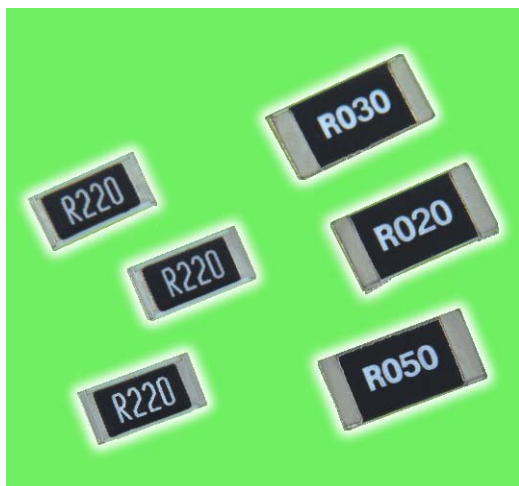


CURRENT SENSING RESISTOR (1) – CS



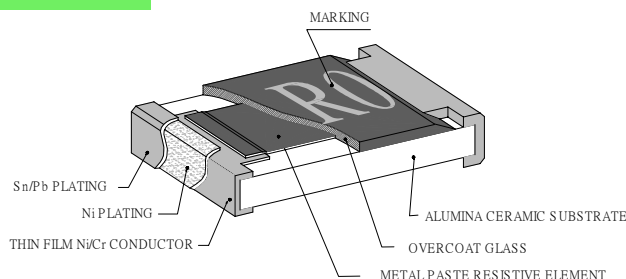
Features

- Low TCR from $\pm 100\text{ppm}$ ~ $\pm 600\text{ppm}$
- Resistance values from 10m ohms to 1 ohms
- High purity alumina substrate for high power dissipation

Applications

- NB (For power management)
- MB (For power management)
- SWPS (DC-DC converter, Charger, Adaptor)
- Monitor (For power management)

Construction



Part Numbering

CS 12 J T G P R010

① ② ③ ④ ⑤ ⑥ ⑦

① Product Type

Product Type	
CS	Current Sensing Resistor (SMD)

② Dimensions (LxW)

Codes	Dimensions (LxW)	EIA
02	1.00x0.50mm	0402
03	1.60x0.80mm	0603
05	2.00x1.25mm	0805
06	3.10x1.55mm	1206
10	5.00x2.50mm	2010
12	6.30x3.10mm	2512
37	3.75x2.00mm	3720
75	7.50x2.00mm	7520

③ Resistance Tolerance

Codes	Resistance Tolerance
J	$\pm 5\%$
G	$\pm 2\%$
F	$\pm 1\%$

④ Packaging

Code	Type
T	Taping Reel
B	Bulk

⑤ TCR

Code	Type
E	$\pm 100\text{ppm}$
F	$\pm 200\text{ppm}$
G	$\pm 300\text{ppm}$
H	$\pm 400\text{ppm}$
I	$\pm 500\text{ppm}$
J	$\pm 600\text{ppm}$

⑥ Power Rating

Code	Type
S	2W
T	1W
U	1/2W
V	1/4W
W	1/8W
X	1/10
Y	1/16
Z	1/32W

⑦ Resistance

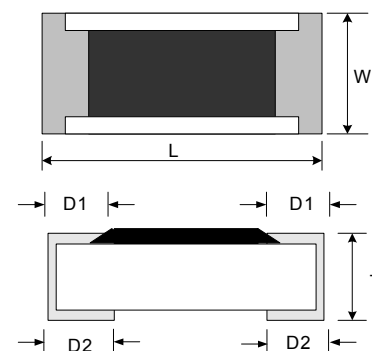
Code	Type
1R00	1.000 Ω
R100	0.100 Ω
R050	0.050 Ω
R015	0.015 Ω
R010	0.010 Ω

* Viking has the ability to manufacture following options based on customer's requirement.

