

International IOR Rectifier

43CTQ... 43CTQ...S 43CTQ...-1

SCHOTTKY RECTIFIER

40 Amp

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

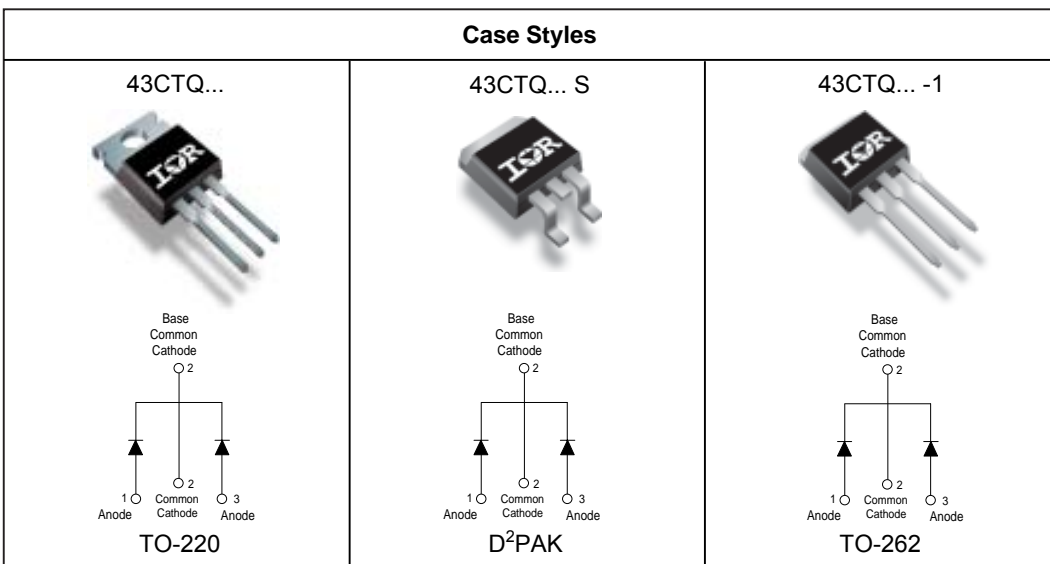
Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	40	A
V_{RRM}	80 - 100	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ 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



Voltage Ratings

Parameters	43CTQ080 43CTQ080S 43CTQ080-1	43CTQ100 43CTQ100S 43CTQ100-1
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) Current * 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 Following any rated load condition and with rated V_{RRM} applied
	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 $T_J = 25^\circ\text{C}$
	0.98	V	@ 40A
	0.67	V	@ 20A $T_J = 125^\circ\text{C}$
	0.81	V	@ 40A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	1	mA	$T_J = 25^\circ\text{C}$
	11	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.71	V	$T_J = T_J \text{ max.}$
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 (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)	2.0	$^\circ\text{C/W}$	DC operation
R_{thJC} Max. Thermal Resistance Junction to Case (Per Package)	1.0	$^\circ\text{C/W}$	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)	

