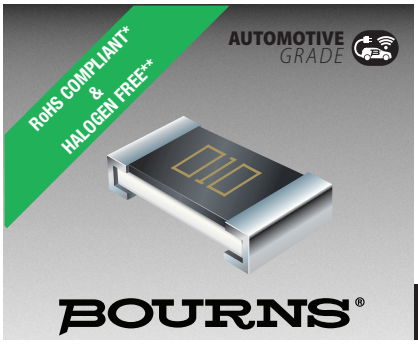


Features

- Metal foil
- High power density
- High reliability and stability
- RoHS compliant* and halogen free**
- AEC-Q200 Compliant

Applications

- Current sensing
- Power supplies
- Stepper motor drives
- Input amplifiers

CFN-A Series Metal Foil, Current Sensing Chip Resistor

Electrical Characteristics

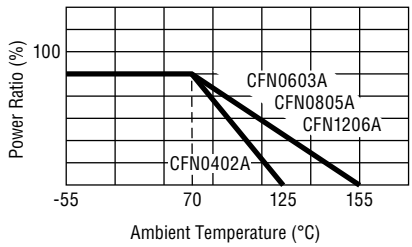
Characteristic	CFN0402A	CFN0603A	CFN0805A	CFN1206A
Power Rating @ 70 °C	0.2 W	0.5 W	0.75 W	1 W
Resistance Value	10 mΩ, 20 mΩ	5 mΩ, 10 mΩ, 20 mΩ	5 mΩ, 10 mΩ, 20 mΩ, 30 mΩ	5 mΩ, 10 mΩ, 20 mΩ, 40 mΩ
Operating Temperature Range	-55 °C ~ +125 °C	-55 °C ~ +155 °C		
Temperature Coefficient of Resistance	±100 ppm/°C	±50 ppm/°C & ±100 ppm/°C		
Tolerance	±1 %, ±5 %			

Additional Information

Click these links for more information:

PRODUCT | TECHNICAL LIBRARY | INVENTORY | SAMPLES | CONTACT

Derating Curve



Environmental Characteristics

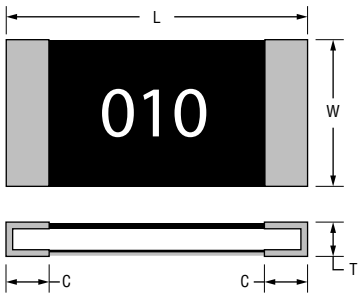
Storage Conditions
- Temperature ..... +5 °C ~ +35 °C
- Humidity ..... 40 % ~ 75 %

Shelf Life ..... 2 years from manufacturing date

Solder Recommendations ..... Reflow profile
(Solder: Sn96.5 / Ag3 / Cu0.5)

Moisture Sensitivity Level 1

Product Dimensions



	L	W	C	T
CFN0402A	1.10 ± 0.10 (.043 ± .004)	0.55 ± 0.10 (.021 ± .004)	0.25 ± 0.10 (.009 ± .004)	0.45 ± 0.10 (.017 ± .004)
CFN0603A	1.60 ± 0.20 (.063 ± .008)	0.80 ± 0.20 (.031 ± .008)	0.40 ± 0.20 (.016 ± .008)	0.60 ± 0.20 (.024 ± .008)
CFN0805A	2.00 ± 0.20 (.079 ± .008)	1.25 ± 0.20 (.049 ± .008)	0.40 ± 0.20 (.016 ± .008)	0.70 ± 0.20 (.028 ± .008)
CFN1206A	3.20 ± 0.20 (.126 ± .008)	1.60 ± 0.20 (.063 ±. 008)	0.50 ± 0.20 (.020 ± .008)	0.70 ± 0.20 (.028 ± .008)

