***IEC 60115-1 4.39*** 2.5 times of rated voltage or maximum overload voltage whichever is less for 1 sec ON and 25 secs OFF. Total $10,000^{+400}_{-0}$ cycles.
6	Terminal Strength A) Bend Test (Applicable for chip size smaller than 1210)	$\leq 50m\Omega$ For 5% tolerance resistor	Tolerance resistor. With no evidence of mechanical damage after releasing the pressure. $\pm (0.5\%+ 0.05\Omega)$ for 1% & 5%	***JIS C 5201-1 4.16 / AEC Q200-005*** Test 1 : The resistor mounted on the board applied 5N pushing force on the sample rear for 10 sec. (CR03:3N) Test 2 : The resistor mounted on the board slowly add force on the sample rear until the sample termination is breakdown.
7	Resistance to soldering heat	$\leq 50m\Omega$ For 5% tolerance resistor	$\pm (0.5\%+0.05\Omega)$ for 1% & 5% tolerance resistor	***MIL-STD-202 Method 210*** Solder bath method Resistor dipped entirely in solder bath of $260 \pm 5°C$ for 10 sec. After which the sample shall be left at ambient temperature for 1~ 2 hrs before measurement.
8	Temperature Cycling	$\leq 50m\Omega$ For 5% tolerance resistor	$\pm (0.5\%+0.05\Omega)$ for 1% tolerance resistor $\pm (1\%+0.05\Omega)$ for 5% tolerance resistor	***JESD 22 Method JA-104*** 1000 cycles (-55°C to 125°C) measurement at 24 ± 2 hours after test conclusion.
9	Resistance to damp Heat (Humidity)	$\leq 100m\Omega$ For 5% tolerance resistor	$\pm (1\%+0.1\Omega)$ for 1% & 5% tolerance resistor	***MIL-STD-202 Method 103*** 1000 hours 85°C / 85%RH Note: Specified condition 10% of operating power. Measurement at 24 ± 2 hours after test conclusion.
10	Loadlife	$\leq 100m\Omega$ For 5% tolerance resistor	$\pm (1.0\%+0.05\Omega)$ for 1% tolerance resistor $\pm (2.0\%+0.1\Omega)$ for 5% tolerance resistor	***MIL-STD-202 Method 108*** At $70 \pm 3°C$ Apply DC rated voltage at 90minutes On, 30minutes Off for 1000^{+48}_{-0} hours Sample shall be left at ambient temperature for 1~ 2 hrs after test before measuring final resistance.
11	Solderability	$\geq$ 95% Coverage at all terminal		***J-STD-002*** For both Leaded & SMD. Electrical test not required. Magnification 50 X. Conditions: Leaded: Method A @ 235°C, category 3.

6.1   Soldering Profile

6.1.1   Wave Soldering
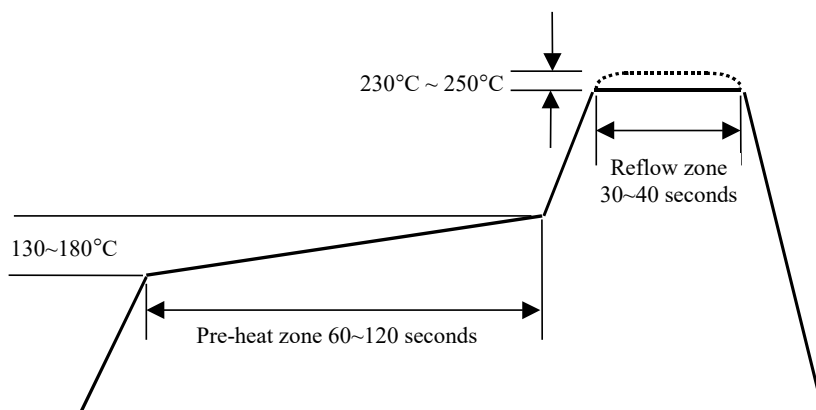
Soldering temperature

245~260°C
Double wave 4~6 seconds

Pre-heat temperature
90~130°C
(Soldering side)

