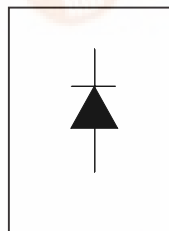


# International IOR Rectifier

## QUIETIR Series 20ETF06SPbF

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



$V_F < 1.2V @ 10A$   
 $I_{FSM} = 300A$   
 $V_{RRM} = 600V$

### Description/Features

The 20ETF06SPbF soft recovery rectifier **QUIETIR** 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	20	A
$V_{RRM}$	600	V
$I_{FSM}$	300	A
$V_F @ 10A, T_J = 25^\circ C$	1.2	V
$t_{rr} @ 1A, 100A/\mu s$	60	ns
$T_J$ range	-40 to 150	$^\circ C$

### Package Outline



### 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
20ETF06SPbF	600	700	5

### Absolute Maximum Ratings

Parameters	20ETF..S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	20	A	@ $T_C = 97^\circ\text{C}$ , 180° conduction half sine wave
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	250	A	10ms Sine pulse, rated $V_{RRM}$ applied
	300		10ms Sine pulse, no voltage reapplied
$I^2t$ Max. $I^2t$ for fusing	316	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied
	442		10ms Sine pulse, no voltage reapplied
$I^2vt$ Max. $I^2vt$ for fusing	4420	$A^2vs$	t = 0.1 to 10ms, no voltage reapplied

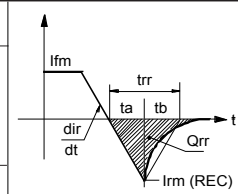
### Electrical Specifications

Parameters	20ETF..S	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop	1.30	V	@ 20A, $T_J = 25^\circ\text{C}$
	1.67	V	@ 60A, $T_J = 25^\circ\text{C}$
$r_t$ Forward slope resistance	12.5	$m\Omega$	
$V_{F(TO)}$ Threshold voltage	0.9	V	$T_J = 150^\circ\text{C}$
$I_{RM}$ Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	5.0	mA	$T_J = 150^\circ\text{C}$

$V_R = \text{rated } V_{RRM}$

### Recovery Characteristics

Parameters	20ETF..S	Units	Conditions
$t_{rr}$ Reverse Recovery Time	160	ns	$I_F @ 20\text{Apk}$
$I_{rr}$ Reverse Recovery Current	10	A	@ 100A/ $\mu\text{s}$
$Q_{rr}$ Reverse Recovery Charge	1.25	$\mu\text{C}$	@ $25^\circ\text{C}$
S Snap Factor $t_b/t_a$	0.6	typical	



Thermal-Mechanical Specifications

Parameters	20ETF..	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range	-40 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-40 to 150	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case	0.9	°C/W	DC operation
R <sub>thJA</sub> Max. Thermal Resistance Junction to Ambient (PCB Mount)**	40	°C/W	
T <sub>s</sub> Soldering Temperature	240	°C	
wt Approximate Weight	2(0.07)	g(oz.)	
Case Style	D <sup>2</sup> Pak		
Marking Device	20ETF06S		

\*\*When mounted on 1" square (650mm<sup>2</sup>) 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