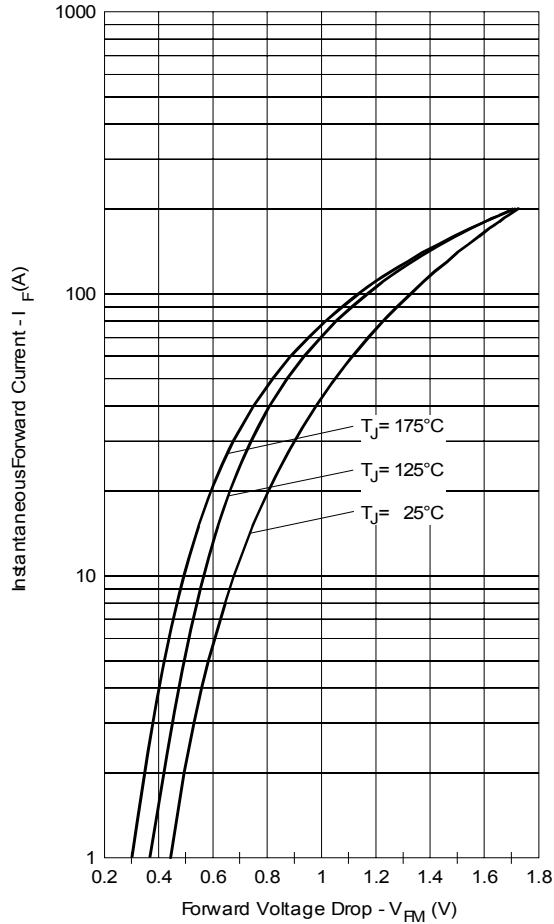


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

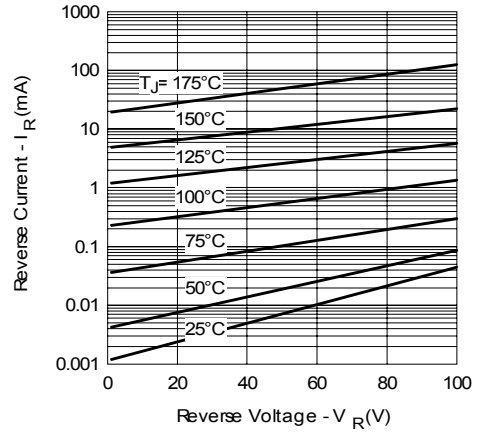


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

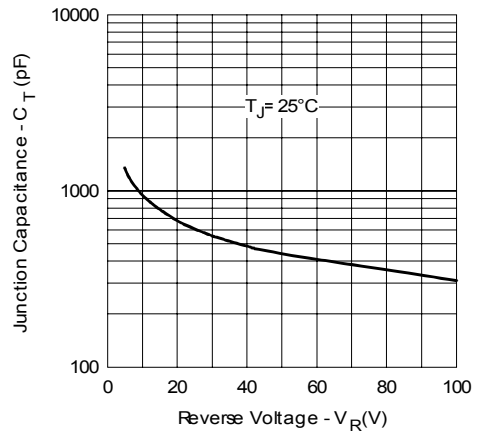


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

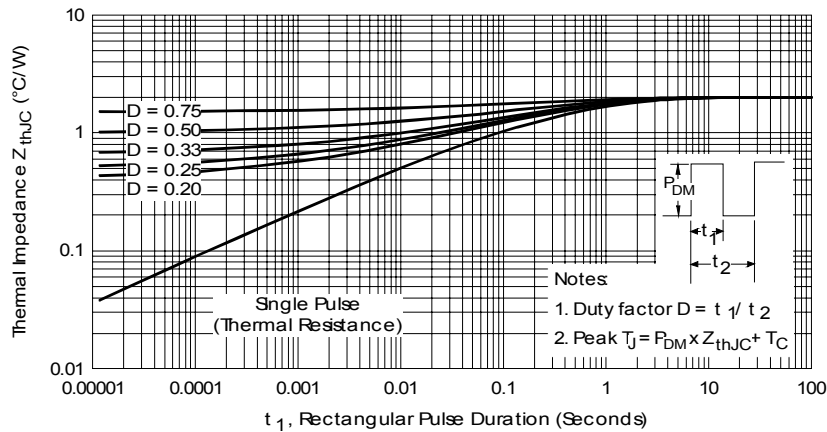


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

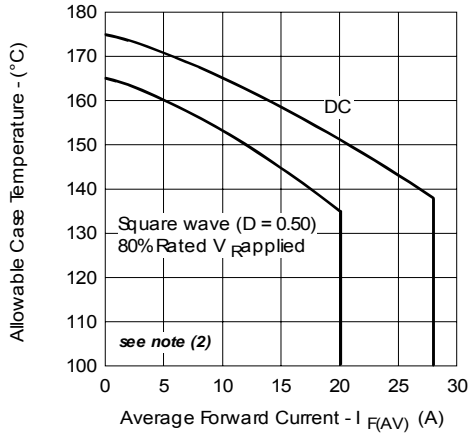


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

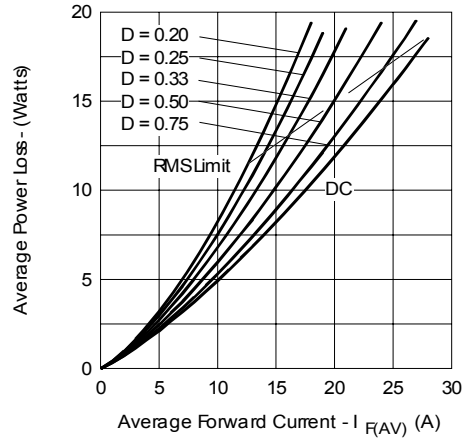


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

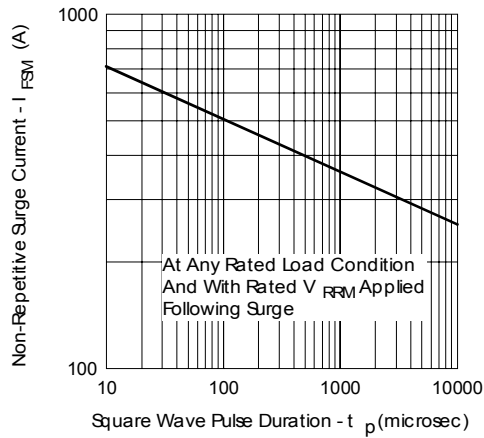


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

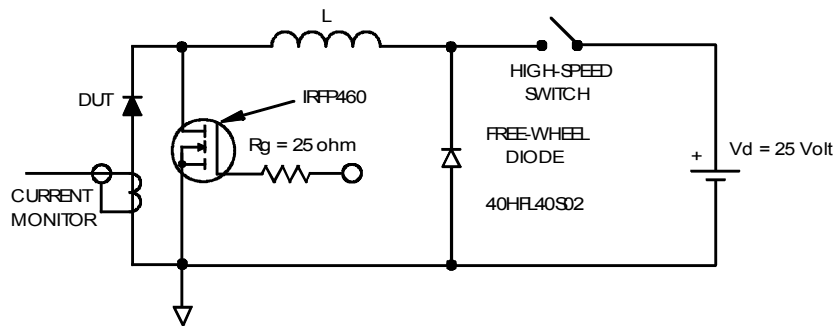


Fig. 8 - Unclamped Inductive Test Circuit

(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 = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 10V$

Outline Table

NOTE:
 1- DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M-1994
 2- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS]
 3- LEAD DIMENSION AND FROM UNIDENTIFIED IN L1
 4- DIMENSION D, DI & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .007 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
 5- DIMENSION b1, b2 & c1 APPLY TO BASE METAL ONLY.
 6- CONTROLLING DIMENSION: INCHES
 7- THERMAL PAD CONTROL OPTIONAL. IF THIS DIMENSION L4/L2 & E1
 8- DIMENSION E2 IS HI DEFINE A DIM. WHERE CHANGING AND INSULATION, IRREGULARITIES ARE ALLOWED.
 9- OUTLINE CONFORMS TO JEDEC TO-220 (EXCEPT A2) AND D2 (MIL) WHERE DIMENSIONS ARE DERIVED FROM THE ACTUAL PACKAGE OUTLINE.

