香港電阻

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香港柴灣安業街十二號長益工業大廈 **10** 字樓 **A** 座

HONG KONG RESISTORS MANUFACTORY

(wholly owned by Hong Kong Resistors Manufactory International Ltd.)

AN ISO 9001:2015 CERTIFIED MANUFACTURER

AN ISO 45001 : 2018 MANUFACTURER

AN ISO 14001 : 2015 MANUFACTURER

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DATASHEET

Name of Product : Current Sensing Chip Resistor- CSN Series

Sales Executive :_____ Date: _____

制造 Prepared by	检验 Inspected by	审核 Audited by	核准 Authorized by
客户 customer approval	客户 customer approval	客户 customer approval	客户 customer approval

Spec. No. 2022 CSN
Rev. No.: 2022 Apr

Current Sensing Chip Resistor

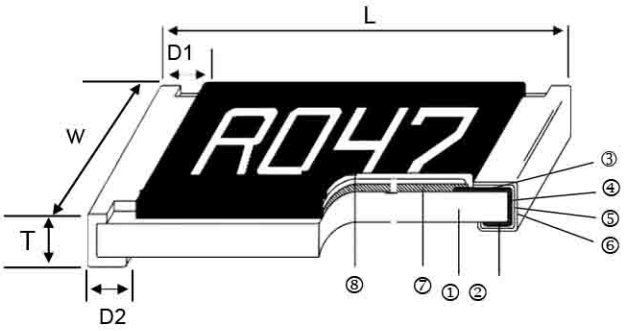
（ CSN Series）



■ Features

- Resistance values from 10mΩ to 1Ω
- Low TCR
- High purity alumina substrate for high power dissipation
- RoHS Compliance

■ Construction



■ Applications

- Power Management Applications
- Switching Power Supply
- Over Current Protection in Audio Applications
- Voltage Regulation Module (VRM)
- DC-DC Converter, Battery Pack, Charger, Adaptor
- Disk Driver

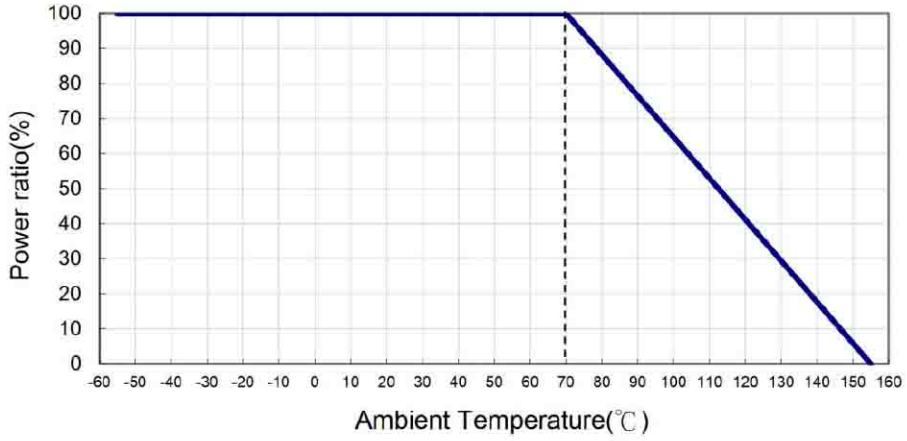
①	Alumina Substrate	④	Edge Electrode	⑦	Resistor Layer
②	Bottom Electrode	⑤	Barrier Layer	⑧	Overcoat
③	Top Electrode	⑥	External Electrode		