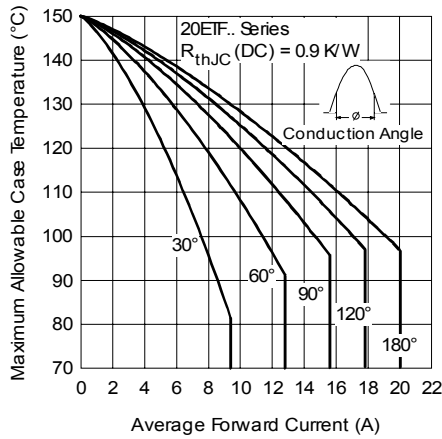


Fig. 1 - Current Rating Characteristics

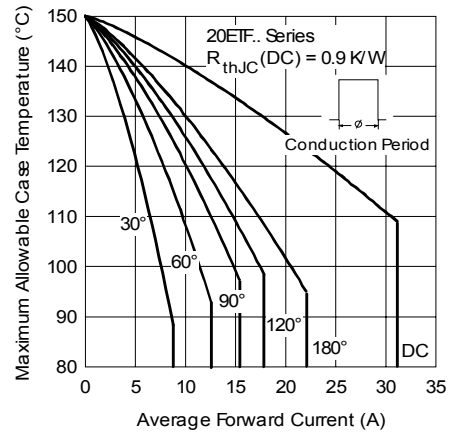


Fig. 2 - Current Rating Characteristics

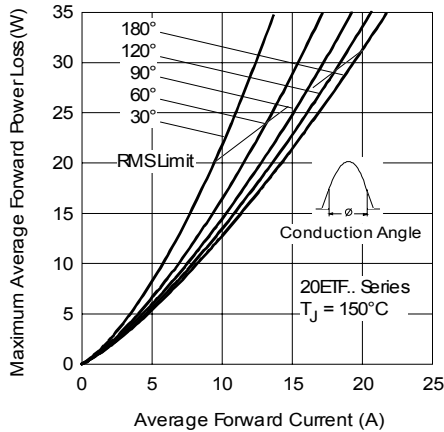


Fig. 3 - Forward Power Loss Characteristics

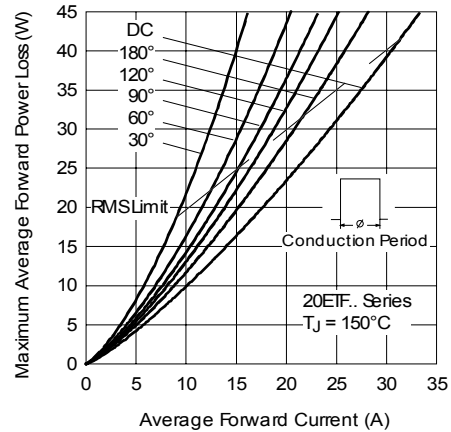


Fig. 4 - Forward Power Loss Characteristics

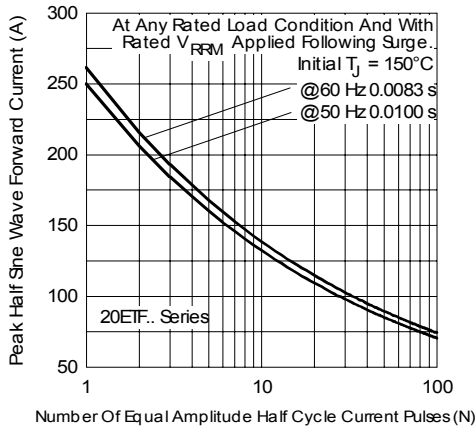


Fig. 5 - Maximum Non-Repetitive Surge Current

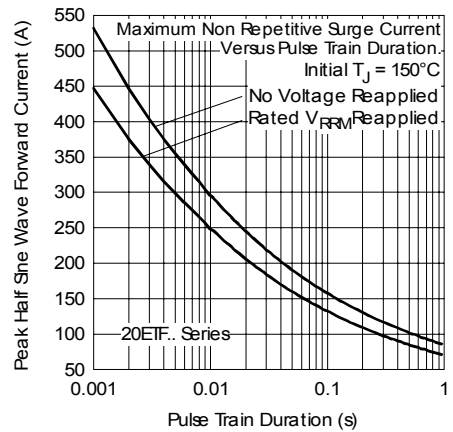


