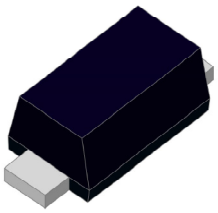
FAGOR

FES1DWSR TG

1.0 Amp. Surface Mount Top Glass Passivated Ultrafast Very Soft Recovery Rectifier

SOD123W



Voltage	Current
200 V	1.0 A

FEATURE

- Top-Glass Technology
- Low profile package
- Ideal for automated placement
- Low power losses, high efficiency
- High surge current capability
- Cavity-free glass-passivated junction
- Low forward voltage drop
- Solder dip 260 ºC, 10s
- AEC-Q101 qualified
- Component in accordance to RoHS 2011/65/EU and WEEE 2002/96/EC
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 ºC
- Very soft recovery characteristics
- Significantly reduced EMI. Very low noise.

AUTOMOTIVE GRADE Available

Pb

e3

RoHS COMPLIANT

MECHANICAL DATA

- **Case:** SOD123W. Epoxy meets UL 94V-0 flammability rating.
- **Polarity:** Color band denotes cathode end.
- **Terminals:** Matte tin plated leads, solderable per MIL-STD-750 Method 2026, J-STD-002 and JESD22-B102. Consumer grade, meets JESD 201 class 1A whisker test.
- **HE3 suffix** for high reliability grade, meets JESD 201 class 2 whisker test.

TYPICAL APPLICATIONS

Used in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

Maximun Ratings and Electrical Characteristics at 25 °C

			FES1DWSR TG
Marking Code			**WF**
V_{RRM}	Maximum Recurrent Peak Reverse Voltage (V)		200
V_{RMS}	Maximum RMS Voltage (V)		140
V_{DC}	Maximum DC Blocking Voltage (V)		200
$I_{F\ (VA)}$	Maximum Average Forward Rectified Current at T_L = 110		1.0 A
I_{FSM}	Peak Forward Surge Current, 8.3 ms. Single Half Sine-Wave Superimposed on Rated Load (Jedec Method)		50 A
V_F	Maximum Instantaneous Forward	Tj = 25 ºC	0.90 V
	Voltaje @ 1 A	Tj = 125 ºC	0.76 V
I_R	Maximum DC Reverse Leakage Current. VR= VRRM	Tj = 25 ºC	2 µA
		Tj = 125 ºC	8 µA
		Tj = 175 ºC	40 µA
Cj	Typical Junction Capacitance (1 MHz; -4.0V)		15 pF
$R_{th\ (j-c)}$	Maximum Thermal Resistance Junction to Case		17 ºC/W
$R_{th\ (j-a)}$	Maximum Thermal Resistance Junction to Ambient:		
	. FR4 PCB Standard Footprint		217 ºC/W
	. FR4 PCB Mounting Pad for Cathode 1 cm^2		126 ºC/W
T_j - T_{stg}	Operating Junction and Storage Temperature Range		-65 to +175 ºC

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Recovery Characteristics (T_j = 25 °C)

Symbol	Test Conditions	Min.	Max	Typ.	Unit
trr	I_F = 0.5 A, dI_F/dt = 100 A/µs, I_R limted to1000 mA		25		ns
ta				15	
tb				6	
tb/ta	Softness	0.45			
Qrr	VR= 30v, dIF/dt = 50 A/µs, I_F = 1A			7	nC
	VR= 30v, dIF/dt = 50 A/µs, I_F = 2A			8.5	
	VR= 30v, dIF/dt = 50 A/µs, I_F = 5A			9.5	
	VR= 30v, dIF/dt = 50 A/µs, I_F = 15A			10	
Qrr	VR= 30v, dIF/dt = 150 A/µs, I_F = 1A			9	nC
	VR= 30v, dIF/dt = 150 A/µs, I_F = 2A			15	
	VR= 30v, dIF/dt = 150 A/µs, I_F = 5A			25	
	VR= 30v, dIF/dt = 150 A/µs, I_F = 15A			30	

