

International IOR Rectifier

16CTQ... 16CTQ...S 16CTQ...-1

SCHOTTKY RECTIFIER

16 Amp

Major Ratings and Characteristics




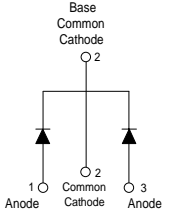
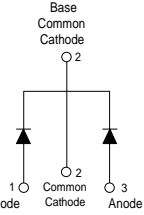
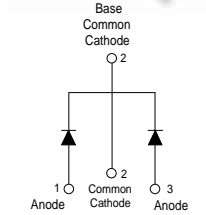
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	16	A
V_{RRM}	60/100	V
I_{FSM} @ tp = 5 μ s sine	850	A
V_F @ 8Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.58	V
T_J range	-55 to 175	$^\circ\text{C}$

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 $^\circ\text{C}$ 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 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...	16CTQ...S	16CTQ...-1
		
<p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-220</p>	<p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>D²PAK</p>	<p>Base Common Cathode</p>  <p>1 Anode 2 Common Cathode 3 Anode</p> <p>TO-262</p>

Voltage Ratings

Parameters	16CTQ060 16CTQ060S 16CTQ060-1	16CTQ80 16CTQ80S 16CTQ80-1	16CTQ100 16CTQ100S 16CTQ100-1
V_R Max. DC Reverse Voltage (V)	60	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)	8	A	50% duty cycle @ $T_C = 148^\circ\text{C}$, rectangular wave form
	16		
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
	275		10ms Sine or 6ms Rect. pulse
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)	0.72	V	@ 8A
	0.88	V	@ 16A
	0.58	V	@ 8A
	0.69	V	@ 16A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	0.55	mA	$T_J = 25^\circ\text{C}$
	7.0	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.415	V	$T_J = T_J$ max.
r_t Forward Slope Resistance	11.07	m Ω	
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 (Rated V_R)	10000	V/ μs	

(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)	3.25	$^\circ\text{C/W}$	DC operation
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.63	$^\circ\text{C/W}$	DC operation
R_{thCS} Typical Thermal Resistance, Case to Heatsink	0.50	$^\circ\text{C/W}$	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)	

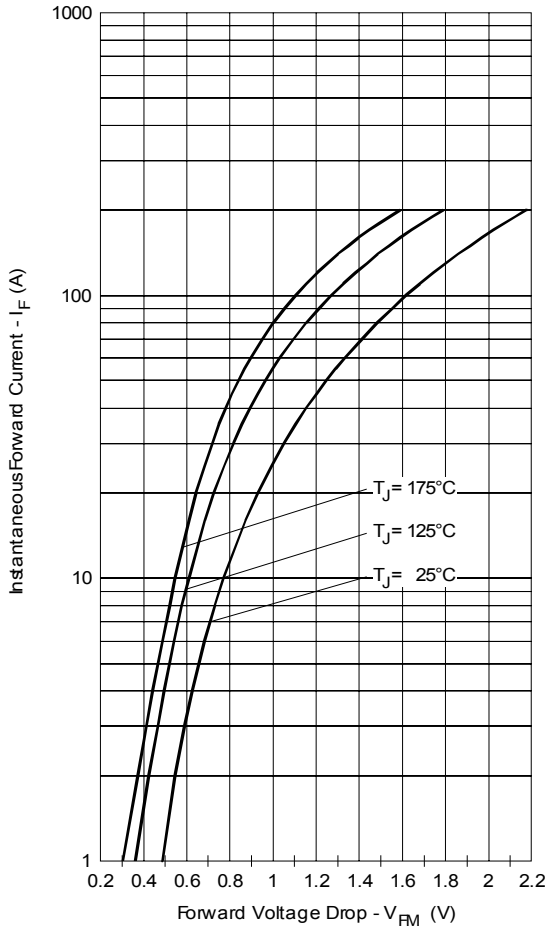


Fig. 1- Max. Forward Voltage Drop Characteristics (PerLeg)

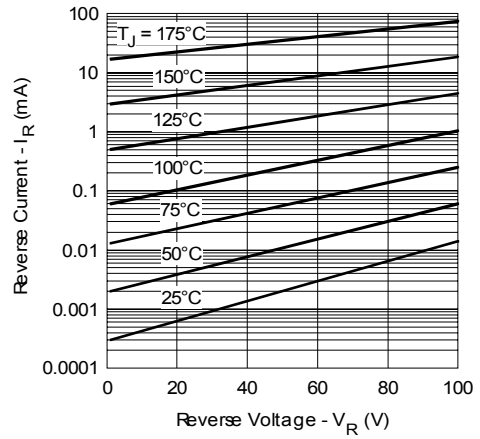


Fig. 2- Typical Values Of Reverse Current Vs. Reverse Voltage (PerLeg)

