

International IOR Rectifier

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

SCHOTTKY RECTIFIER

40 Amp

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

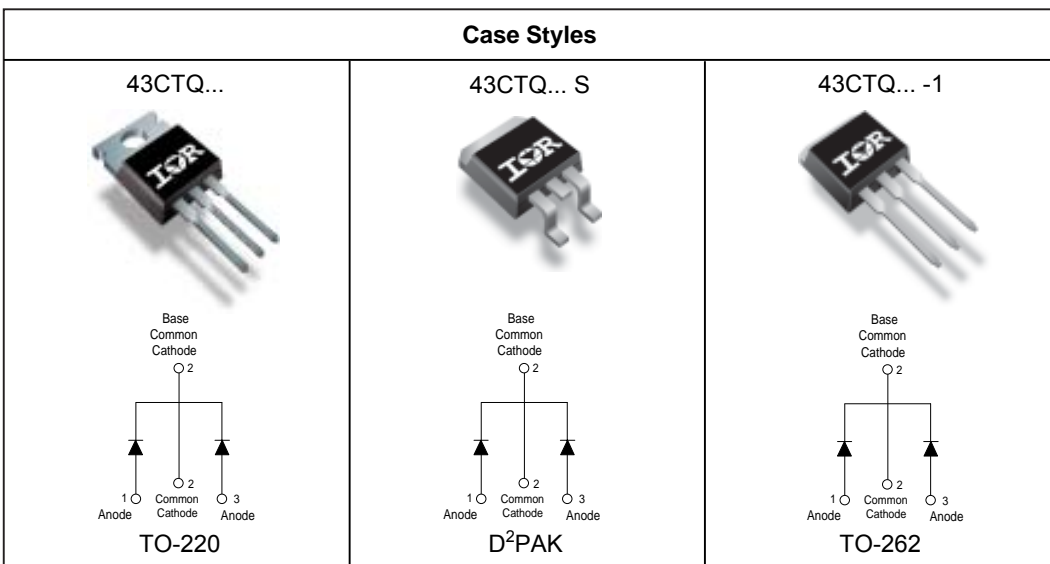
Major Ratings and Characteristics

| Characteristics | Values | Units |
|---|------------|------------------|
| $I_{F(AV)}$ Rectangular waveform | 40 | A |
| V_{RRM} | 80 - 100 | V |
| I_{FSM} @ tp = 5 μs 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 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 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 | $T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$ |
| | 11 | mA | $T_J = 125^\circ\text{C}$ |
| $V_{F(TO)}$ 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) | |

