



30CTH02
 30CTH02S
 30CTH02-1
 30CTH02FP

Hyperfast Rectifier

Features

- Hyperfast Recovery Time
- Low Forward Voltage Drop
- Low Leakage Current
- 175°C Operating Junction Temperature

$t_{rr} = 30\text{ns max.}$
 $I_{F(AV)} = 30\text{Amp}$
 $V_R = 200\text{V}$

Description/ Applications

International Rectifier's 200V series are the state of the art Hyperfast recovery rectifiers specifically designed with optimized performance of forward voltage drop and hyperfast recovery time.


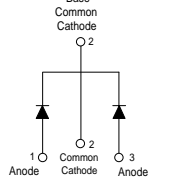

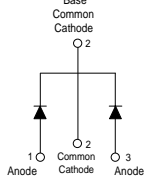

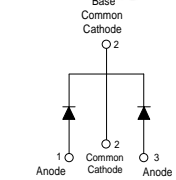

The planar structure and the platinum doped life time control, guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in the output rectification stage of SMPS, UPS, DC-DC converters as well as free-wheeling diode in low voltage inverters and chopper motor drives.

Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

Absolute Maximum Ratings

Parameters	Max	Units
V_{RRM} Peak Repetitive Reverse Voltage	200	V
$I_{F(AV)}$ Average Rectified Forward Current @ $T_C = 159^\circ\text{C}$ Per Diode @ $T_C = 125^\circ\text{C}$ (FULLPACK) Per Diode	15	A
	30	
I_{FSM} Non Repetitive Peak Surge Current @ $T_J = 25^\circ\text{C}$	200	
T_J, T_{STG} Operating Junction and Storage Temperatures	- 65 to 175	$^\circ\text{C}$

Case Styles			
<p>30CTH02</p>  <p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-220AB</p>	<p>30CTH02S</p>  <p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>D²PAK</p>	<p>30CTH02-1</p>  <p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-262</p>	<p>30CTH02FP</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-220 FULLPACK</p>

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
V _{BR} , V _r Breakdown Voltage, Blocking Voltage	200	-	-	V	I _R = 100μA
V _F Forward Voltage	-	0.92	1.05	V	I _F = 15A, T _J = 25°C
	-	0.78	0.85	V	I _F = 15A, T _J = 125°C
I _R Reverse Leakage Current	-	-	10	μA	V _R = V _R Rated
	-	5	300	μA	T _J = 125°C, V _R = V _R Rated
C _T Junction Capacitance	-	57	-	pF	V _R = 200V
L _S Series Inductance	-	8	-	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	-	-	35	ns	I _F = 1A, di _F /dt = 50A/μs, V _R = 30V
	-	-	30		I _F = 1A, di _F /dt = 100A/μs, V _R = 30V
	-	26	-	A	T _J = 25°C
	-	40	-		T _J = 125°C
I _{RRM} Peak Recovery Current	-	2.8	-	A	I _F = 15A di _F /dt = 200A/μs V _R = 160V
	-	6.0	-		
Q _{rr} Reverse Recovery Charge	-	37	-	nC	T _J = 25°C
	-	120	-		T _J = 125°C

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} ① Thermal Resistance, Per Diode	Junction to Case		-	-
	Fullpack (Per Diode)		-	-
Device Marking			30CTH02	Case Style TO-220
			30CTH02S	Case Style D ² Pak
			30CTH02-1	Case Style TO-262
			30CTH02FP	Case Style Fullpack

