

**KEEN SIDE**  
**electronics**

# **DATA SHEET**

**Chip Resistor - General Purpose**

# KSE Chip Resistor - General Purpose [RoHS]

KSE products comply with environmental requirement in accordance with SONY of code no. SS-00259 for not related in 10 harmful materials.

## *Features*

Small size and lightweight with size range per international standard  
Highly stable in auto-placement surface mounting application  
Compatible with both wave soldering and reflow soldering

## *Part Number)*

KSE-XXXX	X	R-07	XXXX	L
(1)	(2)	(3)	(4)	(5)

## *Examples*

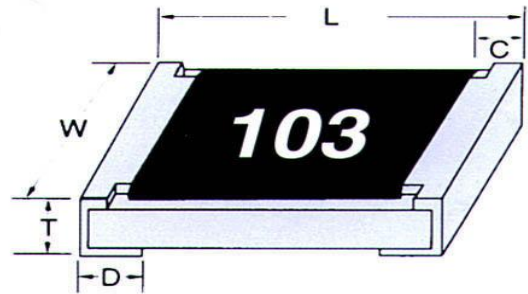
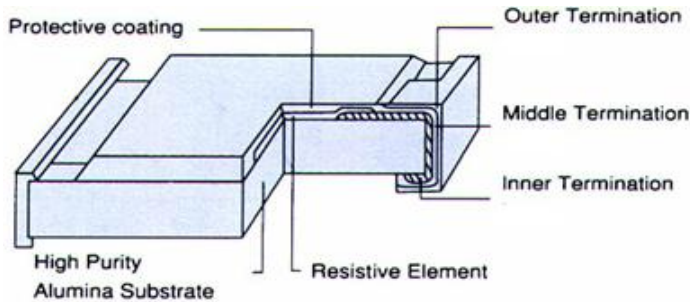
KSE- 0201 F R-07 10K L

KSE- 0603 F R-07 1K3 L

KSE Brand

1. Size = 0201,0402,0603,0805,1206,1210,1812,2010,2512
2. TOLERANCE F :  $\pm 1\%$  J :  $\pm 5\%$
3. R-07 = PACKAGING TYPE REEL
4. RESISTANCE VALUE = 4R8, 10R, 360R, 5K, 1M, 10M
5. L = Lead free

*Configuration*

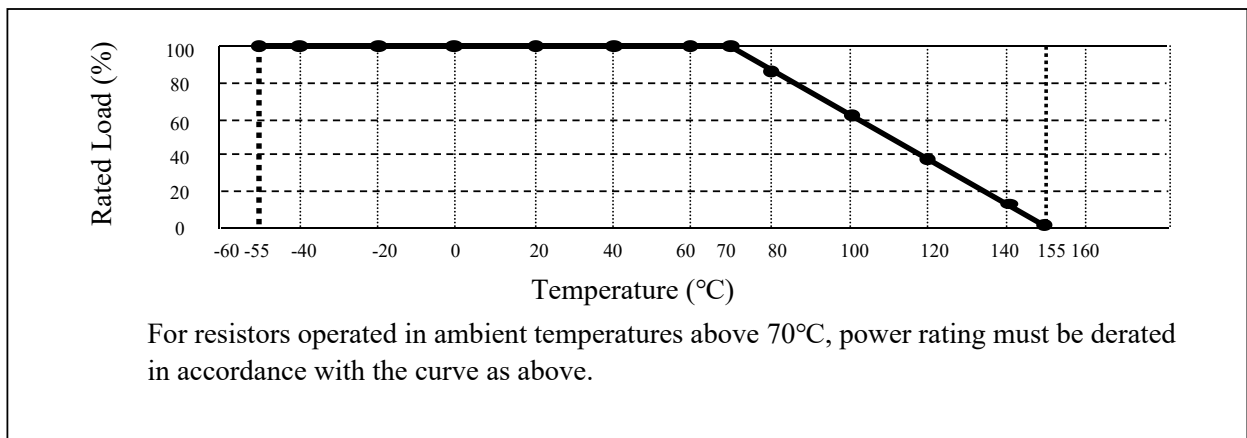


*Dimensions*

(unit: mm)

