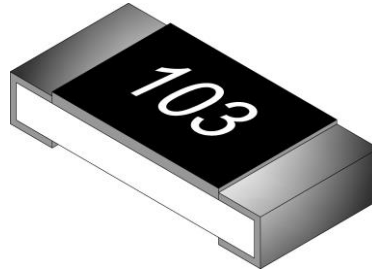




CUH Series Thick Film Ultra High Power Chip Resistor Product Specifications

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Thick Film Ultra High Power Chip Resistor — CUH Series



Application

- Consumer electrical
- Home Appliance: Air conditioner, Refrigerator
- Computer & relative products: Main board
- Communication equipment: Cell phone, Fax machine
- Power equipment: Power supply, Illumination equipment
- Measuring instrument: Electric meter, Navigation equipment

Features

- Small size and light weight
- Reliability, high quality

Parts Number Explanation

Example:

CUH	0603	J	10R0	P	05	Z
Product Type	Size (Inch)	Resistor Tolerance	Resistors Value	Package	Quantity	Optional
Thick Film Ultra High Power Chip Resistor	0402 0603 0805 1206 1210 2010 2512	D : $\pm 0.5\%$ F : $\pm 1\%$ G : $\pm 2\%$ J : $\pm 5\%$		P : Paper Taping (0603~1210) Q : Paper Taping (0402) E : Embossed Taping B : Packed in a Bag	04 : 4000PCS 05 : 5000PCS 10 : 10000PCS 40 : 40000PCS 50 : 50000PCS	Z : Ultra High power 7 : TCR $\pm 200\text{ppm}$



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Ultra High Power Rating Electrical Specifications

Item Type	Rated Power at 70°C	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/ °C)	Resistance Range		
					D(±0.5%)	F(±1%) G(±2%)	J(±5%)
CUH0402	0.125W	50V	100V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
CUH0603	0.33W	75V	125V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
CUH 0805	0.5W	200V	300V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
CUH1206	0.75W	200V	400V	±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
CUH1210	1W			±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
CUH2010	1.5W			±400	-	$1\Omega \leq R < 10\Omega$	
				±100	$10\Omega \leq R \leq 1M\Omega$	$10\Omega \leq R \leq 10M\Omega$	
CUH2512	3W	250V	500V	±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 : $-55^{\circ}\text{C} \sim +155^{\circ}\text{C}$.

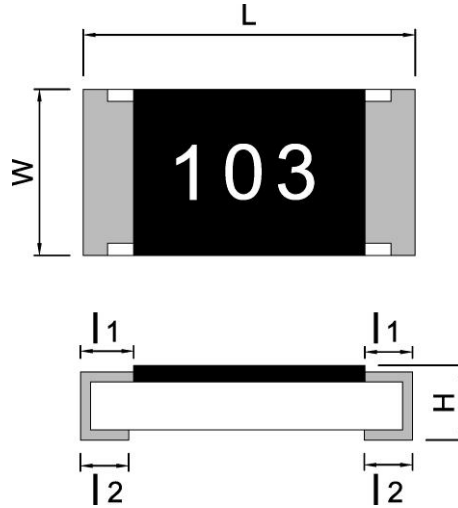
● Type CUH0402/0603/0805/1206/1210/2010/2512 $1\Omega \leq R < 10\Omega$ optional code 「7」 is TCR: $\pm 200\text{PPM}$



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■ Type Dimension



CUH0402 / CUH0603 / CUH0805 / CUH1206
 CUH1210 / CUH1812 / CUH2010 / CUH2512

TYPE	L	W	H	l ₁	l ₂
CUH0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.15 ± 0.10	0.20 ± 0.10
CUH0603	1.60 ± 0.20	0.80 ± 0.15	0.40 ± 0.10	0.30 ± 0.20	0.30 ± 0.10
CUH0805	2.00 ± 0.20	1.25 ± 0.15	0.50 ± 0.15	0.30 ± 0.15	0.40 ± 0.15
CUH1206	3.05 ± 0.10	1.60 ± 0.20	0.55 ± 0.15	0.40 ± 0.20	0.50 ± 0.20
CUH1210	3.05 ± 0.10	2.50 ± 0.20	0.55 ± 0.15	0.50 ± 0.20	0.50 ± 0.20
CUH2010	5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20
CUH2512	6.30 ± 0.20	3.20 ± 0.20	0.68 ± 0.15	0.60 ± 0.20	0.60 ± 0.20