Dimensions

Unit: mm

SIZE	STYLE	L	W	T	D1	D2
0402	CS02	1.00±0.05	0.50±0.05	0.32±0.05	0.25±0.10	0.20±0.10
0603	CS03	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
0805	CS05	2.00±0.15	1.25±0.15	0.50±0.10	0.30±0.20	0.30±0.20
1206	CS06	3.10±0.15	1.55±0.15	0.60±0.10	0.50±0.30	0.40±0.20
2010	CS10	5.00±0.15	2.50±0.15	0.60±0.10	0.60±0.30	0.50±0.25
2512	CS12	6.30±0.15	3.10±0.15	0.60±0.10	0.60±0.30	0.50±0.25
3720	CS37	3.75±0.20	2.00±0.20	0.60±0.10	0.40±0.20	0.40±0.20
7520	CS75	7.50±0.30	2.00±0.20	0.60±0.10	0.40±0.20	0.40±0.20



Standard electrical specifications

Item Type	Power Rating	Operating Temp. Range	Resistance Tolerance	Resistance Range	TCR
CS02	1/16W	-55 ~ +125°C	±1% ±2% ±5%	51mΩ~100mΩ 101mΩ~500mΩ 501mΩ~1Ω	±400 ppm ±300 ppm ±200 ppm
CS03	1/10W			20mΩ~50mΩ 51mΩ~100mΩ 101 mΩ~500mΩ 501mΩ~1Ω	±600 ppm ±400 ppm ±300 ppm ±200 ppm
CS05	1/8W			20mΩ~50mΩ 51mΩ~100mΩ 101 mΩ~500mΩ 501mΩ~1Ω	±600 ppm ±400 ppm ±300 ppm ±200 ppm
CS06	1/4W			10 mΩ~20mΩ 21 mΩ~50mΩ 51mΩ~500mΩ 501mΩ~1Ω	±600 ppm ±400 ppm ±300 ppm ±200 ppm
CS10	1/2W				
CS12	1W				
CS37	1W			10mΩ~50mΩ	±300 ppm
CS75	2W			1mΩ~10mΩ	±300 ppm

High power rating electrical specifications

Item Type	Power Rating	Operating Temp. Range	Resistance Tolerance	Resistance Range
CS05□□□V□□□□	1/4W	-55 ~ +125°C	±1%	100mΩ~1Ω
CS06□□□U□□□□	1/2W		±2% ±5%	100mΩ~1Ω

Low TCR electrical specifications

Item Type	Power Rating	Operating Temp. Range	Resistance Tolerance	Resistance Range	TCR
CS06□□EV□□□□	1/4W	-55 ~ +125°C	±1%	100mΩ~1Ω	±100 ppm
CS10□□EU□□□□	1/2W		±2%	100mΩ~1Ω	±100 ppm
CS12□□ET□□□□	1W		±5%	100mΩ~1Ω	±100 ppm

Packaging

Packaging Quantity

Unit: PCS

Series	Packaging	Paper Tape	Emboss Plastic Tape
CS02		10,000	
CS03		5,000	
CS05		5,000	
CS06		5,000	
CS10			4,000
CS12			4,000
CS37			4,000
CS75			4,000

