**International Rectifier**

**11DQ03**  
**11DQ04**

**SCHOTTKY RECTIFIER**  
**1.1 Amp**

---

**Major Ratings and Characteristics**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>11DQ..</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{F(AV)}$ Rectangular waveform</td>
<td>1.1</td>
<td>A</td>
</tr>
<tr>
<td>$V_{RRM}$</td>
<td>30/40</td>
<td>V</td>
</tr>
<tr>
<td>$I_{FSM}$ (tp = 5 ms) sine</td>
<td>225</td>
<td>A</td>
</tr>
<tr>
<td>$V_F$ (1 Apk, $T_J = 25^\circ$C)</td>
<td>0.55</td>
<td>V</td>
</tr>
<tr>
<td>$T_J$ range</td>
<td>-40 to 150</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Description/ Features**

The 11DQ.. axial leaded Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. Typical applications are in switching power supplies, converters, free-wheeling diodes, and reverse battery protection.

- Low profile, axial leaded outline
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability

---

CASE STYLE AND DIMENSIONS

Conform to JEDEC Outline DO-204AL (DO-41)  
Dimensions in millimeters and inches

---

[www.irf.com](http://www.irf.com)
### Voltage Ratings

<table>
<thead>
<tr>
<th>Part number</th>
<th>11DQ03</th>
<th>11DQ04</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_R$ Max. DC Reverse Voltage (V)</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>$V_{RWM}$ Max. Working Peak Reverse Voltage (V)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Absolute Maximum Ratings

<table>
<thead>
<tr>
<th>Parameters</th>
<th>11DQ..</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{F(AV)}$ Max. Average Forward Current</td>
<td>1.1</td>
<td>A</td>
<td>50% duty cycle @ $T_J = 75^\circ C$, rectangular wave form</td>
</tr>
<tr>
<td>$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current</td>
<td>225</td>
<td>A</td>
<td>5µs Sine or 3µs Rect. pulse / 10ms Sine or 6ms Rect. pulse</td>
</tr>
<tr>
<td>$E_{AS}$ Non-Repetitive Avalanche Energy</td>
<td>3.0</td>
<td>mJ</td>
<td>$T_J = 25^\circ C$, $I_{AS} = 1.0$ Amps, $L = 6$ mH</td>
</tr>
<tr>
<td>$I_{AR}$ Repetitive Avalanche Current</td>
<td>1.0</td>
<td>A</td>
<td>Current decaying linearly to zero in 1 µsec Frequency limited by $T_{j,max}$. $V_A = 1.5 \times V_R$ typical</td>
</tr>
</tbody>
</table>

### Electrical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>11DQ..</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{FM}$ Max. Forward Voltage Drop</td>
<td></td>
<td></td>
<td>$T_J = 25^\circ C$</td>
</tr>
<tr>
<td>$I_{RM}$ Max. Reverse Leakage Current</td>
<td></td>
<td></td>
<td>$T_J = 125^\circ C$</td>
</tr>
<tr>
<td>$C_T$ Typical Junction Capacitance</td>
<td>60</td>
<td>pF</td>
<td>$V_R = 5V_{DC}$ (test signal range 100kHz to 1MHz) $25^\circ C$</td>
</tr>
<tr>
<td>$L_T$ Typical Series Inductance</td>
<td>8.0</td>
<td>nH</td>
<td>Measured lead to lead 5mm from package body</td>
</tr>
<tr>
<td>$\frac{dv}{dt}$ Max. Voltage Rate of Change</td>
<td>10000</td>
<td>V/µs</td>
<td>(Rated $V_R$)</td>
</tr>
</tbody>
</table>

### Thermal-Mechanical Specifications

<table>
<thead>
<tr>
<th>Parameters</th>
<th>11DQ..</th>
<th>Units</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_J$ Max. Junction Temperature Range (*)</td>
<td>-40 to 150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>$T_{aB}$ Max. Storage Temperature Range</td>
<td>-40 to 150</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>$R_{THJA}$ Max. Thermal Resistance Junction to Ambient</td>
<td>100</td>
<td>°C/W</td>
<td>DC Operation Without cooling fin</td>
</tr>
<tr>
<td>$R_{THJC}$ Typical Thermal Resistance Junction to Lead</td>
<td>81</td>
<td>°C/W</td>
<td>DC Operation (*) See Fig. 4</td>
</tr>
<tr>
<td>wt Approximate Weight</td>
<td>0.33(0.012)</td>
<td>g (oz.)</td>
<td></td>
</tr>
<tr>
<td>Case Style</td>
<td>DO-204AL(DO-41)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*) $\frac{dT}{dt} < \frac{1}{R_{TH(A-J)}}$ thermal runaway condition for a diode on its own heatsink
Fig. 1 - Max. Forward Voltage Drop Characteristics

Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage

Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage
At Any Rated Load Condition
And With Rated V_{RMS} Applied
Following Surge

Average Forward Current - I_{F(AV)} (A)

Fig. 6 - Max. Non-Repetitive Surge Current

(2) Formula used: T_{JC} = T_J \cdot (P_d + P_{dREV}) \times R_{thJC} ;

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

P_{dREV} = Inverse Power Loss = V_{R1} \times I_{R} \times (1 - D); I_{R} @ V_{R1} = 80% rated V_r

Average Power Loss - (Watts)

Fig. 5 - Forward Power Loss Characteristics

Average Forward Current - I_{F(AV)} (A)

Square wave (D = 0.50)
80% Rated V applied

Max. Allowable Case Temperature
Vs. Average Forward Current

Fig. 4 - Max. Allowable Case Temperature

Allowable Case Temperature - (°C)

DC

0.2

0.4

0.6

0.8

0

0.3

0.6

0.9

1.2

1.5

0

30

60

90

120

150

Square wave (D = 0.50)
80% Rated V applied see note (2)

RMS Limit

D = 0.20

D = 0.25

D = 0.33

D = 0.50

D = 0.75

DC

0 0.3 0.6 0.9 1.2 1.5

0 0.3 0.6 0.9 1.2 1.5

Average Forward Current - I_{F(AV)} (A)

Average Power Loss - (Watts)

0 0.3 0.6 0.9 1.2 1.5

Square Wave Pulse Duration - \( t_p \) (microsec)

Non-Repetitive Surge Current - I_{F(SM)} (A)

1000

100

10

10 100 1000 10000

10 100 1000 10000

Square Wave Pulse Duration - \( t_p \) (microsec)

10 100 1000 10000

www.irf.com
### Ordering Information Table

<table>
<thead>
<tr>
<th>Device Code</th>
<th>11</th>
<th>D</th>
<th>Q</th>
<th>04</th>
<th>TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>Q</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>04</td>
<td></td>
<td></td>
<td>04</td>
<td>04</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>TR</td>
<td></td>
<td></td>
<td>03</td>
</tr>
</tbody>
</table>

- **11** = 1.1A (Axial and small packages - Current is x10)
- **D** = DO-41 package
- **Q** = Schottky Q.. Series
- **04** = Voltage Ratings
- **TR** = Tape & Reel package (5000 pcs)
- **=** = Box package (1000 pcs)

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.

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 03/03

www.irf.com