Fig. 6 - Maximum Non-Repetitive Surge Current

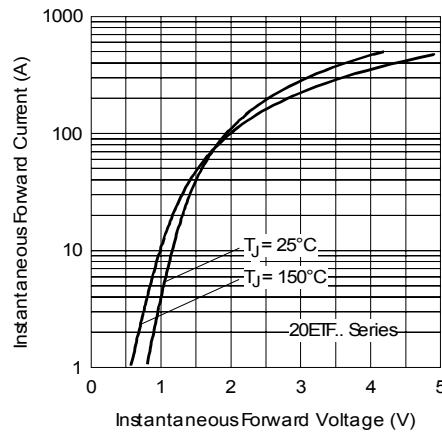


Fig. 7 - Forward Voltage Drop Characteristics

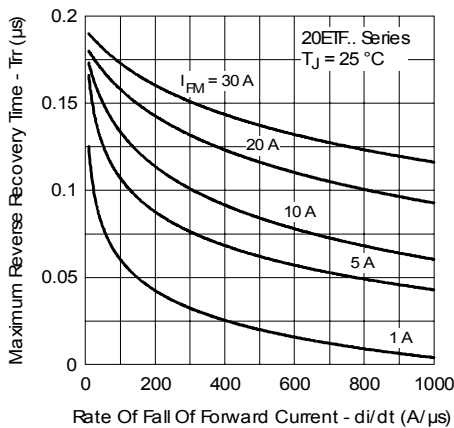


Fig.8 - Recovery Time Characteristics,  $T_J = 25^\circ\text{C}$

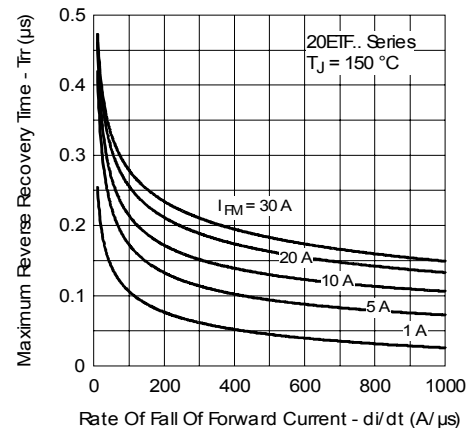


Fig.9 - Recovery Time Characteristics,  $T_J = 150^\circ\text{C}$

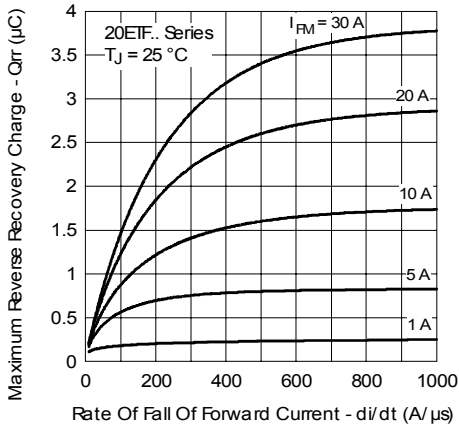


Fig. 10 - Recovery Charge Characteristics,  $T_J = 25^\circ\text{C}$

