Data Sheet

Customer:

Product: Metal Strip Current Sensing Resistors HCS Series

Size : 1206/2512

Issued Date: 11-April-2023

Edition: Ver. 2

Record of change

Date	Ver.	Description	Page
11-April-2023	2	Revised Dimension code	1

HITANO ENTERPRISE CORP.

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Prepared by	Checked by	Approved by	Accepted by (customer)
11-April-2023	11-April-2023	11-April-2023	
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Metal Strip Current Sensing Resistors HCS Series

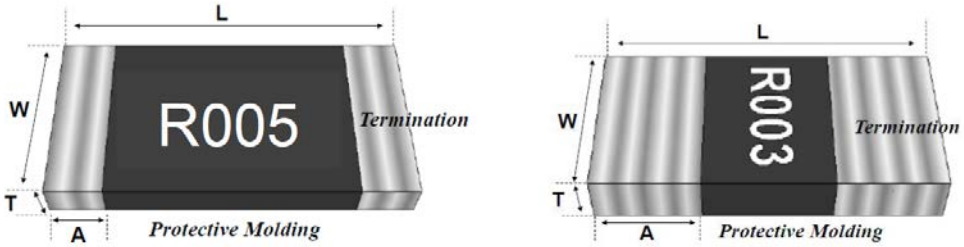
Features

·High power rating and low TCR
·Low resistance and high precision tolerance (1%). Low EMF type ≦3uV/℃
·Low Inductance design less than 1.0nH available
·Excellent reliability and suitable cost
·Suitable for lead free soldering
·High precision trimming implement
·RoHS compliant & Halogen Free

Applications

·Switching model power supply
·Battery pack
·Notebook,Tablet PC
·Test Instrument
·Power Amplifier

Dimension and Construction

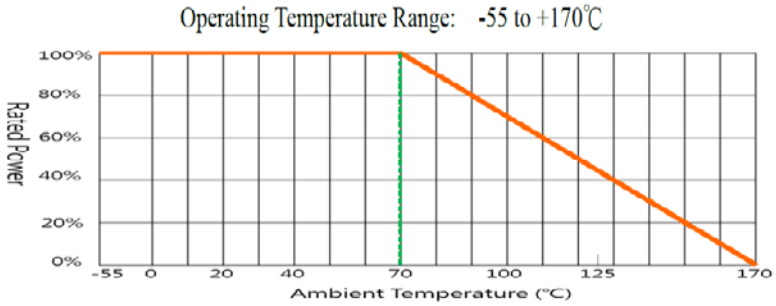


Item	Protective Coating	Resistive Element	Internal Terminal	Outer Terminal
Material	Resin	Alloy Metal	Copper	Solder

Type	L	W	T	A
1206 1~2mΩ	3.20±0.20	1.70±0.20	0.70±0.20	1.10±0.25
1206 3~30mΩ	3.10±0.20	1.65±0.20	0.60±0.20	0.60±0.20
2512 4~100mΩ	6.20±0.20	3.25±0.20	0.60±0.20	0.80±0.20
2512 1~3 mΩ	6.40±0.20	3.25±0.20	0.75±0.20	2.00±0.20
2512 3W 4~100mΩ	6.20±0.20	3.25±0.20	0.65±0.20	0.80±0.20
2512 3W 2~3 mΩ	6.40±0.20	3.25±0.20	0.75±0.20	2.00±0.20
2512 3W 0.5~1mΩ	6.40±0.20	3.25±0.20	0.80±0.20	2.00±0.20

(unit:mm)

Power Derating Curve



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Rating

Table A.

