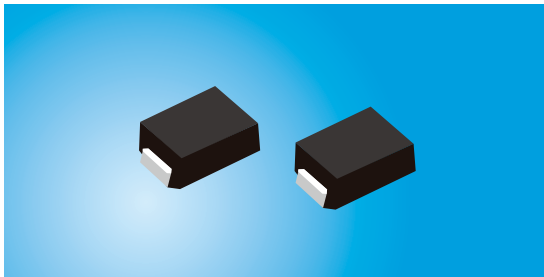


KWPXXXXSX Series Thyristor Surge Suppressors



Description

KWPXXXXSX Series Thyristor solid state protection thyristor Protect telecommunications equipment such as modems, line cards, fax machines, and other CPE.

KWPXXXXSX 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

Compared to surge suppression using other technologies, KWPXXXXSX Series devices offer absolute surge protection regardless of the surge current available and the rate of applied voltage (dv/dt). KWPXXXXSX Series devices:

- 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

Electrical Parameters

Parameter	Definition
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 – minimum current required to maintain on state
C _O	Off-state Capacitance – typical capacitance measured in off state
V _{PP}	Peak Pulse Voltage – maximum rated peak impulse voltage
I _{PP}	Peak Pulse Current – maximum rated peak impulse current



KWPXXXXSX Series Thyristor Surge Suppressors

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Electrical Characteristics

Part Number	Marking	V _{DRM} @I _{DRM} =5μA	V _s @100V/μs	I _H	I _s	I _T	V _T @I _T =2.2Amps	Capacitance @1MHz 2V bias	
		V min	V max	mA min	mA max	A max	Vmax	pf min	pf max
KWP0080SA	P008A	6	25	50	800	2.2	4	25	35
KWP0220SA	P22A	15	32	50	800	2.2	4	25	150
KWP0300SA	P03A	25	40	50	800	2.2	4	15	140
KWP0640SA	P06A	58	77	150	800	2.2	4	40	60
KWP0720SA	P07A	65	88	150	800	2.2	4	35	60
KWP0900SA	P09A	75	98	150	800	2.2	4	25	55
KWP1100SA	P11A	90	130	150	800	2.2	4	30	50
KWP1300SA	P13A	120	160	150	800	2.2	4	25	45
KWP1500SA	P15A	140	180	150	800	2.2	4	25	40
KWP1800SA	P18A	170	220	150	800	2.2	4	25	35
KWP2100SA	P21A	180	240	150	800	2.2	4	20	35
KWP2300SA	P23A	190	260	150	800	2.2	4	25	35
KWP2600SA	P26A	220	300	150	800	2.2	4	20	35
KWP3100SA	P31A	275	350	150	800	2.2	4	15	50
KWP3500SA	P35A	320	400	150	800	2.2	4	15	50
KWP0080SB	P008B	6	25	50	800	2.2	4	25	150
KWP0220SB	P02B	15	32	50	800	2.2	4	25	150
KWP0300SB	P03B	25	40	50	800	2.2	4	15	140
KWP0640SB	P06B	58	77	150	800	2.2	4	40	80
KWP0720SB	P07B	65	88	150	800	2.2	4	35	75
KWP0900SB	P09B	75	98	150	800	2.2	4	35	70
KWP1100SB	P11B	90	130	150	800	2.2	4	30	70
KWP1300SB	P13B	120	160	150	800	2.2	4	25	60
KWP1500SB	P15B	140	180	150	800	2.2	4	25	55
KWP1800SB	P18B	170	220	150	800	2.2	4	25	50
KWP2100SB	P21B	180	240	150	800	2.2	4	20	35
KWP2300SB	P23B	190	260	150	800	2.2	4	25	50
KWP2600SB	P26B	220	300	150	800	2.2	4	20	45
KWP3100SB	P31B	275	350	150	800	2.2	4	20	45
KWP3500SB	P35B	320	400	150	800	2.2	4	20	40
KWP4500SB	P45B	400	530	150	800	2.2	4	20	65
KWP0080SC	P008C	6	25	50	800	2.2	4	45	260
KWP0220SC	P02C	15	32	50	800	2.2	4	30	240
KWP0300SC	P03C	25	40	50	800	2.2	4	25	250
KWP0640SC	P06C	58	77	150	800	2.2	4	55	155

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Electrical Characteristics

Part Number	Marking	V _{DRM} @I _{DRM} =5μA	V _S @100V/μs	I _H	I _S	I _T	V _T @I _T =2.2Amps	Capacitance @1MHz 2V bias	
		V min	V max	mA min	mA max	A max	Vmax	pf min	pf max
KWP0720SC	P07C	65	88	150	800	2.2	4	50	150
KWP0900SC	P09C	75	98	150	800	2.2	4	45	140
KWP1100SC	P11C	90	130	150	800	2.2	4	45	115
KWP1300SC	P13C	120	160	150	800	2.2	4	40	105
KWP1500SC	P15C	140	180	150	800	2.2	4	35	95
KWP1800SC	P18C	170	220	150	800	2.2	4	35	90
KWP2100SC	P21C	180	240	150	800	2.2	4	30	90
KWP2300SC	P23C	190	260	150	800	2.2	4	30	80
KWP2600SC	P26C	220	300	150	800	2.2	4	30	80
KWP3100SC	P31C	275	350	150	800	2.2	4	30	70
KWP3500SC	P35C	320	400	150	800	2.2	4	25	65
KWP4500SC	P45C	400	530	150	800	2.2	4	25	65
KWP4500SCL*	P45L	400	530	50	800	2.2	4	20	65

