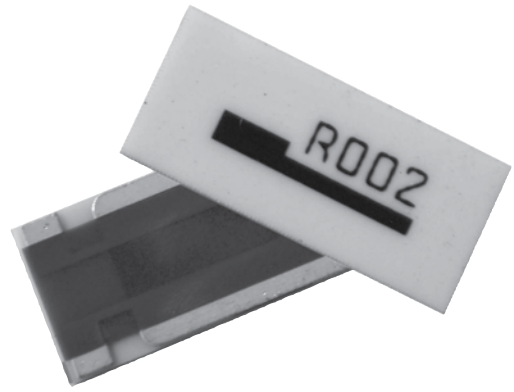


# FC4L Series



## FC4L Four Terminal Current Sense Metal Foil Construction



### 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)

Ohmite extends its FC4L Series with this 4-terminal Kelvin type FC4L derivative in 2 watt and 5 watt package sizes. Employing the same Ni-Cu-Mn resistive element this product affords the user an added advantage of a built in 4-terminal design with 2 larger electrodes for current management and 2 smaller electrodes for current measurement.

### SERIES SPECIFICATIONS

Series	Power Rating	Resistance Range	Tol.	TCR (ppm/°C)	Weight (g)	Series	Power Rating	Resistance Range	Tol.	TCR (ppm/°C)	Weight (g)
FC4L16	0.25W	5m, 10m, 20m, 50mΩ ~ 100mΩ	±1%	±50	0.004	FC4L64	2W	1mΩ	±5%	±100	0.038
								2mΩ	±2%	±100	
FC4L32	1W	1mΩ ~ 500mΩ	±1%	±50	0.015	FC4L110	5W	3mΩ	±1%	±100	0.110
								4m ~ 100mΩ	±1%	±50	
								10m ~ 50mΩ	±0.5%	±50	
								1mΩ	±5%	±100	
FC4L64	2W	1mΩ ~ 100mΩ	±1%	±50	0.038	FC4L110	5W	2mΩ	±2%	±50	0.110
								3mΩ ~ 100mΩ	±1%	±50	
								10m ~ 50mΩ	±0.5%	±50	
								1mΩ	±5%	±100	
FC4L110	5W	1mΩ ~ 500mΩ	±1%	±50	0.110	FC4L110	5W	2mΩ	±2%	±50	0.110
								3mΩ ~ 100mΩ	±1%	±50	
								10m ~ 50mΩ	±0.5%	±50	
								1mΩ	±5%	±100	

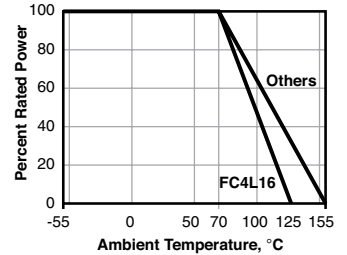
### CHARACTERISTICS

Test Condition	Maximum ΔR
<b>Max. temperature for rated power</b> 70°C	
<b>Operating temperature range</b> -55°C ~ +155°C (FC4L16: -40°C ~ +125°C)	
<b>Rated voltage</b> $\sqrt{(\text{Rated power} \times \text{Resistance value})}$ V	
<b>Overload (FC4L16 only)</b> Rated power x 1.5 for 5s	±(0.5%+0.0005Ω)
<b>In-rush current</b> Rated current 10 msec ON, 60 sec OFF, 10 cycles.	±(1.0% +0.0005Ω)
<b>Rapid change of temperature</b> -55°C (30min.)/+155°C (30min.), 100 cycles 1000 cycles, FC4L16 only	±(1.0% +0.0005Ω) ±(2.0%+0.0005Ω)
<b>Solderability</b> 245°C ±5°C for 3 ±0.5 sec.	Min. 90% coverage
<b>Endurance at 70°C</b> 70°C ±3°C, Rated voltage 1.5h ON, 0.5h OFF, 1000h	±(1.0% +0.0005Ω)
<b>Resistance to soldering heat</b> 260°C ±5°C for 10 ±1 sec.	±(1.0% +0.0005Ω) (±0.5% FC4L16)
<b>Moisture resistance</b> 60°C ±2°C, 90~95% RH, Rated voltage 1.5h ON, 0.5h OFF, 1000h	±(2.0% +0.0005Ω) (±1.0% FC4L16)

