

International IOR Rectifier

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

SCHOTTKY RECTIFIER

40 Amp

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

Major Ratings and Characteristics


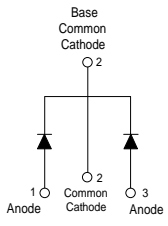

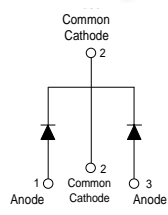
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	80-100	V
I_{FSM} @ tp = 5 μ s sine	850	A
V_F @ 20 Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.67	V
T_J range	-55 to 175	$^\circ\text{C}$

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	43CTQ...G-1
  D²PAK	  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 Current (Per Leg) * See Fig. 5 (Per Device)	20	A	50% duty cycle @ $T_C = 135^\circ\text{C}$, rectangular wave form
	40		
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	850	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse
	275		
E_{AS} Non-Repetitive Avalanche Energy (Per Leg)	7.50	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 0.50$ 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. $V_A = 1.5 \times V_R$ typical

Electrical Specifications

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

Thermal-Mechanical Specifications

Parameters	Values	Units	Conditions
T_J Max. Junction Temperature Range	-55 to 175	$^\circ\text{C}$	
T_{stg} Max. Storage Temperature Range	-55 to 175	$^\circ\text{C}$	
R_{thJC} Max. Thermal Resistance Junction to Case (Per Leg)	2.0	$^\circ\text{C}/\text{W}$	DC operation
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.0	$^\circ\text{C}/\text{W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C}/\text{W}$	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	

