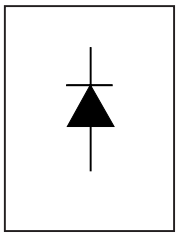
Bulletin I2204 03/05

International
IOR Rectifier

*QUIET**IR*** Series
10ETF06SPbF

FAST SOFT RECOVERY RECTIFIER DIODE
Lead-Free ("PbF" suffix)



V_F < 1.2V @ 10A
t_{rr} = 50ns
V_{RRM} = 600V

Description/ Features

The 10ETF06SPbF fast soft recovery *QUIET**IR*** rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.
The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

Typical applications are both:
- output rectification and freewheeling in inverters, choppers and converters
- and input rectifications where severe restrictions on conducted EMI should be met.

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
V_{RRM}	600	V
I_{FSM}	150	A
V_F @10 A, T_J = 25°C	1.2	V
t_{rr} @1A, 100A/µs	50	ns
T_J range	-40 to 150	°C

Package Outline

D^2 Pak (SMD-220)

Voltage Ratings

Part Number	V_{RRM} , maximum peak reverse voltage V	V_{RSM} , maximum non repetitive peak reverse voltage V	I_{RRM} 150°C mA
10ETF06SPbF	600	700	2

Absolute Maximum Ratings

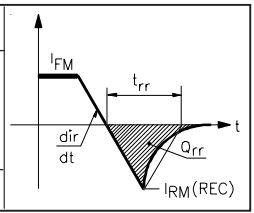
	Parameters	10ETF..	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current	10	A	@ T_C = 128° C, 180° conduction half sine wave
I_{FSM}	Max. Peak One Cycle Non-Repetitive	150	A	10ms Sine pulse, rated V_{RRM} applied
	Surge Current	160		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	112.5	A^2s	10ms Sine pulse, rated V_{RRM} applied
		160		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	1125	$A^2\sqrt{s}$	t = 0.1 to 10ms, no voltage reapplied

Electrical Specifications

	Parameters	10ETF..	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	1.2	V	@ 10A, T_J = 25°C	
r_t	Forward slope resistance	12.7	mΩ	T_J = 150°C	
$V_{F(TO)}$	Threshold voltage	1.25	V		
I_{RM}	Max. Reverse Leakage Current	0.1	mA	T_J = 25 °C	V_R = rated V_{RRM}
		2.0		T_J = 150 °C	

Recovery Characteristics

	Parameters	10ETF..	Units	Conditions
t_{rr}	Reverse Recovery Time	145	ns	I_F @ 10Apk
I_{rr}	Reverse Recovery Current	2.75	A	@ 25A/ µs
Q_{rr}	Reverse Recovery Charge	0.32	µC	@ 25°C
S	Snap Factor	0.6		



Thermal-Mechanical Specifications

	Parameters	10ETF..	Units	Conditions
T_J	Max. Junction Temperature Range	-40 to 150	°C	
T_{stg}	Max. Storage Temperature Range	-40 to 150	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case	1.5	°C/W	DC operation
R_{thJA}	Max. Thermal Resistance Junction to Ambient (PCB Mount)**	40	°C/W	
T_s	Soldering Temperature	240	°C	
wt	Approximate Weight	2 (0.07)	g (oz.)	
	Case Style	D^2Pak (SMD-220)		
	Marking Device	10ETF06S		

** When mounted on 1" square (650mm^2) PCB of FR-4 or G-10 material 4 oz (140µm) copper 40°C/W
For recommended footprint and soldering techniques refer to application note #AN-994

