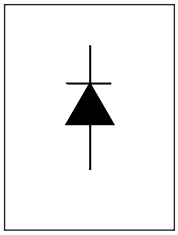
Bulletin I2111 rev. C 03/99

International
IOR Rectifier

*QUIET**IR*** Series
20ETF..S

SURFACE MOUNTABLE FAST SOFT RECOVERY RECTIFIER DIODE



V_F < 1.2V @ 10A
I_{FSM} = 300A
V_{RRM} 200 to 600V

Description/Features

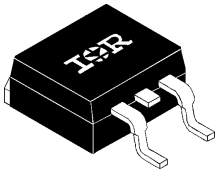
The 20ETF..S soft recovery rectifier *QUIET**IR*** series has been optimized for combined short reverse recovery time and low forward voltage drop.
The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

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	20ETF..S	Units
$I_{F(AV)}$ Sinusoidalwaveform	20	A
V_{RRM} range	200to 600	V
I_{FSM}	300	A
V_F @10A, T_J=25°C	1.2	V
trr @1A, 100A/µs	60	ns
T_J range	-40to150	°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
20ETF02S	200	300	5
20ETF04S	400	500	
20ETF06S	600	700	

Absolute Maximum Ratings

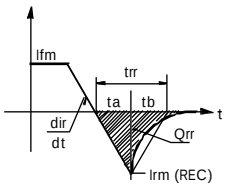
	Parameters	20ETF..S	Units	Conditions
$I_{F(AV)}$	Max. Average Forward Current	20	A	@ T_C = 97°C, 180° conduction half sine wave
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current	250	A	10ms Sine pulse, rated V_{RRM} applied
		300		10ms Sine pulse, no voltage reapplied
I^2t	Max. I^2t for fusing	316	A^2s	10ms Sine pulse, rated V_{RRM} applied
		442		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$	Max. $I^2\sqrt{t}$ for fusing	4420	$A^2\sqrt{s}$	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°C	
		1.67	V	@ 60A, T_J = 25°C	
r_t	Forward slope resistance	12.5	mΩ		
$V_{F(TO)}$	Threshold voltage	0.9	V	T_J = 150°C	
I_{RM}	Max. Reverse Leakage Current	0.1	mA	T_J = 25 °C	V_R = rated V_{RRM}
		5.0	mA	T_J = 150 °C	

Recovery Characteristics

	Parameters	20ETF..S	Units	Conditions
t_{rr}	Reverse Recovery Time	160	ns	I_F @ 20Apk
I_{rr}	Reverse Recovery Current	10	A	@ 100A/ µs
Q_{rr}	Reverse Recovery Charge	1.25	µC	@ 25°C
S	Snap Factor tb/ta	0.6	typical	



Thermal-Mechanical Specifications

	Parameters	20ETF..	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	0.9	°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		

