



SCHOTTKY RECTIFIER

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

40 Amp

Major Ratings and Characteristics

| Characteristics                         | Values     | Units |
|-----------------------------------------|------------|-------|
| $I_{F(AV)}$ Rectangular waveform        | 40         | A     |
| $V_{RRM}$                               | 80/100     | V     |
| $I_{FSM}$ @ tp = 5 $\mu$ s sine         | 850        | A     |
| $V_F$ @ 20 Apk, $T_J$ = 125°C (per leg) | 0.67       | 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

| 43CTQ...                                                                            | 43CTQ...S                                                                           | 43CTQ...-1                                                                            |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|  |  |  |
| TO-220                                                                              | D <sup>2</sup> PAK                                                                  | TO-262                                                                                |

## Voltage Ratings

| Parameters                                      | 43CTQ080<br>43CTQ080S<br>43CTQ080-1 | 43CTQ100<br>43CTQ100S<br>43CTQ100-1 |
|-------------------------------------------------|-------------------------------------|-------------------------------------|
| $V_R$ Max. DC Reverse Voltage (V)               | 80                                  | 100                                 |
| $V_{RRM}$ Max. Working Peak Reverse Voltage (V) |                                     |                                     |

## Absolute Maximum Ratings

| Parameters                                                                           | Values     | Units | Conditions                                                                                                                                                 |
|--------------------------------------------------------------------------------------|------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $I_{F(AV)}$ Max. Average Forward (Per Leg)<br>Current * See Fig. 5 (Per Device)      | 20<br>40   | A     | 50% duty cycle @ $T_C = 135^\circ\text{C}$ , rectangular wave form                                                                                         |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive<br>Surge Current (Per Leg) * See Fig. 7 | 850<br>275 | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse<br>10ms Sine or 6ms Rect. pulse<br>Following any rated load condition and with rated $V_{RRM}$ applied |
| $E_{AS}$ 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 $\mu\text{sec}$<br>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<br>$T_J = 25^\circ\text{C}$                                       |
|                                                                  | 0.98   | V                | @ 40A                                                                   |
|                                                                  | 0.67   | V                | @ 20A<br>$T_J = 125^\circ\text{C}$                                      |
|                                                                  | 0.81   | V                | @ 40A                                                                   |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 1      | mA               | $T_J = 25^\circ\text{C}$<br>$V_R = \text{rated } V_R$                   |
|                                                                  | 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 $\Omega$       |                                                                         |
| $C_T$ Max. Junction Capacitance (Per Leg)                        | 1480   | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance (Per Leg)                        | 8.0    | nH               | Measured lead to lead 5mm from package body                             |
| $dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )               | 10,000 | V/ $\mu\text{s}$ |                                                                         |

(1) Pulse Width < 300 $\mu\text{s}$ , 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<br>(lbf-in)                                      |
|                                                                   | Max.       | 12(10)             |                                                        |

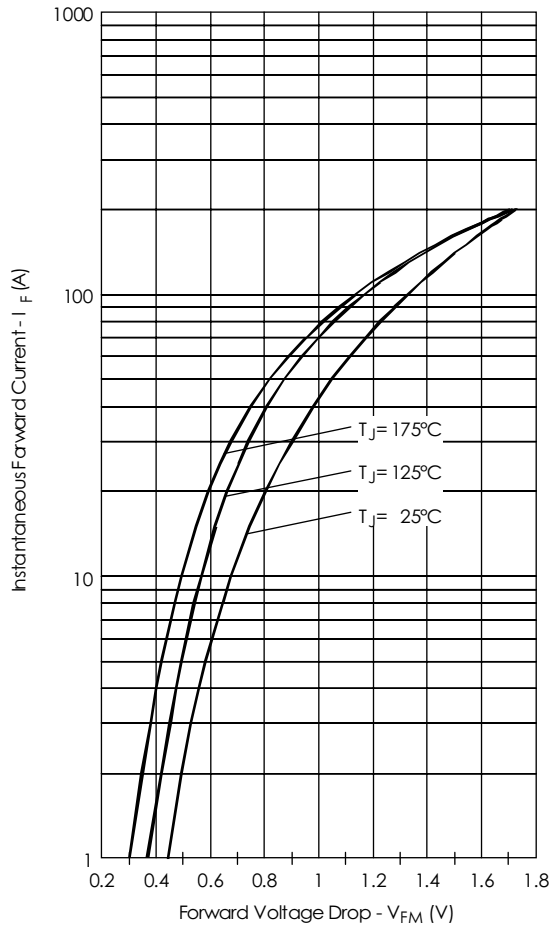


Fig. 1 - Max. Forward Voltage Drop Characteristics (PerLeg)

