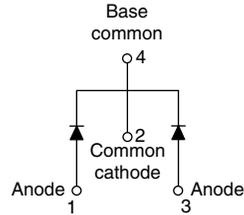


Schottky Rectifier


SOT-223


FEATURES

- Small foot print, surface mountable
- Low profile
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Common cathode
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


RoHS*
 COMPLIANT

PRODUCT SUMMARY

| | |
|-------------|------|
| $I_{F(AV)}$ | 2 A |
| V_R | 60 V |

DESCRIPTION

The 20CJQ060PbF surface mount Schottky rectifier series has been designed for applications requiring very low forward drop and very small foot prints. Typical applications are in portables, switching power supplies, converters, automotive system, freewheeling diodes, battery charging, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---|-------------|------------|
| $I_{F(AV)}$ | Rectangular waveform | 2.0 | A |
| V_{RRM} | | 60 | V |
| I_{FSM} | at $t_p = 5 \mu s$ sine | 385 | A |
| V_F | at 1 Apk, $T_J = 125^\circ C$ (per leg) | 0.56 | V |
| T_J | Range | - 55 to 150 | $^\circ C$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 20CJQ060PbF | UNITS |
|--------------------------------------|-----------|-------------|-------|
| Maximum DC reverse voltage | V_R | 60 | V |
| Maximum working peak reverse voltage | V_{RWM} | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|-------------|---|--------|-------|
| Maximum average forward current See fig. 5 | $I_{F(AV)}$ | per leg 50 % duty cycle at $T_C = 127^\circ C$, rectangular waveform | 2 | A |
| | | per device 50 % duty cycle at $T_C = 109^\circ C$, rectangular waveform | 4 | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 385 | |
| | | 10 ms sine or 6 ms rect. pulse | 22 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25^\circ C$, $I_{AS} = 1 A$, $L = 3 mH$ | 1.5 | mJ |
| Repetitive avalanche current per leg | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | 1.0 | A |

* Pb containing terminations are not RoHS compliant, exemptions may apply

| ELECTRICAL SPECIFICATIONS | | | | | |
|---|----------------|---|---------------------------|--------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | at 1 A | $T_J = 25\text{ °C}$ | 0.59 | V |
| | | at 2 A | | 0.75 | |
| | | at 1 A | $T_J = 125\text{ °C}$ | 0.56 | |
| | | at 2 A | | 0.67 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ °C}$ | $V_R = \text{Rated } V_R$ | 0.1 | mA |
| | | $T_J = 125\text{ °C}$ | | 5.0 | |
| Typical junction capacitance per leg | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C | | 60 | pF |
| Typical series inductance per leg | L_S | Measured lead to lead 5 mm from package body | | 6 | nH |
| Maximum voltage rate of change | dv/dt | Rated V_R | | 10 000 | V/ μ s |

Note(1) Pulse width < 300 μ s, duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | |
|---|-------------|-----------------|--|-------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction temperature range | $T_J^{(1)}$ | | | - 55 to 150 | °C |
| Maximum storage temperature range | T_{Stg} | | | | |
| Maximum thermal resistance, junction to lead | R_{thJL} | DC operation | | 25 | °C/W |
| Maximum thermal resistance, junction to ambient | R_{thJA} | | | 65 | |
| Approximate weight | | | | 0.13 | g |
| | | | | 0.0045 | oz. |
| Case style | | | | SOT-223 | |
| Marking device | | | | 2CJQH | |

