Bulletin PD-20834 rev. A 02/07

International
IOR Rectifier

43CTQ...GS
43CTQ...G-1

SCHOTTKY RECTIFIER

40 Amp

$I_{F(AV)}$ = 40 Amp
V_R = 80 - 100V

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	40	A
V_{RRM}		80 - 100	V
I_{FSM}	@ tp = 5 µs sine	850	A
V_F	@20 Apk, T_J = 125°C (per leg)	0.67	V
T_J	range	- 55 to 175	°C

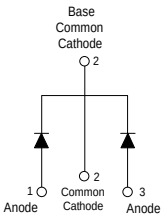
Description/ Features

This center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- 175° C T_J operation
- Center tap configuration
- 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

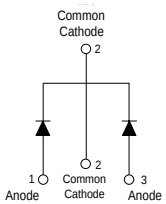
Case Styles

43CTQ...GS



D²PAK

43CTQ...G-1



TO-262

Voltage Ratings

Parameters		43CTQ080GS 43CTQ080G-1	43CTQ100GS 43CTQ100G-1
V_R	Max. DC Reverse Voltage (V)	80	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)		

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg)	20	A	50% duty cycle @ T_C = 135°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	40			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	850	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current (Per Leg) * See Fig. 7	275		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy (Per Leg)	7.50	mJ	T_J = 25 °C, I_{AS} = 0.50 Amps, L = 60 mH	
I_{AR}	Repetitive Avalanche Current (Per Leg)	0.50	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	Values	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.81	V	@ 20A	T_J = 25 °C
		0.98	V	@ 40A	
		0.67	V	@ 20A	T_J = 125 °C
		0.81	V	@ 40A	
I_{RM}	Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.36	mA	T_J = 25 °C	V_R = rated V_R
		13	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.71	V	T_J = T_J max.	
r_t	Forward Slope Resistance	0.43	mΩ		
C_T	Max. Junction Capacitance (Per Leg)	1480	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 < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 175	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 175	°C	
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Leg)		2.0	°C/W	DC operation
R_{thJC}	Max. Thermal Resistance Junction to Case (Per Package)		1.0	°C/W	DC operation
R_{thCS}	Typical Thermal Resistance, Case to Heatsink		0.50	°C/W	Mounting surface, smooth and greased (only for TO-220)
wt	Approximate Weight		2 (0.07)	g (oz.)	
T	Mounting Torque	Min.	6 (5)	Kg-cm (lbf-in)	
		Max.	12 (10)		
	Device Marking		43CTQ...GS		Case style D^2-Pak
			43CTQ...G-1		Case style TO-262

