



8ETL06
8ETL06S
8ETL06-1
8ETL06FP

Ultra-low V_F Hyperfast Rectifier for Discontinuous Mode PFC

Features

- Benchmark Ultra-low Forward Voltage Drop
- Hyperfast Recovery Time
- Low Leakage Current
- 175°C Operating Junction Temperature
- Fully Isolated package ($V_{INS} = 2500 V_{RMS}$)
- UL E78996 approved

$V_F = 0.96V$ typ.
 $I_{F(AV)} = 8Amp$
 $V_R = 600V$

Description

State of the art, ultra-low V_F , soft-switching Hyperfast Rectifiers optimized for Discontinuous (Critical) Mode (DCM) Power Factor Correction (PFC).

The minimised conduction loss, optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.

Applications


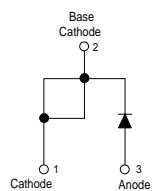

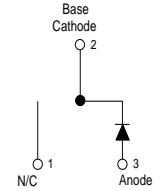

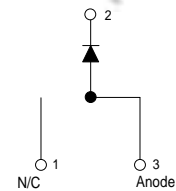
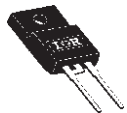
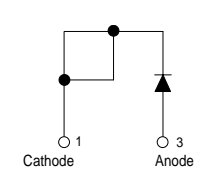
AC-DC SMPS 70W-400W

e.g. Laptop & Printer AC Adaptors, Desktop PC, TV & Monitor, Games units and DVD AC-DC power supplies.

Absolute Maximum Ratings

Parameters	Max	Units
V_{RRM} Peak Repetitive Reverse Voltage	600	V
$I_{F(AV)}$ Average Rectified Forward Current @ $T_C = 160^\circ C$ @ $T_C = 142^\circ C$ (FULLPACK)	8	A
I_{FSM} Non Repetitive Peak Surge Current @ $T_J = 25^\circ C$	175	
I_{FM} Peak Repetitive Forward Current	16	
T_J, T_{STG} Operating Junction and Storage Temperatures	- 65 to 175	$^\circ C$

Case Styles

  TO-220AC	  D²PAK	  TO-262	  TO-220 FULLPACK
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Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
V _{BR} , V _F Breakdown Voltage, Blocking Voltage	600	-	-	V	I _R = 100μA
V _F Forward Voltage	-	0.96	1.05	V	I _F = 8A, T _J = 25°C
	-	0.81	0.86	V	I _F = 8A, T _J = 150°C
I _R Reverse Leakage Current	-	0.05	5	μA	V _R = V _R Rated
	-	20	100	μA	T _J = 150°C, V _R = V _R Rated
C _T Junction Capacitance	-	17	-	pF	V _R = 600V
L _S Series Inductance	-	8.0	-	nH	Measured lead to lead 5mm from package body

Dynamic Recovery Characteristics @ T_C = 25°C (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
t _{rr} Reverse Recovery Time	-	60	100	ns	I _F = 1A, di _F /dt = 100A/μs, V _R = 30V
	-	150	250		I _F = 8A, di _F /dt = 100A/μs, V _R = 30V
	-	170	-		T _J = 25°C
	-	250	-		T _J = 125°C
I _{RRM} Peak Recovery Current	-	15	-	A	T _J = 25°C
	-	20	-		T _J = 125°C
Q _{rr} Reverse Recovery Charge	-	1.3	-	μC	T _J = 25°C
	-	2.6	-		T _J = 125°C

I_F = 8A
di_F/dt = 200A/μs
V_R = 390V

Thermal - Mechanical Characteristics

Parameters	Min	Typ	Max	Units
T _J Max. Junction Temperature Range	-	-	175	°C
T _{Stg} Max. Storage Temperature Range	- 65	-	175	
R _{thJC} Thermal Resistance, Junction to Case	-	1.4	2	°C/W
	-	3.4	4.3	
R _{thJA} ^① Thermal Resistance, Junction to Ambient	-	-	70	
R _{thCS} ^② Thermal Resistance, Case to Heatsink	-	0.5	-	
Weight	-	2.0	-	g
	-	0.07	-	(oz)
Mounting Torque	6.0	-	12	Kg-cm
	5.0	-	10	lbf.in