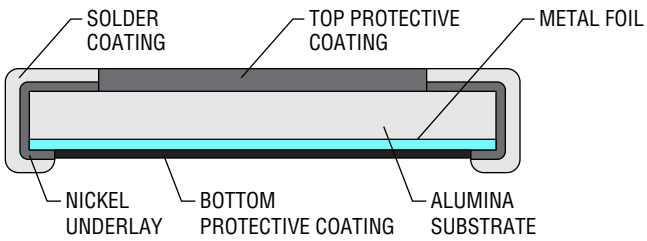
DIMENSIONS: MM (INCHES)

WARNING Cancer and Reproductive Harm
www.P65Warnings.ca.gov

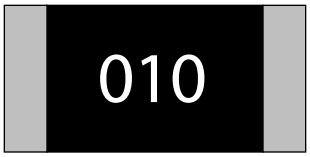
* RoHS Directive 2015/863, Mar 31, 2015 and Annex.
** Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.
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Construction



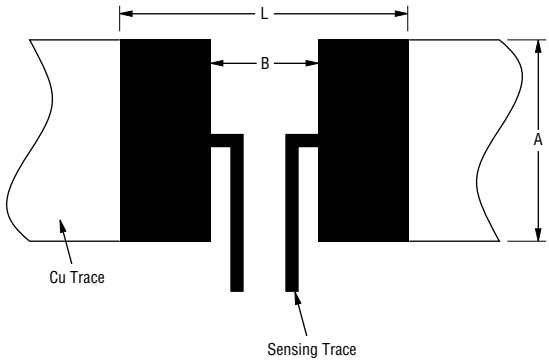
Marking



CFN0805A
CFN1206A
005 = 5 mΩ
010 = 10 mΩ
020 = 20 mΩ
6.5 = 6.5 mΩ

CFN0402A
CFN0603A
No Marking

Recommended Solder Pad Dimensions



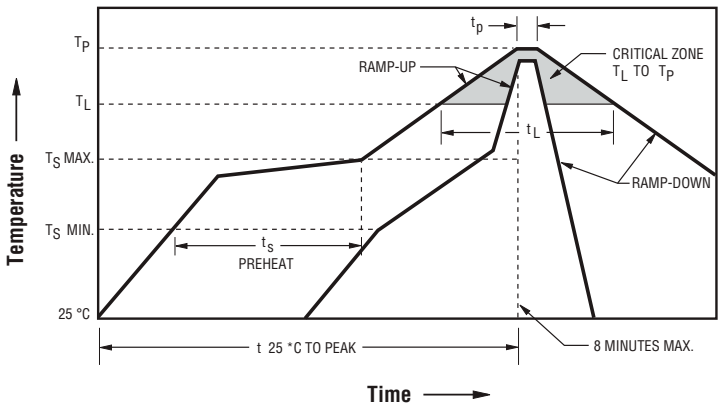
Model		A	L	B
CFN0402A	10 ≤ R ≤ 20	0.70 (.027)	1.20 (.047)	0.45 (.018)
CFN0603A	10 ≤ R ≤ 20	1.00 (.039)	2.80 (.110)	0.60 (.024)
CFN0805A	10 ≤ R ≤ 30	1.40 (.055)	3.20 (.126)	1.20 (.047)
CFN1206A	20 ≤ R ≤ 30	1.80 (.071)	4.70 (.185)	1.60 (.063)
	R = 40			2.20 (.087)

DIMENSIONS: MM / (INCHES)

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Solder Reflow Recommendations



Solder Profile	Lead Free Assembly
Average ramp-up rate (T_{smax} to T_p)	3 °C / second max.
Preheat: - Temperature Min. (T_{smin}) - Temperature Max. (T_{smax}) - Time (T_{smin} to T_{smax}) (t_s)	 150 °C 200 °C 60~150 seconds
Time maintained above: - Temperature (T_L) - Time (T_L)	 217 °C 60~120 seconds
Peak Temperature (T_p)	260 °C
Time within +0/-5 °C of actual Peak Temperature (T_p)[2]	10 seconds
Ramp-down rate	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.

