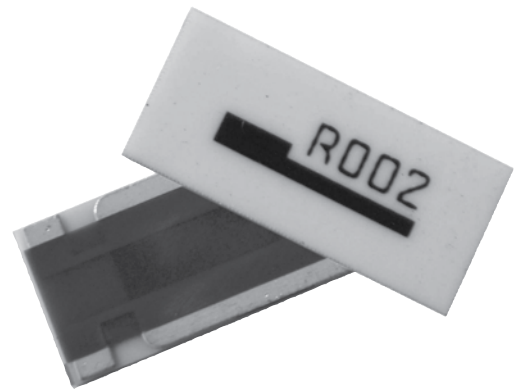


# FC4L Series

## 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.

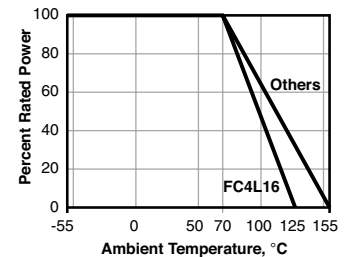
### SERIES SPECIFICATIONS

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	10m, 20m, 50mΩ	±1%	±50	0.004	FC4L64	2W	1mΩ 2mΩ 3mΩ	±5% ±2% ±1%	±100 ±100 ±100	0.038
FC4L32	1W	1mΩ 2mΩ 3mΩ 4mΩ ~ 500mΩ	±5% ±2% ±1% ±1%	±100 ±100 ±100 ±50	0.015			4m ~ 100mΩ 10m ~ 50mΩ	±1% ±0.5%	±50 ±50	
						FC4L110	5W	1mΩ 2mΩ 3mΩ ~ 50mΩ 10m ~ 50mΩ	±5% ±2% ±1% ±0.5%	±100 ±50 ±50 ±50	0.110

### CHARACTERISTICS

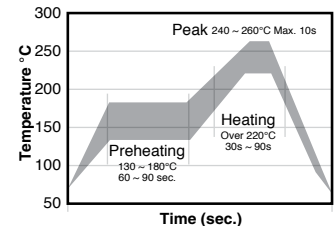
Test Condition	Maximum ΔR																									
Max. temperature for rated power	70°C																									
Operating temperature range	-55°C ~ +155°C (FC4L16: -40°C ~ +125°C)																									
Rated voltage	$\sqrt{(\text{Rated power} \times \text{Resistance value})}$ V																									
Overload (FC4L16 only)	Rated power x 1.5 for 5s ±(0.5%+0.0005Ω)																									
In-rush current	Rated current 10 msec ON, 60 sec OFF, 10 cycles. ±(1.0% +0.0005Ω)																									
	<table border="1"> <thead> <tr> <th>Series</th> <th>Power Rating</th> <th>Resistance Range</th> <th>In-rush Power</th> <th>Max. Current</th> </tr> </thead> <tbody> <tr> <td>FC4L16</td> <td>0.25 watt</td> <td>10mΩ</td> <td>2.5W</td> <td>5A</td> </tr> <tr> <td>FC4L32</td> <td>1 watt</td> <td>1mΩ~9mΩ 10mΩ~500mΩ</td> <td>25W 12.5W</td> <td>45A 24A</td> </tr> <tr> <td>FC4L64</td> <td>2 watt</td> <td>1mΩ~9mΩ 10mΩ~100mΩ</td> <td>100W 50W</td> <td>85A 35A</td> </tr> <tr> <td>FC4L110</td> <td>5 watt</td> <td>1mΩ~50mΩ</td> <td>100W</td> <td>100A</td> </tr> </tbody> </table>	Series	Power Rating	Resistance Range	In-rush Power	Max. Current	FC4L16	0.25 watt	10mΩ	2.5W	5A	FC4L32	1 watt	1mΩ~9mΩ 10mΩ~500mΩ	25W 12.5W	45A 24A	FC4L64	2 watt	1mΩ~9mΩ 10mΩ~100mΩ	100W 50W	85A 35A	FC4L110	5 watt	1mΩ~50mΩ	100W	100A
Series	Power Rating	Resistance Range	In-rush Power	Max. Current																						
FC4L16	0.25 watt	10mΩ	2.5W	5A																						
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FC4L64	2 watt	1mΩ~9mΩ 10mΩ~100mΩ	100W 50W	85A 35A																						
FC4L110	5 watt	1mΩ~50mΩ	100W	100A																						
Rapid change of temperature	-55°C (30min.)/+155°C (30min.), 100 cycles 1000 cycles, FC4L16 only ±(1.0% +0.0005Ω) ±(2.0%+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. ±(1.0% +0.0005Ω) (±0.5% FC4L16)																									
Moisture resistance	60°C ±2°C, 90~95% RH, Rated voltage 1.5h ON, 0.5h OFF, 1000h ±(2.0% +0.0005Ω) (±1.0% FC4L16)																									

