

Features

- For surface mounted applications in order to optimize board space
- Pb-free plated
- Peak Power is 3600W@1ms
- ESD Rating of Class X (> 15 kV) (IEC6100-4-2)
- Response Time is Typically <1 ps
- Low profile package
- Typical I_R less than 2μA above 10V
- Low inductance
- Excellent clamping capability
- AEC-Q101
- MSL Class 1
- HMB Class 3B
- MM Class C



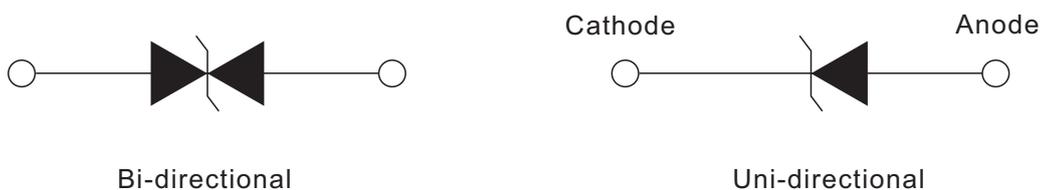
Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

Mechanical Characteristics

- **Case:** JEDEC DO-214AB. Molded plastic over glass passivated junction
- **Terminal:** Solderable per MIL-STD-750, Method 2026
- **Polarity:** Color band denoted positive end (cathode) except Bidirectional
- **Standard Packaging:** 16mm tape (EIA STD RS-481)
- **Weight:** 0.007 ounce, 0.21 gram

Functional Diagram



Maximum Ratings And Characteristics

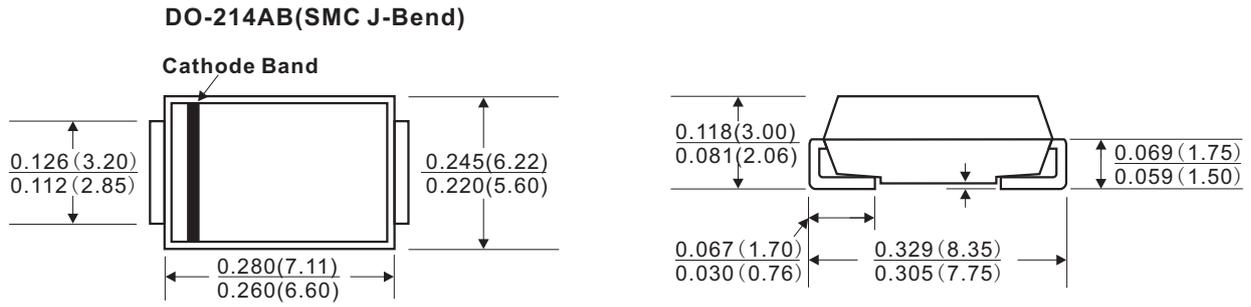
Ratings at 25°C ambient temperature unless otherwise specified.

RATING	SYMBOL	VALUE	UNITS
Peak Pulse Power Dissipation on 10/1000μs waveform	P _{PPM}	3600	Watts
Peak Forward Surge Current, 8.3ms Single Half Sine-Wave Superimposed on Rated Load, (JEDEC Method) (Note 2,3)	I _{FSM}	300	Amps
Operating junction and Storage Temperature Range	T _J , T _{STG}	-55 to +175	°C

Notes :

1. Non-repetitive current pulse, per Fig. 3 and derated above T_A = 25°C per Fig. 2.
2. Mounted on 8.0mm x 8.0mm Copper Pads to each terminal
3. 8.3ms single half sine-wave, or equivalent square wave, Duty cycle = 4 pulses per minutes maximum.

Dimensions (DO-214AB)