① Mounting Surface, Flat, Smooth and Greased

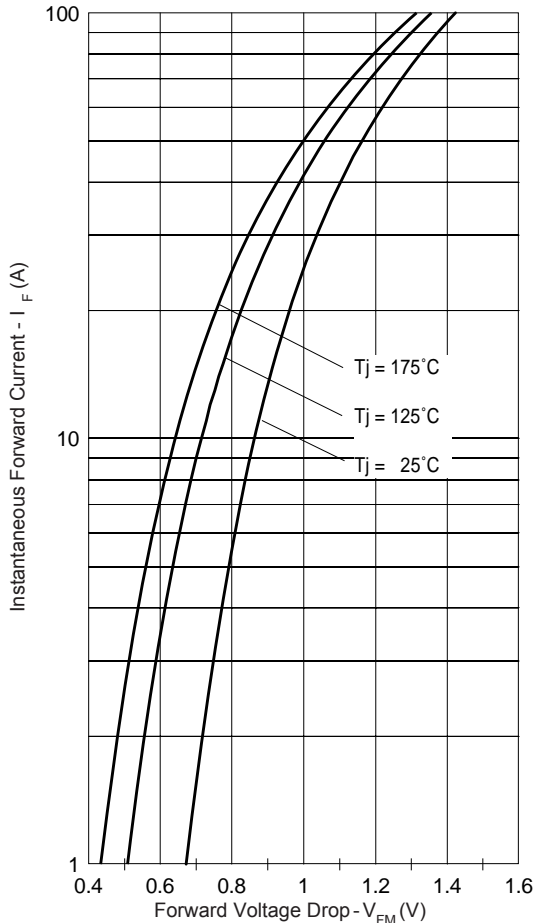


Fig. 1 - Typical Forward Voltage Drop Characteristics

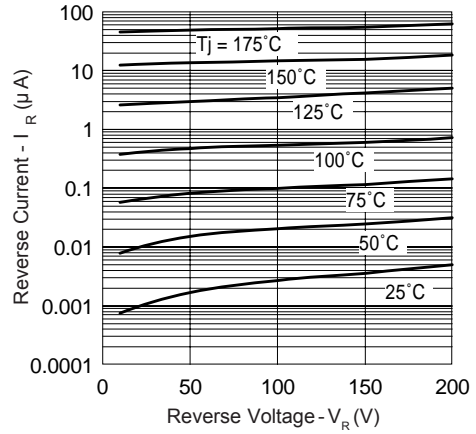


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

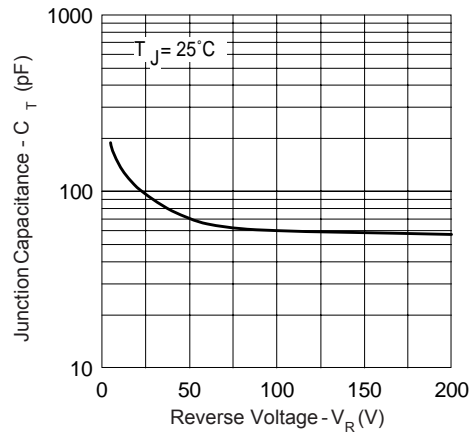


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

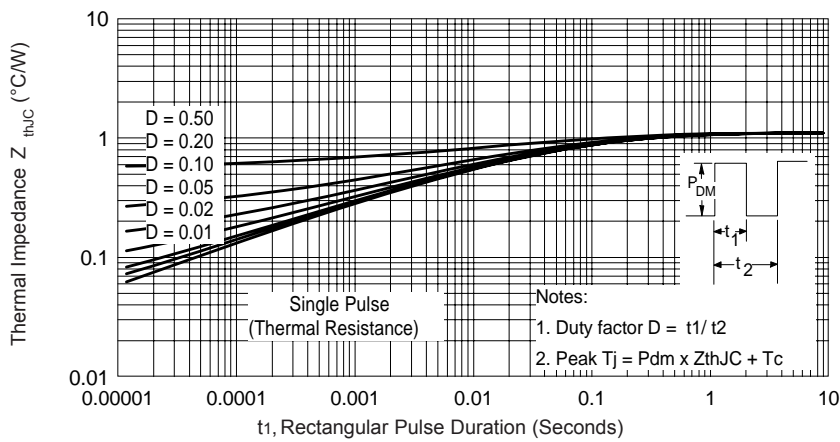


