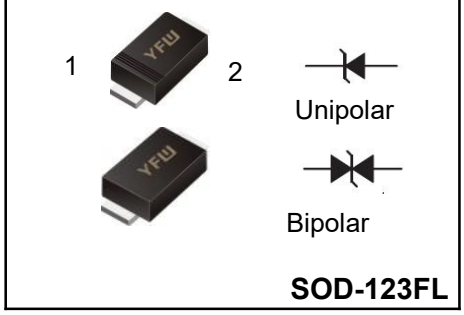
Transient Voltage Suppressor

Pinning

1.Cathode	2.Anode



Description

SM4F Series transient voltage suppressors are excel lent overvoltage protective devices.
The Series is designed specifically to protect sensitive electronic equipment from voltage transients induced by lightning and other transient voltage events.

Features

- Excellent clamping capability
- Low leakage current
- High surge capability
- Glass passivated chip
- Epoxy resin package
- Built-in strain relief
- Will not fatigue
- RoHS Compliant
- Fast response time:typically less than 1.0ps from 0 Volts to VBR min

Mechanical Characteristics

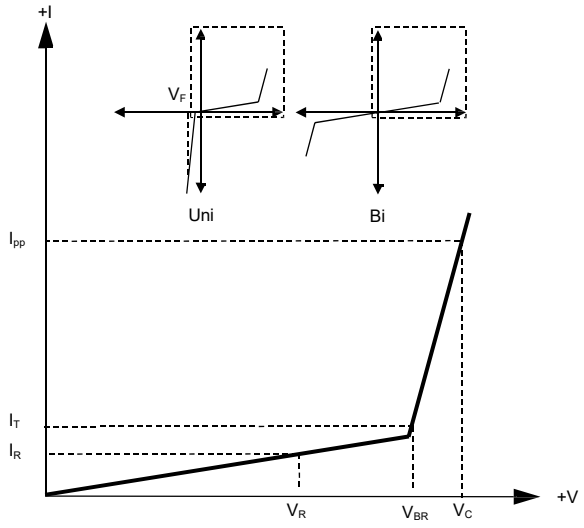
- Package: SOD-123FL plastic package.
- Lead Finish: Matte Tin
- Case Material: Epoxy Molding Compound.
- UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020

Applications

- Cellular phones
- Portable devices
- Business machines
- Power supplies
- Consumer applications

Electrical Parameters

Parameter	Definition
C_J	Junction Capacitance - typical capacitance measured with 0V or V_R bias
I_{PP}	Peak Pulse Current - maximum rated peak impulse current
V_C	Clamping Voltage - Peak voltage measured across the suppressor at a specified Ippm (peak impulse current)
V_{BR}	Breakdown Voltage - Maximum voltage that flows though the TVS at a specified test current (I_T)
I_R	Leakage Current - maximum peak off-state current measured at V_R
V_R	Peak Off-state Voltage - maximum voltage that can be applied while maintaining off state



Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Value	Units	Remarks
Peak Pulse Power Dissipation	P_{PPM}	400	W	(Note1)(Note2)
Steady State Power Dissipation	P_D	1	W	(Note3)
Peak Forward Surge Current	I_{FSM}	30	A	(Note4)
Maximum Instantaneous Forward Voltage at 10A	V_{FM}	3.5	V	(Note5)
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	100	℃/W	
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	220	℃/W	
Operating Temperature Range	T_J	-55 to 150	℃	
Storage Temperature Range	T_{STG}	-55 to 150	℃	

Notes1: Non-repetitive current pulse , 10/1000us Waveform.

Notes2: Mounted on copper pad area of 3×3mm to each terminal.

Notes3: Infinite HeatSink at T_L=50°C

Notes4: Measured on 8.3ms single half sine wave or equivalent square wave, duty cycle=4 perminute maximum.

Notes5: For UnidirectionalOnly.