① Typical Socket Mount

② Mounting Surface, Flat, Smooth and Greased

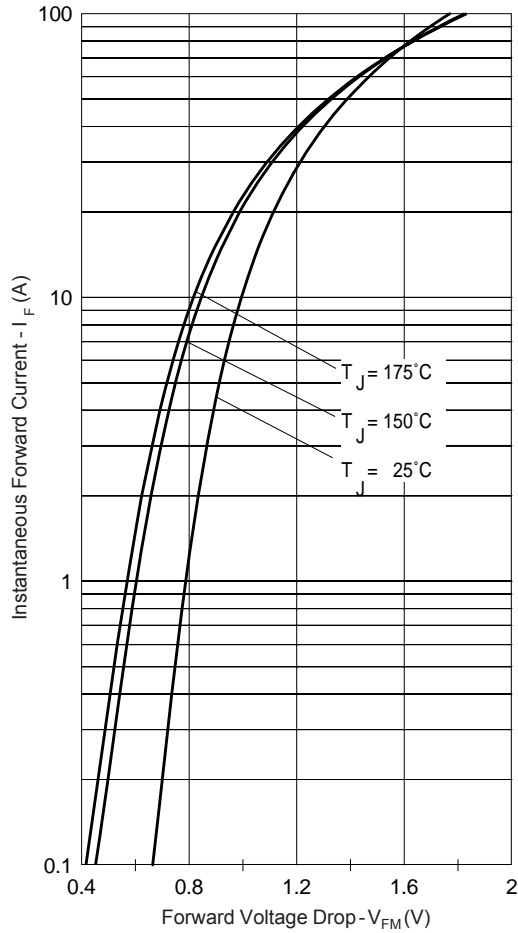


Fig. 1 - Typical Forward Voltage Drop Characteristics

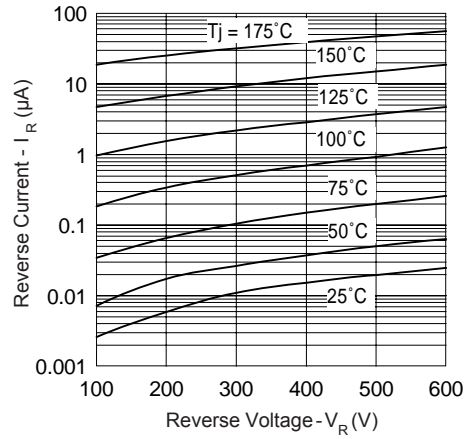


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

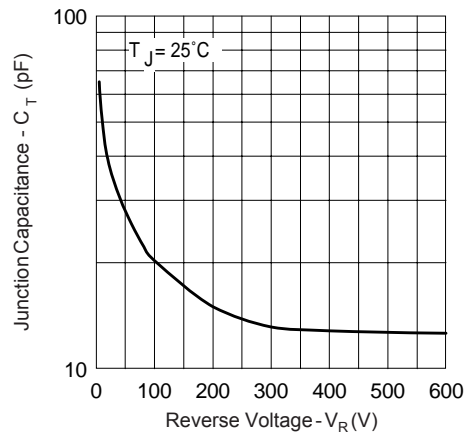


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

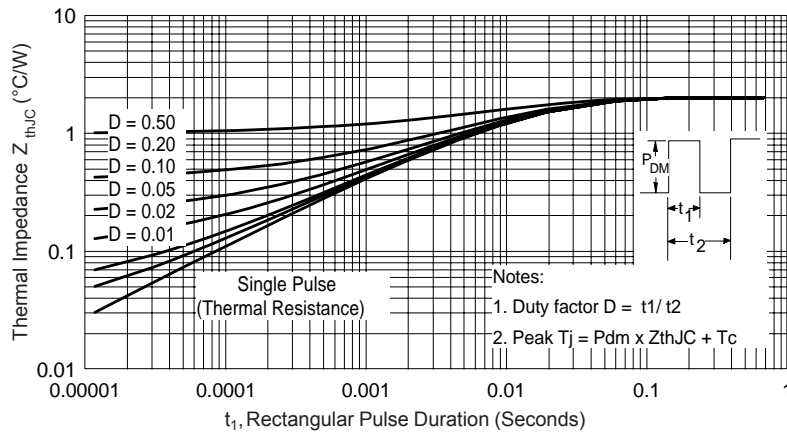


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

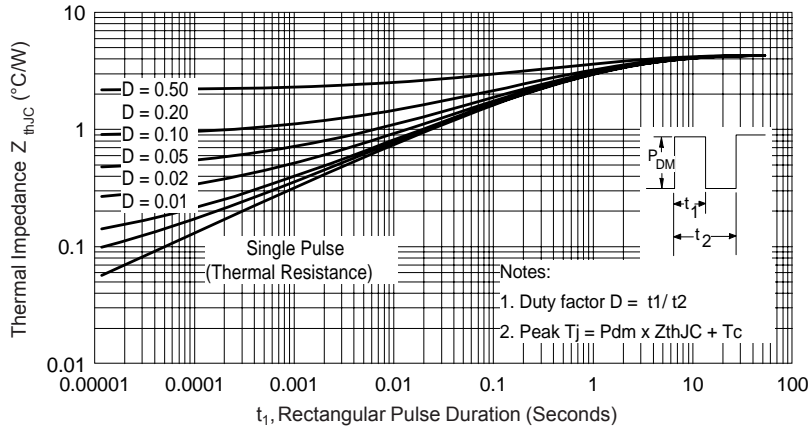


Fig. 5 - Max. Thermal Impedance Z_{thJC} Characteristics (FULLPACK)

