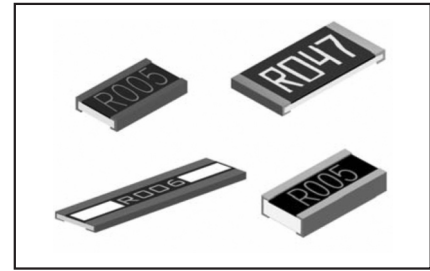


Current Sensing Chip Resistors

- 3W rating in 1W size, 1225 package
- Low TCR from $\pm 100 \sim \pm 600$ ppm/ $^{\circ}\text{C}$
- Resistance values from 1m to 1 Ω
- High purity alumina substrate for high power dissipation
- Long side terminations with higher power rating



Wire Wound Resistors

Current Sensing Resistors

Precision Resistors

Power Film Resistors

High Voltage Resistors

Bulk Ceramic Resistors

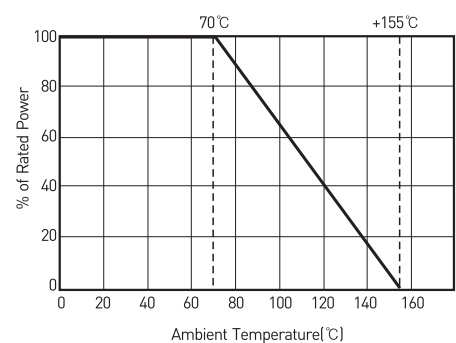
Heaters

GENERAL SPECIFICATIONS

Model	Power Rating	Operating Temperature Range	Resistance Tolerance (%)	Resistance Range[Ω]	TCR[ppm/ $^{\circ}\text{C}$]
CS01 (0201)	1/20W	-55 $^{\circ}\text{C}$ ~ +155 $^{\circ}\text{C}$	F [± 1] G [± 2] J [± 5]	100m ~ 149m	± 1000
CS02 (0402)	1/16W			150m ~ 500m	± 600
				501m ~ 1000m	± 300
				50m ~ 100m	± 400
CS03 (0603)	1/10W			101m ~ 500m	± 300
				501m ~ 1000m	± 200
				20m ~ 50m	± 600
CS05 (0805)	1/8W			51m ~ 100m	± 400
				101m ~ 500m	± 300
				501m ~ 1000m	± 200
CS06 (1206)	1/4W			20m ~ 50m	± 600
				51m ~ 100m	± 400
				101m ~ 500m	± 300
CS13 (1210)	1/2W			501m ~ 1000m	± 200
CS10 (2010)	3/4W				10m ~ 20m
CS12 (2512)	1W	21m ~ 50m	± 400		
CS25 (1225)	3W	51m ~ 99m	± 300		
		100m ~ 1000m	± 200		
		3m ~ 5m	± 300		
CS37 (3720)	1W	6m ~ 20m	± 200		
		21m ~ 30m	± 150		
		31m ~ 8000m	± 100		
CS75 (7520)	2W	10m ~ 19m	± 300		
		20m ~ 500m	± 150		
		G [± 2], J [± 5]	1m ~ 4m	± 300	
CS12 (2512)	2W	F [± 1], G [± 2], J [± 5]	5m ~ 10m	± 200	
			11m ~ 350m	± 150	

HIGH POWER RATING SPECIFICATIONS AND DERATING CURVE

Model	Power Rating	Resistance Range[Ω] $\pm 1\%$, $\pm 2\%$, $\pm 5\%$	TCR[ppm/ $^{\circ}\text{C}$]		
CS02 (0402)	1/8W	51m ~ 100m	± 400		
CS03 (0603)	1/8W, 1/5W	101m ~ 500m	± 300		
CS05 (0805)	1/4W	501m ~ 1000m	± 200		
CS06 (1206)	1/2W	10m ~ 20m	± 600		
CS13 (1210)	3/4W			21m ~ 50m	± 400
CS10 (2010)	1W			51m ~ 99m	± 300
CS12 (2512)	1.5W	100m ~ 1000m	± 200		
CS12 (2512)	2W				