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

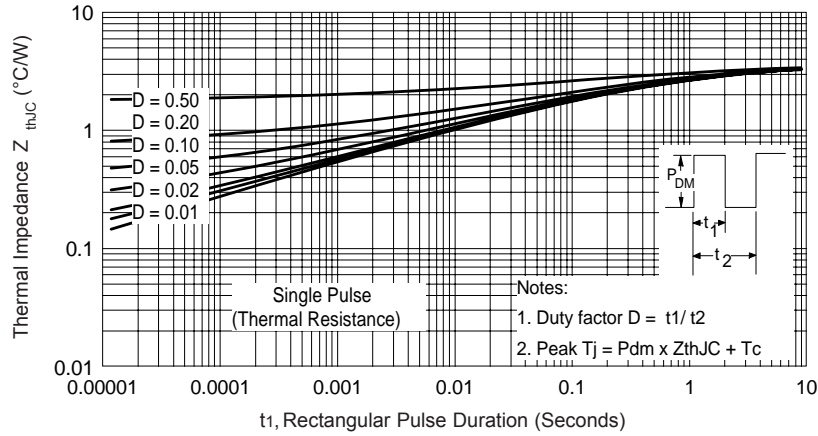


Fig. 5 - Max. Thermal Impedance Z_{thJC} Characteristics (FULLPACK)

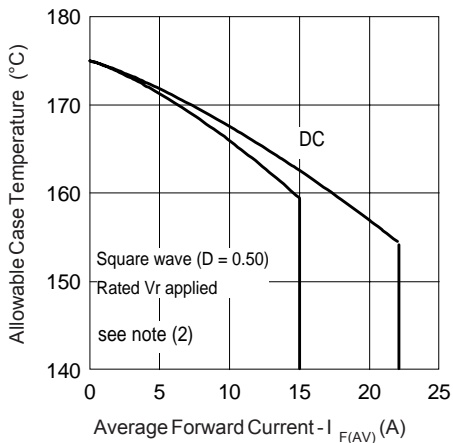


Fig. 6 - Max. Allowable Case Temperature Vs. Average Forward Current

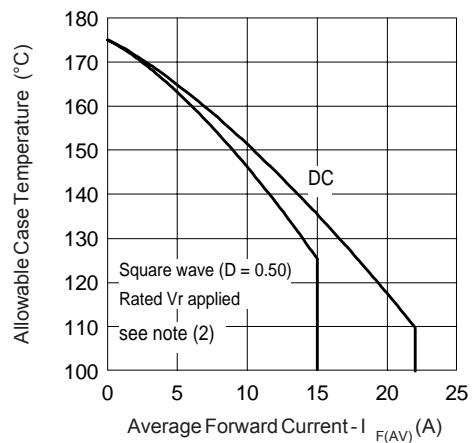


Fig. 7 - Max. Allowable Case Temperature Vs. Average Forward Current (FULLPACK)