Size	L	W	T	C	D
0201	0.60 ±0.03	0.30 ±0.03	0.23 ±0.03	0.15 ±0.05	0.15 ±0.05
0402	1.00 ±0.10	0.50 ±0.05	0.35 ±0.05	0.20 ±0.10	0.25 ±0.10
0603	1.60 ±0.10	0.80 ±0.10	0.45 ±0.10	0.25 ±0.15	0.30 ±0.15
0805	2.00 ±0.10	1.25 ±0.10	0.50 ±0.10	0.35 ±0.20	0.40 ±0.20
1206	3.10 ±0.10	1.55 ±0.10	0.55 ±0.10	0.45 ±0.20	0.40 ±0.20
1210	3.10 ±0.10	2.50 ±0.10	0.55 ±0.10	0.45 ±0.25	0.45 ±0.25
1218	3.10 ±0.10	4.60 ±0.10	0.55 ±0.10	0.45 ±0.25	0.45 ±0.25
1812	4.50 ±0.10	3.10 ±0.20	0.55 ±0.05	0.55 ±0.20	0.70 ±0.20
2010	5.00 ±0.20	2.50 ±0.15	0.55 ±0.10	0.60 ±0.25	0.50 ±0.25
1225	3.10 ±0.15	6.30 ±0.15	0.90 ±0.15	0.60 ±0.30	0.80 ±0.25
2512	6.35 ±0.20	3.10 ±0.15	0.55 ±0.10	0.60 ±0.25	0.60 ±0.25

*Power Derating Curve*



# KSE Chip Resistor - General Purpose

[RoHS]

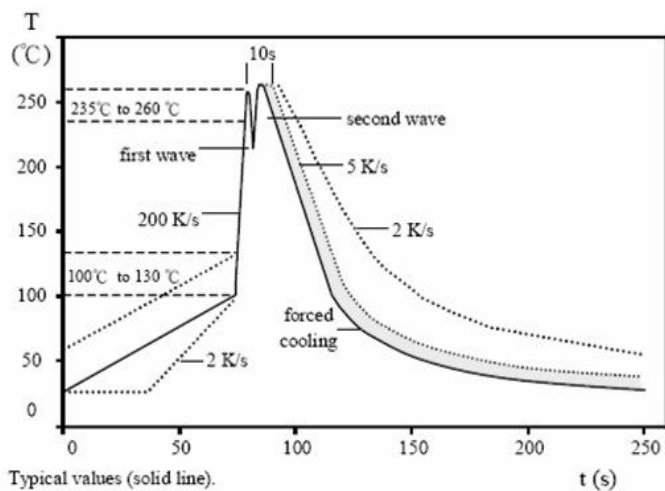
## Rating

Size	0201	0402	0603	0805	1206	1210	1812	1218	2010	2512	1225
Power Rating at 70°C	1/20W	1/16W	1/10W	1/8W	1/4W	1/3W	1/2W	1W	3/4W	1W	2W
Max RCWV	15V	50V	75V	150V	200V	200V	200V	200V	200V	200V	200V
Max Overload Voltage	30V	100V	150V	300V	400V	400V	400V	400V	400V	400V	400V
Jumper<50mΩ	0.5A	1A	1A	2A	2A	2A	2A	2A	2A	2A	10A
Operating Temperature Range	-55~+155°C										
Standard Resistance Range	0Ω	0~50mΩ									
	±1% (E-96)	1Ω~10MΩ	1Ω~10MΩ								10Ω~20KΩ
	±5% (E-24)	1Ω~10MΩ	1Ω~22MΩ								10Ω~20KΩ

