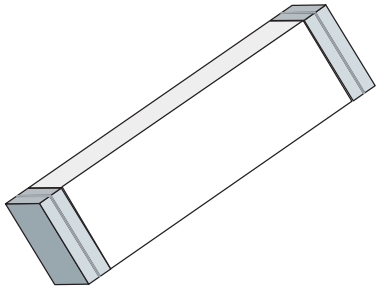


TeleLink® SM Fuse

Product Description

The TeleLink® Surface Mount (SM) surge resistant time lag fuse has been designed to offer the ultimate in circuit protection while meeting the necessary surge requirements of the telecommunications industry. When used in conjunction with the SIDACtor® Transient Voltage Suppressor (TVS), the *TeleLink* SM fuse (F0500T 500mA and F1250T 1.25A) and the *SIDACtor* TVS provide a complete regulatory compliant solution for standards such as GR 1089, FCC Part 68, UL 1950, and ITU K.20 & K.21.

TeleLink® SM Fuse

CSA Approved
File No. LR702828
UL Recognized
E-191008
Patent Pending

Features

- Surface Mount Technology
- 100A, 10x1000µs & 500A, 2x10µs surge current ratings
- Eliminates the need for costly power resistors and PTC's
- Designed specifically for telecommunications equipment

ISO 9001
TECCOR ELECTRONICS

TeleLink SM Fuse Advantages

- The elimination of series line resistance enabling longer loop lengths
- Precise longitudinal balance allowing better transmission quality
- Robust surge performance which elimates costly down time due to nuisance blows
- Greater surge ratings than resettable devices ensuring regulatory compliance
- Non-degenerative performance
- Available in surface mount packaging which utilizes less PCB real estate, eliminates mixed technologies, and reduces manufacturing costs

Selection Criteria

For circuits that do not require additional series resistance, the surge current rating (I_{PP}) of the *TeleLink* SM Fuse should be greater than or equal to the surge currents associated with the lightning immunity tests of the applicable regulatory requirement (I_{PK}).

$$I_{PP} \geq I_{PK}$$

For circuits that utilize additional series resistance, the surge current rating (I_{PP}) of the *TeleLink* SM Fuse should be greater than or equal to the available surge currents associated with the lightning immunity tests of the applicable regulatory requirement ($I_{PK\ (available)}$).

$$I_{PP} \geq I_{PK\ (available)}$$

The maximum available surge current is calculated by dividing the peak surge voltage (V_{PK}) by the total circuit resistance (R_{TOTAL}).

$$I_{PP} \geq I_{PK\ (available)} = V_{PK}/R_{TOTAL}$$

For longitudinal surges (TIP-GND, RING-GND), R_{TOTAL} is calculated for both TIP and RING.

$$R_{TOTAL} = R_{TIP} + R_{SOURCE}$$

$$R_{TOTAL} = R_{RING} + R_{SOURCE}$$

For metallic surges (TIP-RING):

$$R_{TOTAL} = R_{TIP} + R_{RING} + R_{SOURCE}$$

To select the most appropriate *TeleLink* SM Fuse / *SIDACtor* TVS combination, simply decide what regulatory requirement your equipment will need to meet and refer to the following table. For applications that do not require agency approval or multiple listings, please contact Teccor Electronics.

Regulatory Requirement	*TeleLink* SM Fuse	*SIDACtor* TVS
GR 1089	F1250T	C Series
FCC Part 68, Type A	F1250T	B Series
FCC Part 68, Type B	F0500T	A Series
ITU K.20	F1250T	A Series
ITU K.21 Basic/Enhanced	F1250T	A Series
UL 1950	All	All
UL 1950	All	All

Surge Current Ratings

TeleLink SM Fuse	2x10µs	10X160µs	10X560µs	10X1000µs
F0500T	not rated	75A	45A	35A
F1250T	500A	160A	115A	100A

