



AN ISO 9001:2008 CERTIFIED MANUFACTURER
 AN ISO 45001 : 2018 MANUFACTURER
 AN ISO 14001 : 2004 MANUFACTURER



www.atd-elektronik.cz
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SPECIFICATIONS FOR APPROVAL

Customer: _____

Name of Product: Chip Resistor - LED Series(RoHS)

Sales Executive : _____ Date: _____

Prepared by	Quality by	Sales by	Authorized by
customer approval	customer approval	customer approval	customer approval

Chip Resistor - LED Series [RoHS]




■(Part Number)

<u>LED</u>	<u>06</u>	<u>13R</u>	<u>J</u>	<u>LF</u>
Type	Size	Value	Tolerance	Lead Free
LED	06 :1206	13R	J : ±5%	

■ (Label explanation)



香港電阻製造廠
HONG KONG RESISTORS MANUFACTORY

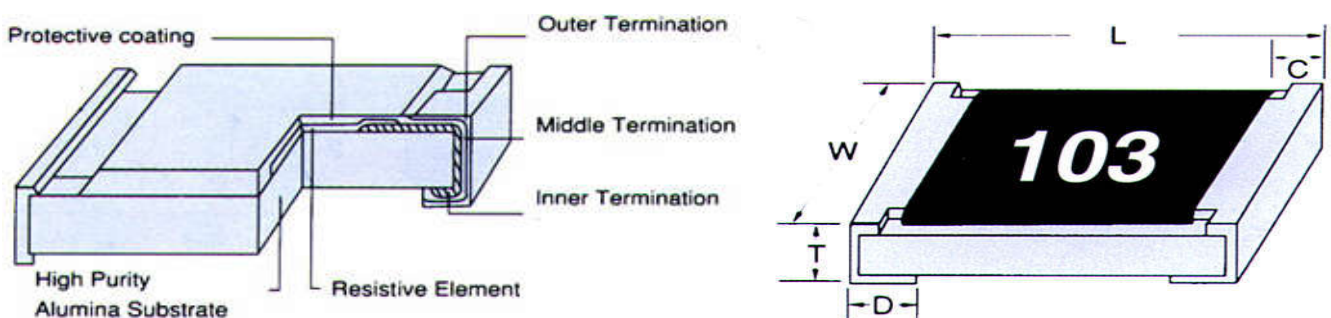
香港電阻P/N	HKR Part No.	→	MFG P/N: LED06 13RJ LF	
規格/阻值/誤差	Size/Value/Tolerance	→	SIZE: 1206 VALUE: 13R	TOL: +/-5%
數量	Quantity	→	QTY: 5000PCS	 
批號及二維碼	Lot No. and QR Code	→	LOT NO: 10722450Y06010	
客戶訂單號	Customer Purchase Order	→	PO: P021070509-108-008	
客戶P/N及條碼	Customer Part No. and barcode	→	PART NO: 3010100410	
				

SONY SS-00259 HKR 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 int'l standard
- Highly stable in auto-placement surface mounting application
- Compatible with both wave soldering and reflow soldering
- Excellent Solderability and Terminal bending capacity, especially suitable for LED and the field of flexible circuit board

■ (Configuration)



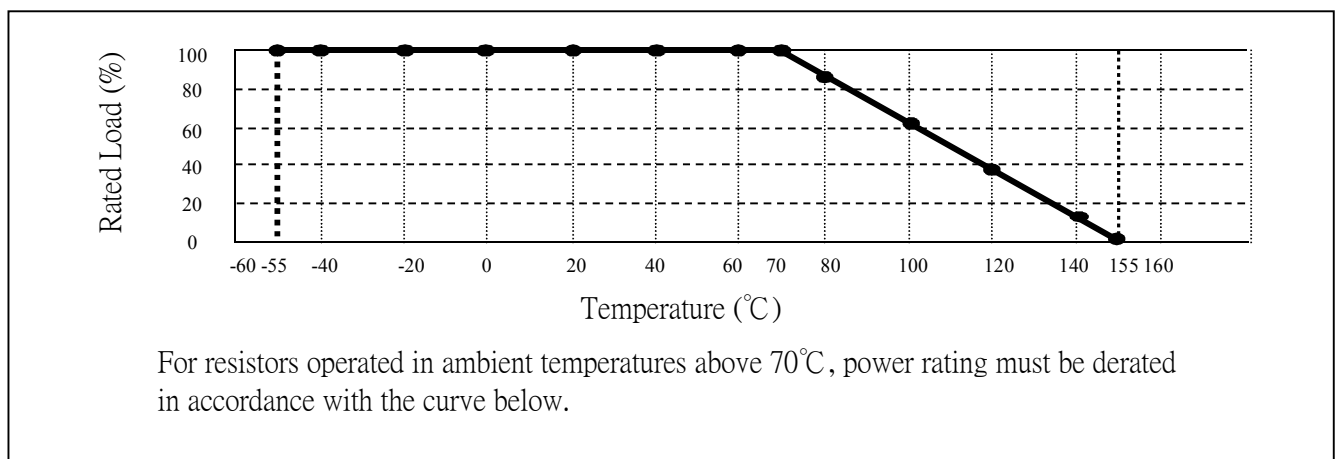
■ (Dimensions)

(unit: mm)

Size	L	W	T	C	D
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	0.30 ±0.20
1206	3.10 ±0.10	1.60 ±0.10	0.55 ±0.10	0.45 ±0.20	0.40 ±0.20

206 10R~910R , D0.70±0.20mm.

