

International IOR Rectifier

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.

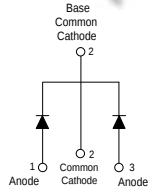
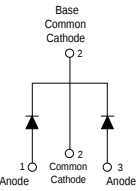
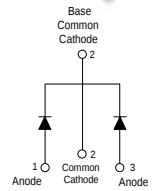
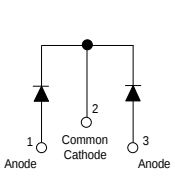
These devices are intended for use in the output rectification stage of SMPS, UPS, DC-DC converters as well as free-wheeling diode in low voltage inverters and chopper motor drives.

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 Per Device	15	A
	30	
	200	
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

30CTH02	30CTH02S	30CTH02-1	30CTH02FP
  TO-220AB	  D²PAK	  TO-262	  TO-220 FULLPACK

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	-		T _J = 25°C
	-	40	-		T _J = 125°C
I _{RRM} Peak Recovery Current	-	2.8	-	A	T _J = 25°C
	-	6.0	-		T _J = 125°C
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	-	-	1.1	°C/W
Junction to Case Fullpack (Per Diode)	-	-	3.5	
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

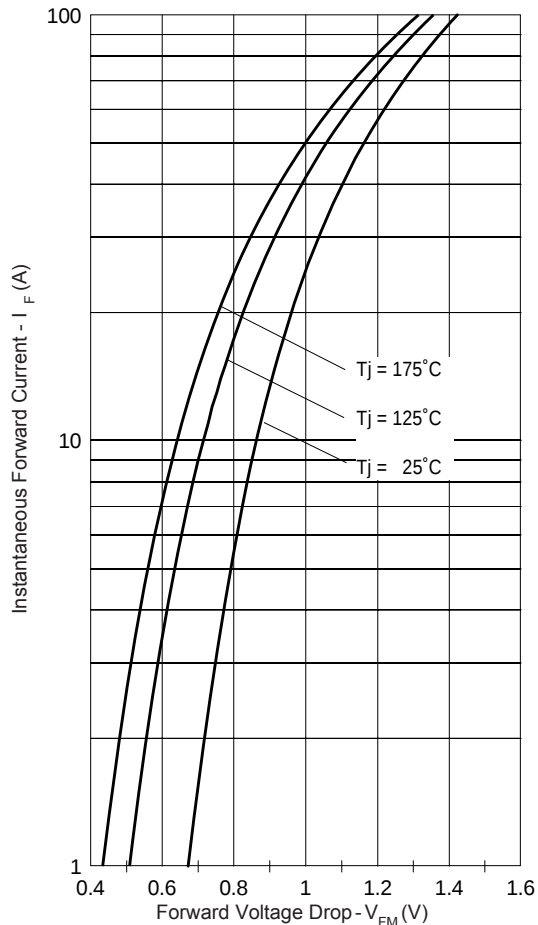


Fig. 1 - Typical Forward Voltage Drop Characteristics

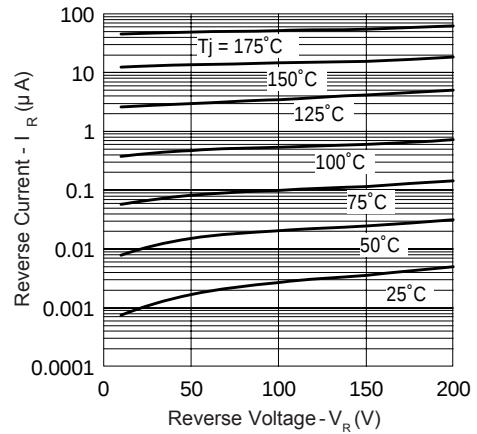


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

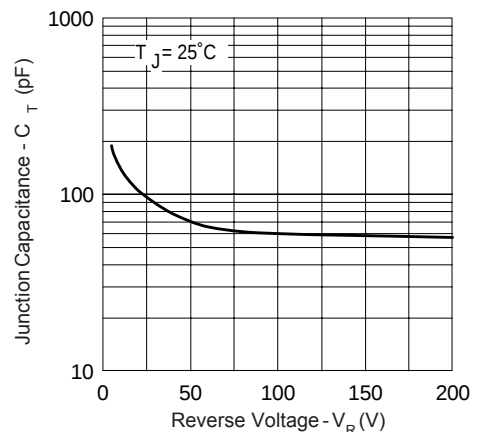


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

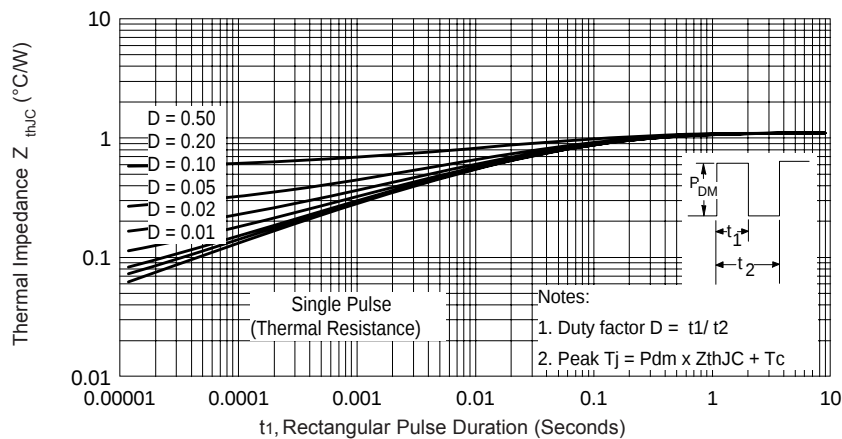


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

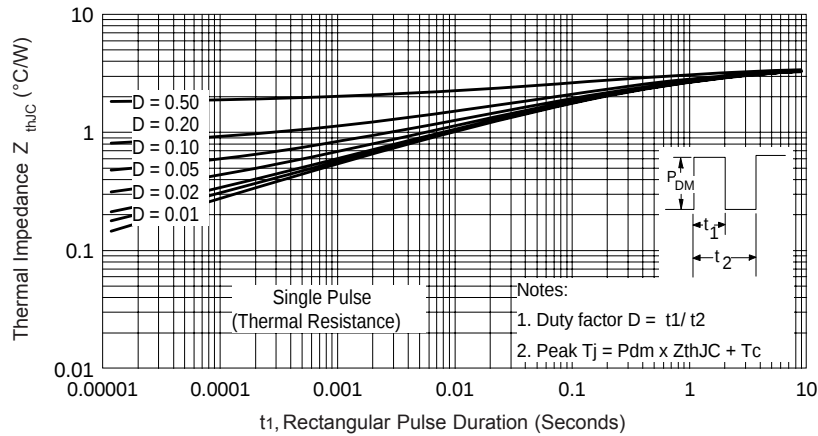


Fig. 5 - Max. Thermal Impedance Z_{thJC} Characteristics (FULLPACK)

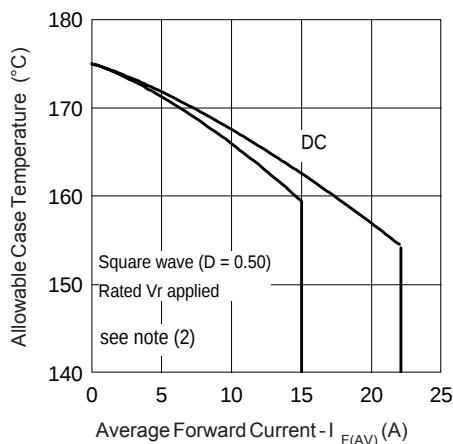


Fig. 6 - Max. Allowable Case Temperature Vs. Average Forward Current

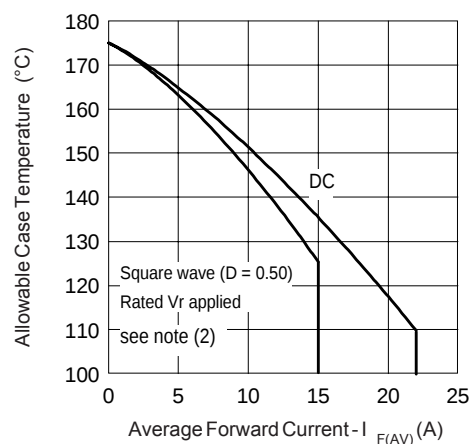


Fig. 7 - Max. Allowable Case Temperature Vs. Average Forward Current (FULLPACK)

