

CSK series Current Sensing Chip Resistor

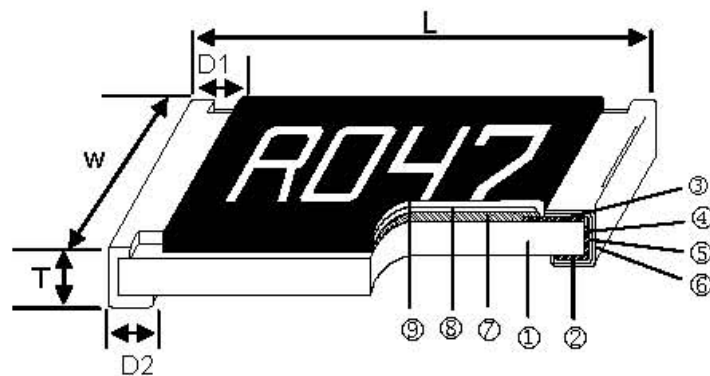
◆ Features

- » 3 Watts power rating in 1 Watt size, 1225 Package
- » Low TCR of ± 100 PPM/ $^{\circ}$ C
- » Resistance values from 1m to 1 ohm
- » High purity alumina substrate for high power dissipation
- » Long side terminations with higher power rating

◆ Applications

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

◆ Construction



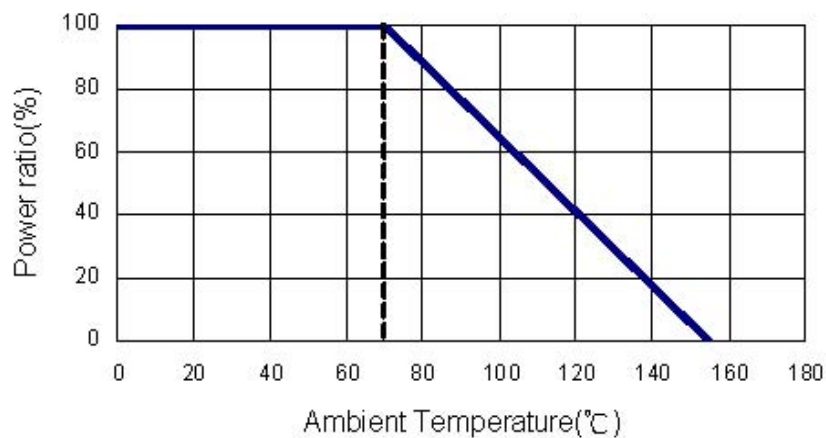
1	Alumina Substrate	4	Edge Electrode (NiCr)	7	Resistor Layer (Ag-Pd)
2	Bottom Electrode (Ag)	5	Barrier Layer (Ni)	8	Primary Overcoat (Glass)
3	Top Electrode (Ag-Pd)	6	External Electrode (Sn)	9	Secondary Overcoat (Epoxy)

◆ Dimensions

Size	L	W	T	D1	D2
CSK0201	0.60±0.03	0.30±0.03	0.23±0.05	0.12±0.05	0.15±0.05
CSK0402	1.00±0.05	0.50±0.05	0.32±0.10	0.25±0.10	0.20±0.10
CSK0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
CSK0805	2.00±0.10	1.25±0.10	0.55±0.10	0.30±0.20	0.40±0.25
CSK1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.30	0.40±0.25
CSK1210	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.30	0.50±0.25
CSK2010	5.00±0.10	2.50±0.15	0.60±0.15	0.60±0.30	0.50±0.25
CSK2512	6.35±0.10	3.10±0.15	0.60±0.10	0.60±0.30	0.55±0.25
CSK2512(2W) 10-99mΩ	6.35±0.20	3.15±0.15	0.74±0.10	0.60±0.30	0.55±0.25
CSK2512(2W) 100-1000mΩ	6.35±0.20	3.15±0.15	0.74±0.10	0.60±0.30	2.10±0.10
CSK1225	3.10±0.15	6.30±0.15	0.90±0.15	0.60±0.30	0.80±0.25
CSK3720	2.00±0.20	3.75±0.20	0.60±0.10	0.40±0.20	0.40±0.20
CSK7520	2.00±0.20	7.50±0.30	0.60±0.10	0.40±0.20	0.40±0.20