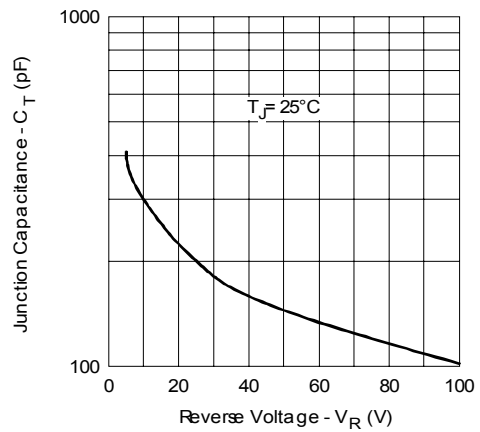


Fig. 3- Typical Junction Capacitance Vs. Reverse Voltage (PerLeg)

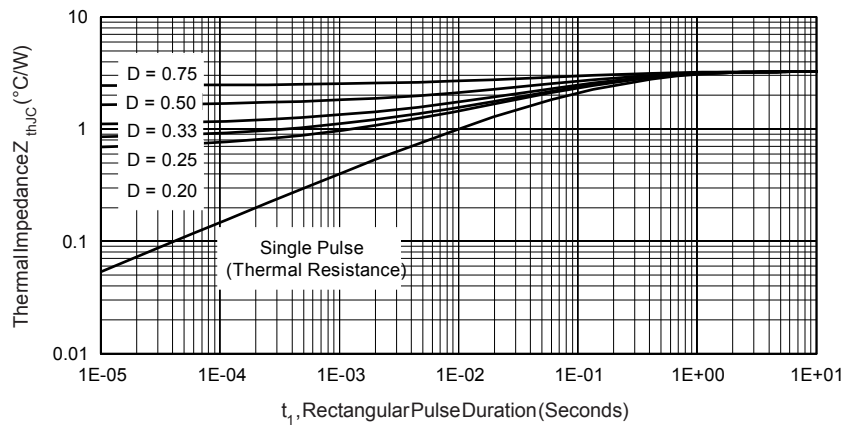


Fig. 4- Max. Thermal Impedance Z_{thJC} Characteristics (PerLeg)

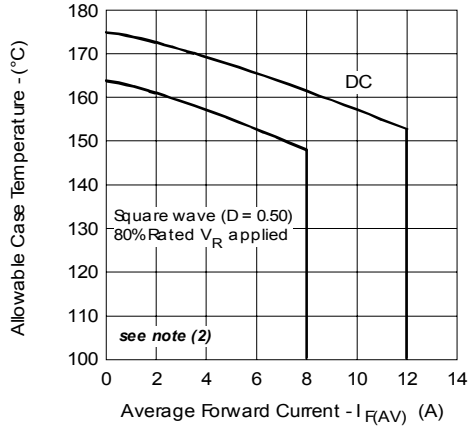


Fig. 5- Max. Allowable Case Temperature Vs. Average Forward Current (PerLeg)

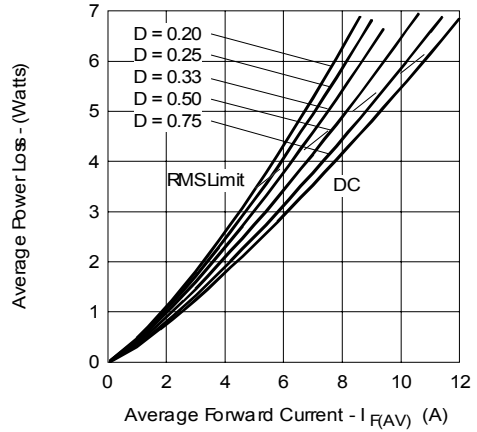


Fig. 6- Forward Power Loss Characteristics (PerLeg)

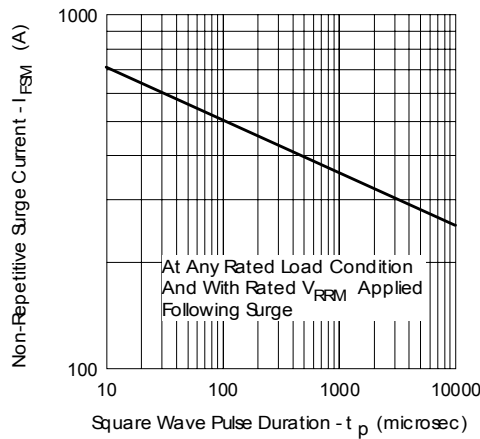


Fig. 7- Max. Non-Repetitive Surge Current (PerLeg)