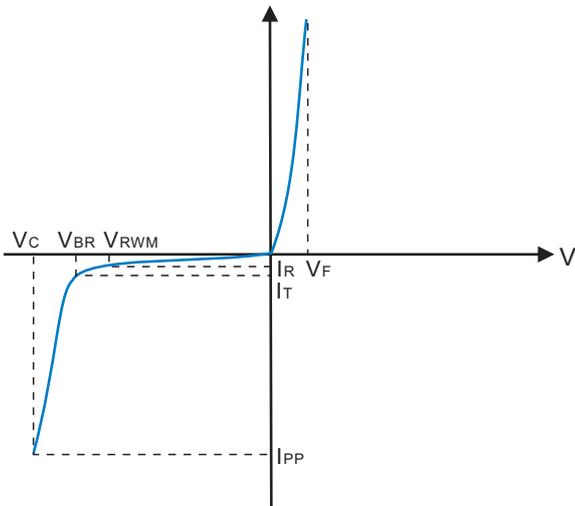
Electrical Characteristics

TSE Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @IT		Test Current	Maximum Clamping Voltage @IPP	Peak Pulse Current	Reverse Leakage @VRWM
UNI-Polar	BI-Polar	UNI	BI	VRWM(V)	VBR(V)Min.	VBR(V)Max.	IT(mA)	Vc(V)	IPP(A)	IR(μA)
TSE6.0U	TSE6.0B	RDG	DDG	6.0	6.67	7.37	10	10.3	349.5	200
TSE8.0U	TSE8.0B	PDR	DDR	8.0	8.89	9.83	1	13.6	264.7	50
TSE10U	TSE10B	PDX	DDX	10.0	11.10	12.30	1	17.0	212.0	5
TSE12U	TSE12B	PEE	DEE	12.0	13.30	14.70	1	19.9	180.9	2
TSE15U	TSE15B	PEM	DEM	15.0	16.70	18.50	1	24.4	147.5	2
TSE16U	TSE16B	PEP	DEP	16.0	17.80	19.70	1	26.0	138.5	2
TSE18U	TSE18B	PET	DET	18.0	20.00	22.10	1	29.2	123.3	2
TSE20U	TSE20B	PEV	DEV	20.0	22.20	24.50	1	32.4	111.1	2
TSE22U	TSE22B	PEX	DEX	22.0	24.40	26.90	1	35.5	101.4	2
TSE24U	TSE24B	PEZ	DEZ	24.0	26.70	29.50	1	38.9	92.5	2
TSE26U	TSE26B	PFE	DFE	26.0	28.90	31.90	1	42.1	85.5	2
TSE28U	TSE28B	PFG	DFG	28.0	31.10	34.40	1	45.4	79.3	2
TSE30U	TSE30B	PFK	DFK	30.0	33.30	36.80	1	48.4	74.4	2
TSE33U	TSE33B	PFM	DFM	33.0	36.70	40.60	1	53.3	67.5	2
TSE36U	TSE36B	PFP	DFP	36.0	40.00	44.20	1	58.1	62.0	2
TSE40U	TSE40B	PFR	DFR	40.0	44.40	49.10	1	64.5	55.7	2
TSE43U	TSE43B	PFT	DFT	43.0	47.80	52.80	1	69.4	51.9	2
TSE51U	TSE51B	PFZ	DFZ	51.0	56.70	62.70	1	82.4	43.6	2
TSE54U	TSE54B	PGE	DGE	54.0	60.00	66.30	1	87.1	41.0	2
TSE58U	TSE58B	PGG	DGG	58.0	64.40	71.20	1	93.6	38.5	2
TSE60U	TSE60B	PGK	DGK	60.0	66.70	73.70	1	96.8	37.2	2
TSE75U	TSE75B	PGR	DGR	75.0	83.30	92.10	1	121.0	29.8	2

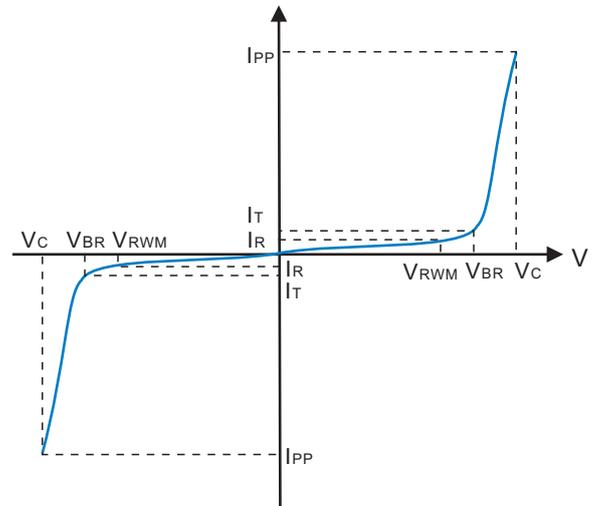
For bidirectional type having VRWM of 10 volts and less, the IR limit is double.