Rating / Type	Tolerance (%)	Rating 70°C (W)	Max. Working Current (Voltage)*	Max. Overload Current (Voltage)*	Alloy Type	Temperatue coefficient of Resistance (ppm/°C)**	Resistance (mΩ)
HCS1206	±1%(F) ±2%(G) ±5%(J)	0.5	22.4A (111mV)	50.0A (250mV)	Low EMF	±75	1,2
						±70	3,4,5,6,7,8,9, 10,12,15,20,25
			10.0A (111mV)	22.4A (250mV)	Standard	±50	5,10,15,18 20,25,30
		1	31.6A (158mV)	70.7A (354mV)	Low EMF	±75	1,2
						±70	3,4,5,6,7,8,9, 10,12,15,20,25
			14.1A (173mV)	31.6A (387mV)	Standard	±50	5,10,15 18,20,25,30
HCS2512	±0.5% (D)*** ±1%(F) ±2%(G) ±5%(J)	1	31.6A (158mV)	70.7A (354mV)	Low EMF	±70	1,2,2.5,3,4,5 10,15,20,25
			18.3A (469mV)	40.8A (1049mV)	Standard	±50	3,4,5,6,7,8,9,10 12,15,18,20,22,25 30,33,35,40,50,60 70,75,80,100
		2	44.7A (224mV)	100A (500mV)	Low EMF	±70	1,2,2.5,3,4,5 10,15,20,25
			25.8A (548mV)	57.7A (1225mV)	Standard	±50	3,4,5,6,7,8,9,10 12,15,18,20,22,25 30,33,35,40,50,60 70,75,80,100,150
HCS2512	±0.5% (D)*** ±1%(F) ±2%(G) ±5%(J)	3	77.5A (47mV)	173.2A (106mV)	Low EMF	±70	0.5,0.75
			54.8A (245mV)	122.5A (548mV)		±70	1,2,2.5,3,4,5 6,7,8,9,10
						±50	20
		3	24.5A (812mV)	54.8A (1817mV)	Standard	±70	5,6,8,10
						±50	12,14,15,16,18,20 25,30,33,35,40,50 60,75,80,100

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Note:
(i) E = $\sqrt{P*R}$ or Max. Working Voltage whichever is lower.
(ii) E：Working Voltage(V)，P：Rated Power (W)，R：Resistance Value(Ω)
(iii) Please keep the surface temperature do not exceed 105℃ when operating.
(iv) * : Related number are depend on specific items only.
(v) ** : TCR Hot (+25~+155℃). *** : ±0.5% available items with underline. Ex. 10
(vi) R-value might be variance depend on soldering conditions and please consider this influence before use milli-ohm resistors, and strongly suggest use the recommend solder pad to design your circuits.
(vii) Max. working &. Max. overload current details please refer Annex. 1.

Table B. Metal Jumper

Rating / Type	Max. Working Current	Max. Overload Current	Resistance
HCS1206 HCS1206JPH-R000-LH	80A	100A	Max. 0.2mΩ
HCS2512 HCS2512JKJ-R000-LH	120A	150A	Max. 0.1mΩ

※ Temperature Coefficient Resistance not applicable.

Part Numbering

HCS	2512	F	K	H	-	R001	-	LH
Type	Size	Tolerance	Packing	Watt		R Value	TCR	Special Code
	1206	F: ±1%	K(plastic)-4Kpcs	F: 1/2W			-:	LH:
	2512	G: ±2%	(for 2512)	H: 1W		4 digits	AS Rating	Standard
		J : ±5%	P(paper)-4Kpcs	J: 2W		R001=1mΩ	table	BH:
			(for1206)	K: 3W		R020=20mΩ	X:	Low EMF
						R000=0Ω	Use for	
							2512≦3mΩ	

Resistance Marking

TOP : Marking (4 Digits Marking to identify the resistance value)

