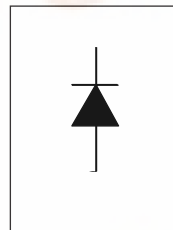


I2140 rev. A 12/99

# International **IR** Rectifier

# QUIETIR Series 10ETF..S

## FAST SOFT RECOVERY RECTIFIER DIODE



$V_F < 1.2V @ 10A$   
 $t_{rr} = 50ns$   
 $V_{RRM} 200 \text{ to } 600V$

### Description/Features

The 10ETF..S fast soft recovery QUIETIR rectifier series has been optimized for combined short reverse recovery time and low forward voltage drop.

The glass passivation ensures stable reliable operation in the most severe temperature and power cycling conditions.

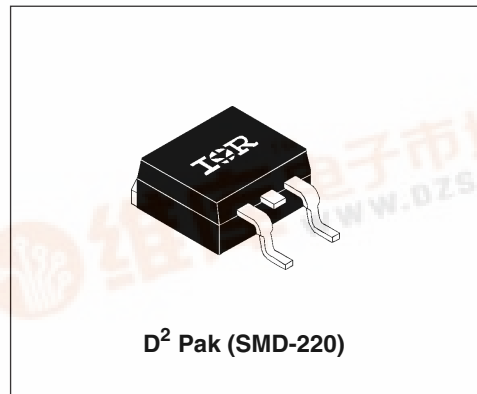
Typical applications are both:

- output rectification and freewheeling in inverters, choppers and converters
- and input rectifications where severe restrictions on conducted EMI should be met.

### Major Ratings and Characteristics

Characteristics	10ETF..S	Units
$I_{F(AV)}$ Sinusoidal waveform	10	A
$V_{RRM}$ range	200 to 600	V
$I_{FSM}$	150	A
$V_F @ 10A, T_J = 25^\circ C$	1.2	V
$t_{rr} @ 1A, 100A/\mu s$	50	ns
$T_J$ range	-40 to 150	$^\circ C$

### Package Outline



# 10ETF..S QUIETIR Series

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## Voltage Ratings

Part Number	$V_{RRM}$ , maximum peak reverse voltage V	$V_{RSM}$ , maximum non repetitive peak reverse voltage V	$I_{RRM}$ 150°C mA
10ETF02S	200	300	2
10ETF04S	400	500	
10ETF06S	600	700	

## Absolute Maximum Ratings

Parameters	10ETF..S	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	10	A	@ $T_C = 128^\circ\text{C}$ , 180° conduction half sine wave
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	150	A	10ms Sine pulse, rated $V_{RRM}$ applied
	160		10ms Sine pulse, no voltage reapplied
$I^2t$ Max. $I^2t$ for fusing	112.5	$A^2s$	10ms Sine pulse, rated $V_{RRM}$ applied
	160		10ms Sine pulse, no voltage reapplied
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for fusing	1125	$A^2\sqrt{s}$	$t = 0.1$ to 10ms, no voltage reapplied

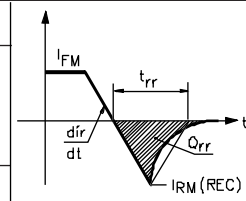
## Electrical Specifications

Parameters	10ETF..S	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop	1.2	V	@ 10A, $T_J = 25^\circ\text{C}$
$r_t$ Forward slope resistance	12.7	mΩ	$T_J = 150^\circ\text{C}$
$V_{F(TO)}$ Threshold voltage	1.25	V	
$I_{RM}$ Max. Reverse Leakage Current	0.1	mA	$T_J = 25^\circ\text{C}$
	2.0		$T_J = 150^\circ\text{C}$

$V_R = \text{rated } V_{RRM}$

## Recovery Characteristics

Parameters	10ETF..S	Units	Conditions
$t_{rr}$ Reverse Recovery Time	145	ns	$I_F @ 10\text{Apk}$ @ 25A/μs @ 25°C
$I_{rr}$ Reverse Recovery Current	2.75	A	
$Q_{rr}$ Reverse Recovery Charge	0.32	μC	
S Snap Factor	0.6		