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	5.56	4.83	.140	.190	
A1	0.51	1.40	.020	.055	
A2	2.03	2.92	.080	.115	
b	0.36	1.01	.015	.040	
b1	0.38	0.87	.015	.038	5
b2	1.14	1.78	.045	.070	
b3	1.14	1.73	.045	.068	5
c	0.36	0.61	.014	.024	
c1	0.36	0.56	.014	.022	
D	14.22	16.51	.560	.650	4
DI	6.36	8.02	.250	.305	
D2	11.68	12.88	.460	.507	7
E	8.65	10.67	.380	.420	4, 7
E1	6.06	8.89	.270	.350	7
E2	-	0.76	-	.030	6
e	2.54 BSC	-	.100 BSC	-	
h	5.84	6.86	.230	.270	7, 8
L	12.70	14.13	.500	.560	
L1	-	6.35	-	.250	
MP	2.54	4.06	.139	.161	
Q	2.54	3.42	.100	.135	

LEAD ASSIGNMENTS
 1- GATE
 2- COLLECTOR
 3- EMITTER

IGBTs, CoPACK
 1- GATE
 2, 4- COLLECTOR
 3- EMITTER

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

* PART DEPENDENT.

Conform to JEDEC outline TO-220AB

NOTE:
 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 [0.005"] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
 4. DIMENSION b1 AND c1 APPLY TO BASE METAL ONLY.
 5. CONTROLLING DIMENSION: INCH.

SYMBOL	MILLIMETERS		INCHES		NOTES
	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	
m1	17.78	-	.700	-	
n1	8.89	-	.350	-	
n	11.43	-	.450	-	
o	2.08	-	.082	-	
p	3.81	-	.150	-	
R	0.51	0.71	.020	.028	
e	90°	93°	90°	93°	

LEAD ASSIGNMENTS
 1- GATE
 2, 4- COLLECTOR
 3- EMITTER

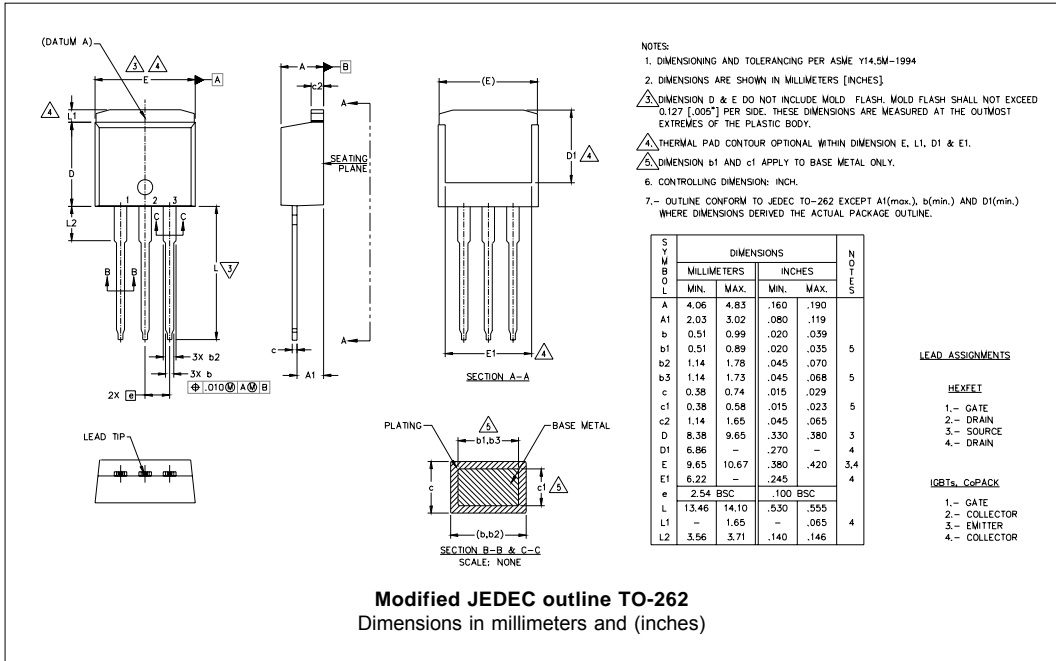
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DIODES
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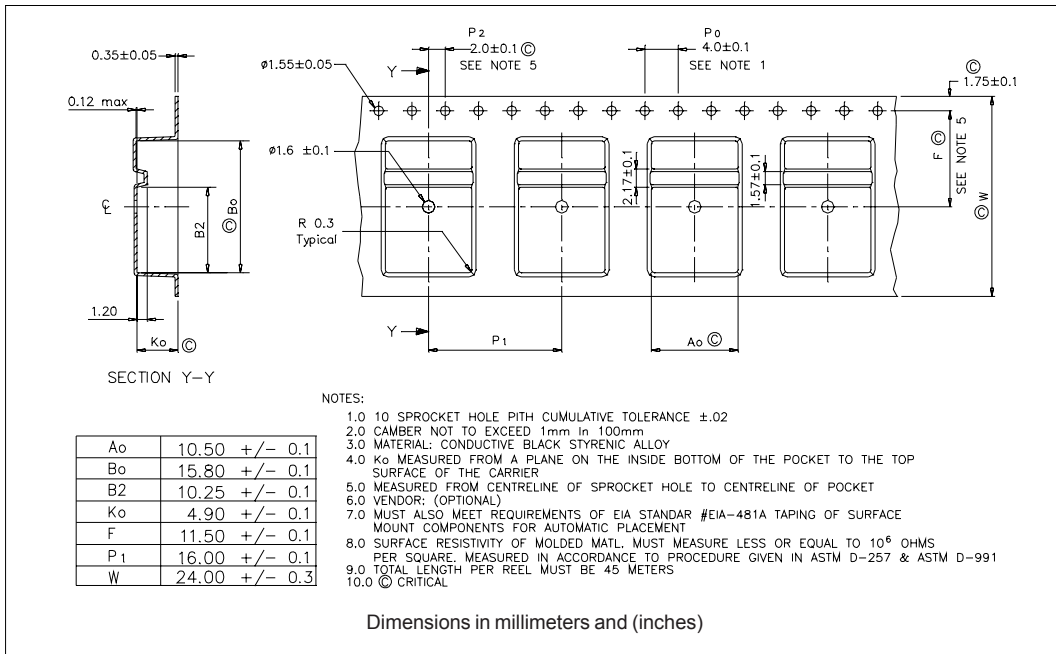
* PART DEPENDENT.