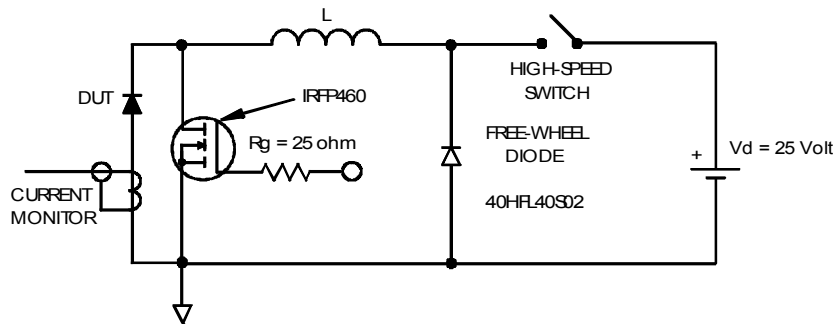


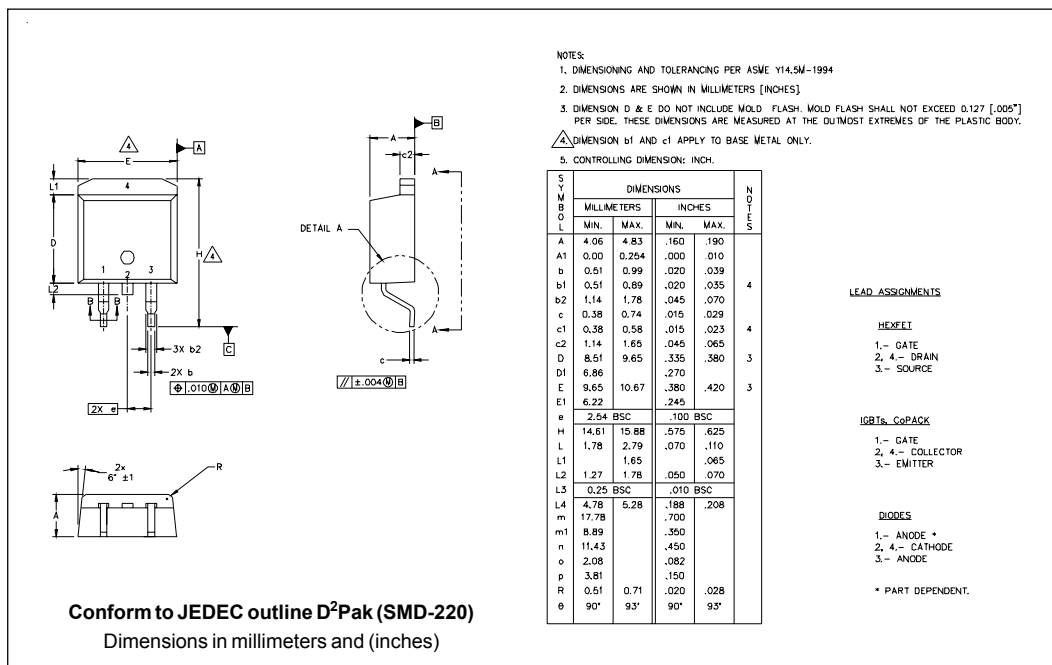
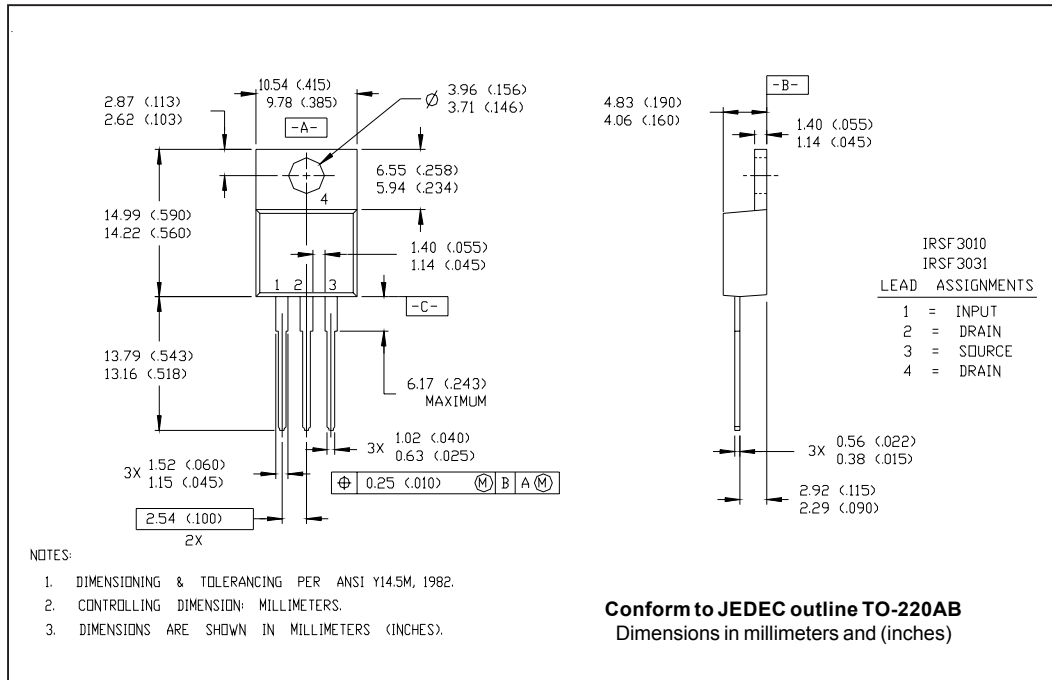
Fig. 8- Unclamped Inductive Test Circuit