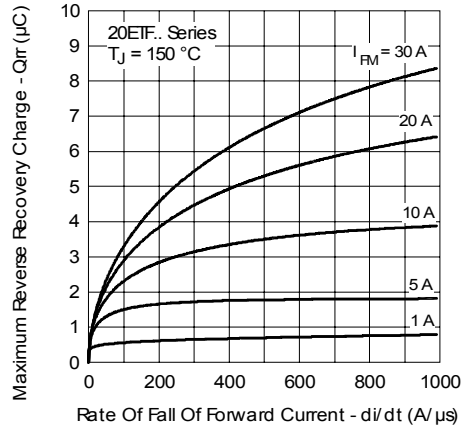


Fig. 11 - Recovery Charge Characteristics,  $T_J = 150^\circ\text{C}$

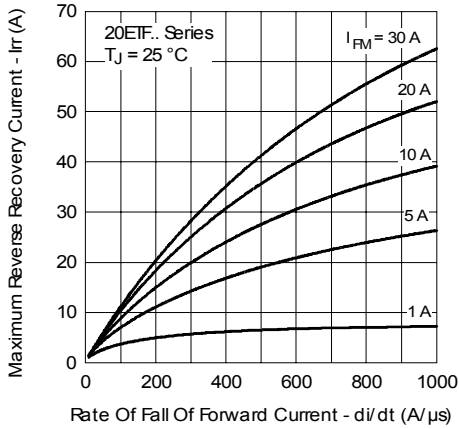


Fig. 12 - Recovery Current Characteristics,  $T_J = 25^\circ\text{C}$

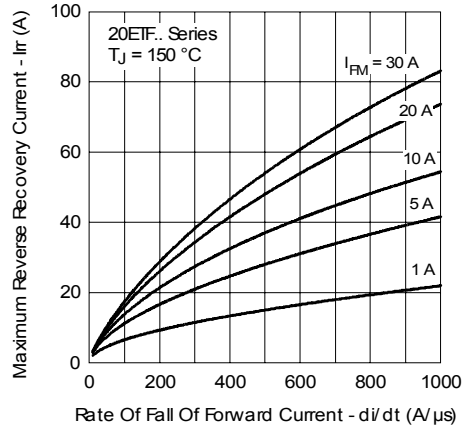


Fig. 13 - Recovery Current Characteristics,  $T_J = 150^\circ\text{C}$

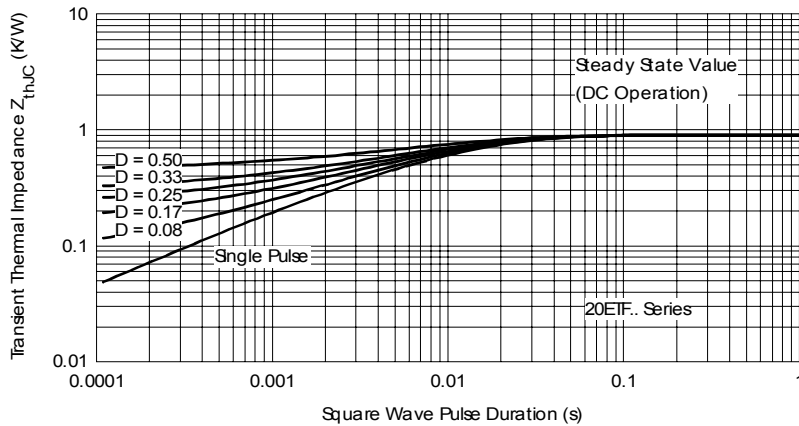
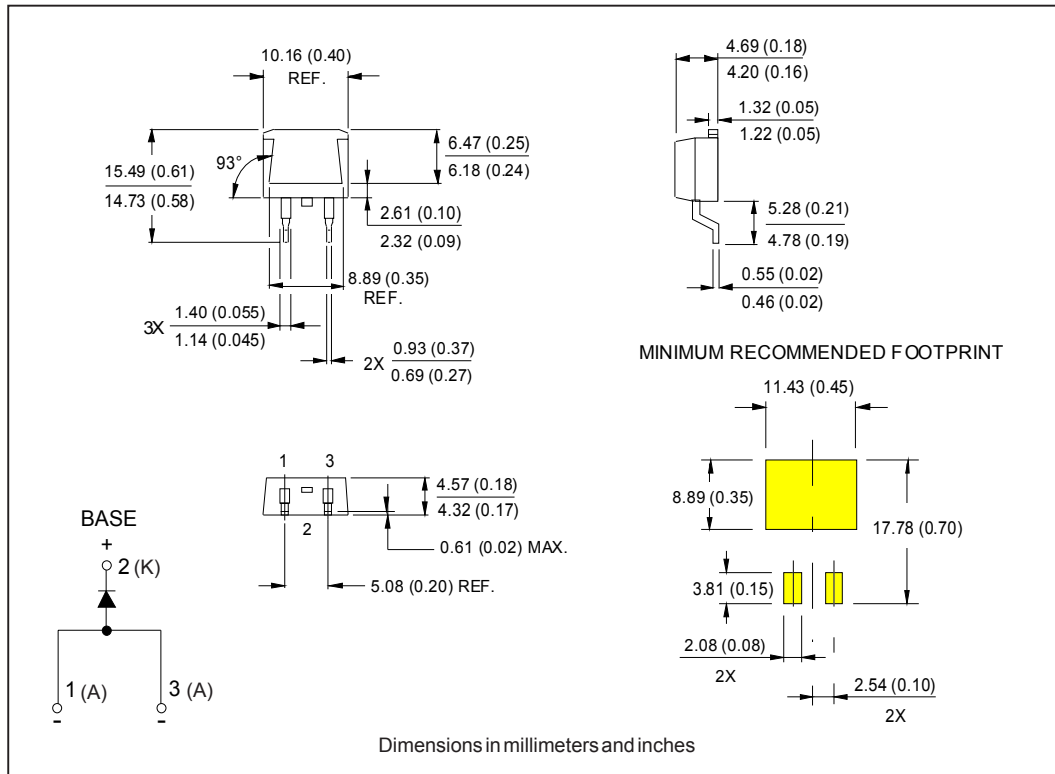
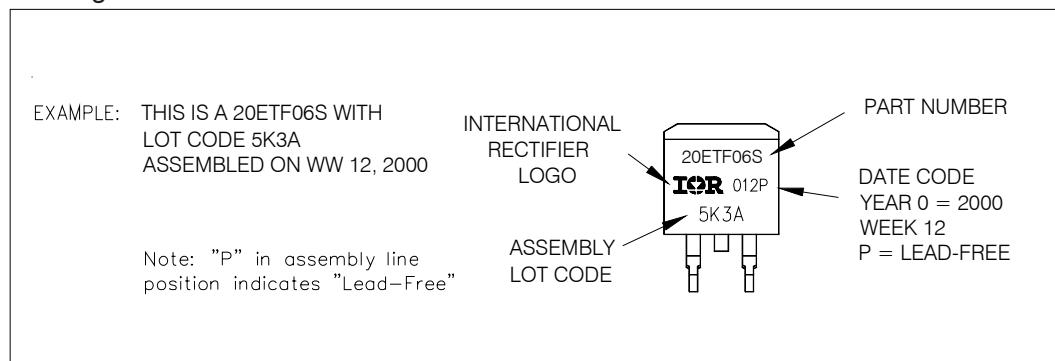


