

$I_{F(AV)} = 3\text{Amp}$
 $V_R = 40\text{V}$

Major Ratings and Characteristics

| Characteristics | Value | Units |
|---|------------|------------------|
| I_F DC | 3 | A |
| V_{RRM} | 40 | V |
| I_{FSM} @ $t_p = 5\mu\text{s}$ sine | 330 | A |
| V_F @ 2Apk , $T_J = 125^\circ\text{C}$ | 0.43 | V |
| T_J range | -40 to 150 | $^\circ\text{C}$ |

Description/ Features

The 15MQ040NPbF Schottky rectifier is designed to be used for low-power applications where a reverse voltage of 40 volts is encountered and surface mountable is required.

Applications

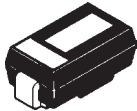
- Switching power supplies
- Meter protection
- Reverse protection for power input to PC board circuits
- Battery isolation and charging
- Low threshold voltage diode
- Free-wheeling or by-pass diode
- Low voltage clamp

Features

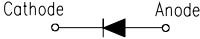
- Surface mountable
- Extremely low forward voltage
- Improved reverse blocking voltage capability relative to other similar size Schottky
- Compact size
- Lead-Free ("PbF" suffix)

Case Styles

15MQ040NPbF



Cathode Anode



SMA

Voltage Ratings

| Part number | 15MQ040NPbF |
|---|-------------|
| V_R Max. DC Reverse Voltage (V) | 40 |
| V_{RWM} Max. Working Peak Reverse Voltage (V) | |

Absolute Maximum Ratings

| Parameters | 15MQ | Units | Conditions |
|--|------|-------|---|
| $I_{F(AV)}$ Max. Average Forward Current * See Fig. 4 | 2.1 | A | 50% duty cycle @ $T_L = 105^\circ\text{C}$, rectangular wave form. On PC board 9mm ² island (.013mm thick copper pad area) |
| I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 6 | 330 | A | Following any rated load condition and with rated V_{RWM} applied |
| | 140 | | |
| E_{AS} Non-Repetitive Avalanche Energy | 6.0 | mJ | $T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{A}$, $L = 12\text{mH}$ |
| I_{AR} Repetitive Avalanche Current | 1.0 | A | |

Electrical Specifications

| Parameters | 15MQ | Units | Conditions |
|---|-------|------------------|--|
| V_{FM} Max. Forward Voltage Drop (1) * See Fig. 1 | 0.42 | V | @ 1A |
| | 0.49 | V | @ 2A |
| | 0.34 | V | @ 1A |
| | 0.43 | V | @ 2A |
| I_{RM} Max. Reverse Leakage Current (1) * See Fig. 2 | 0.5 | mA | $T_J = 25^\circ\text{C}$ |
| | 20 | mA | $T_J = 125^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold Voltage | 0.26 | V | $T_J = T_J \text{ max.}$ |
| r_t Forward Slope Resistance | 64.6 | m Ω | |
| C_T Typical Junction Capacitance | 134 | pF | $V_R = 10V_{DC}$, $T_J = 25^\circ\text{C}$, test signal = 1Mhz |
| L_S Typical Series Inductance | 2.0 | nH | Measured lead to lead 5mm from package body |
| dv/dt Max. Voltage Rate of Change | 10000 | V/ μs | (Rated V_R) |

(1) Pulse Width < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

| Parameters | 15MQ | Units | Conditions |
|---|-------------|---------------------------|--------------|
| T_J Max. Junction Temperature Range (*) | -40 to 150 | $^\circ\text{C}$ | |
| T_{stg} Max. Storage Temperature Range | -40 to 150 | $^\circ\text{C}$ | |
| R_{thJA} Max. Thermal Resistance Junction to Ambient | 80 | $^\circ\text{C}/\text{W}$ | DC operation |
| wt Approximate Weight | 0.07(0.002) | g (oz.) | |
| Case Style | SMA | | Similar D-64 |
| Device Marking | IR3F | | |