Static Characteristics

PARAMETER		UNIT	T_J = -40 °C	T_J = 0 °C	T_J = 25 °C	T_J = 125 °C	T_J = 150 °C	T_J = 175 °C
I_R at V_R =30 V	max.	µA	<0.001	<0.001	<0.001	1	7	25
I_R at V_R =100 V	max.		<0.001	0.05	0.1	1.3	9	30
I_R at V_R =200 V	max.		0.1	0.5	2	8	11	40
V_F at I_F = 0.5 A	max.	V	0.95	0.86	0.82	0.67	0.64	0.61
V_F at I_F = 1 A	max.		1	0.94	0.90	0.76	0.70	0.67

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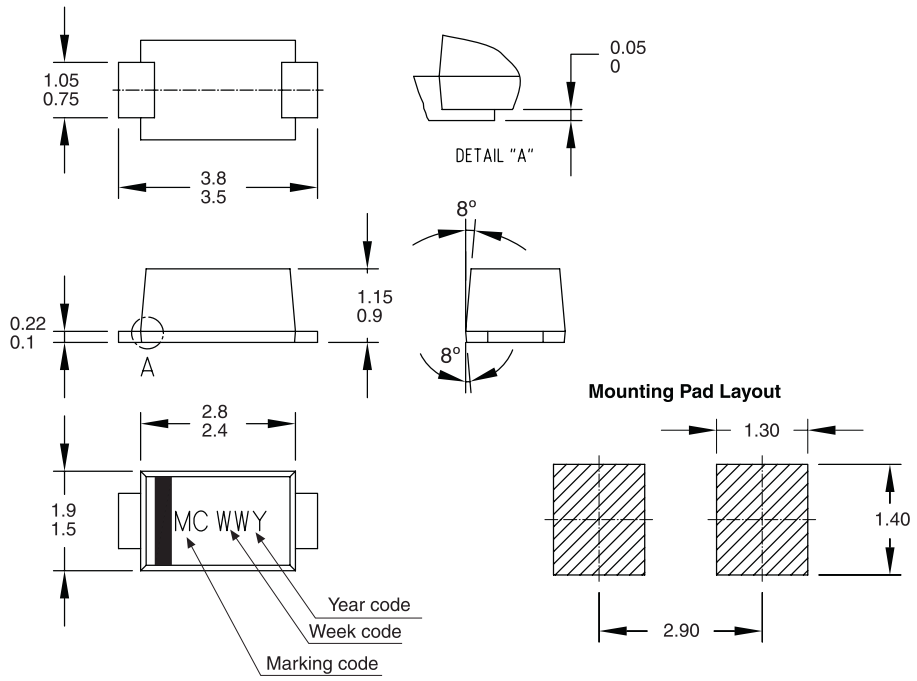
Ordering information

PREFERRED P/N	PACKAGE CODE	DELIVERY MODE	BASE QUANTITY	UNIT WEIGHT (g)
FES1DWSR TG TRTB	TRTB	13" diameter tape and reel	10,000	0.0165
FES1DWSR TG HE3 TRTB	TRTB	13" diameter tape and reel	10,000	0.0165