"R005"=5mΩ

2512 "R001"=1mΩ

1206 "1"=1mΩ

Remarks.
2512 "L50"=0.5mΩ 2512"L75"=0.75 mΩ 2512"2L50"=2.5 mΩ

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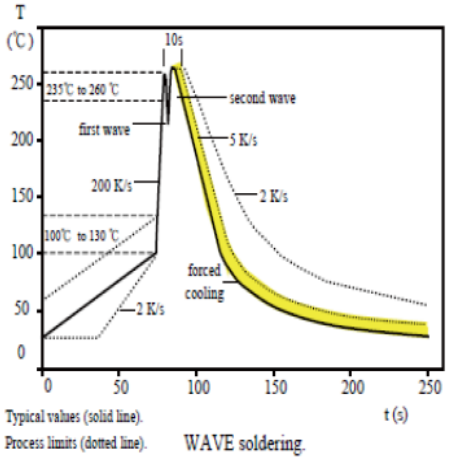
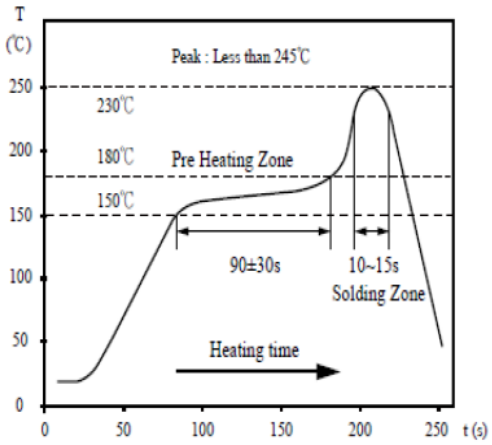
■ Soldering Reference : Applicable for most industrial soldering request.

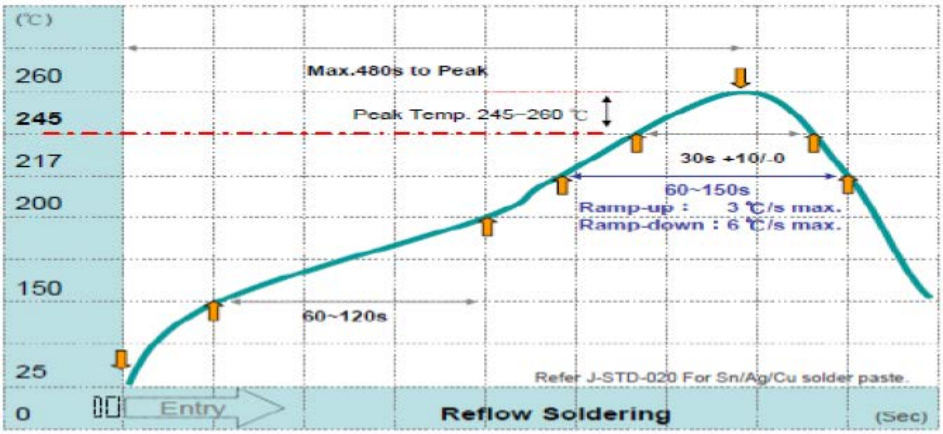


Typical values (solid line).
Process limits (dotted line).

WAVE soldering.

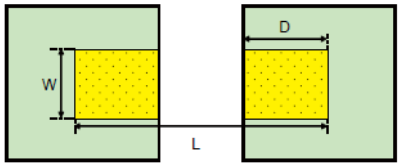


IR Reflow soldering.



Recommend Solder Pad Dimensions : (Unit : mm)

Type	W	D	L
1206	1.80	1.30	4.70
1206 1~2 mΩ	1.80	2.30	5.60
2512	3.70	1.60	7.60
2512 0.5~3 mΩ	4.00	3.00	7.30



