



# SURFACE MOUNT TEMPERATURE VARIABLE ATTENUATOR

DATA SHEET QTVAXX0NXXXSMTF

REV 07/28/2010

## FEATURES

- 36 – 50 GHz
- Surface Mount for Pick and Place Assembly
- 1206 Small Footprint
- RoHS Compliant Versions
- Available on Tape & Reel
- Same Footprint, Fixed Versions Available

## APPLICATIONS

- Point to Point Radios
- Phased Array Radar
- High Frequency Transceivers
- Up/Down Converters
- Software Defined Radios

## GENERAL DESCRIPTION

The QTVA is a one of a kind, temperature variable high frequency surface mount device developed for applications where specific signal level control is required. Being passive in nature, there is no distortion, phase shift or time delay. The attenuator structure is internally tuned for optimum performance beyond Ka band, with the added benefit of being a truly symmetrical, bidirectional attenuator. The QTVA comes in two styles, microstrip and coplanar.

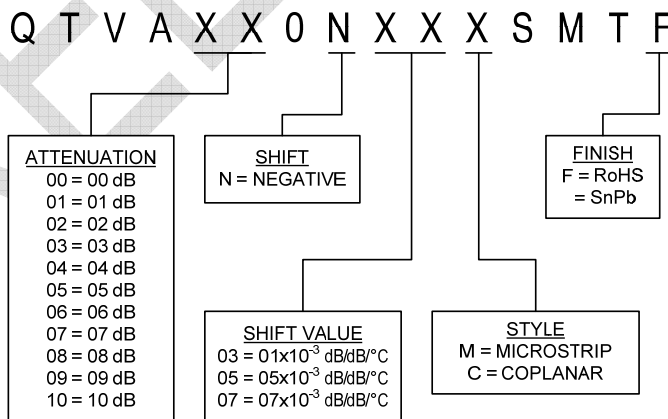
## ELECTRICAL SPECIFICATIONS<sup>(1)</sup>

QTVAXXNXXXSMTF								
Frequency GHz	Impedance $\Omega$	Attenuation dB	Attenuation Accuracy dB	Temperature Coefficient <sup>(2)</sup> $10^{-3}$ dB/dB/°C	Temperature Coefficient Tolerance $10^{-3}$ dB/dB/°C	Power Handling <sup>(3)</sup> mWatts CW	VSWR Max	Operating Temperature °C
36 – 50	50	0, 3 – 10	$\pm 0.5$	3, 5, 7	$\pm 1$	200	1.50	-55 to +150

### Specification Notes:

- (1) Measured on EMC Technology test fixture. Specifications are subject to change without notice.
- (2)  $TCA = (\text{LINEAR REGRESSION SLOPE}) / (\text{ATTENUATION @ } 25^{\circ}\text{C})$ .  
Calculate linear regression slope from attenuation versus temperature from  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  in  $20^{\circ}\text{C}$  increment.
- (3) Full rated power to  $125^{\circ}\text{C}$ , derated linearly to 0 Watts at  $150^{\circ}\text{C}$

## PART NUMBERING





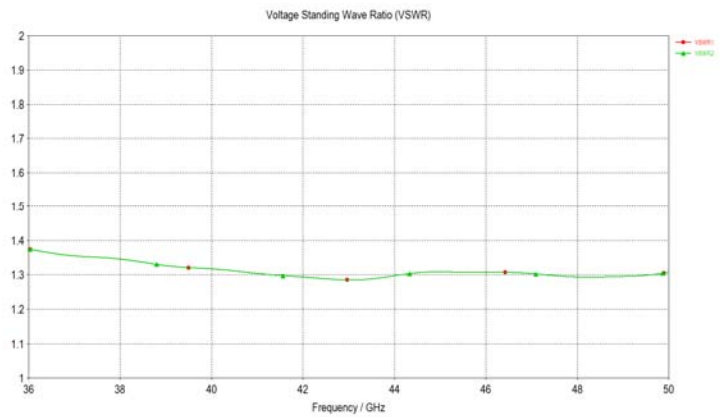
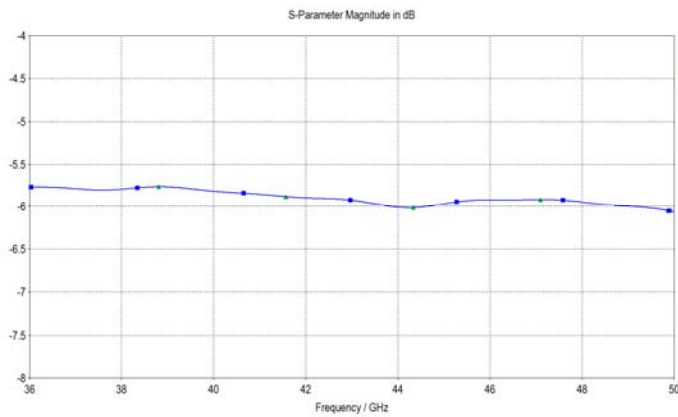
# SURFACE MOUNT HIGH FREQUENCY ATTENUATOR