Thermal-Mechanical Specifications

Parameters	10ETF..S	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range	-40 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-40 to 150	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case	1.5	°C/W	DC operation
R <sub>thJA</sub> Max. Thermal Resistance Junction to Ambient (PCB Mount)**	40	°C/W	
T <sub>s</sub> Soldering Temperature	240	°C	
wt Approximate Weight	2 (0.07)	g (oz.)	
Case Style	D <sup>2</sup> Pak (SMD-220)		

\*\*When mounted on 1" square (650mm<sup>2</sup>) PCB of FR-4 or G-10 material 4 oz (140µm) copper 40°C/W  
For recommended footprint and soldering techniques refer to application note #AN-994

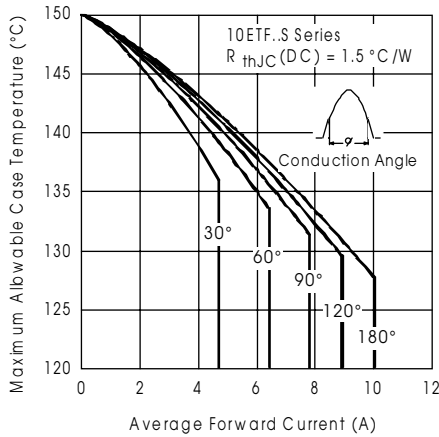


Fig. 1 - Current Rating Characteristics

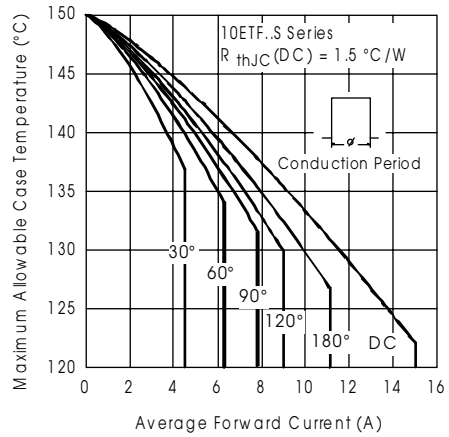


Fig. 2 - Current Rating Characteristics

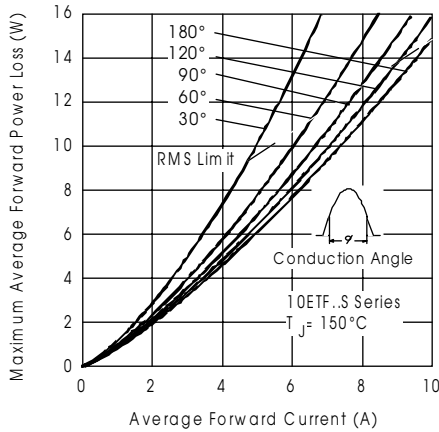


Fig. 3 - Forward Power Loss Characteristics

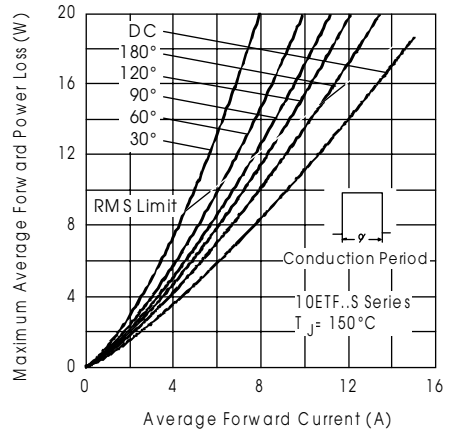


Fig. 4 - Forward Power Loss Characteristics

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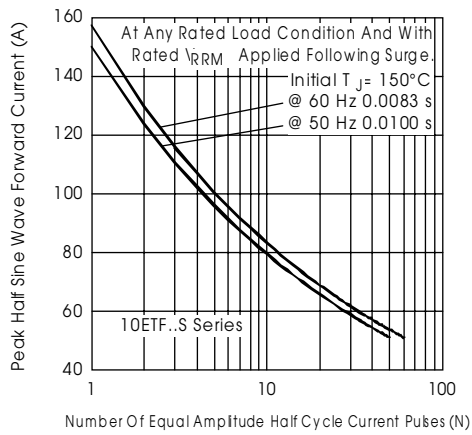