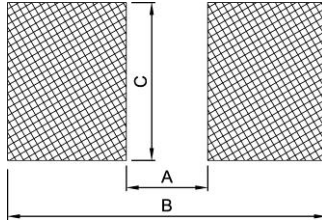


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● General Information

■ Recommend Land Pattern Design



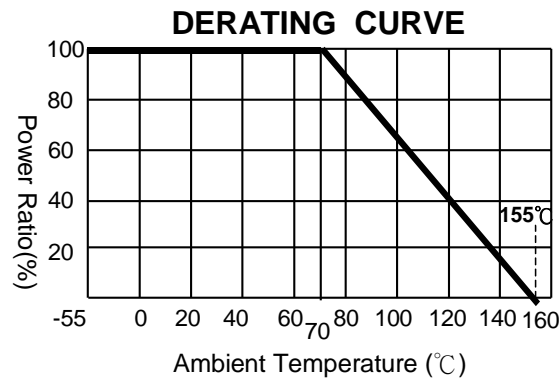
■ Dimension

Unit: mm

Item \ Type	0402	0603	0805	1206	1210	1812	2010	2512
A	0.60	0.80	1.30	2.20	2.00	3.11	3.80	4.90
B	1.60	2.40	2.90	4.20	4.40	5.91	6.60	8.10
C	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)



CUH Series Thick Film Ultra High Power Chip Resistor Product Specifications

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● Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS C 5201-1 clause 4.8	-55°C or +155°C, 25°C is the reference temperature	Refer to Ratings
Short Time Overload	IEC 60115-1, clause 4.13	Ultra Power : 5 × Rated power for 5 seconds	±1 : ±(1.0%+0.05Ω) ±5 : ±(2.0%+0.1Ω) Value <1Ω : ±(2.0%+0.1Ω)
IR Reflow	Sony SS-00254	<p>Peak : 250⁺⁵ °C 230°C or higher</p> <p>180°C --- Pre Heating Zone</p> <p>150°C --- 90 ± 30 s</p> <p>30 ± 10 s Soldering Zone</p> <p>Heating Time</p>	±1 : ±(1.0%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Leaching	Sony SS-00254-9	260±5°C for 30 seconds.	>95% Coverage
Soldering Heat	JIS C 5201-1 clause 4.18	260±5°C for 10 seconds.	±1 : ±(0.5%+0.05Ω) ±5 : ±(1.0%+0.05Ω) Value <1Ω : ±(1.0%+0.05Ω)
Temperature Cycling	JIS C 5201-1 clause 4.19	-55°C to +155°C, 5 cycles	0.1%、0.5%、1% : ±(0.5%+0.05Ω) 2%、5% : ±(1.0%+0.10Ω) Value <1Ω : ±(1.0%+0.10Ω)
Electric Iron	Sony SS-00254-5	Preheating temperature : 350±10°C Electric iron preheating time : 3+1/-0 sec	±1 : ±(1.0%+0.05Ω) ±5 : ±(1.0%+0.05Ω) Value <1Ω : ±(1.0%+0.05Ω)
Resistance to Solvent	JIS C 5201-1 clause 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 : ±(0.5%+0.05Ω) ±5 : ±(0.5%+0.05Ω) Value <1Ω : ±(1.0%+0.05Ω)
Load Life in Humidity	JIS C 5201-1 clause 4.24	40±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 hr "OFF" .	0.1%、0.5%、1% : ±(1.0%+0.05Ω) 2%、5% : ±(2.0%+0.05Ω) Value <1Ω : ±(2.0%+0.05Ω)
Load Life (Endurance)	JIS C 5201-1 clause 4.25	70±2°C, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" .	0.1%、0.5%、1% : ±(1.0%+0.05Ω) 2%、5% : ±(3.0%+0.10Ω) Value <1Ω : ±(3.0%+0.10Ω)
Insulation Resistance	JIS C 5201-1 clause 4.6	100V for 1 minute.	≥ 10GΩ
Terminal Bending Strength	JIS C 5201-1 clause 4.33	Bending once for 5 seconds D : 0402、0603、0805=5mm 1206、1210、1812=3mm 2010、2512 =2mm	±1 : ±(1.0%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Solderability	JIS C 5201-1 clause 4.17	245±5°C for 2±0.5secs	>95% coverage