Electrical Characteristics (TA=25°C unless otherwise)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T(V)		Test Current I_T(mA)	Maximum Clamping Voltage V_C@ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximun Reverse Leakage I_R @ V_R (μA)
		Uni	Bi		Min	Max				
SM4F5.0A	SM4F5.0CA	5.0A	5.0C	5	6.4	7	10	9.2	43.5	800
SM4F6.0A	SM4F6.0CA	6.0A	6.0C	6	6.67	7.37	10	10.3	38.8	800
SM4F6.5A	SM4F6.5CA	6.5A	6.5C	6.5	7.22	7.98	10	11.2	35.7	500
SM4F7.0A	SM4F7.0CA	7.0A	7.0C	7	7.78	8.6	10	12	33.3	200
SM4F7.5A	SM4F7.5CA	7.5A	7.5C	7.5	8.33	9.21	1	12.9	31	100
SM4F8.0A	SM4F8.0CA	8.0A	8.0C	8	8.89	9.83	1	13.6	29.4	50
SM4F8.5A	SM4F8.5CA	8.5A	8.5C	8.5	9.44	10.4	1	14.4	27.8	20
SM4F9.0A	SM4F9.0CA	9.0A	9.0C	9	10	11.1	1	15.4	26	10
SM4F10A	SM4F10CA	10A	10C	10	11.1	12.3	1	17	23.5	5
SM4F11A	SM4F11CA	11A	11C	11	12.2	13.5	1	18.2	22	1
SM4F12A	SM4F12CA	12A	12C	12	13.3	14.7	1	19.9	20.1	1
SM4F13A	SM4F13CA	13A	13C	13	14.4	15.9	1	21.5	18.6	1
SM4F14A	SM4F14CA	14A	14C	14	15.6	17.2	1	23.2	17.2	1
SM4F15A	SM4F15CA	15A	15C	15	16.7	18.5	1	24.4	16.4	1
SM4F16A	SM4F16CA	16A	16C	16	17.8	19.7	1	26	15.4	1
SM4F17A	SM4F17CA	17A	17C	17	18.9	20.9	1	27.6	14.5	1
SM4F18A	SM4F18CA	18A	18C	18	20	22.1	1	29.2	13.7	1
SM4F20A	SM4F20CA	20A	20C	20	22.2	24.5	1	32.4	12.3	1

Electrical Characteristics (TA=25°C unless otherwise noted)