(*) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

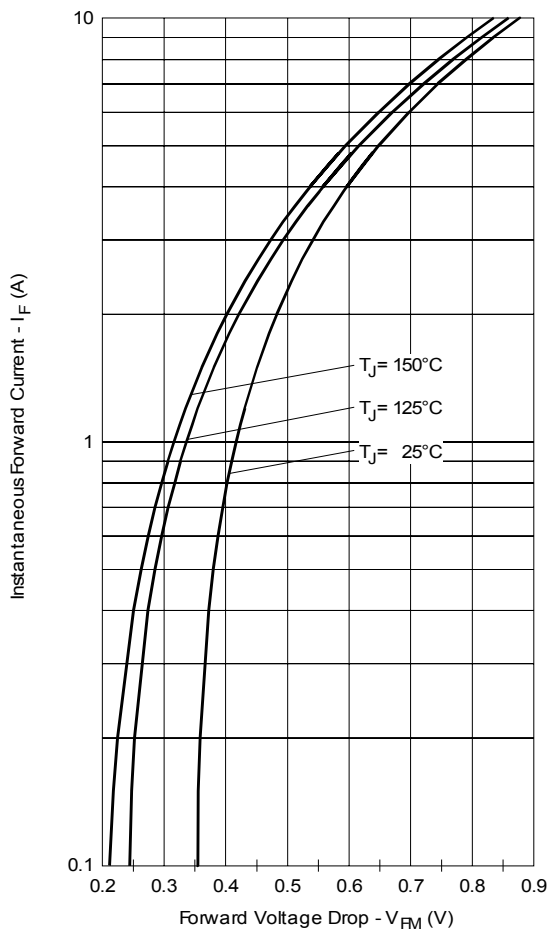


Fig. 1 - Maximum Forward Voltage Drop Characteristics

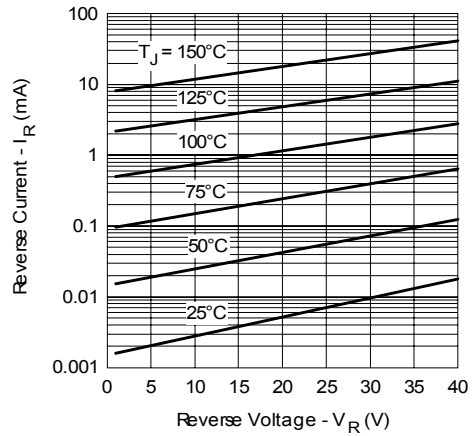


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

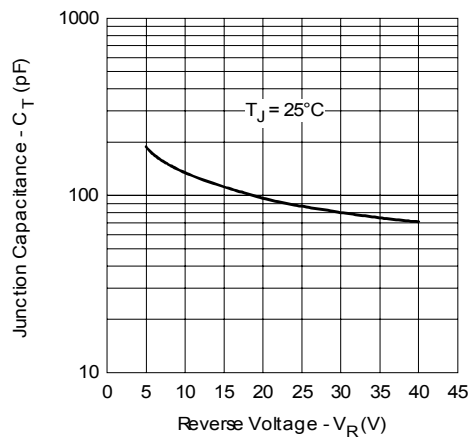


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