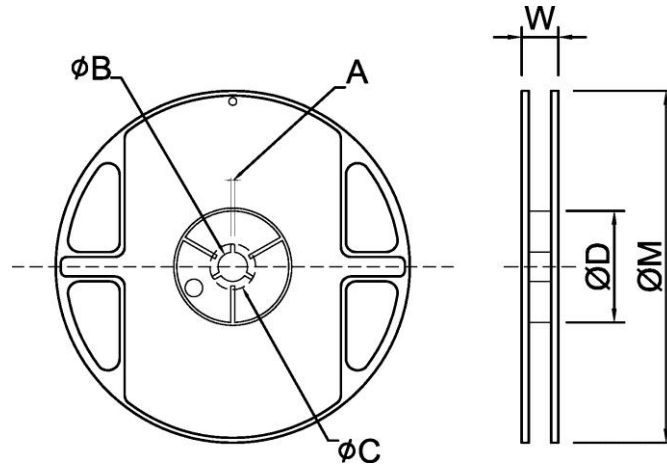


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Appendix For SMD Chip Resistor

● Packaging Information



Dimension

Unit:mm

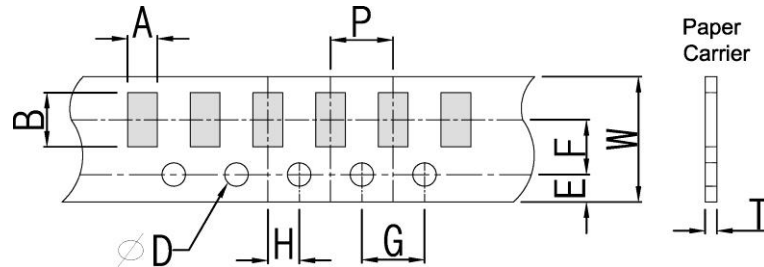
TYPE	SIZE	A	φB	φC	φD	W	φM	
0402	7"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
	13"	40K/50K Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	330±2.0
0603/0805/1206/1210	7"	5K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
0603/0805 /1206	10"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	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
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



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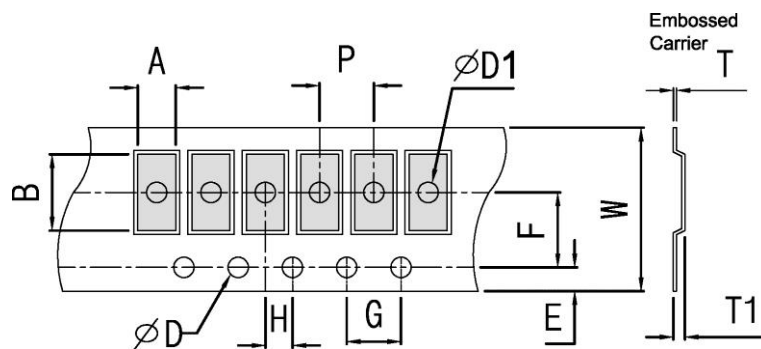
■ Tapping Specification



■ Dimension

Unit: mm

Packaging	Type	A	B	W	E	F	G	H	T	ϕD	P
Paper Type	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	1.50 ^{+0.10} ₋₀	2.0±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		4.0±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		4.0±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		4.0±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



■ Dimension

Unit: mm

Packaging	Type	A	B	W	E	F	G	H	T	ϕD	$\psi D1$	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	

