

CSKA series

Current Sensing Chip Resistor Automotive

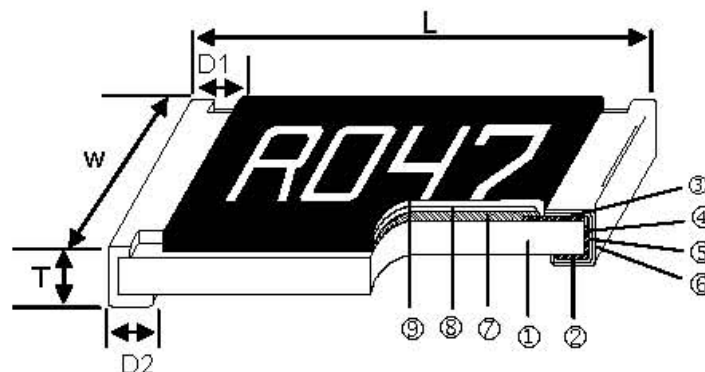
◆ Features

- » 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
- » Highly reliable multilayer electrode construction.
- » Special construction to prevent sulfuration in a sulfur containing environment
- » Meet AEC-Q200 test

◆ 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
- » Automotive Industry

◆ Construction



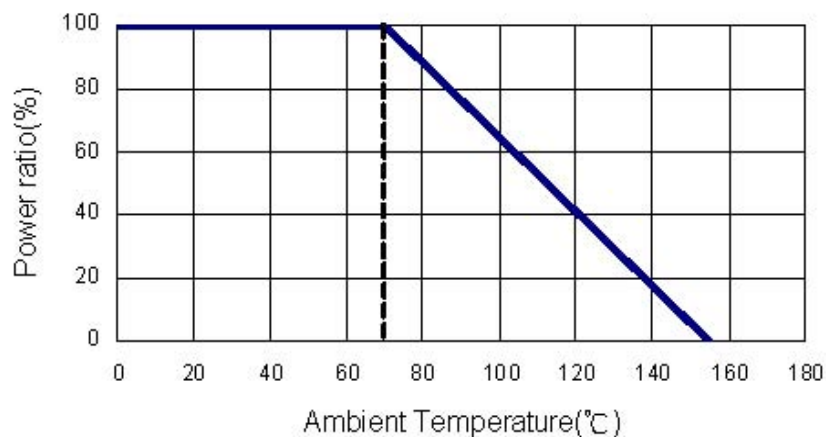
1	Alumina Substrate	4	Edge Electrode (NiCr)	7	Resistor Layer (Ag-Pd)
2	Bottom Electrode (Ag)	5	Barrier Layer (Ni)	8	Primary Overcoat (Glass)
3	Top Electrode (Ag-Pd)	6	External Electrode (Sn)	9	Secondary Overcoat (Epoxy)

◆ Dimensions

Size	L	W	T	D1	D2
CSKA0402	1.00±0.05	0.50±0.05	0.32±0.10	0.25±0.10	0.20±0.10
CSKA0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
CSKA0805	2.00±0.10	1.25±0.10	0.55±0.10	0.30±0.20	0.40±0.25
CSKA1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.30	0.40±0.25
CSKA1210	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.30	0.50±0.25
CSKA2010	5.00±0.10	2.50±0.15	0.60±0.15	0.60±0.30	0.50±0.25
CSKA2512	6.35±0.10	3.10±0.15	0.60±0.10	0.60±0.30	0.55±0.25
CSKA2512(2W) 10-99mΩ	6.35±0.20	3.15±0.15	0.74±0.10	0.60±0.30	0.55±0.25
CSKA2512(2W) 100-1000mΩ	6.35±0.20	3.15±0.15	0.74±0.10	0.60±0.30	2.10±0.10
CSKA1225	3.10±0.15	6.30±0.15	0.90±0.15	0.60±0.30	0.80±0.25
CSKA3720	2.00±0.20	3.75±0.20	0.60±0.10	0.40±0.20	0.40±0.20
CSKA7520	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%	
CSKA0402	1/16W			50-100			±400
				102-500			±300
				501-1000			±200
CSKA0603	1/10W			20-50			±600
				51-100			±400
				102-500			±300
				501-1000			±200
CSKA0805	1/8W			20-50			±600
				51-100			±400
				102-196			±300
				200-1000			±200
CSKA1206	1/4W		-55~ +155°C	10-20			±600
CSKA1210	1/2W			21-50			±400
CSKA2010	3/4W			51-99			±300
CSKA2512	1W			100-1000			±200
CSKA1225	3W						
		3-5					±200
		6-20					±150
		21-30					±100
CSKA3720	1W			33-1000			
				10-18			±300
				20-500			±150
CSKA7520	2W		-55~ +155°C	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%	
CSKA0402	1/8W	-55~ +155°C	51-100			±400
CSKA0603	1/8W		102-500			±300
	1/5W		501-1000			±200
CSKA0805	1/4W	-55~ +155°C	50-91			±300
CSKA1206	1/2W		100-1000			±200
CSKA1210	3/4W					
CSKA2010	1W					
CSKA2512	1.5W					
CSKA2512	2W					

