

FCSL Series

Metal Foil Current Sense



Ohmite continues to add to its complement of Current Sense offerings with the FCSL Series. FCSL incorporates proven metal foil technology to produce the ultimate in a current sense resistor. FCSL features the effective combination of very low and stable TCRs (Temperature Coefficient of Resistance) available in a wide selection of very low ohmic values. Power ratings up to 5 Watts makes FCSL the ideal choice for your current sensing applications.

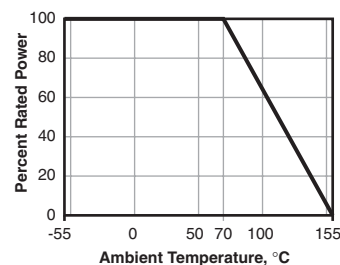
FEATURES

- Foil Construction ensures a very stable TCR (Temperature Coefficient of Resistance)
- Designed for automatic insertion
- Industry standard sizes
- High heat resistant use
- Low heat electromotive use
- Color: white (top) and green (bottom)

SERIES SPECIFICATIONS

Series	Power Rating	Resistance Range	Tolerance	TCR (ppm/°C)	Weight (g)
FCSL64	2.0W	1mΩ	±5%	±150	0.03572
		2mΩ	±2%	±100	
		3mΩ ~ 100mΩ	±1%	±50	
FCSL76	3.0W	1mΩ	±5%	±150	0.05038
		2mΩ	±2%	±100	
		3mΩ ~ 100mΩ	±1%	±50	
FCSL90	4.0W	1mΩ	±5%	±150	0.07065
		2mΩ	±2%	±100	
		3mΩ ~ 100mΩ	±1%	±50	
FCSL110	5.0W	1mΩ	±5%	±150	0.09594
		2mΩ	±2%	±100	
		3mΩ ~ 100mΩ	±1%	±50	

Derating



CHARACTERISTICS

Test Condition	Maximum ΔR
Max. temperature for rated power	70°C
Operating temperature range	-55°C ~ +155°C
Rated voltage	$\sqrt{(\text{Rated power} \times \text{Resistance value})}$ V
In-rush current*	Rated current 10 msec ON, 60 sec OFF, 10 cycles* (see table at right) ±(1.0% +0.0005Ω)
Rapid change of temperature	-55°C (30min.)/+155°C (30min.), 100 cycles ±(1.0% +0.0005Ω)
Solderability	245°C ±5°C for 3 ±0.5 sec. Min. 90% coverage
Endurance at 70°C	70°C ±3°C, Rated voltage 1.5h ON, 0.5h OFF, 1000h ±(1.0% +0.0005Ω)
Resistance to soldering heat	260°C ±5°C for 10 ±1 sec. ±(0.5% +0.0005Ω)
Moisture resistance	60°C ±2°C, 90~95% RH, Rated voltage 1.5h ON, 0.5h OFF, 1000h ±(2.0% +0.0005Ω)

*In-rush Current

Series	Rated Wattage	1mΩ~10mΩ		12mΩ~100mΩ	
		In-rush Power	Continuous Current	In-rush Power	Continuous Current
FCSL64	2W	225W	125A	150W	70A
FCSL76	3W	325W	150A	210W	80A
FCSL90	4W	440W	180A	300W	100A
FCSL110	5W	600W	240A	440W	120A

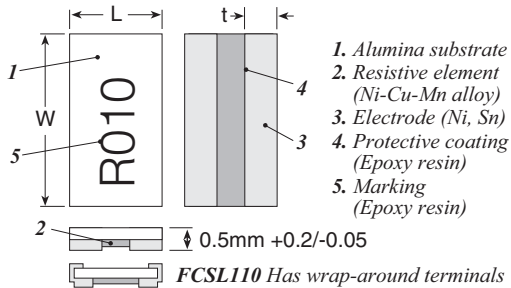
In-rush current = $\sqrt{(\text{in-rush power}/\text{resistance value})}$, or max. current, whichever is smaller

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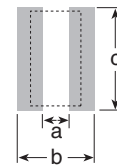
DIMENSIONS

(in.±.008/mm ±0.20)



Series	Power Rating	L	W	t
FCSL64	2.0W	0.122/3.1	0.248/6.3	0.047/1.2 0.020/0.5 0.020/0.5
FCSL76	3.0W	0.15/3.8	0.3/7.6	0.053/1.35 0.024/0.6 0.024/0.6
FCSL90	4.0W	0.177/4.5	0.35/8.9	0.063/1.6 0.028/0.7 0.028/0.7
FCSL110	5.0W	0.197/5.0	0.43/11.0	0.071/1.8 0.031/0.8 0.031/0.8

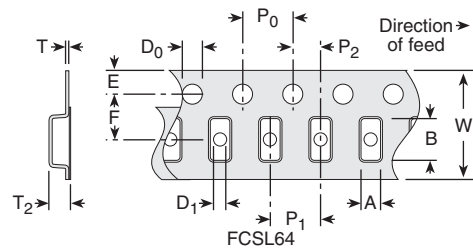
Land Pattern



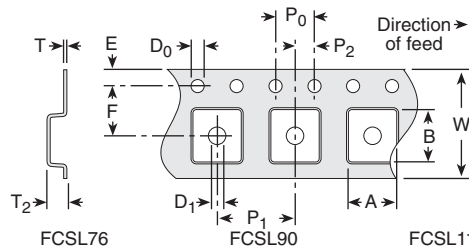
(mm)	Value range	a	b	c
FCSL64	1mΩ	0.9	4.2	6.6
	2mΩ~100mΩ	2.2	4.2	6.6
FCSL76	1mΩ	1.1	4.6	7.8
	2mΩ~100mΩ	2.6	4.6	7.8
FCSL90	1mΩ	1.3	5.1	9.2
	2mΩ~100mΩ	3.1	5.1	9.2
FCSL110	1mΩ	1.5	5.6	11.2
	2mΩ~100mΩ	3.6	5.6	11.2

