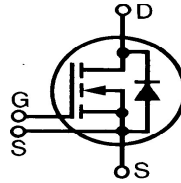


Q3-Class HiperFET™ Power MOSFET

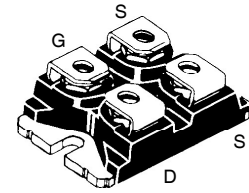
IXFN100N50Q3

$V_{DSS} = 500V$
 $I_{D25} = 82A$
 $R_{DS(on)} \leq 49m\Omega$
 $t_{rr} \leq 250ns$

N-Channel Enhancement Mode
Fast Intrinsic Rectifier



miniBLOC
E153432



G = Gate D = Drain
S = Source

Either Source Terminal S can be used as the Source Terminal or the Kelvin Source (Gate Return) Terminal.

| Symbol | Test Conditions | Maximum Ratings | |
|---------------|--|-----------------|------------|
| V_{DSS} | $T_J = 25^\circ C$ to $150^\circ C$ | 500 | V |
| V_{DGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$ | 500 | V |
| V_{GSS} | Continuous | ± 30 | V |
| V_{GSM} | Transient | ± 40 | V |
| I_{D25} | $T_C = 25^\circ C$ | 82 | A |
| I_{DM} | $T_C = 25^\circ C$, Pulse Width Limited by T_{JM} | 300 | A |
| I_A | $T_C = 25^\circ C$ | 100 | A |
| E_{AS} | $T_C = 25^\circ C$ | 5 | J |
| dv/dt | $I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$ | 50 | V/ns |
| P_D | $T_C = 25^\circ C$ | 960 | W |
| T_J | | -55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | -55 ... +150 | $^\circ C$ |
| V_{ISOL} | 50/60 Hz, RMS, $t = 1$ minute | 2500 | V~ |
| | $I_{ISOL} \leq 1mA$, $t = 1s$ | 3000 | V~ |
| M_d | Mounting Torque for Base Plate | 1.5/13 | Nm/lb.in. |
| | Terminal Connection Torque | 1.3/11.5 | Nm/lb.in. |
| Weight | | 30 | g |

Features

- International Standard Package
- Low Intrinsic Gate Resistance
- miniBLOC with Aluminum Nitride Isolation
- Low Package Inductance
- Fast Intrinsic Rectifier
- Low $R_{DS(on)}$ and Q_G

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- Temperature and Lighting Controls

| Symbol | Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|----------------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0V$, $I_D = 3mA$ | 500 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 8mA$ | 3.5 | | 6.5 V |
| I_{GSS} | $V_{GS} = \pm 30V$, $V_{DS} = 0V$ | | | ± 200 nA |
| I_{DSS} | $V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$ | | | 50 μA 2.5 mA |
| $R_{DS(on)}$ | $V_{GS} = 10V$, $I_D = 50A$, Note 1 | | | 49 m Ω |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | Characteristic Values | | |
|---|---|-----------------------|------|---|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 20\text{V}, I_D = 50\text{A}$, Note 1 | 40 | 65 | S |
| C_{iss} C_{oss} C_{rss} | $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$ | | 13.8 | nF |
| | | | 1690 | pF |
| | | | 177 | pF |
| R_{Gi} | Gate Input Resistance | | 0.12 | Ω |
| $t_{d(on)}$ t_r $t_{d(off)}$ t_f | Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 50\text{A}$ $R_G = 0.5\Omega$ (External) | | 40 | ns |
| | | | 20 | ns |
| | | | 50 | ns |
| | | | 15 | ns |
| $Q_{g(on)}$ Q_{gs} Q_{gd} | $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 50\text{A}$ | | 255 | nC |
| | | | 110 | nC |
| | | | 115 | nC |
| R_{thJC} R_{thCS} | | | | 0.13 $^\circ\text{C/W}$ $^\circ\text{C/W}$ |
| | | 0.05 | | |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | Characteristic Values | | |
|----------------------------------|---|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| I_S | $V_{GS} = 0\text{V}$ | | | 100 A |
| I_{SM} | Repetitive, Pulse Width Limited by T_{JM} | | | 400 A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{V}$, Note 1 | | | 1.5 V |
| t_{rr} Q_{RM} I_{RM} | $I_F = 50\text{A}, -di/dt = 200\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$ | | | 250 ns |
| | | | 3.5 | μC |
| | | | 30.0 | A |

Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

| | | | | | | | | | | |
|---|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: | 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 | 7,005,734 B2 | 7,157,338B2 |
| | 4,860,072 | 5,017,508 | 5,063,307 | 5,381,025 | 6,259,123 B1 | 6,534,343 | 6,710,405 B2 | 6,759,692 | 7,063,975 B2 | |
| | 4,881,106 | 5,034,796 | 5,187,117 | 5,486,715 | 6,306,728 B1 | 6,583,505 | 6,710,463 | 6,771,478 B2 | 7,071,537 | |

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

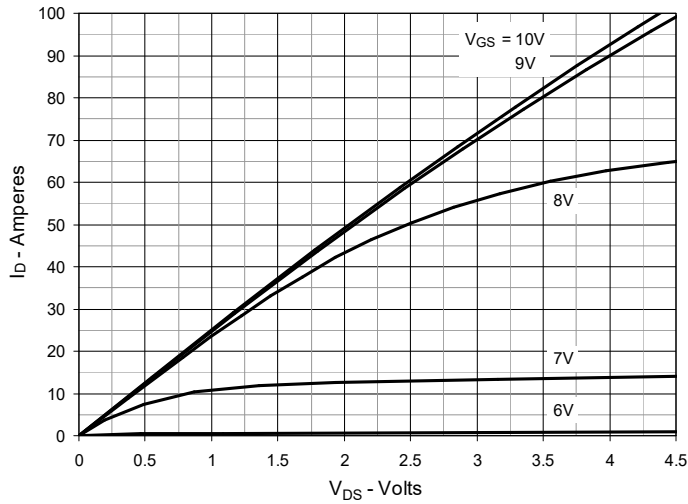


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

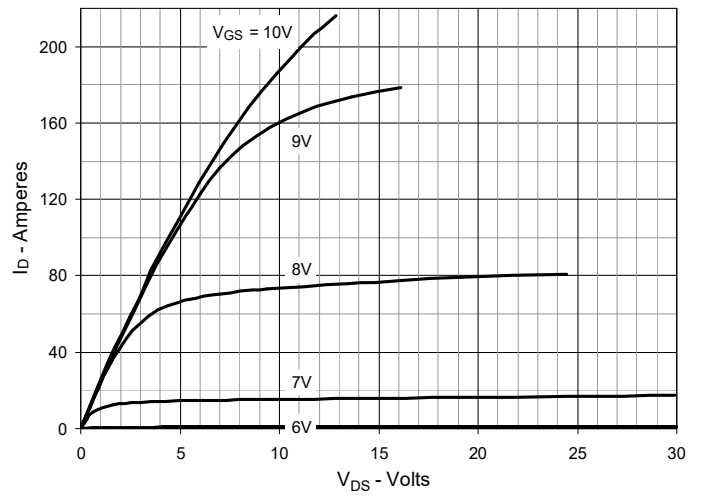


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

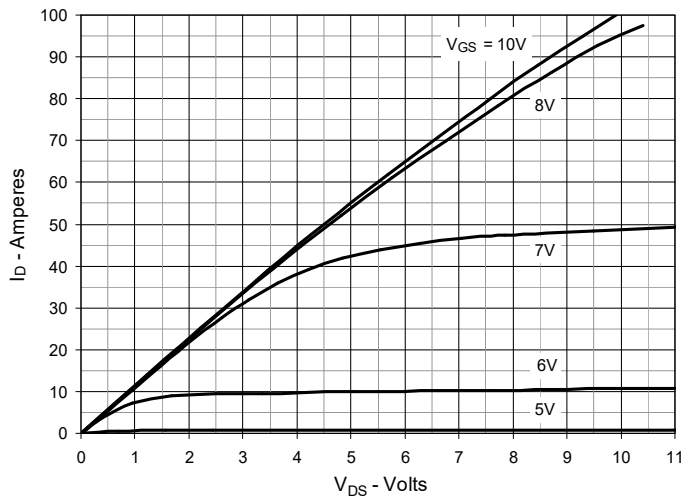


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 50\text{A}$ Value vs. Junction Temperature