40~60 seconds

30~45 seconds
Pre-heat zone

6.1.2   Reflow Soldering

230°C ~ 250°C

Reflow zone
30~40 seconds

130~180°C

Pre-heat zone 60~120 seconds

7. TAPING

7.1 Structure of Taping

Paper Carrier

Top and Bottom Cover
Tape Thickness 0.004(0.1) Maximum

Paper
Carrier

Feeding End
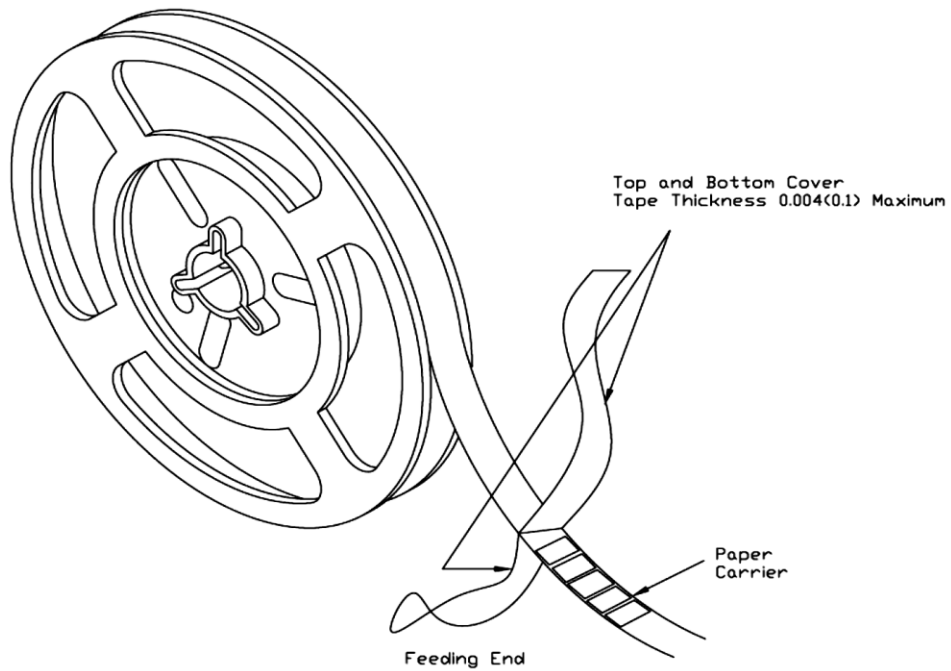
Embossed Plastic Carrier
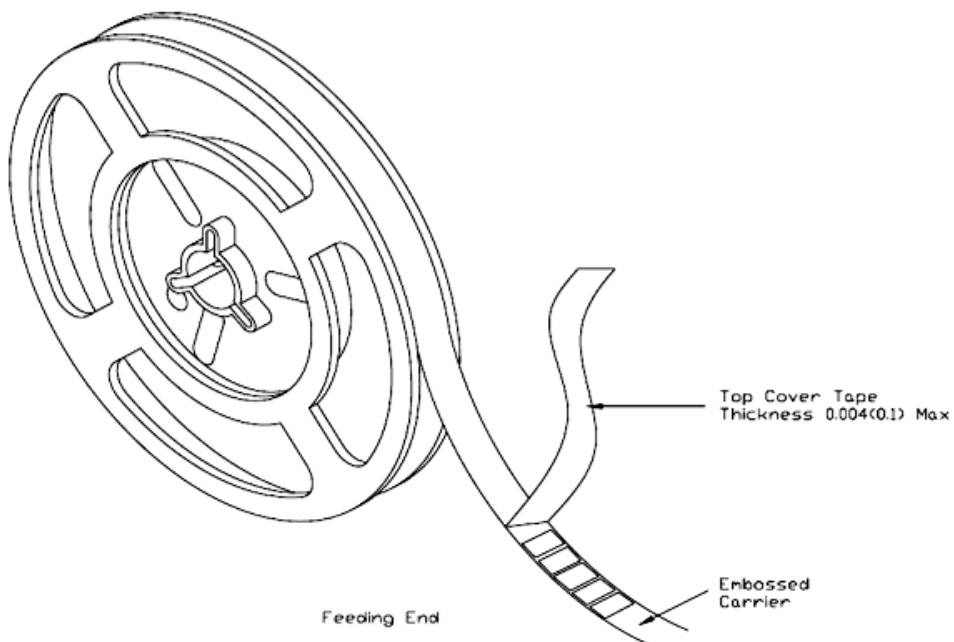
Top Cover Tape
Thickness 0.004(0.1) Max