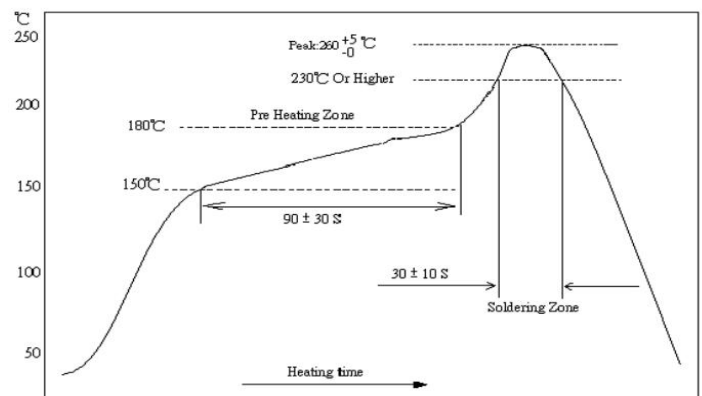
\* The working voltage is calculated based on the resistance value following the formula of  $V=\sqrt{(P*R)}$  or to its maximum extent as indicated above.

\* The overload voltage is calculated based on the resistance value following the formula of  $V=2.5\sqrt{(P*R)}$  or to its maximum extent as indicated above.

## Soldering Temperature Curve



!(WAVE Soldering)



(IR Reflow Soldering)

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## Specification and Test Methods

ITEM	SPECIFICATION	TEST METHOD
Solderability	Over 95% of termination must be covered with solder	<b>JIS C 5201 4.17 / MIL-STD-202G METHOD 208H / IEC 60115-1 4.17</b> Reflow Soldering: Bath temperature:(235±5)°C,Immersion time:(2±0.5)s WAVE Soldering: Bath temperature:(270±10)°C,Immersion time:(2±0.5)s
Resistance to Solder Heat	J、G: $\Delta R \leq \pm(1\% + 0.05\Omega)$ F: $\Delta R \leq \pm(0.5\% + 0.05\Omega)$ No mechanical damage	<b>JIS C 5201 4.18 / MIL-STD-202G METHOD 210F / IEC 60115-1 4.18</b> The temperature of the solder bath shall be (260±5)°C,The immersion time shall be(5±0.5)s or(10±1)s as prescribed by the detail specification
Temperature Coefficient of Resistance (TCR)	0402 (0402 & 0201): 1Ω~10Ω;>3.3M: ±400ppm/°C 10Ω(excluding 10Ω)~3.3M: ±200ppm/°C 0603 (0603 or above): 1Ω~10Ω;>1M: ±200ppm/°C 10Ω(excluding10Ω)~1M: ±100ppm/°C	<b>JIS C 5201 4.8 / MIL-STD-202G METHOD 304 / IEC 60115-1 4.8</b>  The temperature characteristic or temperature coefficient of resistance is not specified for resistance values of less than 5R owing to difficulty of accurate measurement
Short time Overload	J、G: $\Delta R \leq \pm(2\% + 0.05\Omega)$ F: $\Delta R \leq \pm(1\% + 0.05\Omega)$	<b>JIS C 5201 4.13/IEC 60115-1 4.13</b> 2.5×Rated voltage or Max. Overload Voltage for 5 sec. measure resistance after 30 minutes
Load Life Humidity	J、G: $\Delta R \leq \pm(3\% + 0.05\Omega)$ F: $\Delta R \leq \pm(1\% + 0.05\Omega)$	<b>JIS C 5201 4.24/MIL-STD-202G Method 106G / IEC 60115-1 4.24</b> Maintain the temperature of the resistor at 40±2°C and 90~95% RH with the rated voltage applied.Cycle ON for 1.5 hours and OFF for 0.5 hour for1000+48/-0 hours. After 1~4 hour, measure the resistance value.
Load Life	J、G: $\Delta R \leq \pm(3\% + 0.05\Omega)$ F: $\Delta R \leq \pm(1\% + 0.05\Omega)$	<b>JIS C 5201 4.25/MIL-STD-202G Method 108A / IEC 60115-1 4.25</b> 70 ±2°C, Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”.
Temperature Cycle	J、G: $\Delta R \leq \pm(1\% + 0.05\Omega)$ F: $\Delta R \leq \pm(0.5\% + 0.05\Omega)$ No mechanical damage	<b>JIS C 5201 4.19/MIL-STD-202G Method 107G / IEC 60115-1 4.19</b> Repeat 5 cycles as follows -65°C(30 min.)+25°C(2~3 min.) +125°C(30 min.)+25°C(2~3 min.)
Insulation Resistance	Between termination and coating must be over 1000MΩ	<b>JIS C 5201 4.6 / MIL-STD-202G Method 302 / IEC 60115-1 4.6</b> Test voltage: 100±15V
Bending Strength	J、G: $\Delta R \leq \pm(1\% + 0.05\Omega)$ F: $\Delta R \leq \pm(0.5\% + 0.05\Omega)$ No mechanical damage	<b>JIS C 5201 4.33 / MIL-STD-202G Method 211A / IEC 60115-1 4.33</b> Resistance change after bended on the 90mm PCB. Bend: 3mm for 0201、0402、0603、0805、1206 2mm for 1210、1812、1218、1225 1mm for 2010、2512