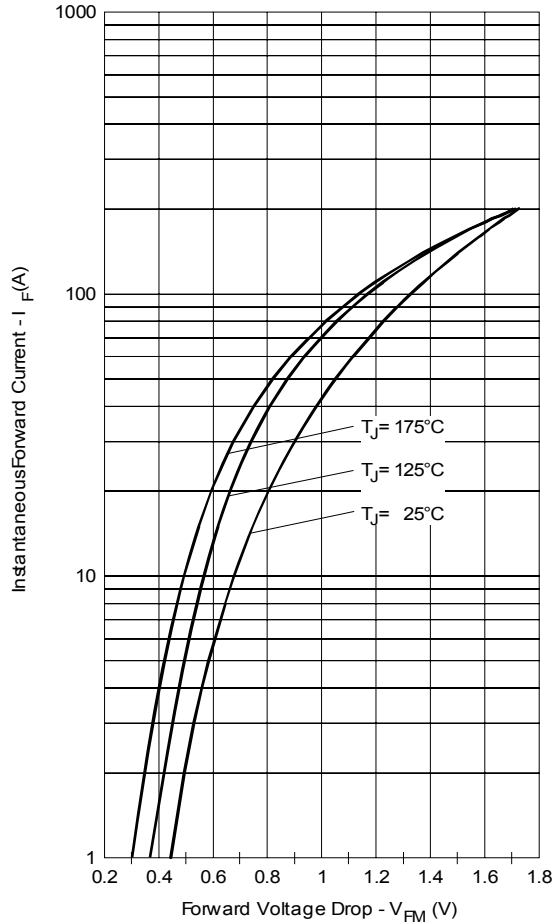


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

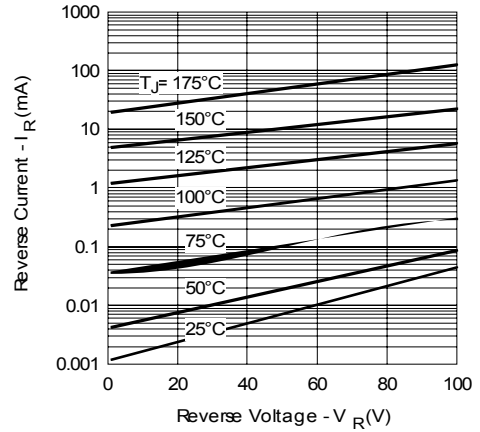


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

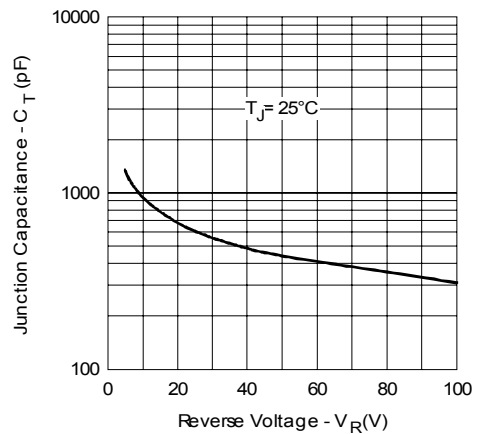


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

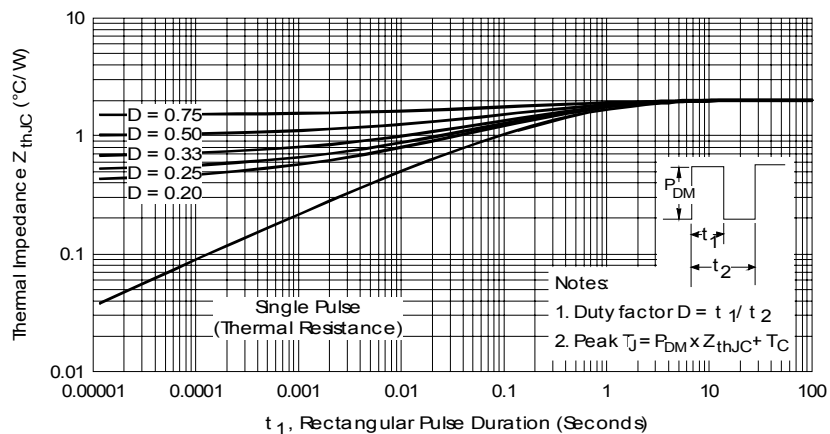


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

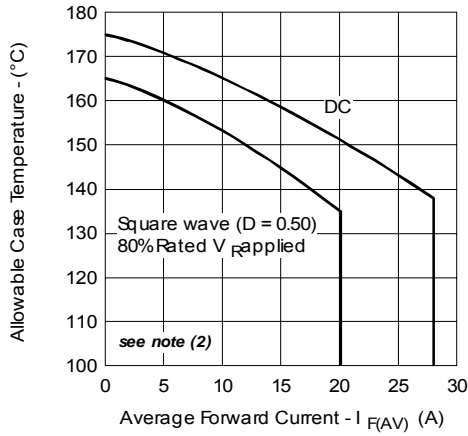


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

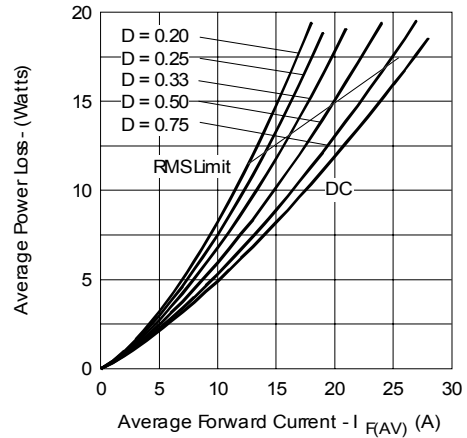


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

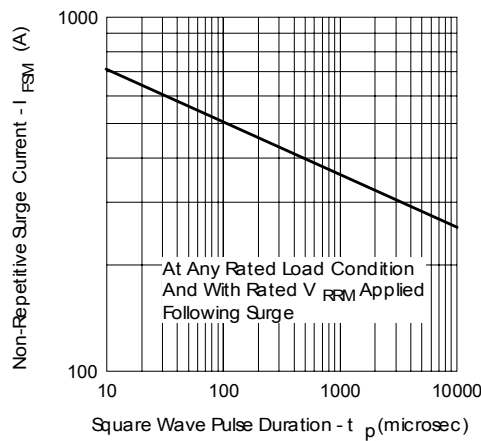


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

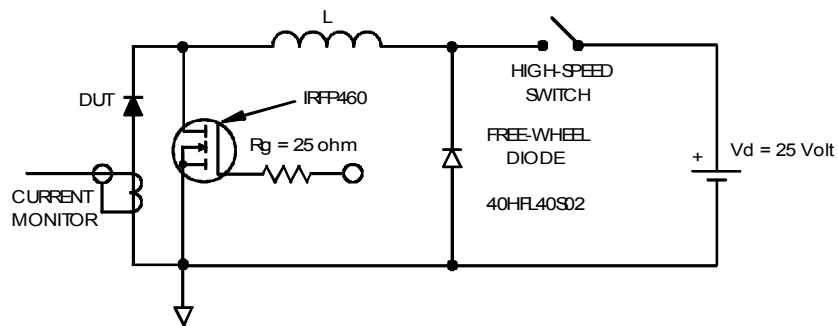


Fig. 8 - Unclamped Inductive Test Circuit

(2) Formula used: $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$

$Pd = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

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		
A	4.06	4.83	.160	.190	4
A1	0.00	0.254	.000	.010	
b	0.51	0.99	.020	.039	
b1	0.51	0.89	.020	.035	
b2	1.14	1.78	.045	.070	
c	0.38	0.74	.015	.029	
c1	0.38	0.58	.015	.023	
