Thin Film Current Sensing Chip Resistor

CST Series

MERITEK

RoHS

Feature and Applications

- Thin film process
- High power rating up to 3 Watts in 2512 size
- Tight tolerance down to ±0.5%
- Extremely low TCR down to ±50 PPM/°C
- Resistance values from 50m to 1ohm
- High purity alumina substrate for high power dissipation
- 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
- Portable Devices (PDA, Cell Phone)



PART NUMBERING SYSTEM

CST 0603 D X 1R00 F

Current Sensing Chip Resistors

SIZE

0402	0603	0805	1206	2010	2512

TCR (PPM/°C)

D	E	F
±50	±100	±200

Power Rating

R	T	Q	U	V	W	X	Y
3W	1W	3/4W	1/2W	1/4W	1/8W	1/10W	1/16W

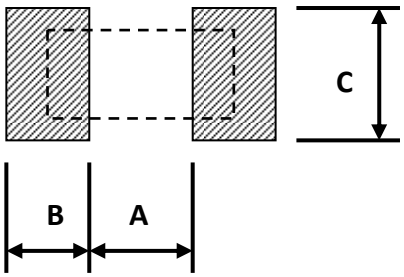
Resistance Value

R010	R100	1R00
0.01Ω	0.1Ω	1Ω

Resistance Tolerance

Code	D	F
Value	±0.5%	±1%

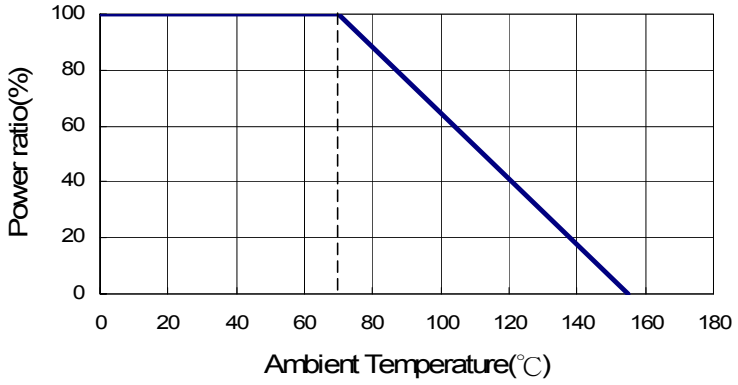
Recommend Land Pattern



Unit: mm

Type	A	B	C
CST0402	0.50	0.50	0.60±0.2
CST0603	0.80	1.00	0.90±0.2
CST0805	1.00	1.00	1.35±0.2
CST1206	2.00	1.15	1.70±0.2
CST2010	3.60	1.40	2.50±0.2
CST2512	4.90	1.60	3.10±0.2

Derating Curve



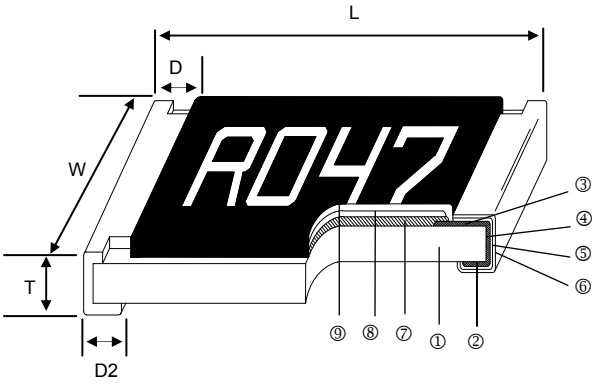
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Construction



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

Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
CST0402	0402	1.00±0.05	0.50±0.05	0.32±0.10	0.25±0.10	0.20±0.10	0.56
CST0603	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	3.1
CST0805	0805	2.00±0.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.25	5.6
CST1206	1206	3.05±0.15	1.55±0.15	0.55±0.10	0.50±0.30	0.40±0.25	12.3
CST2010	2010	5.00±0.20	2.45±0.15	0.60±0.15	0.60±0.30	0.50±0.25	26.7
CST2512	2512	6.35±0.20	3.15±0.15	0.60±0.10	0.60±0.30	0.55±0.25	49.6

Standard Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)		TCR (PPM/°C)
			±0.5%	±1%	
CST0402	1/16W	-55~+155°C	500 - 1000		±100 ±50
CST0603	1/10W	-55~+155°C	200 - 300 301 - 1000		±100 ±50
CST0805	1/8W		200 - 300 301 - 1000		±100 ±50
CST1206	1/4W	-55~+155°C	–	50 - 100	±200 ±100 ±50
			101 - 300 301 - 1000		
CST2010	3/4W	-55~+155°C	50 - 100 101 - 300 301 - 1000		±200 ±100 ±50
CST2512	1W	-55~+155°C	50 - 100 101 - 300 301 - 1000		±200 ±100 ±50

High Power Rating Electrical Specifications

Item / Type	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)	TCR (PPM/°C)
			±1%	
CST2512	3W	-55~+155°C	100 - 1000	±100

