

Bulletin PD-21025 rev. A 06/06

International
IR Rectifier

15CTQ...SPbF
15CTQ...-1PbF

SCHOTTKY RECTIFIER

15 Amp

$$I_{F(AV)} = 15\text{Amp}$$
$$V_R = 35/45\text{V}$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	15	A
V_{RRM} range	35/45	V
I_{FSM} @ $t_p = 5\mu\text{s}$ sine	810	A
V_F @ 7.5A, $T_J = 125^\circ\text{C}$ (per leg)	0.51	V
T_J range	-55 to 150	$^\circ\text{C}$

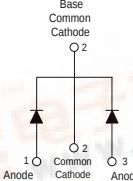
Description/ Features

The 15CTQ center tap Schottky rectifier series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 $^\circ\text{C}$ junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175 $^\circ\text{C}$ T_J operation
- Center tap TO-220 package
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

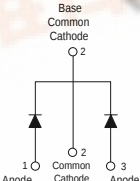
Case Styles

15CTQ...SPbF



D²PAK

15CTQ...-1PbF



TO-262



Voltage Ratings

Part number	15CTQ035SPbF 15CTQ035-1PbF	15CTQ040SPbF 15CTQ040-1PbF	15CTQ045SPbF 15CTQ045-1PbF
V_R Max. DC Reverse Voltage (V)	35	40	45
V_{RWM} Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

Parameters		15CTQ	Units	Conditions	
I _{F(AV)}	Max. Average Forward Current * See Fig. 5	15	A	50% duty cycle @ T _C = 123°C, rectangular wave form	
I _{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	810	A	5μs Sine or 3μs Rect. pulse	Following any rated load condition and with rated V _{RRM} applied
		145		10ms Sine or 6ms Rect. pulse	
E _{AS}	Non-Repetitive Avalanche Energy (Per Leg)	10	mJ	T _J = 25 °C, I _{AS} = 1.20 Amps, L = 11.10 mH	
I _{AR}	Repetitive Avalanche Current	1.5	A	Current decaying linearly to zero in 1 μsec	

Electrical Specifications

Parameters		15CTQ	Units	Conditions	
V _{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.55	V	@ 7.5A	T _J = 25 °C
		0.70	V	@ 15A	
		0.51	V	@ 7.5A	T _J = 125 °C
		0.65	V	@ 15A	
I _{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.8	mA	T _J = 25 °C	V _R = rated V _R
		32	mA	T _J = 125 °C	
C _T	Max. Junction Capacitance (Per Leg)	400	pF	V _R = 5V _{DC} (test signal range 100Khz to 1Mhz) 25°C	
L _S	Typical Series Inductance (Per Leg)	8.0	nH	Measured lead to lead 5mm from package body	
dv/dt	Max. Voltage Rate of Change	10000	V/ μs	(Rated V _R)	

(1) Pulse Width < 300 μs , Duty Cycle <2%

Thermal-Mechanical Specifications

Parameters		15CTQ	Units	Conditions		
T _J	Max. Junction Temperature Range	-55 to 150	°C			
T _{stg}	Max. Storage Temperature Range	-55 to 150	°C			
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)	3.50	°C/W	DC operation	* See Fig. 4	
R _{thJC}	Max. Thermal Resistance Junction to Case (Per Package)	1.75	°C/W	DC operation		
R _{thCS}	Typical Thermal Resistance, Case to Heatsink	0.50	°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)			
Marking Device		15CTQ...S		Case style D ² Pak		
		15CTQ...-1		Case style TO-262		