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## TYPICAL PERFORMANCE

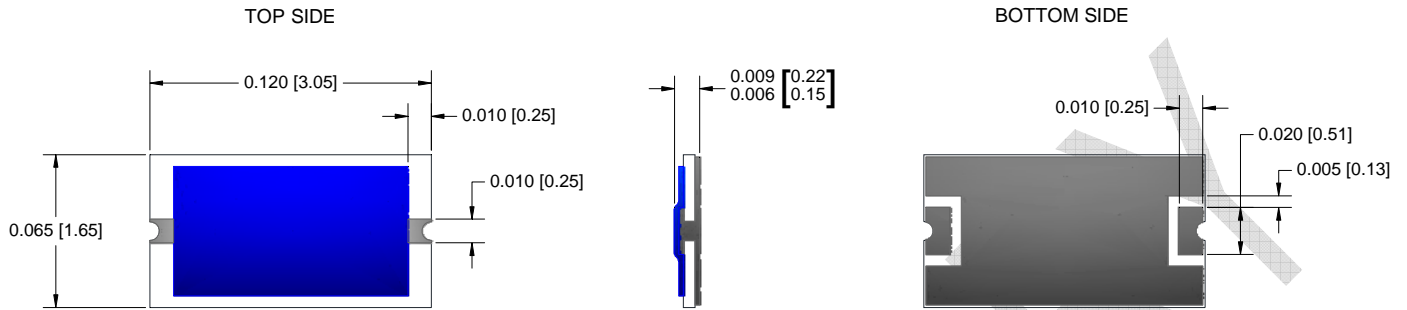
### QTVAX060NXXMSMTF\*



\* simulation data at 25°C

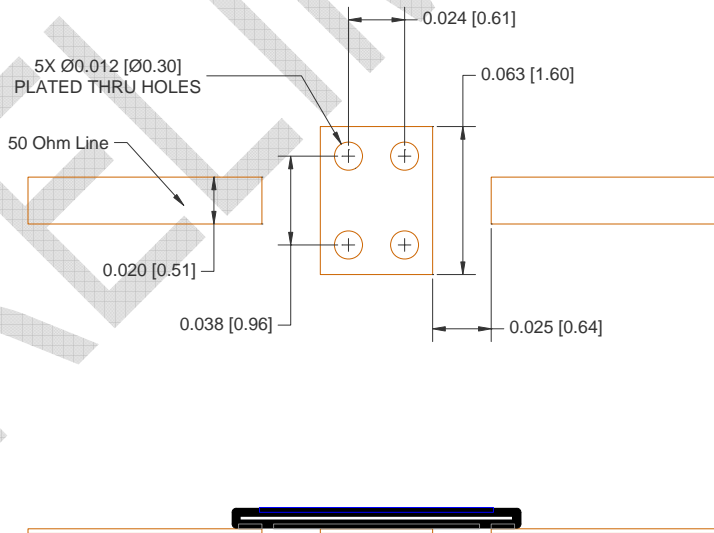
### QTVAXXXNXXCSMTF

**QTVAXX0NXXMSMTF PIN DESIGNATION / MECHANICAL SPECIFICATION**



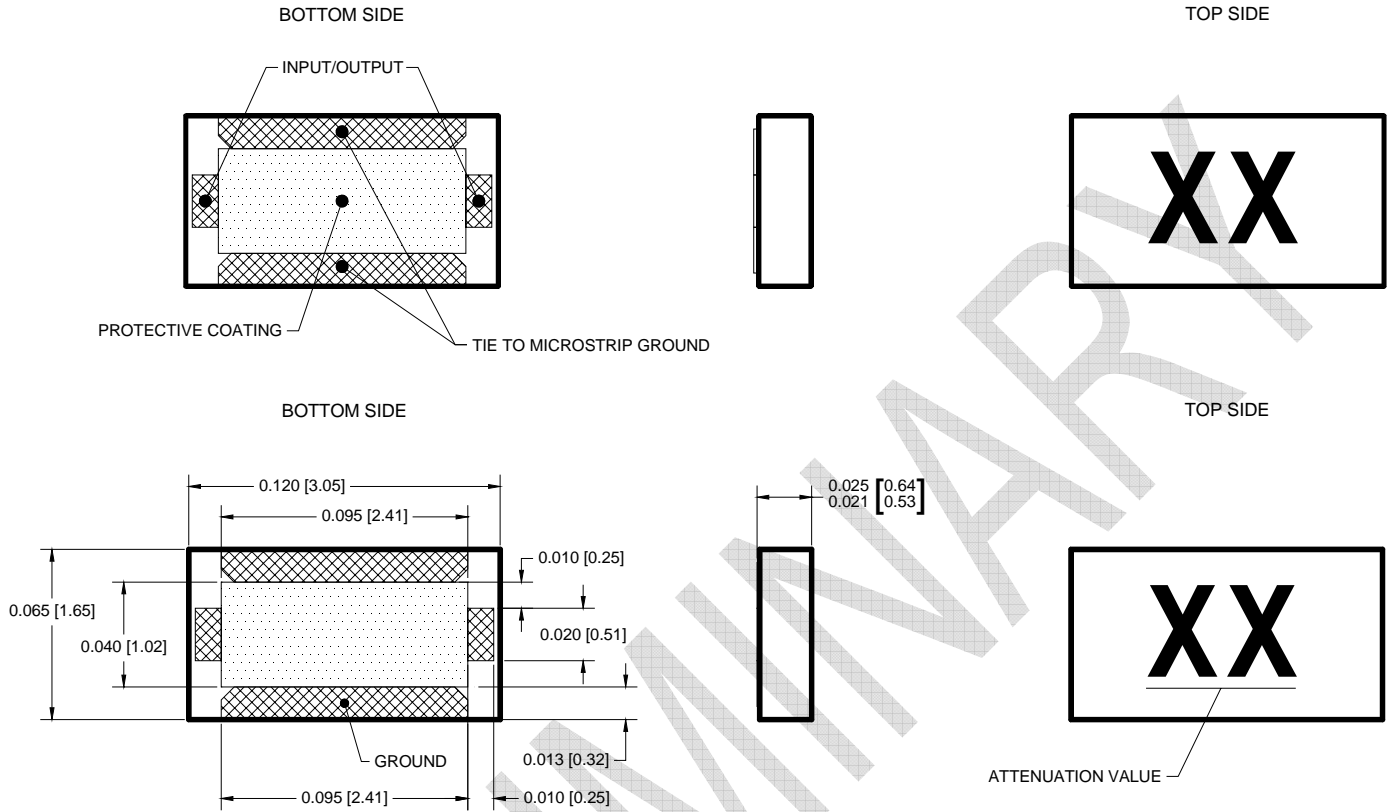
MECHANICAL SPECIFICATION	
Substrate	96% Alumina
Resistive Element	Thick Film
Encapsulant	Silicon Polymer
Termination	Gold
Termination Finish	Silver .0003 - .0006 Nickel .0001 - .0003