Unit: mm

◆ Derating Curve



◆ **Standard Electrical Specifications**

Type	Item	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
				±1%	±2%	±5%	
CSK0201	1/20W			100-149			±1000
				150-500			±600
				501-1000			±300
CSK0402	1/16W			50-100			±400
				101-500			±300
				501-1000			±200
CSK0603	1/10W		-55~ +155°C	20-50			±600
				51-100			±400
				101-500			±300
				501-1000			±200
CSK0805	1/8W			20-50			±600
				51-100			±400
				101-500			±300
				501-1000			±200
CSK1206	1/4W			10-20			±600
CSK1210	1/2W			21-50			±400
CSK2010	3/4W			51-99			±300
CSK2512	1W			100-1000			±200
CSK1225	3W			3-5			±300
				6-20			±200
				21-30			±150
				31-8000			±100
CSK3720	1W		-55~ +155°C	10-19			±300
				20-500			±150
CSK7520	2W			--	1-4		±300
				5-10			±200
				11-350			±150

◆ High Power Rating Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±2%	±5%	
CSK0402	1/8W	-55~ +155°C	51-100			±400
CSK0603	1/8W		101-500			±300
	1/5W		501-1000			±200
CSK0805	1/4W	-55~ +155°C	10-20			±600
CSK1206	1/2W		21-50			±400
CSK1210	3/4W		51-99			±300
CSK2010	1W		100-1000			±200
CSK2512	1.5W					
CSK2512	2W					

◆ Low TCR Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±2%	±5%	
CSK0805	1/8W	-55~ +155°C	100-1000			±100
CSK1206	1/4W		100-1000			
CSK1210	1/2W		75-1000			
CSK2010	3/4W		50-1000			
CSK2512	1W		20-1000			
CSK2512	2W		50-1000			
CSK3720	1W		100-500			
CSK7520	2W		50-350			

Operating Voltage= $\sqrt{P \cdot R}$; Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$; Operating Current= $\sqrt{P/R}$

※Faithfullink is capable of manufacturing the optional spec based on customer's requirement.

◆ Marking for 0603

Codes	Type
1R0	1.000Ω
R10	0.100Ω
R01	0.010Ω
<u>10</u> 1	0.101Ω
<u>03</u> 5	0.035Ω

◆ **Part Number**

CSK	0603	F	T	G		0R1
Type	Size	Tolerance	Packing	TCR (ppm/°C)	Watt	R Value
CSK	0201	F: ±1%	T: Taping Reel	E: ±100	Blank: standard	0.01Ω = 0R01
	0402	G: ±2%		F: ±200	A: 1.5W	0.1Ω = 0R1
	0603	J: ±5%		G: ±300	Q: 3/4W	1Ω= 1R
	0805			H: ±400	S: 2W	
	1206			J: ±600	T: 1W	
	1210			K: ±150	U: 1/2W	
	2010			R: ±1000	V: 1/4W	
	2512			I: ±800	P: 1/5W	
	1225				W: 1/8W	
	3720					

◆ Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec	-55°C -+ -125°C, +25°C is the reference temperature
Short Time Overload	$\pm(0.5\%+0.05\Omega)$	RCWV*2.5 or Max Overload Voltage for 5 seconds
	$\pm(1.0\%+0.05\Omega)$ for high power rating	
Insulation Resistance	$\geq 10G$	Max. Overload Voltage for 1 minute
Endurance	$\pm(1.0\%+0.05\Omega)$	70 \pm 2°C, Max. working voltage for 1000 hrs with 1.5hrs "ON" and 0.5hrs "OFF"
Damp Heat with Load	$\pm(0.5\%+0.05\Omega)$	40 \pm 2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5hrs "ON" and 0.5hrs "OFF"
Dry Heat	$\pm(0.5\%+0.05\Omega)$	At +155°C for 1000hrs
Bending Strength	As Spec	Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% min. coverage	245 \pm 5°C for 3 seconds
Resistance to Soldering Heat	$\pm(0.5\%+0.05\Omega)$	260 \pm 5°C for 10 seconds
Voltage Proof	No breakdown or flashover	1.42 times RCWV (RMS) for 1 minute
Leaching	Individual leaching area $\leq 5\%$	260 \pm 5°C for 30 seconds
	Total leaching area $\leq 10\%$	
Rapid Change of Temperature	$\pm(0.5\%+0.05\Omega)$	-55°C to +155°C, 5 cycles

