

International
IR Rectifier

SAFEIR Series 20ETS16, 20ETS16S

INPUT RECTIFIER DIODE

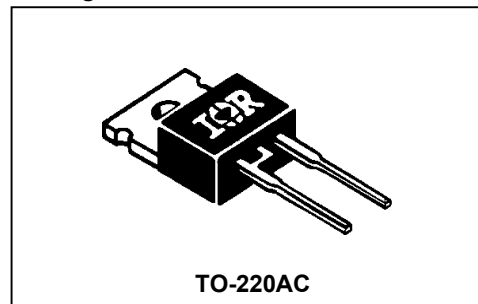
Description/Features

The 20ETS.. rectifier **SAFEIR** series has been optimized for very low forward voltage drop, with moderate leakage. The glass passivation technology used has reliable operation up to 150°C junction temperature.

Typical applications are in input rectification and these products are designed to be used with International Rectifier Switches and Output Rectifiers which are available in identical package outlines.

	$V_F < 1V @ 10A$
	$I_{FSM} = 300A$
	$V_{RRM} 1600V$

Package Outline

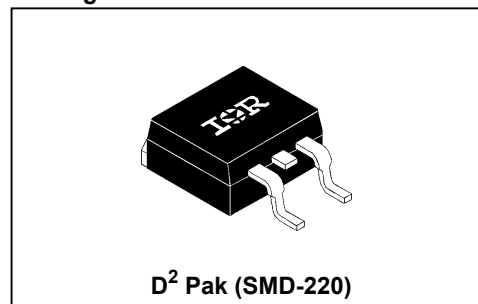


Major Ratings and Characteristics

Characteristics	20ETS..	Units
$I_{F(AV)}$ Sinusoidal waveform	20	A
V_{RRM} Range(*)	1600	V
I_{FSM}	300	A
$V_F @ 10A, T_J = 25^\circ C$	1.0	V
T_J	-40 to 150	°C

(*)Contact Factory

Package Outline



Output Current in Typical Applications

	Single-phase Bridge	Three-phase Bridge	Units
Capacitive input filter $T_A = 55^\circ C$, $T_J = 125^\circ C$, common heatsink of $1^\circ C/W$	16.3	21	A

20ETS16, 20ETS16S *SAFEIR* Series

Bulletin I2161 10/01

International
IR Rectifier

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
20ETS16, 20ETS16S	1600	1700	1

Absolute Maximum Ratings

Parameters	20ETS..	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	20	A	@ $T_C = 105^\circ\text{C}$, 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
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	4420	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

Electrical Specifications

Parameters	20ETS..	Units	Conditions
V_{FM} Max. Forward Voltage Drop	1.1	V	@ 20A, $T_J = 25^\circ\text{C}$
r_t Forward slope resistance	10.4	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	0.85	V	
I_{RM} Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	1.0		$T_J = 150^\circ\text{C}$ $V_R = \text{rated } V_{RRM}$

Thermal-Mechanical Specifications

Parameters			20ETS..	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		1.3	°C/W	DC operation
R _{thJA}	Max. Thermal Resistance Junction to Ambient		62	°C/W	(*) For D ² Pak version
R _{thCS}	Typ. Thermal Resistance Case to Heatsink		0.5	°C/W	Mounting surface, smooth and greased
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		
Case Style			TO-220AC, D ² Pak (SMD-220)		

* When mounted on 1" square (650mm²) 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