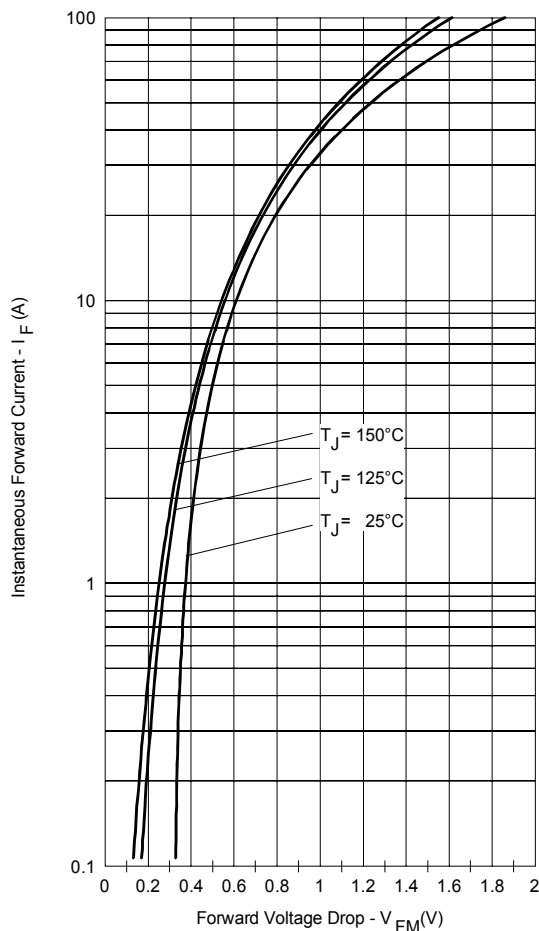


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

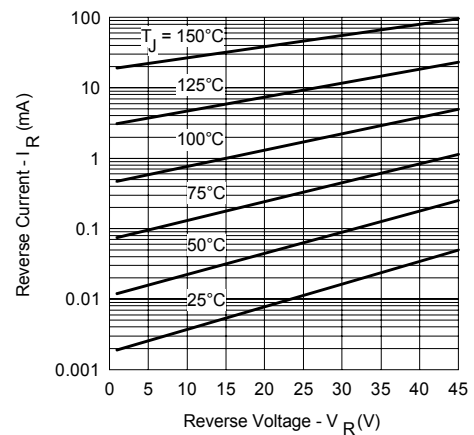


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

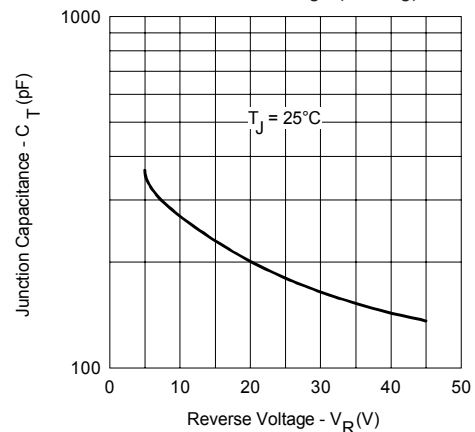


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

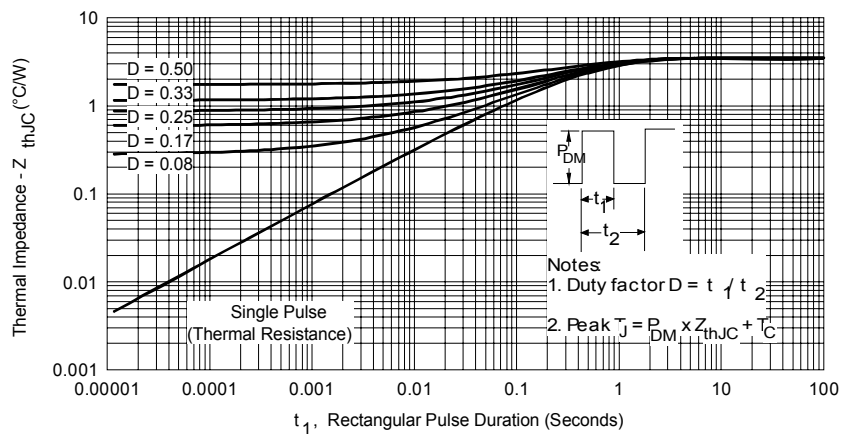


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

15CTQ...SPbF, 15CTQ...-1PbF Series

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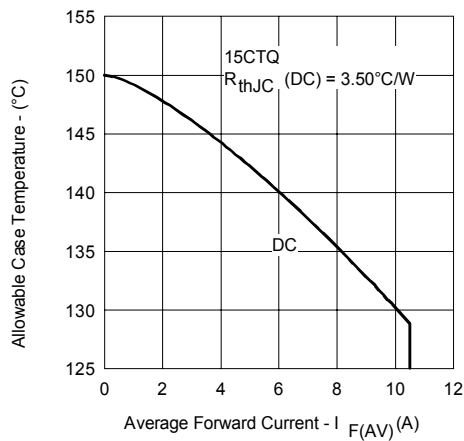