Embossed
Carrier
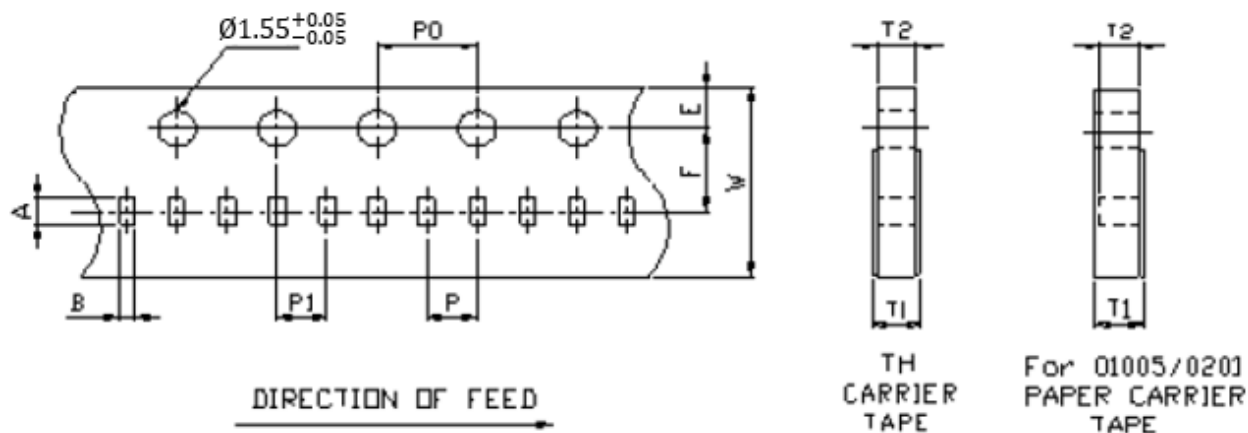
Feeding End

7.2   Dimension

7.2.1   Dimension of Punched Paper Tape Carrier System (CR -03, 05, 10)

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

Dimension of Punched Paper Tape Carrier System (CR-03, 05, 10)

(unit : mm)

Code	A	B	W	E	F	T1
CR03	0.45±0.02	0.25±0.02	8.00±0.30	1.75±0.10	3.50±0.05	0.31±0.03
CR05	0.68±0.05	0.38±0.03	8.00±0.10	1.75±0.10	3.50±0.05	$0.42^{+0.1}_{-0}$
CR10	1.15±0.03	0.65±0.03	8.00±0.10	1.75±0.10	3.50±0.05	$0.42^{+0.2}_{-0}$

Code	T2	P	P0	10xP0	P1
CR03	0.17±0.03	2.00±0.05	4.00±0.05	40.0±0.20	2.00±0.05
CR05	0.28±0.02	2.00±0.05	4.00±0.05	40.0±0.20	2.00±0.05
CR10	$0.42^{+0.03}_{-0.03}$	2.00±0.05	4.00±0.10	40.0±0.20	2.00±0.05