c2	1.14	1.65	.045	.065	
D	8.91	9.65	.355	.380	
D1	6.86	1.65	.270	.065	
E	9.65	10.67	.380	.420	
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	4
L3	0.25	BSC	.010	BSC	
L4	4.78	5.28	.188	.208	
m	17.78		.700		3
m1	8.89		.350		
n	11.43		.450		
o	2.08		.082		3
p	3.81		.150		
R	0.61	0.71	.020	.028	
θ	90°	93°	90°	93°	

LEAD ASSIGNMENTS

HEXFET
 1.- GATE
 2, 4.- GRAIN
 3.- SOURCE

IGBTs, COIPACK
 1.- GATE
 2, 4.- COLLECTOR
 3.- EMITTER

DIODES
 1.- ANODE +
 2, 4.- CATHODE
 3.- ANODE

* PART DEPENDENT.

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

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

SECTION X-X

0.939 (0.037)
 0.686 (0.027)

0.55 (0.022)
 0.45 (0.018)

10.54 (0.415)
 10.29 (0.405)

1.15 (0.45) MIN.

10.16 (0.400) REF.
 10.00 (0.394)

8.76 (0.345)
 8.61 (0.339)

1.40 (0.055) MAX.

1.32 (0.052)
 1.22 (0.048)

24.25 (0.955)
 23.47 (0.924)

14.09 (0.555)
 13.47 (0.530)

3.96 (0.156)
 3.55 (0.140)

1.40 (0.055)
 1.15 (0.045)

2.89 (0.114)
 2.64 (0.104)

4.57 (0.180)
 4.32 (0.170)

5.33 (0.210)
 4.83 (0.190)

2.79 (0.110)
 2.29 (0.090)

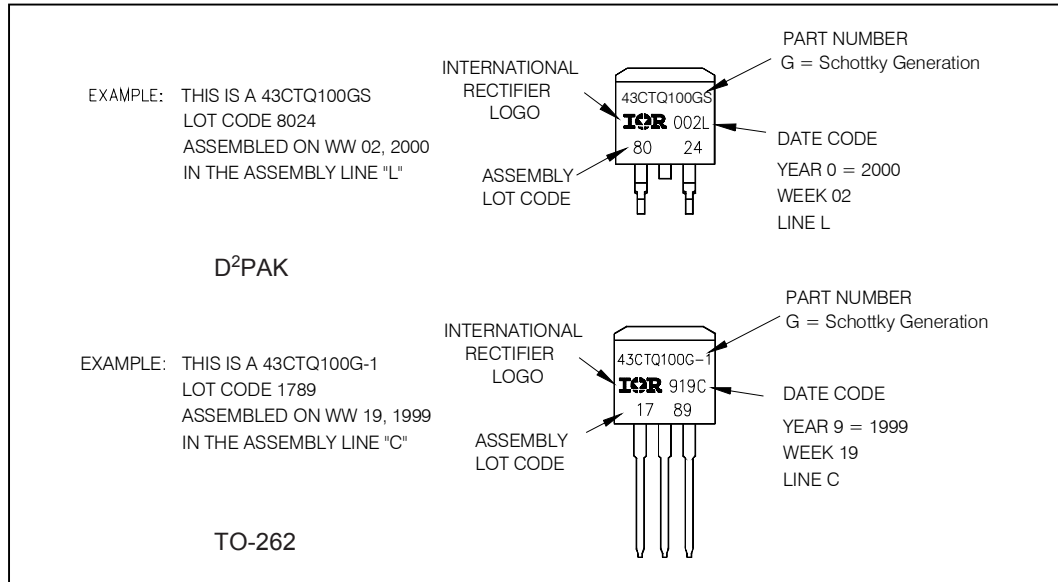
0.61 (.024) MAX.

