

Data Sheet No: E08001

Version: V2

Date: 2024/8/21



# HPCR

## High Power Thick Film Chip Resistor

Resistance	1Ω~10MΩ
Tolerance	±0.1%
TCR	±100、±400ppm/°C
Rated Power	0.1W~2W

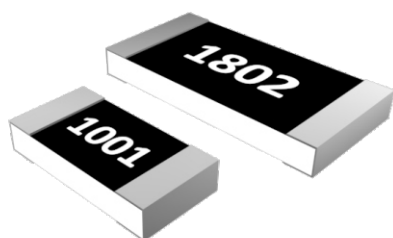
### Applications

- Instrumentation
- Consumer Electronics
- Communication Equipment
- Power Equipment

**Better Solution for Sustainable  
High End Manufacturing**



### Rated power is twice higher than general thick film resistor High Reliability & Stable Electrical Performance



### Introduction

By improving the process, HPCR high-power thick film resistors can withstand greater power than ordinary thick film resistors of the same size, which is more conducive to saving space and improving pulse load capacity. In industries such as military, medical, and railway, customers have already started using this series of products.

The load life of a resistor is closely related to its power. Using a high-power thick film resistor instead of a standard thick film resistor of the same size will have greater space for derating, which helps improve the long-term stability of the resistor and enhance its reliability.

### Electrical Parameters

Size	Rated Power (+70°C)	Max. Operating Voltage	Overload Voltage	Overload Current	Operating Temperature °C	Resistance	TCR ppm/°C	Tolerance %
HPCR0402	0.1W	50V	100V	6A	-55~+155	1Ω ≤ R < 10Ω	±400	±1
						10Ω ≤ R ≤ 1MΩ	±100	±0.1, ±0.5, ±1
						1MΩ < R ≤ 10MΩ	±100	±1
*	0Ω Jumper Resistor		R <sub>max.</sub> = 20mΩ		I <sub>max.</sub> at 70°C = 2A			
HPCR0603	0.125W	75V	150V	9A	-55~+155	1Ω ≤ R < 10Ω	±400	±1
						10Ω ≤ R ≤ 1MΩ	±100	±0.1, ±0.5, ±1
						1MΩ < R ≤ 10MΩ	±100	±1
*	0Ω Jumper Resistor		R <sub>max.</sub> = 20mΩ		I <sub>max.</sub> at 70°C = 2.5A			
HPCR0805	0.25W	150V	300V	13A	-55~+155	1Ω ≤ R < 10Ω	±400	±1
						10Ω ≤ R ≤ 1MΩ	±100	±0.1, ±0.5, ±1
						1MΩ < R ≤ 10MΩ	±100	±1
*	0Ω Jumper Resistor		R <sub>max.</sub> = 20mΩ		I <sub>max.</sub> at 70°C = 3.5A			
HPCR1206	0.5W	200V	400V	16A	-55~+155	1Ω ≤ R < 10Ω	±400	±1
						10Ω ≤ R ≤ 1MΩ	±100	±0.1, ±0.5, ±1
						1MΩ < R ≤ 10MΩ	±100	±1
*	0Ω Jumper Resistor		R <sub>max.</sub> = 20mΩ		I <sub>max.</sub> at 70°C = 5A			
HPCR1210	0.66W	200V	400V	19A	-55~+155	1Ω ≤ R < 10Ω	±400	±1
						10Ω ≤ R ≤ 1MΩ	±100	±0.1, ±0.5, ±1
						1MΩ < R ≤ 10MΩ	±100	±1
*	0Ω Jumper Resistor		R <sub>max.</sub> = 20mΩ		I <sub>max.</sub> at 70°C = 6A			
HPCR1812	1W	200V	400V	22A	-55~+155	1Ω ≤ R < 10Ω	±400	±1
						10Ω ≤ R ≤ 1MΩ	±100	±0.1, ±0.5, ±1
						1MΩ < R ≤ 10MΩ	±100	±1
*	0Ω Jumper Resistor		R <sub>max.</sub> = 20mΩ		I <sub>max.</sub> at 70°C = 7A			

