Data Sheet

Customer:	
Product:	Current Sensing Metal Chip Resistor (Wide Terminal) – CSMW Series
Size:	0306/0508/0612/1020/1225
Issued Date:	6-Sep-24
Edition:	REV.A2

RoHS Compliant

HONG KONG HELISTO INDUSTRIAL LIMITED
香港海利斯特实业有限公司

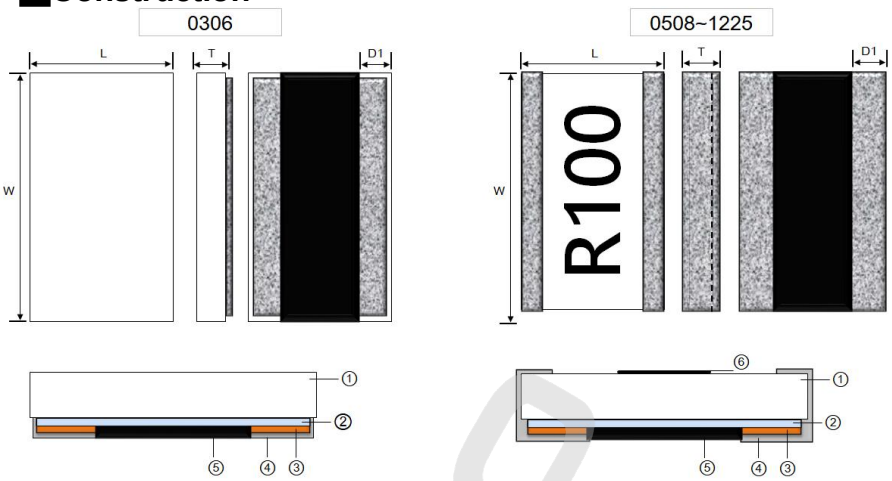
SHENZHEN HELISTO TECHNOLOGYCOLTD
深圳市海利斯特科技有限公司

ADD:5/F., A Block, Hongdu Industrial Park, Fanshen Road, 45 Area, Baoan, Shenzhen, China
TEL:+86-755-29741555 29749555
FAX:+86-755-29742111
E-mail:donnyhai@helisto.com
www.Helisto.com

Produced by (QC)	Checked (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
6-Sep-24	6-Sep-24	6-Sep-24	6-Sep-24	
Chun	***Ben Chang***	***Ben Chang***		



Construction



①	Alumina Substrate	④	External Electrode
②	Resistor Layer	⑤	Primary Overcoat
③	Bottom Electrode	⑥	Marking

Features

- SMD Type designed for automatic insertion
- Low resistance resistor for current detection
- Metal foil construction ensures high reliability and performance with very low and stable TCR
- Designed for current sense circuits in power electronic systems
- Pb-Free to meet RoHS requirements
- AEC-Q200 Compliance
- Inherently Anti-Sulfur

Dimensions

Type	Size (Inch)	Resistance Range (mΩ)	L	W	T	D1	Weight (g) (1000pcs)
CSMW36	0306	5 – 19	0.85±0.20	1.60±0.20	0.55±0.20	0.25±0.15	2.626
		20 – 100	0.85±0.20	1.60±0.20	0.55±0.20	0.25±0.15	2.448
CSMW08	0508	3 – 19	1.35±0.20	2.00±0.20	0.60±0.20	0.30±0.20	6.671
		20 – 100	1.35±0.20	2.00±0.20	0.60±0.20	0.30±0.20	5.884
CSMW62	0612	3 – 19	1.65±0.20	3.20±0.20	0.60±0.20	0.30±0.20	13.237
		20 – 100	1.65±0.20	3.20±0.20	0.60±0.20	0.30±0.20	12.094
CSMW20	1020	3 – 19	2.60±0.30	5.00±0.20	0.60±0.20	0.55±0.30	33.246
		20 – 100	2.60±0.30	5.00±0.20	0.60±0.20	0.55±0.30	31.873
CSMW25	1225	3 – 19	3.20±0.30	6.40±0.20	0.60±0.20	0.60±0.30	51.846
		20 – 100	3.20±0.30	6.40±0.20	0.60±0.20	0.60±0.30	50.015

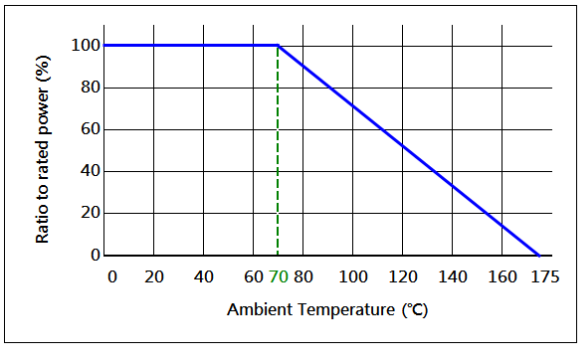
Applications

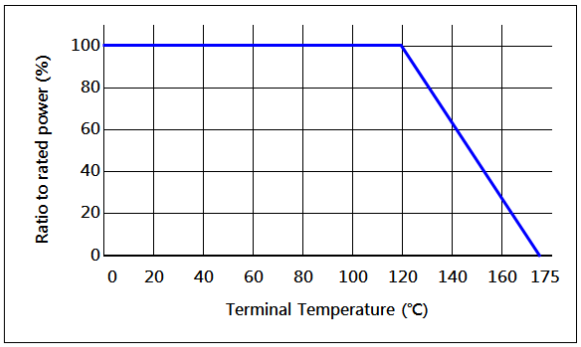
- Power Management Applications
- Switching Power Supply
- Over Current Protection in Audio Applications
- Voltage Regulation Module (VRM)
- DC-DC Converter, Battery Pack, Charger, Adaptor