Fig. 5 - Maximum Non-Repetitive Surge Current

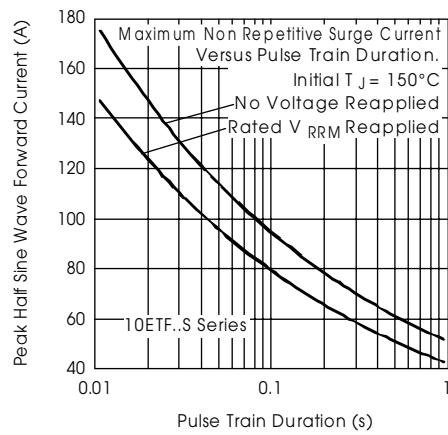


Fig. 6 - Maximum Non-Repetitive Surge Current

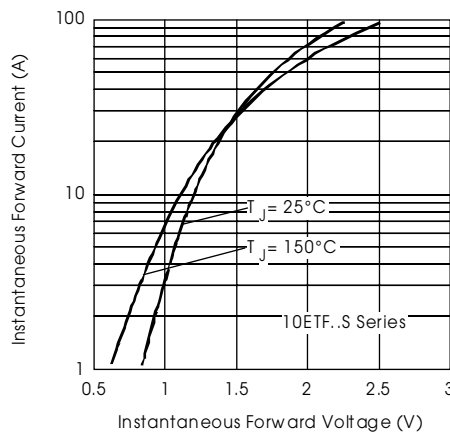


Fig. 7 - Forward Voltage Drop Characteristics

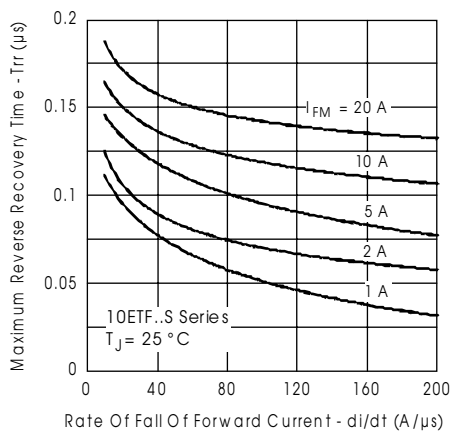


Fig. 8 - Recovery Time Characteristics,  $T_J = 25^\circ\text{C}$

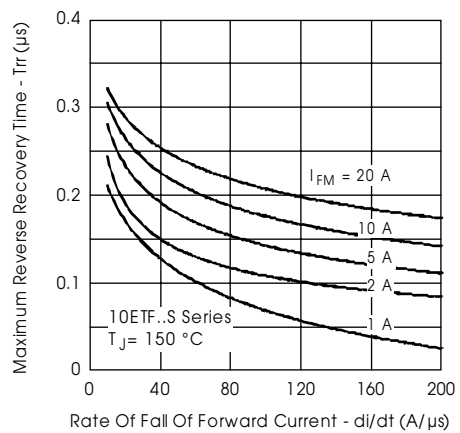


Fig. 9 - Recovery Time Characteristics,  $T_J = 150^\circ\text{C}$

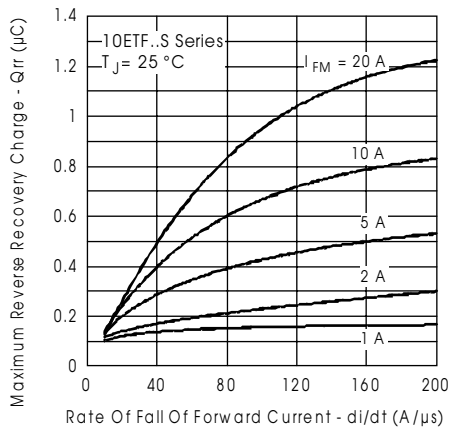


Fig. 10 - Recovery Charge Characteristics,  $T_j = 25^\circ\text{C}$

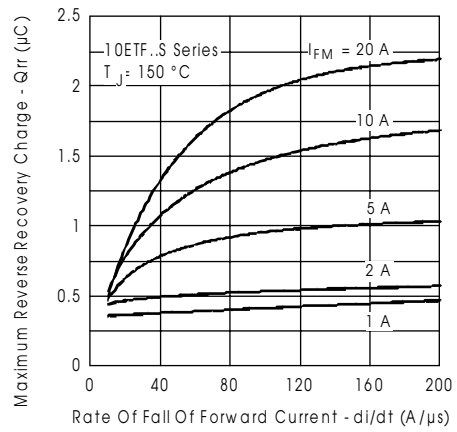