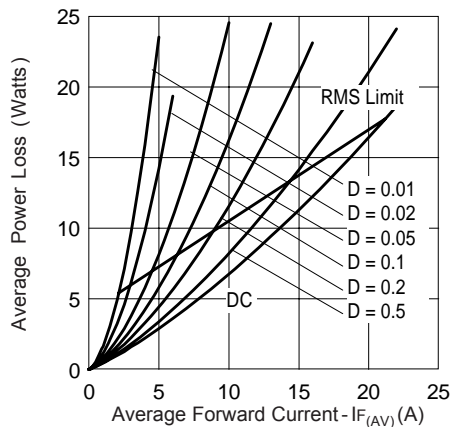


Fig. 8 - Forward Power Loss Characteristics

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

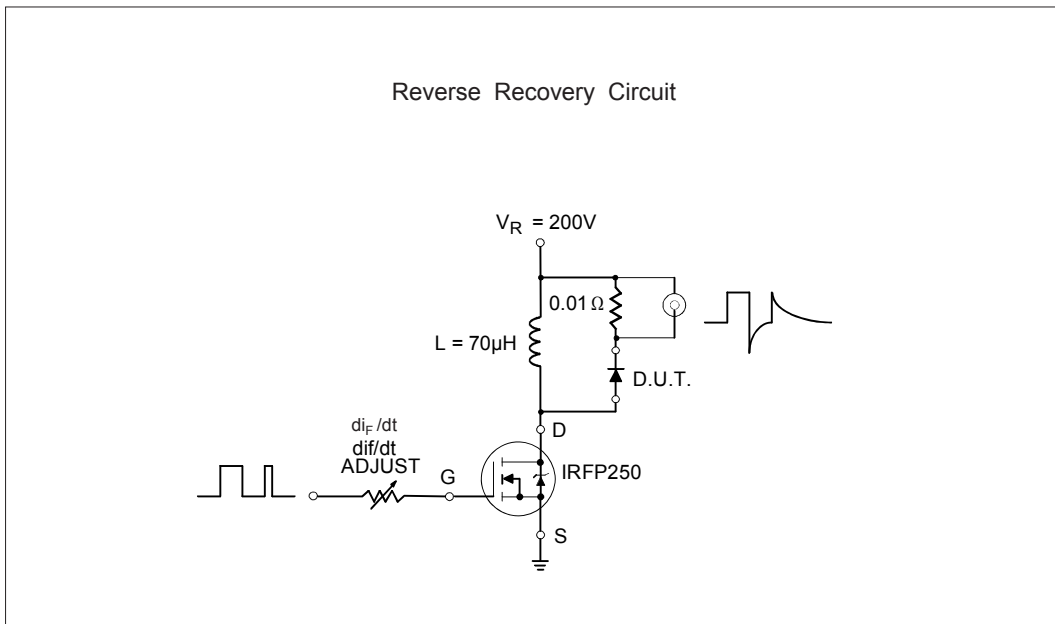
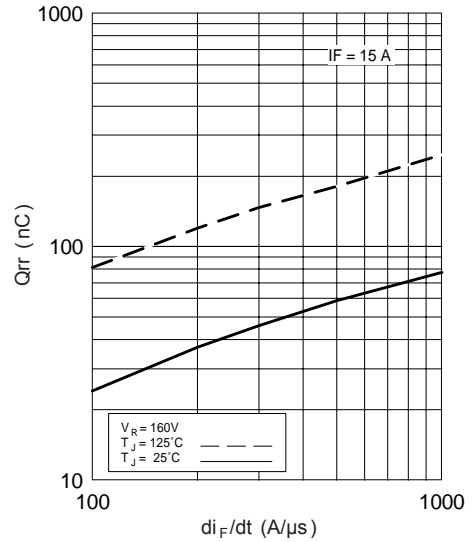
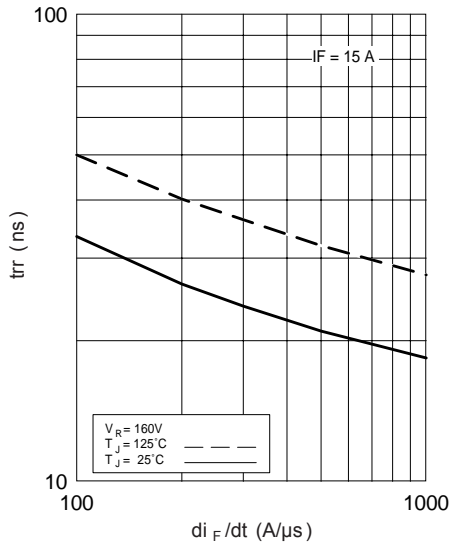