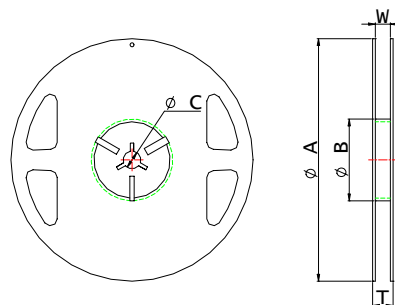
Marking for 0603

Code	Type
1R0	1.000Ω
R10	0.100Ω
R15	0.150Ω
R01	0.010Ω
101	0.101Ω
035	0.035Ω

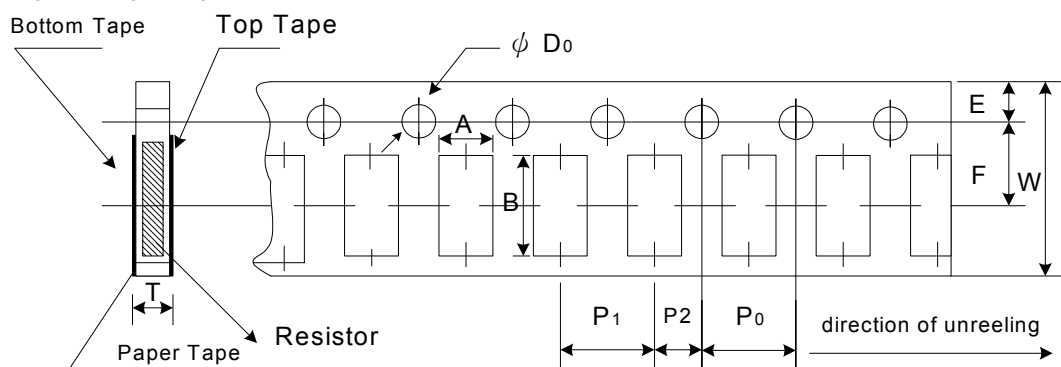
Reel Specifications

Unit: mm

Series	ΦA	ΦB	ΦC	W	T
CS02	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	9.00±0.50	11.40±1.00
CS03	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	9.00±0.50	11.40±1.00
CS05	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	9.00±0.50	11.40±1.00
CS06	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	9.00±0.50	11.40±1.00
CS10	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	14.0±0.50	16.40±1.00
CS12	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	14.0±0.50	16.40±1.00
CS37	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	14.0±0.50	16.40±1.00
CS75	180 ⁺⁰ ₋₃	60 ⁺¹ ₊₀	13.0±1.0	17.0±0.50	19.00±1.00



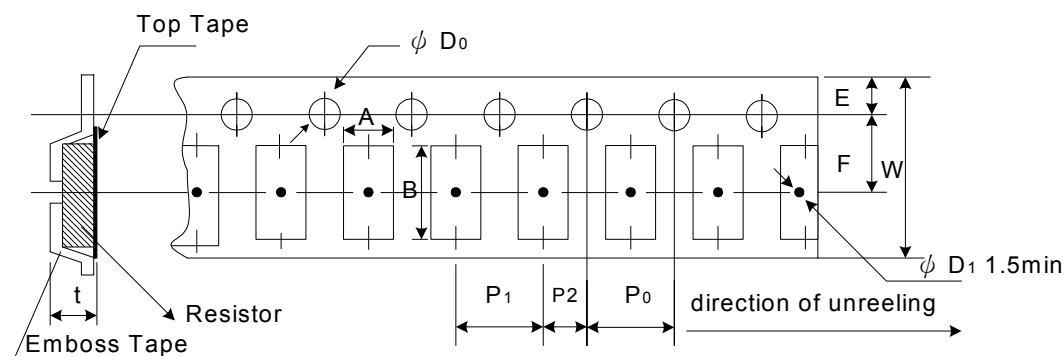
Paper Tape Specifications



Unit: mm

Series	A	B	W	F	E	P ₁	P ₂	P ₀	ϕ D ₀	T
AR02	0.62±0.05	1.12±0.05	8.00 ±0.10	3.50 ±0.05	1.75 ±0.05	2.00±0.02	2.00 ±0.05	4.00 ±0.05	1.55 ±0.05	0.50±0.10
AR03	1.10±0.10	1.90±0.10				4.00±0.05				0.70±0.10
AR05	1.60±0.15	2.40±0.20								0.80±0.10
AR06	2.00±0.15	3.60±0.20								0.80±0.10

Emboss Plastic Tape Specifications



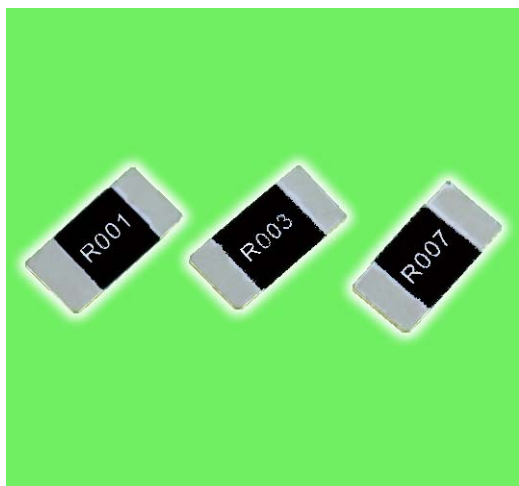
Unit: mm

Series	A	B	W	F	E	P ₁	P ₂	P ₀	ϕD_0	t
CS10	2.80±0.20	5.30±0.20	12.00	5.50	1.75 ±0.05	4.00 ±0.05	2.00 ±0.05	4.00 ±0.05	1.55 ±0.05	1.0
CS12	3.50±0.20	6.80±0.20	±0.10	±0.05						±0.20
CS37	2.40±0.20	4.25±0.20	12.00	5.50						1.5±0.20
CS75	2.40±0.20	8.20±0.20	16.00	7.50						
			±0.30	±0.10						