■ (Power Derating Curve)



■ (Rating) LED

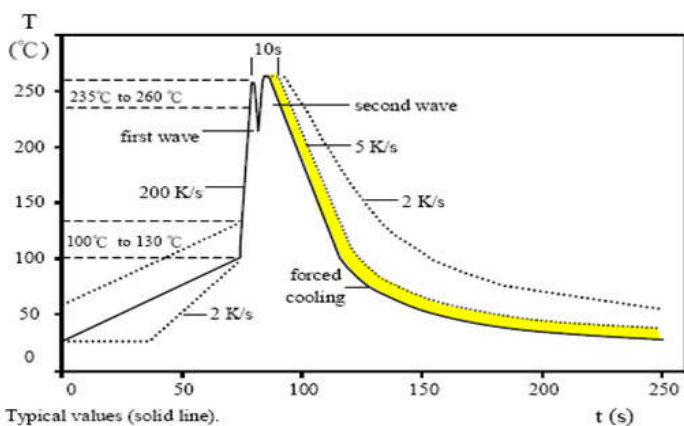
Type	LED03	LED05	LED06
Size	0603	0805	1206
Power Rating at 70°C	1/10W	1/8W	1/4W
Max RCWV	50V	150V	200V
Max Overload Voltage	100V	300V	400V
Jumper<50mΩ	1A	1A	2A
Operating Temperature Range	-55~+125°C		
Standard Resistance Range	0Ω	0~50mΩ	
	±1% (E-96)	10Ω~2.2MΩ	
	±5% (E-24)	1Ω~22MΩ	

* 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.

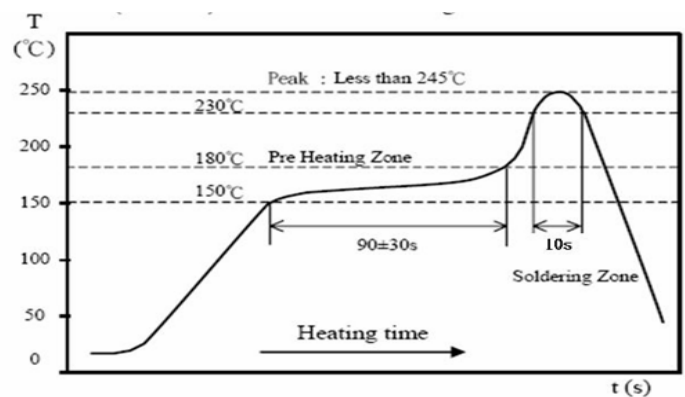
* $2.5\sqrt{(P*R)}$ °

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)



波峰焊 (Wave Soldering)



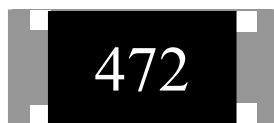
回流焊 (IR Reflow Soldering)

Chip Resistor - LED Series [RoHS]

■ (Specification and Test Methods)

ITEM	SPECIFICATION	TEST METHOD
Solderability	Over 95% of termination must be covered with solder	JIS C 5201 4.17 / MIL-STD-202G METHOD 208H / IEC 60115-1 4.17 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	JIS C 5201 4.18 / MIL-STD-202G METHOD 210F / IEC 60115-1 4.18 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)	1Ω~10Ω;>1M : ±200ppm/°C 10Ω(excluding10Ω)~1M : ±100ppm/°C	JIS C 5201 4.8 / MIL-STD-202G METHOD 304 / IEC 60115-1 4.8 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: $\Delta R \leq \pm(1\% + 0.05\Omega)$	JIS C 5201 4.13/IEC 60115-1 4.13 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: $\Delta R \leq \pm(1\% + 0.05\Omega)$	JIS C 5201 4.24/MIL-STD-202G Method 106G / IEC 60115-1 4.24 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: $\Delta R \leq \pm(1\% + 0.05\Omega)$	JIS C 5201 4.25/MIL-STD-202G Method 108A / IEC 60115-1 4.25 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	JIS C 5201 4.19/MIL-STD-202G Method 107G /IEC 60115-1 4.19 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	JIS C 5201 4.6 / MIL-STD-202G Method 302 / IEC 60115-1 4.6 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	JIS C 5201 4.33 / MIL-STD-202G Method 211A / IEC 60115-1 4.33 Resistance change after bended on the 90mm PCB. Bend: 3mm0603、0805、1206

■ (Markings)



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

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

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

a. 0805、1206 $\pm 1\%$

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

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 the value code and the last capital letter represents the multiplier.