**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

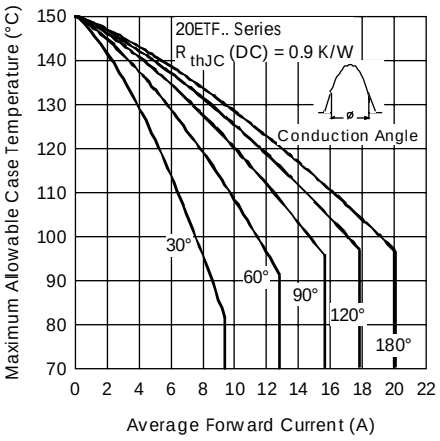


Fig. 1 - Current Rating Characteristics

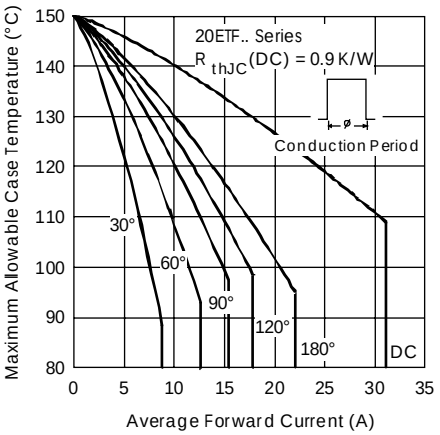


Fig. 2 - Current Rating Characteristics

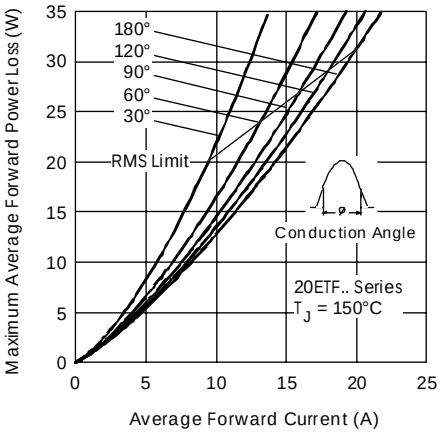


Fig. 3 - Forward Power Loss Characteristics

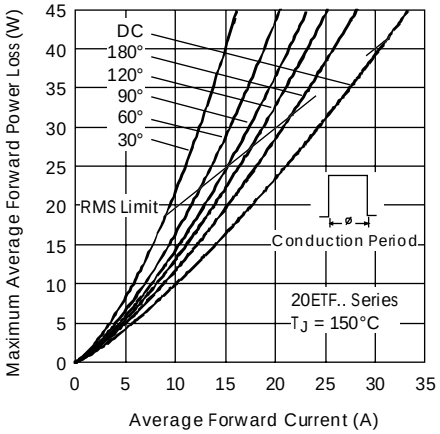


Fig. 4 - Forward Power Loss Characteristics

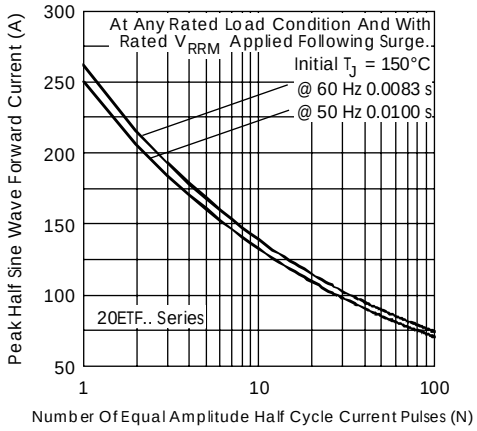


Fig. 5 - Maximum Non-Repetitive Surge Current

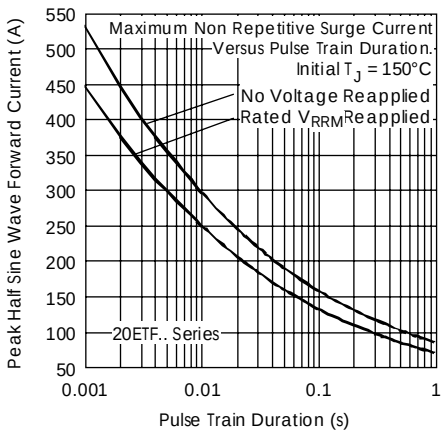


Fig. 6 - Maximum Non-Repetitive Surge Current