CHARACTERISTICS

Values in [] mean change in Ω after test

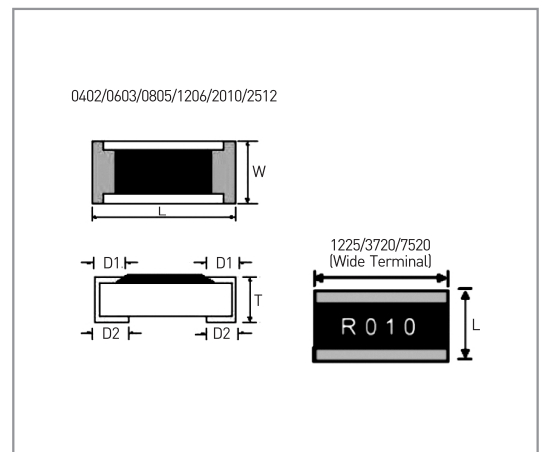
Temp. Coefficient of Resistance	As Spec.	-55°C~125°C, 25°C is the reference temperature
Short Time Overload	±[1.0%+0.05Ω] for high power rating	RCWW*2.5 or maximum Overload Voltage, 5seconds
Dielectric Withstanding Voltage	No breakdown or flashover	1.42 times RCWW(RMS) for 1minute
Insulation Resistance	≥10GΩ	Maximum Overload voltage for 1minute
Thermal Shock	±[0.5%+0.05Ω]	-55°C~155°C, 5cycles
Load Life	±[1.0%+0.05Ω]	RCWW, 70±2°C 1.5hours on, 0.5hours off for 1000~1048hours
Humidity(Steady State)	±[0.5%+0.05Ω]	40±2°C, 90~95%RH, RCWW 1.5hours on, 0.5hours off for 1000~1048hours
Resistance to Dry Heat	±[0.5%+0.05Ω]	at +155°C for 1000hours without load
Bending Strength	As Spec.	Bending once for 5seconds, 2010, 2512 size: 2mm, other size: 3mm
Solerability	95% coverage minimum	245±5°C, 3seconds
Resistance to Soldering Heat	±[0.5%+0.05Ω]	260±5°C, 10±1seconds

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

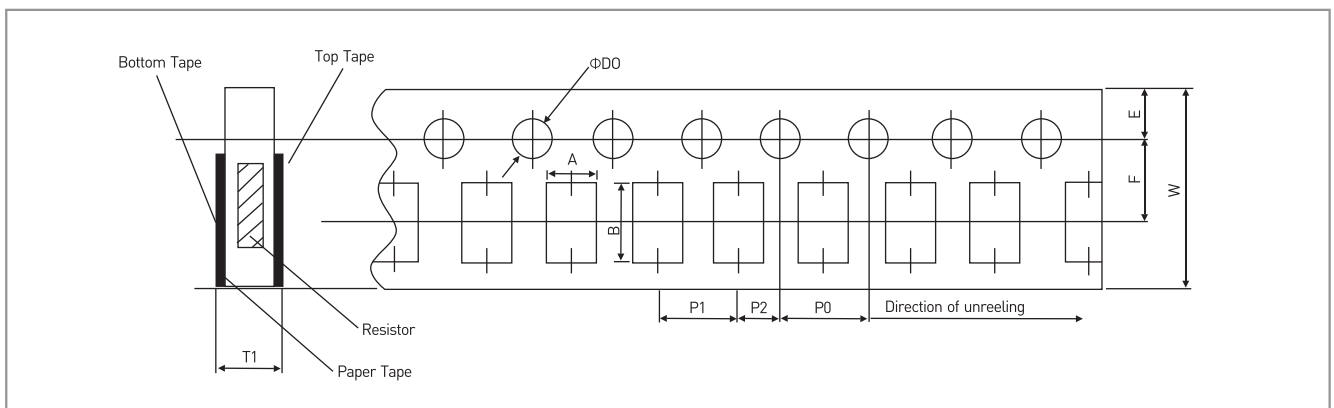
* Reference Standards: IEC60115-1, 60068-2-58, JIS-C 5201-1

DIMENSIONS [mm]

Model	Dimensions [mm]				
	L	W	T	D1	D2
CS01	0.60±0.03	0.30±0.03	0.23±0.05	0.12±0.05	0.15±0.05
CS02	1.00±0.05	0.50±0.05	0.32±0.10	0.25±0.10	0.20±0.10
CS03	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
CS05	2.00±1.15	1.25±0.15	0.55±0.10	0.30±0.20	0.40±0.25
CS06	3.10±0.15	1.55±0.15	0.55±0.10	0.50±0.30	0.40±0.25
CS13	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.30	0.50±0.25
CS10	5.00±0.20	2.50±0.15	0.60±0.15	0.60±0.30	0.50±0.25
CS12	6.35±0.20	3.10±0.15	0.60±0.10	0.60±0.30	0.55±0.25
CS25	3.10±0.15	6.30±0.15	0.90±0.15	0.60±0.30	0.80±0.25
CS37	2.00±0.20	3.75±0.20	0.60±0.10	0.40±0.20	0.40±0.20
CS75	2.00±0.20	7.50±0.30	0.60±0.10	0.40±0.20	0.40±0.20