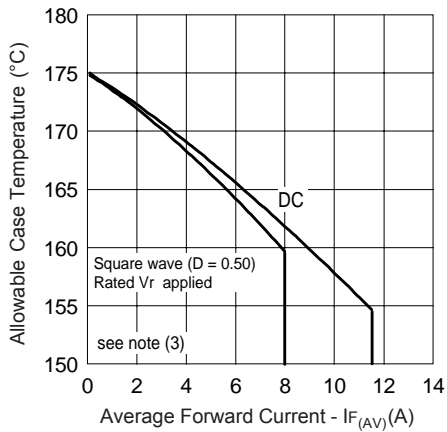


Fig. 6 - Max. Allowable Case Temperature Vs. Average Forward Current

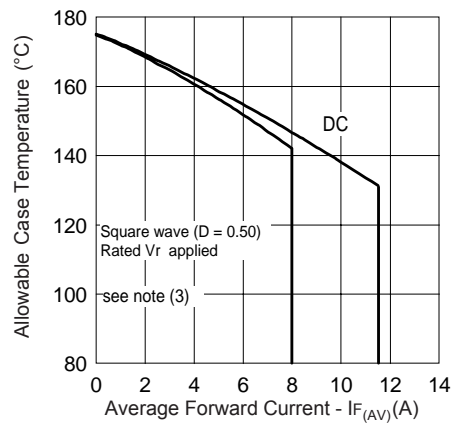


Fig. 7 - Max. Allowable Case Temperature Vs. Average Forward Current (FULLPACK)

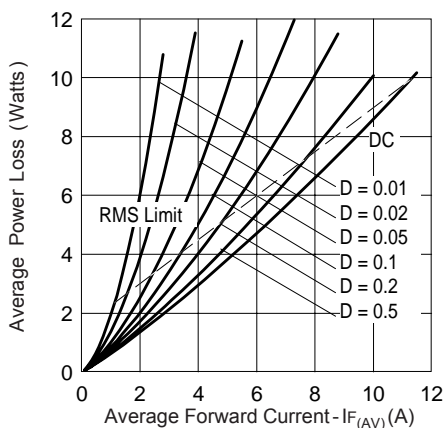


Fig. 8 - Forward Power Loss Characteristics

(3) Formula used: $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$;
 Pd = Forward Power Loss =
 $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$
 (see Fig. 8);
 Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$;
 $I_R @ V_{R1}$ = rated V_R

