

Data Sheet

Customer:

Product: Automotive Grade Current Sensing Chip Resistor (Wide Terminal)
– CSW..A Series

Size: 0508/0612/1020/1225

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VIKING TECH CORPORATION

光頤科技股份有限公司

No.70 Guangfu N. Rd., Hukou
Township, Hsinchu County 303,
Taiwan

TEL:886-3-5972931

FAX:886-3-5972935•886-3-5973494

E-mail:sales@viking.com.tw

VIKING TECH CORPORATION KAOHSIUNG BRANCH

光頤科技股份有限公司高雄分公司

No.248-3, Sin-Sheng Rd., Cian-Jhen Dist., Kaohsiung,
806, Taiwan

TEL:886-7-8217999

FAX:886-7-8228229

E-mail:sales@viking.com.tw

VIKING ELECTRONICSW (WUXI) CO., LTD.

光頤電子(無錫)有限公司

No.22 Xixia Road, Machinery & Industry Park,
National Hi-Tech Industrial Development Zone
of Wuxi, Wuxi, Jiangsu Province, China
Zip Code:214028

TEL:86-510-85203339

FAX:86-510-85203667•86-510-85203977

E-mail:china@viking.com.tw

Produced by (QC)	Checked (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
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Alice Hsiao	Susan Huang	Susan Huang		

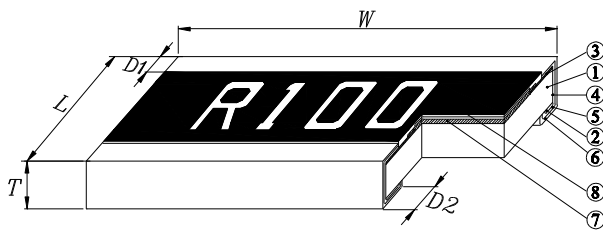
Automotive Grade Current Sensing Chip Resistor (Wide Terminal)



■ Features

- AEC-Q200 Compliance
- Highly reliable multilayer electrode construction
- Reduced size of final equipment reliability
- 3 Watts power rating in 1 Watt size, 1225 package
- Resistance values from 10m to 750m Ω
- High purity alumina substrate for high power dissipation
- Long side terminations with higher power rating
- 100% CCD inspection
- Total Lead(Pb)-free
- MSL: Level 1

■ Construction



■ Applications

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

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

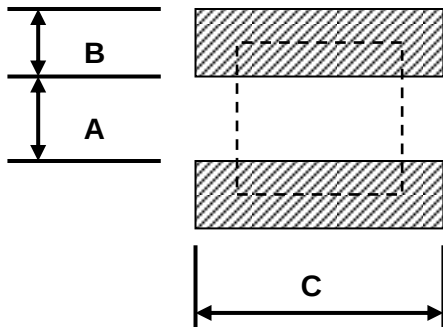
■ Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	Weight (g) (1000pcs)
CSW08	0508	1.25±0.15	2.00±0.15	0.60±0.10	0.30±0.20	0.35±0.15	6
CSW62	0612	1.60±0.15	3.20±0.20	0.60±0.10	0.30±0.20	0.45±0.15	12
CSW20	1020	2.50±0.15	5.00±0.15	0.60±0.10	0.40±0.20	0.75±0.15	35
CSW25	1225	3.10±0.15	6.30±0.20	0.60±0.10	0.45±0.20	0.75±0.15	48

Part Numbering

CSW	25	F	T	F	R	R100	A
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking
	08: 0508 62: 0612 20: 1020 25: 1225	F: ±1% J: ±5%	T: Taping Reel	E: ±100 F: ±200 J: ±600	U: 1/2W Q: 3/4W T: 1W A: 1.5W S: 2W R: 3W	R010: 0.01Ω R100: 0.1Ω	A: Automotive Grade