Notes:

- Absolute maximum ratings measured at T_A= 25°C (unless otherwise noted).
- Devices are bi-directional.
- * KWP4500SCL is low I_H product

Surge Ratings


Series	I _{pp}									I _{TSM} 50/60 Hz	di/dt
	0.2X310 ¹ 0.5X700 ²	2X10 ¹ 2X10 ²	8X20 ¹ 1.2X50 ²	10X160 ¹ 10X160 ²	10X560 ¹ 10X560 ²	5X320 ¹ 9X720 ²	10X360 ¹ 10X360 ²	10X1000 ¹ 10X1000 ²	5X310 ¹ 10X700 ²		
	A min	A min	A min	A min	A min	A min	A min	A min	A min	A min	Amps/us max
A	20	150	150	90	50	75	75	45	75	20	500
B	25	250	250	150	100	100	125	80	100	25	500
C	50	500	400	200	150	200	175	100	200 ³	30	500

Notes:

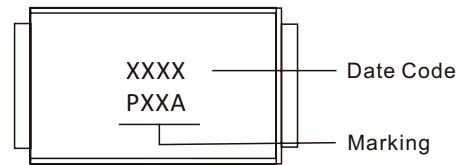
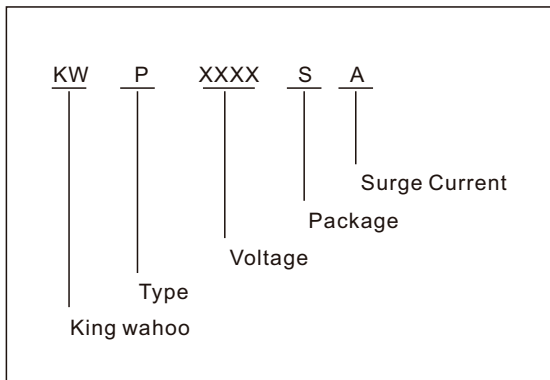
1. Current waveform in μs
 2. Voltage waveform in μs
 3. For surge rating of KWP4500SCL 10x700μs min=150A & typical=180A
For surge rating of KWP4500SCL 10x700μs min=150A
- Peak pulse current rating (I_{PP}) is repetitive and guaranteed for the life of the product.
 - I_{PP} ratings applicable over temperature range of -40°C to +85°C
 - The device must initially be in thermal equilibrium with -40°C < T_J < +150°C

KWPXXXXSX Series Thyristor Surge Suppressors

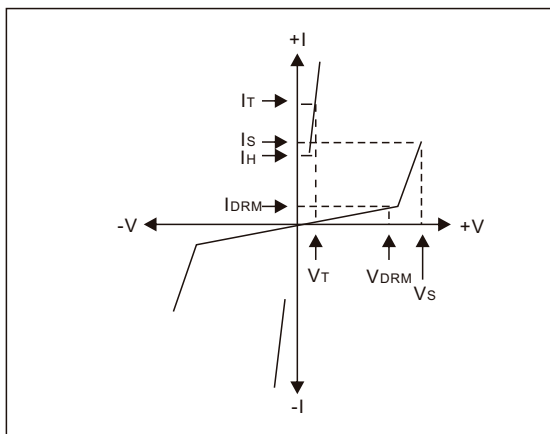
Thermal Considerations

Package KWPXXXXSX Series	Symbol	Parameter	Value	Unit
	T _J	Operating Junction Temperature	-40 to +150	°C
	T _S	Storage Temperature Range	-65 to +150	°C
	R _{θJA}	Junction to Ambient on printed circuit	90	°C/W