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Reliability Performance

Test Item	Specification	Test Method (IEC 60115 / JIS C 5201-1)
DC Resistance	J：±5% G ： ±2% F：±1% D±0.5%	IEC 60115-1 / JIS C 5201-1 , Clause 4.5 Measure the resistance Value.
Short Time Overload	J、G：ΔR≦ ±2% F、D：ΔR≦ ±1%	IEC 60115-1 / JIS C 5201-1 , Clause 4.13 5×Rated power for 5 seconds Measure resistance after 30 minutes
Solderability	Over95% of termination must be covered with Solder	IEC 60115-1 / JIS C 5201-1 , Clause 4.17 After immersing flux, dip in the 235±2℃ molten solder bath for 3±0.5 sec.
Resistance to Solder Heat	ΔR≦±(1%+0.1mΩ) No mechanical damage	IEC 60115-1/JIS C 5201-1 , Clause 4.18 With 260±5℃ for 10±1sec.
Temperature Cycle	J、G：ΔR≦ ±1% F、D：ΔR≦ ±0.5% No mechanical damage.	IEC 60115-1/JIS C 5201-1 Clause 4.19 Repeat 5 cycles as follows -55℃(30min.)→25 ℃(2~3min.)→155℃(30min.)→25℃(2~3min.)
Load Life Humidity	J、G：△ R≦ ±3% F、D：△ R≦ ±1%	IEC 60115-1 / JIS C 5201-1 , Clause 4.24 40±2℃ with relative humidity 90% ~ 95% DC rated voltage for 1.5 hours On 30 minutes Off.Cycle repeated 1000 hours. (Not applicable if 3W R value<1mΩ)
Temperature Coefficient of Resistance (TCR)	Refer Rating Table.	IEC 60115-1, Clause 4.8 Temperature：(T1. +25℃) ~ (T2. +155℃) TCR(ppm/℃) = (R2-R1)/R1×1/(T2-T1)×10^6 (+25~ -55℃ please contact factory.)
Load Life	J、G：△ R≦ ±3% F、D：△ R≦ ±1%	IEC 60115-1, Clause 4.25 Rated voltage for 1.5 hours then a pause 0.5 hours at T=70±2℃. Cycle repeated 1000 hours.
Insulation Resistance	Between termination and coating must over 1000MΩ	IEC 60115-1, Clause 4.6 Test voltage：100±15V
Bending strength	J、G：ΔR≦ ±1% F、D：ΔR≦ ±0.5% No mechanical damage.	IEC 60115-1 / JIS C 5201-1 , Clause 4.33 Resistance change after bended on the 90mm PCB. Bending :2mm

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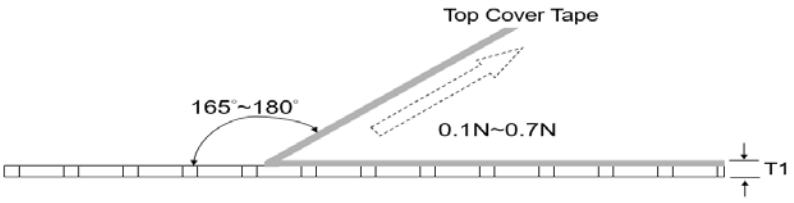
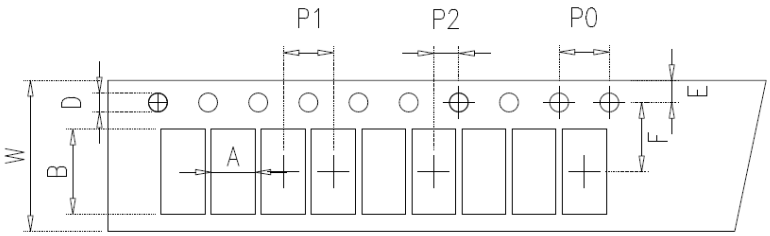
Packaging

(A).Peel Strength of Top Cover Tape

The peel speed shall be about 300 mm/min
The peel force of top cover tape shall between 0.1 to 0.7N

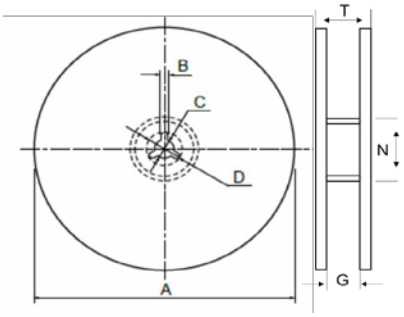


(B).Tape Packaging Dimensions：(Unit:mm)



Size	A	B	W	F	E	P1	P2	P0	D	T1
1206	2.00±0.20	3.60±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	1.00±0.10
2512	3.50±0.20	6.75±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	1.15±0.10

(C).Reel Dimensions：(Unit:mm)



Size	Packaging Q'ty	A	N	C	D	B	G	T
1206	4kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	10.0±1.5	14.9max.
2512	4kpcs/Reel	178.0±2.0	60.0±0.5	13.0±0.5	20(Min.)	2.0±0.5	13.8±1.5	16.7max.

(D).Storage &. Handling

** Products are recommended to be used up within one year as ensured shelf life.
Check solder ability in case shelf life extension is needed.