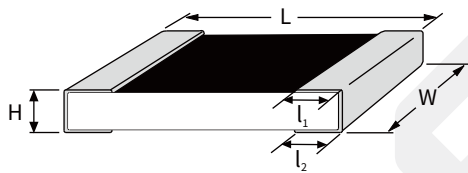
### Electrical Parameters

Size	Rated Power (+70°C)	Max. Operating Voltage	Overload Voltage	Overload Current	Operating Temperature °C	Resistance	TCR ppm/°C	Tolerance %
HPCR2010	1W	200V	400V	22A	-55~+155	$1\Omega \leq R < 10\Omega$	±400	±1
						$10\Omega \leq R \leq 1M\Omega$	±100	±0.1, ±0.5, ±1
						$1M\Omega < R \leq 10M\Omega$	±100	±1
*	<b>0Ω Jumper Resistor</b>			<b><math>R_{max.} = 20m\Omega</math></b>	<b><math>I_{max.} \text{ at } 70^\circ\text{C} = 7A</math></b>			
HPCR2512	2W	200V	400V	30A	-55~+155	$1\Omega \leq R < 10\Omega$	±400	±1
						$10\Omega \leq R \leq 1M\Omega$	±100	±0.1, ±0.5, ±1
						$1M\Omega < R \leq 10M\Omega$	±100	±1
*	<b>0Ω Jumper Resistor</b>			<b><math>R_{max.} = 20m\Omega</math></b>	<b><math>I_{max.} \text{ at } 70^\circ\text{C} = 10A</math></b>			