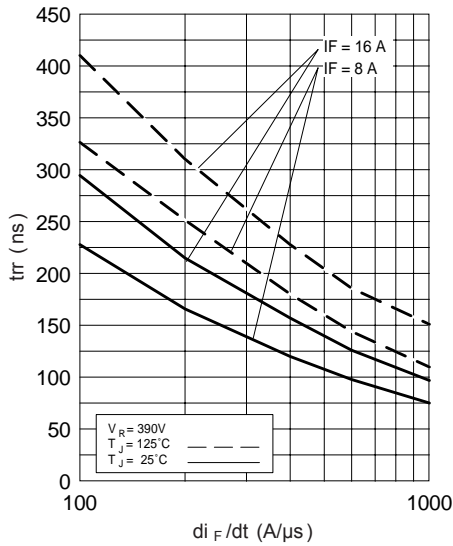


Fig. 9 - Typical Reverse Recovery vs. di_F/dt

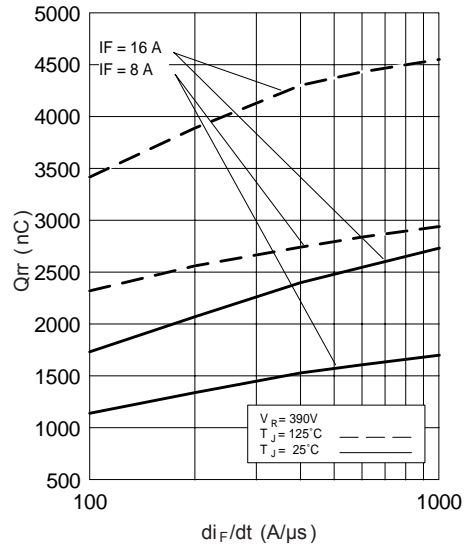