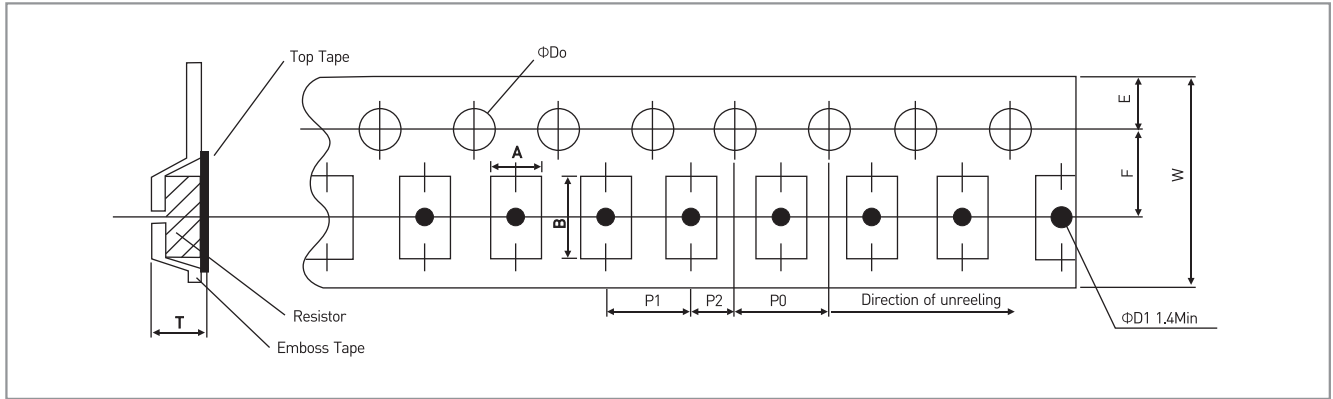


PAPER TAPE SPECIFICATIONS



Model	Dimensions [mm]									
	A	B	W	E	F	P0	P1	P2	ΦD0	T
CS01	0.38±0.05	0.68±0.05								0.42±0.2
CS02	0.65±0.1	1.15±0.1					2.00±0.05			0.45±0.1
CS03	1.10±0.1	1.90±0.1	8.00±0.2	1.75±0.1	3.5±0.05	4.00±0.1				0.70±0.1
CS05	1.60±0.1	2.40±0.2					4.00±0.1	2.00±0.05	1.50± ^{0.1} _{0.0}	
CS06	1.90±0.1	3.50±0.2								0.85±0.1
CS13	2.90±0.1	3.50±0.2								

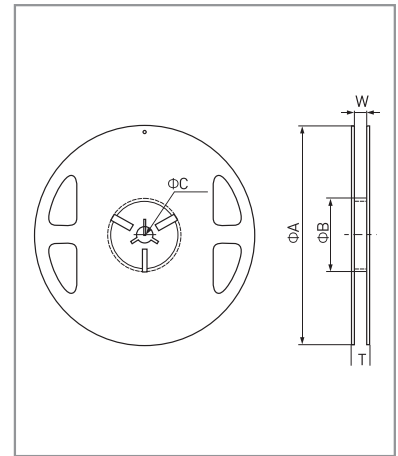
EMBOSS PLASTIC TAPE SPECIFICATIONS



Model	Dimensions [mm]									
	A	B	W	E	F	P0	P1	P2	ΦD0	T
CS10	2.80±0.10	5.50±0.10	12.0±0.10		5.5±0.05	4.0±0.05			1.50±0.10	1.00±0.20
CS12	3.40±0.10	6.70±0.10	12.0±0.10		5.5±0.05	4.0±0.05			1.50±0.10	1.00±0.20
CS25	3.38±0.10	6.68±0.10	12.0±0.30	1.75±0.10	5.5±0.10	4.0±0.10	4.0±0.10	2.0±0.05	1.55±0.05	1.45±0.20
CS37	2.50±0.20	4.45±0.20	12.0±0.30		5.5±0.05	4.0±0.05			1.50±0.10	1.20±0.20
CS75	2.50±0.20	8.30±0.20	16.0±0.30		7.8±0.05	4.0±0.05			1.50±0.10	1.20±0.20

REEL SPECIFICATIONS

Model	Dimensions [mm]					Paper Tape [pcs]	Emboss Plastic Tape [pcs]
	ΦA	ΦB	ΦC	W	T		
CS01	178±1	60.0±1.0	13.5±0.7	9.5±0.50	11.5±1.0	10,000	-
CS02	178±1	60.0±1.0	13.5±0.7	9.5±0.50	11.5±1.0	10,000	-
CS03	178±1	60.0±1.0	13.5±0.7	9.5±0.50	11.5±1.0	5,000	-
CS05	178±1	60.0±1.0	13.5±0.7	9.5±0.50	11.5±1.0	5,000	-
CS06	178±1	60.0±1.0	13.5±0.7	9.5±0.50	11.5±1.0	5,000	-
CS13	178±1	60.0±1.0	13.5±0.7	9.5±0.50	11.5±1.0	5,000	-
CS10	178±1	60.0±1.0	13.5±0.7	13.5±1.50	15.5±1.0	-	4,000
CS12	178±1	60.0±1.0	13.5±0.7	13.5±1.50	15.5±1.0	-	4,000
CS25	178±1	60.0±1.0	13.5±0.7	13.5±1.50	15.5±1.0	-	2,000
CS37	178±1	60.0±1.0	13.5±0.7	13.5±1.50	15.5±1.0	-	2,000
CS75	178±1	60.0±1.0	13.5±0.7	17.5±1.50	19.5±1.0	-	2,000



ORDERING PROCEDURE EXAMPLE