Note(1) $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink

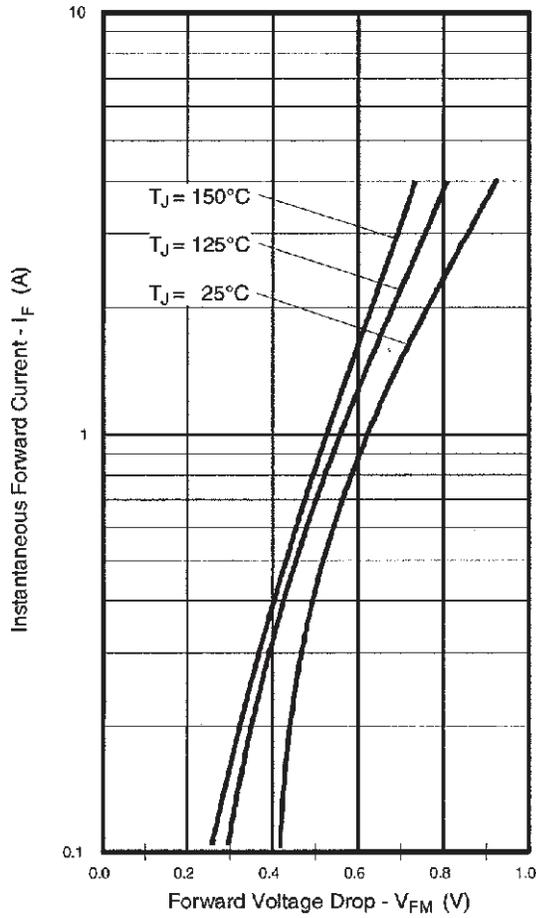


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

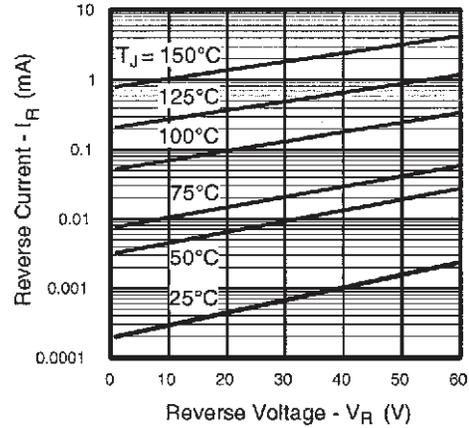


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

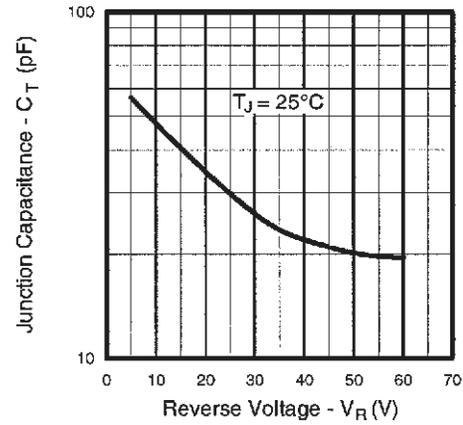


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

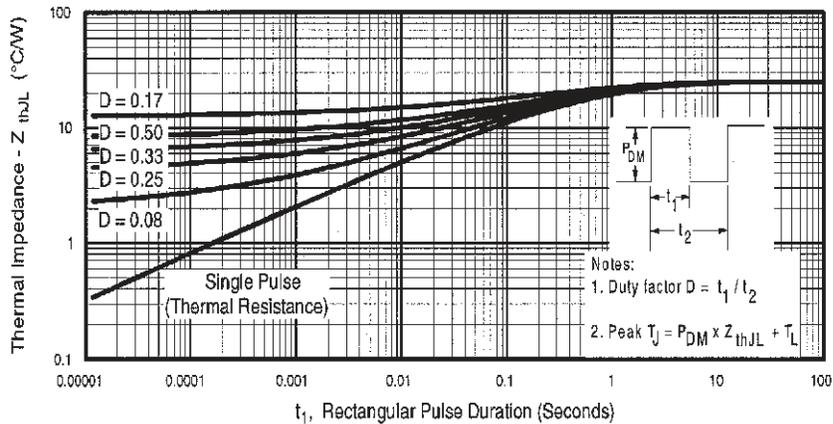


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

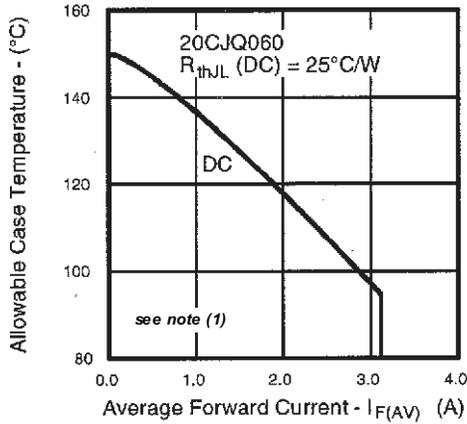


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

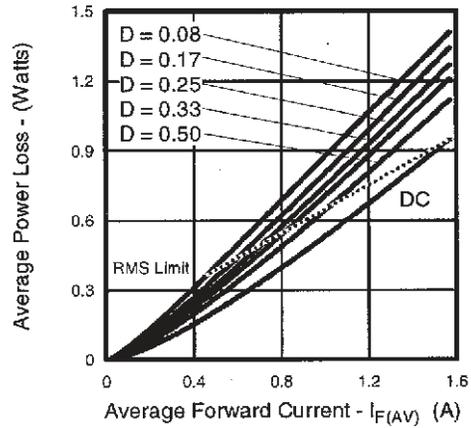


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

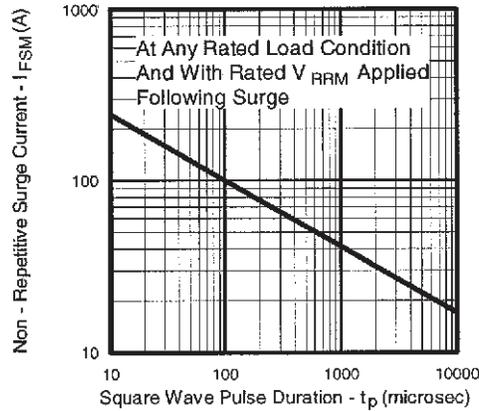


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

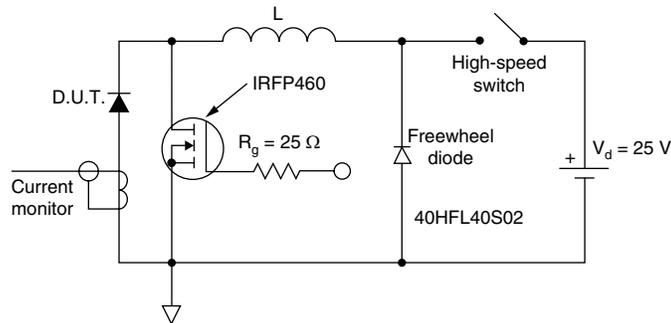
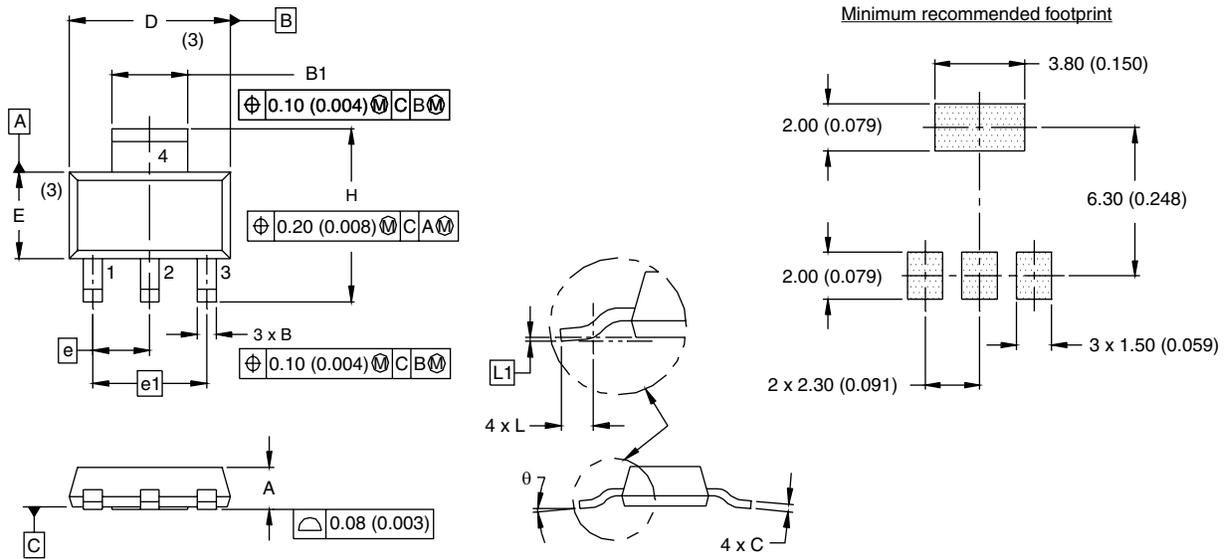


