

## Quad Flat No Lead Molded Precision Thin Film Resistor, Surface Mount Network



The QFN- series features a standard 20 pins quad flat no lead 5 mm x 5 mm 0.65 mm pitch package. The quad flat no lead package saves board space over traditional SOIC packages. Additional pin counts available, consult factory.

### FEATURES

- 0.65 mm lead pitch
- MSL level 1 per J-STD-020
- Low profile 1 mm seated height
- Small size 5 mm x 5 mm
- Low TCR  $\pm 25$  ppm, TCR tracking to  $\pm 5$  ppm
- Compliant to RoHS Directive 2002/95/EC

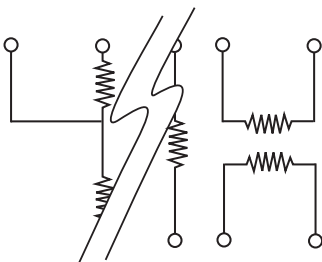


**RoHS**  
COMPLIANT

### TYPICAL PERFORMANCE

	ABSOLUTE	TRACKING
TCR	25	5
	ABSOLUTE	RATIO
TOL.	0.1	0.05

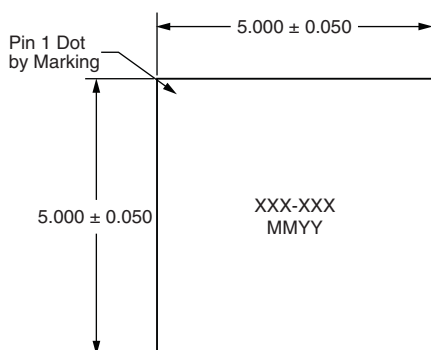
### SCHEMATIC



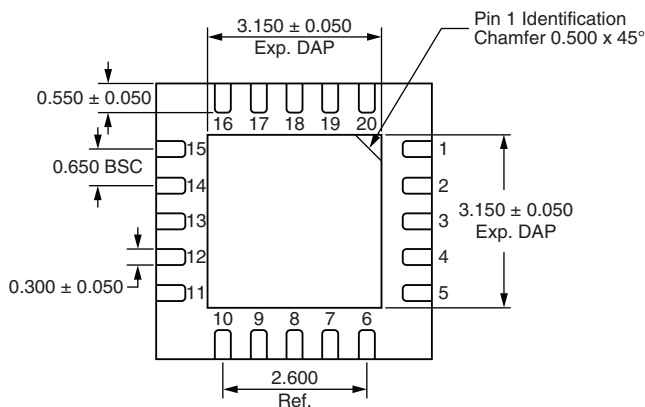
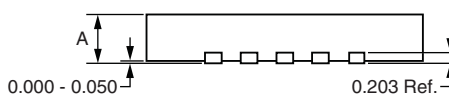
Custom schematics available  
Please consult factory

### STANDARD ELECTRICAL SPECIFICATIONS

TEST	SPECIFICATIONS	CONDITIONS
Material	Passivated nichrome	-
Pin/Lead Number	20	-
Resistance Range	100 $\Omega$ (resistor) to 500 k $\Omega$ (total)	-
TCR: Absolute	$\pm 25$ ppm/ $^{\circ}\text{C}$ to $\pm 100$ ppm/ $^{\circ}\text{C}$	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$
TCR: Tracking	$\pm 5$ ppm/ $^{\circ}\text{C}$ (typical)	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$
Tolerance: Absolute	$\pm 0.1$ % to $\pm 1.0$ %	+ 25 $^{\circ}\text{C}$
Tolerance: Ratio	$\pm 0.05$ % to $\pm 0.1$ %	+ 25 $^{\circ}\text{C}$
Power Rating: Resistor	100 mW (per element)	Maximum at + 70 $^{\circ}\text{C}$
Power Rating: Package	500 mW	Maximum at + 70 $^{\circ}\text{C}$
Stability: Absolute	$\Delta R \pm 0.05$ %	2000 h at + 70 $^{\circ}\text{C}$
Stability: Ratio	$\Delta R \pm 0.015$ %	2000 h at + 70 $^{\circ}\text{C}$
Voltage Coefficient	0.1 ppm/V	-
Working Voltage	100 V max. not to exceed $\sqrt{P \times R}$	-
Operating Temperature Range	- 55 $^{\circ}\text{C}$ to + 125 $^{\circ}\text{C}$	-
Storage Temperature Range	- 55 $^{\circ}\text{C}$ to + 150 $^{\circ}\text{C}$	-
Noise	< - 30 dB	-
Thermal EMF	0.08 $\mu\text{V}/^{\circ}\text{C}$	-
Shelf Life Stability: Absolute	$\Delta R \pm 0.01$ %	1 year at + 25 $^{\circ}\text{C}$
Shelf Life Stability: Ratio	$\Delta R \pm 0.002$ %	1 year at + 25 $^{\circ}\text{C}$

**DIMENSIONS AND IMPRINTING** in millimeters

**TOP VIEW**

A	Max.	0.900
	Nom.	0.850
	Min.	0.800


**BOTTOM VIEW**

**SIDE VIEW**
**Note**

- Contact factory for package outlines for higher pin count or custom configurations

**MECHANICAL SPECIFICATIONS**

<b>Resistive Element</b>	Passivated nichrome
<b>Substrate Material</b>	Silicon
<b>Body</b>	Molded epoxy
<b>Terminals</b>	Copper alloy
<b>Plating</b>	100 % matte tin
<b>Marking Resistance to Solvents</b>	Per MIL-PRF-914

**ORDERING INFORMATION CHECK LIST (Customs)**

Special requirements should be identified in advance, but as a minimum, you should have the following information ready.

<b>ELECTRICAL</b>	<b>MECHANICAL</b>
<ol style="list-style-type: none"> <li>1. Resistors, by value and tolerance</li> <li>2. Reference resistor(s) and matching of which resistors to which reference resistors</li> <li>3. Reference by ratio</li> <li>4. Absolute temperature coefficient of resistivity</li> <li>5. Temperature tracking of subordinate resistors to reference resistor(s)</li> <li>6. Maximum operating voltage</li> <li>7. Resistor power ratings</li> <li>8. Operating temperature range</li> </ol>	<ol style="list-style-type: none"> <li>1. Maximum allowable seated height (from PC board to top of network)</li> <li>2. Special marking concerns</li> <li>3. Schematic pin out of package</li> </ol>



**GLOBAL PART NUMBER INFORMATION**

**Q** **F** **N** **-**

GLOBAL MODEL  
(4 digits)  
**QFN-**  
(Lead (Pb)-free)  
(e3)

**1** **x** **x** **-** **x** **x** **x**

CUSTOM PART NUMBER  
(7 or 9 digits)  
**1xx-xxx**  
or  
**1xx-xxx-x**

**T** **1**

PACKAGING  
TAPE AND REEL  
**T0** = 100 min., 100 mult  
**T1** = 1000 min., 1000 mult  
**T3** = 300 min., 300 mult  
**T5** = 500 min., 500 mult  
**TF** = Full reel  
**TS** = 100 min., 1 mult  
**UF** = TUBED



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