Final PD-20685 rev. A 01/06

International
IOR Rectifier

16CTQ...G

SCHOTTKY RECTIFIER

16 Amp

$I_{F(AV)}$ = 16 Amp
V_R = 60/100V

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	16	A
V_{RRM}	60/ 100	V
I_{FSM} @ tp = 5 μs sine	650	A
V_F @8 Apk, T_J = 125°C (per leg)	0.58	V
T_J range	- 55 to 175	°C

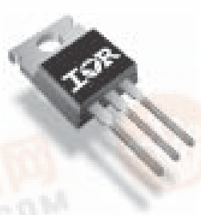
Description/ Features

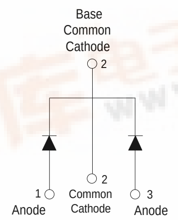
This center tap Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse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

16CTQ...G





TO-220

Voltage Ratings

	Parameters	16CTQ060G	16CTQ80G	16CTQ100G
V_R	Max. DC Reverse Voltage (V)	60	80	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)			

Absolute Maximum Ratings

	Parameters	16CTQ	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg)	8	A	50% duty cycle @ T_C = 148°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	16			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	650	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	210		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	16CTQ	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.72	V	@ 8A	T_J = 25 °C
	(Per Leg) * See Fig. 1 (1)	0.88	V	@ 16A	
		0.58	V	@ 8A	T_J = 125 °C
		0.69	V	@ 16A	
I_{RM}	Max. Reverse Leakage Current	0.28	mA	T_J = 25 °C	V_R = rated V_R
	(Per Leg) * See Fig. 2 (1)	7.0	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.415	V	T_J = T_J max.	
r_t	Forward Slope Resistance	11.07	mΩ		
C_T	Max. Junction Capacitance (Per Leg)	500	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		16CTQ	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 Juntion to Case	Per Leg	3.25	°C/W	DC operation * See Fig. 4
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)		
	Device Marking		16CTQ...G		