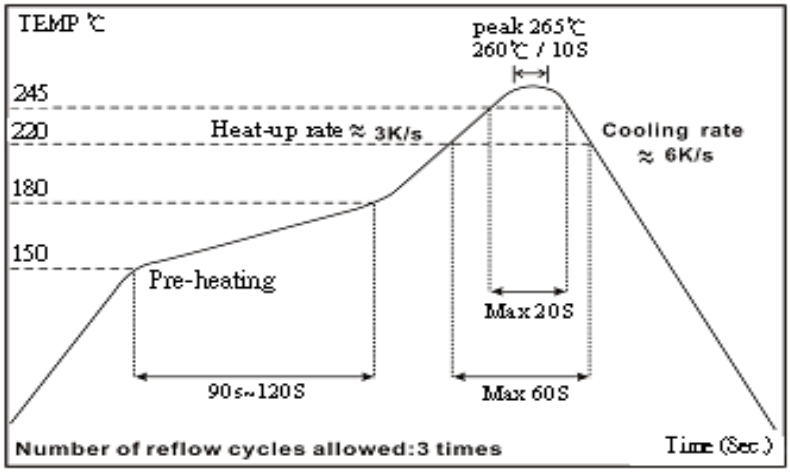
Operating Voltage=$\sqrt{}$(P*R)
Overload Voltage=2.5*$\sqrt{}$(P*R)

Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	**MIL-STD-202F Method 304** +25/-55/+25/+125/+25°C
Short Time Overload	±1%	**JIS-C-5201-1 5.5** RCWV*2.5 or Max. overload voltage for 5 seconds
Insulation Resistance	>1000MΩ	**MIL-STD-202F Method 302** Apply 100V_{DC} for 1 minute
Endurance	±1%	**MIL-STD-202F Method 108A** 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	±0.5%	**MIL-STD-202F Method 103B** 40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Bending Strength	As Spec.	**JIS-C-5201-1 6.1.4** Bending amplitude 3mm for 10 seconds
Solderability	95% min. coverage	**MIL-STD-202F Method 208H** 245±5°C for 3 seconds
Resistance to Soldering Heat	±0.5%	**MIL-STD-202F Method 210E** 260±5°C for 10 seconds
Dielectric Withstand Voltage	By Type	**MIL-STD-202F Method 301** Apply Max. Overload Voltage for l minute
Thermal Shock	±0.5%	**MIL-STD-202F Method 107G** -55°C ~150°C, 100 cycles
Low Temperature Operation	±0.5%	**JIS-C-5201-1 7.1** 1 hour, -65°C followed by 45 minutes of RCWV

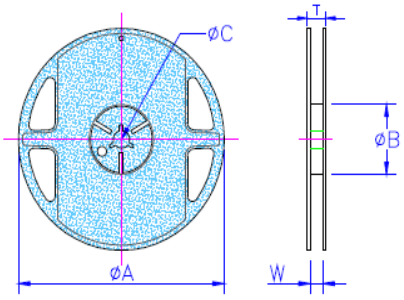
Storage Temperature: 25±3°C; Humidity < 80%RH

Reflow

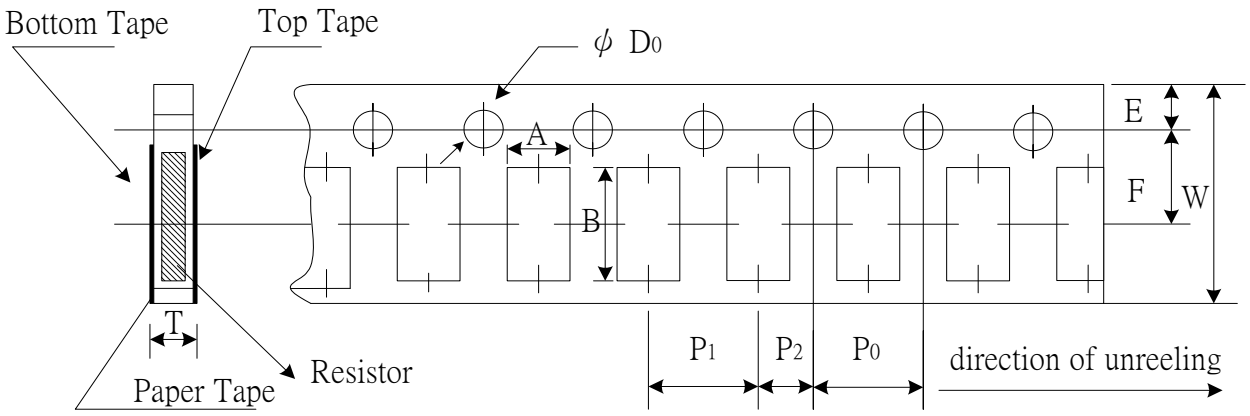


Packaging

Type	ψA	ΦB	ψC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
CST0402	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	
CST0603	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
CST0805	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
CST1206	178.0±1.0	60.0+1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
CST2010	178.0±1.0	60.0+1.0	13.5±0.7	13.5±1.00	15.5±1.0	-	4,000
CST2512	178.0±1.0	60.0+1.0	13.5±0.7	13.5±1.00	15.5±1.0	-	4,000