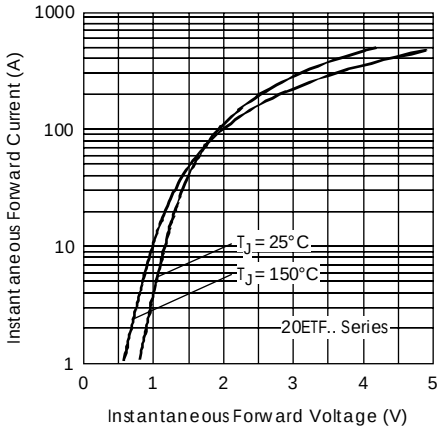


Fig. 7 - Forward Voltage Drop Characteristics

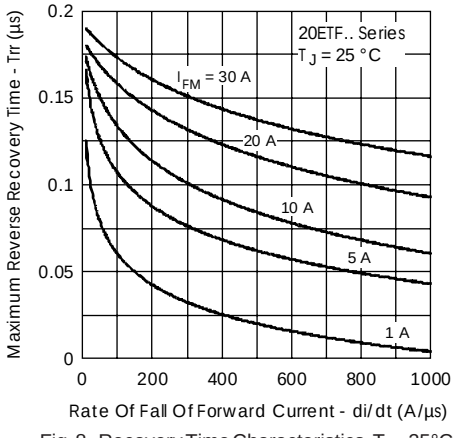


Fig. 8 - Recovery Time Characteristics, T_J = 25°C

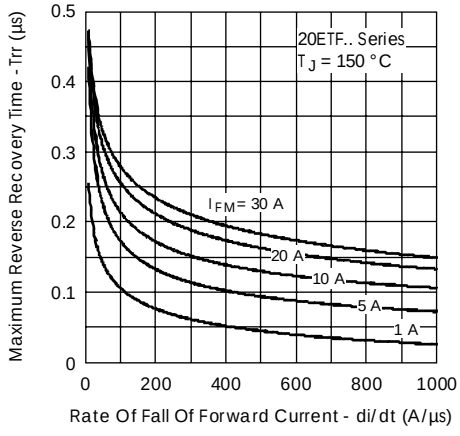


Fig. 9 - Recovery Time Characteristics, T_J = 150°C

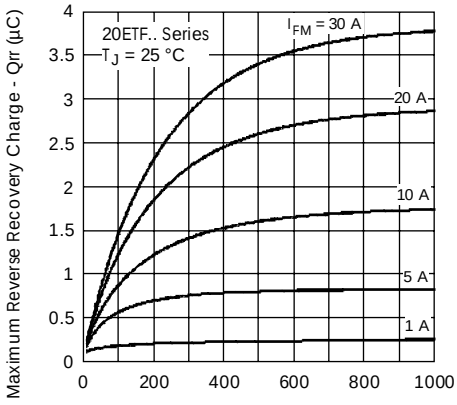


Fig. 10 - Recovery Charge Characteristics, T_J = 25°C

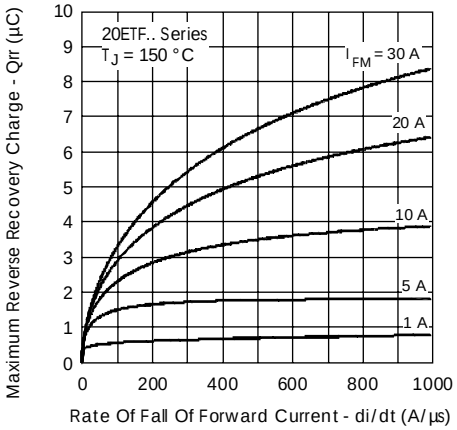


Fig. 11 - Recovery Charge Characteristics, T_J = 150°C

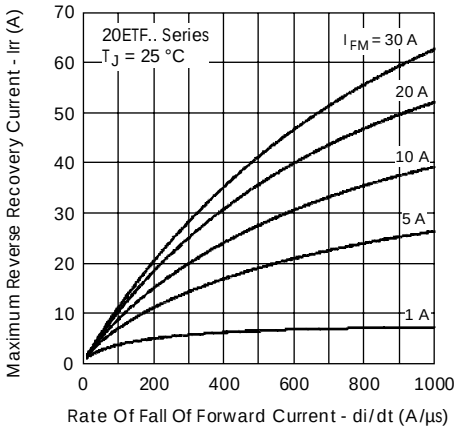