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7.2.2   Dimension of Punched Paper Tape Carrier System /Plastic Embossed Carrier System
(CR16, 21, 32, 40)
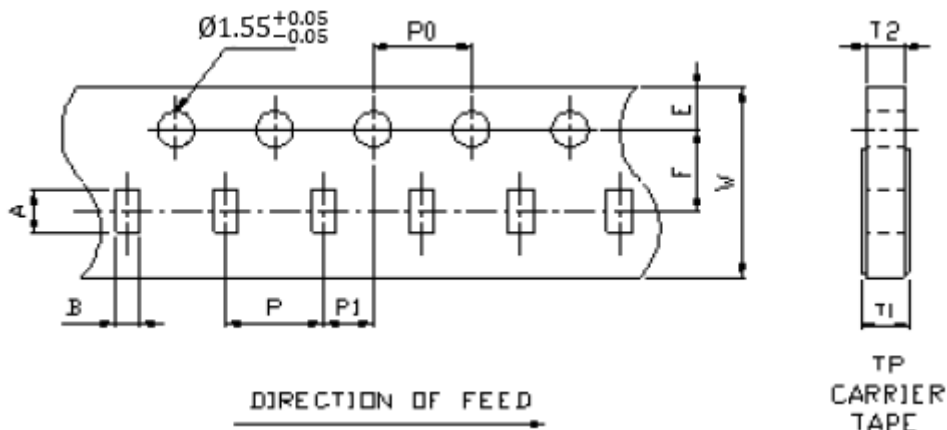
Remark : Pitch tolerance over any 10 pitches of Po is ± 0.2 mm

Dimension of Punched Paper Tape Carrier System (CR - 16, 21, 32, 40)

Code	A	B	W	E	F	T1	T2	P	P0	P1
CR16	1.8±0.10	1.0±0.10	8.0±0.10	1.75±0.10	3.50±0.05	$0.60^{+0.2}_{-0}$	$0.60^{+0.03}_{-0.03}$	4.0±0.05	4.0±0.10	2.0±0.05
CR21	2.33±0.05	1.58±0.05	8.0±0.10	1.75±0.10	3.50±0.05	$0.75^{+0.2}_{-0}$	$0.75^{+0.03}_{-0.05}$	4.0±0.05	4.0±0.10	2.0±0.05
CR32	3.30±0.05	1.90±0.05	8.0±0.10	1.75±0.10	3.50±0.05	$0.75^{+0.2}_{-0}$	$0.75^{+0.03}_{-0.05}$	4.0±0.05	4.0±0.10	2.0±0.05
CR40	3.5±0.2	2.8±0.2	8.0±0.20	1.75±0.10	3.50±0.05	$0.75^{+0.2}_{-0}$	$0.75^{+0.1}_{-0.0}$	4.0±0.10	4.0±0.05	2.0±0.05
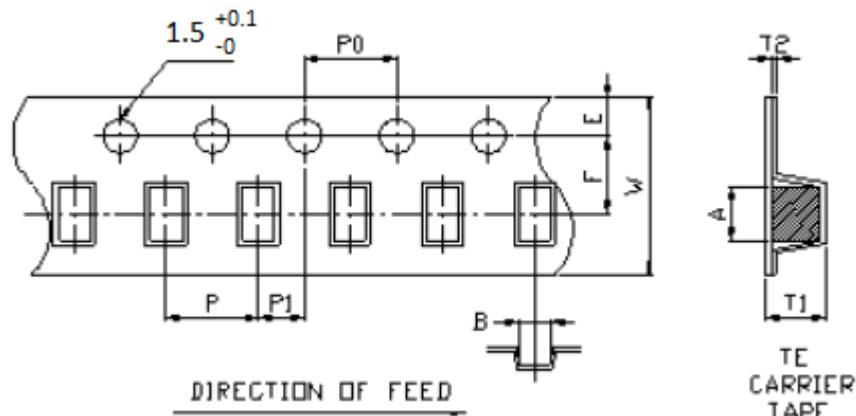
Dimension of Plastic Embossed Carrier System (CR - 50, 63)