■ Dimensions

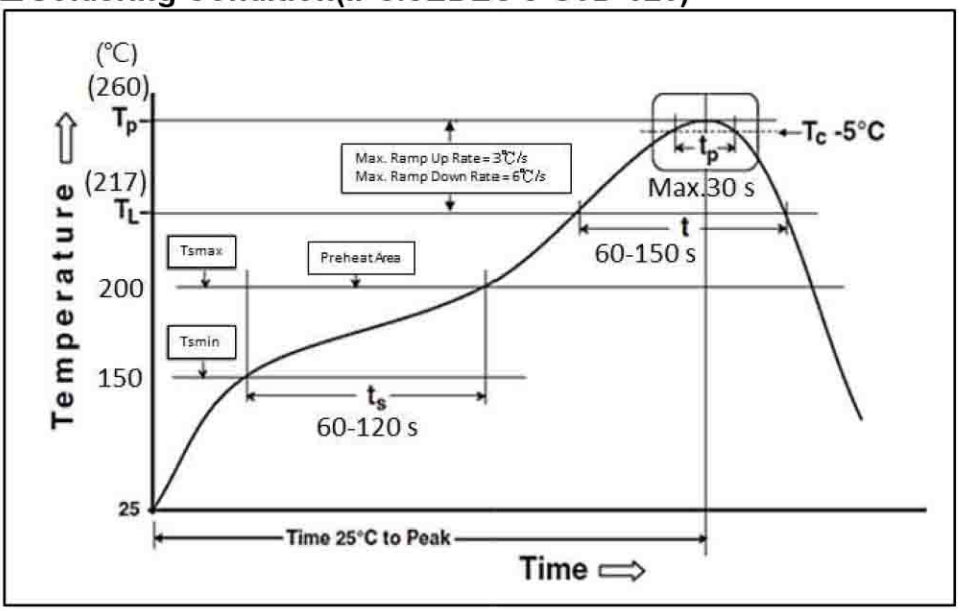
Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)
CSN05	0805	2.00±0.10	1.25±0.10	0.55±0.10	0.30±0.20	0.40±0.25
CSN06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.30	0.40±0.25
CSN10	1210	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.30	0.50±0.25
CSN20	2010	5.00±0.10	2.50±0.15	0.60±0.15	0.60±0.30	0.50±0.25
CSN25	2512	6.35±0.10	3.10±0.15	0.60±0.10	0.60±0.30	0.55±0.25
CSN25 (2W)	2512	6.35±0.10	3.10±0.15	0.60±0.10	0.74±0.30	2.10±0.25

CSN	06	0R1	F	F	1/4W
Type	Size	Value	Tolerance	TCR	Power
	05 : 0805		F : ±1%	D:±50ppm	1/8W
	06 : 1206		G :±2%	W:±75ppm	1/4W
	10 : 1210		J : ±5%	E:±100ppm	1/2W
	20 : 2010			F: ±200ppm	3/4W
	25 : 2512			G:±300ppm	1W
				H:±400ppm	1.5W
				J:±600ppm	2W

■ Derating Curve



■ Soldering Condition(IPC/JEDEC J-STD-020)



■ Standard Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range (mΩ) ±1% (E24 & E96)※1	Resistance Range (mΩ) ±2% (E24)	Resistance Range (mΩ) ±5% (E24)	TCR (PPM/°C)
CSN05 (0805)	1/8W	-55 ~ +155°C	2.5A	20 – 50 51 - 100 102 - 196 200 - 1000	20 - 50 51 - 100 110 - 180 200 - 1000		±600 ±400 ±300 ±200
CSN06 (1206)	1/4W	-55 ~ +155°C	5.0A	10 - 20 22 - 50 51 - 91 100 - 1000	10 - 20 22 - 50 51 - 91 100 - 1000		±600 ±400 ±300 ±200
CSN10 (1210)	1/2W		7.07A				
CSN20 (2010)	3/4W		8.66A				
CSN25 (2512)	1W		10.0A				

■ High Power Rating Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range (mΩ) ±1% (E24 & E96)※1	Resistance Range (mΩ) ±2% (E24)	Resistance Range (mΩ) ±5% (E24)	TCR (PPM/°C)
CSN05 (0805)	1/4W	-55 ~ +155°C	2.21A	20 - 50 51 - 100 102 - 196 200 - 1000	20 - 50 51 - 100 110 - 180 200 - 1000		±600 ±400 ±300 ±200
CSN06 (1206)	1/2W		7.07A	10 - 20 22 - 50 51 - 91 100 - 1000	10 - 20 22 - 50 51 - 91 100 -1000		±600 ±400 ±300 ±200
CSN10 (1210)	3/4W		8.66A				
CSN20 (2010)	1W		10.0A				
CSN25 (2512)	1.5W		12.2A				
CSN25 (2512)	*2W		14.1A				