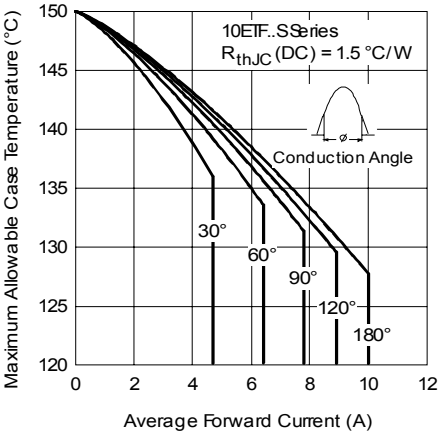


Fig. 1 - Current Rating Characteristics

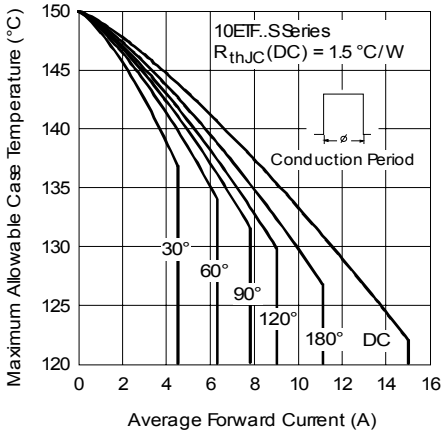


Fig. 2 - Current Rating Characteristics

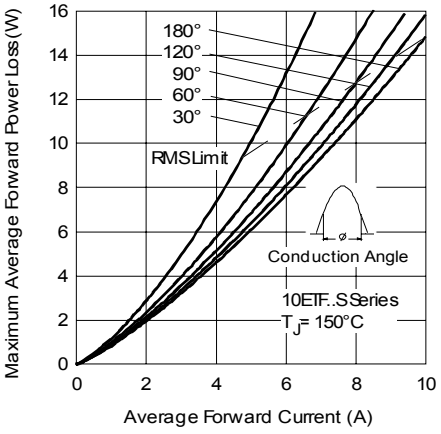


Fig. 3 - Forward Power Loss Characteristics

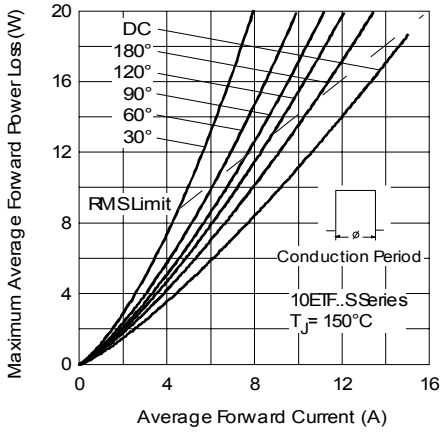


Fig. 4 - Forward Power Loss Characteristics

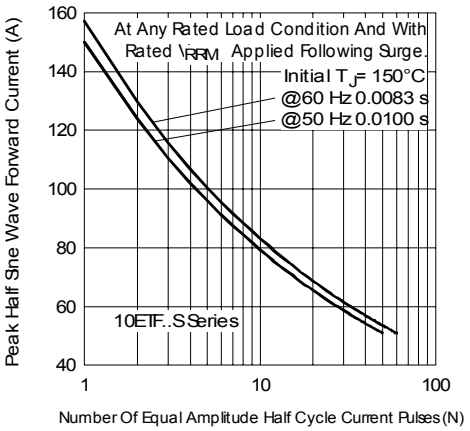


Fig. 5 - Maximum Non-Repetitive Surge Current