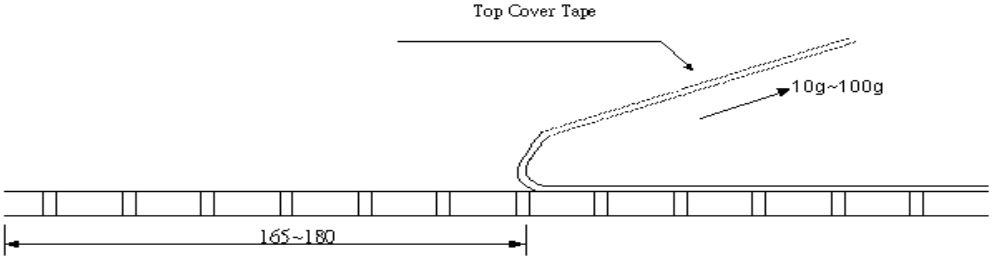
Paper Tape Specifications



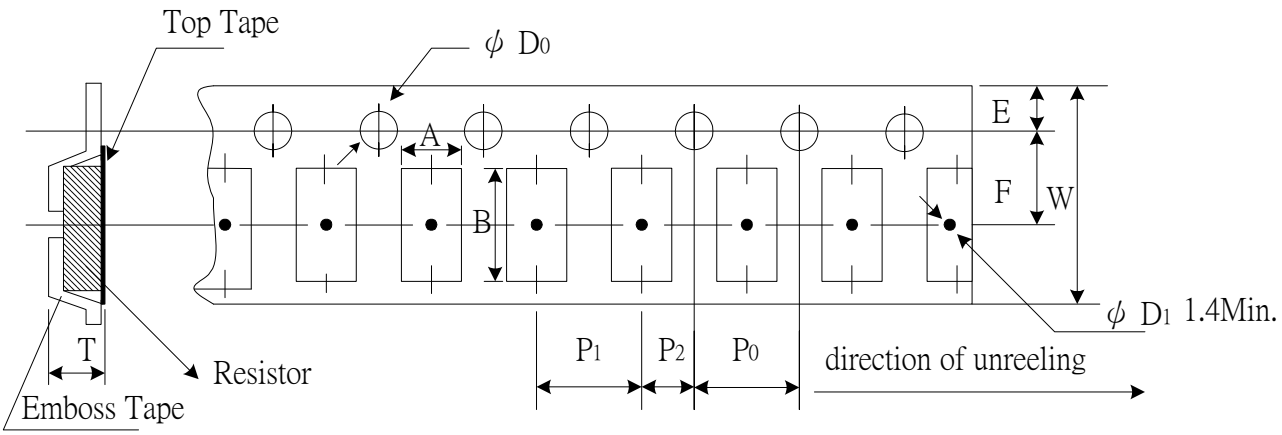
Unit: mm

Type	A	B	W	E	F	P0	P1	P2	ψD0	T
CST0402	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
CST0603	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
CST0805	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
CST1206	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 10 to 100g



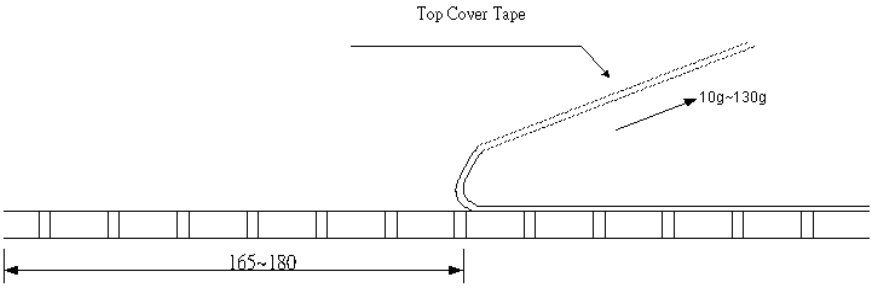
Emboss Plastic Tape Specifications



Unit: mm

Type	A	B	W	E	F	P_0	P_1	P_2	ψD_0	T
CST2010	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
CST2512	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

- Peel force of top cover tape
- The peel speed shall be about 300mm/min±5%
- The peel force of top cover tape shall be between 10 to 130g



Marking

0603 3digit marking

Example：

Resistance	1Ω	0.1Ω	0.15Ω	0.01Ω	0.101Ω	0.035Ω
Codes	1R0	R10	R15	R01	101	035

0805~2512 4digit marking

Example：

Resistance	1Ω	0.1Ω	0.05Ω	0.015Ω	0.01Ω
Codes	1R00	R100	R050	R015	R010