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

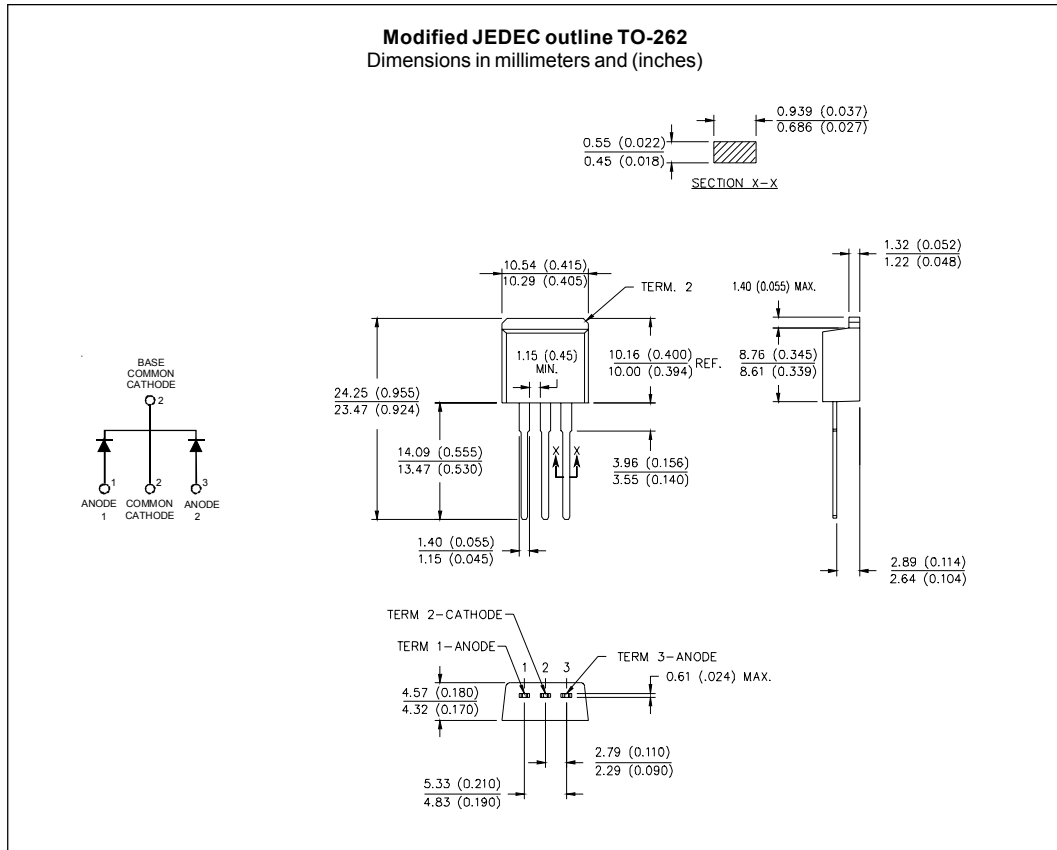
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R applied