Interrupting Values

TeleLink SM Fuse	Voltage Rating	Current Rating	I^2t Measured @ DC Rated Voltage	Interrupting Rating	Min.	Typ.	Max.
F0500T	250V	500mA	$1.3A^2s$	600V, 40A	1 sec	2 sec	60 sec
F1250T	250V	1.25A	$22.2A^2s$	600V, 60A*	1 sec	2 sec	60 sec

Notes:

- The TeleLink SM Fuse is designed to carry 100% of its' rated current for four hours and 250% of its' rated current for one second minimum and 120 seconds maximum. Typical time is 4 to 10 seconds. For optimal performance, an operating current of 80% or less is recommended.
- I^2t is a non-repetitive RMS surge current rating for a period of 16.7 msec.
- *Interrupt test characterized at 50° to 70° phase angle. Phase angles approximating 90° may result in damage to the body of the fuse.

Resistance Ratings

TeleLink SM Fuse	Typical Voltage Drop @ Rated Current	DC Cold Resistance	
		Min.	Max.
F0500T	.471V	.420Ω	.640Ω
F1250T	.205V	.107Ω	.150Ω

Notes:

- Typical inductance ≅ 4µH up to 500MHz.
- Resistance changes .5% for every °C.
- Measured at 10% rated current.

Design Considerations

The PCB traces must be designed such that its I^2t rating exceeds the I^2t of the TeleLink fuse. A 1oz. .025" width is recommended, but reference to the IPC D 275 standard may provide more precise details.

For UL1950 compliance, design considerations must be given to the test conditions of Annex NAC. In particular, test 3 and 3A are intended to produce the maximum heating effects. Therefore, PCB layout design should compensate appropriately.

Qualification Data

The F1250T has been designed to meet the following test conditions per GR 1089 without any additional series resistance, however in-circuit test verification is required. Please note that considerable heating may occur during Test 4 of the Second Level AC Power Fault Test.

First Level Lightning Surge Test

Test	Surge Voltage	Wave-form	Surge Current	Repetitions Each Polarity
1	±600V	10x1000µs	100A	25
2	±1000V	10x360µs	100A	25
3	±1000V	10x1000µs	100A	25
4	±2500V	2x10µs	500A	10
5	±1000V	10x360µs	25A	5

Second Level Lightning Surge Test

Test	Surge Voltage	Wave-form	Surge Current	Repetitions Each Polarity
1	± 5000V	2x10µs	500A	1

First Level AC Power Fault Test

Test	Applied Voltage, 60Hz	Short Circuit Current	Duration
1	$50V_{RMS}$	.33A	15 minutes
2	$100V_{RMS}$	.17A	15 minutes
3	$200V_{RMS}$, $400V_{RMS}$, $600V_{RMS}$	1A at 600V	60 Applications, 1 second each
4	$1000V_{RMS}$	1A	60 Applications, 1 second each
5	Diagram	Diagram	60 Applications, 5 seconds each
6	$600V_{RMS}$	0.5A	30 seconds each
7	$600V_{RMS}$	2.2A	2 seconds each
8	$600V_{RMS}$	3A	1 second each
9	$1000V_{RMS}$	5A	0.5 second each

