Thyristor Surge Suppressors (TSS) Data Sheet

Description

DO-214AA Thyristor solid state protection thyristor protect telecommunications equipment such as modems, line cards, fax machines, and other CPE.

FTR Series devices are used to enable equipment to meet various regulatory requirements including GR 1089, ITU K.20, K.21 and K.45, IEC 60950, UL 60950, and TIA-968 (formerly known as FCC Part 68).

Features

- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative
- Will not fatigue
- Have low capacitance, making them ideal for high-speed transmission equipment
- Meets MSL level 1, per J-STD-020.

Mechanical Data

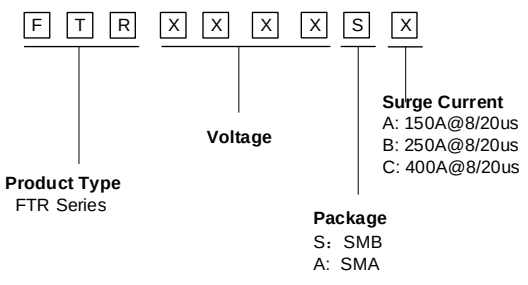
- Case: JEDEC DO-214AAMoulded plastic
- Terminal:solderplated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Mounting Position: Any

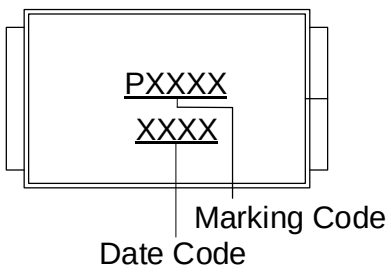
Thermal Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

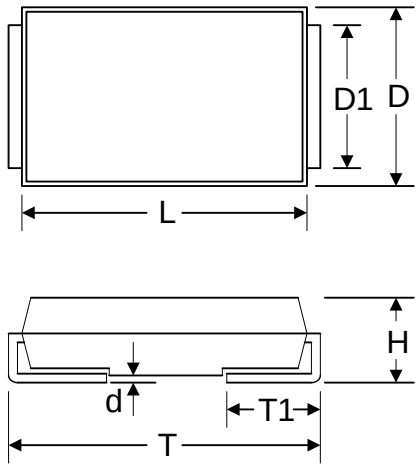
Rating	Symbol	Value	Units
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-55 to +125	℃
Typical thermal resistance junction to ambient	$R_{\theta JA}$	90	℃/W

Partnumber code





Dimensions (DO-214AA/SMB)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	4.06	4.75	0.160	0.187
D	3.30	3.94	0.130	0.155
D1	1.95	2.20	0.077	0.086
T	5.18	5.59	0.204	0.220
T1	0.76	1.52	0.030	0.060
d	-	0.203	-	0.008
H	1.99	2.61	0.078	0.103

Electrical Characteristics (T_A=25℃)

Part Number	V_{DRM} (V)	V_S (V)	V_T (V)	I_{DRM} (uA)	I_S (mA)	I_T (A)	I_H (mA)	C_O (pF)	Marking
FTR0800SA	6	25	4	5	800	2.2	50	50	P008A
FTR0800SB	6	25	4	5	800	2.2	50	70	P008B
FTR0800SC	6	25	4	5	800	2.2	50	100	P008C
FTR0300SA	25	40	4	5	800	2.2	50	70	P03A
FTR0300SB	25	40	4	5	800	2.2	50	70	P03B
FTR0300SC	25	40	4	5	800	2.2	50	100	P03C
FTR0640SA	58	77	4	5	800	2.2	150	50	P06A
FTR0640SB	58	77	4	5	800	2.2	150	60	P06B
FTR0640SC	58	77	4	5	800	2.2	150	100	P06C
FTR0720SA	65	88	4	5	800	2.2	150	50	P07A
FTR0720SB	65	88	4	5	800	2.2	150	60	P07B
FTR0720SC	65	88	4	5	800	2.2	150	100	P07C
FTR0900SA	75	98	4	5	800	2.2	150	45	P09A
FTR0900SB	75	98	4	5	800	2.2	150	55	P09B
FTR0900SC	75	98	4	5	800	2.2	150	90	P09C
FTR1100SA	90	130	4	5	800	2.2	150	45	P11A
FTR1100SB	90	130	4	5	800	2.2	150	55	P11B
FTR1100SC	90	130	4	5	800	2.2	150	90	P11C
FTR1300SA	120	160	4	5	800	2.2	150	45	P13A
FTR1300SB	120	160	4	5	800	2.2	150	55	P13B
FTR1300SC	120	160	4	5	800	2.2	150	90	P13C
FTR1500SA	140	180	4	5	800	2.2	150	40	P15A
FTR1500SB	140	180	4	5	800	2.2	150	60	P15B
FTR1500SC	140	180	4	5	800	2.2	150	85	P15C