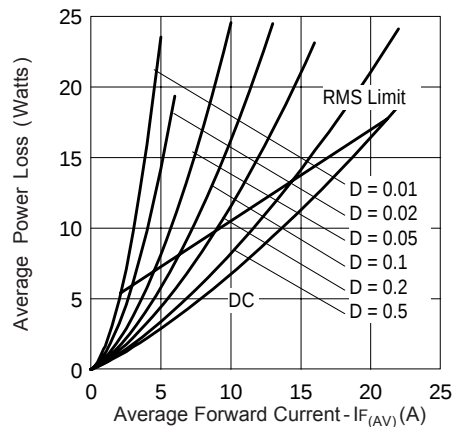


Fig. 8 - Forward Power Loss Characteristics

(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

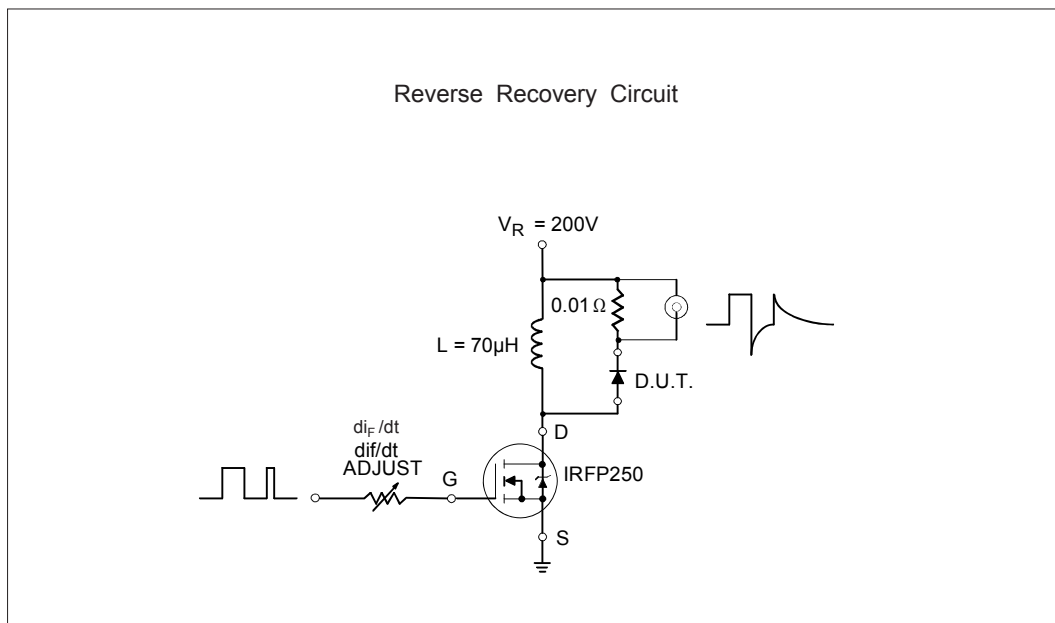
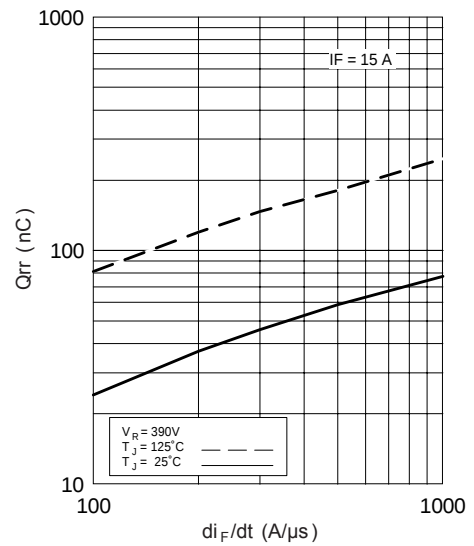
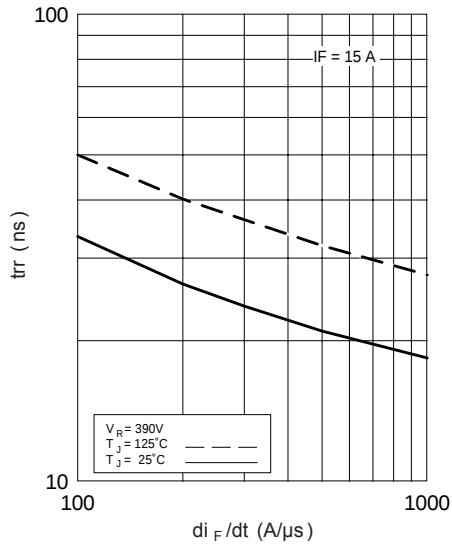