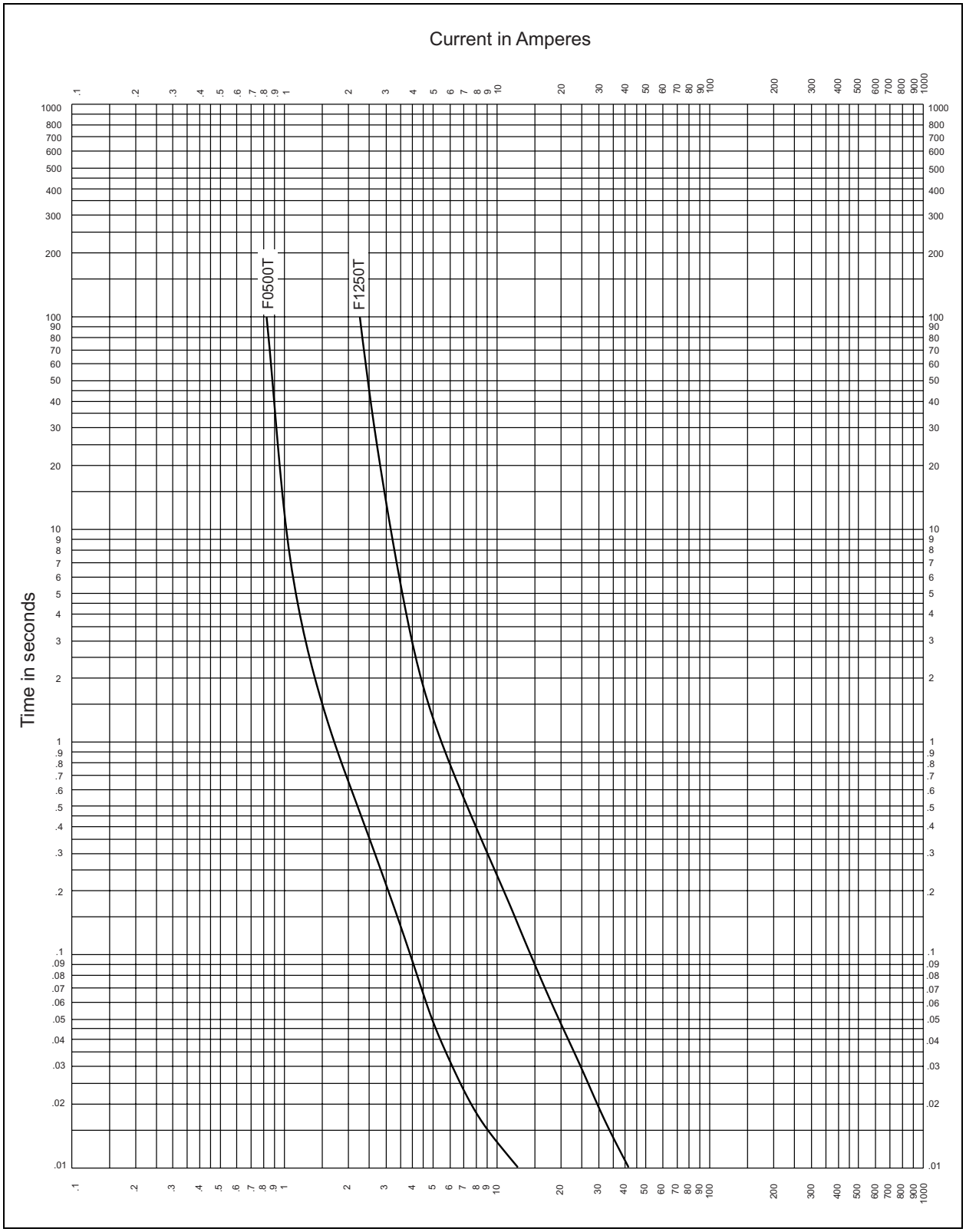
Second Level AC Power Fault Test for Non-Customer Premises Equipment

Test	Applied Voltage, 60Hz	Short Circuit Current	Duration
1	$120V_{RMS}$, $277V_{RMS}$	30A	30 minutes
2	$600V_{RMS}$	60A	5 seconds
3	$600V_{RMS}$	7A	5 seconds
4	$100V_{RMS}$ - $600V_{RMS}$	2.2A at 600V	30 minutes

Notes:

