

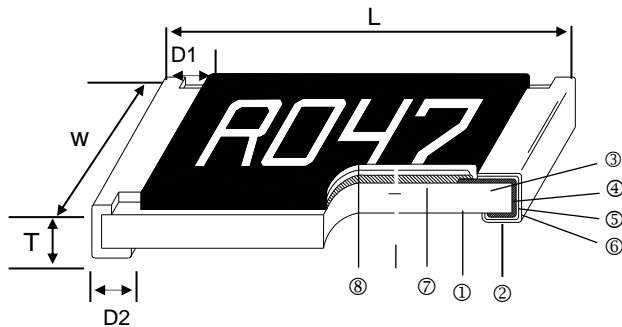
## Current Sensing Chip Resistor



### ■ Features

- Resistance values from 51mΩ to 549 mΩ
- 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	

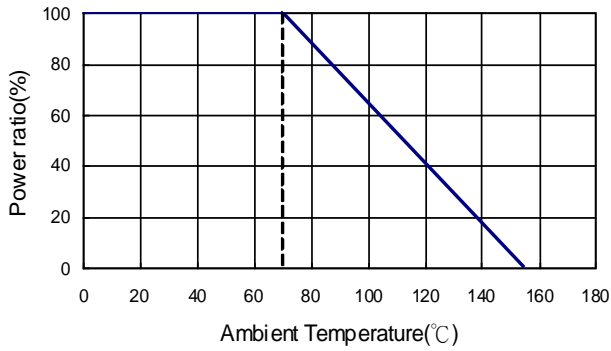
### ■ Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	Weight(g) (1000pcs)
CSN05	0805	2.00±0.10	1.25±0.10	0.55±0.10	0.30±0.20	0.40±0.25	4.6
CSN06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.30	0.40±0.25	8.7
CSN13	1210	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.30	0.50±0.25	16.0
CSN10	2010	5.00±0.10	2.50±0.15	0.60±0.15	0.60±0.30	0.50±0.25	23.7
CSN12	2512	6.35±0.10	3.10±0.15	0.60±0.10	0.60±0.30	0.55±0.25	40.0

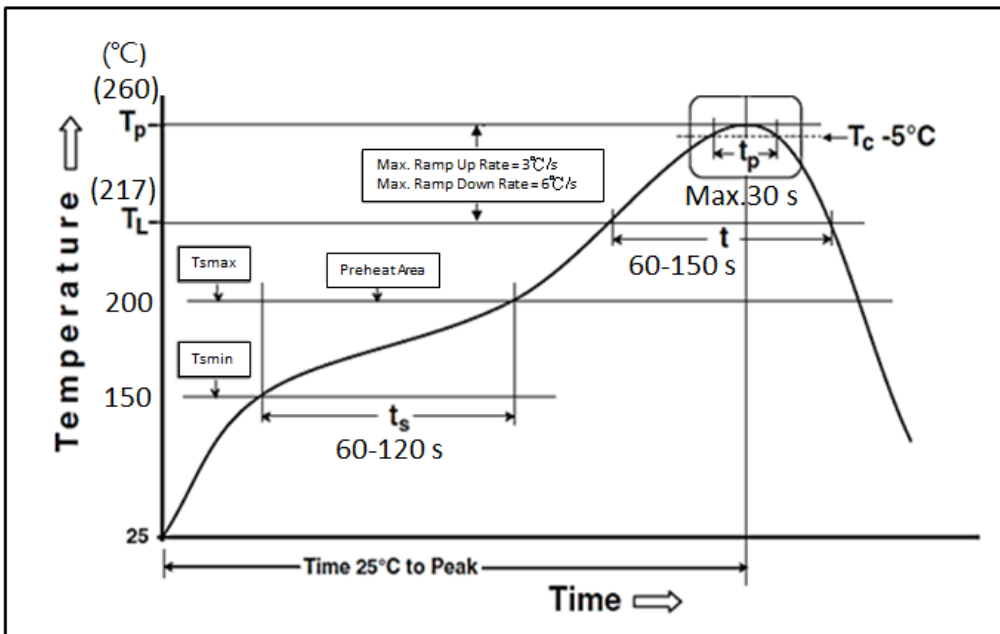
### ■ Part Numbering

CSN	06	F	T	F	V	R100
Product Type	Dimensions (LxW)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance
	05: 0805 06: 1206 13: 1210 10: 2010 12: 2512	F: ±1% G: ±2% J: ±5%	T: Taping Reel	F: ±200 G: ±300 H: ±400	A: 1.5W T: 1W Q: 3/4W U: 1/2W V: 1/4W W: 1/8W	R051: 0.051Ω R100: 0.1Ω R549: 0.549Ω