Fig. 11 - Recovery Charge Characteristics,  $T_j = 150^\circ\text{C}$

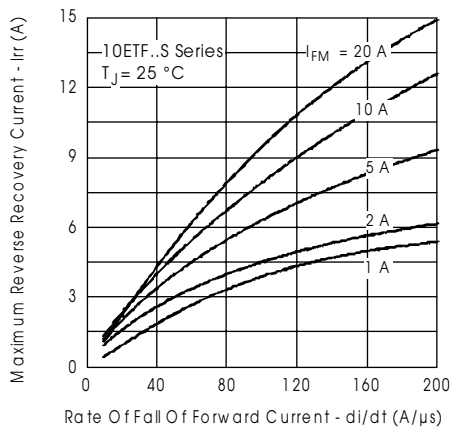


Fig. 12 - Recovery Current Characteristics,  $T_j = 25^\circ\text{C}$

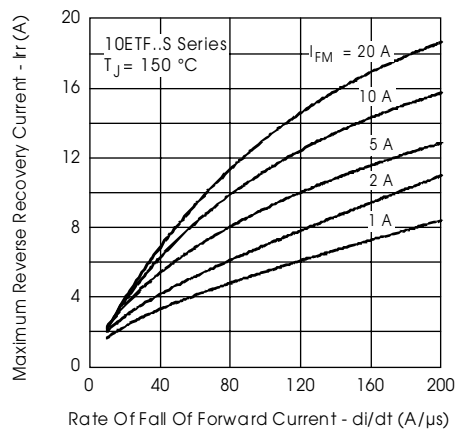


Fig. 13 - Recovery Current Characteristics,  $T_j = 150^\circ\text{C}$

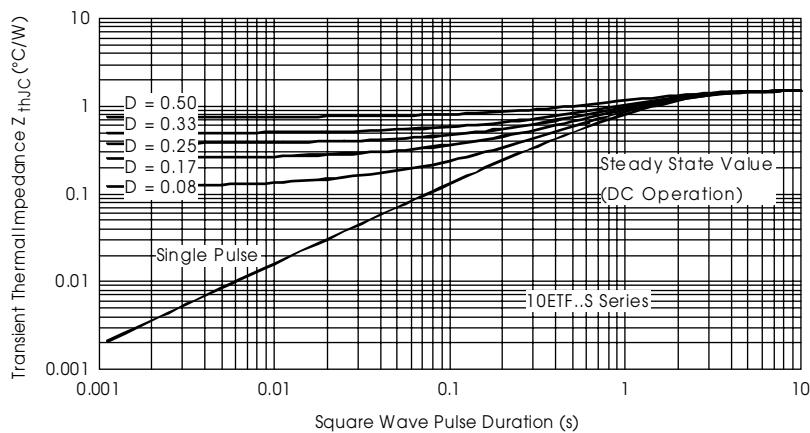


Fig. 14 - Thermal Impedance  $Z_{thJC}$  Characteristics

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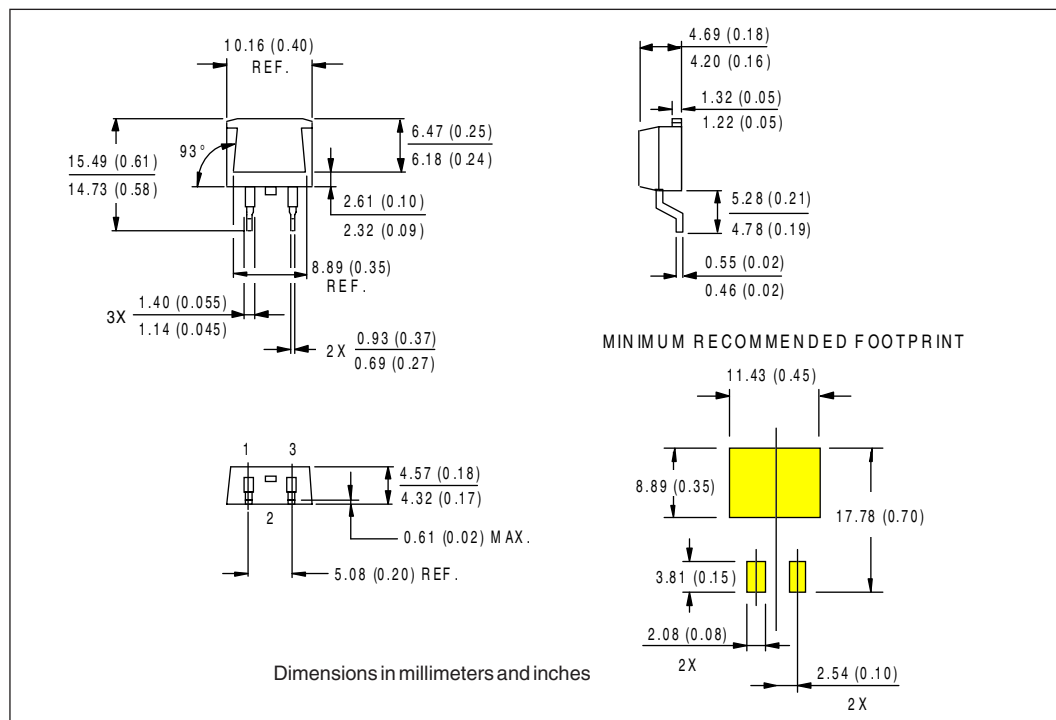
## Ordering Information Table

Device Code						
10	E	T	F	06	S	TRL
①	②	③	④	⑤	⑥	⑦

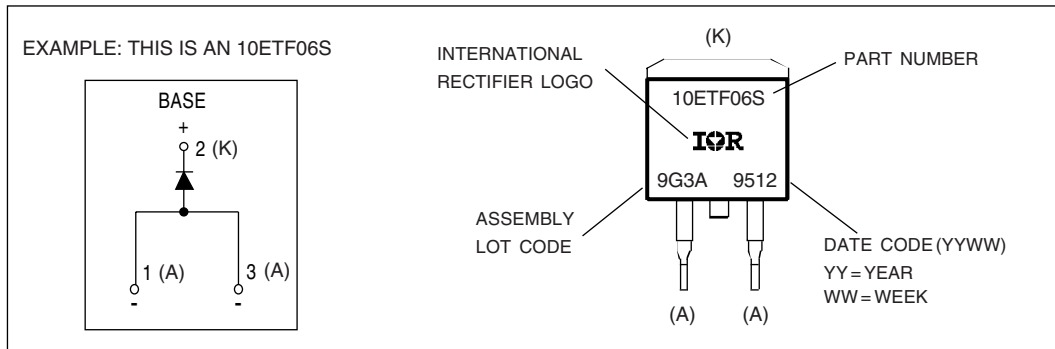
  

<p><b>1</b> - Current Rating</p> <p><b>2</b> - Circuit Configuration: E = Single Diode</p> <p><b>3</b> - Package: T = TO-220AC</p> <p><b>4</b> - Type of Silicon: F = Fast Soft Recovery Rectifier</p> <p><b>5</b> - Voltage code: Code x 100 = <math>V_{RRM}</math></p> <p><b>6</b> - S = TO-220 D<sup>2</sup>Pak (SMD-220) Version</p> <p><b>7</b> - Tape and Reel Option</p>	<p>TRL = Left Reel</p> <p>TRR = Right Orientation Reel</p>	<table border="1"> <tr> <td>02 = 200V</td> </tr> <tr> <td>04 = 400V</td> </tr> <tr> <td>08 = 800V</td> </tr> </table>	02 = 200V	04 = 400V	08 = 800V
02 = 200V					
04 = 400V					
08 = 800V					