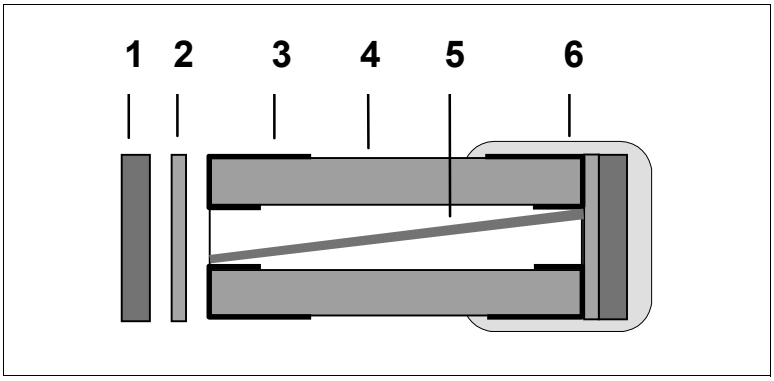
- Power fault tests equal or exceed the requirements of UL1950 3rd edition.
- Test 4 is intended to produce a maximum heating effect. Temperature readings can exceed 150°C.
- Test 2 may be dependent on the closing angle of the voltage source. Fuse is characterized at 50° to 70°. Closing angles approximating 90° may result in damage to the body of the fuse.
- Caution should be used when routing internal traces adjacent to the F1250T.

Time Current Curve



SM Mechanical Data

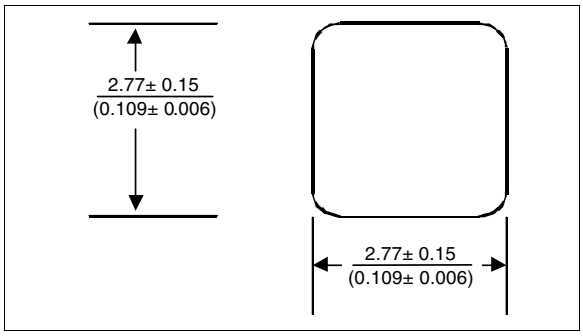
Construction



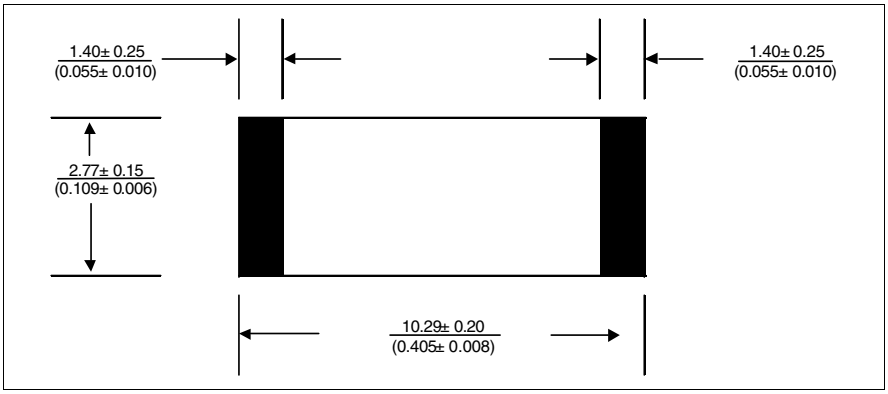
1. End plate
2. High temperature solder preform
3. Metallization of ceramic body
4. Ceramic body
5. Fuse element
6. End termination overcoat on both ends (Nickel flash, Tin/Lead overcoat)

Dimensions

End View in mm (inches)

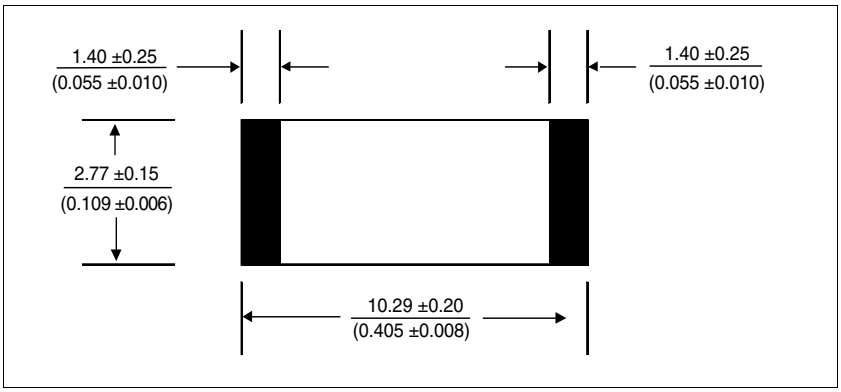


Top View in mm (inches)