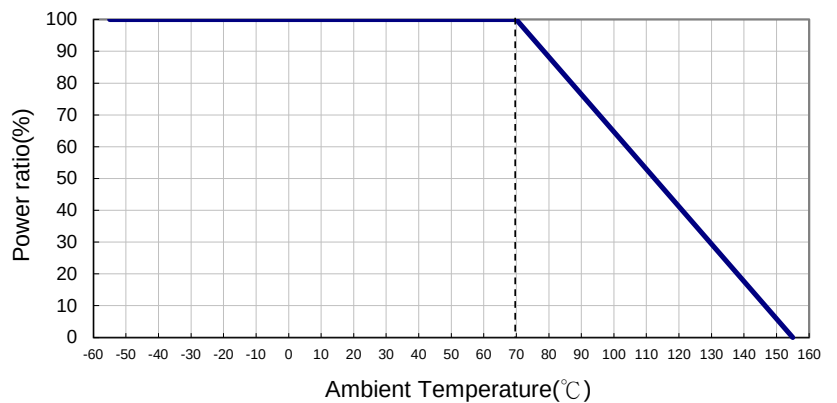
Recommend Land Pattern



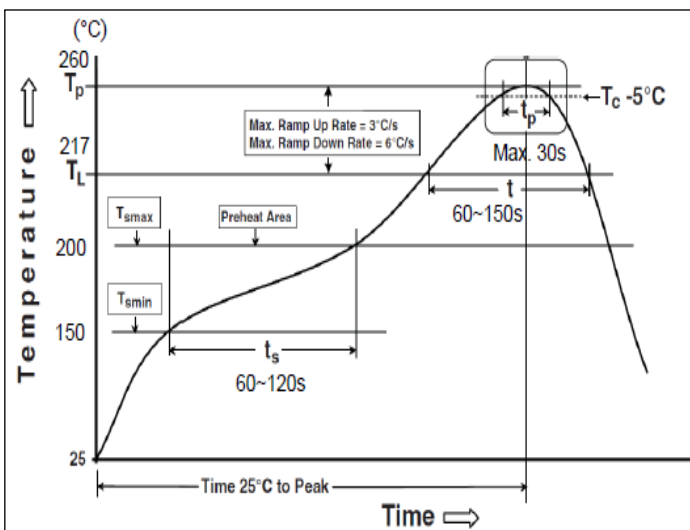
Pad Layout

Type	A (mm)	B (mm)	C (mm)
CSW08	0.55	0.90	2.00
CSW62	0.70	0.80	3.20
CSW20	1.00	1.30	5.00
CSW25	1.60	1.20	6.40

Derating Curve



Soldering Condition (Ref. IPC/JEDEC J-STD-020 & J-STD-002)



Reflow Profiles	
Profile Feature	Pb-Free Assembly
Preheat	
Min. Temperature (T _{smin})	150 °C
Max Temperature (T _{smax})	200 °C
Preheating time (ts) from (T _{smin} to T _{smax})	60-120 seconds
Ramp-up rate (T _L to T _p)	3 °C/second max.
Liquidous temperature (T _L)	217 °C
Time (t _L) maintained above T _L	60-150 seconds
Min. Peak temperature (Tp min)	235°C
Max. Peak temperature (Tp max)	260°C
Time (tp) within 5 °C of the specified classification temperature (Tc)	30 seconds max.
Ramp-down rate (Tp to T _L)	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

Standard Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range* (mΩ)		TCR (PPM/°C)
				±1%	±5%	
CSW08 (0508)	1/2W	-55 ~ +155°C	7.07A	10-27		±600
				30- 510		±200
CSW62 (0612)	3/4W		8.66A	10-27		±600
				30- 510		±200
CSW20 (1020)	1W		10A	10-27		±600
				30- 750		±200
CSW25 (1225)	1.5W		12.2A	10-27		±600
				30- 750		±200

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%	±5%	
CSW08 (0508)	1W	-55~+155°C	10.0A	10 - 27		±600
				30 - 510		±200
CSW62 (0612)	1.5W		12.2A	10 - 27		±600
				30 - 510		±200
CSW20 (1020)	2W		14.1A	10 - 27		±600
				30 - 750		±200
CSW25 (1225)	3W		17.3A	10 - 27		±600
				30 - 750		±200

High Power Rating & Low TCR Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Current	Resistance Range* (mΩ)	TCR (PPM/°C)
				±1%	
CSW08 (0508)	1W	-55~+155°C	3.16A	100 - 510	±100
CSW62 (0612)	1.5W		7.07A	30 - 510	±100
CSW20 (1020)	2W		8.16A	30 - 750	±100
CSW25 (1225)	3W		10.0A	30 - 750	±100

*Resistance Value <100mΩ: Only E24 Series

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

■ The nominal resistance value for ±5% is E24; for ±1% is E24 and E96.

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

■ Environmental Characteristics

Item	Requirement	Test Method
High Temperature Exposure (Storage)	$\pm(3.0\%+0.05\Omega)$	MIL-STD-202 Method 108 at +155°C for 1000 hrs
Temperature Cycling	$\pm(3.0\%+0.05\Omega)$	JESD22-A104 -55°C to +155°C, 1000 cycles
Humidity Bias	$\pm(3.0\%+0.05\Omega)$	MIL-STD-202 Method 103 1000 hrs 85°C/85%RH 10% of operating power
High Temperature Operating Life	$\pm(3.0\%+0.05\Omega)$	MIL-STD-202 Method 108 70 $\pm$ 2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Resistance to Solvents	No visible damage on appearance and marking.	MIL-STD-202 Method 215 Add an Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Mechanical Shock	$\pm(3.0\%+0.05\Omega)$	MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	$\pm(3.0\%+0.05\Omega)$	MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10 Hz - 2000 Hz
Resistance to Soldering Heat	$\pm(1.0\%+0.05\Omega)$	JIS-C-5201-1 4.18 IEC-60115-1 11.2 260 $\pm$ 5°C for 10 seconds
ESD	$\pm(1.0\%+0.05\Omega)$	AEC-Q200-002 Human body model 2KV
Solderability	95% min. coverage	JIS-C-5201-1 4.17 IEC-60115-1 11.1 245 $\pm$ 5°C for 3 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.
Board Flex (SMD)	$\pm(1.0\%+0.05\Omega)$	AEC-Q200-005 Bending once for 60 seconds with 3mm
Terminal Strength (SMD)	No broken	AEC-Q200-006 Force of 1.8kg for 60 seconds.
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	JIS-C-5201-1 4.8 IEC-60115-1 6.2 At 25°C/-55°C and 25°C/+125°C, 25°C is the reference temperature
Short Time Overload	$\pm(2.0\%+0.05\Omega)$	JIS-C-5201-1 4.13 IEC-60115-1 8.1 RCWV*2 for 5 seconds
Insulation Resistance	$\geq 10G$	JIS-C-5201-1 4.6 IEC-60115-1 12.1 Max. Overload Voltage for 1 minute
Voltage Proof	No breakdown or flashover	JIS-C-5201-1 4.7 IEC-60115-1 12.2 1.42 times Max. Operating Voltage for 1 minute CSW08:300V;CSW62/20/25:400V
Sulfur Test	$\Delta R \pm 1\%$	105 $\pm$ 2°C, no power rating for 1000 hrs.