# KSE Chip Resistor - General Purpose [RoHS]

## Markings



1.1.  $\pm 5\%$  (IEC E-24 Series) 0603、0805、1206 (0201、0402)

No markings on 0201 and 0402. Markings on the other sizes are expressed by a 3-digit code in its exact value.

E. G. : 6R8=6.8 $\Omega$ ; 100=10 $\times 10^0$ =10 $\Omega$ ; 472=47 $\times 10^2$ =4700 $\Omega$ =4.7K $\Omega$ 。

1.2.  $\pm 1\%$  (+/-1% Resistance value markings)

a. 0805、1206  $\pm 1\%$

Markings on sizes 0805, 1206 and above are expressed by a 4-digit code.

E. G. : 82R5=82.5 $\Omega$ ; 1000=100 $\times 10^0$ =100 $\Omega$ ; 2212=221 $\times 10^2$ =22100 $\Omega$ =22.1K $\Omega$ 。

b. 0603  $\pm 1\%$ ( IEC E-96)

Markings on 0603  $\pm 1\%$ ( IEC E-96 Series ) are expressed by a 3-digit code; the first two digits represent E-96: The coding system of the E-96 series is as follows :

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

Multiplier code

Code	A	B	C	D	E	F	G	X	Y	Z
Multiplier	10 <sup>0</sup>	10 <sup>1</sup>	10 <sup>2</sup>	10 <sup>3</sup>	10 <sup>4</sup>	10 <sup>5</sup>	10 <sup>6</sup>	10 <sup>-1</sup>	10 <sup>-2</sup>	10 <sup>-3</sup>

E. G. : 01Y=100 $\times 10^{-2}$ =1 $\Omega$ ; 68A=499 $\times 10^0$ =499 $\Omega$ ; 02D=102 $\times 10^3$ =102K $\Omega$

c. Any resistance values of 1% tolerance but not included in the E-96 series, the value markings are the same as +/-5% tolerance with labelling identification.

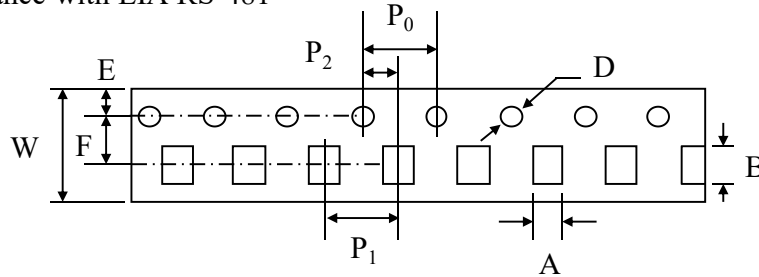
E. G.: 120=12 $\times 10^0$ =12 $\Omega$ ; 475=47 $\times 10^5$ =4.7M $\Omega$ 。

d. Marking of the 0 Ohm resistor is a '0' with its value range from 0-50m $\Omega$ . No tolerance shown on the product label.