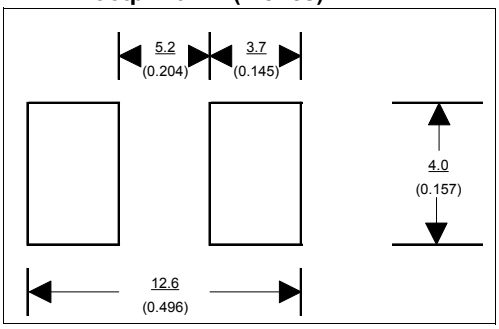


Dimensions

Side View mm (inches)



Footprint mm(inches)



Soldering Recommendations

Wave Soldering:

Reservoir Temperature: 260°C (500 °F)

Time in Reservoir: 3 seconds maximum

Infrared:

Temperature: 240°C (464°F)

Time: 30 seconds maximum

Hand Soldering:

Hand soldering is not recommended for this fuse because excessive heat can affect the fuse performance. Hand soldering should be used only for rework and low volume samples.

Maximum tip temperature: 240°C (464°F)

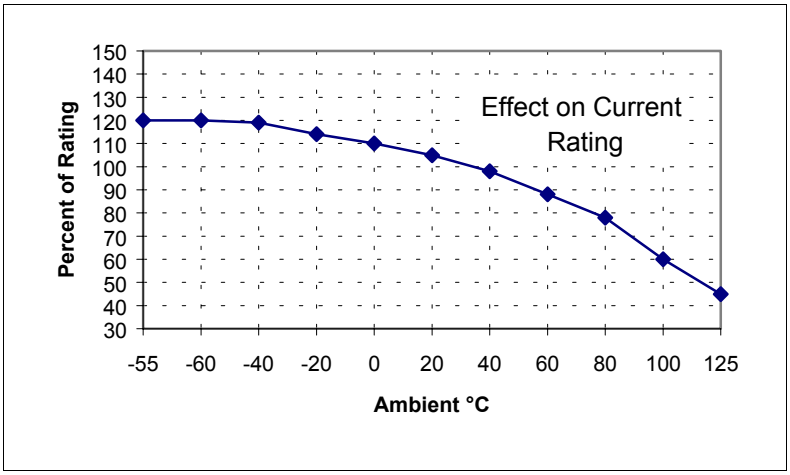
Minimize the soldering time at temperature to achieve the solder joint. Measure the fuse resistance before and after soldering. Any fuse that shifts more than ±3% should be replaced. An increase in resistance above this amount increases the possibility of a surge failure and a decrease in resistance may cause low overloads to exceed the maximum opening times.

Inspect the solder joint to ensure an adequate solder fillet has been produced without any cracks or visible defects.