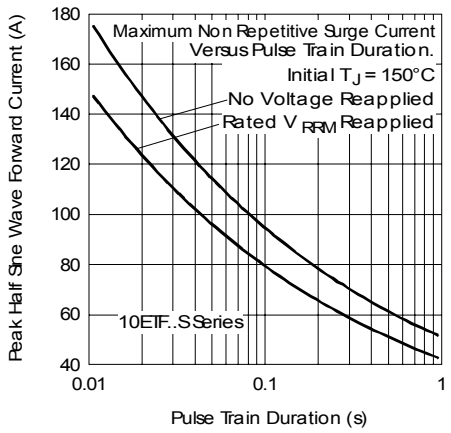


Fig. 6 - Maximum Non-Repetitive Surge Current

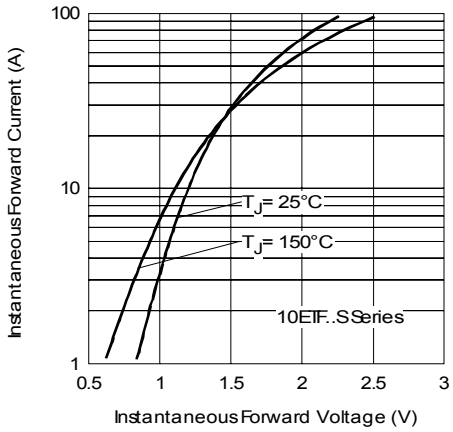


Fig. 7 - Forward Voltage Drop Characteristics

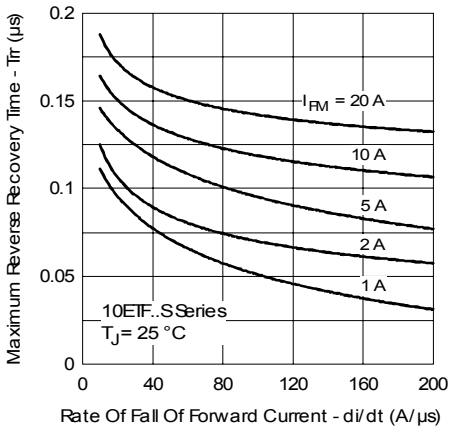


Fig. 8 - Recovery Time Characteristics, T_J = 25°C

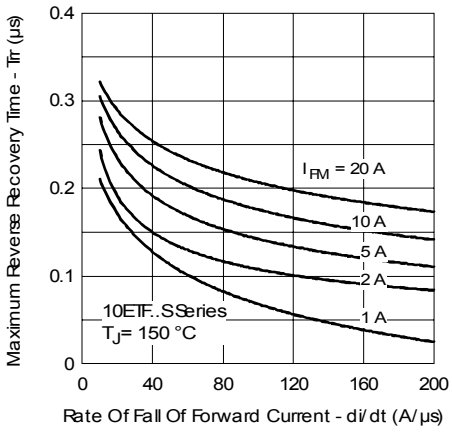


Fig. 9 - Recovery Time Characteristics, T_J = 150°C

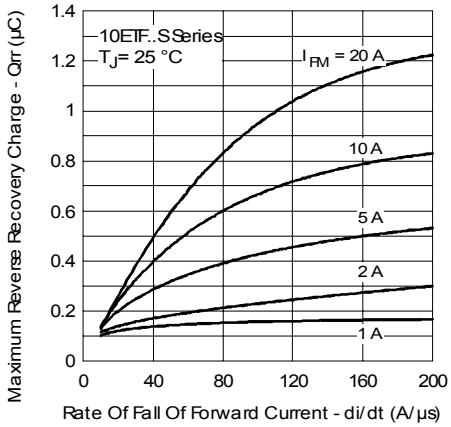