Part Number (Uni)	Part Number (Bi)	Marking Code		Reverse Stand off Voltage V_R (V)	Breakdown Voltage V_{BR} @ I_T(V)		Test Current I_T(mA)	Maximum Clamping Voltage V_C@ I_{PP} (V)	Maximum Peak Pulse Current I_{PP} (A)	Maximun Reverse Leakage I_R @ V_R (μA)
		Uni	Bi		Min	Max				
SM4F22A	SM4F22CA	22A	22C	22	24.4	26.9	1	35.5	11.3	1
SM4F24A	SM4F24CA	24A	24C	24	26.7	29.5	1	38.9	10.3	1
SM4F26A	SM4F26CA	26A	26C	26	28.9	31.9	1	42.1	9.5	1
SM4F28A	SM4F28CA	28A	28C	28	31.1	34.4	1	45.4	8.8	1
SM4F30A	SM4F30CA	30A	30C	30	33.3	36.8	1	48.4	8.3	1
SM4F33A	SM4F33CA	33A	33C	33	36.7	40.6	1	53.3	7.5	1
SM4F36A	SM4F36CA	36A	36C	36	40	44.2	1	58.1	6.9	1
SM4F40A	SM4F40CA	40A	40C	40	44.4	49.1	1	64.5	6.2	1
SM4F43A	SM4F43CA	43A	43C	43	47.8	52.8	1	69.4	5.8	1
SM4F45A	SM4F45CA	45A	45C	45	50	55.3	1	72.7	5.5	1
SM4F48A	SM4F48CA	48A	48C	48	53.3	58.9	1	77.4	5.2	1
SM4F51A	SM4F51CA	51A	51C	51	56.7	62.7	1	82.4	4.9	1
SM4F54A	SM4F54CA	54A	54C	54	60	66.3	1	87.1	4.6	1
SM4F58A	SM4F58CA	58A	58C	58	64.4	71.2	1	93.6	4.3	1
SM4F60A	SM4F60CA	60A	60C	60	66.7	73.7	1	96.8	4.1	1
SM4F64A	SM4F64CA	64A	64C	64	71.1	78.6	1	103	3.9	1
SM4F70A	SM4F70CA	70A	70C	70	77.8	86	1	113	3.5	1
SM4F75A	SM4F75CA	75A	75C	75	83.3	92.1	1	121	3.3	1
SM4F78A	SM4F78CA	78A	78C	78	86.7	95.8	1	126	3.2	1
SM4F85A	SM4F85CA	85A	85C	85	94.4	104	1	137	2.9	1
SM4F90A	SM4F90CA	90A	90C	90	100	111	1	146	2.7	1
SM4F100A	SM4F100CA	100A	100C	100	111	123	1	162	2.5	1
SM4F110A	SM4F110CA	110A	110C	110	122	135	1	177	2.3	1
SM4F120A	SM4F120CA	120A	120C	120	133	147	1	193	2.1	1
SM4F130A	SM4F130CA	130A	130C	130	144	159	1	209	1.9	1
SM4F150A	SM4F150CA	150A	150C	150	167	185	1	243	1.6	1
SM4F160A	SM4F160CA	160A	160C	160	178	197	1	259	1.5	1
SM4F170A	SM4F170CA	170A	170C	170	189	209	1	275	1.5	1
SM4F180A	SM4F180CA	180A	180C	180	201	222	1	292	1.4	1
SM4F200A	SM4F200CA	200A	200C	200	224	247	1	324	1.2	1
SM4F220A	SM4F220CA	220A	220C	220	246	272	1	356	1.1	1

Rating And Characteristic Curves (TA=25°C unless otherwise noted)