Temperature Derating Curve

Operating Temperature: -55°C to +125°C with proper correction factor applied

Chart of correction factor



Maximum Temperature Rise

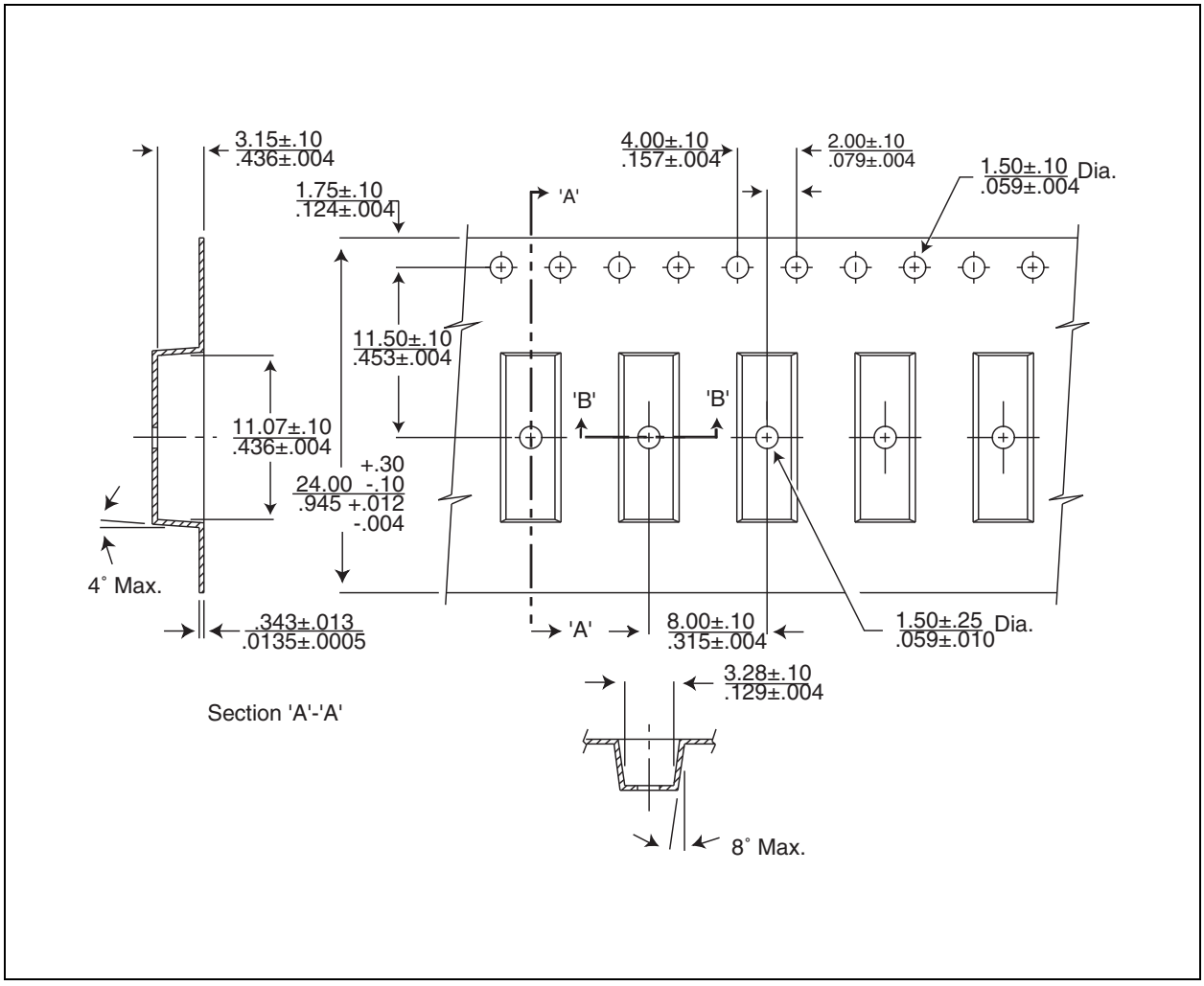
Fuse	Temperature Reading
F0500T	≤ 75°C* (167°F)
F1250T	≤ 75°C* (167°F)

Notes:

- Measured at rated current after temperature stabilizes.
- *Higher currents and PCB layout designs can effect this parameter.
- The F1250T meets the requirements of UL 248-14. However, board layout, board trace widths, and ambient temperature values can cause higher than expected rises in temperature. During UL testing, the typical recorded heat rise for the F1250T at 2.2A was 120°C.