Fig. 11- Reverse Recovery Parameter Test Circuit

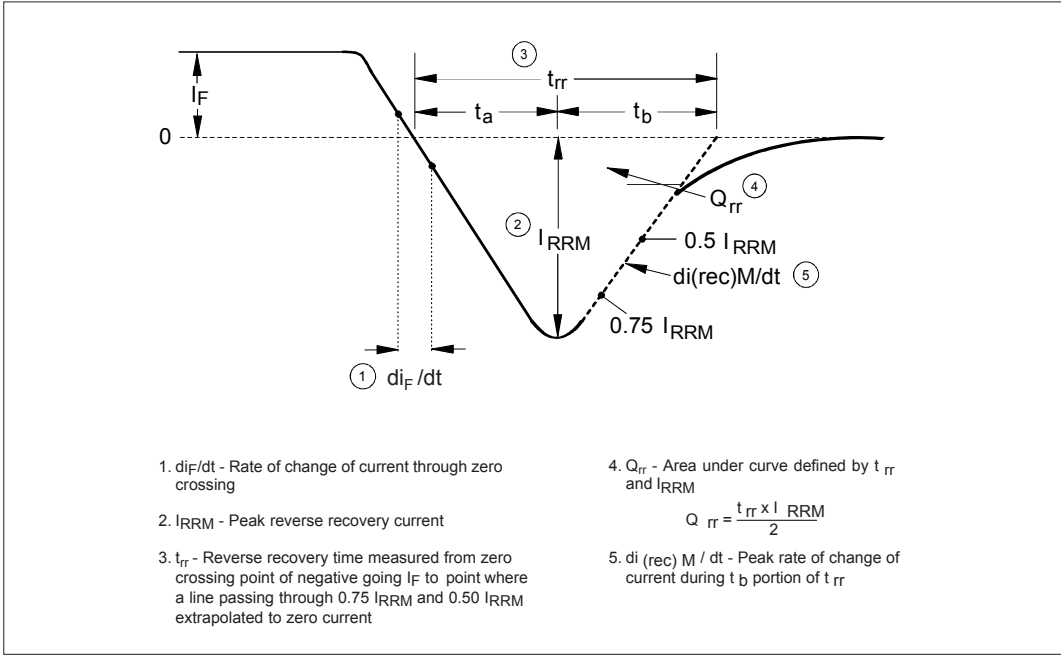