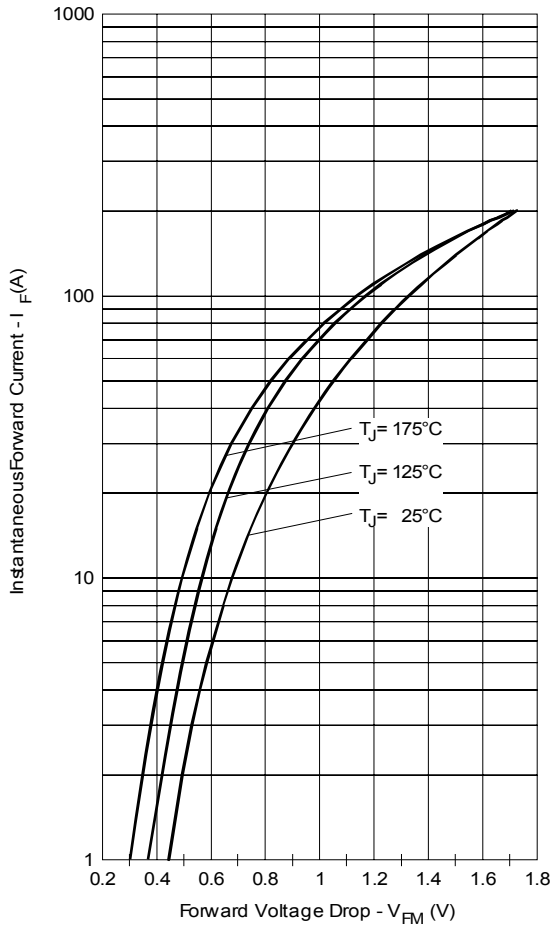


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

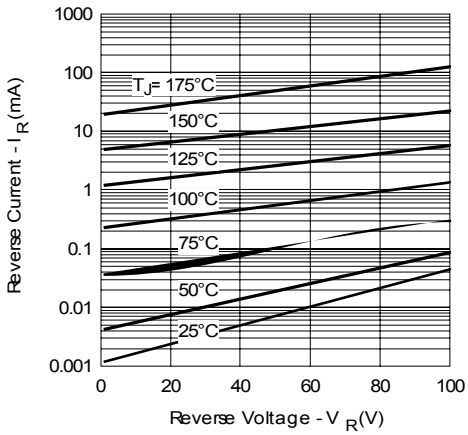


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

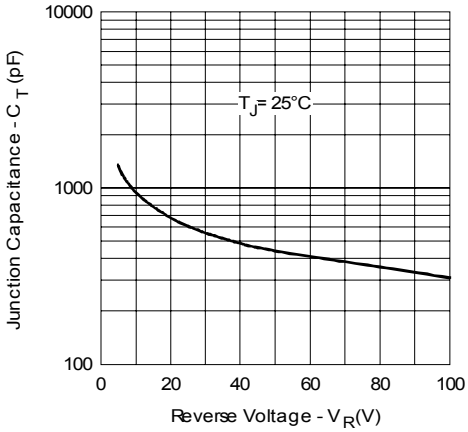


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

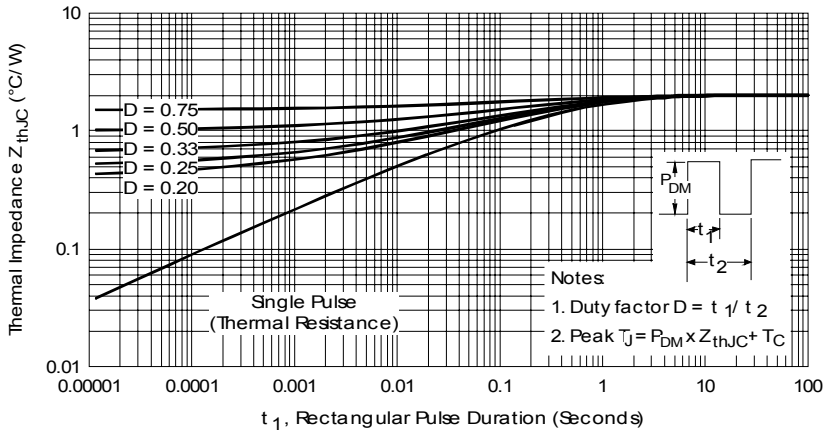


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

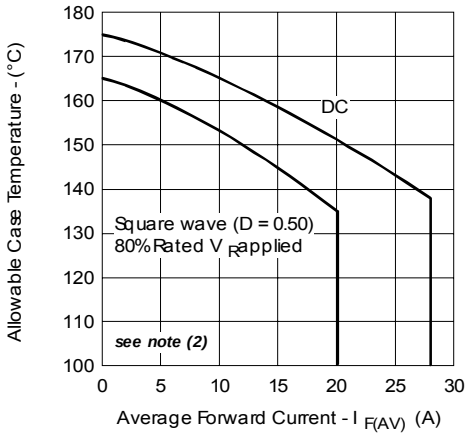


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

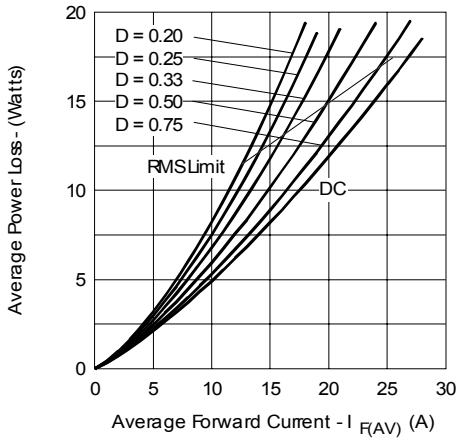


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

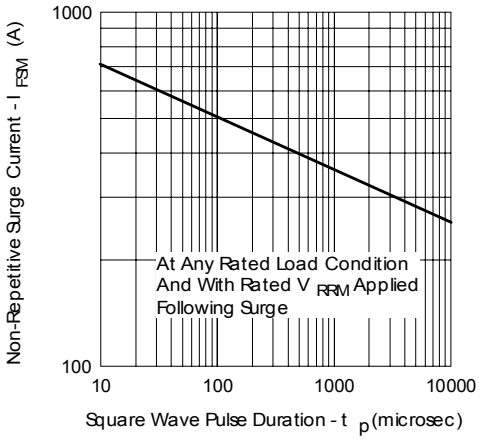


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

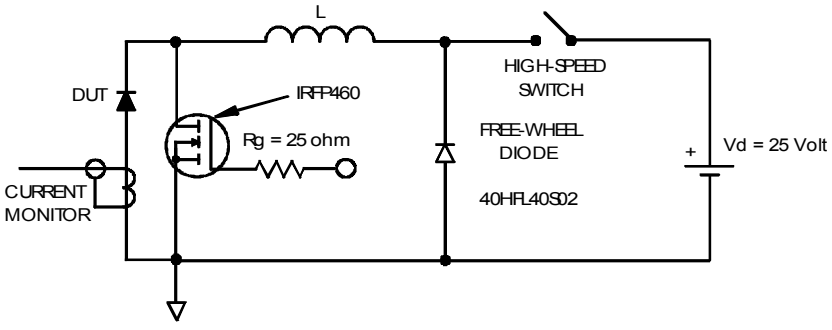
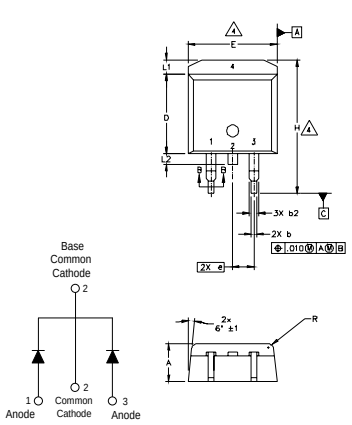


Fig. 8 - Unclamped Inductive Test Circuit

(2) 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. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 10\,V$

Outline Table



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M–1994
