

## Specification Status: Released

**Maximum Operating Voltage:** 60V<sub>DC</sub>

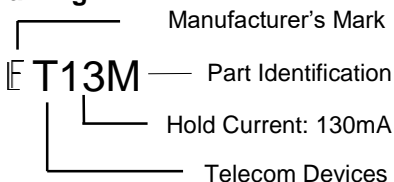
**Fault Ratings at 20°C:**

250 V<sub>RMS</sub>, 3A, 10 applications

600 V<sub>RMS</sub>, 1A, 5 applications

**Configuration:** Two PPTC devices per TSM250 part

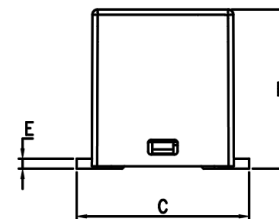
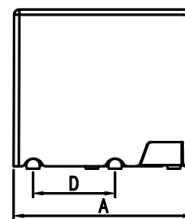
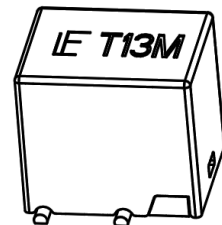
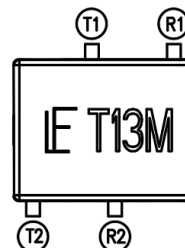
**Marking:**



**Terminal Description:**

T1 = Tip In T2 = Tip Out

R1 = Ring In R2 = Ring Out



**Table I. Dimensions**

	A		B		C		D		E	
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
mm:	8.2	8.9	--	9.0	7.8	8.6	--	3.9	--	0.7
in:	(0.323)	(0.350)	--	(0.354)	(0.307)	(0.339)	--	(0.154)	--	(0.026)

**Table II. Performance Ratings @ 20°C (unless otherwise noted)**

Part No.	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	RESISTANCE ** @ 20° C (Ω)			TIME TO TRIP @ 1.0 A (Seconds)		OPERATING TEMPERATURE (°C)		TRIPPED STATE POWER DISSIPATION @ 60V <sub>DC</sub> (W)
	20°C	20°C	R <sub>MIN</sub>	R <sub>MAX</sub>	R <sub>1 MAX</sub> *	TYP	MAX	MIN	MAX	TYP
TSM250-130F	0.13	0.26	4.0	9.0	15.0	1.0	2.4	-40	85	1.5
TSM250-130F-RA	0.13	0.26	4.0	22.0	30.0	1.0	2.4	-40	85	1.5

\* Maximum device resistance: measured 1-hour post reflow or post trip.

\*\* Resistance per PPTC device.

**Additional Ratings @ 20°C**

Line Balance:

Lightning Withstand: 10/700μS, 40 Ω (ITU-T K.20, K.21):

Lightning Withstand: 10/1000μS, 60 Ω:

Moisture Sensitivity Level (MSL):

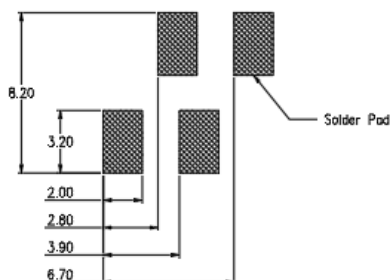
0.5 Ohm

1.5kV, 10 shots, 1 minute interval

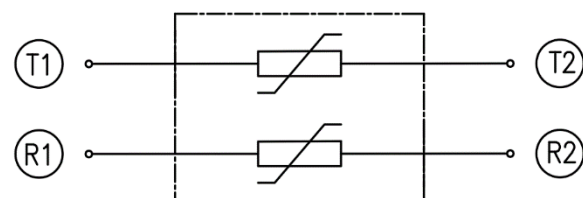
2.0kV, 30 shots, 3 minutes interval

1

**Recommended Pad Layout (mm)**

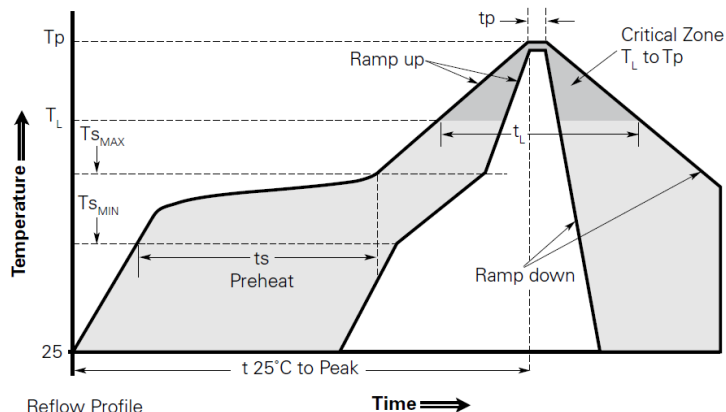


**Schematic**



## Recommended Reflow Profile

Profile Feature	Pb-Free Assembly
<b>Average ramp up rate (<math>T_{S_{MAX}}</math> to <math>T_p</math>)</b>	3°C/second max.
<b>Preheat</b>	
* Temperature min. ( $T_{S_{MIN}}$ )	150°C
* Temperature max. ( $T_{S_{MAX}}$ )	200°C
* Time ( $t_{S_{MIN}}$ to $t_{S_{MAX}}$ )	60-180 seconds
<b>Time maintained above:</b>	
* Temperature ( $T_L$ )	217 °C
* Time ( $t_L$ )	60-150 seconds
<b>Peak/Classification Temperature (<math>T_p</math>)</b>	260°C
<b>Time within 5°C of actual peak temperature</b>	
* Time ( $t_p$ )	20-40 seconds
<b>Ramp down rate</b>	6°C/second max.
<b>Time 25°C to peak temperature</b>	8 minutes max.