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

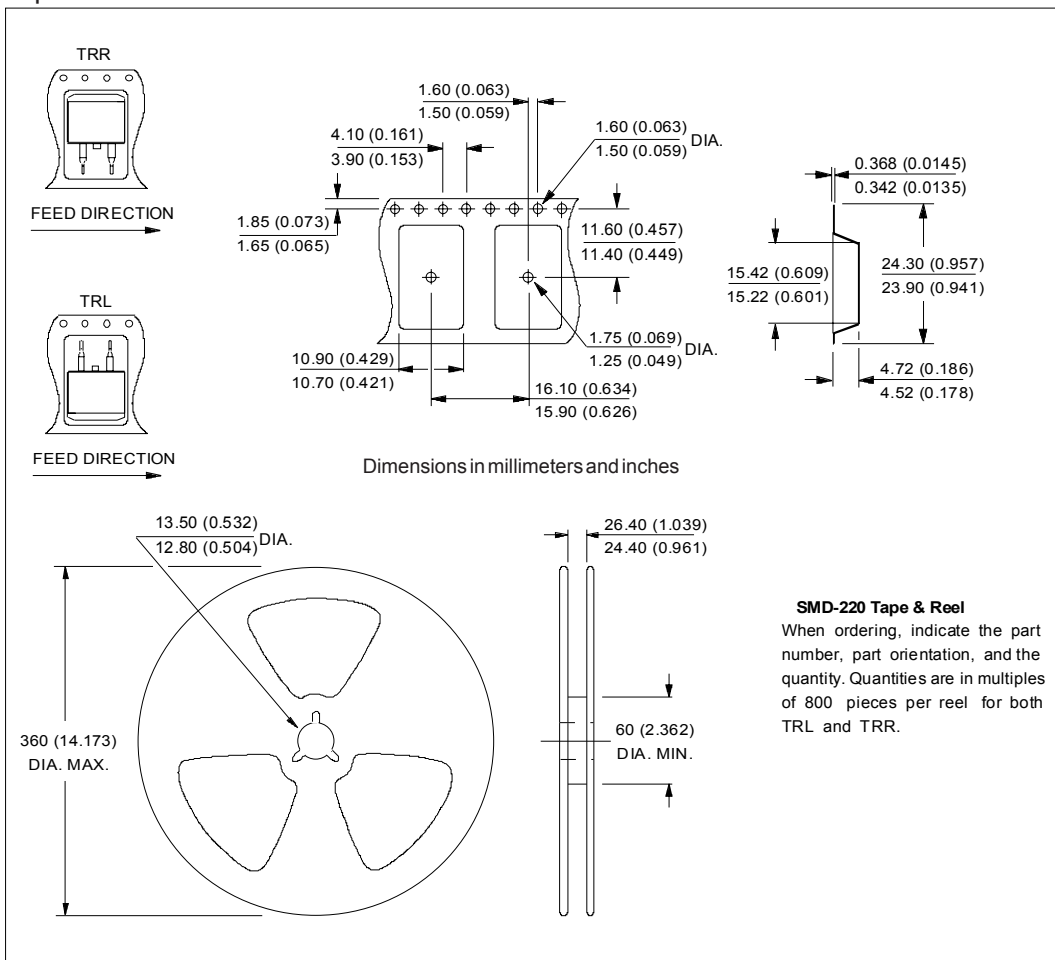
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code																	
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">20</td> <td style="padding: 5px;">E</td> <td style="padding: 5px;">T</td> <td style="padding: 5px;">F</td> <td style="padding: 5px;">06</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">TRL</td> <td style="padding: 5px;">PbF</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> <td style="text-align: center;">⑦</td> <td style="text-align: center;">⑧</td> </tr> </table>	20	E	T	F	06	S	TRL	PbF	①	②	③	④	⑤	⑥	⑦	⑧
20	E	T	F	06	S	TRL	PbF										
①	②	③	④	⑤	⑥	⑦	⑧										
<b>1</b>	- Current Rating (20 = 20A)																
<b>2</b>	- Circuit Configuration: E = Single Diode																
<b>3</b>	- Package: T = D <sup>2</sup> Pak (TO-220AC)																
<b>4</b>	- Type of Silicon: F = Fast Soft Recovery Rectifier																
<b>5</b>	- Voltage Rating (06 = 600V)																
<b>6</b>	- S = Surface Mountable																
<b>7</b>	- <ul style="list-style-type: none"> <li>• none = Tube</li> <li>• TRR = Tape &amp; Reel (Right Oriented)</li> <li>• TRL = Tape &amp; Reel (Left Oriented)</li> </ul>																
<b>8</b>	- <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>																

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.