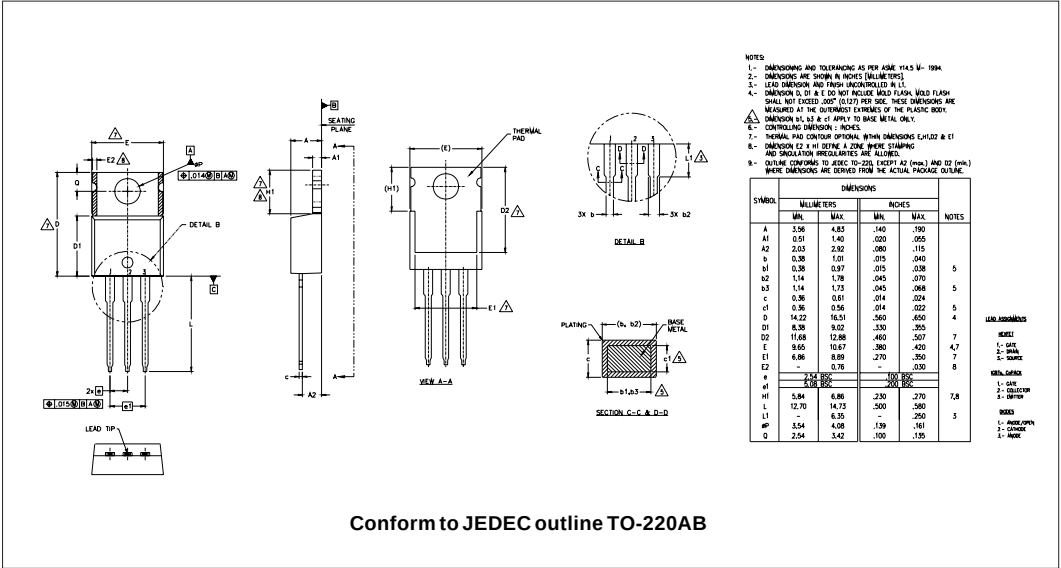
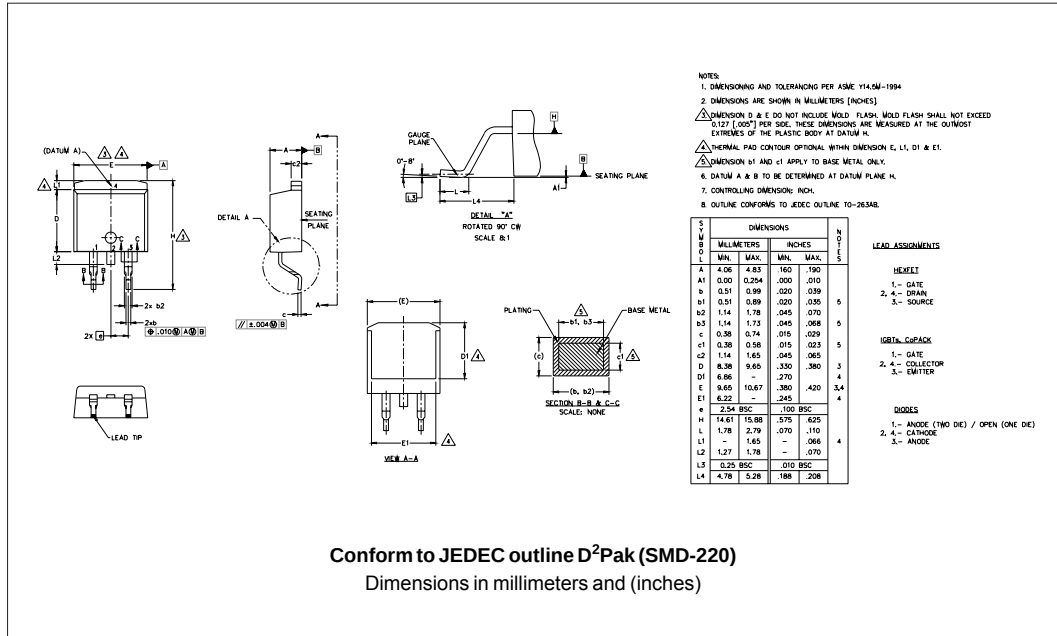