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

Outline Table



Tape & Reel Information



Part Marking Information

<p>TO-220</p>	<p>EXAMPLE: THIS IS A 43CTQ100 LOT CODE 1789 ASSEMBLED ON WW 19, 2000 IN THE ASSEMBLY LINE "C"</p>		<p>PART NUMBER DATE CODE YEAR 0 = 2000 WEEK 19 LINE C</p>
<p>D²PAK</p>	<p>EXAMPLE: THIS IS A 43CTQ100S LOT CODE 8024 ASSEMBLED ON WW 02, 2003 IN ASSEMBLY LINE "C"</p>		<p>PART NUMBER DATE CODE YEAR 3 = 2003 WEEK 02 LINE C</p>
<p>TO-262</p>	<p>EXAMPLE: THIS IS A 43CTQ100-1 LOT CODE 1789 ASSEMBLED ON WW 19, 2002 IN ASSEMBLY LINE "C"</p>		<p>PART NUMBER DATE CODE YEAR 2 = 2002 WEEK 19 LINE C</p>

Ordering Information Table

Device Code	
43	C
T	Q
100	S
TRL	-
①	②
③	④
⑤	⑥
⑦	⑧
1	- Current Rating (40A)
2	- Circuit Configuration C = Common Cathode
3	- T = TO-220
4	- Schottky "Q" Series
5	- Voltage Ratings
6	- • S = D ² Pak • -1= TO-262
7	- • none = Tube (50 pieces) • TRL = Tape & Reel (Left Oriented - for D ² Pak only) • TRR = Tape & Reel (Right Oriented - for D ² Pak only)
8	- • none = Standard Production • PbF = Lead-Free

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.