Fig. 10 - Typical Stored Charge vs. di_F/dt

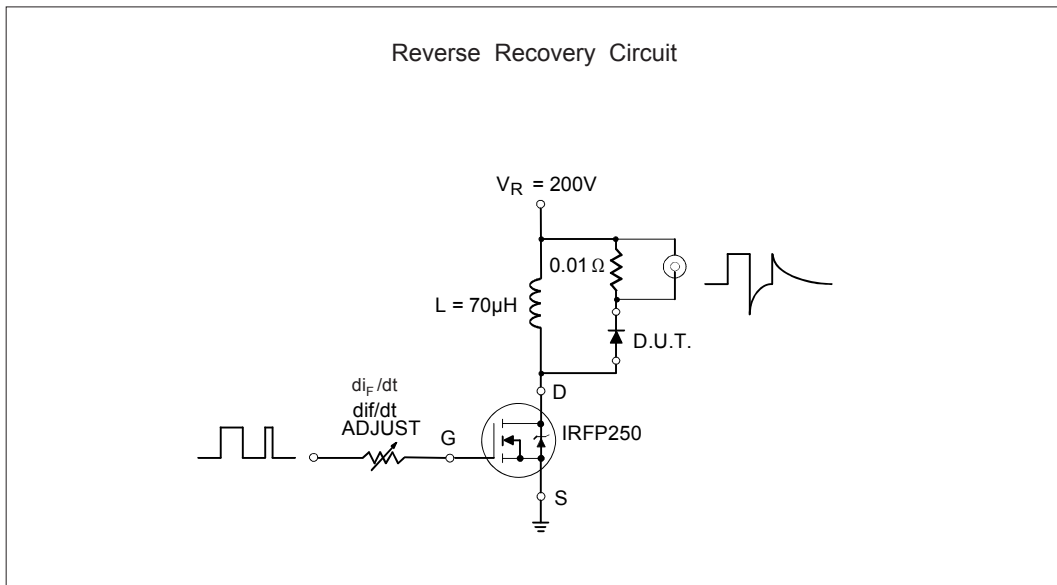


Fig. 11 - Reverse Recovery Parameter Test Circuit