**Derating Curve**



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



**Standard Electrical Specifications**

Type	Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range (mΩ)			TCR (PPM/°C)
					±1% (E24 & E96)	±2% (E24)	±5% (E24)	
CSN05 (0805)		1/8W	-55 ~ +155°C	1.56A	51 - 100 (E24) 102 - 196 200 - 300	51 - 100 110 - 180 200 - 300	±400 ±300 ±200	
CSN06 (1206)		1/4W		2.21A	51 - 91 (E24) 100 - 549	51 - 91 100 - 510	±300 ±200	
CSN13 (1210)		1/2W		3.13A	51 - 91 (E24) 100 - 300	51 - 91 100 - 300	±300 ±200	
CSN10 (2010)		3/4W		3.83A	51 - 91 (E24) 100 - 500	51 - 91 100 - 500	±300 ±200	
CSN12 (2512)		1W		4.42A				

**High Power Rating Electrical Specifications**

Type	Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range (mΩ)			TCR (PPM/°C)
					±1% (E24 & E96)	±2% (E24)	±5% (E24)	
CSN05 (0805)		1/4W	-55 ~ +155°C	2.21A	51 - 100 (E24) 102 - 196 200 - 300	51 - 100 110 - 180 200 - 300	±400 ±300 ±200	
CSN06 (1206)		1/2W	-55 ~ +155°C	3.13A	51 - 91 (E24) 100 - 549	51 - 91 100 - 510	±300 ±200	
CSN13 (1210)		3/4W		3.83A	51 - 91 (E24) 100 - 300	51 - 91 100 - 300	±300 ±200	
CSN10 (2010)		1W		4.42A	51 - 91 (E24) 100 - 500	51 - 91 100 - 500	±300 ±200	
CSN12 (2512)		1.5W		5.42A				

**Environmental Characteristics**

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	<b>JIS-C-5201-1 4.8</b> <b>IEC-60115-1 4.8</b> At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	±(0.5%+0.05Ω)	<b>JIS C 5201-1 4.13</b> <b>IEC 60115-1 4.13</b> RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	≥ 10G	<b>JIS-C-5201-1 4.6</b> <b>IEC-60115-1 4.6</b> Max. Overload Voltage for 1 minute
Endurance	±(1.0%+0.05Ω)	<b>JIS-C-5201-1 4.25</b> <b>IEC-60115-1 4.25.1</b> 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)	<b>JIS-C-5201-1 4.24</b> <b>IEC-60115-1 4.24</b> 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)	<b>JIS-C-5201-1 4.23</b> <b>IEC-60115-1 4.23.2</b> at +155°C for 1000 hrs
Bending Strength	±(1.0%+0.05Ω)	<b>JIS-C-5201-1 4.33</b> <b>IEC-60115-1 4.33</b> Bending once for 60 seconds with 3mm 2010, 2512 sizes: 2mm
Solderability	95% min. coverage	<b>JIS-C-5201-1 4.17</b> <b>IEC-60115-1 4.17</b> 245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	<b>JIS-C-5201-1 4.18</b> <b>IEC-60115-1 4.18</b> 260±5°C for 10 seconds

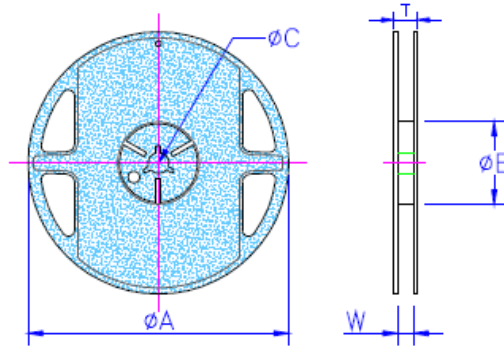
Item	Requirement	Test Method
Voltage Proof	No breakdown or flashover	<b>JIS-C-5201-1 4.7</b> <b>IEC-60115-1 4.7</b> 1.42 times Max. Operating Voltage for 1 minute CSN05:300V CSN06/13/10:400V; CSN12:500V
Leaching	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$	<b>JIS-C-5201-1 4.18</b> <b>IEC-60068-2-58 8.2.1</b> 260 $\pm$ 5°C for 30 seconds
Rapid Change of Temperature	$\pm(0.5\%+0.05\Omega)$	<b>JIS-C-5201-1 4.19</b> <b>IEC-60115-1 4.19</b> -55°C to +155°C, 5 cycles