Fig. 12 - Recovery Current Characteristics, T_J = 25°C

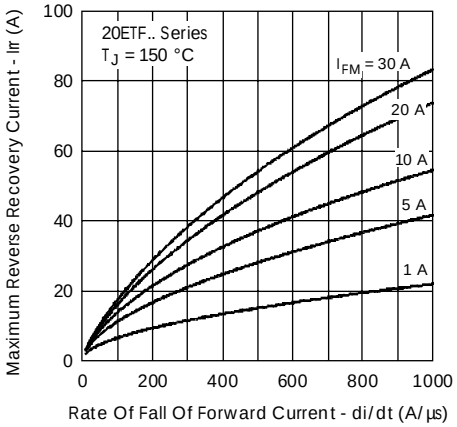


Fig. 13 - Recovery Current Characteristics, T_J = 150°C

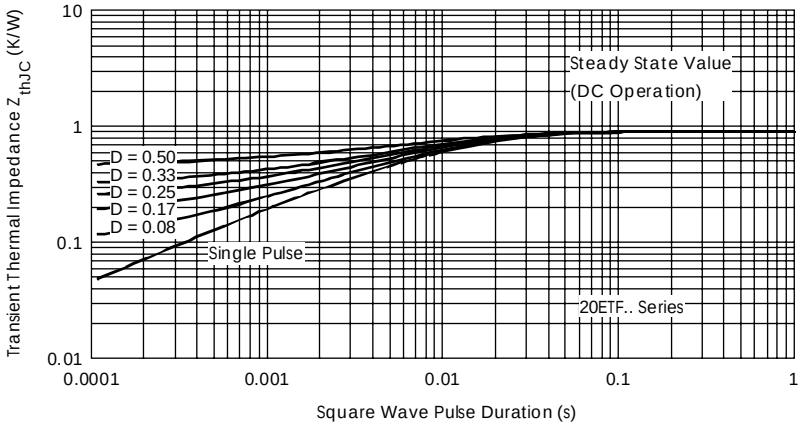
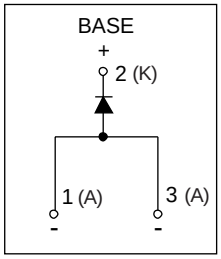


Fig. 14 - Thermal Impedance Z_{thJC} Characteristics

Ordering Information Table

Device Code

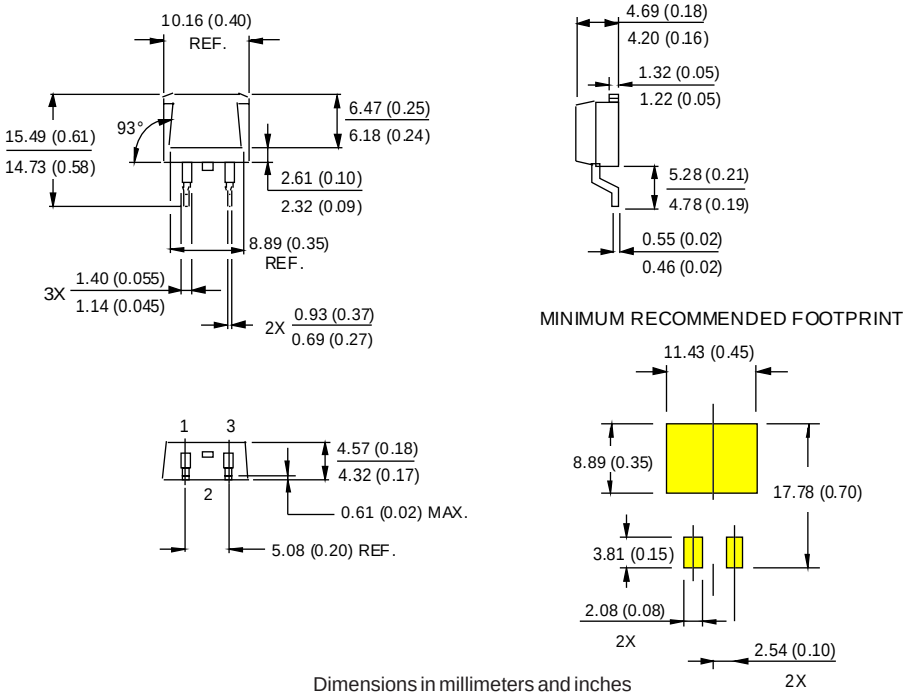
20	E	T	F	06	S	TRL
1	2	3	4	5	6	7



- **1** - Current Rating
- **2** - Circuit Configuration: E = Single Diode
- **3** - T = TO-220AC
- **4** - F = Fast Recovery
- **5** - Voltage code: Code x 100 = V_{RRM}