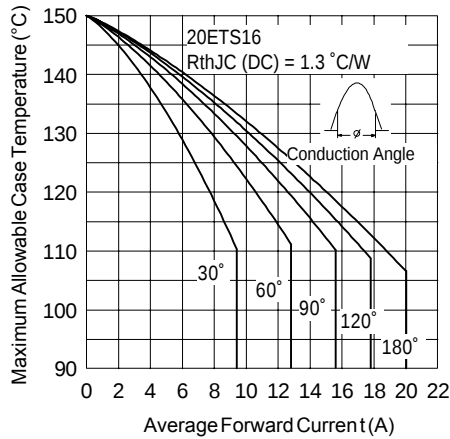


Fig. 1 - Current Rating Characteristics

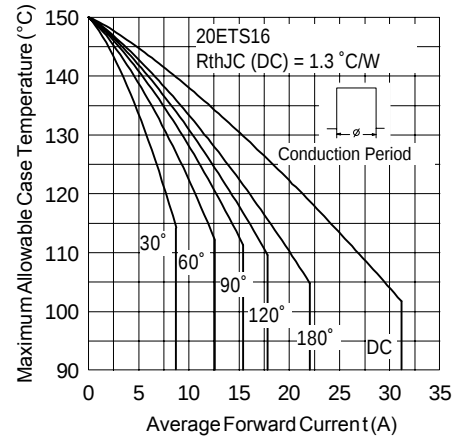


Fig. 2 - Current Rating Characteristics

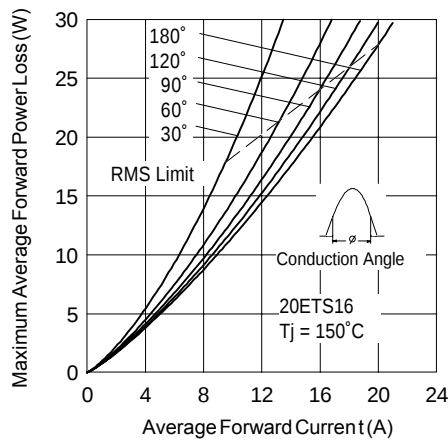