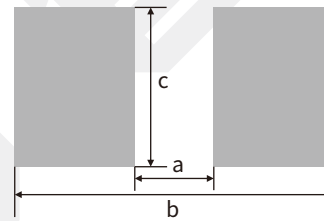
### Dimensions

Unit:mm

Resistor



Land Pattern

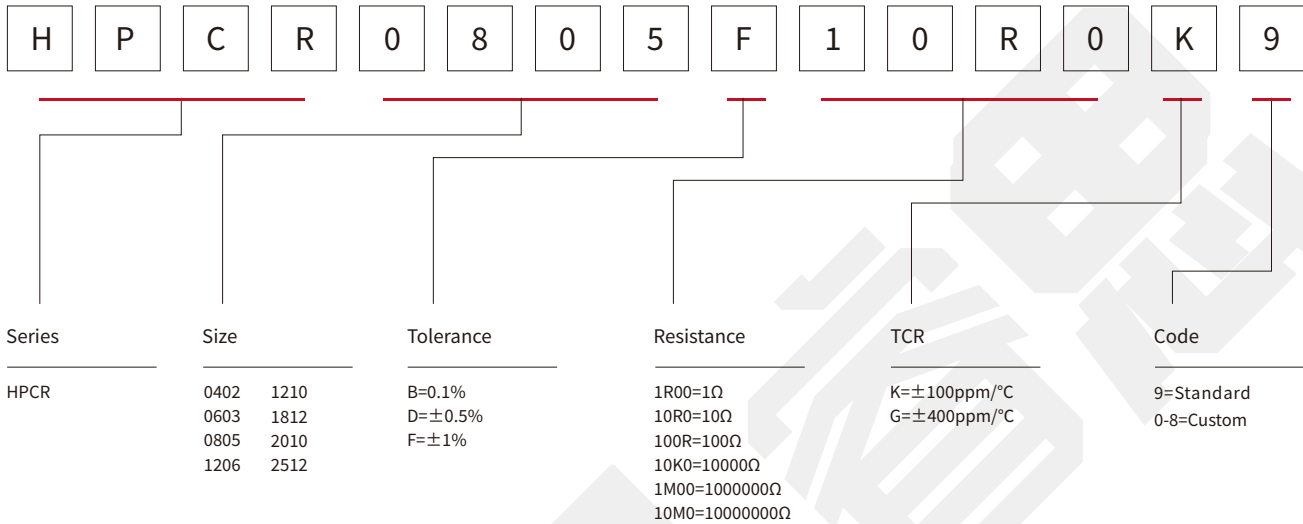


Resistance	L	W	H	$l_1$	$l_2$	a	b	c	Packaging	Quantity Per reel
HPCR0402	1.00±0.05	0.50±0.05	0.30±0.05	0.15±0.10	0.20±0.10	0.60	1.60	0.70	Tape&Reel	10000pcs
HPCR0603	1.60±0.10	0.80±0.10	0.40±0.10	0.30±0.20	0.30±0.10	0.80	2.40	1.00	Tape&Reel	5000pcs
HPCR0805	2.00±0.10	1.25±0.10	0.50±0.15	0.30±0.15	0.40±0.15	1.30	2.90	1.40	Tape&Reel	5000pcs
HPCR1206	3.05±0.10	1.60±0.10	0.55±0.15	0.40±0.20	0.50±0.20	2.20	4.20	1.70	Tape&Reel	5000pcs
HPCR1210	3.05±0.10	2.50±0.15	0.55±0.15	0.50±0.20	0.50±0.20	2.00	4.40	2.70	Tape&Reel	5000pcs
HPCR1812	4.50±0.10	3.10±0.15	0.55±0.05	0.55±0.20	0.70±0.20	3.11	5.91	3.00	Tape&Reel	4000pcs
HPCR2010	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.20	0.60±0.20	3.80	6.60	2.70	Tape&Reel	4000pcs
HPCR2512	6.30±0.20	3.20±0.15	0.65±0.10	0.60±0.30	0.60±0.30	4.90	8.10	3.40	Tape&Reel	4000pcs

### Part Number Information

Example: HPCR0805F10R0K9 (HPCR 0805 ±1% 10Ω ±100ppm/°C Standard)

Example of jumper: HPCR0805F0000K9 (HPCR 0805 0Ω Standard)

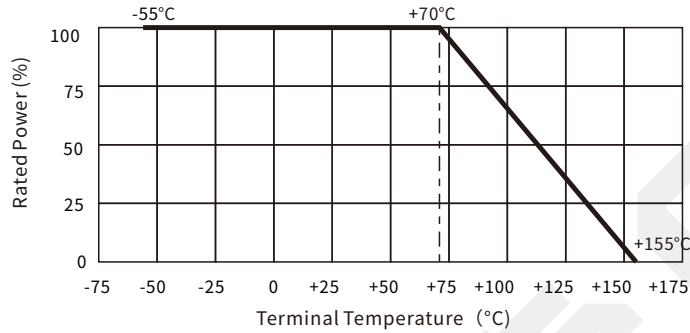


For higher/lower resistance, tighter tolerance, higher power, lower TCR and larger size, please contact us.

### Performance

Test	Test Method	Standards	Test Result
Short Time Overload	2.5 times rated voltage, 5 s	IEC 60115-1 4.13	$\Delta R \leq \pm (1.0\% + 0.05\Omega)$ Jumper: 0.02Ω max. after testing
Resistance to Solder Heat	+260°C±5°C, 10s	IEC 60115-1 4.18	$\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Temperature Cycling	-55°C to +155°C, 5 cycles	IEC 60115-1 4.19	$\Delta R \leq \pm (0.5\% + 0.05\Omega)$
Resistance to Solvent	+20~+25°C IPA, 60s	JIS-C-5201-1 4.29	$\Delta R \leq \pm (0.5\% + 0.05\Omega)$ Jumper: 0.02Ω max. after testing
Moisture Resistance	+40°C±2°C, 90~95%RH, max. operating voltage. 1000h, 90min on, 30min off	IEC 60115-1 4.24	$\Delta R \leq \pm (1.0\% + 0.05\Omega)$ Jumper: 0.05Ω max. after testing
Load Life	1000h @ +70°C±2°C, rated power, 90min on, 30min off	IEC 60115-1 4.25.1	$\Delta R \leq \pm (1.0\% + 0.05\Omega)$ Jumper: 0.05Ω max. after testing
Insulation Resistance	Apply a DC voltage of 100V between the electrodes and the substrate for 60 s and measure the insulation resistance	IEC 60115-1 4.6	≥10GΩ
Substrate Bending	0402/0603/0805=5mm, 1206/1210/1812=3mm, 2010/2512=2mm, 5s	IEC 60115-1 4.33	$\Delta R \leq \pm (1.0\% + 0.05\Omega)$