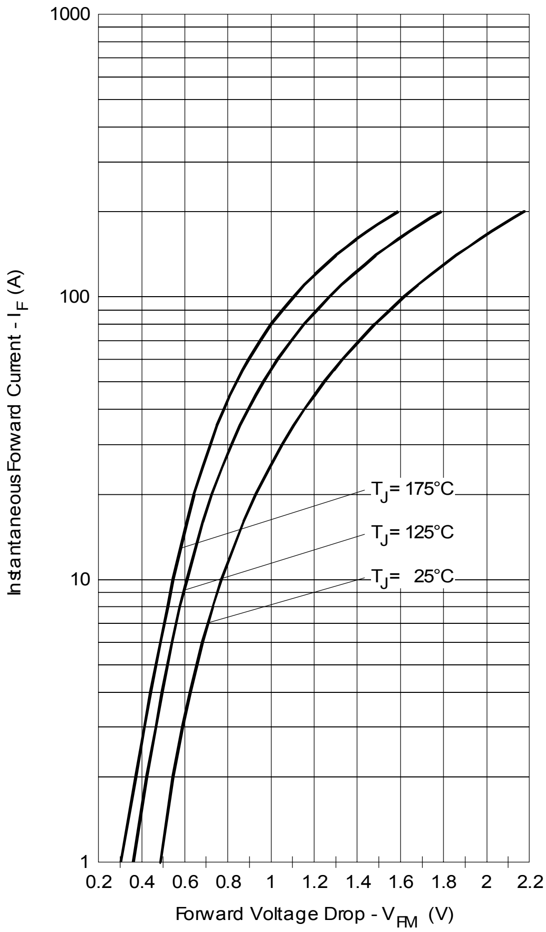


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

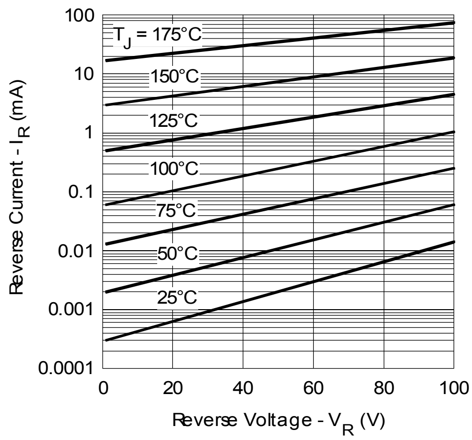


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

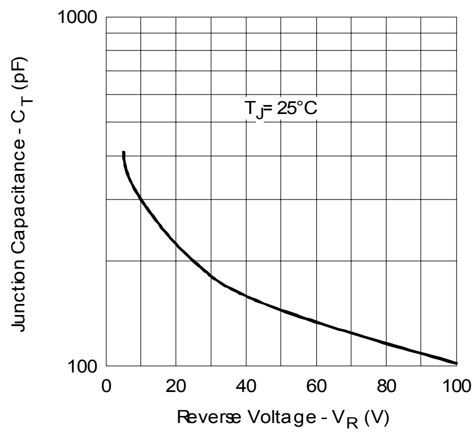


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

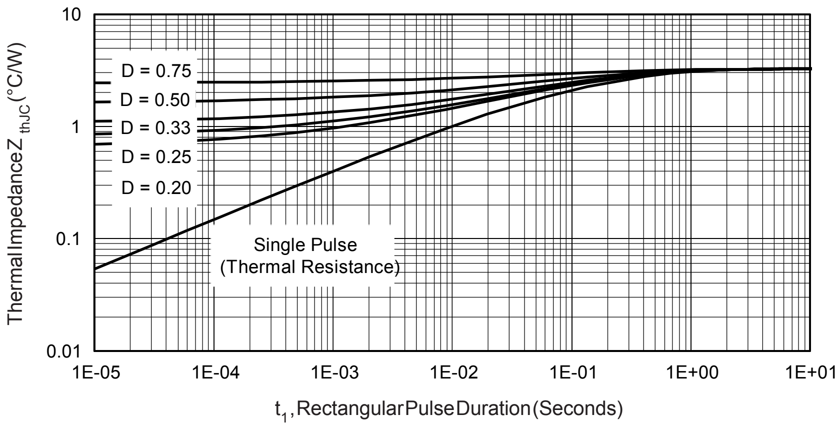


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

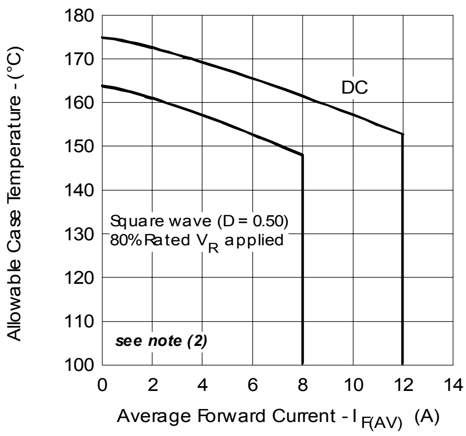


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

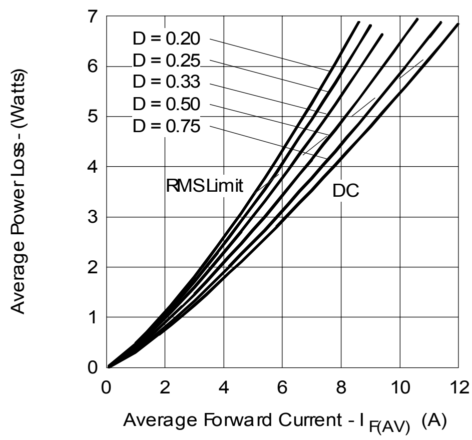


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

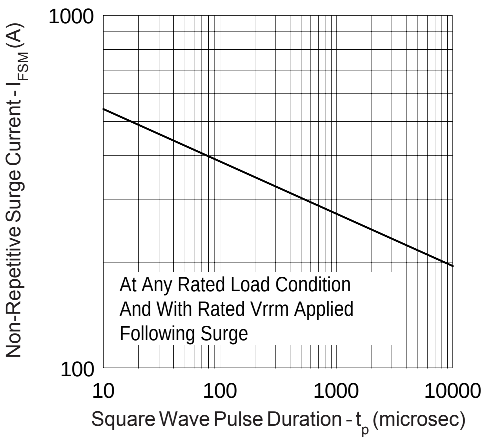


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

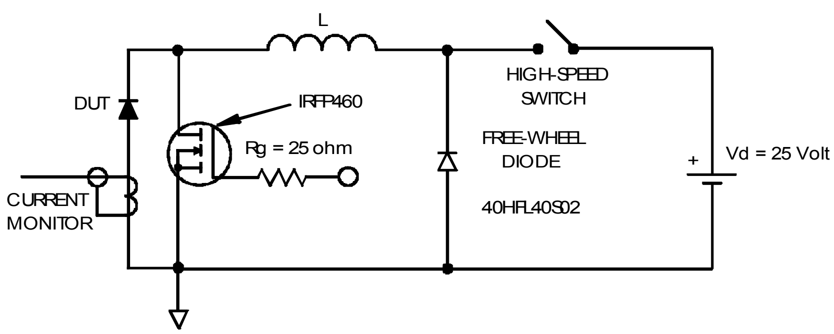
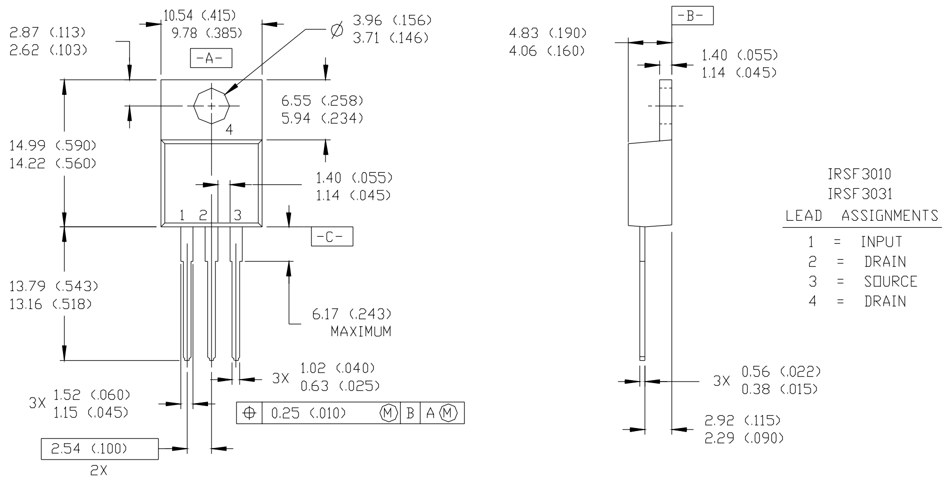


Fig. 8 - Unclamped Inductive Test Circuit

(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



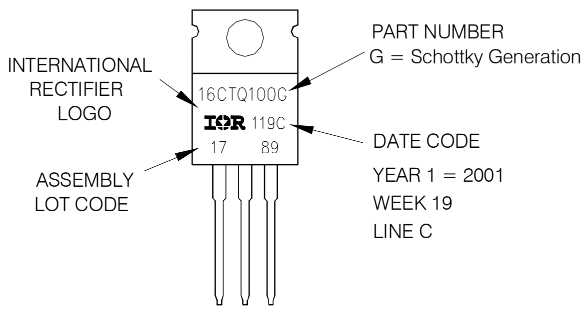
NOTES:

1. DIMENSIONING & TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).

Conform to JEDEC outline TO-220AB
Dimensions in millimeters and (inches)

Part Marking Information

EXAMPLE: THIS IS A 16CTQ100G
LOT CODE 1789
ASSEMBLED ON WW 19, 2001
IN THE ASSEMBLY LINE "C"



Ordering Information Table

Device Code

16	C	T	Q	100	G	-