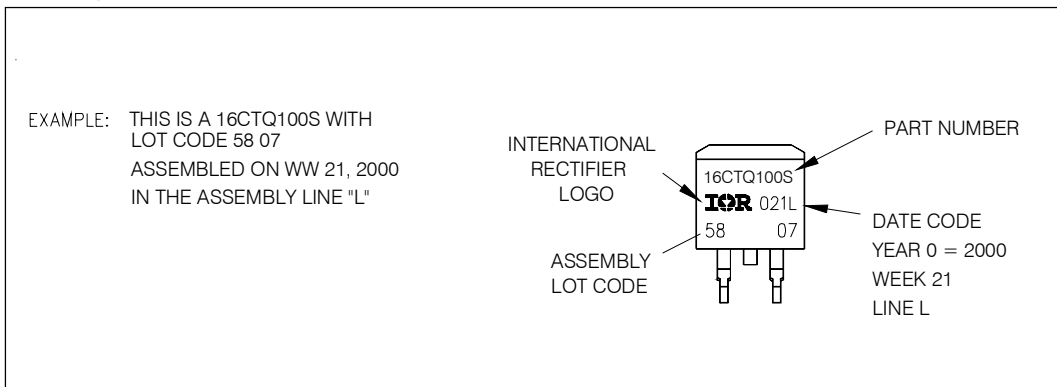
Outline Table



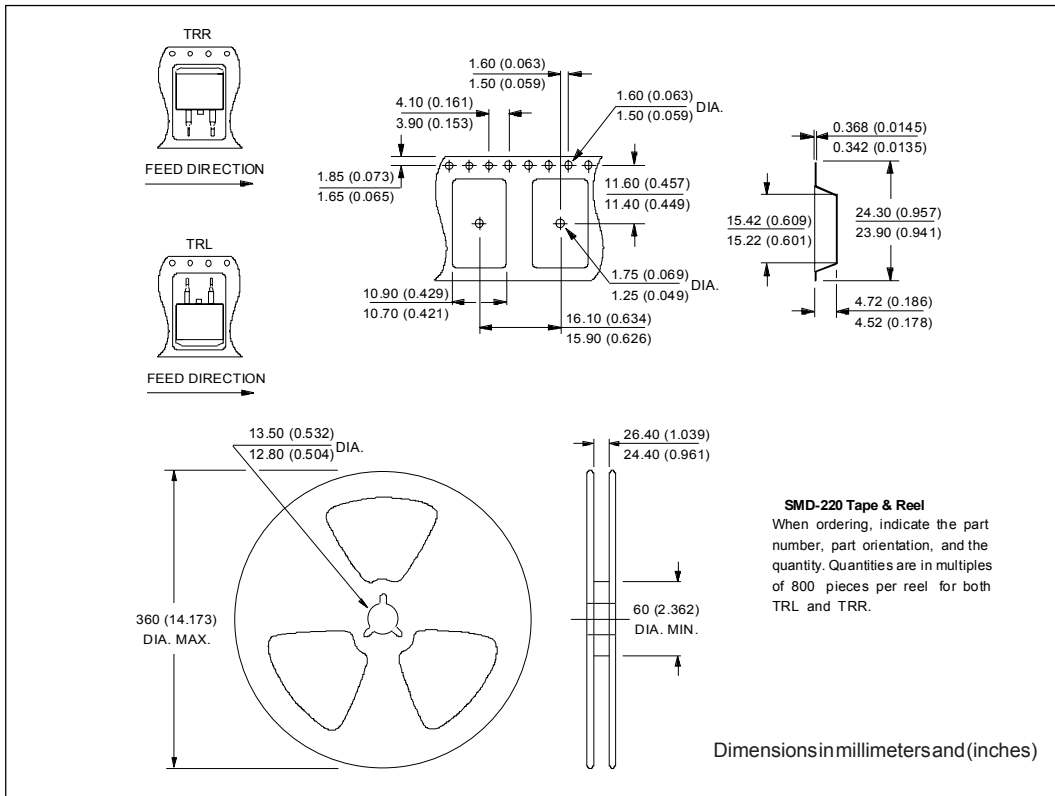
Outline Table



Marking Information



Tape & Reel Information



Ordering Information Table

Device Code									
16	C	T	Q	100	-1	-			
①	②	③	④	⑤	⑥	⑦			
1	- Current Rating (16 = 16A)								
2	- Common Cathode								
3	- T = TO-220								
4	- Q = Schottky Q Series								
5	- Voltage Ratings								
6	- S = D ² Pak								
	- -1 = TO-262								
7	- • none = Standard Production								
	- • PbF = Lead-Free								
	<table border="1" style="margin-left: auto;"> <tr> <td>060 = 60V</td> </tr> <tr> <td>080 = 80V</td> </tr> <tr> <td>100 = 100V</td> </tr> </table>						060 = 60V	080 = 80V	100 = 100V
060 = 60V									
080 = 80V									
100 = 100V									
	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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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.