Fig. 11 - Reverse Recovery Parameter Test Circuit

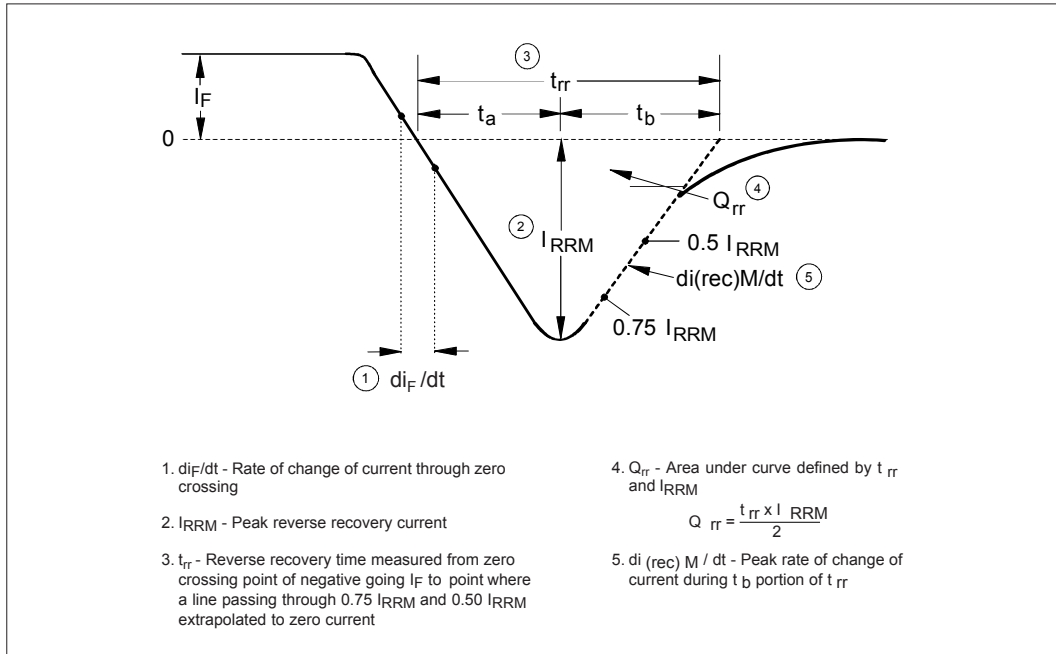