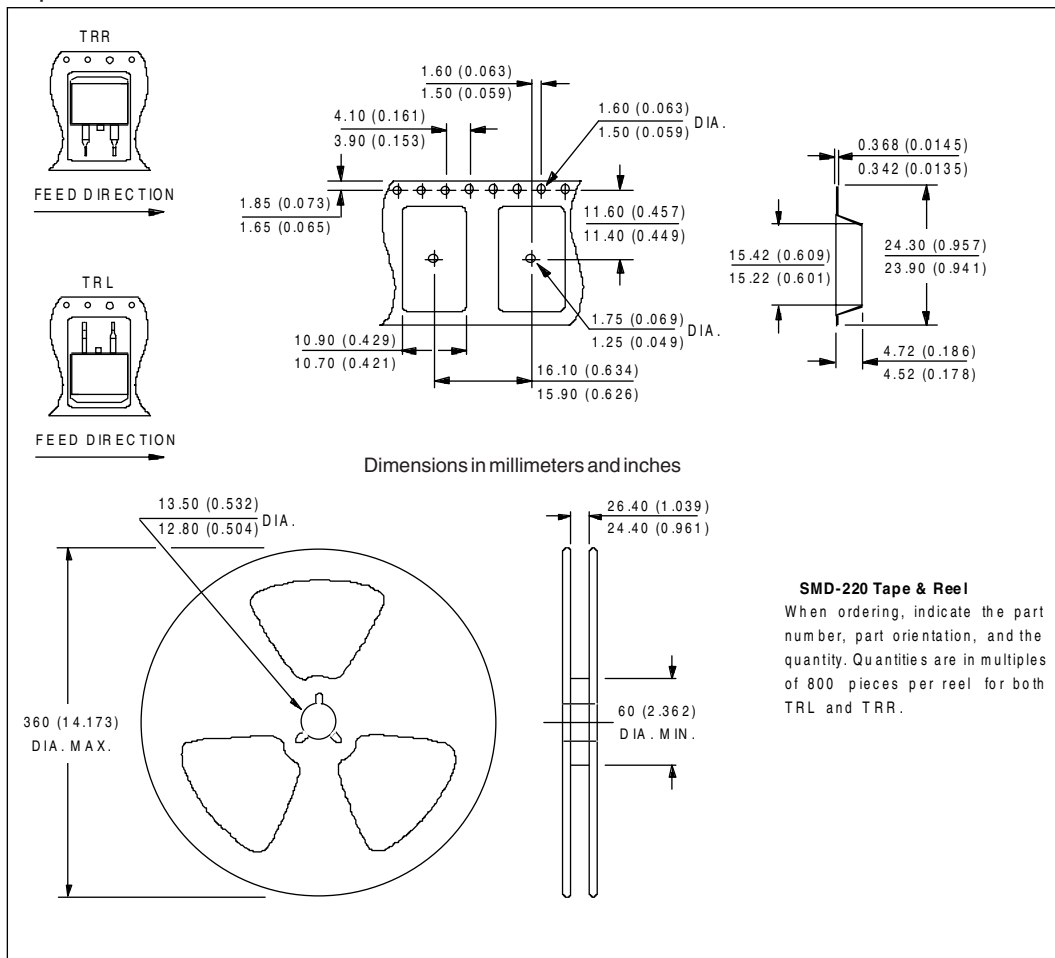
## Outline Table



Marking Information



Tape & Reel Information



## 10ETF..S QUIETIR Series

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**WORLD HEADQUARTERS:** 233 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) 453 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.

<http://www.irf.com>

Fax-On-Demand: +44 1883 733420

Data and specifications subject to change without notice.