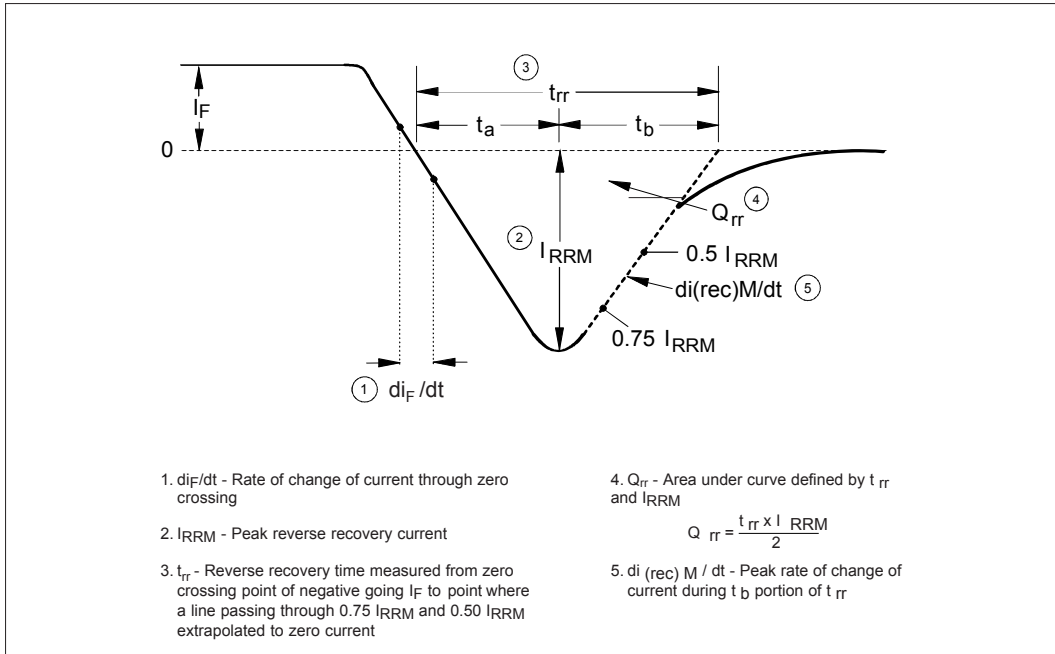
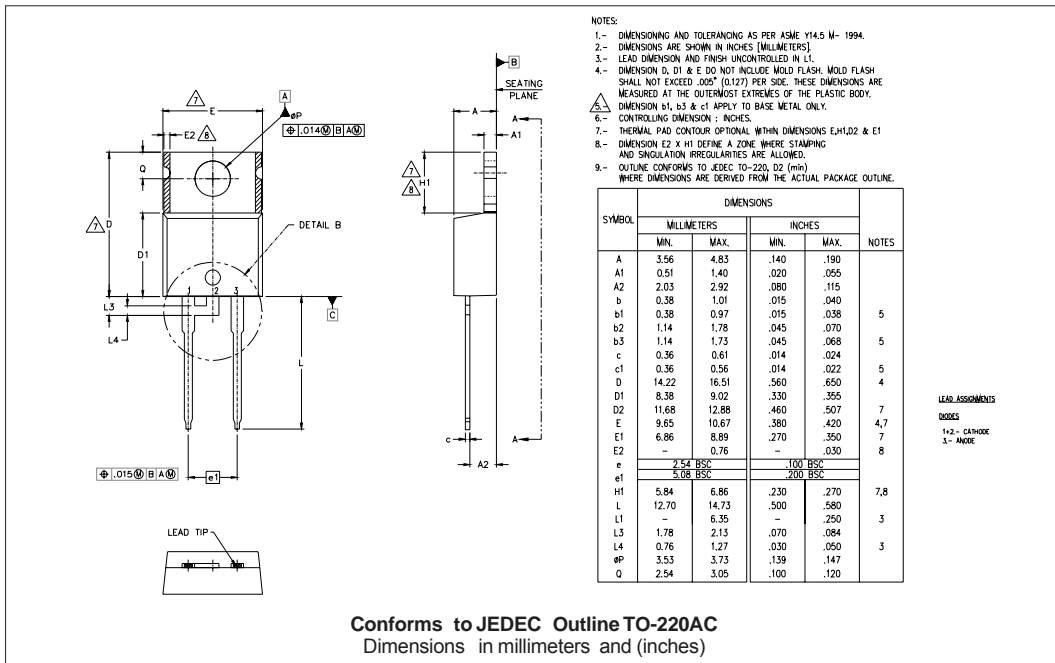
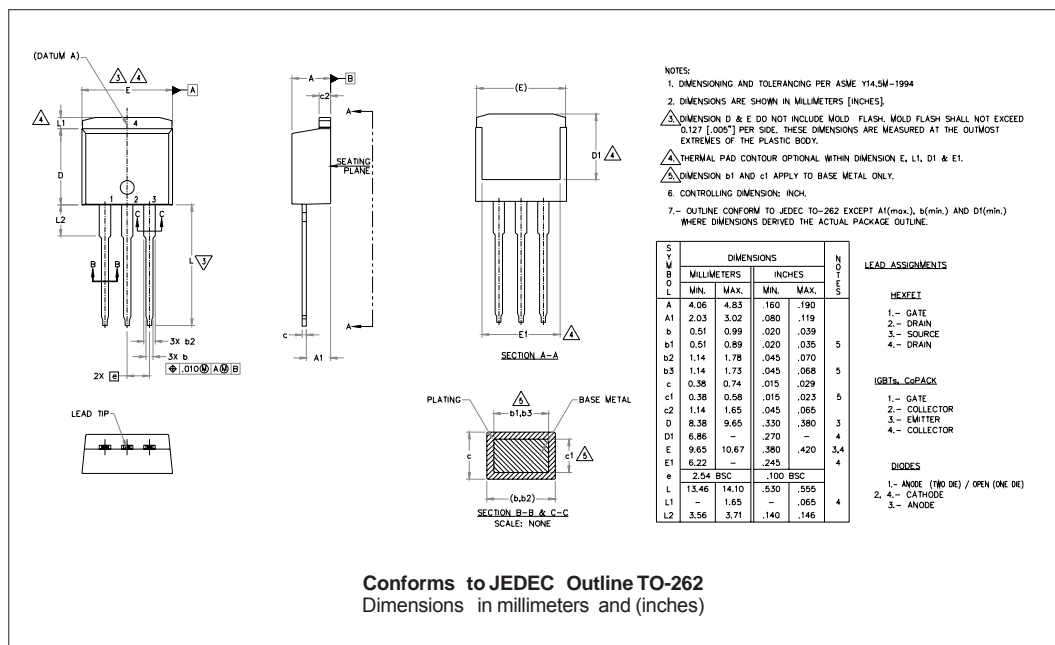
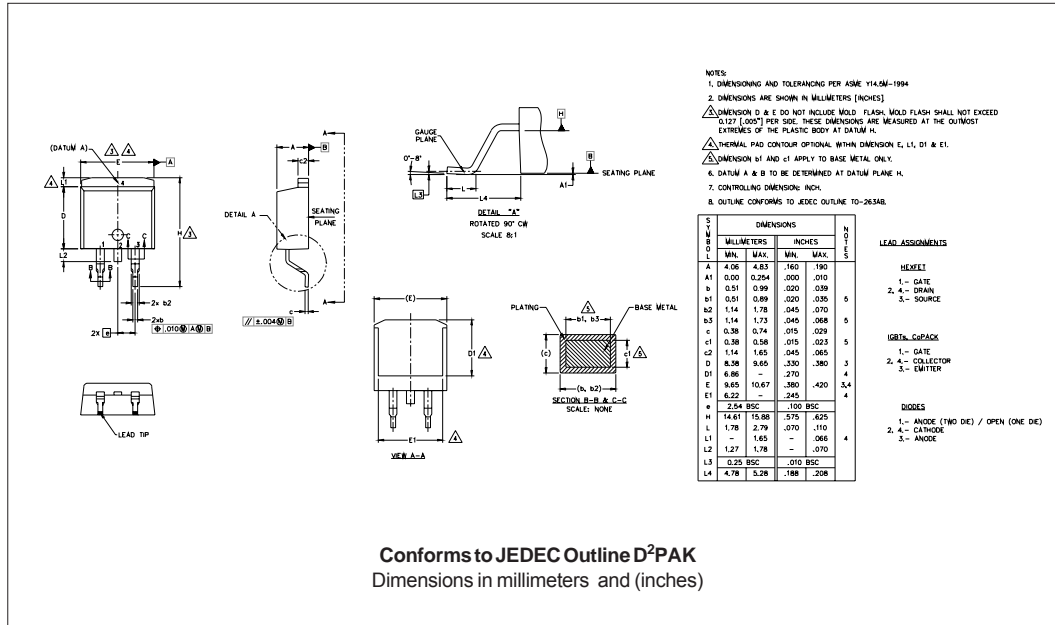