Part Numbering

CSMW	36	F	T	D	U	R100	
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking
	36: 0306 08: 0508 62: 0612 20: 1020 25: 1225	F: ±1% G: ±2% J: ±5%	T: Taping Reel	D: ±50 E: ±100 K: ±150	U: 1/2W T: 1W A: 1.5W S: 2W R: 3W	R003: 0.003Ω R010: 0.01Ω R100: 0.1Ω	: Standard N: No Marking

■Derating Curve





■Standard Electrical Specifications

Item / Type	Power Rating	Operating Temp. Range	Resistance Range (mΩ) ±1%	±2%	±5%	TCR (ppm/℃)
CSMW36 (0306)	1/2W	-55 ~ +175℃	5 – 19			±150
			20 – 100			±100
CSMW08 (0508)	1W		3 – 19			±100
			20 – 100			±50
CSMW62 (0612)	1.5W		3 – 19			±100
			20 – 100			±50
CSMW20 (1020)	2W		3 – 19			±100
			20 – 100			±50
CSMW25 (1225)	3W		3 – 19			±100
			20 – 100			±50

Operating Current=$\sqrt{(P/R)}$

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

■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** 25℃~+125℃, 25℃ is the reference temperature
Short Time Overload	△R ≤ ±1%R	**JIS-C-5201-1 4.13** **IEC-60115-1 4.13** 2.5X Rated Power for 5 seconds
Insulation Resistance	≧1000MΩ	**JIS-C-5201-1 4.6** **IEC-60115-1 4.6** Max. Overload Voltage for 1 minute
Operational Life	△R ≤ ±1%R	**MIL-STD-202 Method 108** Condition D Steady State T_A=125℃ at derated power. Measurement at 24±4 hours after test conclusion
Biased Humidity	△R ≤ ±1%R	**MIL-STD-202 Method 103** 85℃/85RH., 1000 hrs, apply 10% of operating power (current) or limiting element current whichever is lower
High Temperature Exposure	△R ≤ ±1%R	**MIL-STD-202 Method 108** at +155℃ for 1000 hrs
Temperature Cycling	△R ≤ ±1%R △R ≤ ±2%R	**JESD22 Method JA-104** -55℃ to +155℃, 100 cycles -55℃ to +155℃, 1000 cycles
Bending Strength (Board Flex)	△R ≤ ±1%R	**JIS-C-5201-1 4.33** Bending once for 60 seconds Bending displacement:2mm
Solderability	95% min. coverage	**JIS-C-5201-1 4.17** **IEC-60115-1 4.17** 245±5℃ for 3 seconds

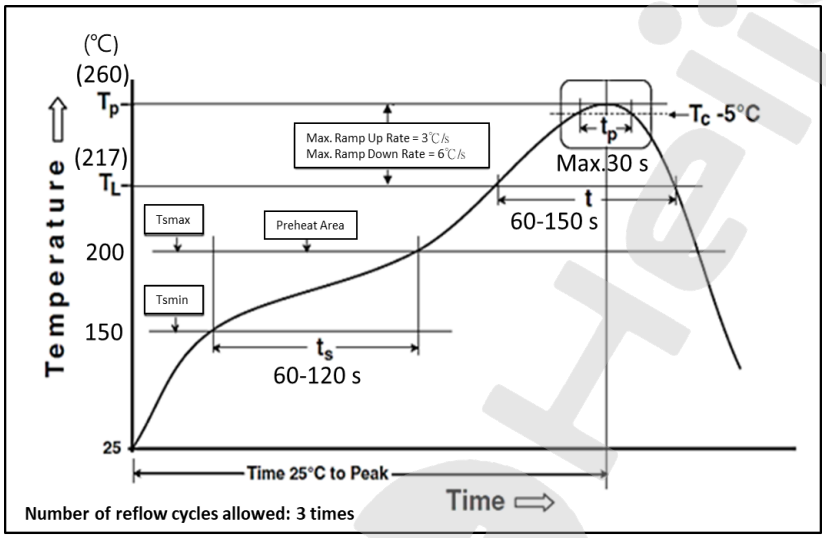
Resistance to Soldering Heat	△R≤±1%R	**JIS-C-5201-1 4.18** **IEC-60115-1 4.18** 260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover	**JIS-C-5201-1 4.7** **IEC-60115-1 4.7** 1.42 times Max. Operating Voltage for 1 minute
Resistance to solvents	Marking Unsmeared	**MIL-STD-202 Method 215** Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Mechanical Shock	△R≤±1%R	**MIL-STD-202 Method 213** Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	△R≤±1%R	**MIL-STD-202 Method 204** 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	△R≤±1%R	**AEC-Q200-002** Human body model 0306 sizes: 1KV Other sizes: 2KV
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.
Terminal strength	No broken	**AEC-Q200-006** Force of 1.8kg for 60 seconds

RCWV(Rated Continuous Working Voltage)=√(P*R) or Max. Operating Voltage whichever is lower.