* Reference Standards: IEC 60115-1, 60068-2-58, JIS-C 5201-1

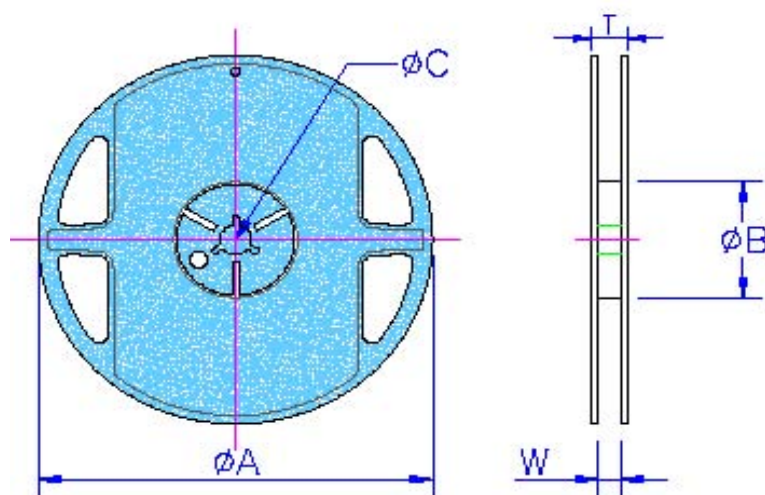
* Storage Temperature: 25 \pm 3°C; Humidity < 80% RH

◆ Packaging

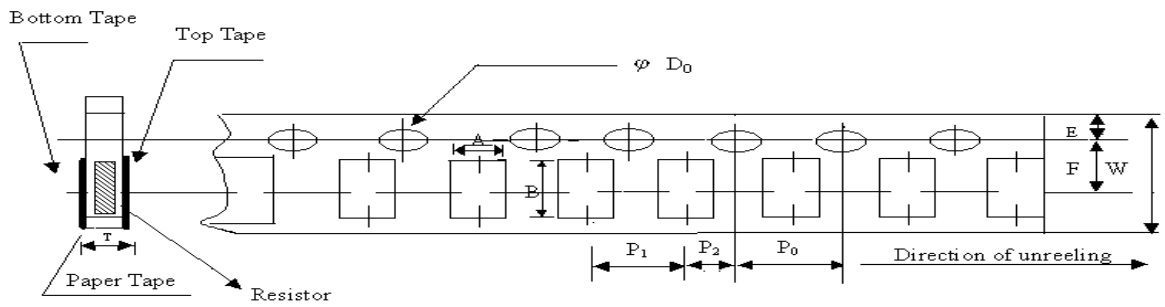
Packaging Quantity & Reel Specifications

Unit: mm

Size	øA	øB	øC	W	T	Paper Tape (EA)	Embossed Plastic Tape(EA)
CSK0201	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	10,000	-
CSK0402	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	10,000	-
CSK0603	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSK0805	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSK1206	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSK1210	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSK2010	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
CSK2512	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
CSK2512(2W)	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	2,000
CSK1225	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	2,000
CSK3720	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	2,000
CSK7520	178.0±1.0	60.0±1.0	13.5±0.7	17.5±1.0	19.5±1.0	-	2,000