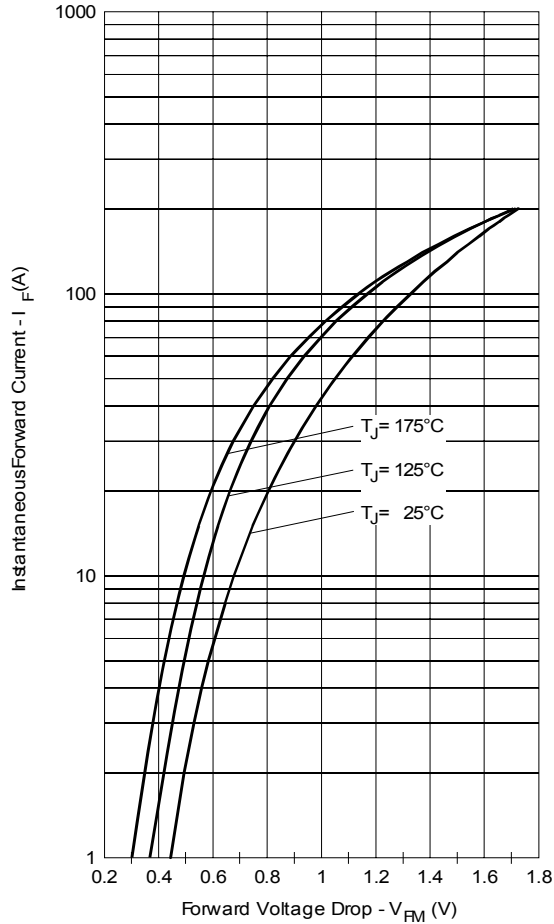


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

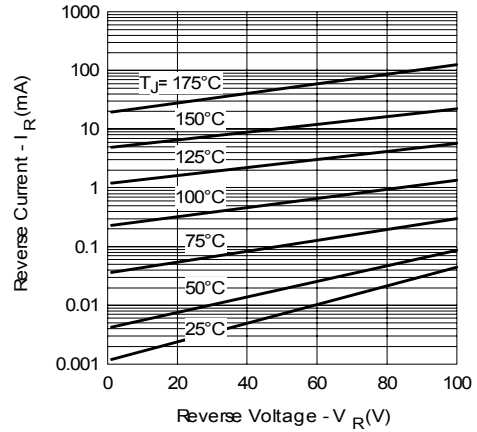


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

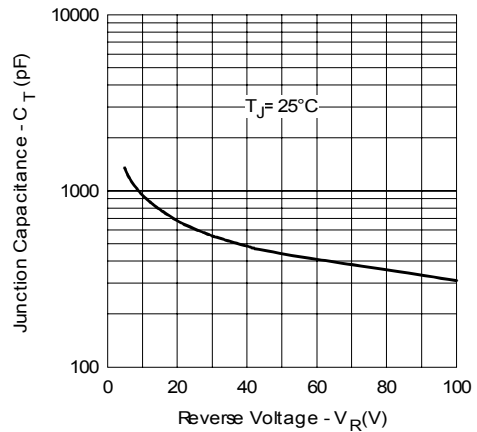


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

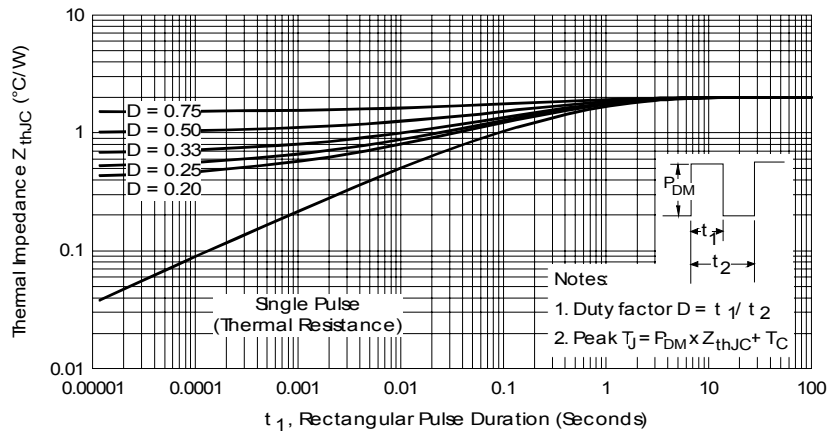


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