Package Outline Dimensions: (mm) SOD123W



1.0 Amp. Surface Mount Top Glass Passivated Ultrafast Very Soft Recovery Rectifier

Fig. 1 REVERSE CURRENT vs REVERSE VOLTAGE

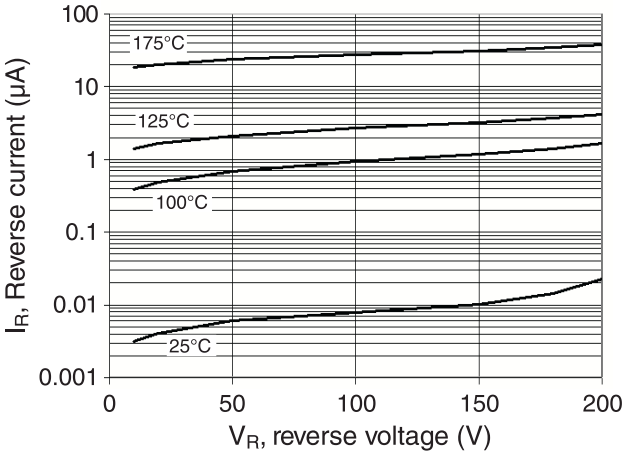


Fig. 2 FORWARD VOLTAGE vs FORWARD CURRENT

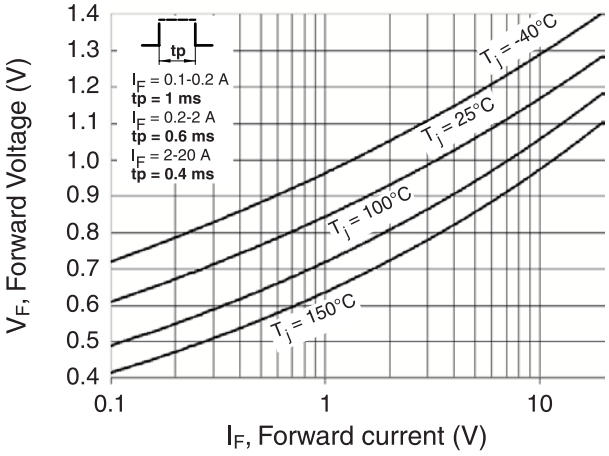


Fig. 3 LOW FREQUENCY POWER LOSSES vs. AVERAGE CURRENT

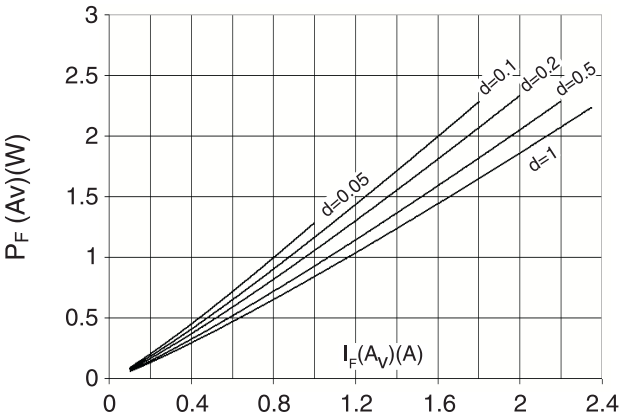


Fig. 4 PEAK CURRENT vs. FORM FACTOR

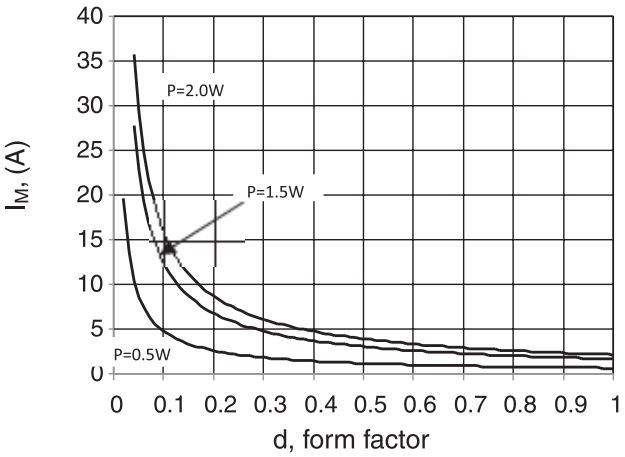


Fig. 5 FORWARD CURRENT DERATING CURVE

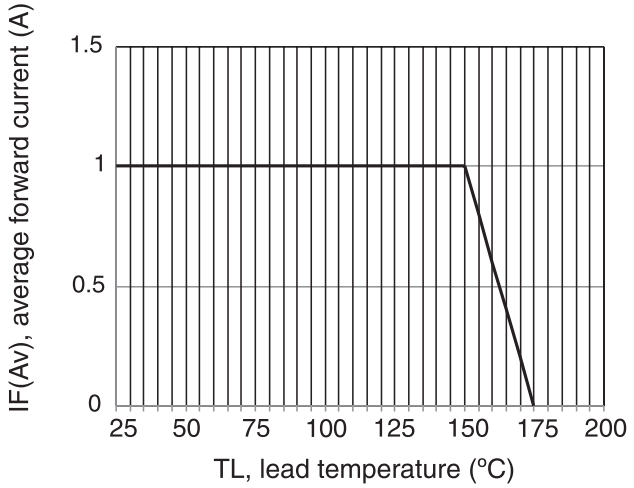
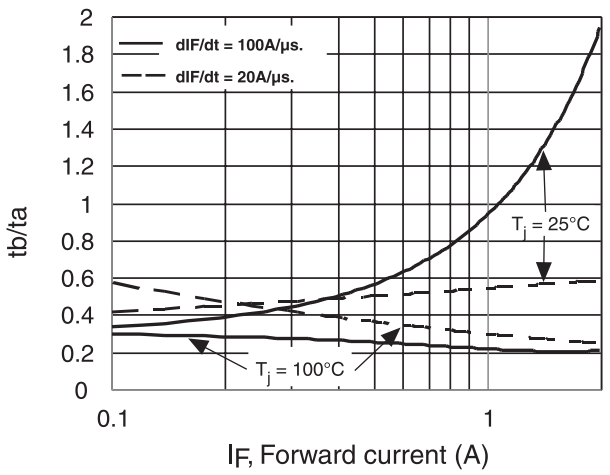