Series	Power Rating	Resistance Range	In-rush Power	Max. Current
FC4L16	0.25 watt	5m, 10mΩ	2.5W	5A
FC4L32	1 watt	1mΩ~9mΩ	25W	45A
		10mΩ~500mΩ	12.5W	24A
FC4L64	2 watt	1mΩ~9mΩ	100W	85A
		10mΩ~100mΩ	50W	35A
FC4L110	5 watt	1mΩ~50mΩ	100W	100A

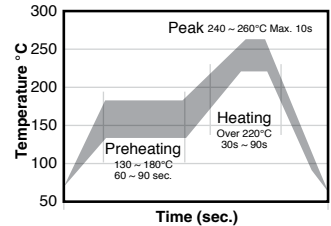
In-rush current =  $\sqrt{(\text{In-rush power}/\text{resistance value})}$ , or max. current, whichever is smaller

### Derating



### Recommended Reflow Temperature Profile

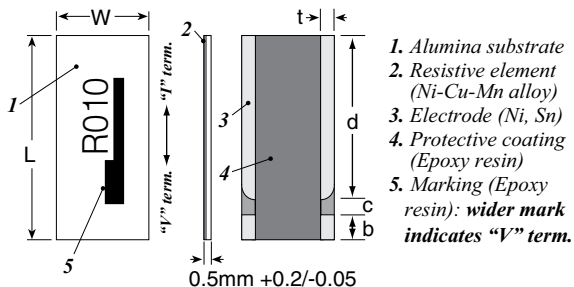
For lead free soldering (Sn-Ag-Cu solder)  
Preheating: 130° ~ 180° 60s ~ 90s  
Heating: Over 220° 30s ~ 90s  
Peak: 240° ~ 260° Max. 10s  
Max. number of reflow: 2



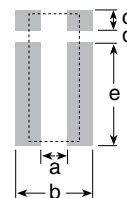
# FC4L Series

## FC4L Four Terminal Current Sense Metal Foil Construction

### DIMENSIONS



### Land Pattern



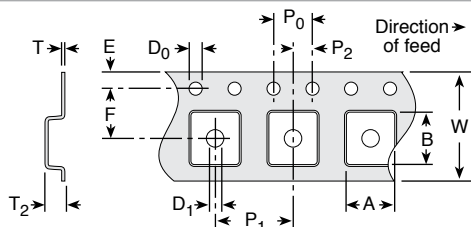
	Rating	L (in.±.008/mm ±0.20)	W (in./mm)	t (in./mm)	b mm ±0.15	c mm ±0.1	d mm ±0.15
FC4L16	0.25 watt	0.063 / 1.60	0.031 / 0.8	0.010 / 0.26	0.30 ±2	0.3 ±2	1.0 ±2
FC4L32	1 watt	0.126 / 3.20	0.063 / 1.6	0.014 / 0.35	0.35	0.2	2.6
FC4L64	2 watt	0.251 / 6.40	0.126 / 3.2	0.020 / 0.5	0.7	0.5	5.2
FC4L110	5 watt	0.433 / 11.0	0.197 / 5.0	0.028 / 0.7	1.4	1.1	8.5

(mm)	a	b	c	d	e
FC4L16	0.25	1.2	0.40	0.30	1.2
FC4L32	0.4	2.7	0.35	0.3	2.7
FC4L64	2.0	4.4	0.7	0.5	5.4
FC4L110	3.2	5.6	1.6	1.1	8.7

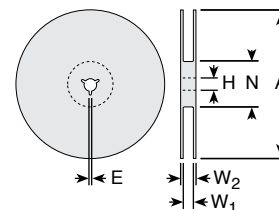
### PACKAGING SPECIFICATIONS

#### Tape

inches (mm)