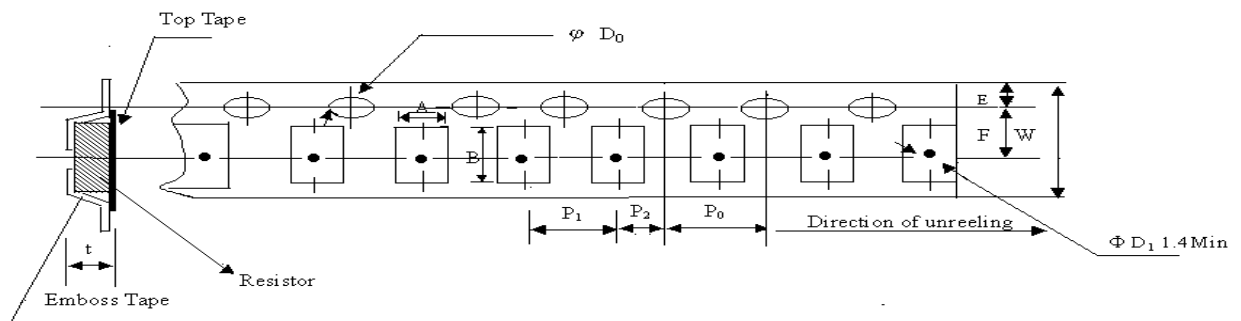
Paper Tape Specifications



Unit: mm

Size	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
CSK0201	0.38±0.05	0.68±0.05	8.00±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	2.0±0.05	1.50+0.1,-0	0.42±0.20
CSK0402	0.65±0.10	1.15±0.10	8.00±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	2.0±0.05	1.50+0.1,-0	0.45±0.10
CSK0603	1.10±0.10	1.90±0.10	8.00±0.20	1.75±0.10	3.5±0.05	4.0±0.10	4.0±0.05	2.0±0.05	1.50+0.1,-0	0.70±0.10
CSK0805	1.60±0.10	2.40±0.20	8.00±0.20	1.75±0.10	3.5±0.05	4.0±0.10	4.0±0.05	2.0±0.05	1.50+0.1,-0	0.85±0.10
CSK1206	1.90±0.10	3.50±0.20	8.00±0.20	1.75±0.10	3.5±0.05	4.0±0.10	4.0±0.05	2.0±0.05	1.50+0.1,-0	0.85±0.10
CSK1210	2.90±0.10	3.50±0.20	8.00±0.20	1.75±0.10	3.5±0.05	4.0±0.10	4.0±0.05	2.0±0.05	1.50+0.1,-0	0.85±0.10

Embossed Plastic Tape Specifications



Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
CSK2010	2.80±0.1	5.50±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.05	4.0±0.1	2.0±0.05	1.50±0.10	1.00±0.20
CSK2512	3.50±0.1	6.70±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.05	4.0±0.1	2.0±0.05	1.50±0.10	1.00±0.20
CSK2512(2W)	3.38±0.1	6.68±0.1	12.0±0.3	1.75±0.1	5.5±0.10	4.0±0.10	4.0±0.1	2.0±0.05	1.55±0.05	1.45±0.20
CSK1225	3.38±0.1	6.68±0.1	12.0±0.3	1.75±0.1	5.5±0.10	4.0±0.10	4.0±0.1	2.0±0.05	1.55±0.05	1.45±0.20
CSK3720	2.50±0.2	4.45±0.2	12.0±0.3	1.75±0.1	5.5±0.05	4.0±0.05	4.0±0.1	2.0±0.05	1.50±0.10	1.20±0.20
CSK7520	2.50±0.2	8.30±0.2	16.0±0.3	1.75±0.1	7.8±0.05	4.0±0.05	4.0±0.1	2.0±0.05	1.50±0.10	1.20±0.20

◆ Recommend Land Pattern

Pad Layout (Except For CSK2512: High Power Rating Series)

Size	A	B	C
CSK0201	0.25	0.30	0.40±0.2
CSK0402	0.50	0.50	0.60±0.2
CSK0603	0.80	1.00	0.90±0.2
CSK0805	1.00	1.00	1.35±0.2
CSK1206	2.00	1.15	1.70±0.2
CSK1210	2.00	1.15	2.50±0.2
CSK2010	3.60	1.40	2.50±0.2
CSK2512	4.90	1.60	3.10±0.2
CSK1225	2.00	2.00	6.40±0.2
CSK3720	1.00	1.80	3.90±0.2
CSK7520	1.00	1.80	7.60±0.2

Unit: mm

Pad Layout (For CSK2512: High Power Rating Series)

Size	Resistance Range	A	B	C
CSK2512	10-99mΩ	4.90	1.60	3.10±0.2
CSK2512	100-1000mΩ	1.00	3.55	3.10±0.2

Unit: mm