2. DIMENSIONS ARE SHOWN IN MILLIMETERS [INCHES].
3. DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.127 [.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
5. CONTROLLING DIMENSION: INCH.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	.160	.190	
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	4
b2	1.14	1.78	.045	.070	
c	0.38	0.74	.015	.029	
c1	0.38	0.58	.015	.023	4
c2	1.14	1.65	.045	.065	
D	8.51	9.65	.335	.380	3
D1	6.86		.270		
E	9.65	10.67	.380	.420	3
E1	6.22		.245		
e	2.54 BSC		.100 BSC		
H	14.61	15.88	.575	.625	
L	1.78	2.79	.070	.110	
L1		1.65		.065	
L2	1.27	1.78	.050	.070	
L3	0.25 BSC		.010 BSC		
L4	4.78	5.28	.188	.208	
m	17.78		.700		
m1	8.89		.350		
n	11.43		.450		
o	2.08		.082		
p	3.81		.150		
R	0.51	0.71	.020	.028	
θ	90°	93°	90°	93°	

LEAD ASSIGNMENTS

HEXFET
1.– GATE
2, 4.– DRAIN
3.– SOURCE

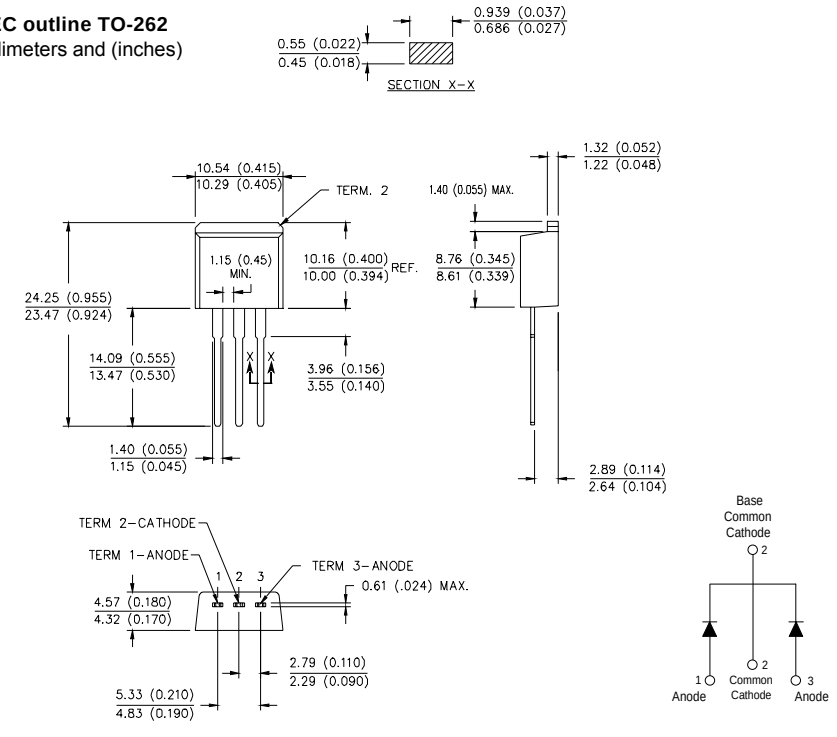
IGBTs, CoPACK
1.– GATE
2, 4.– COLLECTOR
3.– EMITTER

DIODES
1.– ANODE *
2, 4.– CATHODE
3.– ANODE

* PART DEPENDENT.