  02 = 200V
  04 = 400V
  06 = 600V
- **6** - S = D^2Pak (SMD-220) Version
- **7** - Tape and Reel Option:
  TRL = Left Reel
  TRR = Right Orientation Reel

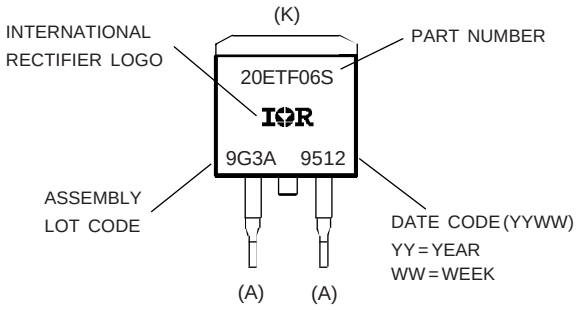
Outline Table



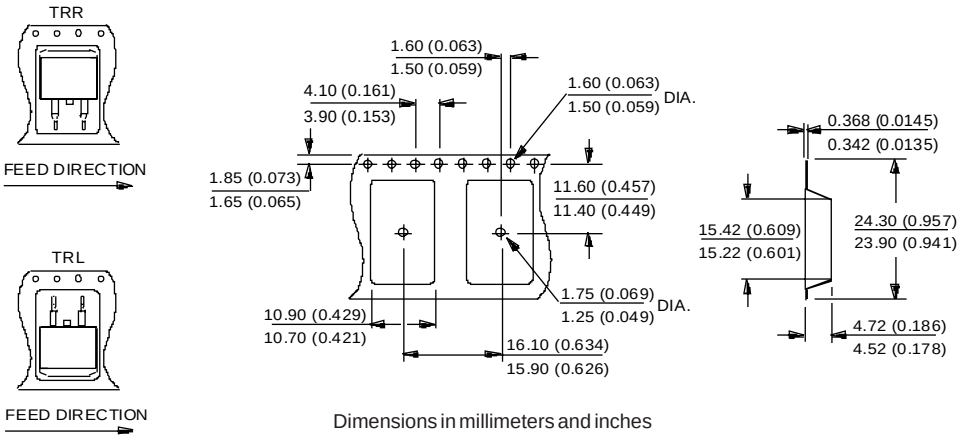
Dimensions in millimeters and inches

Marking Information

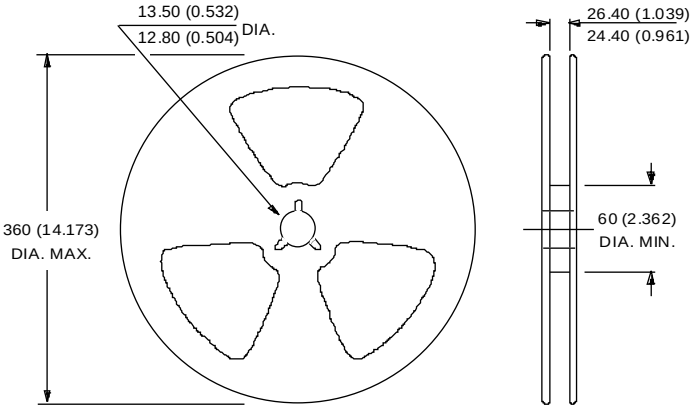
EXAMPLE: THIS IS AN 20ETF06S



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.

International
IOR Rectifier

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EUROPEAN HEADQUARTERS: Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.
IR CANADA: 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 453 2200. Fax: (905) 475 8801.
IR GERMANY: Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.
IR ITALY: Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.
IR FAR EAST: K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.
IR SOUTHEAST ASIA: 1 Kim Seng Promenade, Great World City West Tower,13-11, Singapore 237994. Tel: ++ 65 838 4630.
IR TAIWAN: 16 Fl. Suite D.207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan. Tel: 886 2 2377 9936.

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