**Note:** All temperatures refer to topside of the package, measured on the package body surface.

**Agency Recognitions:** UL (File #E74889)  
**Reference Documents:** PS300  
**Precedence:** This specification takes precedence over documents referenced herein  
**Effectivity:** Reference documents shall be the issue in effect on the date of invitation for bid.

## Part Numbering System and Ordering Information

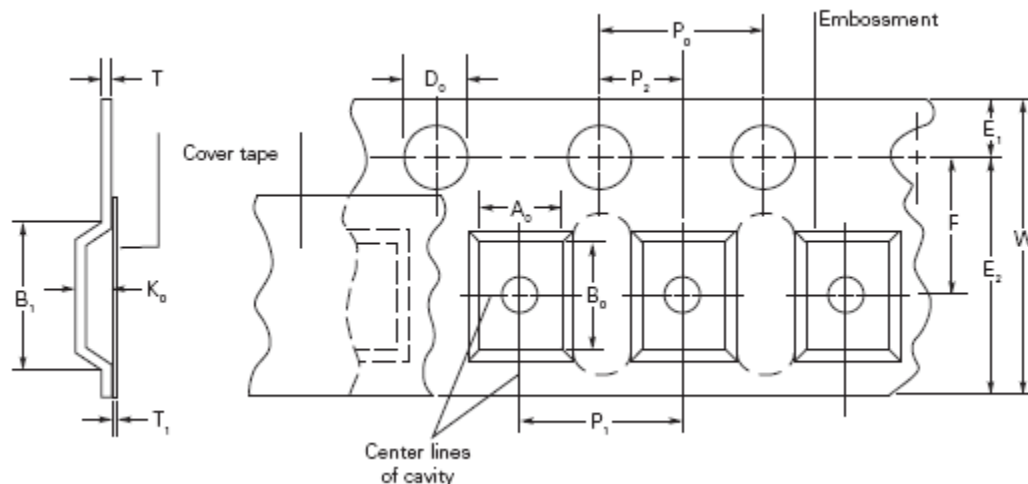
TSM 250 - 130 F - RA - 2

- TSM: Product Series: Dual Channels Surface Mount Device
- 250: Maximum Voltage Withstand, V
- 130: Hold Current, mA
- F: F = RoHS Compliant, ELV Compliant
- RA: Resistance Range
- 2: Packaging: 2 = Tape and Reel, (Blank)=Bulk

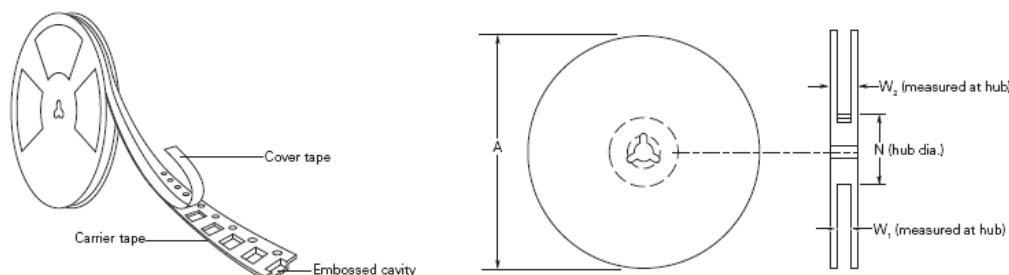
- Packaged with Tape and Reel only, Per EIA481-2
- Standard Package Quantity: 600pcs per reel
- MPQ/MOQ: 3000pcs

**TSM250 Tape and Reel Specifications: per EIA 481 standard**

Description	EIA Mark	Dimension (mm)	Tolerance (mm)
Carrier tape width	W	24.0	±0.5
Sprocket hole pitch	P <sub>0</sub>	4.0	±0.1
	P <sub>1</sub>	16.0	±0.1
	P <sub>2</sub>	2.0	±0.1
	A <sub>0</sub>	7.05	±0.2
	B <sub>0</sub>	8.85	±0.2
	B <sub>1</sub> max.	12.45	
Sprocket hole diameter	D	1.5	-0/+1.0
	F	11.5	±0.1
	E <sub>1</sub>	1.75	±0.1
	E <sub>2</sub> max.	22.25	
Tape thickness	T max.	0.5	±0.5
Tape thickness with splice	T <sub>1</sub> max.	0.1	
	K <sub>0</sub>	8.55	±0.2
<b>Reel Dimensions</b>			
Reel diameter	A max.	390	
Core diameter	N min.	75	
Space between flanges less device	W <sub>1</sub>	25.4	±0.5
Reel width	W <sub>2</sub> max.	30.4	



**EIA Referenced Reel Dimensions for TSM250 Devices**



## Materials Information

### ROHS Compliant

Directive 2011/65/EU  
Compliant

### ELV Compliant

Directive 2000/53/EC  
Compliant

### Pb-Free



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