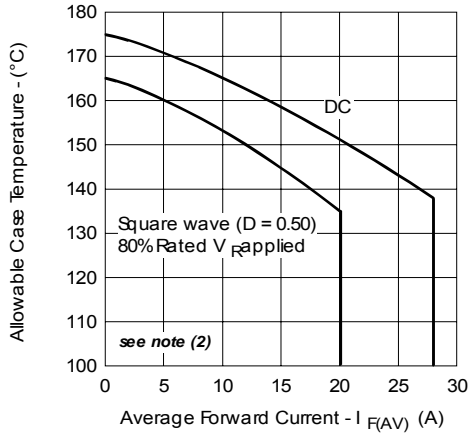


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

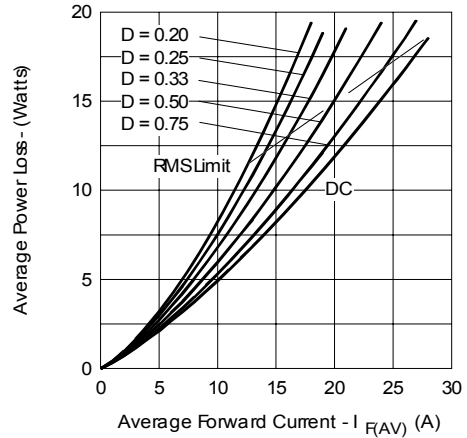


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

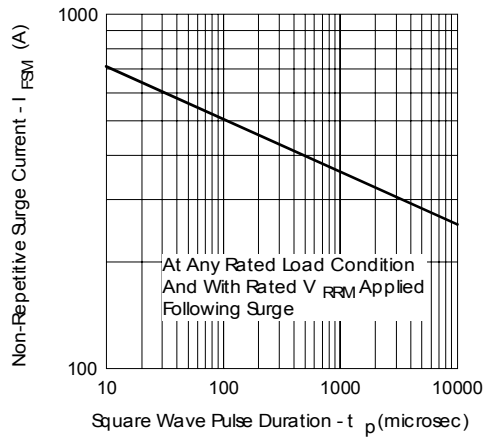


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

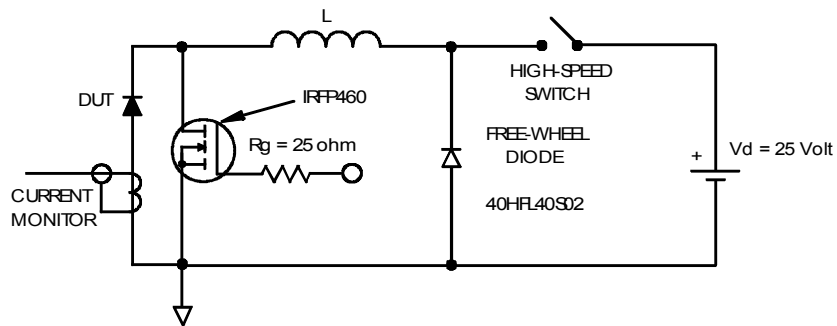


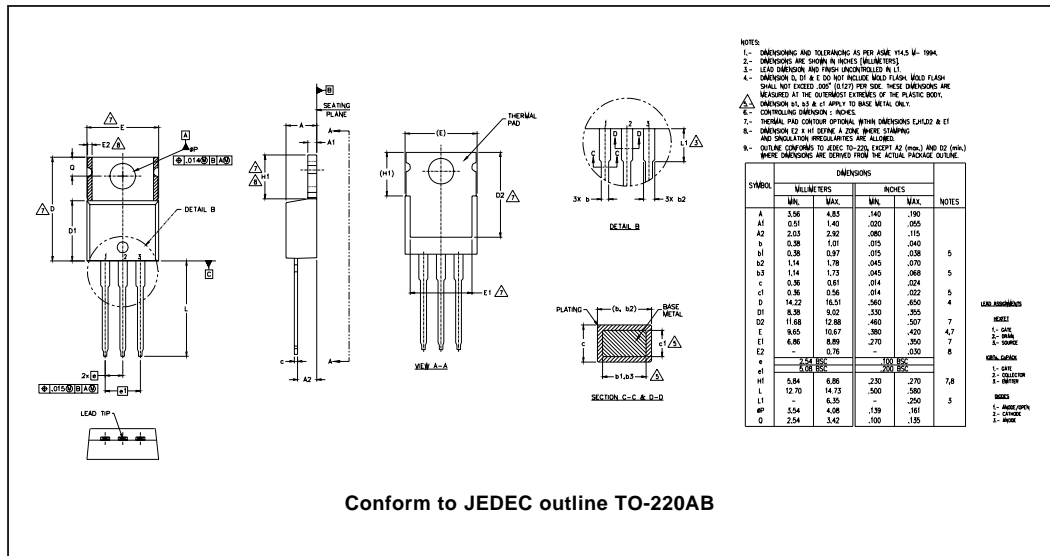
Fig. 8 - Unclamped Inductive Test Circuit