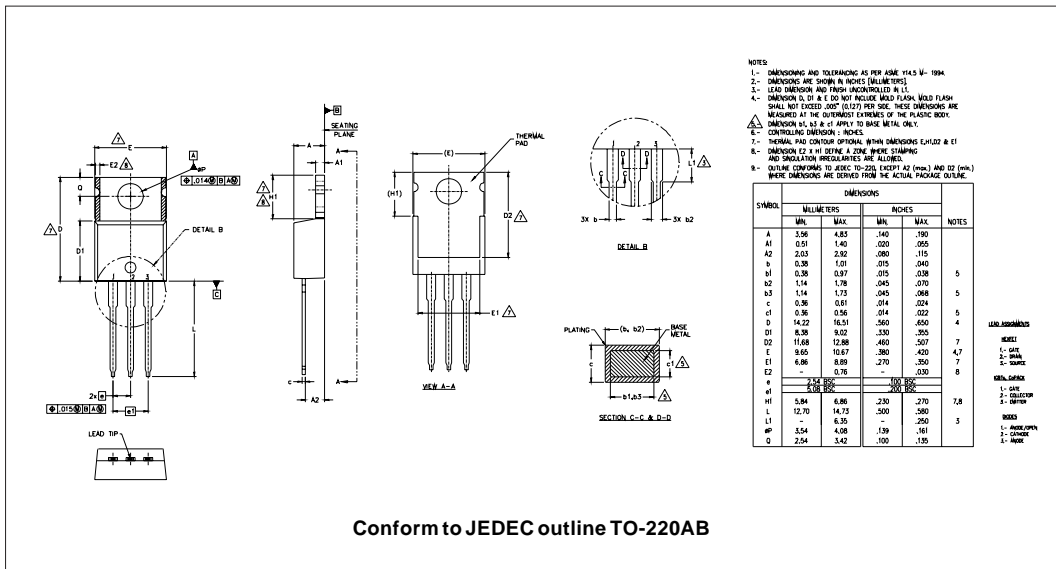
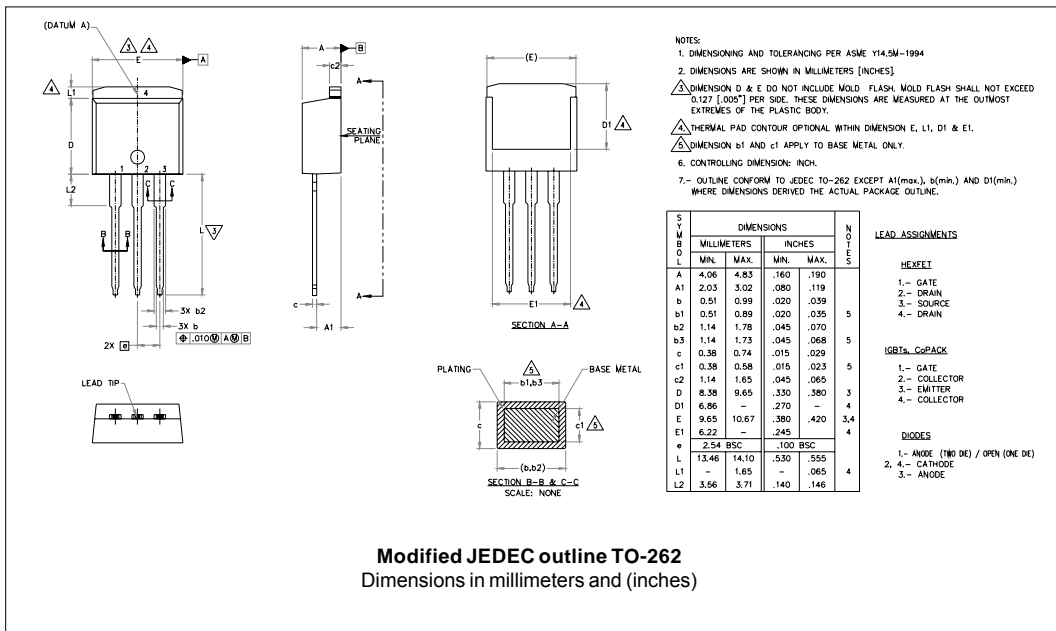
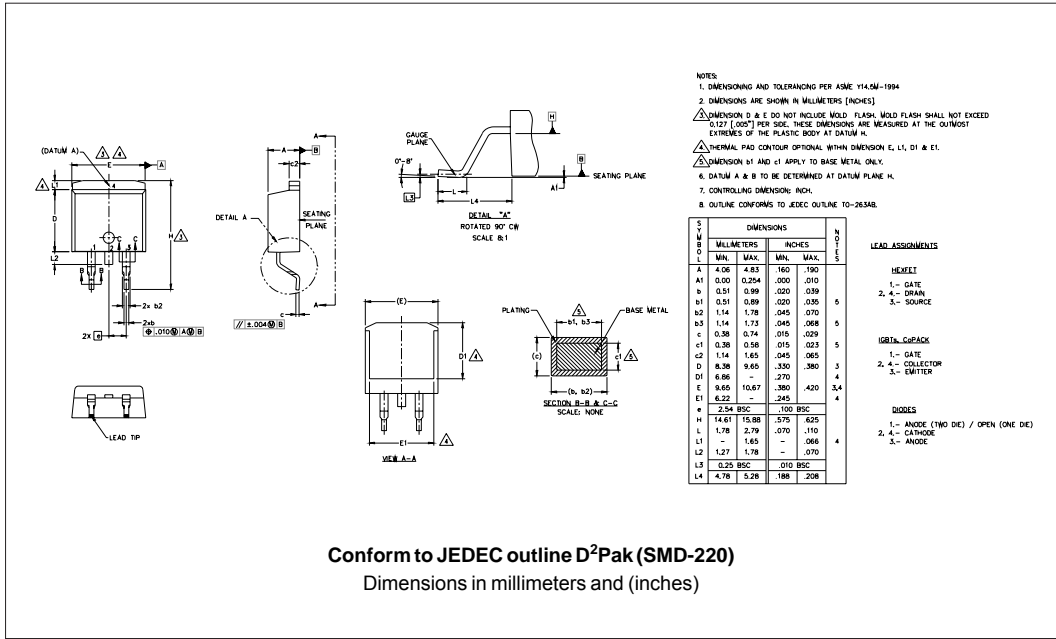