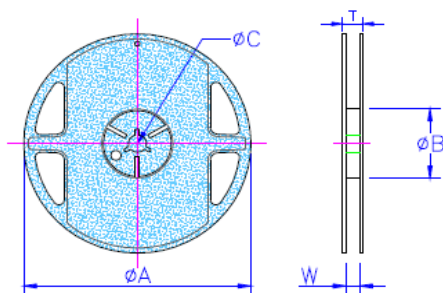
RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

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

■ Shelf Life: 2 years from production date.

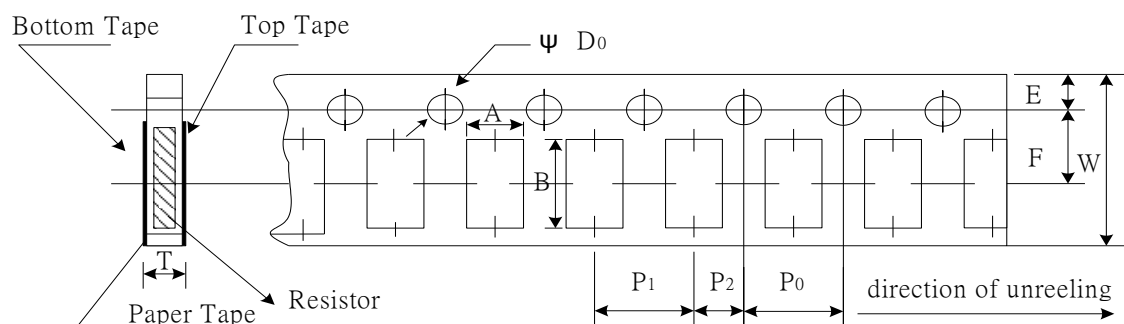
■Packaging

Packaging Quantity & Reel Specifications



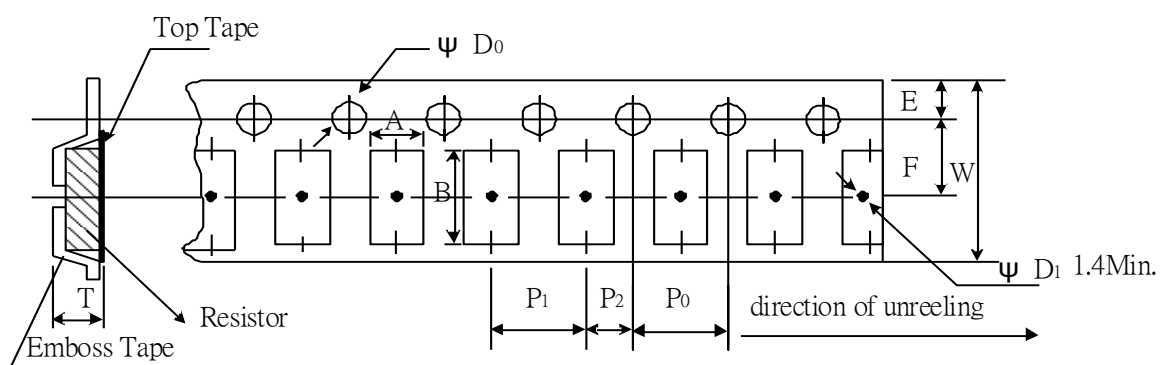
Type	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)	Paper Tape (EA)	Emboss Plastic Tape (EA)
CSW08	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSW62	178.0±1.0	60.0±1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSW20	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
CSW25	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000

Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	ΦD ₀ (mm)	T (mm)
CSW08	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
CSW62	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

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)
CSW20	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
CSW25	3.38±0.10	6.68±0.10	12.0±0.30	1.75±0.10	5.5±0.10	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20

■ Marking

1%, 5% for 0508/0612/1020/1225; 4 digits marking

Example:

Resistance	10mΩ	100mΩ
Marking	R010	R100

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Apr 21, 2026	-	- New product release