Fig. 3 - Forward Power Loss Characteristics

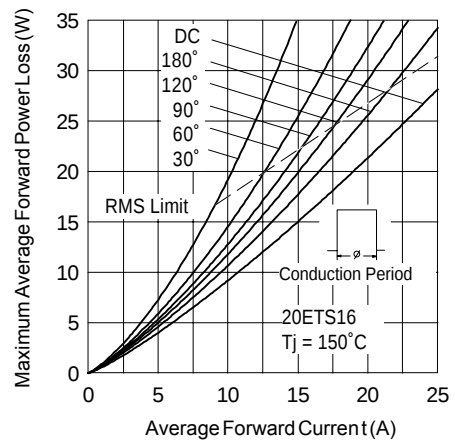


Fig. 4 - Forward Power Loss Characteristics

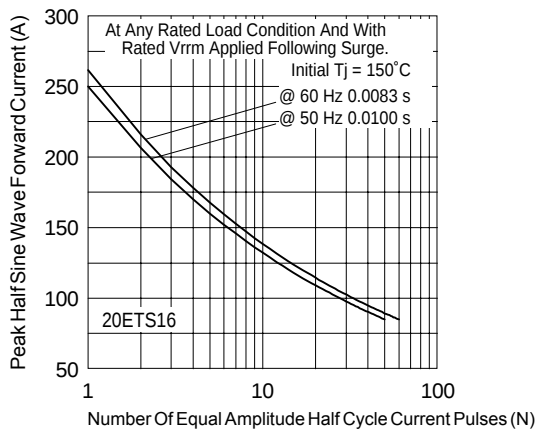


Fig. 5 - Maximum Non-Repetitive Surge Current