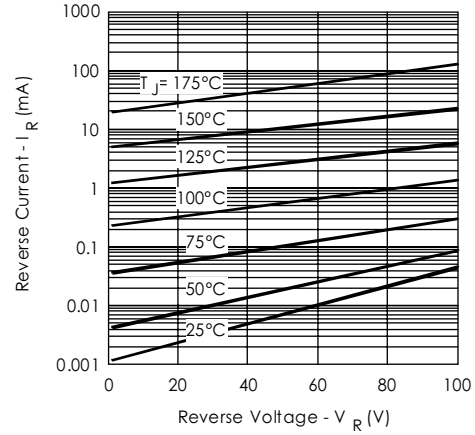


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (PerLeg)

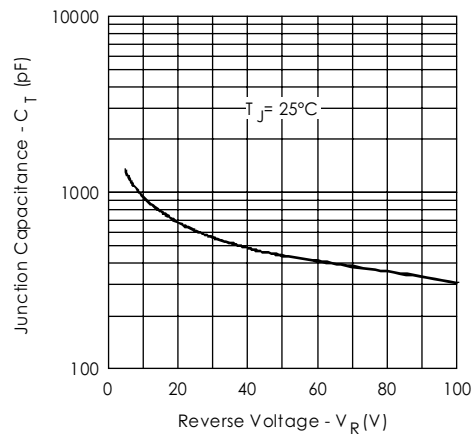


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (PerLeg)

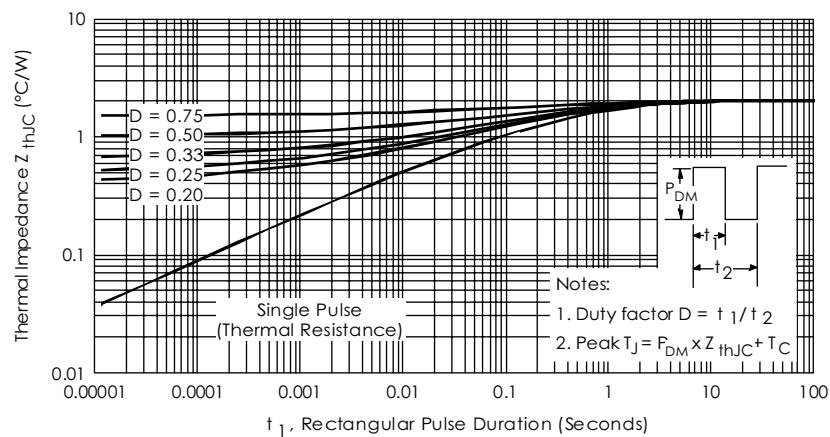


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (PerLeg)

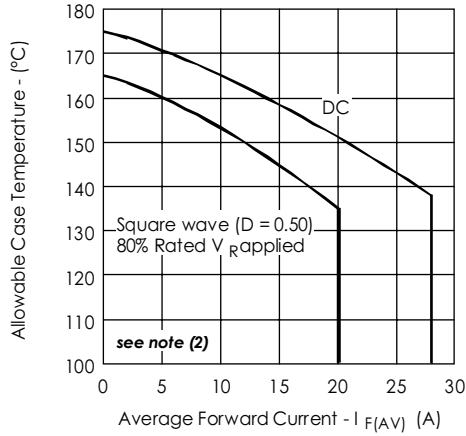


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (PerLeg)

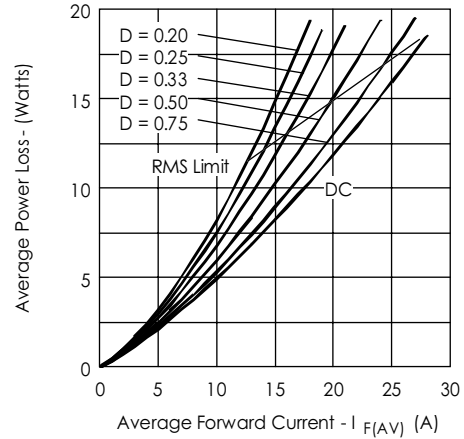


Fig. 6 - Forward Power Loss Characteristics (PerLeg)