** To store products with following condition:
Temperature:5 to 40℃；Humidity: 20 to 70% relative humidity.

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Annex.1 Max. working &. Max. overload current

2512 Rating Power 1.0 W			2512 Rating Power 2.0 W		
R Value (mΩ)	Max. Working (A)	Max. Overload (A)	R Value (mΩ)	Max. Working (A)	Max. Overload (A)
1	31.6	70 .7	1	44 .7	100 .0
2	22 .4	50 .0	2	31.6	70 .7
2 .5	20 .0	44 .7	2 .5	28 .3	63 .2
3	18 .3	40 .8	3	25 .8	57 .7
4	15 .8	35 .4	4	22 .4	50 .0
5	14 .1	31.6	5	20 .0	44 .7
6	12 .9	28 .9	6	18 .3	40 .8
7	12 .0	26 .7	7	16 .9	37 .8
8	11.2	25 .0	8	15 .8	35 .4
9	10 .5	23 .6	9	14 .9	33 .3
10	10 .0	22 .4	10	14 .1	31.6
12	9 .1	20 .4	12	12 .9	28 .9
15	8 .2	18 .3	15	11.5	25 .8
18	7 .5	16 .7	18	10 .5	23 .6
20	7 .1	15 .8	20	10 .0	22 .4
22	6 .7	15 .1	22	9 .5	21.3
25	6 .3	14 .1	25	8 .9	20 .0
30	5 .8	12 .9	30	8 .2	18 .3
33	5 .5	12 .3	33	7 .8	17 .4
35	5 .3	12 .0	35	7 .6	16 .9
40	5 .0	11.2	40	7 .1	15 .8
50	4 .5	10 .0	50	6 .3	14 .1
60	4 .1	9 .1	60	5 .8	12 .9
70	3 .8	8 .5	70	5 .3	12 .0
75	3 .7	8 .2	75	5 .2	11.5
80	3 .5	7 .9	80	5 .0	11.2
100	3 .2	7 .1	100	4 .5	10 .0
			150	3 .7	8 .2

2512 Rating Power 3.0 W		
R Value (mΩ)	Max. Working (A)	Max. Overload (A)
0 .5	77 .5	173 .2
0 .75	63 .2	141.4
1	54 .8	122 .5
2	38 .7	86 .6
2 .5	34 .6	77 .5
3	31.6	70 .7
4	27 .4	61.2
5	24 .5	54 .8
6	22 .4	50 .0
7	20 .7	46 .3
8	19 .4	43 .3
9	18 .3	40 .8
10	17 .3	38 .7
12	15 .8	35 .4
14	14 .6	32 .7
15	14 .1	31.6
16	13 .7	30 .6
18	12 .9	28 .9
20	12 .2	27 .4
25	11.0	24 .5
30	10 .0	22 .4
33	9 .5	21.3
35	9 .3	20 .7
40	8 .7	19 .4
50	7 .7	17 .3
60	7 .1	15 .8
75	6 .3	14 .1
80	6 .1	13 .7
100	5 .5	12 .2

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Annex.1 Max. working &. Max. overload current

1206 Rating Power 0.5 W			1206 Rating Power 1.0 W		
R Value (mΩ)	Max. Working (A)	Max. Overload (A)	R Value (mΩ)	Max. Working (A)	Max. Overload (A)
1	22 .4	50 .0	1	31.6	70 .7
2	15 .8	35 .4	2	22 .4	50 .0
3	12 .9	28 .9	3	18 .3	40 .8
4	11.2	25 .0	4	15 .8	35 .4
5	10 .0	22 .4	5	14 .1	31.6
6	9 .1	20 .4	6	12 .9	28 .9
7	8 .5	18 .9	7	12 .0	26 .7
8	7 .9	17 .7	8	11.2	25 .0
9	7 .5	16 .7	9	10 .5	23 .6
10	7 .1	15 .8	10	10 .0	22 .4
12	6 .5	14 .4	12	9 .1	20 .4
15	5 .8	12 .9	15	8 .2	18 .3
18	5 .3	11.8	18	7 .5	16 .7
20	5 .0	11.2	20	7 .1	15 .8
25	4 .5	10 .0	25	6 .3	14 .1
30	4 .1	9 .1	30	5 .8	12 .9