Fig. 6 tb/ta CURVES vs. FORWARD CURRENT



1.0 Amp. Surface Mount Top Glass Passivated Ultrafast Very Soft Recovery Rectifier

Fig. 7 t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT. Tc = 25 °C

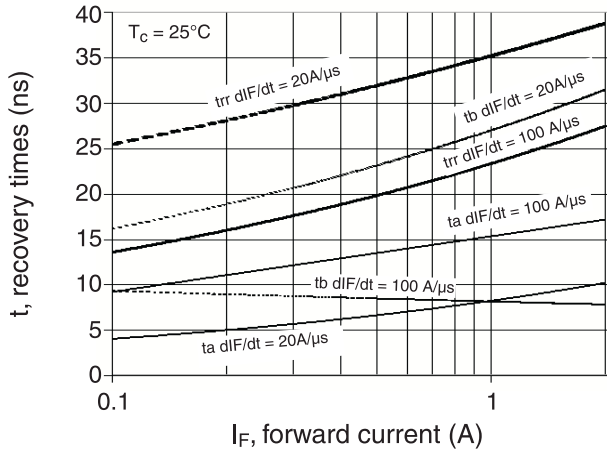


Fig. 8 t_{rr}, t_a AND t_b CURVES vs FORWARD CURRENT. T_C = 100 °C