TERM 2-CATHODE
 TERM 1-ANODE
 TERM 3-ANODE

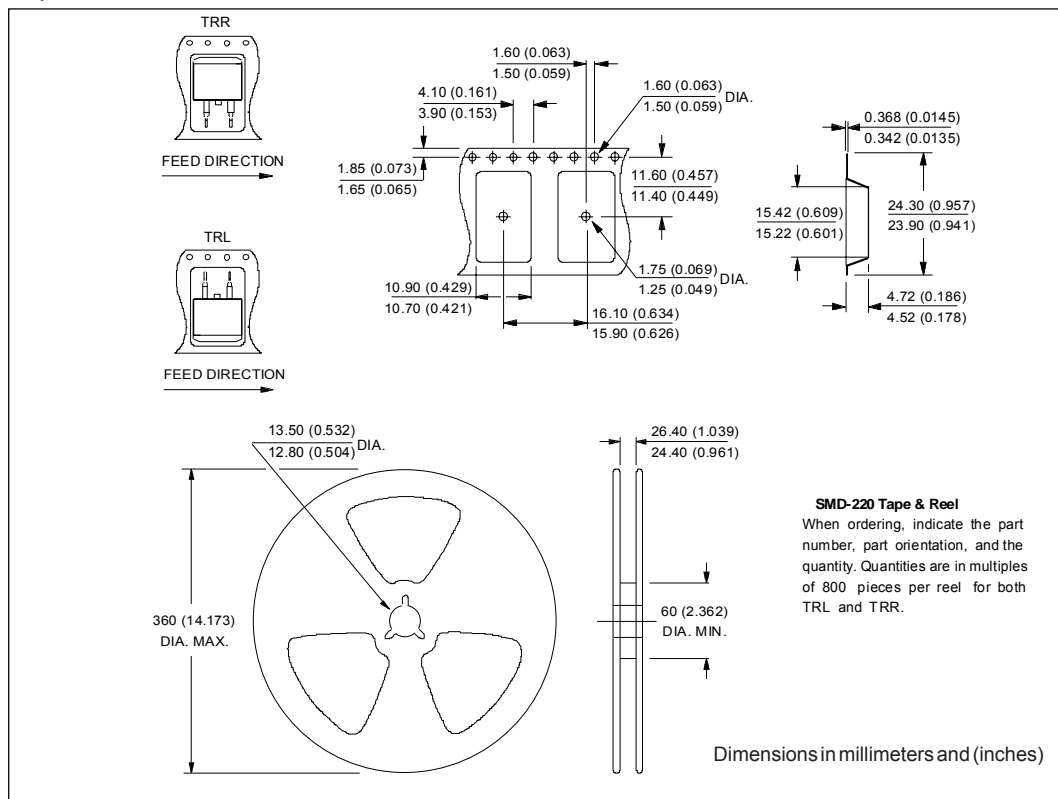
Base
 Common
 Cathode
 2

1 Anode
 2 Common
 Cathode
 3 Anode

Part Marking Information



Tape & Reel Information



Ordering Information Table

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

<p>1 - Current Rating (40 = 40A)</p> <p>2 - C = Common Cathode</p> <p>3 - T = TO-220, TO-262, D²Pak</p> <p>4 - Q = Schottky Q Series</p> <p>5 - Voltage Ratings</p> <p>6 - G = Schottky Generation</p> <p>7 -</p> <ul style="list-style-type: none"> • none = TO-220 • -1 = TO-262 • S = D²Pak <p>8 -</p> <ul style="list-style-type: none"> • none = Tube (50 pieces) • TRL = Tape & Reel (Left Oriented - for D²Pak only) • TRR = Tape & Reel (Right Oriented - for D²Pak only) <p>9 -</p> <ul style="list-style-type: none"> • none = Standard Production • PbF = Lead-Free (for D²Pak tube and TO-262) • P = Lead-Free (for D²Pak TRL and TRR) 	<table border="1" style="border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">080 = 80V</td> </tr> <tr> <td style="padding: 2px 5px;">100 = 100V</td> </tr> </table>	080 = 80V	100 = 100V
080 = 80V			
100 = 100V			

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.