Fig. 12 - Reverse Recovery Waveform and Definitions

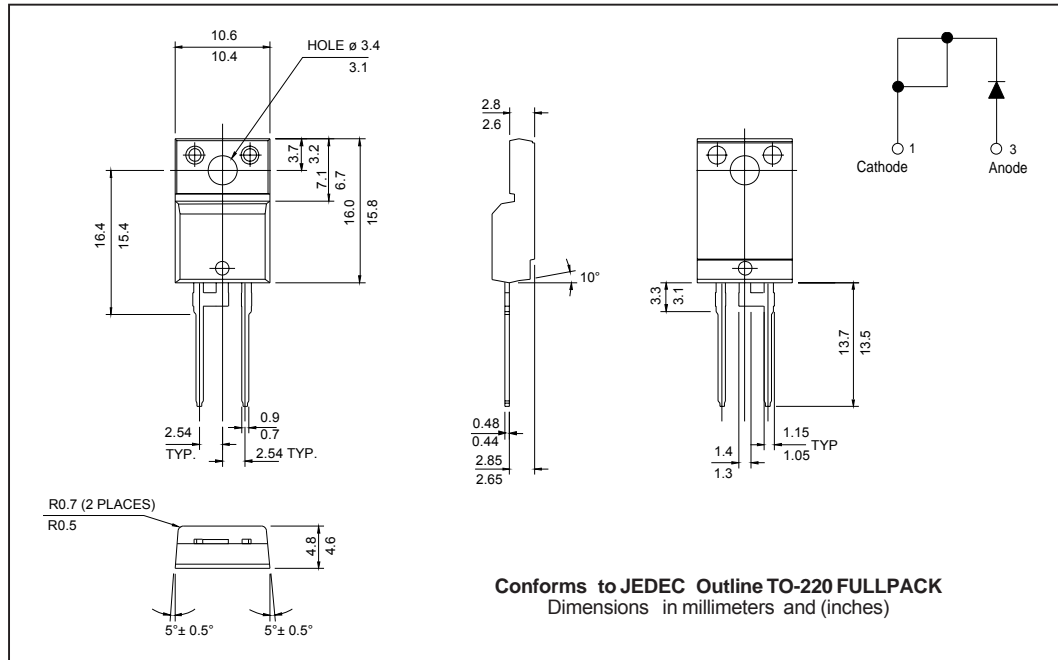
Outline Table



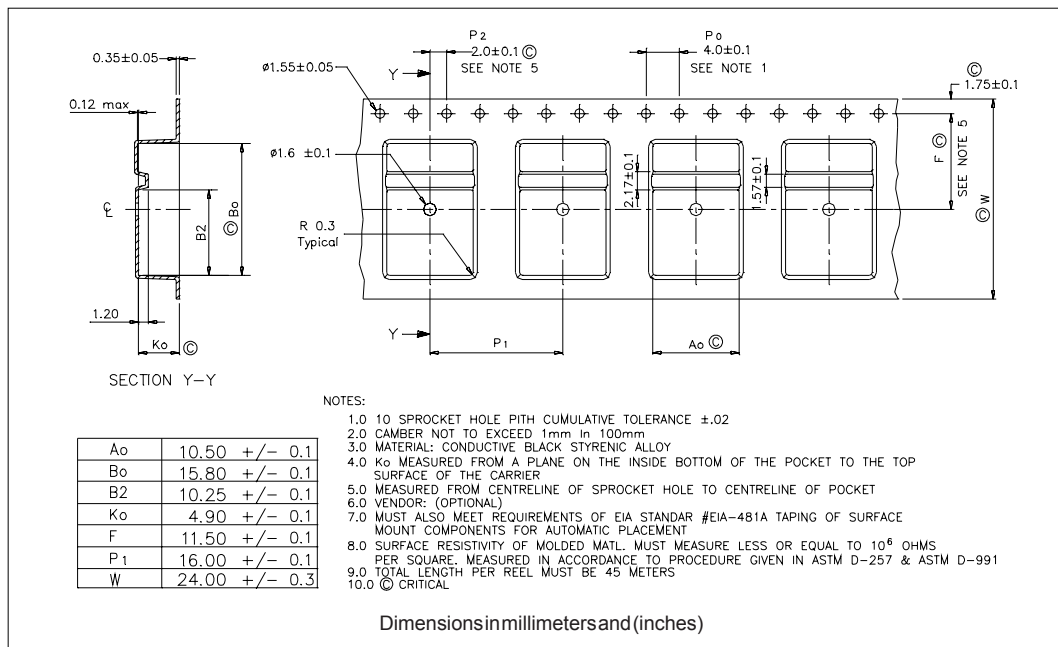
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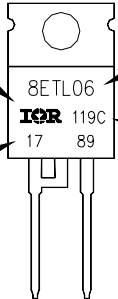
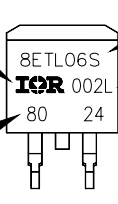
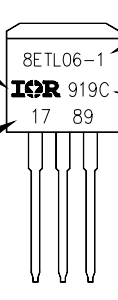
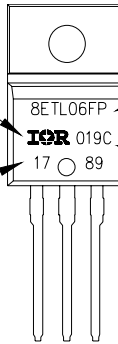
Outline Table



Tape & Reel Information



Part Marking Information

TO-220AC	<p>EXAMPLE: THIS IS A 8ETL06 LOT CODE 1789 ASSEMBLED ON WW 19, 2001 IN THE ASSEMBLY LINE "C"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 1 = 2001 WEEK 19 LINE C</p>
D ² PAK	<p>EXAMPLE: THIS IS A 8ETL06S LOT CODE 8024 ASSEMBLED ON WW 02, 2000 IN THE ASSEMBLY LINE "L"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 0 = 2000 WEEK 02 LINE L</p>
TO-262	<p>EXAMPLE: THIS IS A 8ETL06-1 LOT CODE 1789 ASSEMBLED ON WW 19, 1999 IN THE ASSEMBLY LINE "C"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 9 = 1999 WEEK 19 LINE C</p>
FULLPACK	<p>EXAMPLE: THIS IS A 8ETL06FP LOT CODE 1789 ASSEMBLED ON WW 19, 2000 IN THE ASSEMBLY LINE "C"</p>	 <p>INTERNATIONAL RECTIFIER LOGO</p> <p>ASSEMBLY LOT CODE</p> <p>PART NUMBER</p> <p>DATE CODE YEAR 0 = 2000 WEEK 19 LINE C</p>

Ordering Information Table

Device Code							
8	E	T	L	06	-1	TRL	-
①	②	③	④	⑤	⑥	⑦	⑧
1	-	Current Rating (8 = 8A)					
2	-	E = Single Diode					
3	-	T = TO-220					
4	-	L = Ultra Low V_F HyperFast Recovery					
5	-	Voltage Rating (06 = 600V)					
6	-	None = TO-220AC					
		S = D ² Pak					
		-1 = TO-262 Option					
		FP = TO-220 FULLPACK					
7	-	None = Tube (50 pieces)					
		TRL = Tape & Reel (Left Oriented - for D ² Pak only)					
		TRR = Tape & Reel (Right Oriented - for D ² Pak only)					
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.
 Qualification Standards can be found on IR's Web site.



Notice

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