**MOUNTING FOR QTVAXX0NXXMSMTF**



MOUNTING  
CROSS-SECTION VIEW

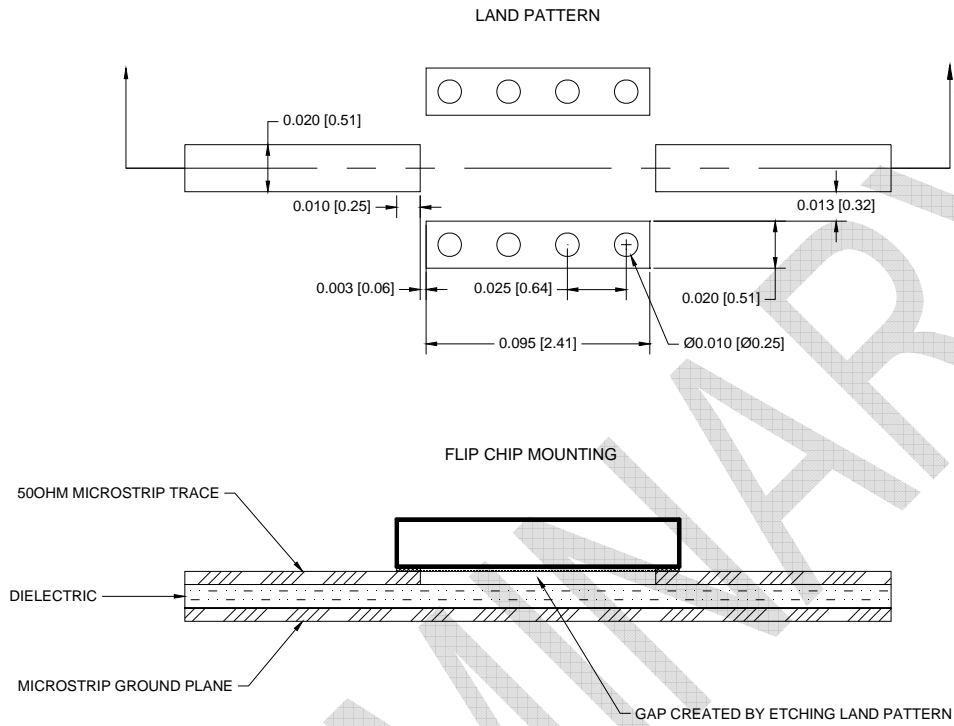
## QTVAXX0NXXCSMTF PIN DESIGNATION / MECHANICAL SPECIFICATION



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## MOUNTING FOR QTVAXX0NXXCSMTF



# EMC Technology SURFACE MOUNT HIGH FREQUENCY ATTENUATOR

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## COMMONLY USED ATTACHMENT MATERIALS

Material	Composition	Thermal Conductivity (Watts/cm/°C)	Melting Temperature (°C)
Gold-Tin Solder	80% Gold / 20% Tin	0.58	280
Lead-Free Solder	99.3% Tin - 0.7% Copper	N/A	227
Lead-Free Solder	96.5% Tin / 3.5% Silver	0.33	221
Lead-Free Solder	96.5% Tin / 3% Silver / 0.5% Copper	N/A	217 - 220
Sn63 Solder	63% Tin / 37% Lead	0.49	183
Conductive Epoxy	Silver Filled	0.01 to 0.29	N/A

## CIRCUIT BOARD LAYOUT QTVAXX0NXXXSMTF

In order to achieve the specified RF performance, an optimized RF test board must be used for testing this attenuator. Florida RF Labs test board is constructed with a 0.010 in Rogers RO4350B high frequency board material is shown below.

[DRAWING TBD]