Fig. 13 - Reverse Recovery Waveform and Definitions

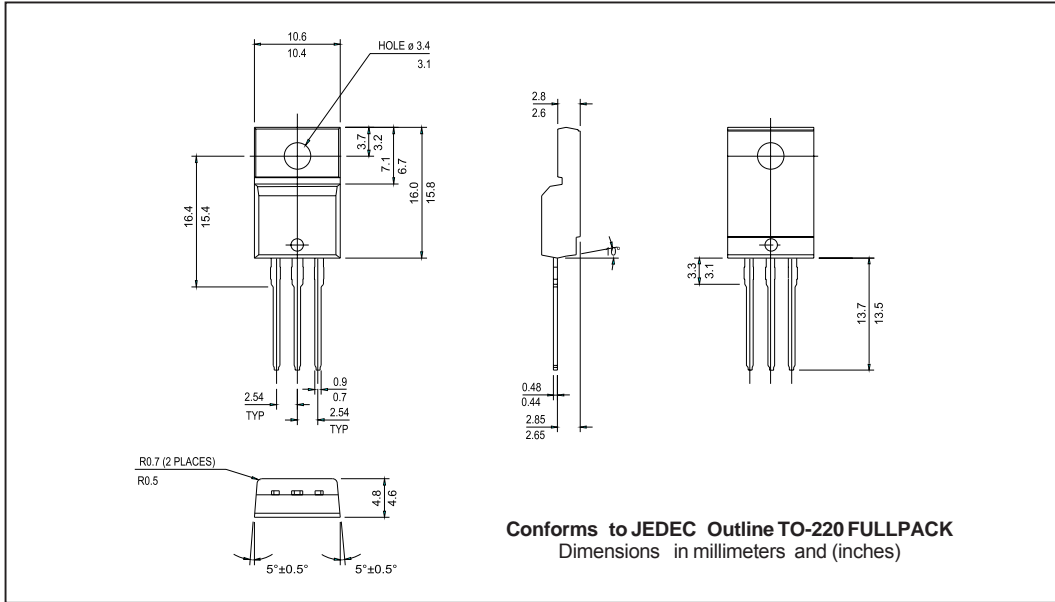
Outline Table



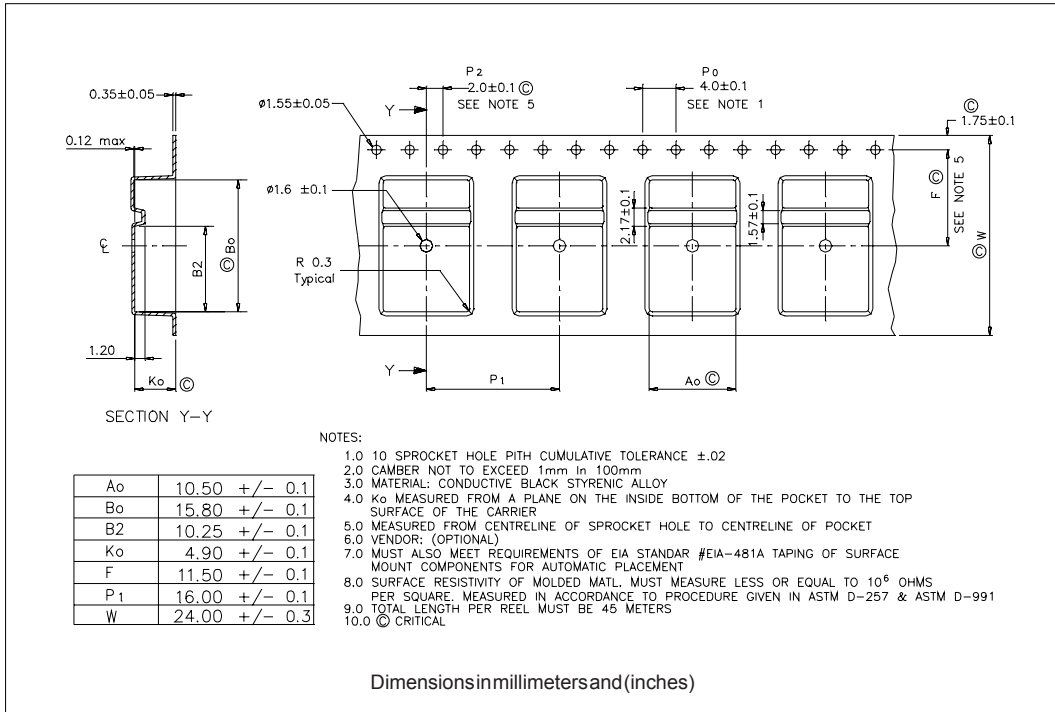
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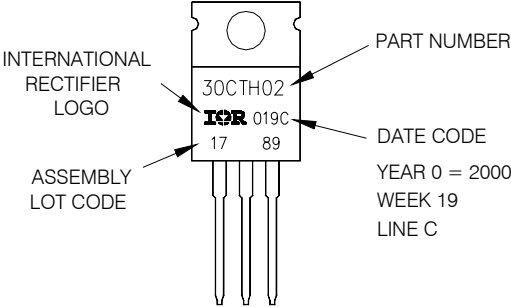
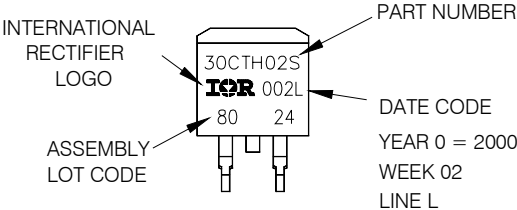
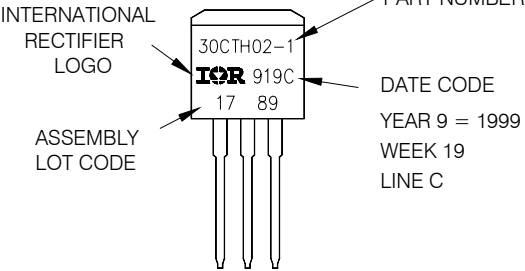
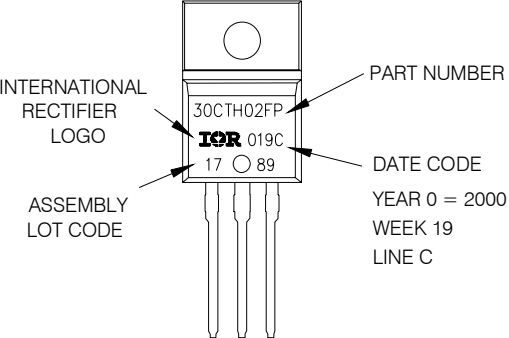
Outline Table



Tape & Reel Information



Part Marking Information

<p>TO-220AB</p>	<p>EXAMPLE: THIS IS A 30CTH02 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</p> <p>YEAR 0 = 2000 WEEK 19 LINE C</p>
<p>D²PAK</p>	<p>EXAMPLE: THIS IS A 30CTH02S 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</p> <p>YEAR 0 = 2000 WEEK 02 LINE L</p>
<p>TO-262</p>	<p>EXAMPLE: THIS IS A 30CTH02-1 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</p> <p>YEAR 9 = 1999 WEEK 19 LINE C</p>
<p>FULLPACK</p>	<p>EXAMPLE: THIS IS A 30CTH02FP 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</p> <p>YEAR 0 = 2000 WEEK 19 LINE C</p>

Ordering Information Table

Device Code	30	C	T	H	02	-1	TRL	-
	①	②	③	④	⑤	⑥	⑦	⑧
1	-	Current Rating (30 = 30A)						
2	-	C = Common Cathode						
3	-	T = TO-220						
4	-	H = HyperFast Recovery						
5	-	Voltage Rating (02 = 200V)						
6	-	None = TO-220AB						
		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.