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 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁻¹	10 ⁻²	10 ⁻³

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

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.

G. : 120=12 $\times 10^0$ =12 Ω ; 475=47 $\times 10^5$ =4.7M Ω ◦

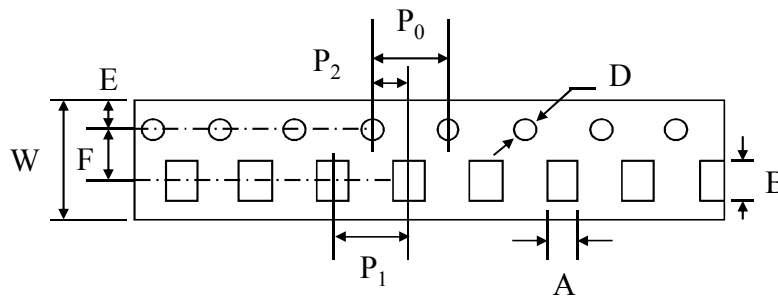
Marking of the 0 Ohm resistor is a '0' with its value range from 0-50m Ω . No tolerance shown on the product label.

Chip Resistor - LED Series

[RoHS]

■ **(Tape and Reel Package)** Taping is in accordance

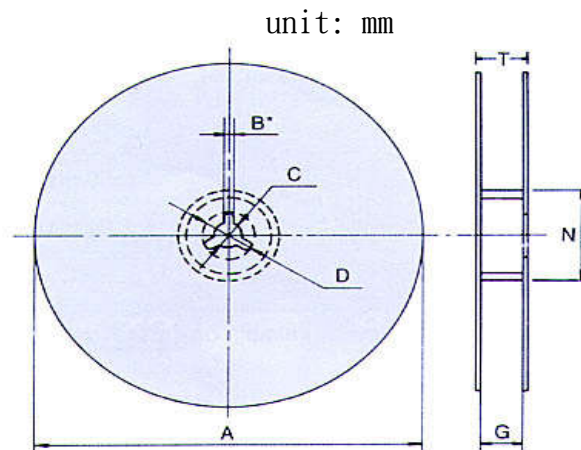
with EIA RS-481



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

Size	A	B	W	F	E	P ₁	P ₂	P ₀	D
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

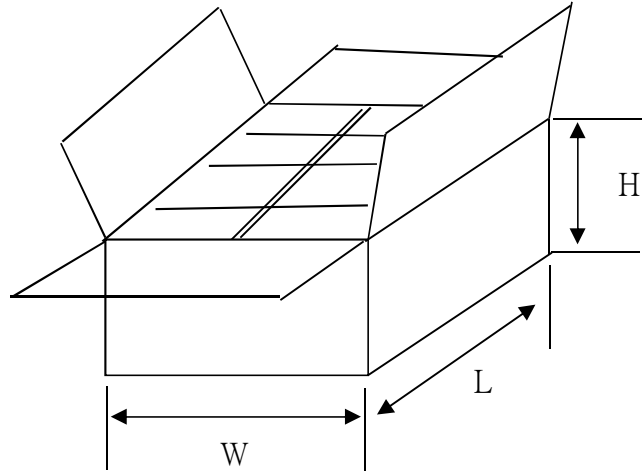
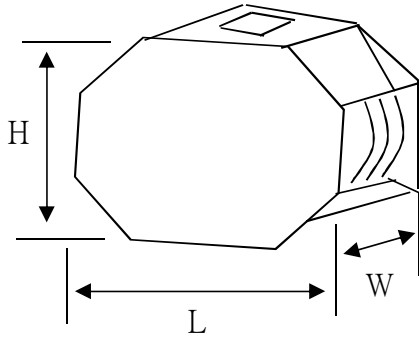
Size	Packaging Q'ty
0603	5Kpcs/Reel
0805	
1206	



Symbol	A	N	C	D	B	G	T
Dimension	178 ±2.0	80.0 ±0.5	13.0 ±0.5	20min	2.00 ±0.5	10.0 ±1.5	14.9 max.
	178 ±2.0	80.0 ±0.5	13.0 ±0.5	20min	2.00 ±0.5	13.8 ±1.5	16.7 max.

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

■ (Outer Packaging)



First package : 1~10 reels (inner box)

Second package : 66 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.

TYPE	PER CARTON	INNER BOX			EXPORT CARTON		
		L	W	H	L	W	H
0603	300,000PCS	180mm	118mm	180mm	350mm	348mm	237mm
0805	300,000PCS	180mm	118mm	180mm	350mm	348mm	237mm
1206	300,000PCS	180mm	118mm	180mm	350mm	348mm	237mm