### Derating Curve



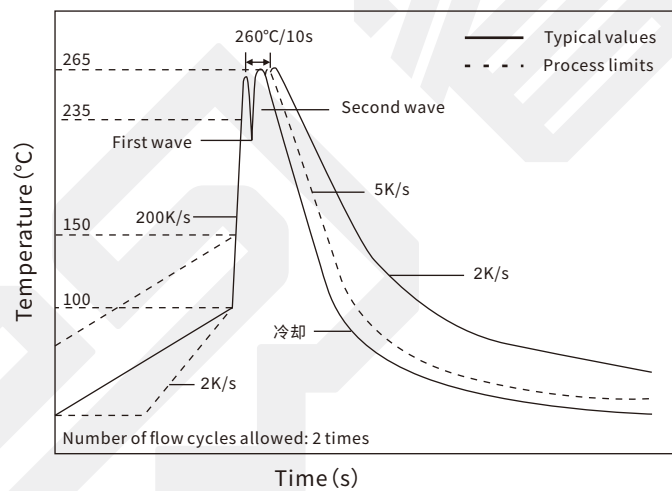
### Reflow Soldering Profile

Resistor Surface Temperature:

Max. Temperature: +260°C, within 10sec.

Applicable Solder Composition: Sn-Ag-Cu solder

Cycles: limited to 2



### Flow Soldering Profile

Resistor Surface Temperature:

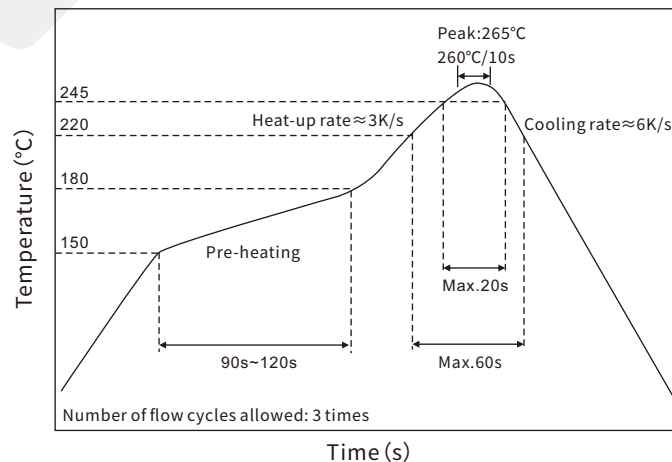
Pre-Heat: +150°C~+180°C, 90~120sec.

Reflow: Above +220°C, Max. 60sec.

Max. Temperature: +260°C, within 10sec.