#### Reel



	FC4L16	FC4L32	FC4L64	FC4L110
A	0.037 (0.95±0.05)	0.075 (1.90 ±0.1)	0.135 (3.43 ±0.2)	0.213 (5.40 ±0.10)
B	0.073 (1.85±0.05)	0.138 (3.50 ±0.1)	0.261 (6.63 ±0.2)	0.453 (11.50 ±0.10)
W	0.315 (8.00±0.10)	0.315 (8.00 ±0.2)	0.472 (12.0 ±0.3)	0.945 (24.00 ±0.30)
F	0.138 (3.50±0.05)	0.138 (3.50 ±0.05)	0.069 (1.75 ±0.1)	0.069 (1.75 ±0.10)
E	0.069 (1.75±0.10)	0.069 (1.75 ±0.1)	0.217 (5.5 ±0.05)	0.453 (11.50 ±0.10)
P <sub>0</sub>	0.157 (4.00±0.10)	0.157 (4.0 ±0.1)	0.157 (4.0 ±0.1)	0.157 (4.00 ±0.10)
P <sub>1</sub>	0.157 (4.00±0.10)	0.157 (4.0 ±0.1)	0.157 (4.0 ±0.1)	0.315 (8.00 ±0.10)
P <sub>2</sub>	0.079 (2.00±0.05)	0.079 (2.0 ±0.05)	0.079 (2.0 ±0.05)	0.079 (2.00 ±0.10)
D <sub>0</sub>	0.059 (1.50±0.10/-0)	0.059 (1.50 ±0.1/-0)	0.059 (1.5 ±0.1/-0)	0.059 (1.50 ±0.10)
D <sub>1</sub>	0.024 (0.60±0.05)	0.039 (1.00 ±0.2/-0)	0.059 (1.5 ±0.2/-0)	0.059 (1.50 ±0.10)
T	0.008 (0.20±0.05)	0.008 (0.20 ±0.05)	0.008 (0.20 ±0.05)	0.012 (0.30 ±0.05)
T <sub>2</sub>	0.022 (0.55±0.05)	0.039 (1.00 ±0.2)	0.059 (1.5) max.	0.047 (1.2 ±0.15)

	FC4L16	FC4L32 & 64	FC4L110
A	7.087 (180 +0/-3)	7.087 (180 +0/-3)	7.087 (180 ±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	2.362 (60 +1/-0)	2.362 (60 +1/-0)	0.827 (21 ±0.8)
W <sub>1</sub>	0.354 (9.0 ±0.3)	0.512 (13.0 ±0.3)	1.000 (25.4 ±1.0)
W <sub>2</sub>	0.512 (13.0 ±0.3)	0.669 (17.0 ±1.4)	1.157 (29.4 ±1.0)

### ORDERING INFORMATION

Ohms  
R005=0.005Ω  
R050=0.050Ω

RoHS Compliant

## FC4L110R005FER

Series	TCR* (ppm)	Package Size	Tolerance	Taping Code
W = 25	110=11050=5W	J = 5%	1,000 pc/reel	FC4L16: 5,000 pc/reel
V = 50	64=6432=2W	G = 2%		
L = per chart above	32=3216=1W 16=1608=0.25W	F = 1% D = 0.5%		

\*FC4L32 and FC4L64 values over 0.100Ω only

#### Standard Part Numbers for FC4L series

	0.25 watt	1 watt	2 watt	5 watt
FC4L16R005FER	FC4L32R001JER FC4L32R002GER FC4L32R003FER FC4L32R005FER	FC4L64R001JER FC4L64R002GER FC4L64R003FER FC4L64R005FER	FC4L110R001JER FC4L110R002GER FC4L110R003FER FC4L110R005FER	FC4L110R010DER FC4L110R010FER FC4L110R015DER FC4L110R015FER
FC4L16R010FER	FC4L32R010FER	FC4L64R010FER FC4L64R015DER FC4L64R015FER	FC4L110R020DER FC4L110R020FER FC4L110R025DER FC4L110R025FER	FC4L110R030DER FC4L110R030FER FC4L110R050DER FC4L110R050FER
FC4L16R015FER	FC4L32R015FER	FC4L64R020FER FC4L64R025DER FC4L64R025FER	FC4L110R020FER FC4L110R025DER FC4L110R025FER FC4L110R030DER	FC4L110R030FER FC4L110R050DER FC4L110R050FER FC4L110R100FER
FC4L16R020FER	FC4L32R020FER	FC4L64R030DER FC4L64R030FER FC4L64R050DER	FC4L110R020FER FC4L110R025DER FC4L110R025FER FC4L110R030DER	FC4L110R030FER FC4L110R050DER FC4L110R050FER FC4L110R100FER
FC4L16R025FER	FC4L32R025FER	FC4L64R100FER	FC4L110R030FER FC4L110R050DER FC4L110R050FER FC4L110R100FER	FC4L110R030FER FC4L110R050DER FC4L110R050FER FC4L110R100FER
FC4L16R030FER	FC4L32R030FER			
FC4L16R050FER	FC4L32R050FER			
FC4L16R100FER	FC4L32R100FER			

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[FC4L32R020FER](#)