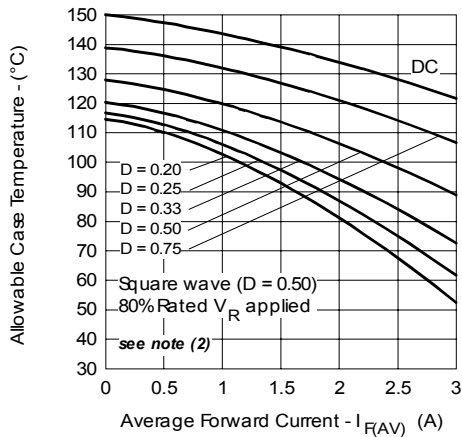


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

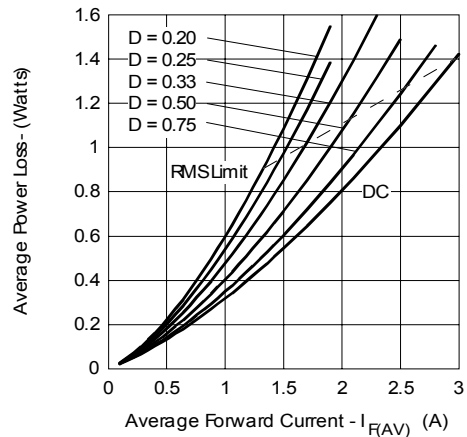


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

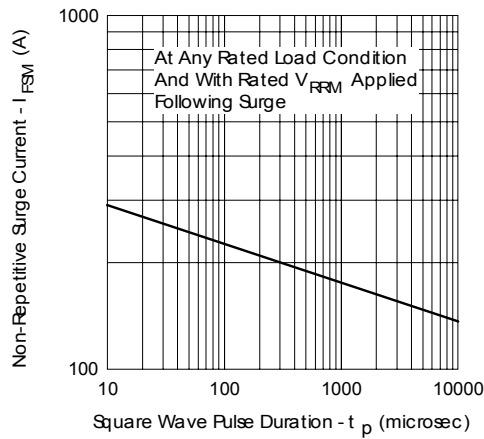


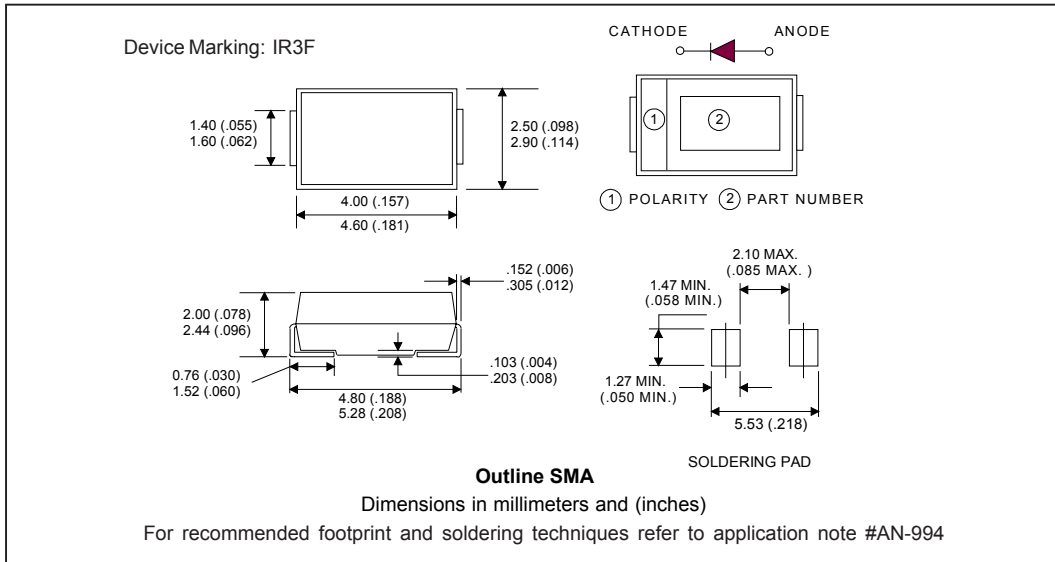
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