I-V Curve Characteristics

Uni-directional



Bi-directional



Ratings And Characteristic Curves ($T_A=25^\circ\text{C}$ Unless otherwise noted)

Fig.1 Peak Pulse Power Rating

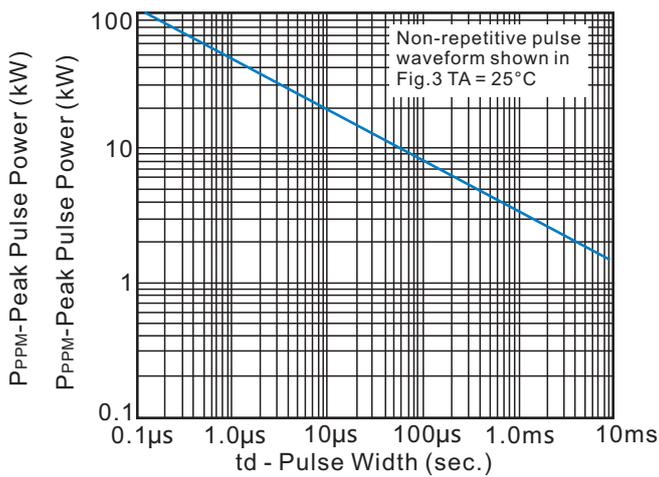


Fig.2 Pulse Derating Curve

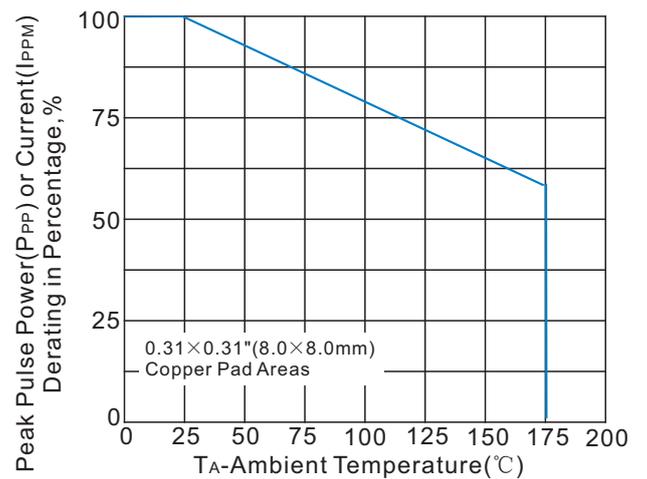


Fig.3 Pulse Waveform

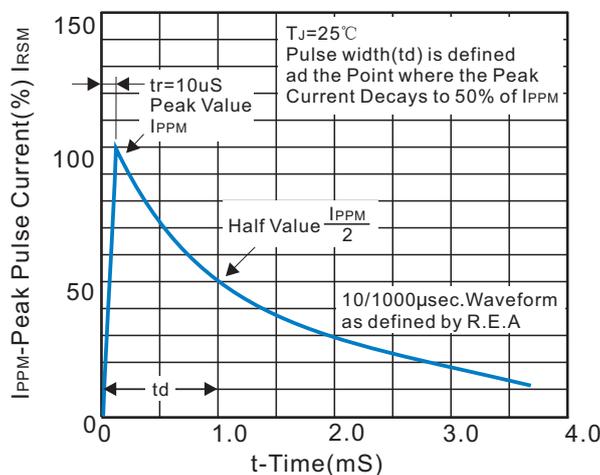
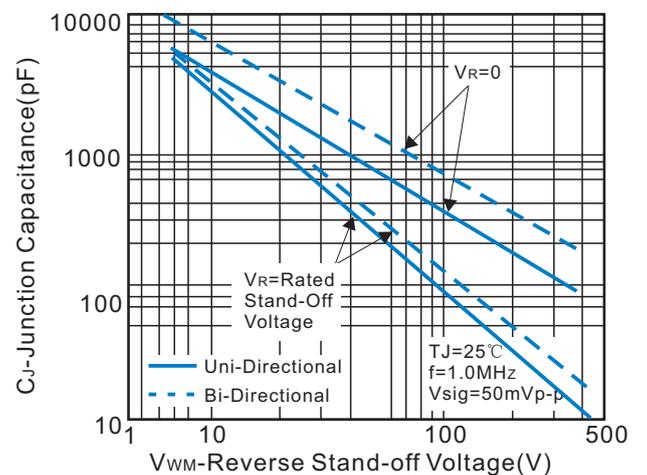


Fig.4 Typical Junction Capacitance



Ratings And Characteristic Curves($T_A=25^{\circ}\text{C}$ Unless otherwise noted)