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

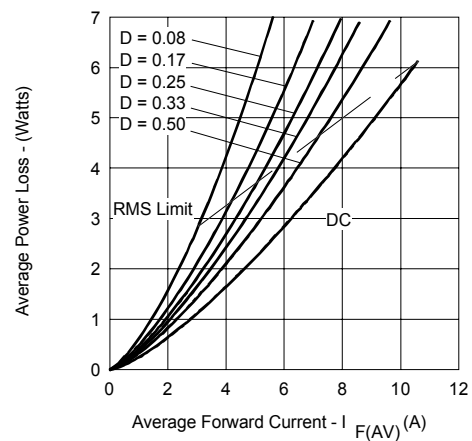


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

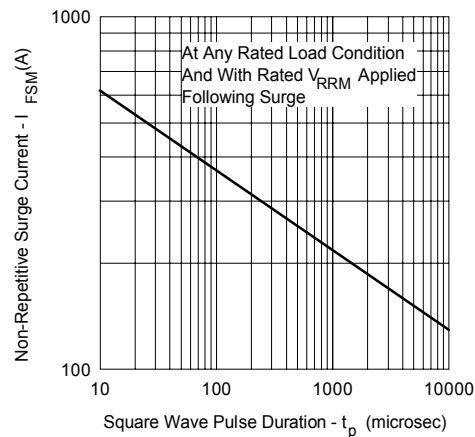


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

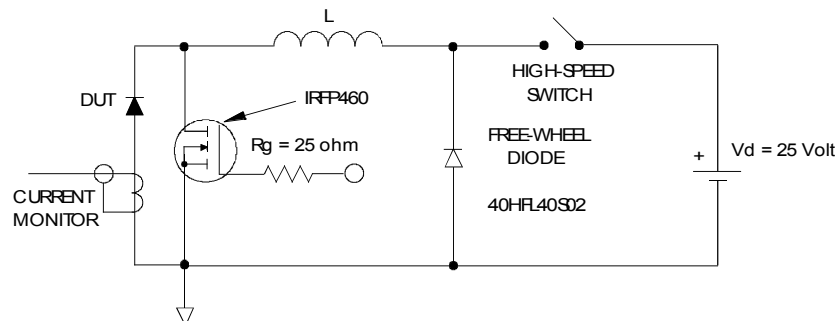