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

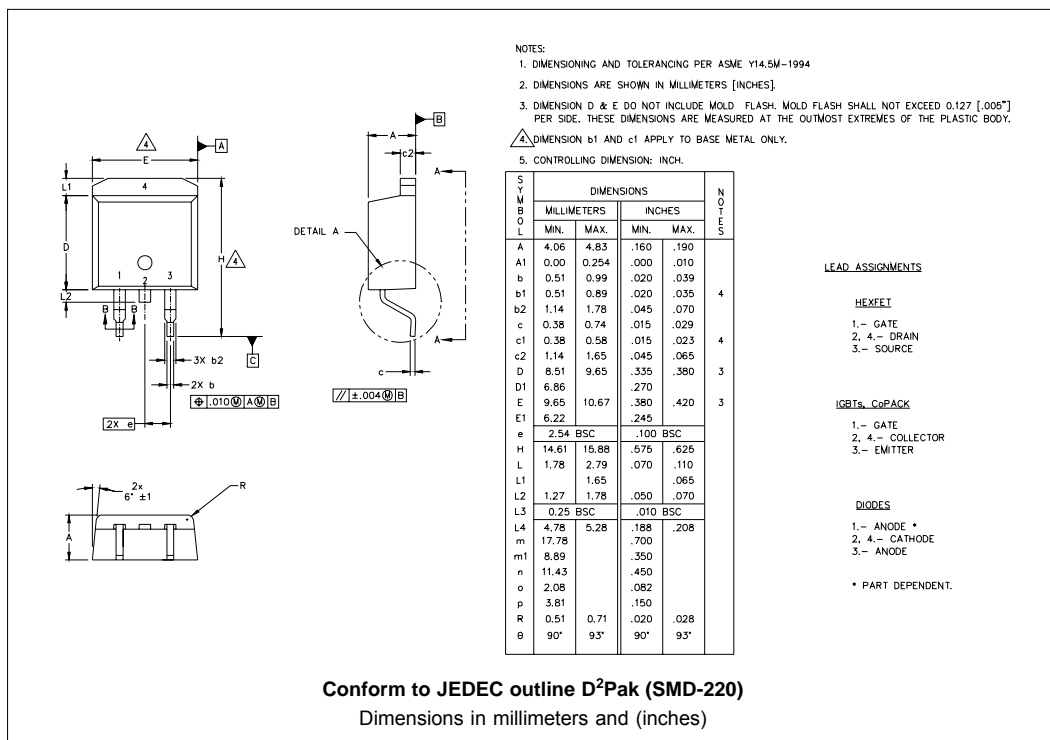
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