■ High Power Rating & Low TCR Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range (mΩ) ±1% (E24 & E96)※1	Resistance Range (mΩ) ±2% (E24)	Resistance Range (mΩ) ±5% (E24)	TCR (PPM/°C)
CSN05 (0805)	1/4W	-55 ~ +155°C	1.58A	100 - 196 200 - 499 500 - 1000	100 - 180 200 - 470 500 - 1000		±100 ±75 ±50
CSN06 (1206)	1/2W		2.58A	75 - 100 102 - 147 150 - 1000	75 - 100 110 - 140 150 - 1000		±100 ±75 ±50
CSN06 (1206)	*1W		3.65A				
CSN10 (1210)	3/4W		3.87A	50 - 147 150 - 1000	50 - 140 150 - 1000		±75 ±50
CSN20 (2010)	1W		4.47A				
CSN25 (2512)	1.5W		5.47A				
CSN25 (2512)	*2W		6.32A				

*: Ultra High Power

※1: The nominal resistance value for less than 100mΩ is in E-24 series, other requirement of resistance value please contact our sales office.

■ Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	**JIS-C-5201-1 4.8** **IEC-60115-1 4.8** At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature Low TCR: At 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	±(0.5%+0.05Ω) ±(1.0%+0.05Ω) For ≦50mR & all High power 、 Ultra High Power	**JIS C 5201-1 4.13** **IEC 60115-1 4.13** RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	≧10G	**JIS-C-5201-1 4.6** **IEC-60115-1 4.6** Max. Overload Voltage for 1 minute
Endurance	±(1.0%+0.05Ω) ±(2.0%+0.05Ω) For ≦50mΩ & all High power 、 Ultra High Power。	**JIS-C-5201-1 4.25** **IEC-60115-1 4.25.1** 70±2°C, RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Damp Heat with Load	±(0.5%+0.05Ω) ±(1.0%+0.05Ω) For ≦50mΩ & all High power 、 Ultra High Power。	**JIS-C-5201-1 4.24** **IEC-60115-1 4.24** 40±2°C, 90~95% R.H., RCWV for 1000 hrs with 1.5 hrs “ON” and 0.5 hr “OFF”
Dry Heat	±(1.0%+0.05Ω) ±(2.0%+0.05Ω) For ≦50mΩ & all High power 、 Ultra High Power。	**JIS-C-5201-1 4.23** **IEC-60115-1 4.23.2** at +155°C for 1000 hrs
Bending Strength	±(1.0%+0.05Ω)	**JIS-C-5201-1 4.33** **IEC-60115-1 4.33** Bending once for 60 seconds with 3mm 2010, 2512 sizes: 2mm
Solderability	95% min. coverage	**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** 245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	**JIS-C-5201-1 4.18** **IEC-60115-1 4.18** 260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover	**JIS-C-5201-1 4.7** **IEC-60115-1 4.7** 1.42 times Max. Operating Voltage for 1 minute CSN05:300V CSN06/10/20:400V; CSN25:500V
Leaching	Individual leaching area ≦5% Total leaching area ≦10%	**JIS-C-5201-1 4.18** **IEC-60068-2-58 8.2.1** 260±5°C for 30 seconds
Rapid Change of Temperature	±(0.5%+0.05Ω)	**JIS-C-5201-1 4.19** **IEC-60115-1 4.19** -55°C to +155°C, 5 cycles

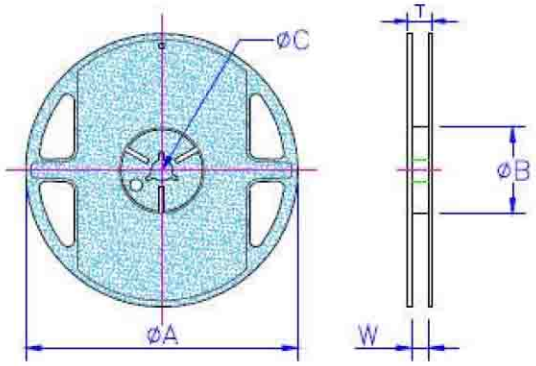
RCWV(Rated Continuous Working Voltage)=$\sqrt{}$(P*R) or Max. Operating Voltage whichever is lower.