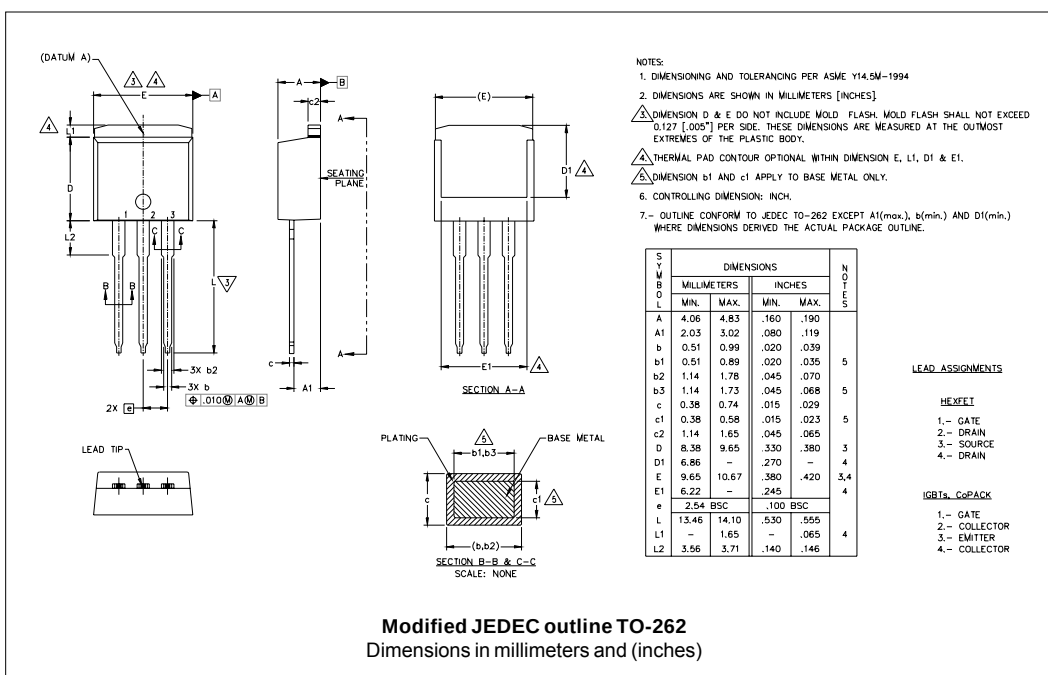
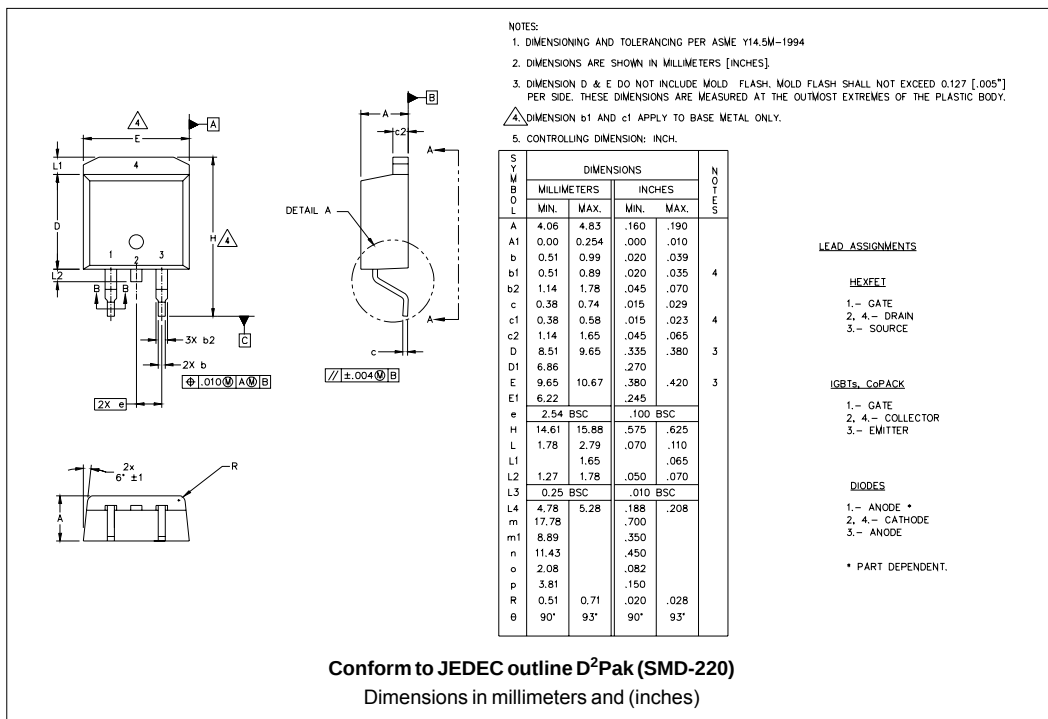


Fig. 8 - Unclamped Inductive Test Circuit

Outlines Table

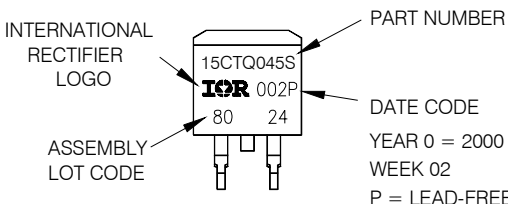


Part Marking Information

D²PAK

EXAMPLE: THIS IS A 15CTQ045S
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