Outline Table

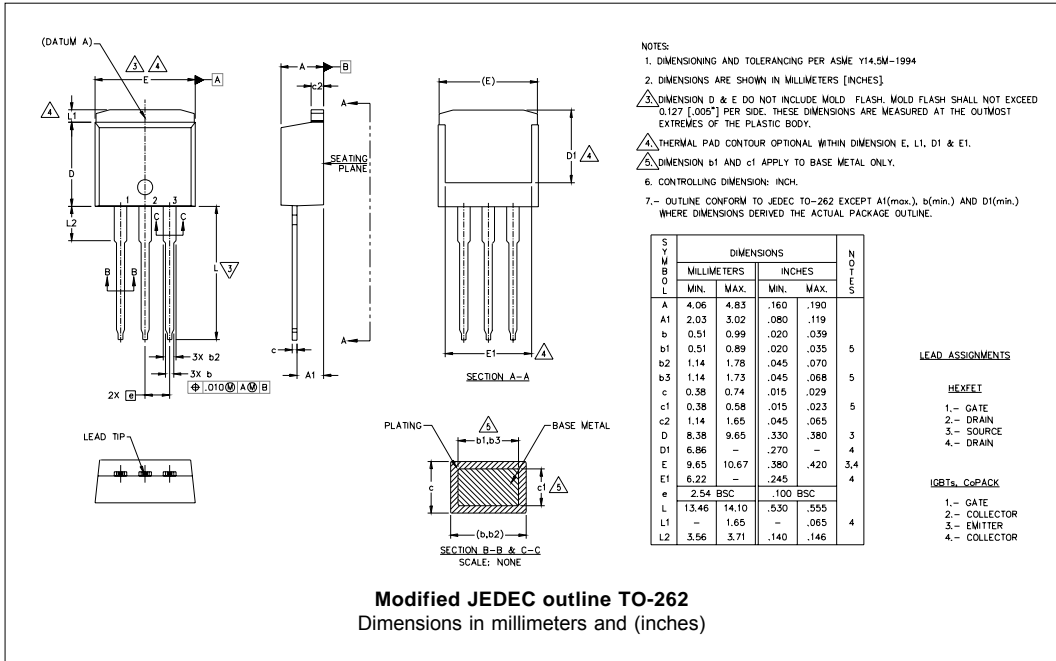


Conform to JEDEC outline TO-220AB

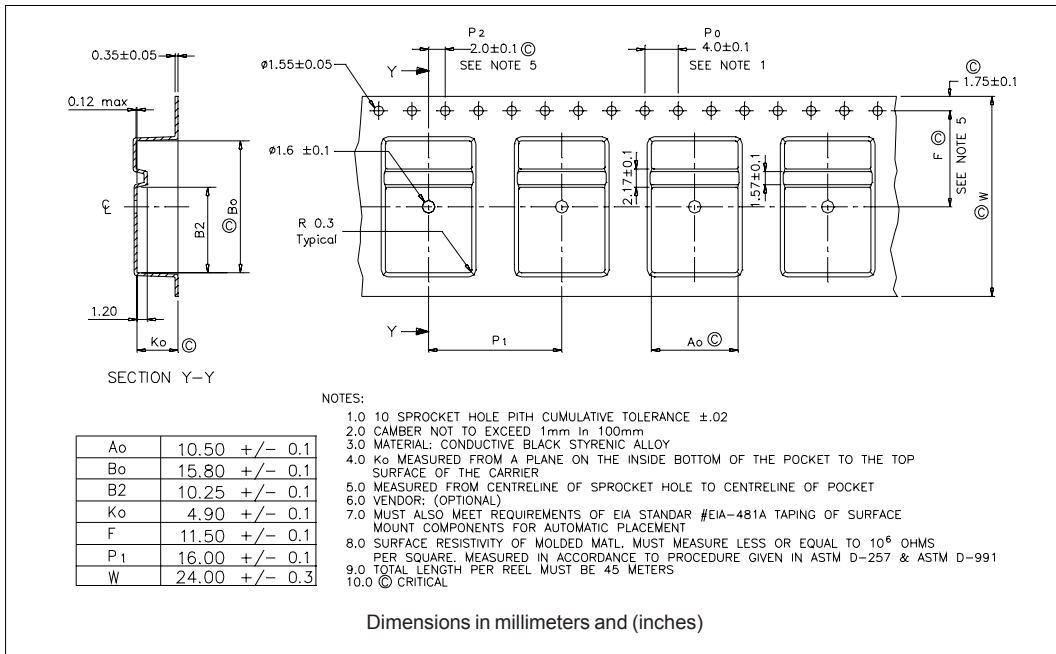


Conform to JEDEC outline D²Pak (SMD-220)
 Dimensions in millimeters and (inches)

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 | | | | | | | | | | | | | | | | | |
|-------------|--|----|---|-----|---|-----|---|-----|---|---|---|---|---|---|---|---|---|
| | <table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">43</td> <td style="padding: 5px;">C</td> <td style="padding: 5px;">T</td> <td style="padding: 5px;">Q</td> <td style="padding: 5px;">100</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">TRL</td> <td style="padding: 5px;">-</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> <td style="text-align: center;">⑦</td> <td style="text-align: center;">⑧</td> </tr> </table> | 43 | C | T | Q | 100 | S | TRL | - | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| 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 | - <ul style="list-style-type: none"> • S = D²Pak • -1= TO-262 | | | | | | | | | | | | | | | | |
| 7 | - <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) | | | | | | | | | | | | | | | | |
| 8 | - <ul style="list-style-type: none"> • 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.