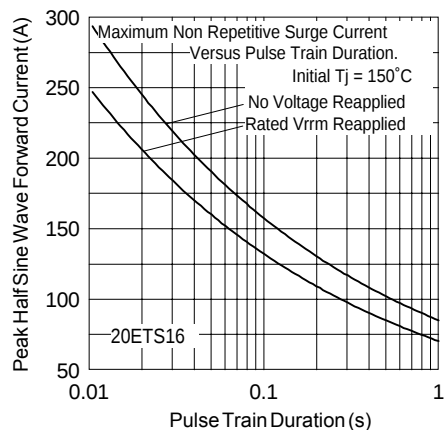
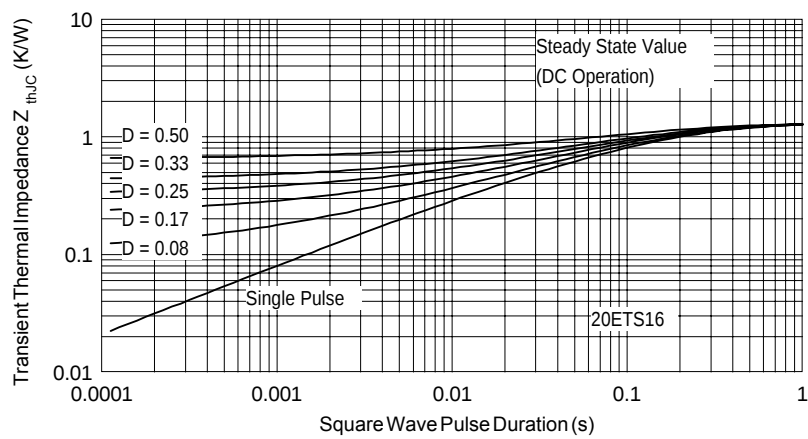
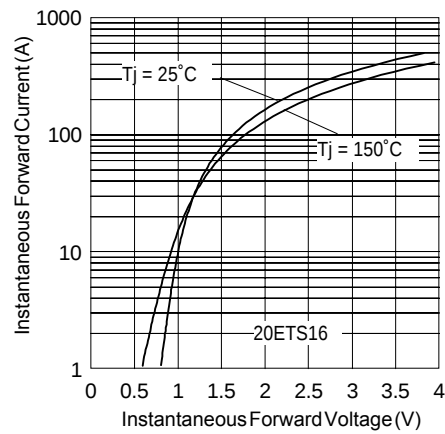
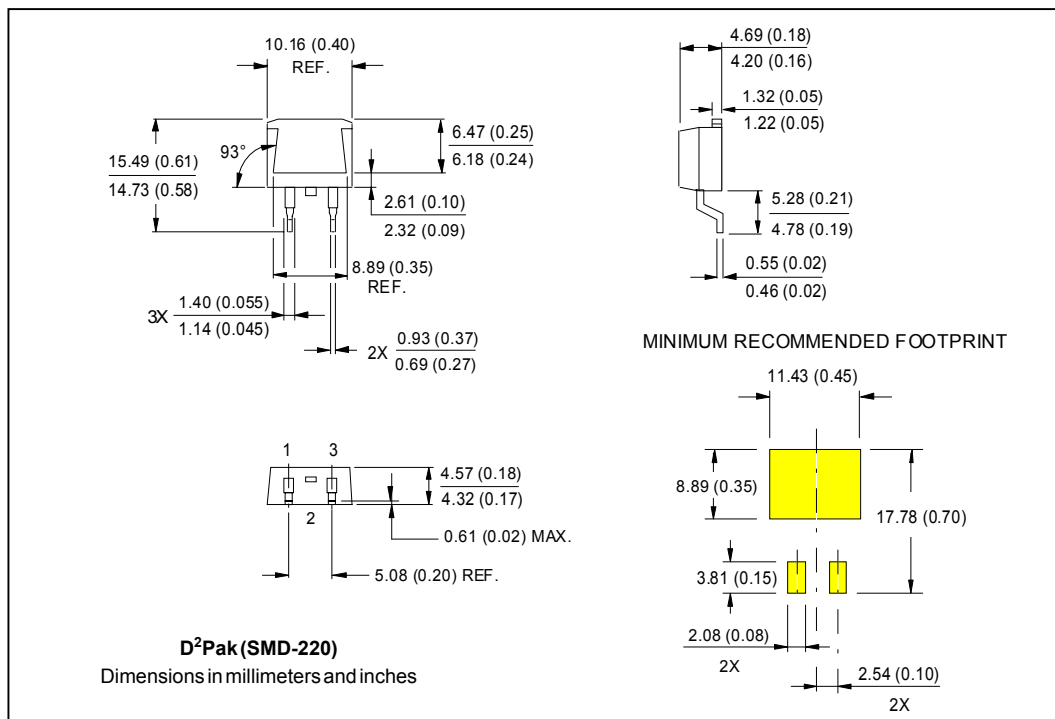
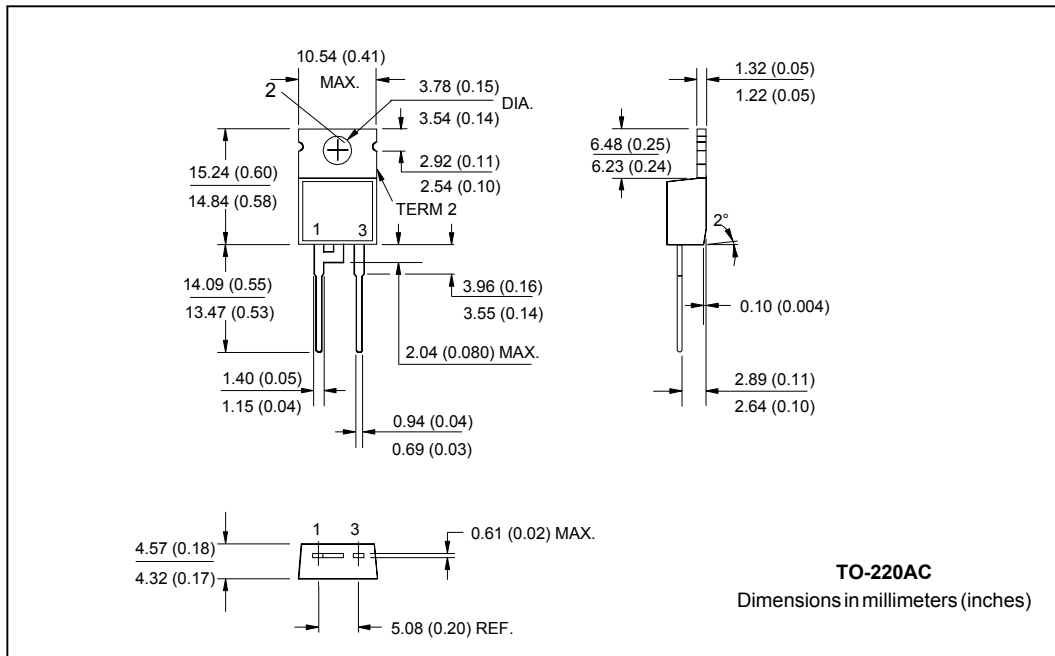