Environmental Characteristics

Item	Specification	Test Method
1 Temperature Coefficient of Resistance	As Spec	MIL-STD-202F Method 304 +25/-55/+25/+125/+25°C
2 Short Time Overload	±(0.5% + 0.05Ω)	JIS-C-5202-5.5 RCWV*2.5orMax Overloading Voltage 5seconds
3 Dielectric Withstand Voltage	by Type	MIL-STD-202F Method 301 Apply Max Overload Voltage for 1 minute
4 Insulation Resistance	>1000MΩ	MIL-STD-202F Method 302 Apply 100V _{DC} for 1minute
5 Thermal Shock	±(0.5% + 0.05Ω)	MIL-STD-202F Method 107G -55°C ~ 125°C, 100cycles
6 Load Life	±(1% + 0.05Ω)	MIL-STD-202F Method 108A RCWV , 70°C , 1.5 hours on , 0.5 hours off 1000~1048 hours
7 humidity (Steady State)	±(1% + 0.05Ω)	MIL-STD-202F Method 103B 40°C , 90~95%RH , RCWV 1.5 hours ON , 0.5 hours OFF , total 1000 ~ 1048 hours
8 Resistance to dry heat	±(0.5% + 0.05Ω)	JIS-C-5202-7.2 96hours @ +125°C without load
9 Low Temperature Operation	±(0.5% + 0.05Ω)	JIS-C-5202-7.1 1hour, -65°C followed by 45minutes of RCWV
10 Bending Strength	±(0.5% + 0.05Ω)	JIS-C-5202-6.1.4 Bending Amplitude 3mm for 10seconds
11 Solderability	95%min coverage	MIL-STD-202F Method 208H 235°C ±5°C, 2±0.5 (sec)
12 Resistance to Soldering Heat	±(0.5% + 0.05Ω)	MIL-STD-202F Method 210E 260±5°C, 10±1second

CURRENT SENSING RESISTOR (2) – LR



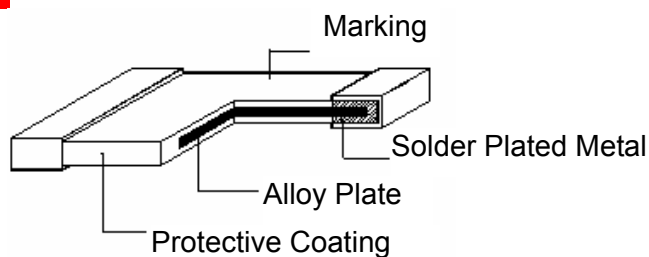
Features

- Low TCR $\pm 100\text{ppm}$
- Resistance values from 1m ohms to 10m ohms
- High power dissipation
- Lower inductance

Applications

- NB (For power management)
- MB (For power management)
- SWPS (DC-DC converter, Charger, Adaptor)
- Monitor (For power management)

Construction



Part Numbering

LR	12	J	T	E	R003
①	②	③	④	⑤	⑥

① Product Type

Product Type	
LR	Current Sensing Resistor (SMD)

② Dimensions (LxW)

Codes	Dimensions (LxW)	EIA
12	6.3x3.1mm	2512

③ Resistance Tolerance

Codes	Resistance Tolerance
J	$\pm 5\%$
G	$\pm 2\%$
F	$\pm 1\%$

④ Packaging

Code	Type
T	Taping Reel

⑤ TCR

Code	Type
E	$\pm 100\text{ PPM}$

⑥ Resistance

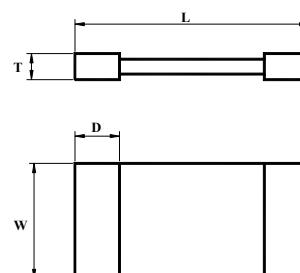
Code	Type
R001	0.001 Ω
R003	0.003 Ω
R005	0.005 Ω
R007	0.007 Ω

Dimensions

Unit: mm

SIZE	STYLE	L	W	T	D	Resistance
2512	LR12	6.3 $\pm$ 0.15	3.1 $\pm$ 0.15	*	1.3 $\pm$ 0.3 0.8 $\pm$ 0.3	0.001~0.006 0.007~0.010

* (T) Thickness will change according to resistance value,
Please refer to our detailed data sheet.