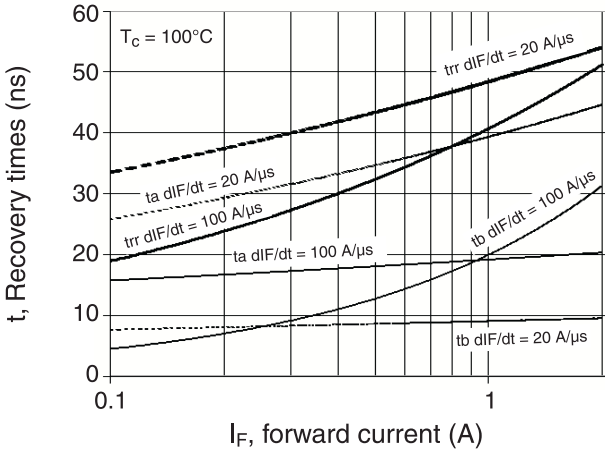


Fig. 9 RECOVERY TIME vs dI_F/dt

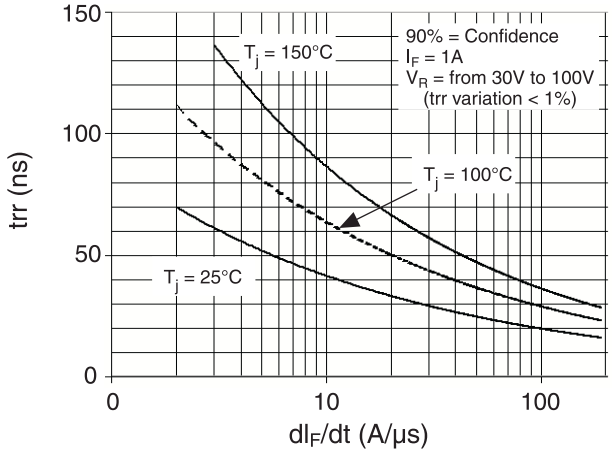


Fig. 10 PEAK REVERSE CURRENT vs dI_F/dt

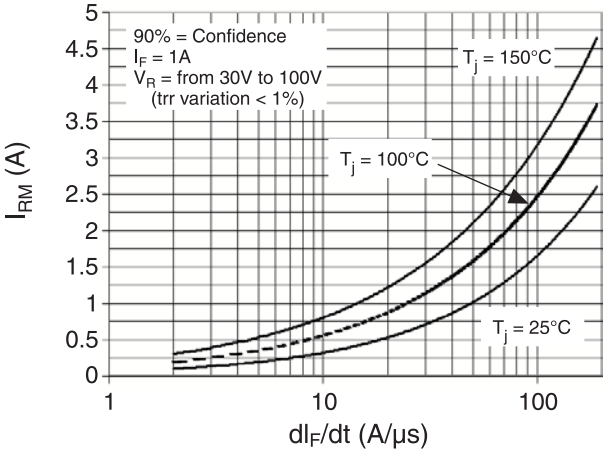


Fig. 11 trr vs dI_F/dt. I_F = 2 A

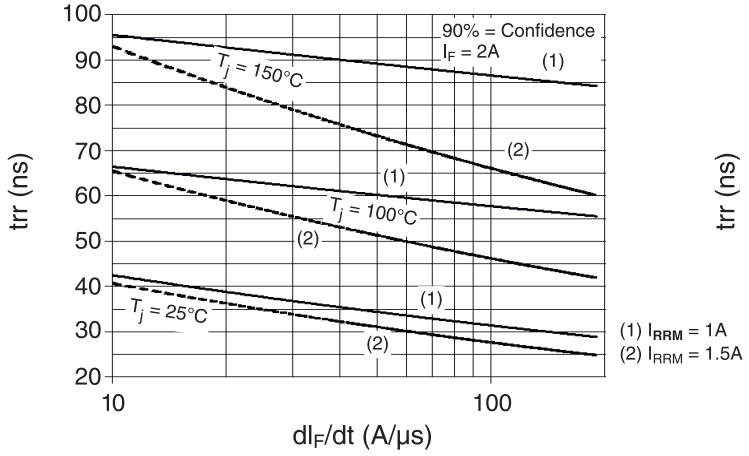
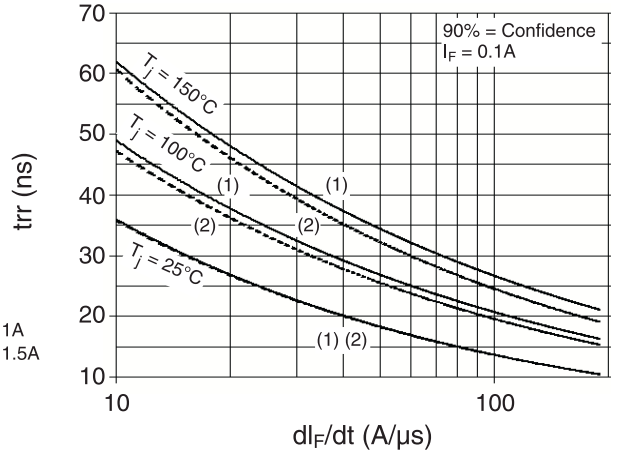