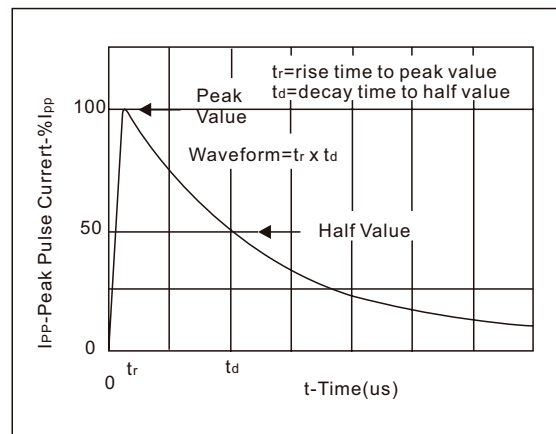
Part Number Code and Marking

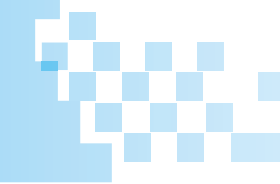


V-I Characteristics



tr X td Pulse Waveform

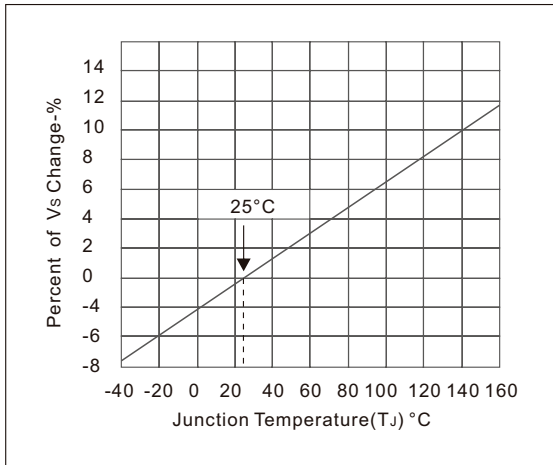




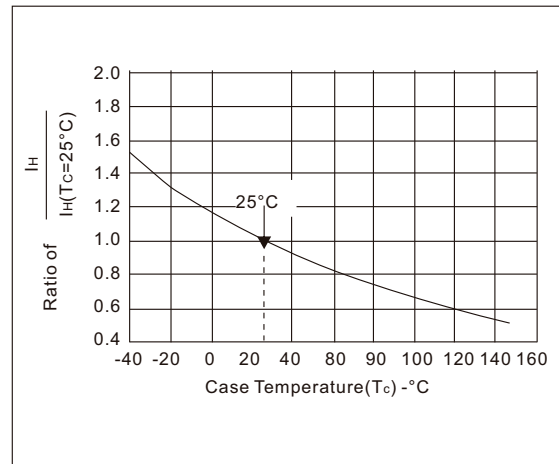
KWPXXXXSX Series Thyristor Surge Suppressors

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Normalized Vs Change vs. Junction Temperature



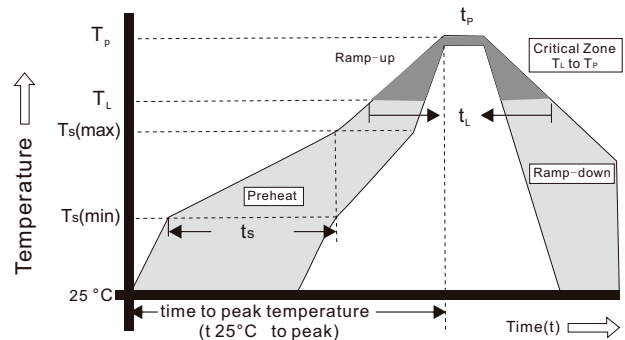
Normalized DC Holding Current vs. Case Temperature

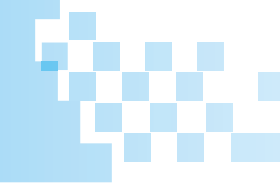


Recommended Conditions

Profile Feature	Pb – Free assembly
Average ramp-up rate(TL to TP)	3°C/second max
Preheat	
-Temperature Min(Ts min)	150°C
-Temperature Max(Ts max)	200°C
-Time (Min to Max)(ts)	60 – 180 secs
Ts(max) to TL - Ramp-up Rate	3°C/second max
Time maintained above:	
-Temperature(TL)	217°C
-Time (tL)	60 – 150 seconds
Peak Temperature (TP)	260 °C
Time within 5°C of actual peak Temperature (tp)	30 second max
Ramp-down Rate	6°C/second max
Time 25°C to peak Temperature	8 minutes Max.

Recommended Soldering Conditions

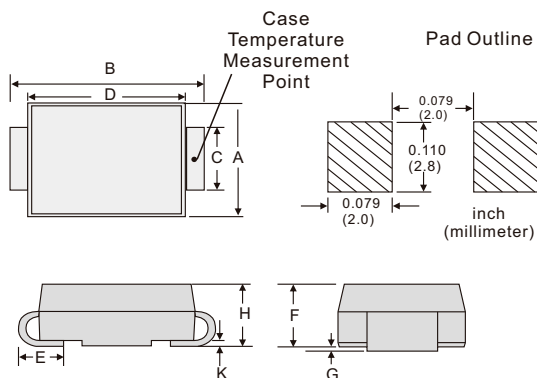




KWPXXXXSX Series Thyristor Surge Suppressors

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Dimensions



Dimensions	Inches		Millimeters	
	Min	Max	Min	Max
A	0.130	0.156	3.30	3.95
B	0.201	0.220	5.10	5.60
C	0.077	0.087	1.95	2.20
D	0.159	0.181	4.05	4.60
E	0.030	0.063	0.75	1.60
F	0.075	0.096	1.90	2.45
G	0.002	0.008	0.05	0.20
H	0.077	0.104	1.95	2.65
H-KWP4500SCL	0.077	0.096	1.95	2.43
K	0.006	0.016	0.15	0.41

Packaging

Package Type	Description	Quantity	Added Suffix	Industry Standard
S	DO-214AA Tape & Reel Pack	2500	RP	EIA-481-D