Code	A	B	W	E	F	T1	T2	P	P0	P1
CR50	5.5±0.20	2.8±0.20	12.0±0.20	1.75±0.10	5.50±0.05	1.10±0.15	0.23±0.15	4.0±0.10	4.0±0.05	2.0±0.05
CR63	6.7±0.20	3.4±0.20	12.0±0.20	1.75±0.10	5.50±0.05	1.10±0.15	0.23±0.15	4.0±0.10	4.0±0.05	2.0±0.05

7.3   Packaging

7.3.1   Taping

7.3.2 Quantity – Tape and Reels

Code	Quantity	Model	Remarks
CR03	20000 pcs	7" Reel	---
CR05	10000 pcs	7" reel	7" reel for 20 000 pcs or 13" Reel for 50 000pcs on request
CR10	10000 pcs	7" Reel	
CR16			
CR21	5000 pcs	7" Reel	10" reel for 10 000 pcs or 13" Reel for 20 000 pcs on request
CR32			
CR40	5000 pcs	7" Reel	-
CR50	4000 pcs	7" Reel	-
CR63	4000 pcs	7" Reel	-

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.
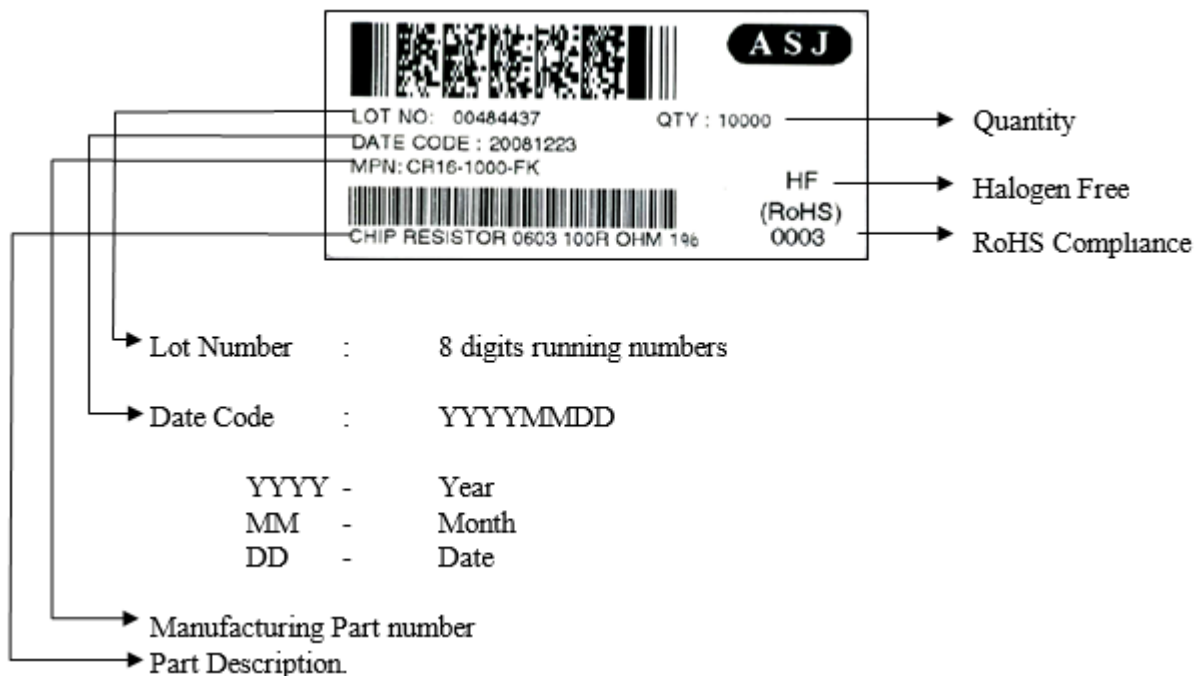
LOT NO: 00484437   QTY : 10000 → Quantity
DATE CODE : 20081223
MPN: CR16-1000-FK
                                    HF → Halogen Free
                                    (RoHS)
CHIP RESISTOR 0603 100R OHM 1%   0003 → RoHS Compliance