Fig. 12 trr vs dI_F/dt. I_F = 0.1 A



1.0 Amp. Surface Mount Top Glass Passivated Ultrafast Very Soft Recovery Rectifier

Fig. 13 trr vs dI_F/dt. I_F = 0.5 A

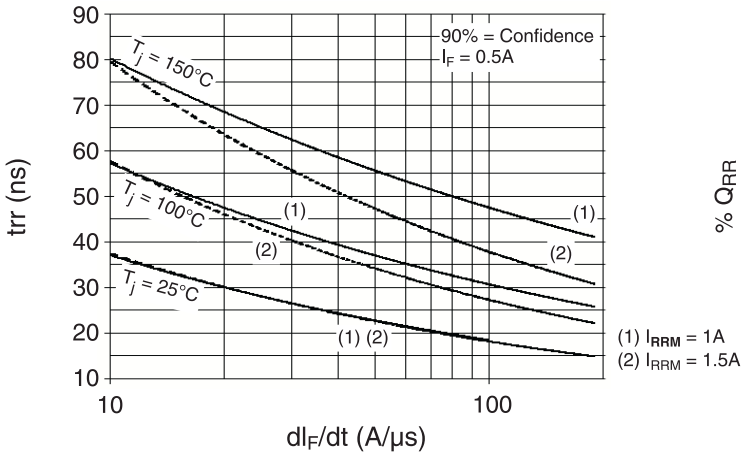


Fig. 14 QRR vs JUNCTION TEMPERATURE

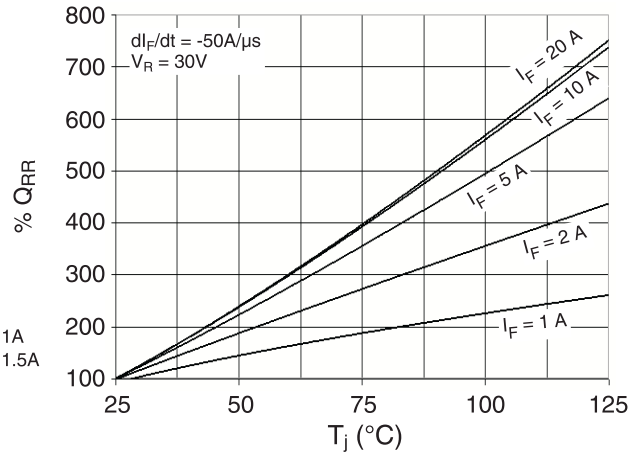


Fig. 15 IRM vs JUNCTION TEMPERATURE

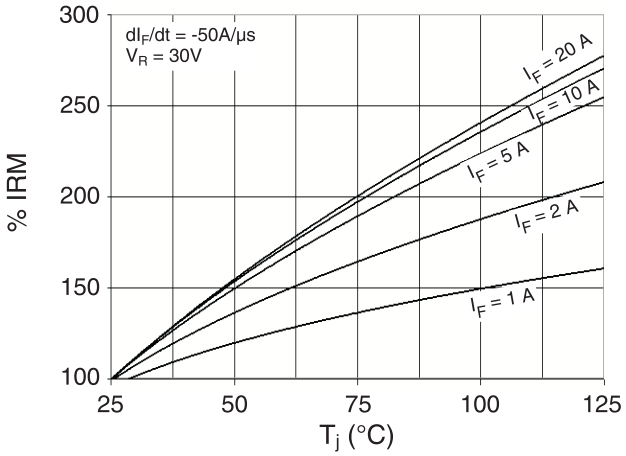


Fig. 16 trr vs JUNCTION TEMPERATURE

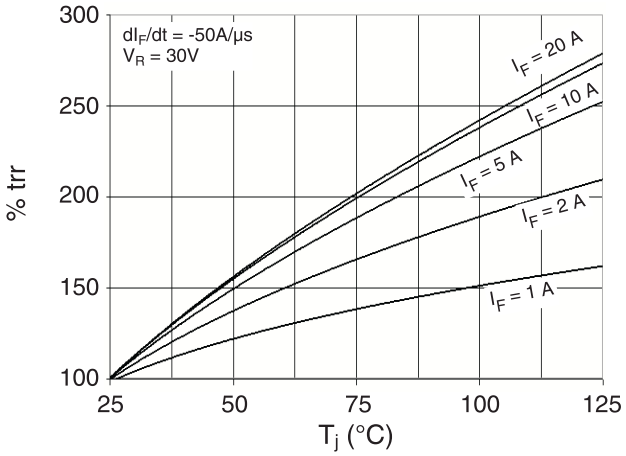