Figure 1: QTVAXX0NXXMSMTF

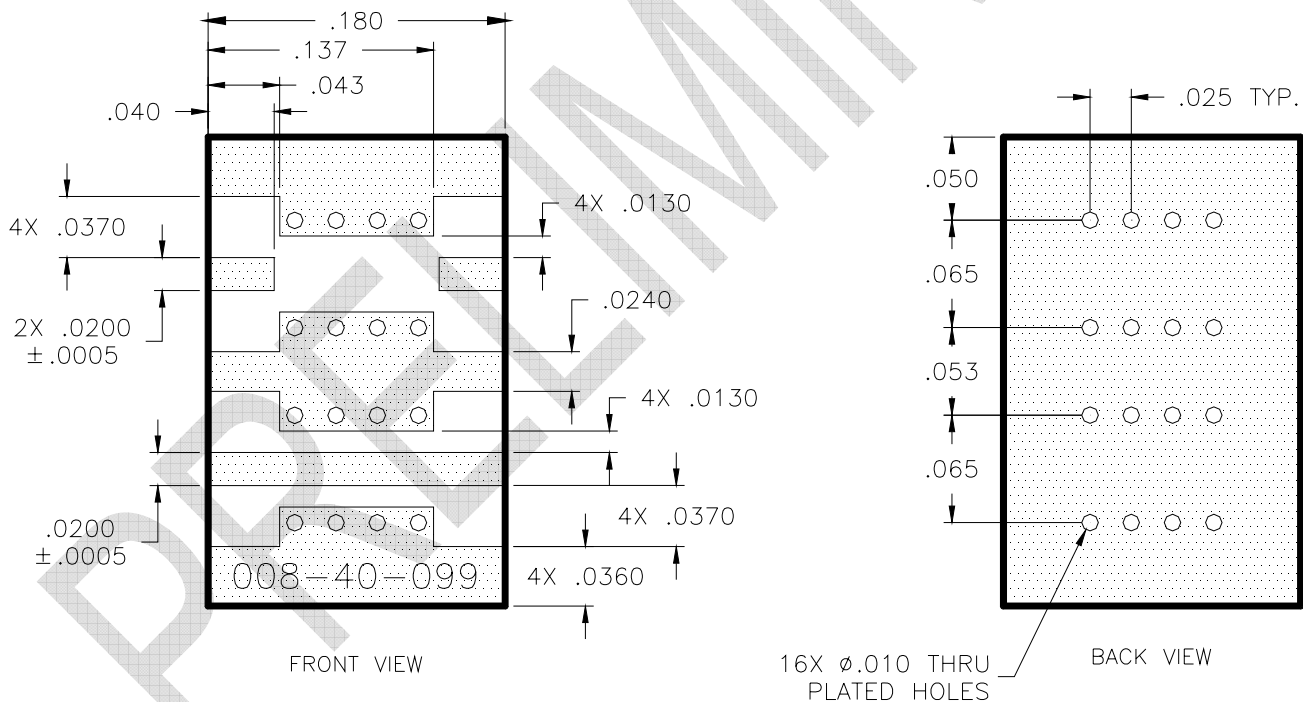
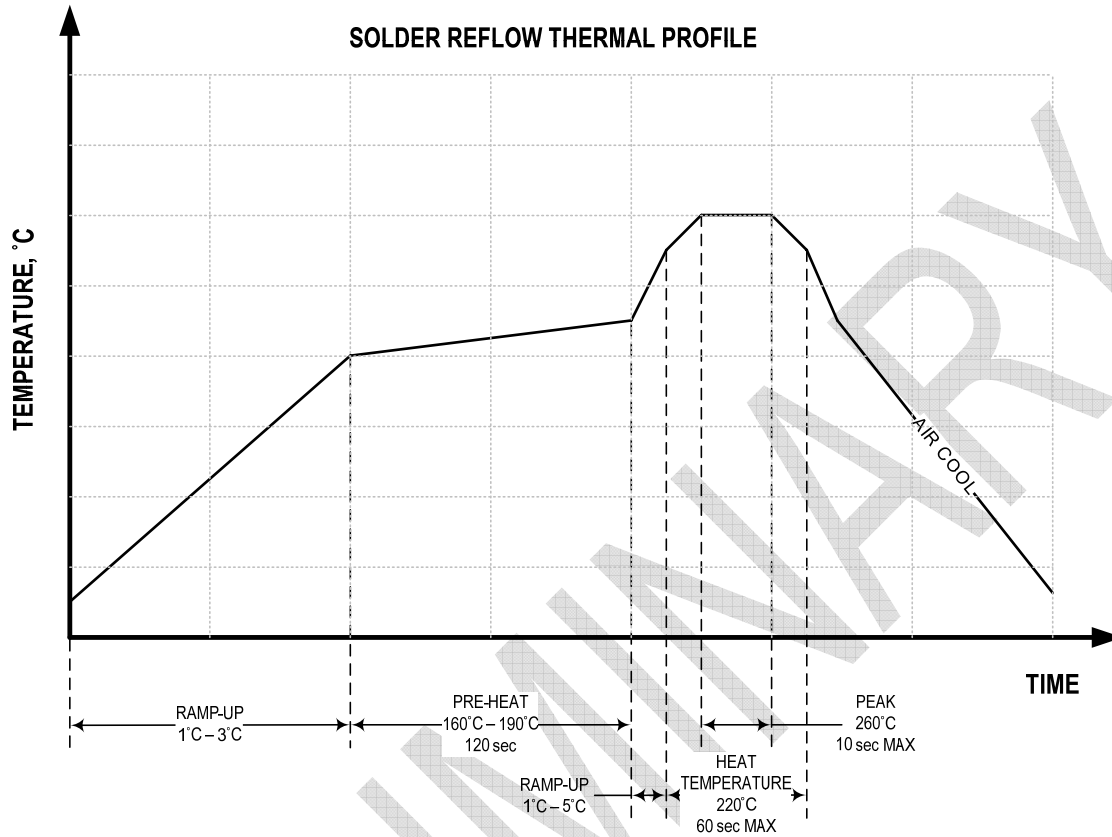