Packaging

Carrier Tape



Material

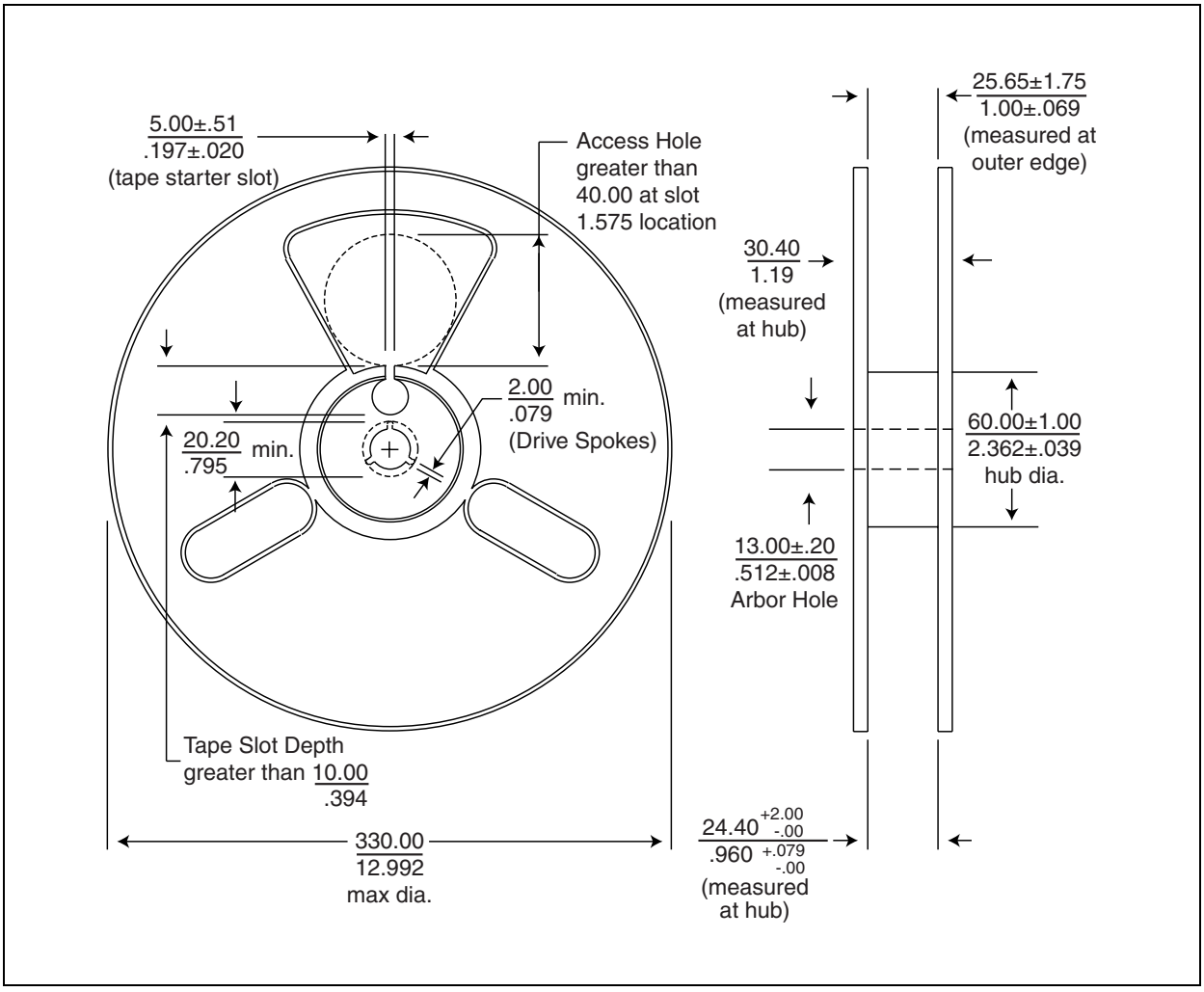
- 24mm black anti-static tape

Package Symbolization

Marking	F0500T	F1250T	Manufactured in USA	Manufactured in Taiwan
FU	F		U	
FT	F			T
JU		J	U	
JT		J		T

Packaging

13 Inch Reel (330mm)



Material

- Injection molded, high impact anti-static, white plastic reel
- Conforms to EIA-481-1
- Surface resistivity 1011 OHMS/Square
- Per ASTM D-257

Packing Information

Description	Packing Quantity	Suffix
Embossed Carrier Reel Pack	2500	RP
Bulk Pack	1000	BP

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Irving, Texas 75038-4385
United States of America

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sidactor.techsales@teccor.com

Please contact the factory for further information.

Ref: TeleLink_1250T_011012

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