◆ Low TCR Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±2%	±5%	
CSKA0805	1/8W	-55~ +155°C	100-1000			±100
CSKA1206	1/4W		100-1000			
CSKA1210	1/2W		75-1000			
CSKA2010	3/4W		50-1000			
CSKA2512	1W		50-1000			
CSKA2512	2W		50-1000			
CSKA3720	1W		100-500			
CSKA7520	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**

CSKA	0603	F	T	G		0R1
Type	Size	Tolerance	Packing	TCR (ppm/°C)	Watt	R Value
CSKA	0402	F: ±1%	T: Taping Reel	E: ±100	Blank: standard	0.01Ω = 0R01
	0603	G: ±2%		F: ±200	A: 1.5W	0.1Ω = 0R1
	0805	J: ±5%		G: ±300	Q: 3/4W	1Ω= 1R
	1206			H: ±400	S: 2W	
	1210			J: ±600	T: 1W	
	2010			K: ±150	U: 1/2W	
	2512			R: ±1000	V: 1/4W	
	1225			I: ±800	P: 1/5W	
	3720				W: 1/8W	
	7520					

◆ 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 -55 C~+125C, 25C is the reference temperature
Short Time Overload	$\pm(0.5\%+0.05\Omega)$	JIS C 5201-1 4.13 IEC 60115-1 4.13
	$\pm(1.0\%+0.05\Omega)$ for high power rating	RCWV*2.5 or Max. Overload Voltage whichever is lower for 5 seconds
Insulation Resistance	$\geq 10G$	JIS C 5201-1 4.6 IEC 60115-1 4.6 Max. Overload Voltage for 1 minute
Endurance	$\pm(1.0\%+0.05\Omega)$	JIS-C-5201-1 4.25 IEC-60115-1 4.25.1 MIL-STD-202 Method 108 70 \pm 2C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Biased Humidity	(1.0%+0.05 Ω)	MIL-STD-202 Method 103 1000 hrs 85C/85%RH 10% of operating power.
High Temperature Exposure	(0.5%+0.05 Ω)	MIL-STD-202 Method 108 at +155C for 1000 hrs
Board Flex	(1.0%+0.05 Ω)	AEC-Q200-005 Bending once for 60 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% min. coverage	JIS C 5201-1 4.17 IEC 60115-1 4.17 J-STD-002 245 \pm 5C for 3 seconds
Resistance to Soldering Heat	(0.5%+0.05 Ω)	MIL-STD-202 Method 210 260 \pm 5C 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

Leaching	Individual leaching area $\leq 5\%$ Total leaching area $\leq 10\%$	JIS C 5201-1 4.18 IEC 60068-2-58 8.2.1 260 \pm 5C for 30 seconds
Temperature Cycling	(0.5%+0.05 Ω)	JESD22 Method JA-104 -55C to +125 C, 1000 cycles
Mechanical Shock	(0.25%+0.05 Ω)	MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	(0.5%+0.05 Ω)	MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	(1%+0.05 Ω)	AEC-Q200-002 Human body, 2KV
Resistance to Solvents	No visible damage on appearance and marking.	MIL-STD-202 Method 215 Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Terminal Strength	No broken	AEC-Q200-006 Force of 1.8kg for 60 seconds.
Flammability	No ignition of the tissue paper or scorching or the pinewood board	UL-94 V-0 or V-1 are acceptable. Electrical test not required.
Sulfur Test	(0.5%+0.05 Ω)	ASTM-B-809-95 H2S, 50 \pm 2C, 91~93% R.H., no power rating for 1000 hrs

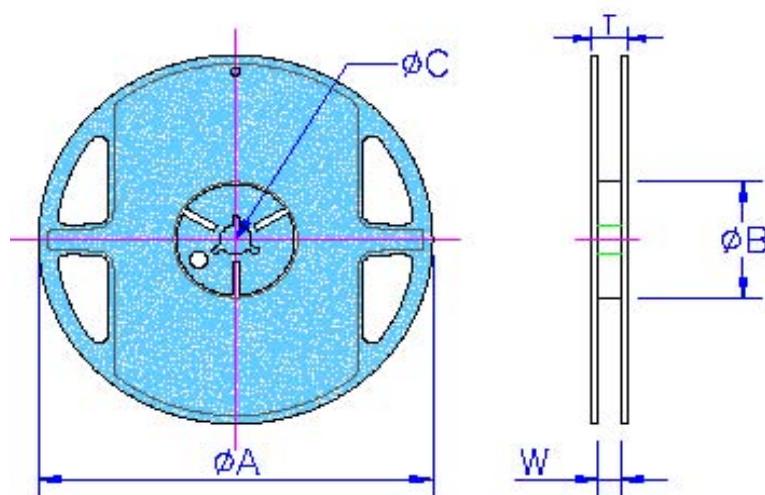
RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower

◆ Packaging

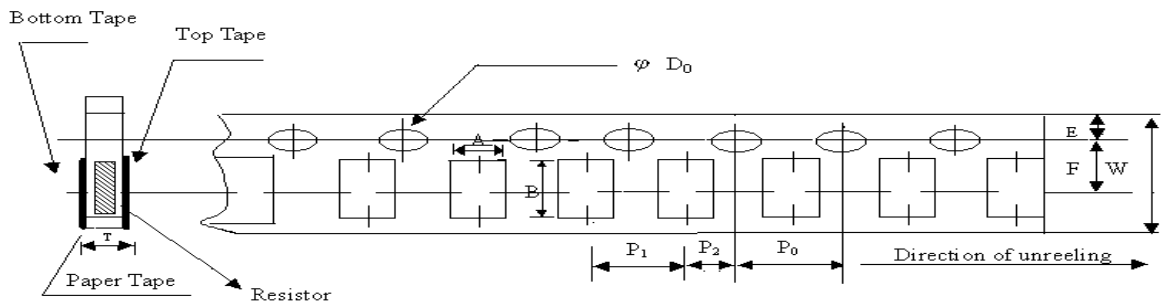
Packaging Quantity & Reel Specifications

Unit: mm

Size	øA	øB	øC	W	T	Paper Tape (EA)	Embossed Plastic Tape(EA)
CSKA0402	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	10,000	-
CSKA0603	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSKA0805	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSKA1206	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSKA1210	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSKA2010	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
CSKA2512	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
CSKA2512(2W)	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	2,000
CSKA1225	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	2,000
CSKA3720	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	2,000
CSKA7520	178.0±1.0	60.0±1.0	13.5±0.7	17.5±1.0	19.5±1.0	-	2,000



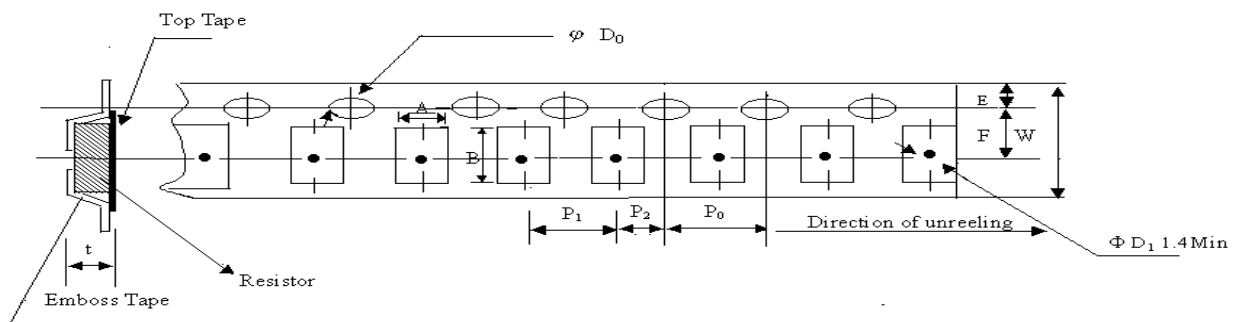
Paper Tape Specifications



Unit: mm

Size	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
CSKA0402	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
CSKA0603	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
CSKA0805	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
CSKA1206	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
CSKA1210	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
CSKA2010	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
CSKA2512	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
CSKA2512(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
CSKA1225	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
CSKA3720	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
CSKA7520	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 CSKA2512: High Power Rating Series)

Size	A	B	C
CSKA0402	0.50	0.50	0.60±0.2
CSKA0603	0.80	1.00	0.90±0.2
CSKA0805	1.00	1.00	1.35±0.2
CSKA1206	2.00	1.15	1.70±0.2
CSKA1210	2.00	1.15	2.50±0.2
CSKA2010	3.60	1.40	2.50±0.2
CSKA2512	4.90	1.60	3.10±0.2
CSKA1225	2.00	2.00	6.40±0.2
CSKA3720	1.00	1.80	3.90±0.2
CSKA7520	1.00	1.80	7.60±0.2

Unit: mm

Pad Layout (For CSKA2512: High Power Rating Series)

Size	Resistance Range	A	B	C
CSKA2512	10-99mΩ	4.90	1.60	3.10±0.2
CSKA2512	100-1000mΩ	1.00	3.55	3.10±0.2

Unit: mm