Fig. 10 - Recovery Charge Characteristics, $T_J = 25°C$

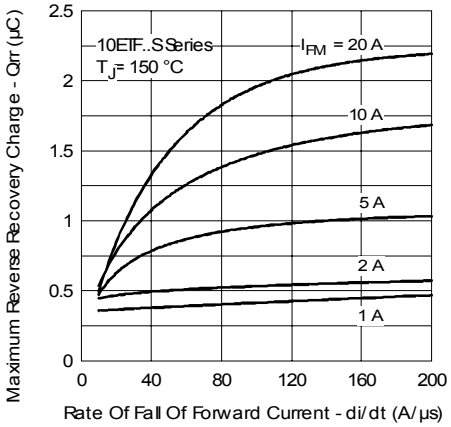


Fig. 11 - Recovery Charge Characteristics, $T_J = 150°C$

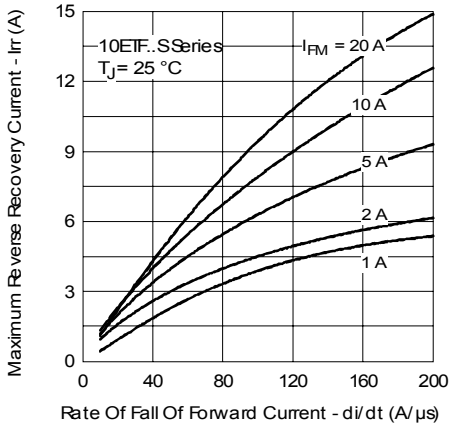


Fig. 12 - Recovery Current Characteristics, $T_J = 25°C$

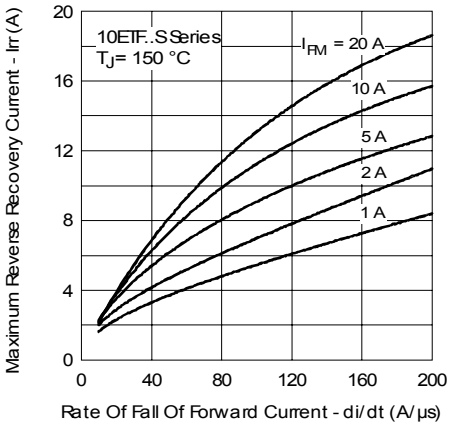


Fig. 13 - Recovery Current Characteristics, $T_J = 150°C$

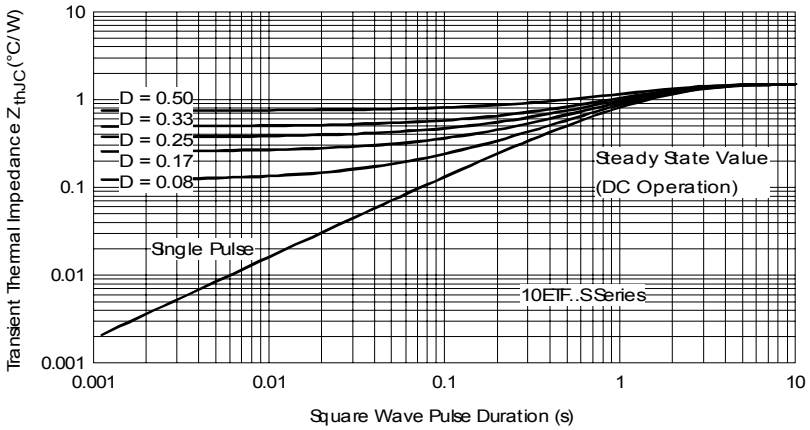
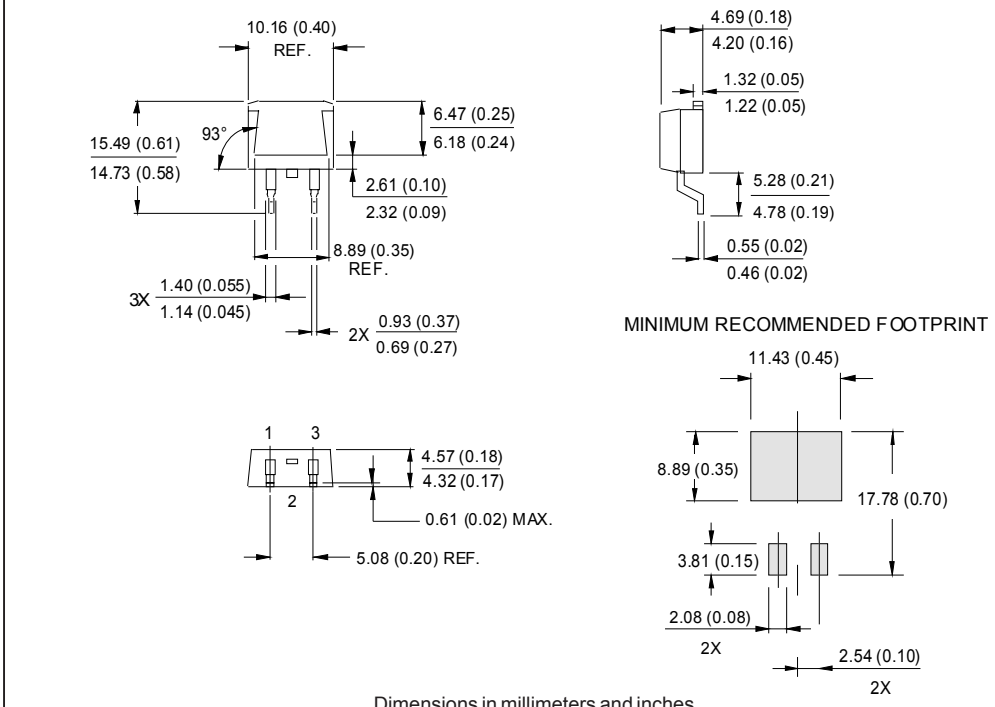