Fig. 17 TRANSIENT PEAK FORWARD VOLTAGE vs dI_F/dt

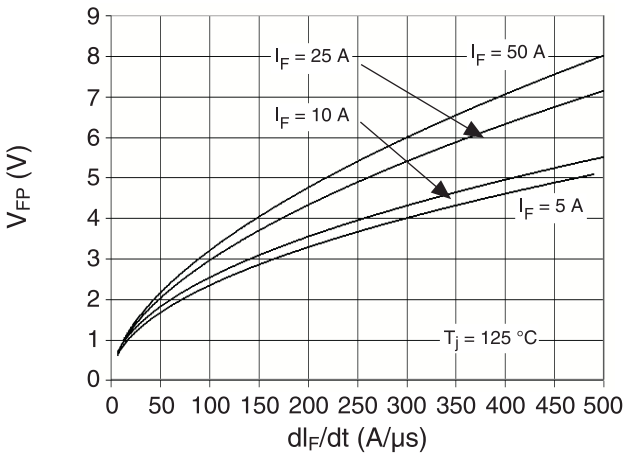


Fig. 18 FORWARD RECOVERY TIME vs dI_F/dt

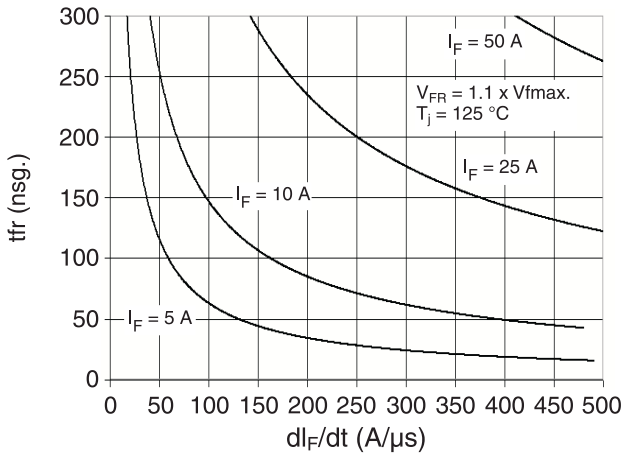


Fig. 19 RECOVERY TIME vs JUNCTION TEMPERATURE

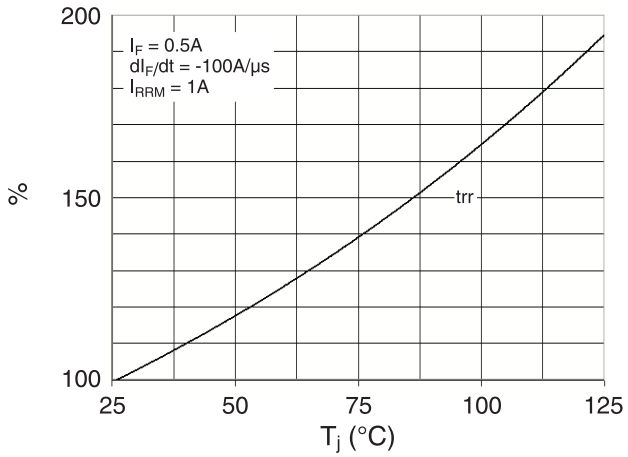


Fig. 20 JUNCTION CAPACITANCE vs. REVERSE BIAS

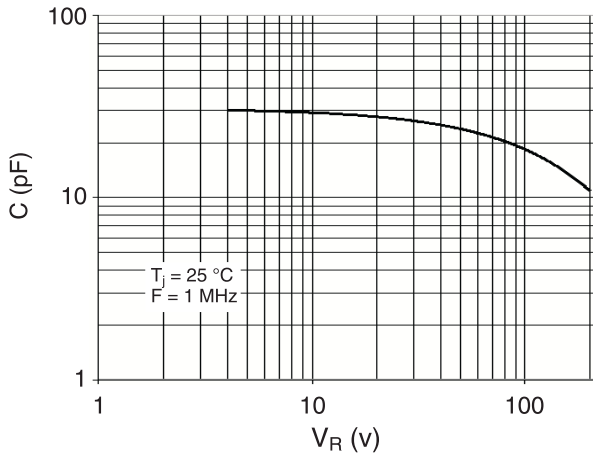
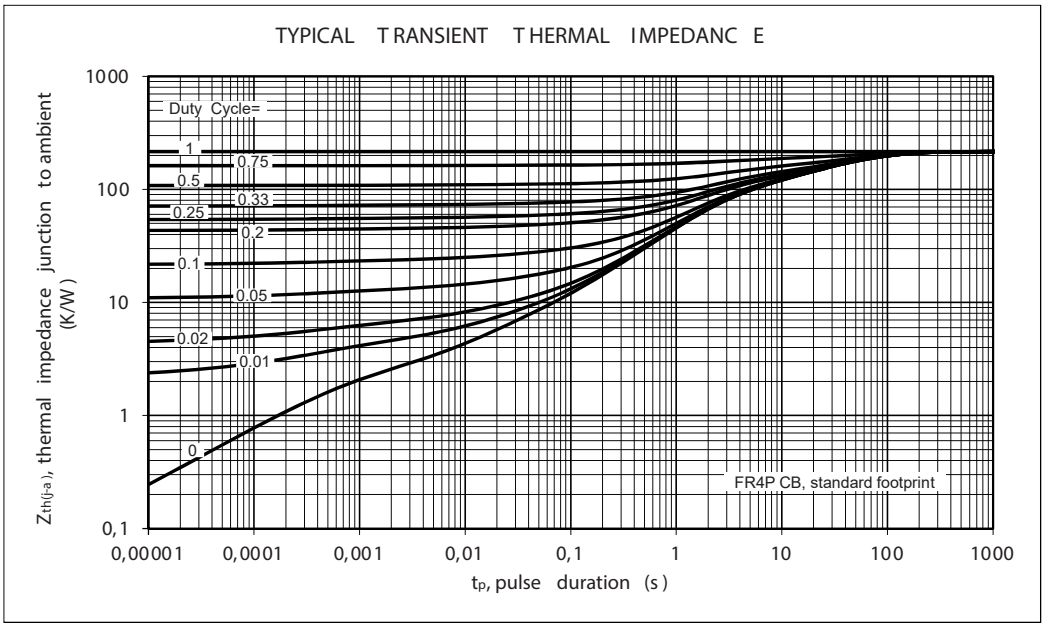
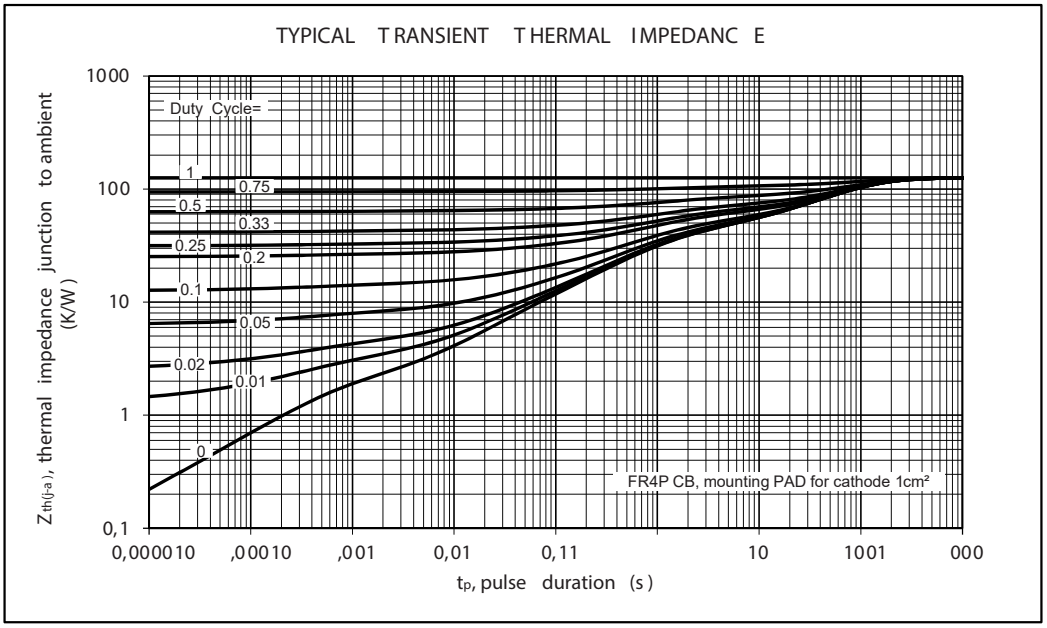


Fig. 21 RELATIVE VARIATION OF THERMAL IMPEDANCE TO AMBIENT vs. PULSE DURATION





Revision History

DATE	REVISION	DESCRIPTION OF CHANGES
14-Jan-2013	0	Original Data Sheet
04-Dec-2015	1	Static Characteristics table added
05-Jan-2018	2	Thermal Impedance and graph revised
27-Oct-2020	3	Thermal Resistance Junction to Case included
23-Feb-2021	4	Correct the definition of IR used iin the Test Condition for trr, ta and tb

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