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

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

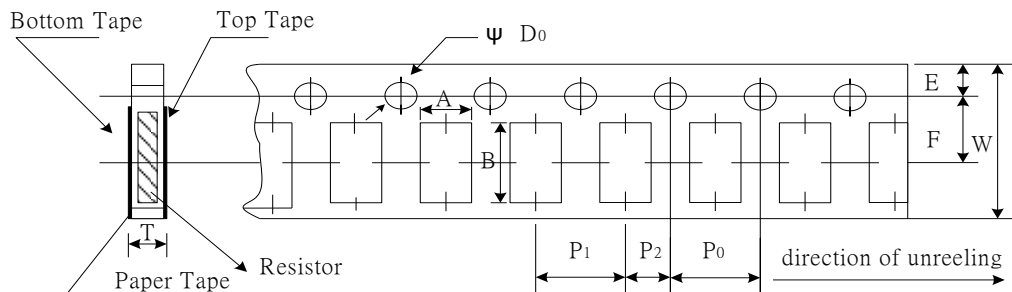
■ **Packaging**

Packaging Quantity & Reel Specifications



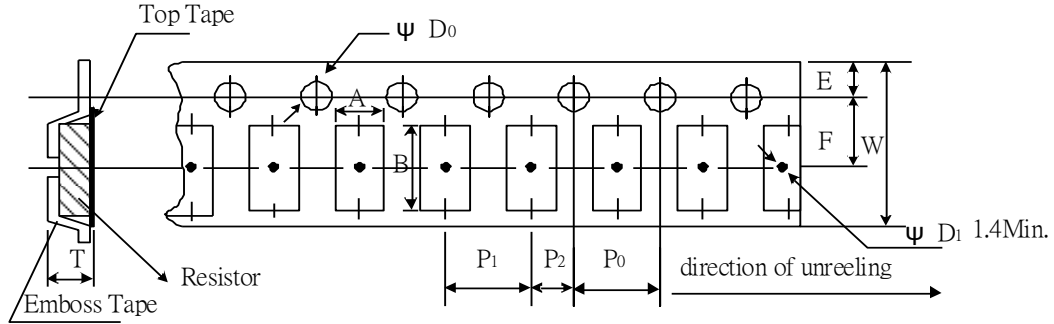
Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
CSN05 CSN06 CSN13	Paper	5K	8mm	7 inch	178.5 $\pm$ 1.5	60+1/-0	13.0 $\pm$ 0.2	9.0 $\pm$ 0.5	12.5 $\pm$ 0.5
CSN10 CSN12	Embossed	4K	12mm	7 inch	178.5 $\pm$ 1.5	60+1/-0	13.0 $\pm$ 0.5	13.0 $\pm$ 0.5	15.5 $\pm$ 0.5

Paper Tape Specifications



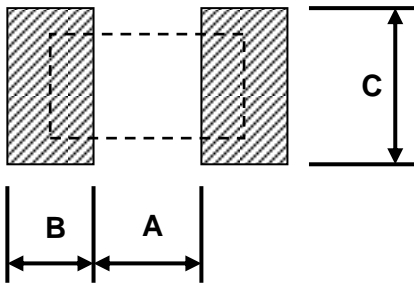
Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD <sub>0</sub> (mm)	T (mm)
CSN05	1.60 $\pm$ 0.10	2.40 $\pm$ 0.20	8.0 $\pm$ 0.20	1.75 $\pm$ 0.10	3.50 $\pm$ 0.05	4.00 $\pm$ 0.10	4.00 $\pm$ 0.05	2.00 $\pm$ 0.05	1.50+0.1,-0	0.85 $\pm$ 0.10
CSN06	1.90 $\pm$ 0.10	3.50 $\pm$ 0.20	8.0 $\pm$ 0.20	1.75 $\pm$ 0.10	3.50 $\pm$ 0.05	4.00 $\pm$ 0.10	4.00 $\pm$ 0.05	2.00 $\pm$ 0.05	1.50+0.1,-0	0.85 $\pm$ 0.10
CSN13	2.90 $\pm$ 0.10	3.50 $\pm$ 0.20	8.0 $\pm$ 0.20	1.75 $\pm$ 0.10	3.50 $\pm$ 0.05	4.00 $\pm$ 0.10	4.00 $\pm$ 0.05	2.00 $\pm$ 0.05	1.50+0.1,-0	0.85 $\pm$ 0.10

Emboss Plastic Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P <sub>0</sub> (mm)	P <sub>1</sub> (mm)	P <sub>2</sub> (mm)	ΦD <sub>0</sub> (mm)	T (mm)
CSN10	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
CSN12	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
CSN13	2.00	1.15	2.50±0.2
CSN10	3.60	1.40	2.50±0.2
CSN12	4.90	1.60	3.20±0.2

**Marking**

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

Example:

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

**REVISION HISTORY**

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Jun 28, 2021	-	- New product release