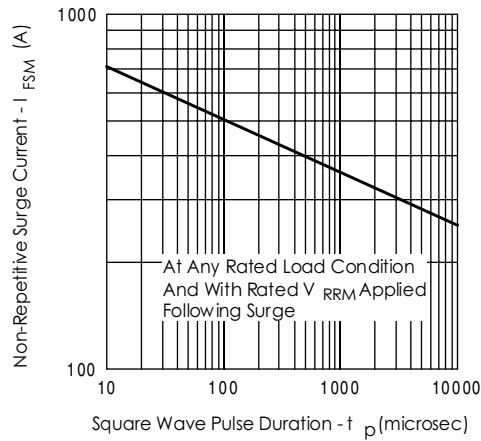


Fig. 7 - Max. Non-Repetitive Surge Current (PerLeg)

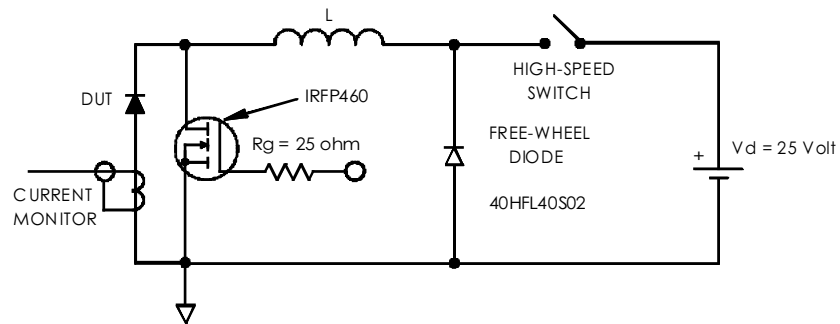


Fig. 8 - Unclamped Inductive Test Circuit

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

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

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

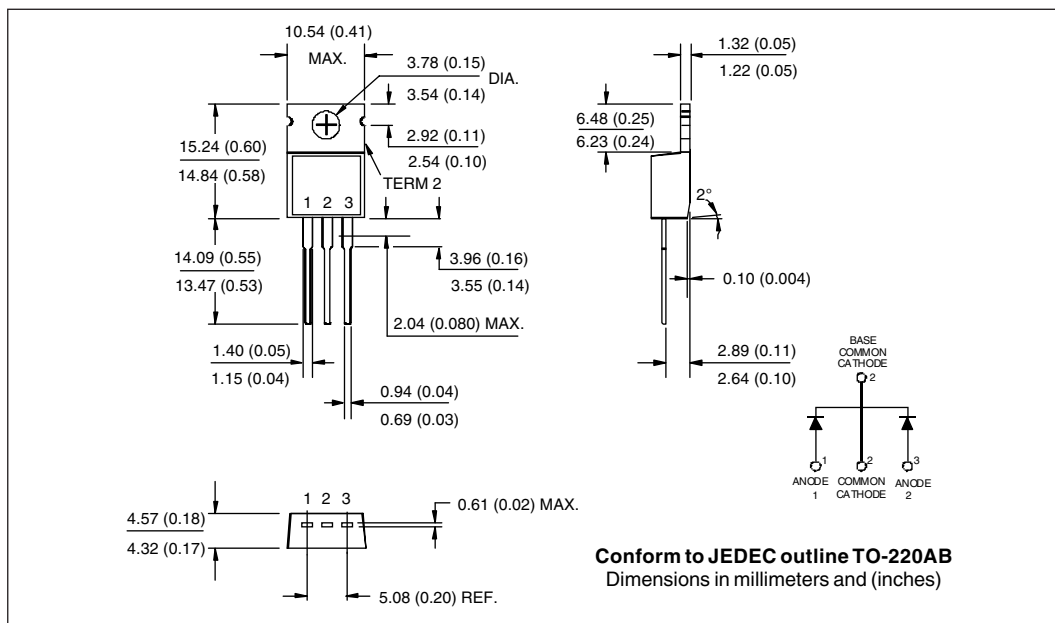
## Ordering Information Table

| Device Code |                                      |   |   |     |    |
|-------------|--------------------------------------|---|---|-----|----|
| 43          | C                                    | T | Q | 100 | -1 |
| ①           | ②                                    | ③ | ④ | ⑤   | ⑥  |
| 1           | Essential Part Number                |   |   |     |    |
| 2           | C = Common Cathode                   |   |   |     |    |
| 3           | T = TO-220                           |   |   |     |    |
| 4           | Q = Schottky Q Series                |   |   |     |    |
| 5           | Voltage Rating                       |   |   |     |    |
| 6           | 1 = TO-262<br>S = D <sup>2</sup> Pak |   |   |     |    |