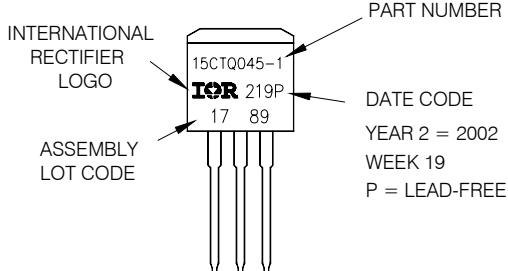
Note: "P" in assembly line position indicates "Lead-Free"



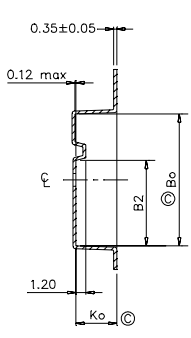
TO-262

EXAMPLE: THIS IS A 15CTQ045-1
LOT CODE 1789
ASSEMBLED ON WW 19, 2002

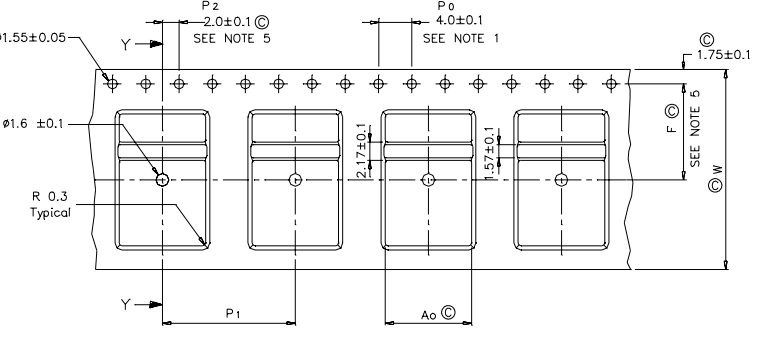
Note: "P" in assembly line position indicates "Lead-Free"



Tape & Reel Information



SECTION Y-Y



NOTES:

- 1.0 10 SPROCKET HOLE PITH CUMULATIVE TOLERANCE ±.02
- 2.0 CAMBER NOT TO EXCEED 1mm in 100mm
- 3.0 MATERIAL: CONDUCTIVE BLACK STYRENIC ALLOY
- 4.0 K₀ MEASURED FROM A PLANE ON THE INSIDE BOTTOM OF THE POCKET TO THE TOP SURFACE OF THE CARRIER
- 5.0 MEASURED FROM CENTRELINE OF SPROCKET HOLE TO CENTRELINE OF POCKET
- 6.0 VENDOR: (OPTIONAL)
- 7.0 MUST ALSO MEET REQUIREMENTS OF EIA STANDAR #EIA-481A TAPING OF SURFACE MOUNT COMPONENTS FOR AUTOMATIC PLACEMENT
- 8.0 SURFACE RESISTIVITY OF MOLDED MATL. MUST MEASURE LESS OR EQUAL TO 10⁸ OHMS PER SQUARE. MEASURED IN ACCORDANCE TO PROCEDURE GIVEN IN ASTM D-257 & ASTM D-991
- 9.0 TOTAL LENGTH PER REEL MUST BE 45 METERS
- 10.0 © CRITICAL

Ao	10.50	+/- 0.1
Bo	15.80	+/- 0.1
B2	10.25	+/- 0.1
Ko	4.90	+/- 0.1
F	11.50	+/- 0.1
P1	16.00	+/- 0.1
W	24.00	+/- 0.3

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code							
	15	C	T	Q	045	S	TRL PbF
	①	②	③	④	⑤	⑥	⑦ ⑧
1	-	Current Rating (15A)					
2	-	Circuit Configuration					
		C = Common Cathode					
3	-	T = TO-220					
4	-	Schottky "Q" Series					
5	-	Voltage Ratings					
6	-	- S = D²Pak -1= TO-262					
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					

035 = 35V

040 = 40V

045 = 45V

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