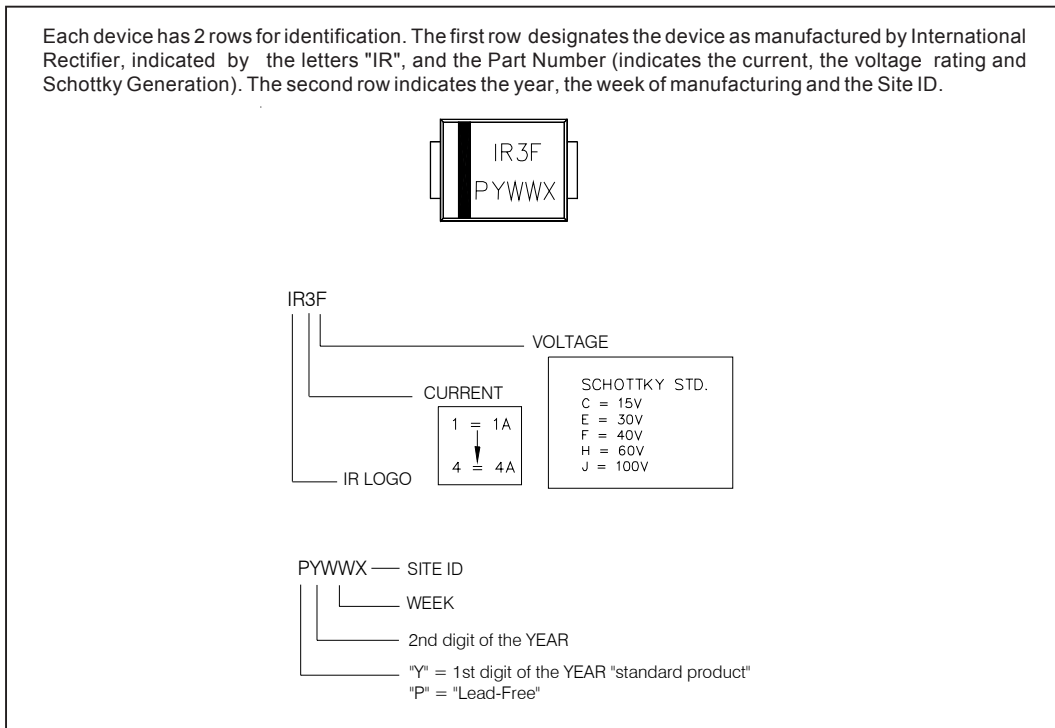
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1} = 80\%$ rated V_R

Outline Table



Marking & Identification

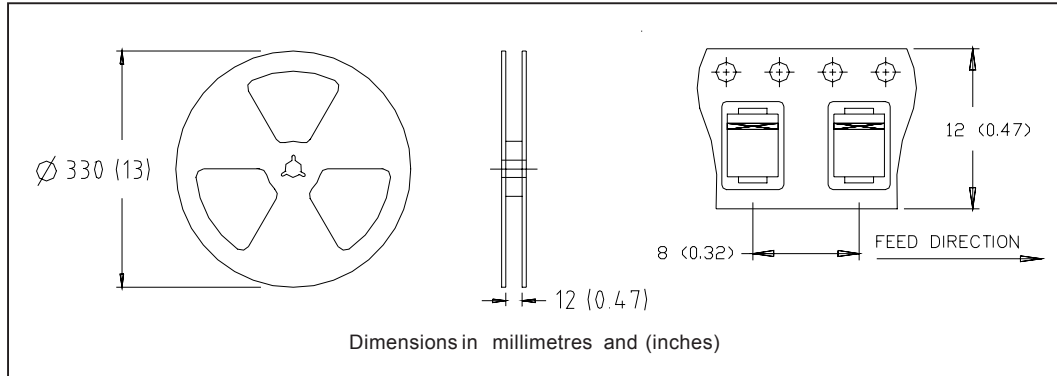


15MQ040NPbF

Bulletin PD-20775 06/04



Tape & Reel Information



Ordering Information Table

| Device Code | | | | | | |
|-------------|--|---|-----|---|----|-----|
| 15 | M | Q | 040 | N | TR | PbF |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |
| 1 | - Current Rating | | | | | |
| 2 | - M = SMA | | | | | |
| 3 | - Q = Schottky Q Series | | | | | |
| 4 | - Voltage Rating (040 = 40V) | | | | | |
| 5 | - N = New SMA | | | | | |
| 6 | - • none = Box (1000 pieces) • TR = Tape & Reel (7500 pieces) | | | | | |
| 7 | - • none = Standard Production • PbF = Lead-Free | | | | | |

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level and Lead-Free.
Qualification Standards can be found on IR's Web site.



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