Electrical Characteristics (T_A=25℃)

Part Number	V_{DRM} (V)	V_S (V)	V_T (V)	I_{DRM} (uA)	I_S (mA)	I_T (A)	I_H (mA)	C_O (pF)	Marking
FTR1800SA	170	220	4	5	800	2.2	150	40	P18A
FTR1800SB	170	220	4	5	800	2.2	150	60	P18B
FTR1800SC	170	220	4	5	800	2.2	150	85	P18C
FTR2300SA	190	260	4	5	800	2.2	150	35	P23A
FTR2300SB	190	260	4	5	800	2.2	150	55	P23B
FTR2300SC	190	260	4	5	800	2.2	150	80	P23C
FTR2600SA	220	300	4	5	800	2.2	150	35	P26A
FTR2600SB	220	300	4	5	800	2.2	150	50	P26B
FTR2600SC	220	300	4	5	800	2.2	150	80	P26C
FTR3100SA	275	350	4	5	800	2.2	150	30	P31A
FTR3100SB	275	350	4	5	800	2.2	150	45	P31B
FTR3100SC	275	350	4	5	800	2.2	150	65	P31C
FTR3500SA	320	400	4	5	800	2.2	150	30	P35A
FTR3500SB	320	400	4	5	800	2.2	150	40	P35B
FTR3500SC	320	400	4	5	800	2.2	150	65	P35C

Notes: Off-state capacitance(C O) is measured at 1 MHz with a 2V bias and is typical value.

Electrical Parameters

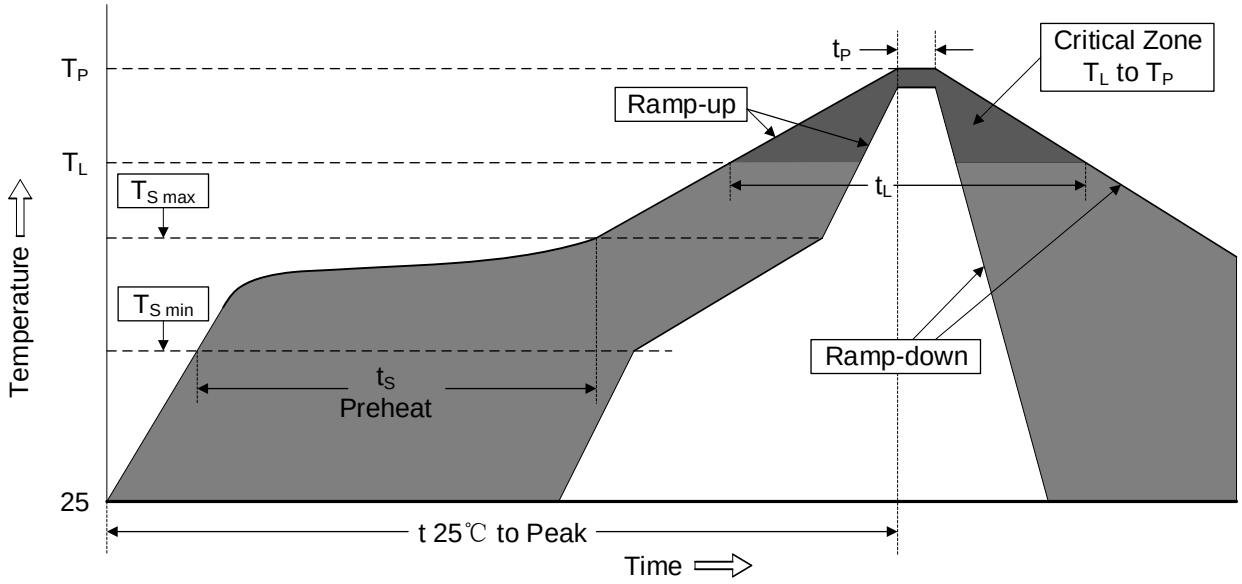
Parameter	Parameter
V_{DRM}	Peak Off-state Voltage – maximum voltage that can be applied while maintaining off state
V_S	Switching Voltage – maximum voltage prior to switching to on state
V_T	On-state Voltage – maximum voltage measured at rated on-state current
I_{DRM}	Leakage Current – maximum peak off-state current measured at V_{DRM}
I_S	Switching Current – maximum current required to switch to on state
I_T	On-state Current – maximum rated continuous on-state current
I_H	Holding Current – typical current required to maintain on state
C_O	Off-state Capacitance – typical capacitance measured in off state
I_{PP}	Peak Pulse Current – maximum rated peak impulse current