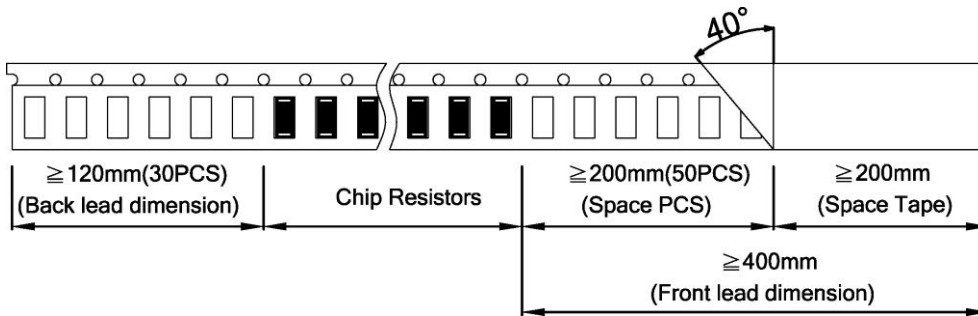


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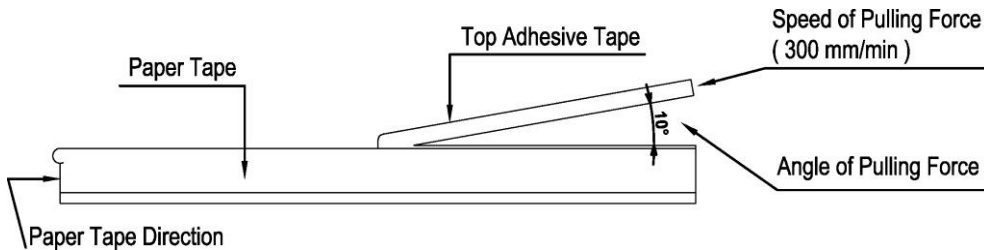
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■ Packing Material Data/Storage Data

■ Front & Back Lead Dimension

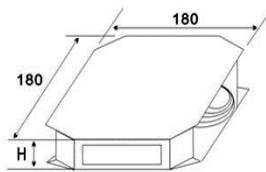


■ Top Adhesive Peel Off Strength : 10~70g

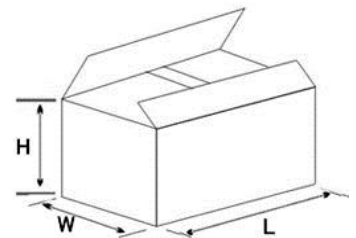


■ Package

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: $25 \pm 5^\circ\text{C}$ & humidity: $60 \pm 20\%$ is valid for one year from the date of delivery.



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■ Standard Resistance Values in a Decade

Marking code:

- 1%: marking code, please refer to E96 and E24 data form as below
 Ex: 120K, The marking code is 1203 in E24
 121K, The marking code is 1213 in E96
- 5%: marking code, please refer to E24 data form as below
 Ex: 120K, The marking code is 124 in E24
- Note: 0402 series resistor has no marking code.
- Type: 0603 1% marking code, please refer to E-96 multiplier code.
- Note: jumper zero ohm resistor marking code is one 「0」 (except type below 0402).

E192	E96	E48	E192	E96	E48	E192	E96	E48	E192	E96	E48	E192	E96	E48
100	100	100	169	169	169	287	287	287	487	487	487	825	825	825
101			172			291			493			835		
102	102		174	174		294	294		499	499		845	845	
104			176			298			505			856		
105	105	105	178	178	178	301	301	301	511	511	511	866	866	866
106			180			305			517			876		
107	107		182	182		309	309		523	523		887	887	
109			184			312			530			898		
110	110	110	187	187	187	316	316	316	536	536	536	909	909	909
111			189			320			542			920		
113	113		191	191		324	324		549	549		931	931	
114			193			328			556			942		
115	115	115	196	196	196	332	332	332	562	562	562	953	953	953
117			198			336			569			965		
118	118		200	200		340	340		576	576		976	976	
120			203			344			583			988		
121	121	121	205	205	205	348	348	348	590	590	590			
123			208			352			597					
124	124		210	210		357	357		604	604				
126			213			361			612					
127	127	127	215	215	215	365	365	365	619	619	619	10	10	10
129			218			370			626			11	10	10
130	130		221	221		374	374		634	634		12	12	
132			223			379			642			13		
133	133	133	226	226	226	383	383	383	649	649	649	15	15	15
135			229			388			657			16	15	15
137	137		232	232		392	392		665	665		18	18	
138			234			397			673			20		
140	140	140	237	237	237	402	402	402	681	681	681	22	22	22
142			240			407			690			24	22	22
143	143		243	243		412	412		698	698		27	22	22
145			246			417			706			30	27	
147	147	147	249	249	249	422	422	422	715	715	715	33	33	33
149			252			427			723			36	33	33
150	150		255	255		432	432		732	732		39	33	
152			258			437			741			43	39	
154	154	154	261	261	261	442	442	442	750	750	750	47	47	47
156			264			448			759			51	47	47
158	158		267	267		453	453		768	768		56	56	
160			271			459			777			62	56	
162	162	162	274	274	274	464	464	464	787	787	787	68	68	68
164			277			470			796			75	68	68
165	165		280	280		475	475		806	806		82	82	
167			284			481			816			91		

According to IEC publication 63