Lot Number   :   8 digits running numbers

Date Code   :   YYYYMMDD

              YYYY -   Year
              MM -   Month
              DD -   Date

Manufacturing Part number
Part Description.

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
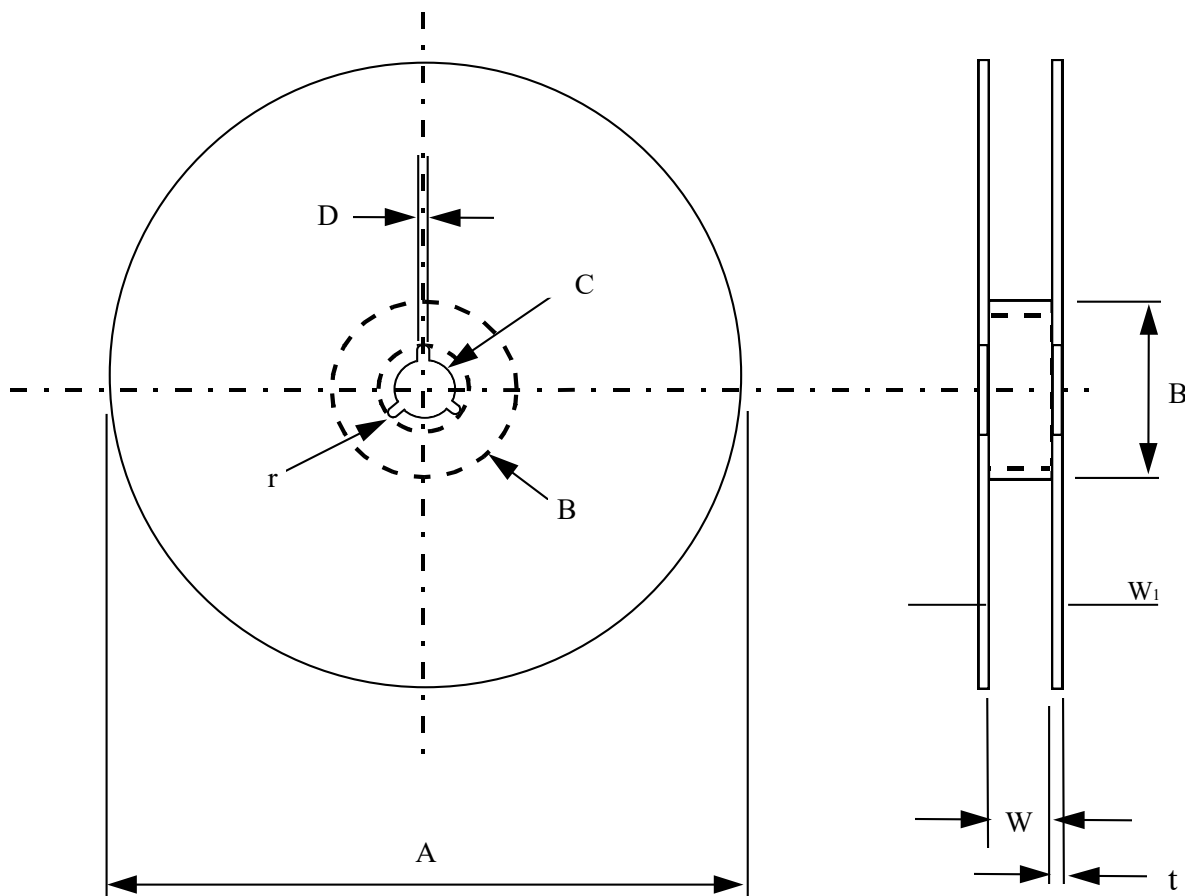
Model	A	B	C	D	W	W$_1$	t	r
7"Reel (5K) (except 0402 10K)	φ178±2.0	φ60min	13± 0.2	φ2.0± 0.5	11± 0.1	14.4 max	1.0± 0.1	1.0
7"Reel (4K)	φ178±2.0	φ60min	13± 0.2	φ2.0± 0.5	13±1.0	14.4 max	1.2± 0.1	1.0
7''Reel (10K)	φ178±2.0	φ60min	13± 0.2	φ2.0± 0.5	11± 0.1	14.4 max	1.0± 0.1	1.0
10"Reel (10K)	φ254±2.0	φ60min	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	-
13"Reel (20K)	φ330±1.0	φ100±1	13.5±0.5	2~3±0.5	10±0.5	-	-	-