Fig.5 Typ. Transient Thermal Impedance

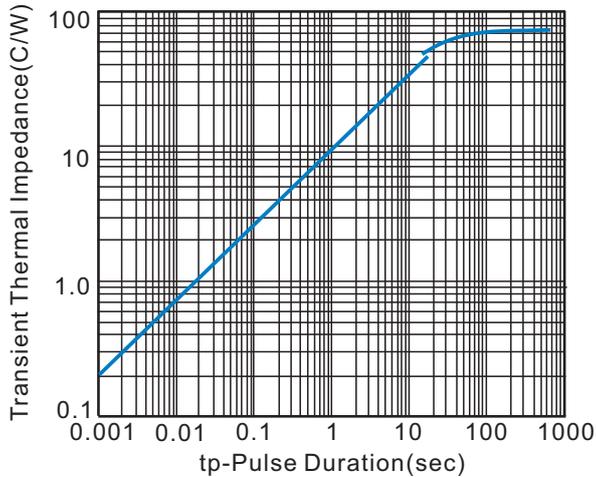
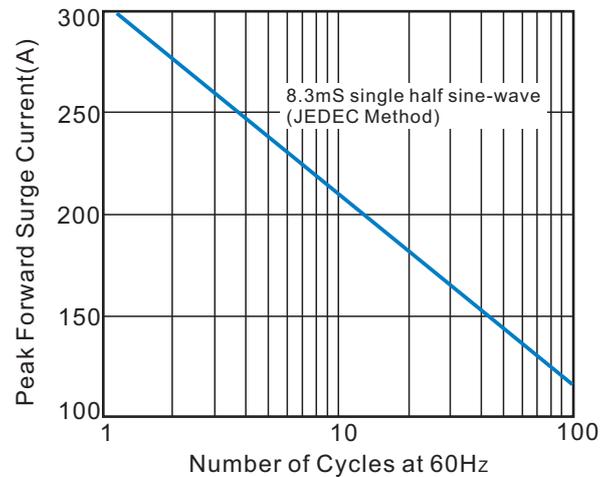


Fig.6 Maximum Non-Repetitive Peak Forward Surge Current Uni-Directional Only

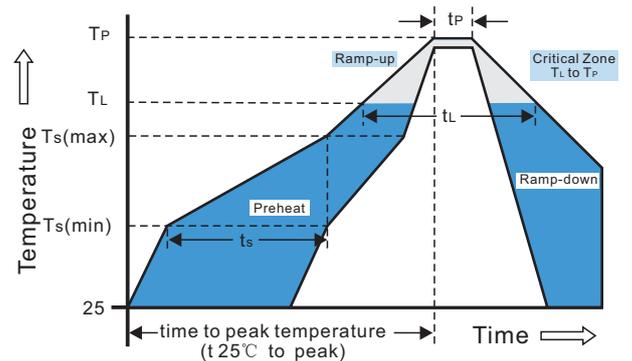


Recommended Soldering Conditions

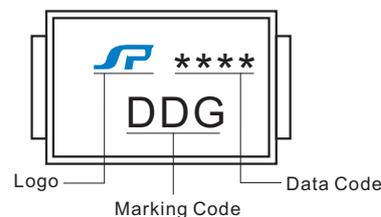
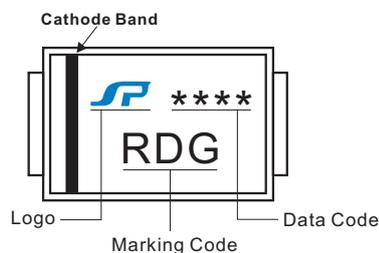
Recommended Conditions

Reflow Condition		Pb-Free assembly (see Fig.1)
Pre Heat	-Temperature Min($T_{s(min)}$)	+150 $^{\circ}\text{C}$
	-Temperature Max($T_{s(max)}$)	+200 $^{\circ}\text{C}$
	-Time(Min to Max)(t_s)	60-180secs
Average ramp up rate (Liquidus Temp(T_L) to peak)		3 $^{\circ}\text{C}/\text{sec. Max.}$
$T_{s(max)}$ to T_L -Ramp-up Rate		3 $^{\circ}\text{C}/\text{sec. Max.}$
Reflow	-Temperature(T_L)(Liquidus)	+217 $^{\circ}\text{C}$
	-Temperature(t_L)	60-150secs
Peak Temp(T_P)		+260(+0/-5) $^{\circ}\text{C}$
Time within 5 $^{\circ}\text{C}$ of actual Peak Temp(t_P)		30 secs. Max.
Ramp-down Rate		6 $^{\circ}\text{C}/\text{sec. Max.}$
Time 25 $^{\circ}\text{C}$ to Peak Temp(T_P)		8 min. Max.
Do not exceed		+260 $^{\circ}\text{C}$

Reflow Soldering



Marking Code



Packing Options And Reel Specification-DO-214AB

Symbol	Ea Per Reel	REEL DIA (mm)	Industry Standard
TSE***	500/3000	178/330	EIARS-481