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

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

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



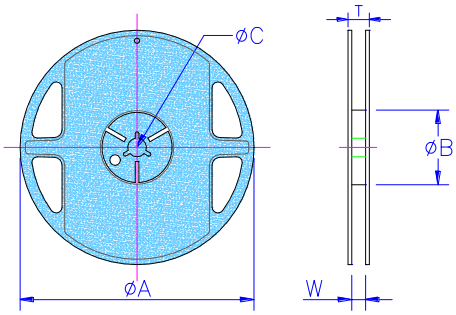
Reflow Profiles	
Profile Feature	**Pb-Free Assembly**
Preheat Min. Temperature (Tsmin) Max Temperature (Tsmax) Preheating time (ts) from (Tsmin to Tsmax)	 150 °C 200 °C 60-120 seconds
Ramp-up rate (T_L to Tp)	3 °C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217 °C 60-150 seconds
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.

■Packaging

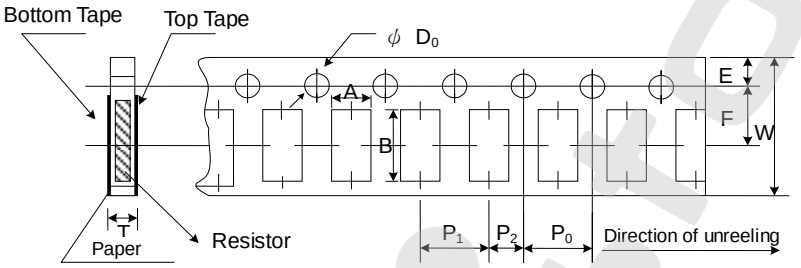
Packaging Quantity & Reel Specifications

Unit: mm

Type	ΦA	ΦB	ΦC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
CSMW36	178.0±1.0	60.0+1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSMW08	178.0±1.0	60.0+1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSMW62	178.0±1.0	60.0+1.0	13.5±0.7	9.5±0.1	11.5±1.0	5,000	-
CSMW20	178.0±1.0	60.0+1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
CSMW25	178.0±1.0	60.0+1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000



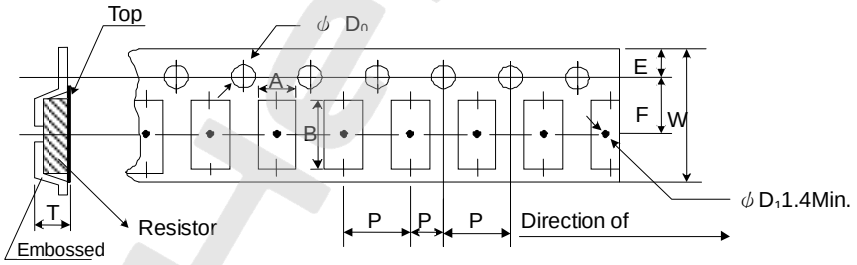
Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
CSMW36	1.10±0.10	1.85±0.10	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.55±0.05	0.60±0.05
CSMW08	1.60±0.10	2.37±0.10	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.55±0.05	0.75±0.05
CSMW62	2.00±0.10	3.55±0.10	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.55±0.05	0.75±0.05

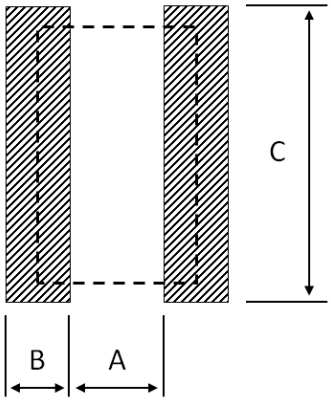
Embossed Plastic Tape Specifications



Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ΦD_0	T
CSMW20	2.85±0.10	5.45±0.10	12.0±0.10	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
CSMW25	3.40±0.10	6.65±0.10	12.0±0.10	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



Pad Layout

Type	Resistance Range	A (mm)	B (mm)	C (mm)	t (μm)
CSMW36	5 – 100mΩ	0.25	0.68	1.70	35
CSMW08	3 – 100mΩ	0.60	0.70	2.20	35
CSMW62	3 – 100mΩ	0.60	0.90	3.40	35
CSMW20	3 – 100mΩ	1.20	1.40	5.20	100
CSMW25	3 – 100mΩ	2.20	1.00	6.60	100
t：copper toil minimum thickness of PCB					

■Marking

No Marking for 0306

For 0508-1225

Type	Code
R100	0.100Ω
R050	0.050Ω
R003	0.003Ω