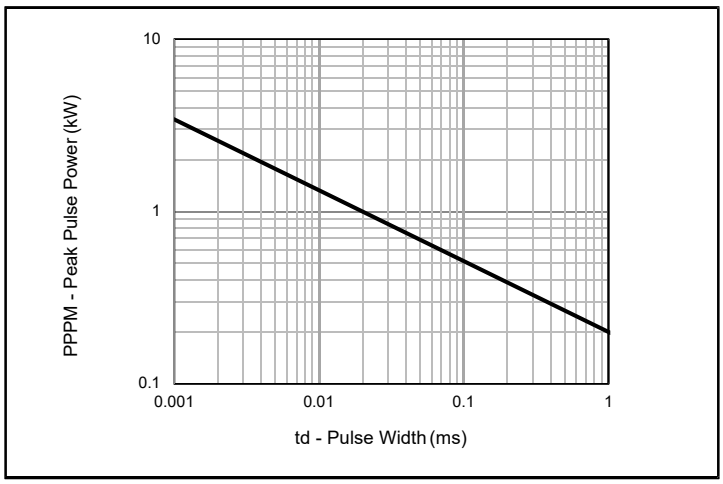


Fig.1 - Peak Pulse Power Rating

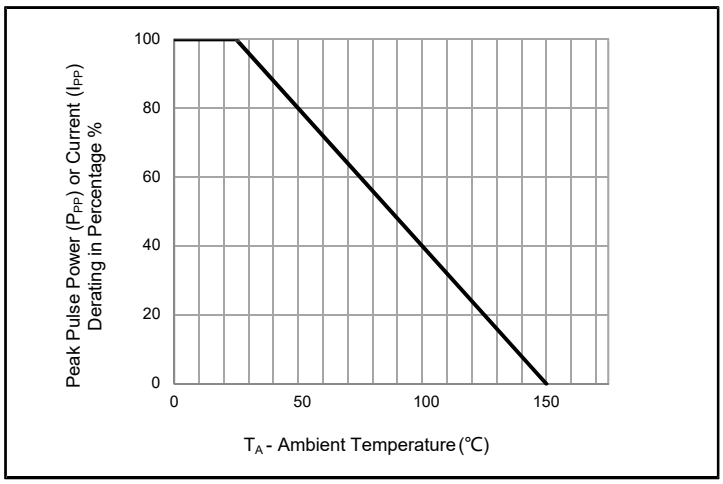


Fig.2 - Pulse Derating Curve

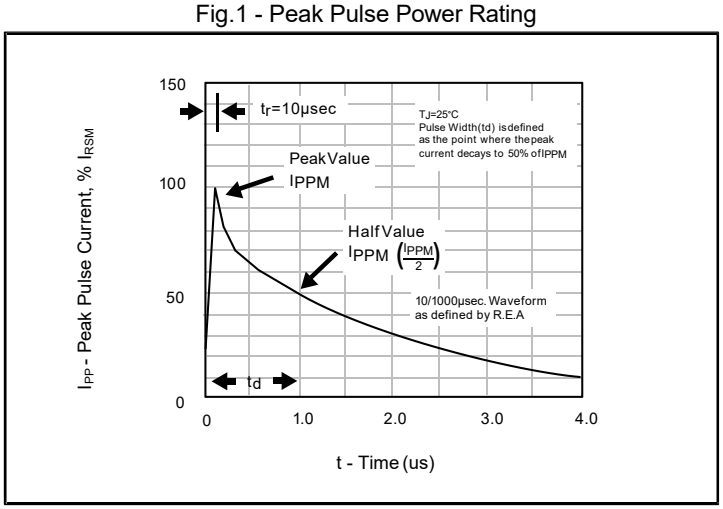


Fig.3 - Pulse Waveform

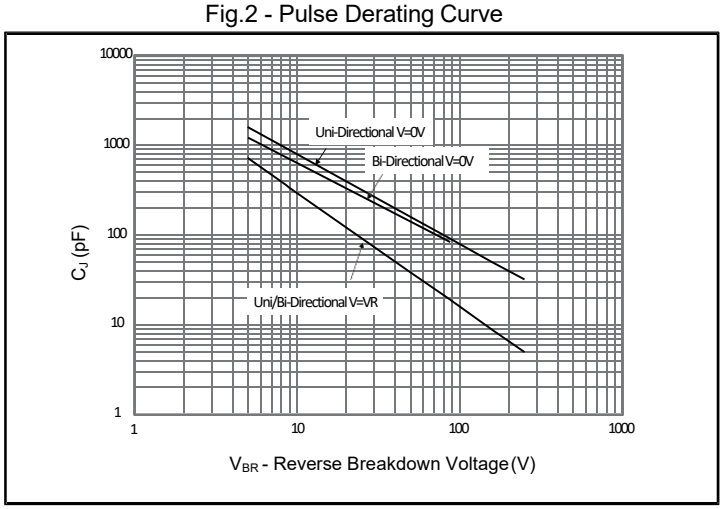


Fig.4 - Typical Junction Capacitance

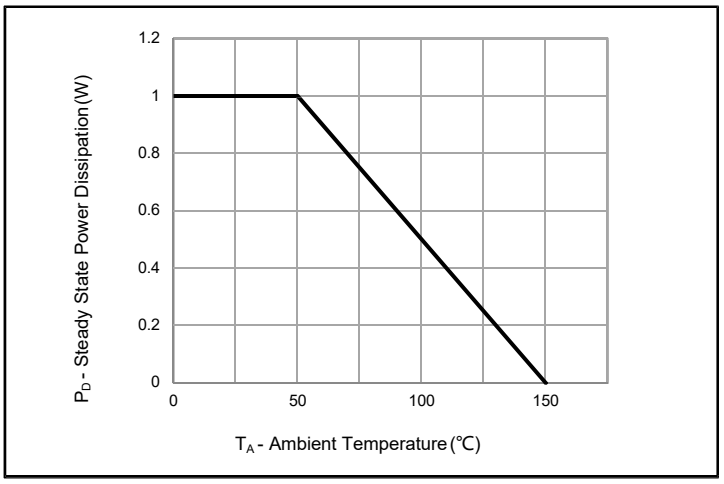


Fig.5 - Steady State Power Dissipation Derating Curve