Applicable Solder Composition: Sn-Ag-Cu solder

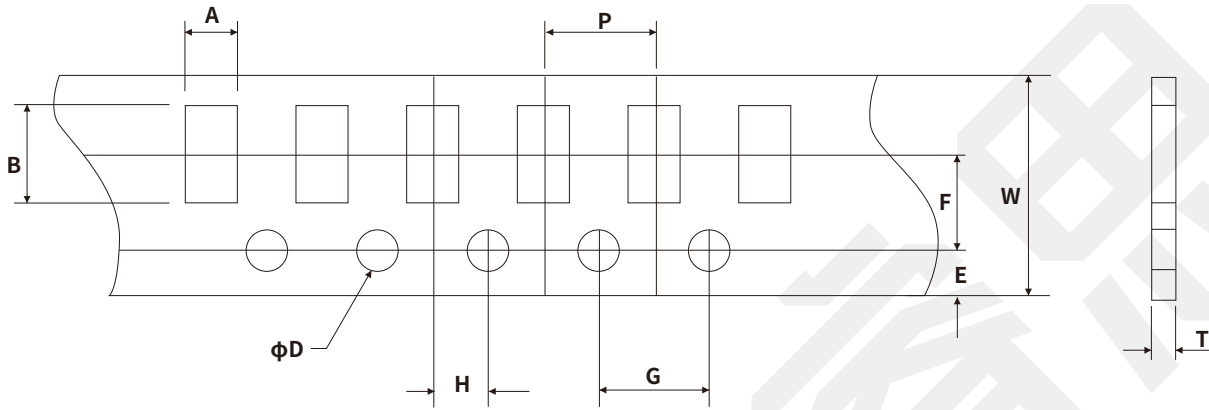
Cycles: limited to 3



### Packaging

#### Tape Specifications

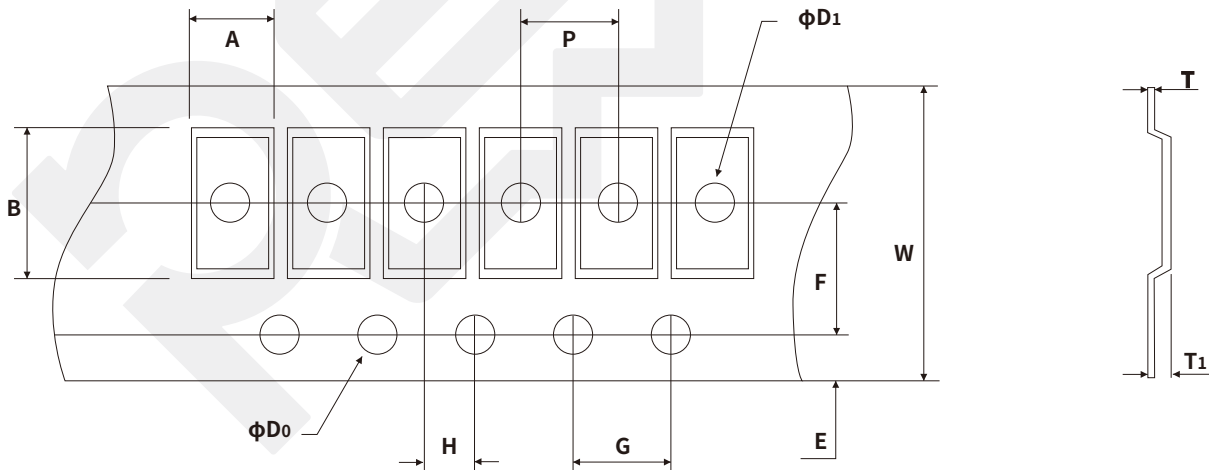
Unit:mm  
Pitch: 7"



Size	A	B	W	E	F	G	H	T	$\phi D$	P
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	1.50+0.10/-0	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	1.50+0.10/-0	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	1.50+0.10/-0	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	1.50+0.10/-0	4.0±0.1

#### Tape Specifications

Unit:mm  
Pitch: 7"

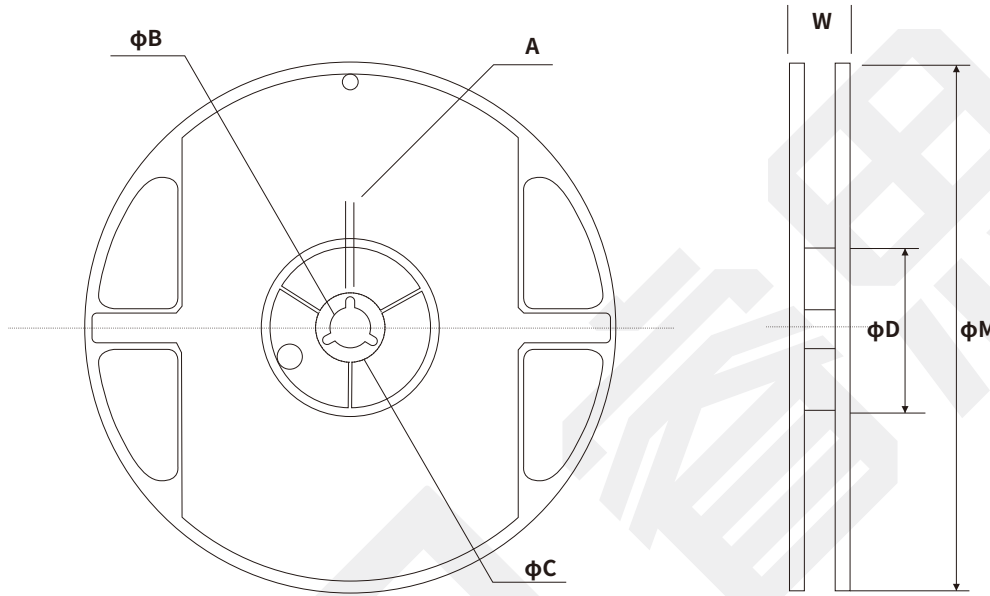


Size	A	B	W	E	F	G	H	T	$\phi D_0$	$\phi D_1$	T1	P
1812	3.30±0.2	4.60±0.2	12±0.1	1.75±0.1	5.5±0.05	4±0.1	2.0±0.05	0.23±0.1	1.50+0.10/-0	1.50±0.1	0.85±0.15	4.0±0.1
2010	2.80±0.2	5.60±0.2	12±0.1	1.75±0.1	5.5±0.05	4±0.1	2.0±0.05	0.23±0.1	1.50+0.10/-0	1.50±0.1	0.85±0.15	4.0±0.1
2512-0.635mm	3.40±0.2	6.70±0.2	12±0.1	1.75±0.1	5.5±0.05	4±0.1	2.0±0.05	0.23±0.1	1.50+0.10/-0	1.50±0.1	0.95±0.15	4.0±0.1