Fig. 13 - Reverse Recovery Waveform and Definitions

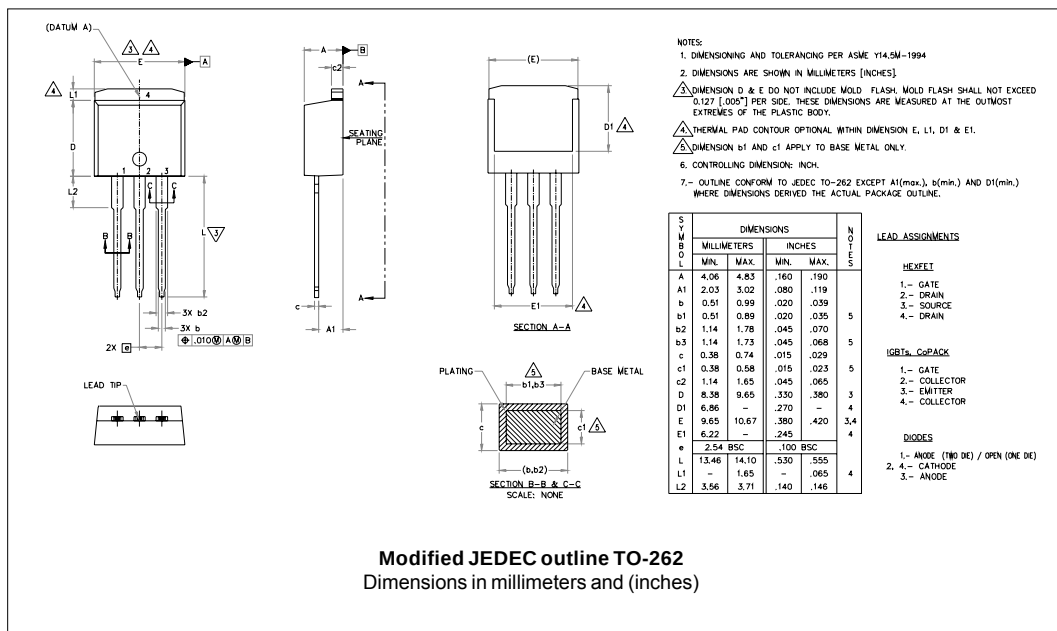
Outline Table



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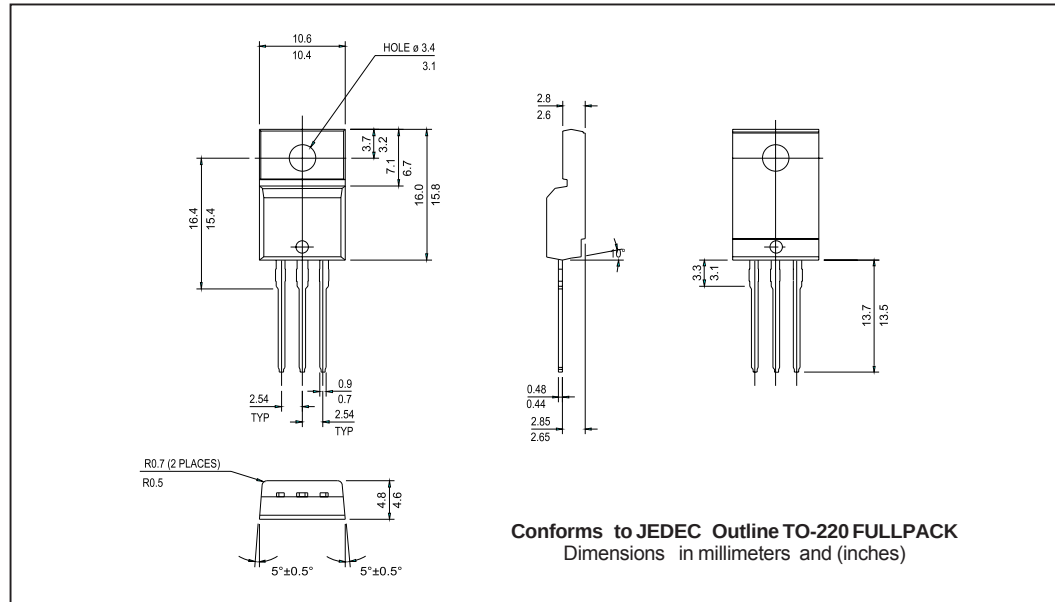


Conform to JEDEC outline D²Pak (SMD-220)
Dimensions in millimeters and (inches)