How to Order

CFN 0805 A F X - R005 E LF

Model
- CFN = Metal Foil Current Sense Resistor

Size
- 0402 = 0402 Size
- 0603 = 0603 Size
- 0805 = 0805 Size
- 1206 = 1206 Size

Feature
- A = AEC-Q200 Compliant

Resistance Tolerance
- F = ±1 %
- J = ±5 %

TCR
- X = ±100 PPM/°C
- Z = ±50 PPM/°C

Resistance Code – (See Popular Resistance Table)
- "R" (decimal point) followed by three significant digits *(example: R005 = 0.005 ohms)*

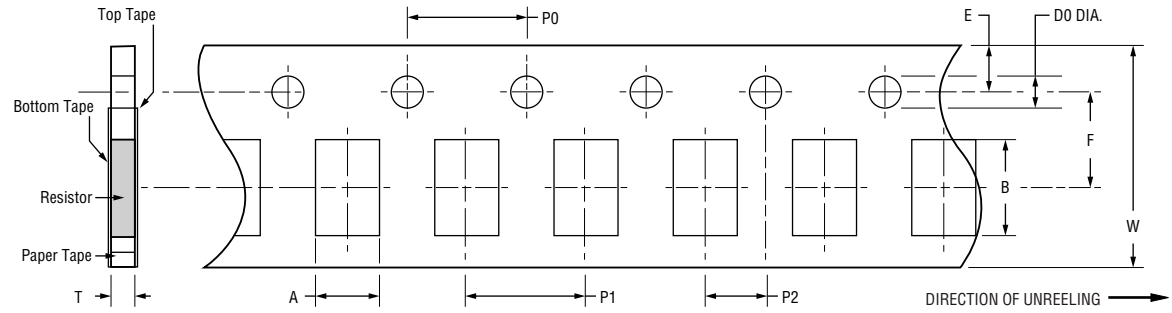
Packaging
- E = Tape and Reel
  - 4,000 pcs. / 7-inch reel, paper tape (CFN0805A, CFN1206A)
  - 5,000 pcs. / 7-inch reel, paper tape (CFN0603A)
  - 10,000 pcs. / 7-inch reel, paper tape (CFN0402A)

Termination
- LF = Tin-plated (RoHS Compliant)

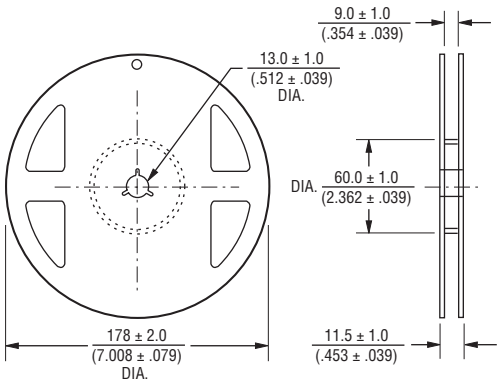
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Packaging Dimensions (Conforms to EIA RS-481A)



	A	B	W	F	E	P1	P2	P0	D0	T
CFN0402A	0.75 (.030)	1.30 (.051)	8.00 (.315)	3.50 (.138)	1.75 (.069)	2.00 (.079)	2.00 (.079)	4.00 (.157)	1.50 (.059)	0.65 (.026)
CFN0603A	1.10 (.043)	1.90 (.075)				4.00 (.157)				0.85 (.033)
CFN0805A	1.60 (.063)	2.40 (.094)								1.05 (.041)
CFN1206A	2.00 (.079)	3.60 (.142)								1.05 (.041)



DIMENSIONS: MM / (INCHES)