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
- P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
- P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

DIMENSIONS in millimeters (inches)

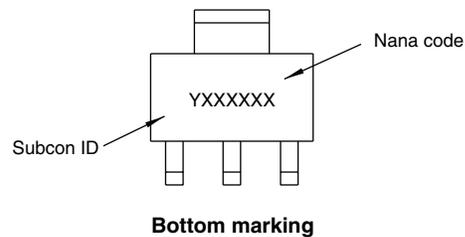
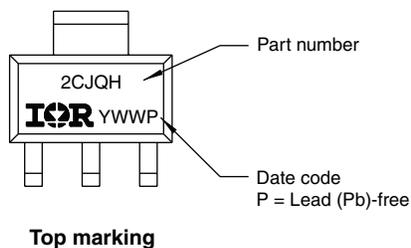


| SYMBOL | MILLIMETERS | | INCHES | |
|--------|-------------|------|------------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 1.55 | 1.80 | 0.061 | 0.071 |
| B | 0.65 | 0.85 | 0.026 | 0.033 |
| B1 | 2.95 | 3.15 | 0.116 | 0.124 |
| C | 0.25 | 0.35 | 0.010 | 0.014 |
| D | 6.30 | 6.70 | 0.248 | 0.264 |
| E | 3.30 | 3.70 | 0.130 | 0.146 |
| e | 2.30 BSC | | 0.0905 BSC | |
| e1 | 4.60 BSC | | 0.181 BSC | |
| H | 6.71 | 7.29 | 0.264 | 0.287 |
| L | 0.91 | - | 0.036 | - |
| L1 | 0.061 BSC | | 0.0024 BSC | |
| θ | - | 10° | - | 10° |