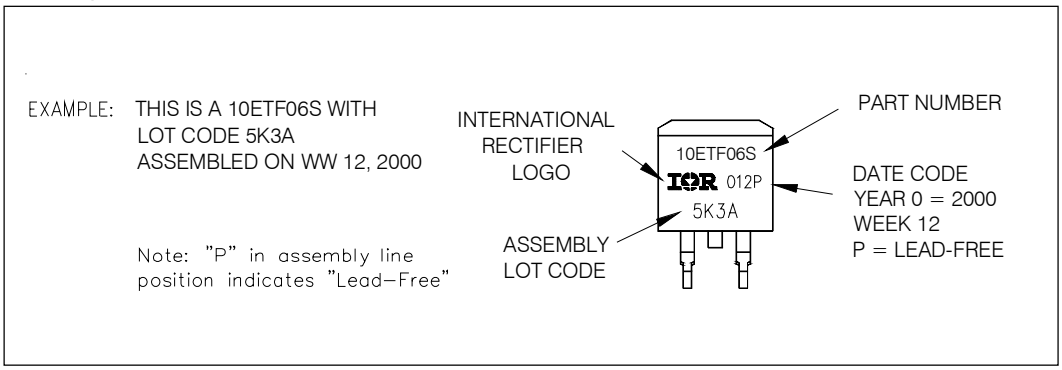
Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Outline Table

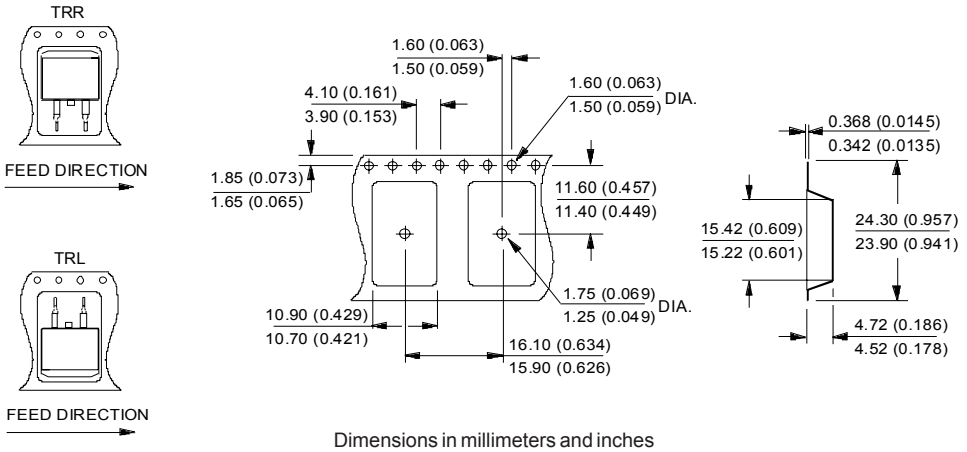


Dimensions in millimeters and inches

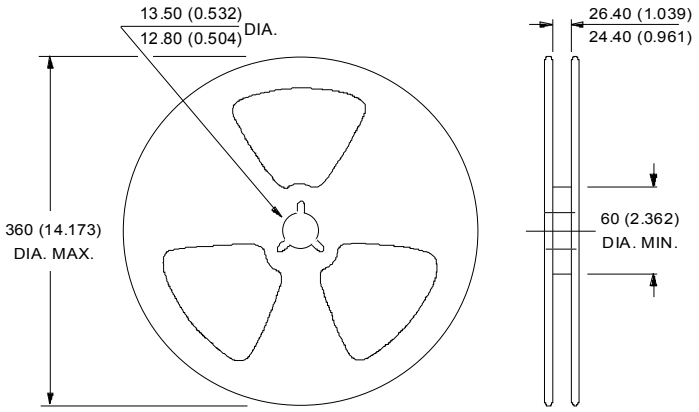
Marking Information



Tape & Reel Information



Dimensions in millimeters and inches

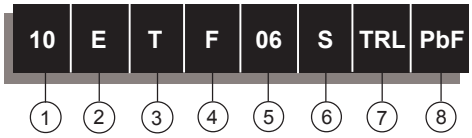


SMD-220 Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

Ordering Information Table

Device Code



1 - Current Rating (10 = 10A)

2 - Circuit Configuration:
E = Single Diode

3 - Package:
T = D^2Pak (TO-220AC)

4 - Type of Silicon:
F = Fast Soft Recovery Rectifier

5 - Voltage Rating (06 = 600V)

6 - S = Surface Mountable

7 -
- none = Tube
- TRR = Tape & Reel (Right Oriented)
- TRL = Tape & Reel (Left Oriented)

8 -
- none = Standard Production
- PbF = Lead-Free

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

International IOR Rectifier

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