1	2	3	4	5	6	7

1 - Current Rating (16 = 16A)
2 - C = Common Cathode
3 - T = TO-220
4 - Q = Schottky Q Series
5 - Voltage Ratings (060 = 60V; 080 = 80V; 100 = 100V)
6 - G = Schottky Generation
7 - • none = Standard Production
  • PbF = Lead-Free

Tube Standard Pack Quantity : 50 pieces

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16CTQ100
*********************************************
* SPICE Model Diode                         *
*********************************************
.SUBCKT 16CTQ100 ANO CAT
D1 ANO 1 DMOD (0.07089)
*Define diode model
.MODEL DMOD D(IS=21.21E-06,N=1.578,Rs=7.804E-03,Ikf=0.9497, Xti=2, Eg=1.11
+ Cjo=1.278E-09, M=0.4736, Vj=0.4972, Fc=0.5, Isr =1.114e-21, Nr=4.755,
+ Bv=119.9, Ibv=215.5E-06, Tt=18.2E-09)
*********************************************

.ENDS 16CTQ100

Thermal Model Subcircuit
.SUBCKT 16CTQ100  5 1

CTHERM1    5    4    1.45E+00
CTHERM2    4    3    4.54E+00
CTHERM3    3    2    1.09E+01
CTHERM4    2    1    1.01E+02

RTHERM1    5    4    2.49E+00
RTHERM2    4    3    5.20E-04
RTHERM1    3    2    5.43E-01
RTHERM1    2    1    3.05E-02

.ENDS 16CTQ100
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International IOR Rectifier

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