Surge Rating

Series	I_{PP} 2×10μs (A)	I_{PP} 8×20μs (A)	I_{PP} 10×160μs (A)	I_{PP} 10×560μs (A)	I_{PP} 10×1000μs (A)	V_{PP} 10×1000μs (KV)	I_{TSM} 60Hz (A)	di/dt (A/μs)
A	150	150	90	50	45	2	20	500
B	250	250	150	100	80	4	30	500
C	500	400	200	150	100	6	50	500

Recommended Soldering Conditions

Reflow Soldering



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate ($T_L$to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\,min}$) -Temperature Max ($T_{S\,max}$) -Time (min to max)(t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\,max}$to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual PeakTemperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

Figure 1. V/I Characteristics

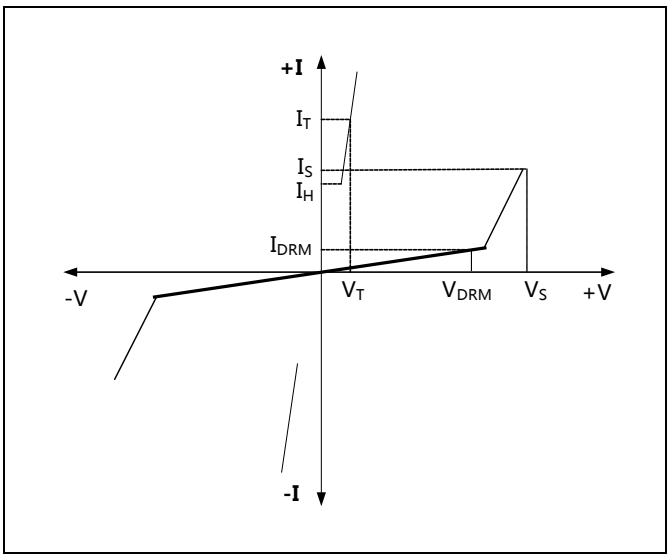


Figure 2. Normalized Vs Change versus Junction Temperature

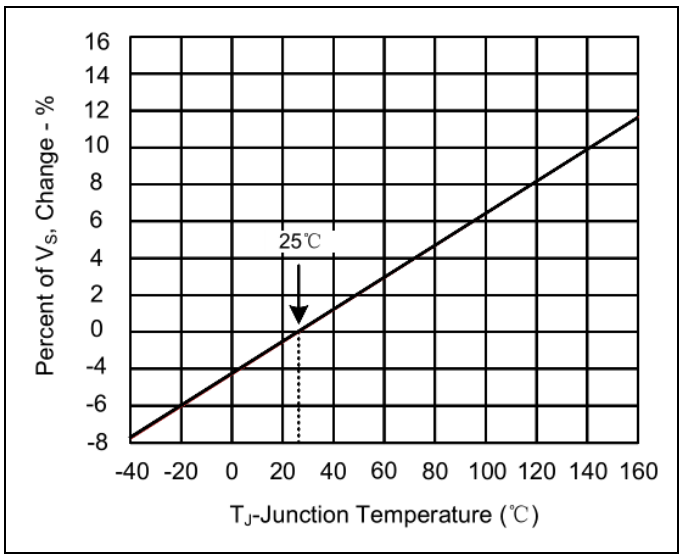


Figure 3. Pulse Waveform

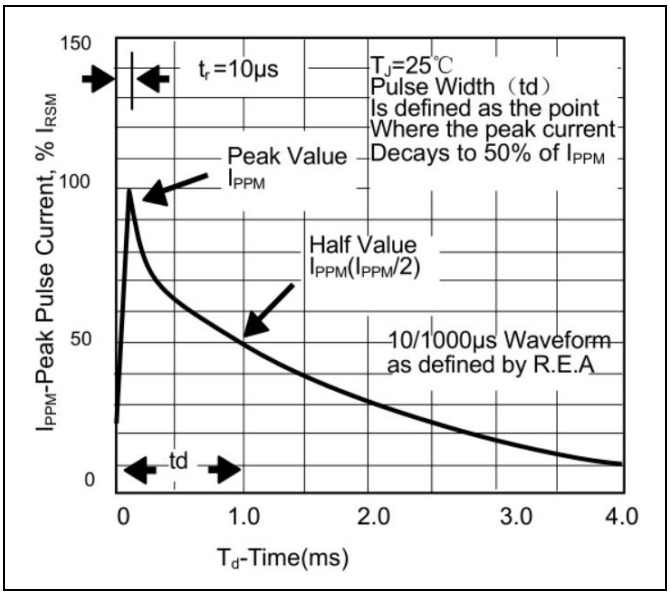
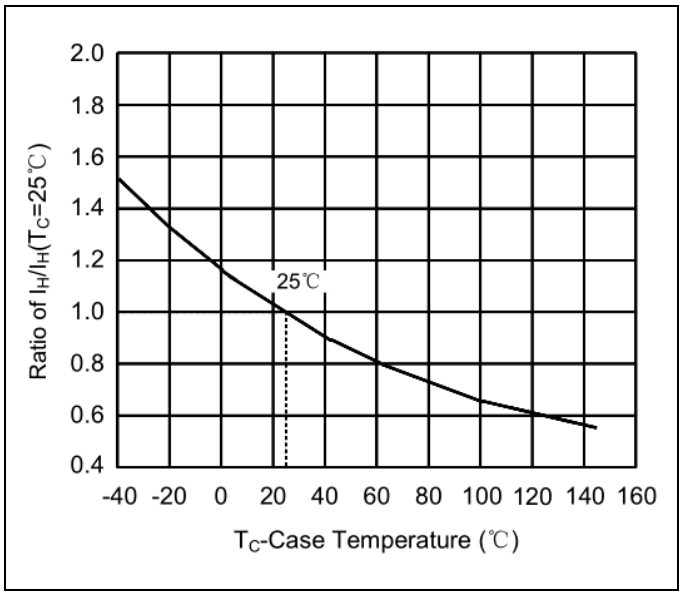
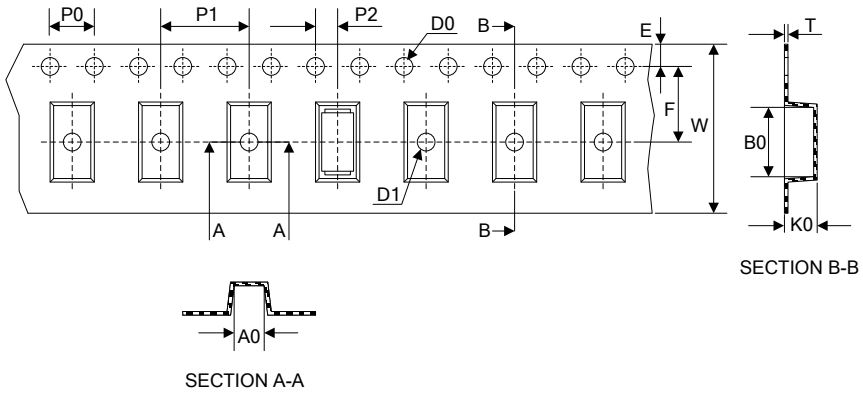


Figure 4. Normalized DC Holding Current versus Case Temperature



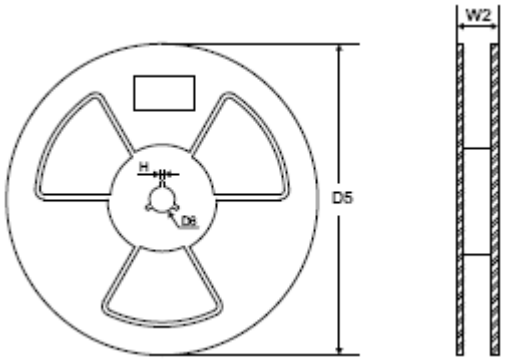
Packaging

Tape



Symbol	Dimension (mm)
W	12.00±0.30
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
D0	Φ1.55±0.05
D1	Φ1.55±0.05
E	1.75±0.10
F	5.50±0.10
A0	3.76±0.10
B0	5.69±0.10
K0	2.70±0.10
T	0.25±0.10

Reel



D5	Φ330.0±2.0
D6	Φ13.5±0.5
H	2.5±1.0
W2	16.0±1.0

Quantity: 3000PCS