### Derating



### Recommended Reflow Temperature Profile

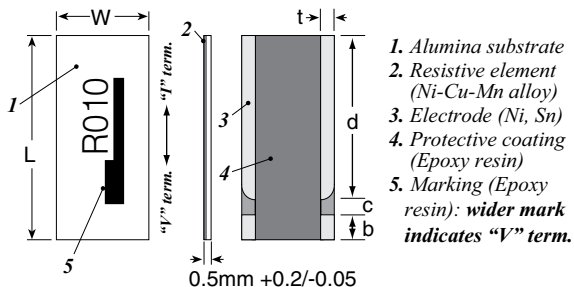
For lead free soldering (Sn-Ag-Cu solder)  
 Preheating: 130° ~ 180° 60s ~ 90s  
 Heating: Over 220° 30s ~ 90s  
 Peak: 240° ~ 260° Max. 10s  
 Max. number of reflow: 2



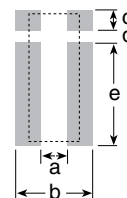
# FC4L Series

## FC4L Four Terminal Current Sense Metal Foil Construction

### DIMENSIONS



### Land Pattern



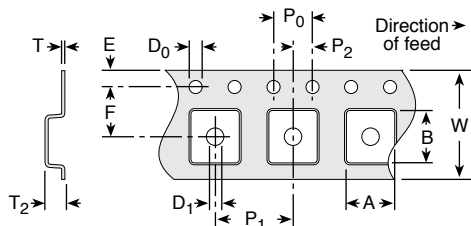
Rating	L (in.±.008/mm ±0.20)	W (in./mm)	t (in./mm)	b mm ±0.15	c mm ±0.1	d mm ±0.15	
FC4L16	0.25 watt	0.063 / 1.60	0.031 / 0.8	0.010 / 0.26	0.30 ±2	0.3 ±2	1.0 ±2
FC4L32	1 watt	0.126 / 3.20	0.063 / 1.6	0.014 / 0.35	0.35	0.2	2.6
FC4L64	2 watt	0.251 / 6.40	0.126 / 3.2	0.020 / 0.5	0.7	0.5	5.2
FC4L110	5 watt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

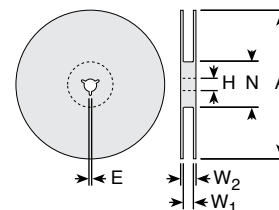
#### Tape

inches (mm)



	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)
P0	0.157 (4.00±0.10)	0.157 (4.0 ±0.1)	0.157 (4.0 ±0.1)	0.157 (4.00 ±0.10)
P1	0.157 (4.00±0.10)	0.157 (4.0 ±0.1)	0.157 (4.0 ±0.1)	0.315 (8.00 ±0.10)
P2	0.079 (2.00±0.05)	0.079 (2.0 ±0.05)	0.079 (2.0 ±0.05)	0.079 (2.00 ±0.10)
D0	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)
D1	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)
T2	0.022 (0.55±0.05)	0.039 (1.00 ±0.2)	0.059 (1.5) max.	0.047 (1.2 ±0.15)

#### Reel



	FC4L16	FC4L32 & 64	FC4L110
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	2.362 (60 +1/-0)	2.362 (60 +1/-0)	3.937 (100 ±1.0)
W1	0.354 (9.0 ±0.3)	0.512 (13.0 ±0.3)	1.000 (25.4 ±1.0)
W2	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	
V = 50	64=6432=2W	G = 2%	FC4L16: 5,000 pc/reel	
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
FC4L16R010FER	FC4L32R010FER	FC4L64R001JER FC4L64R002GER FC4L64R003FER FC4L64R005FER	FC4L110R001JER FC4L110R002GER FC4L110R003FER FC4L110R005FER FC4L110R010DER FC4L110R010FER FC4L110R015DER FC4L110R015FER FC4L110R020DER FC4L110R020FER FC4L110R025DER FC4L110R025FER FC4L110R030DER FC4L110R030FER FC4L110R050DER FC4L110R050FER
FC4L16R015FER	FC4L32R015FER	FC4L64R010DER FC4L64R010FER FC4L64R015DER FC4L64R015FER FC4L64R020DER FC4L64R020FER FC4L64R025DER FC4L64R025FER FC4L64R030DER FC4L64R030FER FC4L64R050DER FC4L64R050FER	
FC4L16R020FER	FC4L32R020FER		
FC4L16R025FER	FC4L32R025FER		
FC4L16R030FER	FC4L32R030FER		
FC4L16R050FER	FC4L32R050FER		