Fig. 6 - Maximum Non-Repetitive Surge Current



Outline Table

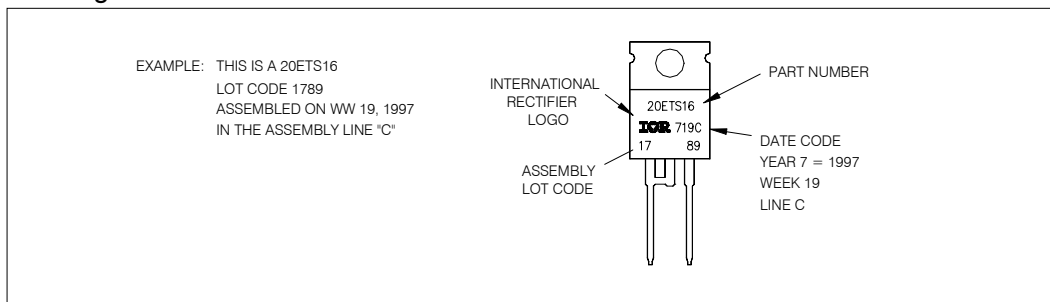


20ETS16, 20ETS16S *SAFEIR* Series

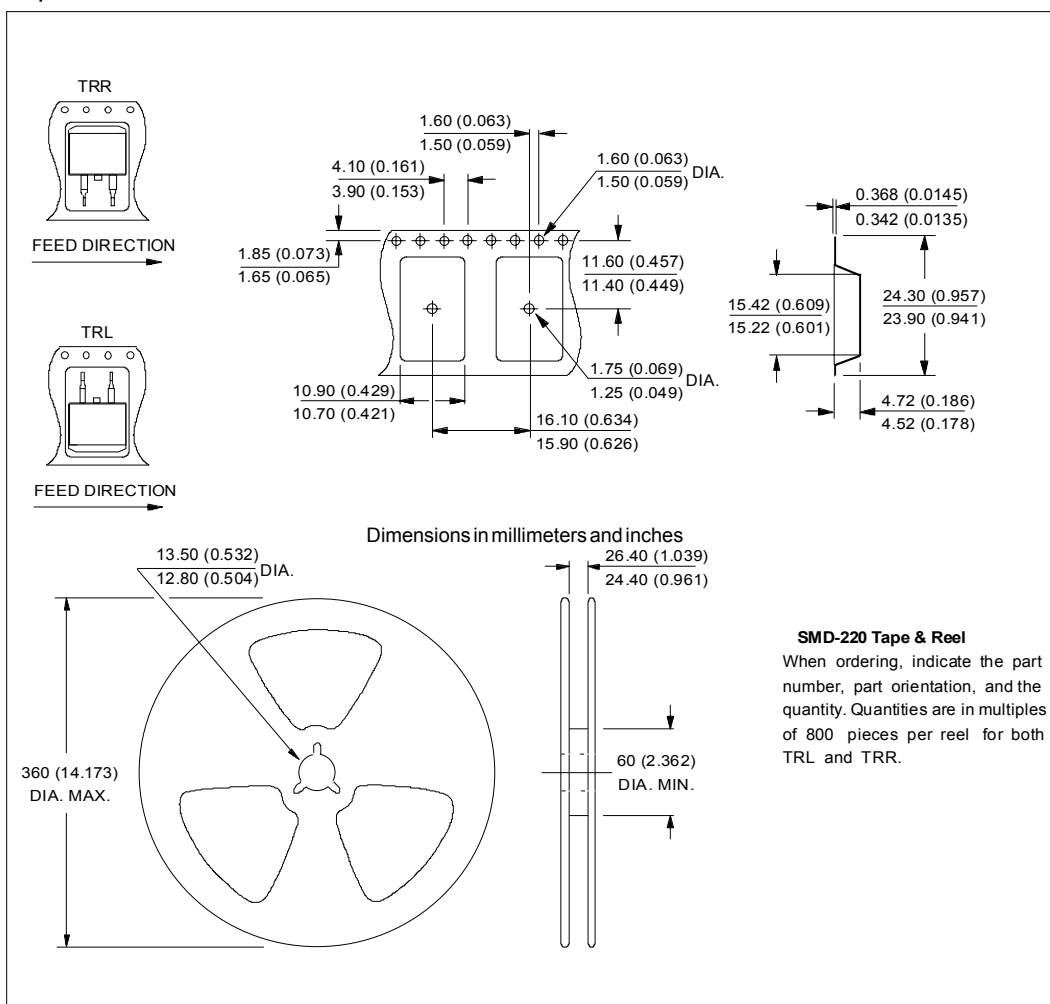
Bulletin I2161 10/01

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IR Rectifier

Marking Information

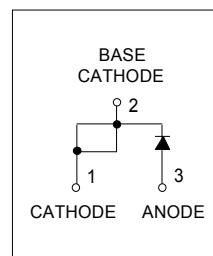


Tape & Reel Information



Ordering Information Table

Device Code						
20	E	T	S	16	S	TRL
1	2	3	4	5	6	7
1	- Current Rating					
2	- Circuit Configuration					
	E = Single Diode					
3	- Package					
	T = TO-220AC					
4	- Type of Silicon					
	S = Standard Recovery Rectifier					
5	- Voltage code: Code x 100 = V_{RRM}					
6	- S = TO-220 D ² Pak (SMD-220) Version					
7	- Tape and Reel Option					
	TRL = Left Reel					
	TRR = Right Orientation Reel					



16 = 1600V (*)

(*) Contact Factory

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

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Visit us at www.irf.com for sales contact information. 10/01