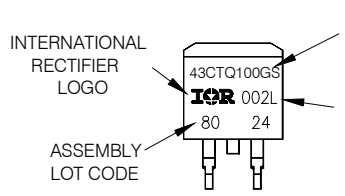
Conform to JEDEC outline D^2Pak (SMD-220)
Dimensions in millimeters and (inches)

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



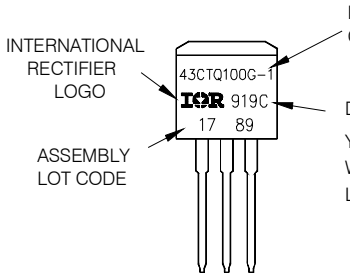
Part Marking Information

EXAMPLE: THIS IS A 43CTQ100GS
LOT CODE 8024
ASSEMBLED ON WW 02, 2000
IN THE ASSEMBLY LINE "L"



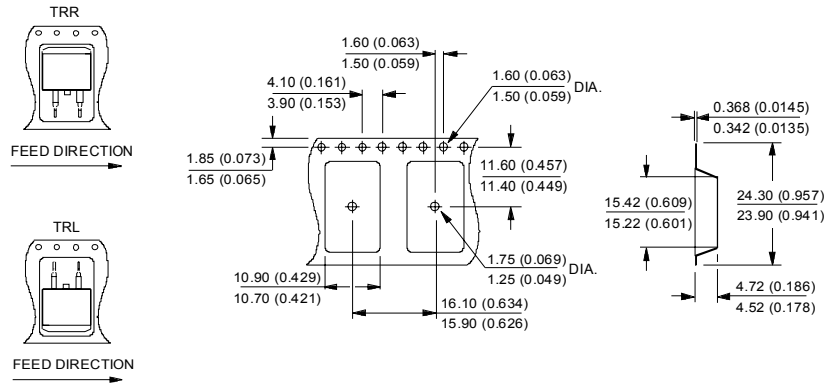
D^2PAK

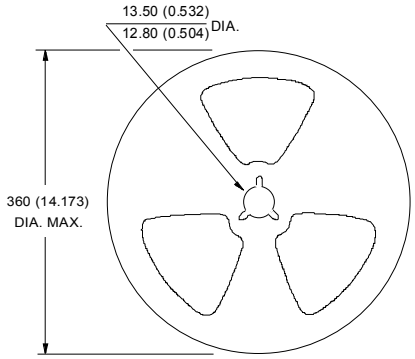
EXAMPLE: THIS IS A 43CTQ100G-1
LOT CODE 1789
ASSEMBLED ON WW 19, 1999
IN THE ASSEMBLY LINE "C"

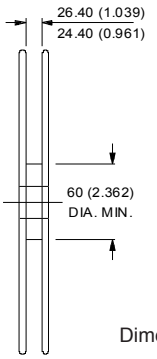


TO-262

Tape & Reel Information







SMD-220 Tape & Reel
When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 800 pieces per reel for both TRL and TRR.

Dimensions in millimeters and (inches)

Ordering Information Table

Device Code

43	C	T	Q	100	G	S	TRL	-
1	2	3	4	5	6	7	8	9

1 - Current Rating (40 = 40A)

2 - C = Common Cathode

3 - T = TO-220, TO-262, D^2Pak

4 - Q = Schottky Q Series

5 - Voltage Ratings
- 080 = 80V
- 100 = 100V

6 - G = Schottky Generation

7 -
- none = TO-220
- -1 = TO-262
- S = D^2Pak

8 -
- none = Tube (50 pieces)
- TRL = Tape & Reel (Left Oriented - for D^2Pak only)
- TRR = Tape & Reel (Right Oriented - for D^2Pak only)

9 -
- none = Standard Production
- PbF = Lead-Free (for D^2Pak tube and TO-262)
- P = Lead-Free (for D^2Pak TRL and TRR)

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
IOR Rectifier

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