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Reliability Tests

Test Items	Reference Standard	Condition of Test	Test Limits
Temperature Coefficient of Resistance	IEC 60115-1 4.8	+25 ~ 125 °C	Reference item 4
Short Time Overload	IEC 60115-1 4.13	5X rated power for 5 s	< ±1 %
High Temperature Exposure (Storage)	AEC-Q200-REV D-Test 3 MIL-STD-202 Method 108	1000 hrs @ T = 125 °C. Unpowered. Measurement at 24 ±2 hours after test conclusion.	< ±1 %
Temperature Cycling	AEC-Q200-REV D-Test 4 JESD22 Method JA-104	1000 cycles (-55 °C to +125 °C). Measurement at 24 ±4 hours after test conclusion. 30 min. max. dwell time at each temperature extreme. 1 min. max. transition time.	< ±1 %
Moisture Resistance	AEC-Q200-REV D-Test 6 MIL-STD-202 Method 106	T = 24 hours/cycle, 10 cycles. Notes: Steps 7a & 7b not required. Unpowered.	< ±1 %
Biased Humidity	AEC-Q200-REV D-Test 7 MIL-STD-202 Method 103	1000 hours 85 °C / 85 % RH. Note: Specified conditions: 10 % of operating power (not exceeding max. working voltage). Measurement at 24 ±2 hours after test conclusion.	< ±1 %
Operational Life	AEC-Q200-REV D-Test 8 MIL-STD-202 Method 108	1000 hours T_A = 125 °C at 35 % rated power. Measurement at 24 ±4 hours after test conclusion.	< ±2 %
External Visual	AEC-Q200-REV D-Test 9 MIL-STD-883 Method 2009	Electrical test not required. Inspect device construction, marking and workmanship.	
Physical Dimensions	AEC-Q200-REV D-Test 10 JESD22 Method JB-100	Verify physical dimensions to the applicable device detail specification. Note: User(s) and Suppliers spec. Electrical test not required.	
Resistance to Solvents	AEC-Q200-REV D-Test 12 MIL-STD-202 Method 215	a: Isopropyl Alcohol : Mineral Spirits = 1 : 3 b: Terpene Defluxer (Bioact EC-7R) c: Deionized Water : Propylene Glycol Monomethyl Ether : monoethanolamine 42 : 1 : 1	Marking and protective layer cannot be detached
Mechanical Shock	AEC-Q200-REV D-Test 13 MIL-STD-202 Method 213	Wave Form: Tolerance for half sine shock pulse. Peak value is 100 g's. Normal duration (D) is 6 ms	< ±1.0 %
Vibration	AEC-Q200-REV D-Test 14 MIL-STD-202 Method 204	5 g's for 20 min., 12 cycles each of 3 orientations. Note: Test from 10-2000 Hz.	< ±1.0 %
Resistance to Soldering Heat	AEC-Q200-REV D-Test 15 MIL-STD-202 Method 210	Condition B: Immerse the specimens in an eutectic solder at 260 ±5 °C for 10 ±1 s.	< ±0.5 %
Thermal Shock	AEC-Q200-REV D-Test 16 MIL-STD-202 Method 107	-55 °C / +155 °C. Note: Number of cycles required: 300, Maximum transfer time: 20 s, Dwell time: 15 minutes, Air - Air	< ±1.0 %
ESD	AEC-Q200-REV D-Test 17 AEC-Q200-002 or ISO/DIS 10605	Verify the voltage setting at 500 V	< ±1.0 %
Solderability	AEC-Q200-REV D-Test 18 J-STD-202	Method B, aging 4 hours @ 155 °C dry heat. Lead-free solder bath @ 235 ±3 °C Dipping time: 3 ±0.5 seconds.	> 95 % area covered with tin
Flammability	AEC-Q200-REV D-Test 20 UL 94	V-0 or V-1 are acceptable. Electrical test not required.	V-0 or V-1
Board Flex (Bending)	AEC-Q200-REV D-Test 21 AEC-Q200-005	The duration of the applied forces shall be 60 +5 seconds 3 mm deflection (RLS06 ~ RLS 12) 2 mm deflection (RLS 25)	< ±1.0 %
Terminal Strength (SMD)	AEC-Q200-REV D-Test 22 AEC-Q200-006	Force of 1.8 kg for 60 seconds Remarks: 0201-NA	< ±1.0 %

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