A S J   Product Specification

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8.   SURFACE MOUNT LAND PATTERNS
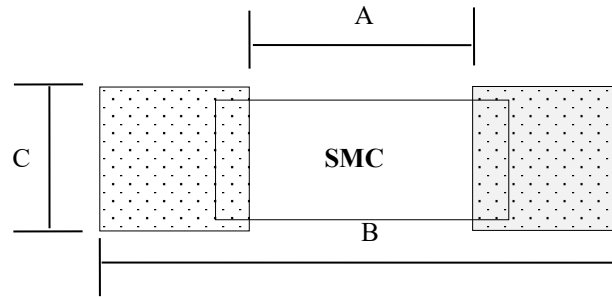
Product (Type)	Land Dimension		
	A	**B**	**C**
CR05 (0201)	0.012 [0.3]	0.04 [1.0]	0.016 [0.4]
CR10 (0402)	0.020 [0.5]	0.059 [1.5]	0.024 [0.6]
CR16 (0603)	0.031 [0.8]	0.083 [2.1]	0.035 [0.9]
CR21 (0805)	0.047 [1.2]	0.118 [3.0]	0.051 [1.3]
CR32 (1206)	0.087 [2.2]	0.165 [4.2]	0.063 [1.6]
CR40 (1210)	0.087 [2.2]	0.165 [4.2]	0.110 [2.8]
CR50 (2010)	0.138 [3.5]	0.240 [6.1]	0.110 [2.8]
CR63 (2512)	0.149 [3.8]	0.315 [8.0]	0.137 [3.5]

9.   REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version. 1	February 13,2015		Initial Release
Version.2	February 19,2016	Change 0201 I_1 dimension from 0.15±0.05 mm to 0.10±0.05 mm	Refer to ECO No. : 001/2016
Version.3	March 25,2016	Revise clause 6.1.1, typo error, change IR Reflow to Wave Soldering, 6.1.2, change Wave soldering to Reflow Soldering.	
Version.4	June 08, 2016	Revise clause 7.2.1, change dimension of punch paper carrier system for CR03, 05, 10 Revise clause 7.2.2, change dimension of punch paper carrier system for CR16, CR21, CR32, CR40, CR50, CR63	
Version 5	December 06, 2016	Update clause 7.3.4, insert 13" reel information	Refer to PCN-ECO :01/2016
Version.6	April 06, 2017	Typo error in clause 5.1 review and update dimension	
Version.7	May 19, 2017	Insert product 01005 into clause 1.2	
Version.8	Sep 14, 2017	Update clause 7.2.1 & 7.2.2 dimension information	
Version.9	05, 2017 Oct	Review and update clause 7.3.2 Packaging information	
Version.10	29,2017 Nov	Review clause 6 test condition Revise clause 7.2, update dimension of punch paper tape	Refer to PCR-004/17
Version.11	22,2017 Jan	Typo Error in clause 2	