■ **Storage Temperature: 15~28°C; Humidity < 80%RH**

■ **Shelf Life: 2 years from production date.**

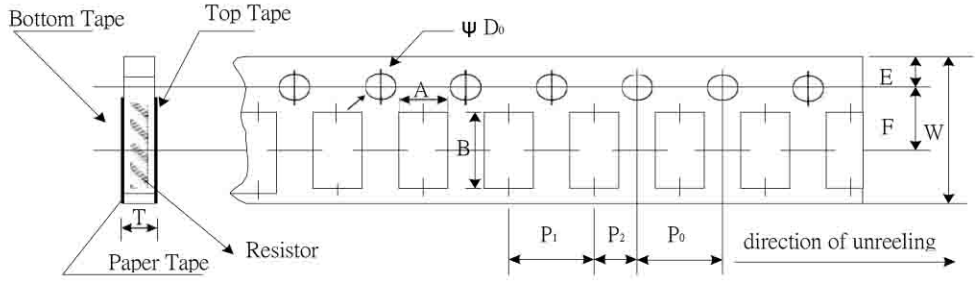
■Packaging

Packaging Quantity & Reel Specifications



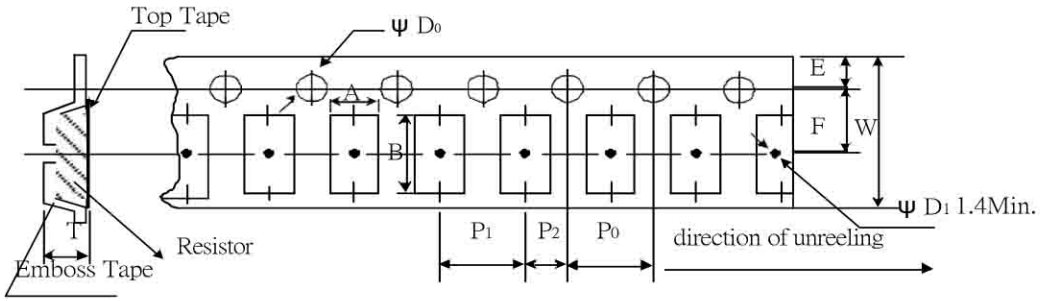
Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
CSN05 CSN06 CSN10	Paper	5K	8mm	7 inch	178.5±1.5	60+1/-0	13.0±0.2	9.0±0.5	12.5±0.5
CSN20 CSN25	Embossed	4K	12mm	7 inch	178.5±1.5	60+1/-0	13.0±0.5	13.0±0.5	15.5±0.5

Paper Tape Specifications



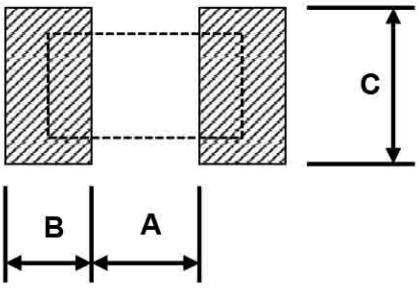
Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD₀ (mm)	T (mm)
CSN05	1.60±0.10	2.40±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10
CSN06	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10
CSN10	2.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10

Emboss Plastic Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P_0 (mm)	P_1 (mm)	P_2 (mm)	ΦD_0 (mm)	T (mm)
CSN20	2.80±0.10	5.40±0.20	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20
CSN25	3.50±0.10	6.70±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50+0.10	1.00±0.20

■ Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)
CSN05	1.00	1.00	1.35±0.2
CSN06	2.00	1.15	1.70±0.2
CSN10	2.00	1.15	2.50±0.2
CSN20	3.60	1.40	2.50±0.2
CSN25	4.90	1.60	3.20±0.2

■ Marking

1%, 5% for 0805/1206/1210/2010/2512: 4 digits marking

Example:

Resistance	10mΩ	51mΩ	75mΩ	100mΩ	549mΩ
Marking	R010	R051	R075	R100	R549