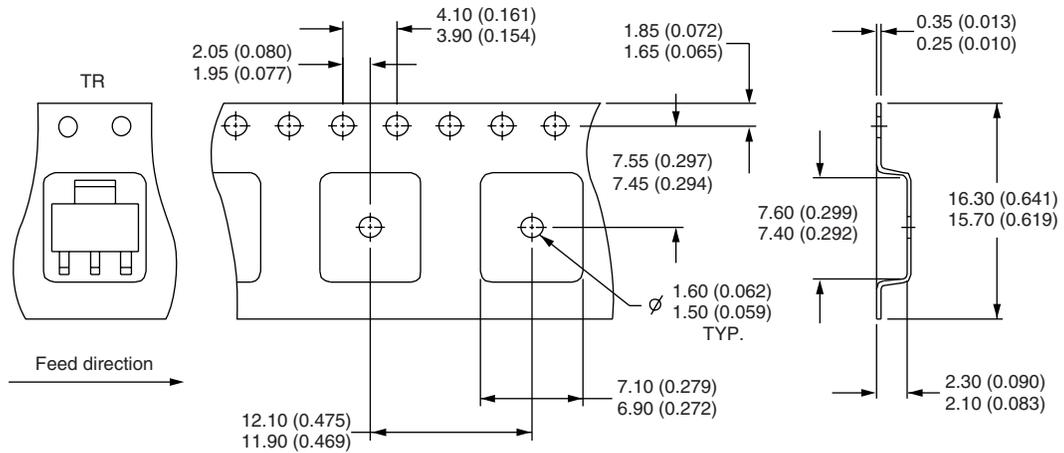
Notes

1. Dimensioning and tolerancing per ASME Y14.5M - 1994
2. Controlling dimension: inch
- (3) Dimensions do not include mold flash
4. Outline conforms to JEDEC outline TO-261AA

PART MARKING INFORMATION

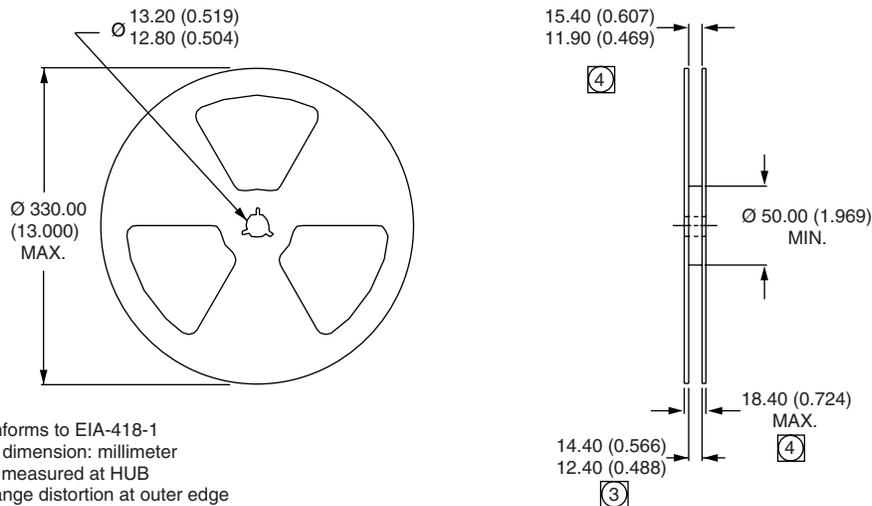


TAPE AND REEL INFORMATION in millimeters (inches)



Notes:

1. Controlling dimension: millimeter
2. Outline conforms to EIA-481 and EIA-541
3. Each \varnothing 330.00 (13.00) reel contains 2500 devices



Notes:

1. Outline conforms to EIA-418-1
2. Controlling dimension: millimeter
3. Dimension measured at HUB
4. Includes flange distortion at outer edge

ORDERING INFORMATION TABLE

| | | | | | | | |
|-------------|----------|----------|----------|----------|----------|------------|------------|
| Device code | 2 | 0 | C | J | Q | 060 | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ |

- 1** - Current rating (2 = 2 A)
- 2** - Schottky rectifier series
- 3** - Circuit configuration
C = Common cathode
- 4** - Package
J = SOT-223
- 5** - Schottky "Q" series
- 6** - Voltage rating (060 = 60 V)
- 7** -
 - None = Standard production
 - PbF = Lead (Pb)-free



Notice

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