### Package size

#### Reel Specifications

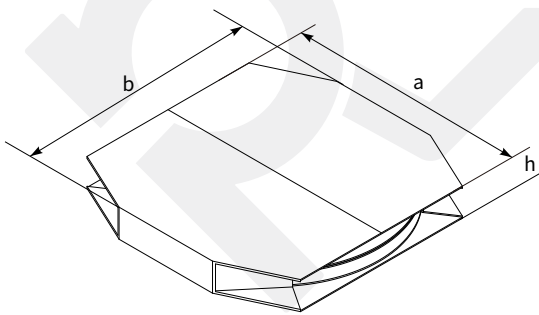
Pitch: 7"



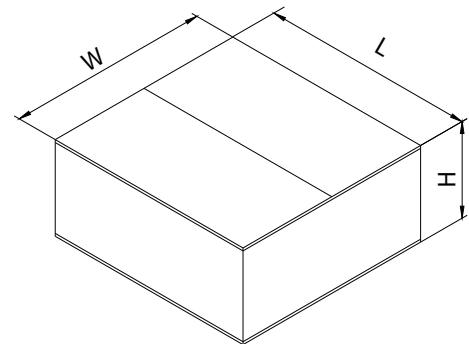
Size	A	$\phi B$	$\phi C$	$\phi D$	W	$\phi M$
0402	2.0±0.5	13.5 ±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
0603/0805/1206/1210	2.0±0.5	13.5 ±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
1812/2010/2512	2.0±0.5	13.5 ±1.0	21±1.0	60±1.0	16.5±2.0	178±2.0

### Packaging

Unit:mm



Quantity (Reel)	a	b	h
1	180	180	13
2	180	180	24
3	180	180	36
5	180	180	60
10	180	180	113



Quantity (pcs)	L	W	H
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200

### Revision

Version	Revised Content	Date	Approver
V1	Initial Issue	2021.12.28	LFY
V2	<ol style="list-style-type: none"><li>1. Change the datasheet template</li><li>2. Add 1812 product size</li><li>3. Change derating curve</li><li>4. Add packaging dimension information</li></ol>	2024.08.21	LFY



### Disclaimer

All products, datasheets and data can be changed without prior notice.

C&B Electronics Shenzhen CO., LTD., its affiliates, distributors, employees, and any other person acting on its behalf (collectively referred to as "C&B Electronics") shall not bear any legal responsibility for any errors, inaccuracies, or incompleteness of information related to the product disclosed under this agreement or other disclosures.

Product datasheet does not constitute an extension or revision of the purchase terms and conditions in C&B Electronics, including but not limited to the warranties under this agreement.

Unless specified in the purchase terms and conditions, C&B Electronics makes no guarantees, representations or warranties.

**To the maximum extent permitted by applicable laws, C&B Electronics hereby makes the following disclaimer:**

- (1) All liabilities arising from the use of the product;**
- (2) Including but not limited to all liabilities arising from special, indirect or incidental damages;**
- (3) All implied warranties, including warranties of suitability for special purposes, non infringement possibility, and marketability.**

The information provided in the datasheet and parameter tables may vary in different applications, and the performance of the product may change over time. The recommended application instructions for the product are based on C&B Electronics' understanding and experience of typical requirements. Customers are obligated to verify whether the product is suitable for a specific application based on the parameters provided in the datasheet. Before officially installing or using the product, you should ensure that you have obtained the latest version of relevant information, which can be obtained through the website: [resistor.today](http://resistor.today).

The signing of this agreement does not constitute an express, implied or other form of license related to all intellectual property rights of C&B Electronic Products.

Unless explicitly stated, the products listed in this agreement are not applicable to lifesaving or life sustaining products. In the absence of a clear indication, the customer shall bear all risks caused by unauthorized use of the above products and agree to fully compensate C&B Electronics for all losses caused by such sales or use. For written product terms for such special applications, please contact authorized personnel from C&B Electronics to obtain.

The names and markings on the listed products may be trademarks owned by others.