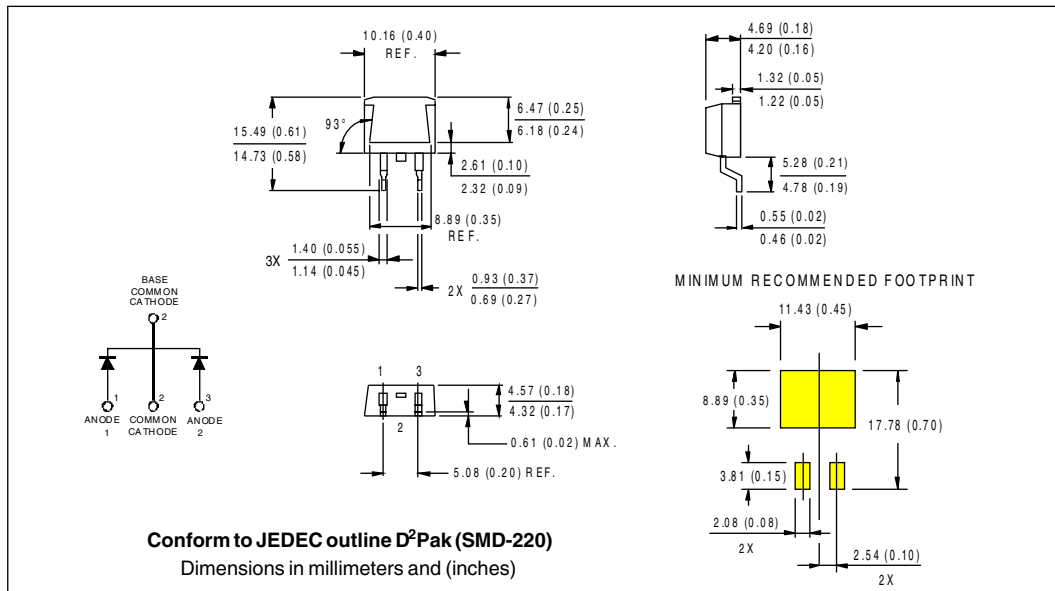
080 = 80V

100 = 100V

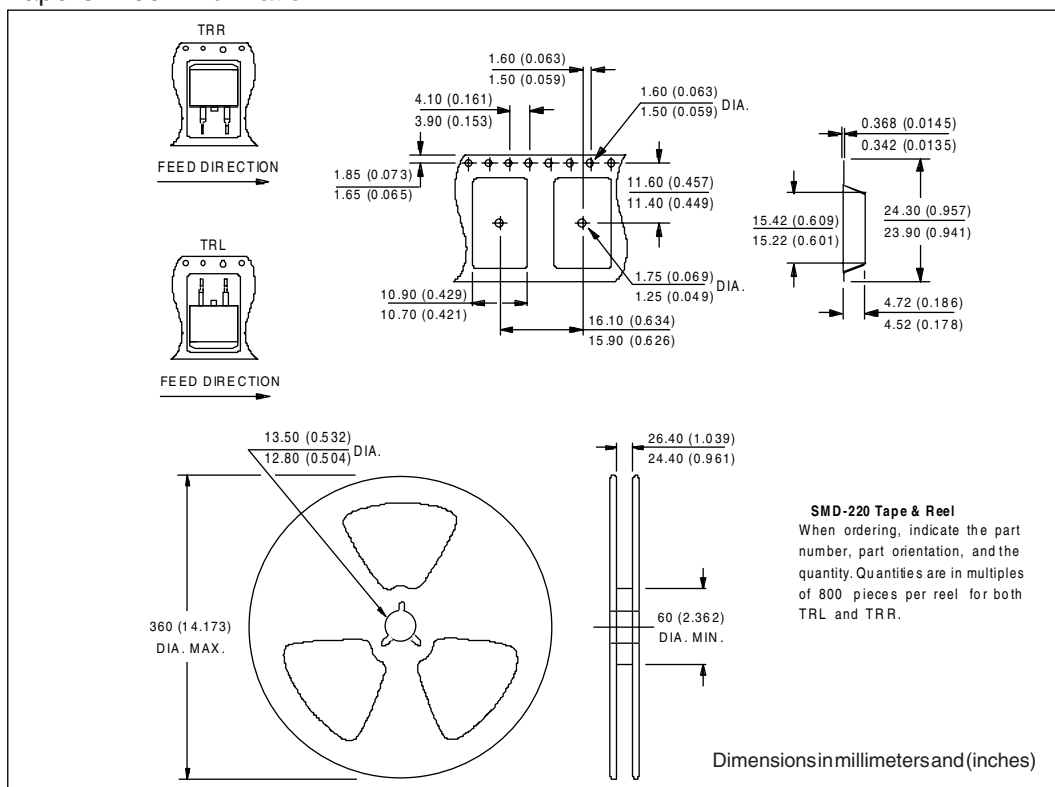
## Outline Table



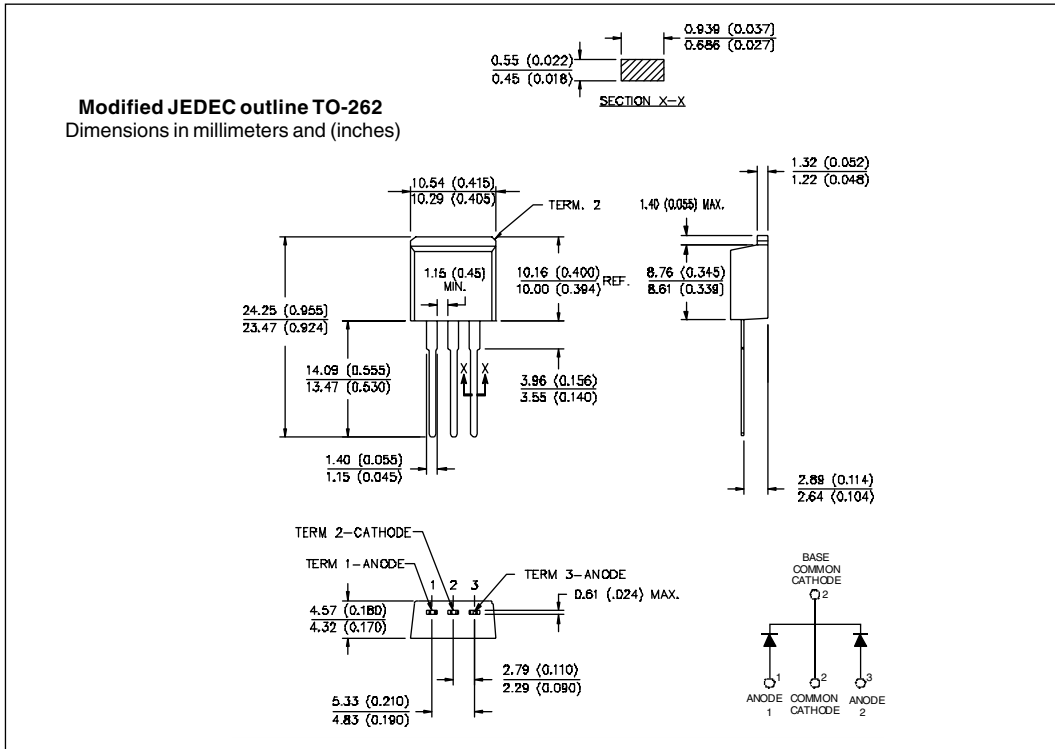
## Outline Table



## Tape &amp; Reel Information



## Outline Table



**WORLD HEADQUARTERS:** 235 Kansas St., El Segundo, California 90245 U.S.A. Tel: (310) 322 3331. Fax: (310) 322 3332.  
**EUROPEAN HEADQUARTERS:** Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.  
**IR CANADA:** 15 Lincoln Court, Brampton, Markham, Ontario L6T3Z2. Tel: (905) 455 2200. Fax: (905) 475 8801.  
**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.  
**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.  
**IR FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171. Tel: 81 3 3983 0086.  
**IR SOUTHEAST ASIA:** 1 Kim Seng Promenade, Great World City West Tower, 13-11, Singapore 237994. Tel: ++ 65 838 4630.  
**IR TAIWAN:** 16 Fl. Suite D.207, Sec. 2, Tun Haw South Road, Taipei, 10673, Taiwan. Tel: 886 2 2377 9936.