Figure 2: QTVAXX0NXXCSMTF

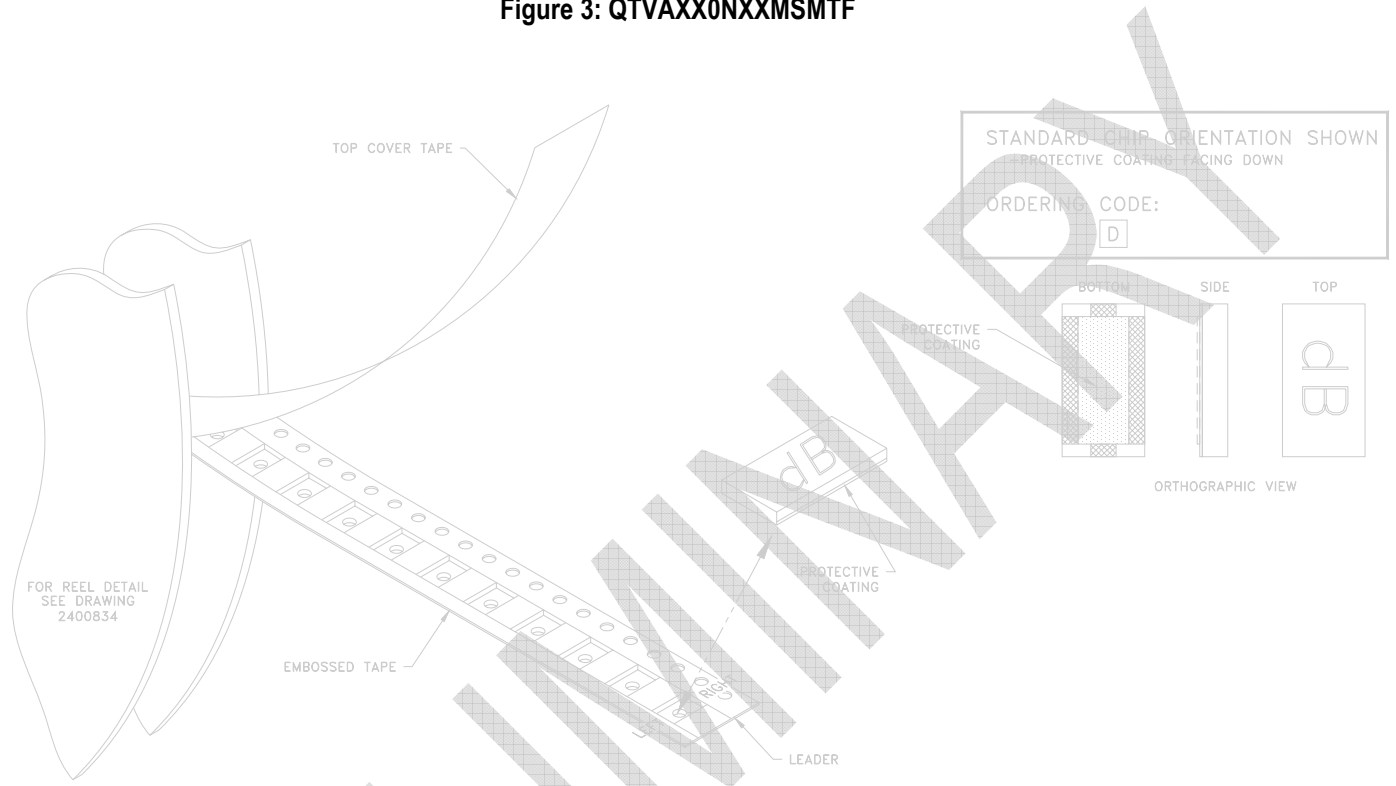
## SOLDERING PROFILE



## PACKAGING

[DRAWING TBD]

Figure 3: QTVAXX0NXXMSMTF



NOTE:

1. ORIENTATION OPTIONS:

ORIENTATION OPTIONS	
PROTECTIVE COATING POSITIONING	UP OR DOWN
<input type="checkbox"/>	

Figure 4: QTVAXX0NXXCSMTF