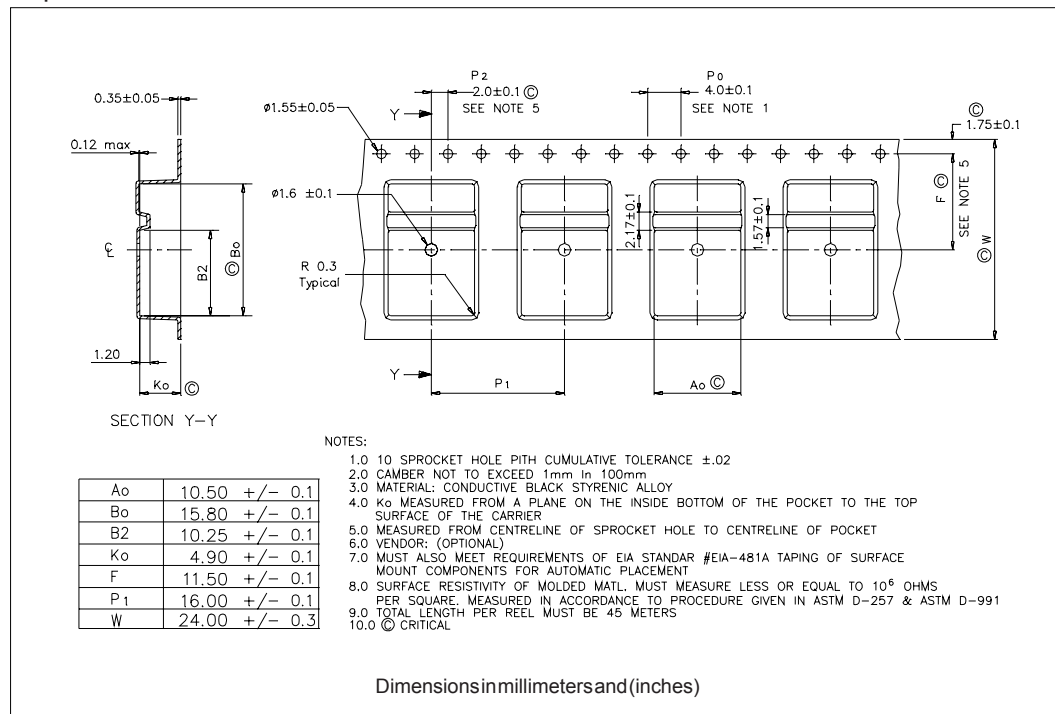


Modified JEDEC outline TO-262
Dimensions in millimeters and (inches)

Outline Table



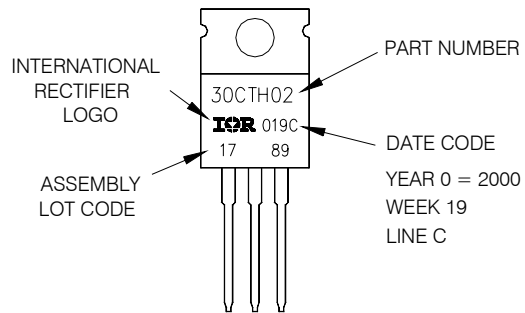
Tape & Reel Information



Part Marking Information

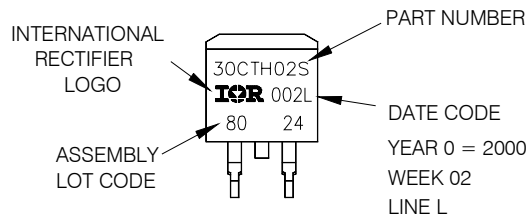
TO-220AB

EXAMPLE: THIS IS A 30CTH02
LOT CODE 1789
ASSEMBLED ON WW 19, 2000
IN THE ASSEMBLY LINE "C"



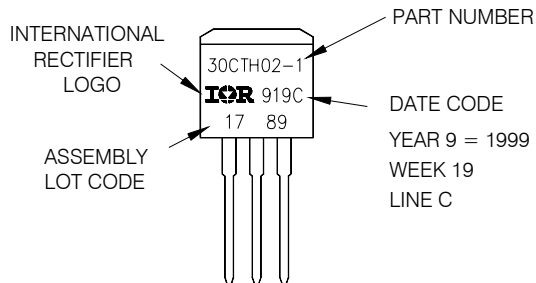
D²PAK

EXAMPLE: THIS IS A 30CTH02S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000
IN THE ASSEMBLY LINE "L"



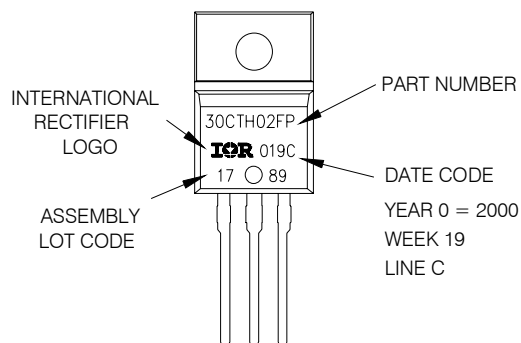
TO-262

EXAMPLE: THIS IS A 30CTH02-1
LOT CODE 1789
ASSEMBLED ON WW 19, 1999
IN THE ASSEMBLY LINE "C"



FULLPACK

EXAMPLE: THIS IS A 30CTH02FP
LOT CODE 1789
ASSEMBLED ON WW 19, 2000
IN THE ASSEMBLY LINE "C"



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 = D²Pak
 -1 = TO-262 Option
 FP = TO-220 FULLPACK
- 7** - None = Tube (50 pieces)
 TRL = Tape & Reel (Left Oriented - for D²Pak only)
 TRR = Tape & Reel (Right Oriented - for D²Pak 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.

International
IR Rectifier

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