PACKAGING SPECIFICATIONS

Tape (in./mm)

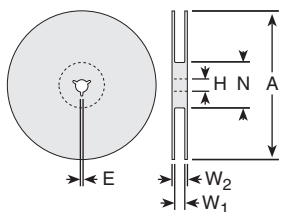


A	0.135 (3.43 ±0.2)
B	0.261 (6.63 ±0.2)
W	0.472 (12.0 ±0.3)
E	0.069 (1.75 ±0.1)
F	0.217 (5.5 ±0.05)
P0	0.157 (4.0 ±0.1)
P1	0.157 (4.0 ±0.1)
P2	0.079 (2.0 ±0.05)
D0	0.059 (1.5 ±0.1/-0)
D1	0.059 (1.5 ±0.2/-0)
T	0.008 (0.2 ±0.05)
T2	0.059 (1.5 max.)



A	0.196 (4.98 ±0.1)	0.187 (4.75 ±0.1)	0.211 (5.36 ±0.1)
B	0.310 (7.88 ±0.1)	0.372 (9.45 ±0.1)	0.463 (11.74 ±0.1)
W	0.630 (16.0 ±0.3/-0.1)	0.630 (16.0 ±0.3/-0.1)	0.945 (24.0 ±0.3/-0.1)
E	0.069 (1.75 ±0.1)	0.069 (1.75 ±0.1)	0.069 (1.75 ±0.1)
F	0.295 (7.5 ±0.05)	0.295 (7.5 ±0.1)	0.453 (11.50 ±0.1)
P0	0.157 (4.0 ±0.1)	0.157 (4.0 ±0.1)	0.157 (4.0 ±0.1)
P1	0.315 (8.0 ±0.1)	0.315 (8.0 ±0.1)	0.315 (8.0 ±0.1)
P2	0.185 (2.0 ±0.1)	0.185 (2.0 ±0.1)	0.185 (2.0 ±0.1)
D0	0.059 (1.5 ±0.1/-0)	0.059 (1.5 ±0.1/-0)	0.059 (1.5 ±0.1/-0)
D1	0.059 (1.5 ±0.25/-0)	0.059 (1.5 ±0.1/-0)	0.059 (1.5 ±0.25/-0)
T	0.012 (0.305 ±0.2)	0.008 (0.32 ±0.05)	0.013 (0.33 ±0.02)
T2	0.037 (0.93 ±0.1)	0.074 (1.89 ±0.1)	0.077 (1.96 ±0.1)

Reel (in./mm)



	FCSL64	FCSL76/90	FCSL110
A	7.087 (180 ±0/-3)	7.087 (180 ±0/-3)	12.992 (330 ±2.0)
H	0.512 (13 ±0.2)	0.512 (13 ±0.2)	0.512 (13 ±0.2)
E	0.079 (2.0 ±0.5)	0.079 (2.0 ±0.5)	0.079 (2.0 ±0.5)
N	0.236 (60 ±1/-0)	0.236 (60 ±1/-0)	3.937 (100 ±1.0)
W1	0.518 (13.0 ±0.3)	0.669 (17.0 ±0.3)	1.000 (25.4 ±1.0)
W2	0.669 (17.0 ±1.4)	0.764 (19.4 ±1.0)	1.157 (29.4 ±1.0)

ORDERING INFORMATION

RoHS Compliant				
F C S L 6 4 R 0 0 5 J E R				
Series	Package Size	Ohms	Tolerance	Taping Code
	64=6432=2W	R005 = 0.005Ω	J = 5%	R = 1,000 pc/reel
	76=7638=3W	R050 = 0.050Ω	G = 2%	
	90=9045=4W		F = 1%	
	110=11050=5W			

Standard Part Numbers

Ohms	2 Watts	3 Watts	4 Watts	5 Watts	Tolerance	TCR
0.0010	FCSL64R001JE	FCSL76R001JE	FCSL90R001JE	FCSL110R001JER	±5%	±150ppm/°C
0.0020	FCSL64R002GE	FCSL76R002GE	FCSL90R002GE	FCSL110R002GER	±2%	±100ppm/°C
0.0050	FCSL64R005FE	FCSL76R005FE	FCSL90R005FE	FCSL110R005FER	±1%	±50ppm/°C
0.0100	FCSL64R010FE	FCSL76R010FE	FCSL90R010FE	FCSL110R010FER	±1%	±50ppm/°C
0.0250	FCSL64R025FE	FCSL76R025FE	FCSL90R025FE	FCSL110R025FER	±1%	±50ppm/°C
0.0500	FCSL64R050FE	FCSL76R050FE	FCSL90R050FE	FCSL110R050FER	±1%	±50ppm/°C