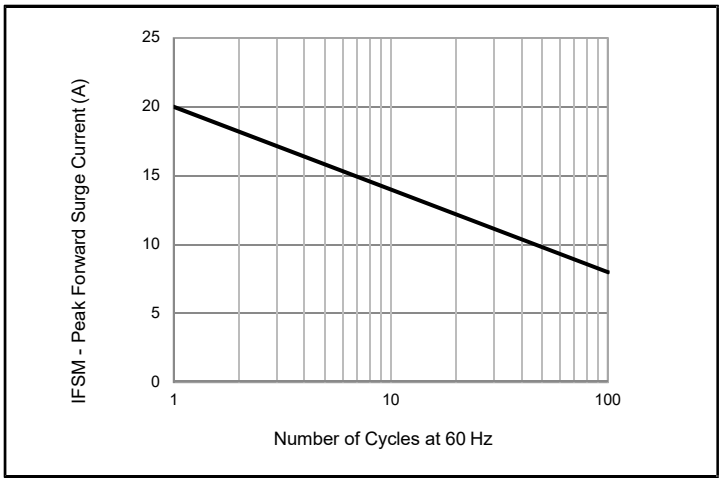
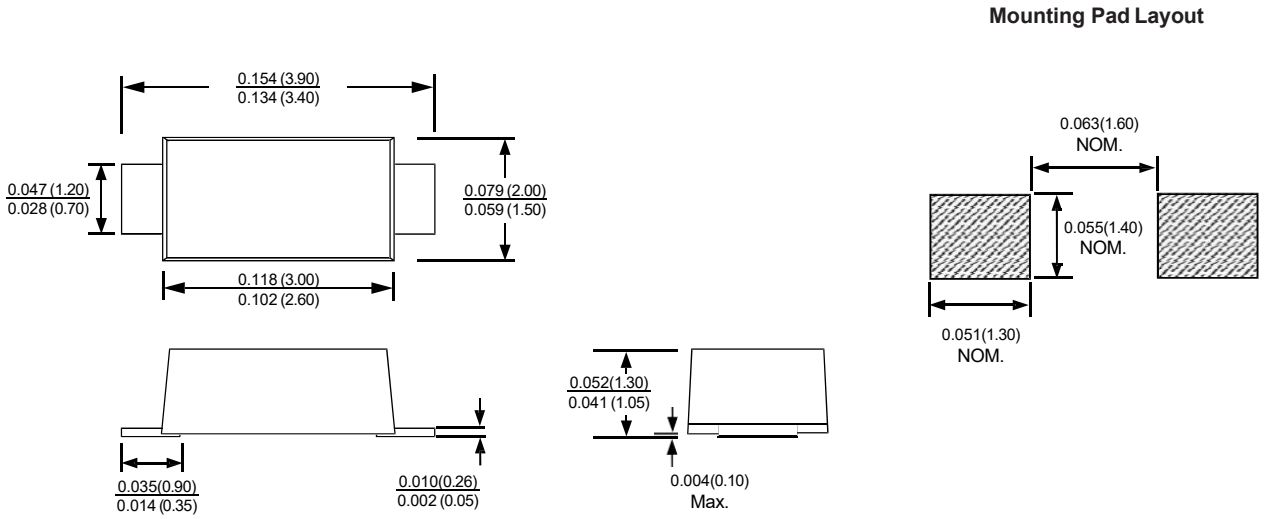


Fig.6 - Maximum Non-Repetitive Peak Forward Surge Current
Uni-Directional Only

Package Outline SOD-123FL



Summary of Packing Options

Package	Packing Description	Packing Quantity	Industry Standard
SOD-123FL	Tape/Reel,13”reel	10000	EIA-481-1
	Tape/Reel,7”reel	3000	EIA-481-1