Standard electrical specifications

Item Type	Power Rating	Operating Temp. Range	Max Operating Voltage	Max Overloading Voltage	Resistance Tolerance	Resistance Range	TCR (ppm)
LR12	1W 2W	-55°C~170°C	200V	400V	±1% ±2% ±5%	1mΩ~10mΩ	±100

Packaging

Packaging Quantity

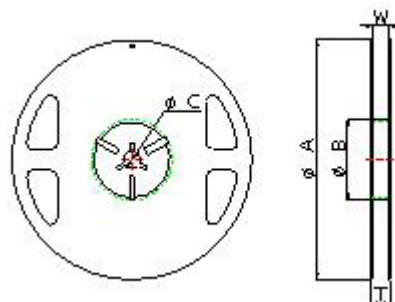
Unit: pcs

Packaging Series	Paper Tape	Emboss Plastic Tape
LR12		4,000

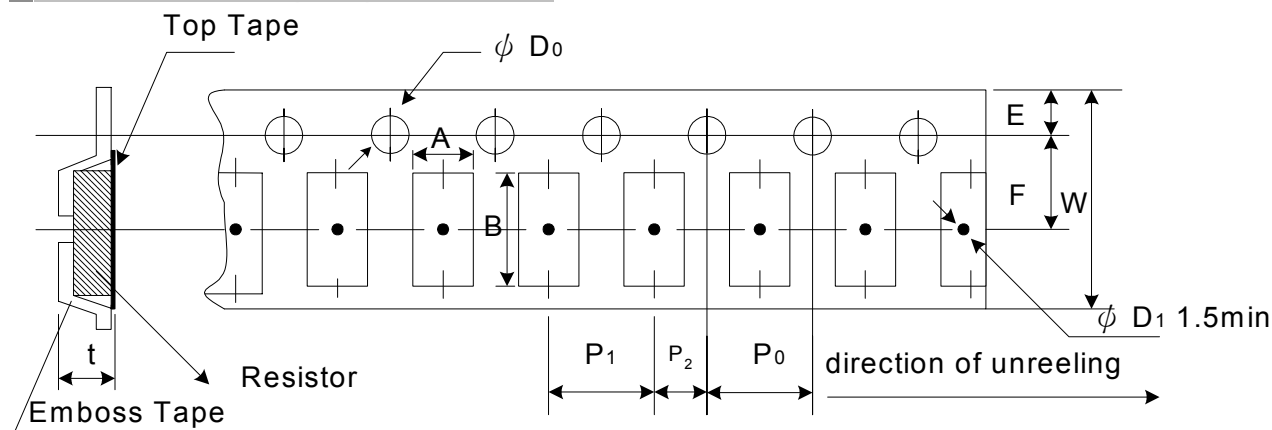
Reel Specifications

Unit: mm

Series	ΦA	ΦB	ΦC	W	T
LR12	180 ⁺⁰ ₋₃	60min.	13.0±1.0	14±0.1	16.4±1.0



Emboss Plastic Tape Specifications



Unit: mm

Series	A	B	W	F	E	P ₁	P ₂	P ₀	φ D ₀	t
LR12	3.50±0.20	6.80±0.20	12.00 ±0.10	5.50 ±0.05	1.75 ±0.05	4.00 ±0.05	2.00 ±0.05	4.00 ±0.05	1.55 ±0.05	1.0 ±0.20

Environmental Characteristics

Item	Specification	Test Method
1 Temperature Coefficient of Resistance	As Spec.	MIL-STD-202 Method 304 +25/-30/+25/+130/+25°C
2 Thermal Shock	±(0.5mΩ)	MIL-STD-202 Method 107G -55°C~150°C, 100 cycles
3 Short Time Overload	±(0.5mΩ)	JIS-C-5202-5.5 RCWV*2.5 or Max Overloading Voltage , 5 seconds
4 Resistance to dry heat	±(0.5mΩ)	JIS-C-5202-7.2 96 hours @ +125°C without load
5 Load Life	±(0.5mΩ)	MIL-STD-202 M108 RCWV , 70°C , 1.5 hours on , 0.5 hours off 1000~1048 hours
6 Resistance to Soldering Heat	±(0.5mΩ)	MIL-STD-202F-Method210E 260±5°C, 10±1second