# KSE Chip Resistor - General Purpose [RoHS]

## Tape and Reel Package

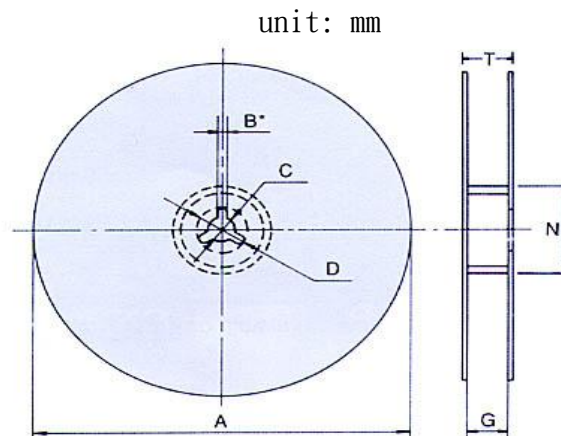
Taping is in accordance with EIA RS-481



Accumulated dimensional tolerance  $40 \pm 0.2 \text{mm}$

Size	A	B	W	F	E	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	D
0201	0.40 ±0.10	0.75 ±0.10	8.00 ±0.30	3.50 ±0.05	1.75 ±0.10	2.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
0402	0.65 ±0.10	1.15 ±0.10	8.00 ±0.30	3.50 ±0.05	1.75 ±0.10	2.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
0603	1.10 ±0.20	1.90 ±0.20	8.00 ±0.30	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
0805	1.65 ±0.20	2.40 ±0.20	8.00 ±0.30	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
1206	2.00 ±0.20	3.50 ±0.20	8.00 ±0.30	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
1210	2.85 ±0.20	3.50 ±0.20	8.00 ±0.30	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
1218	5.50 ±0.20	3.50 ±0.20	12.0 ±0.30	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
1812	3.50 ±0.20	5.50 ±0.20	12.0 ±0.30	3.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
2010	2.80 ±0.20	5.50 ±0.20	12.0 ±0.30	5.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
1225	3.38 ±0.20	6.68 ±0.20	12.0 ±0.30	5.50 ±0.10	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10
2512	3.50 ±0.20	6.70 ±0.20	12.0 ±0.30	5.50 ±0.05	1.75 ±0.10	4.00 ±0.10	2.00 ±0.05	4.00 ±0.10	1.50 ±0.10

Size	Packaging Q'ty
0201	10Kpcs/Reel
0402	10Kpcs/Reel
0603	5Kpcs/Reel
0805	
1206	
1210	
1218	4Kpcs/Reel
1812	
2010	
2512	
1225	2Kpcs/Reel

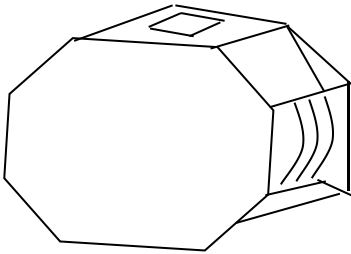


Symbol	A	N	C	D	B	G	T
Dimension	178 ±3.0	60.0 ±2.0	13.0 ±1.0	19.5 ±1.0	2.30 ±0.5	10.0 ±1.5	14.9 max.
	178 ±3.0	60.0 ±2.0	13.0 ±1.0	19.5 ±1.0	2.30 ±0.5	13.8 ±1.5	16.7 max.

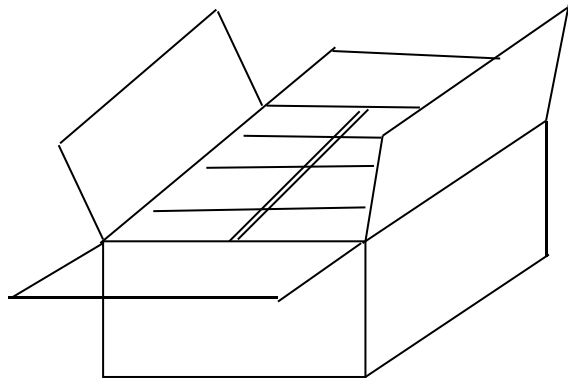
Storage Condition	Temp	Humidity	Storage Time	1 year
	5~35°C	20%-70%		

# KSE Chip Resistor - General Purpose [RoHS]

## *Outer Packaging*



First package: 1~10 reels (inner box)



Second package: 80 reels Max (export carton)

- When quantity shall not reach the max, the remaining empty space shall be filled up with buffer material.
- When the quantity is a few, alternative packing methods may be used. It is important to ensure the safety of the products during transportation.