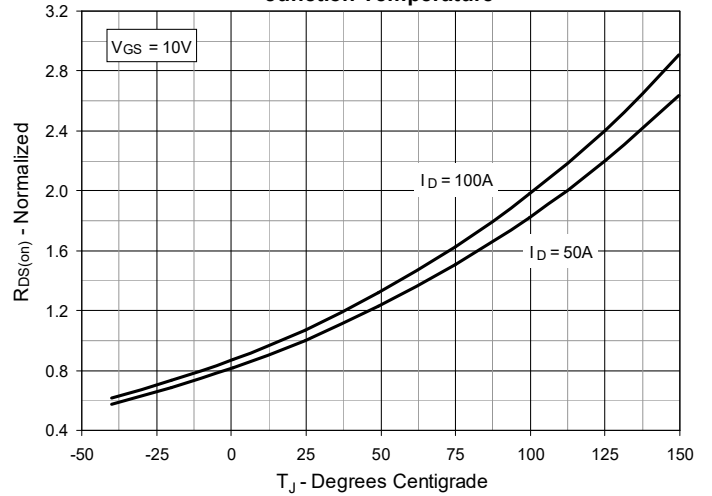


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 50\text{A}$ Value vs. Drain Current

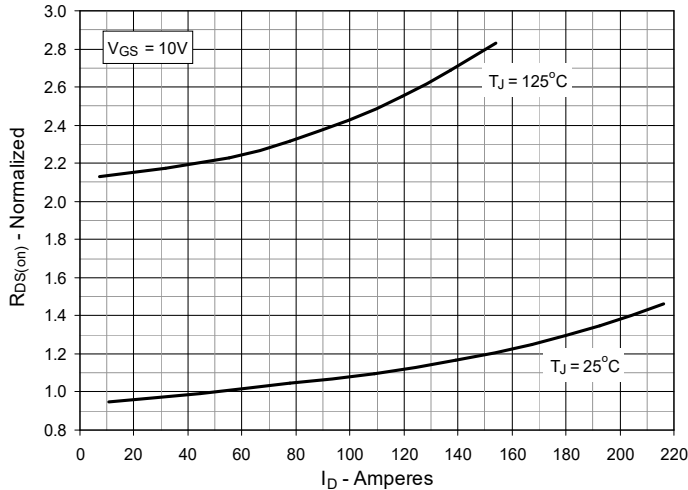


Fig. 6. Maximum Drain Current vs. Case Temperature

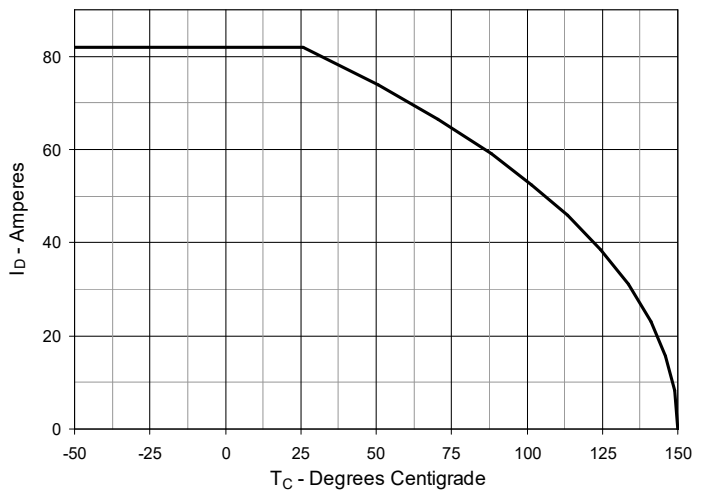


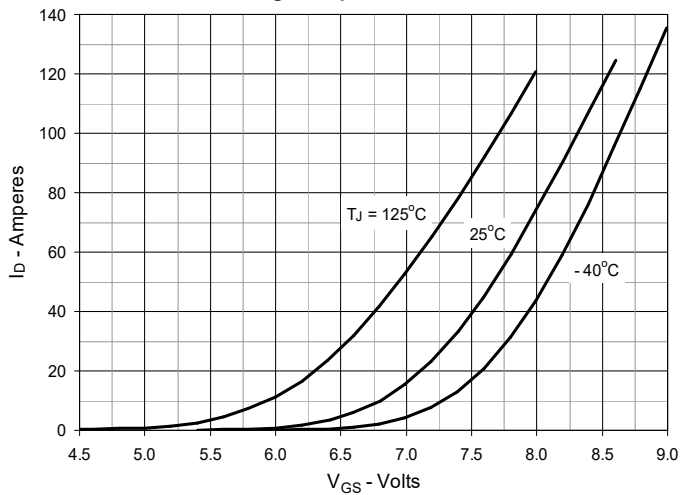
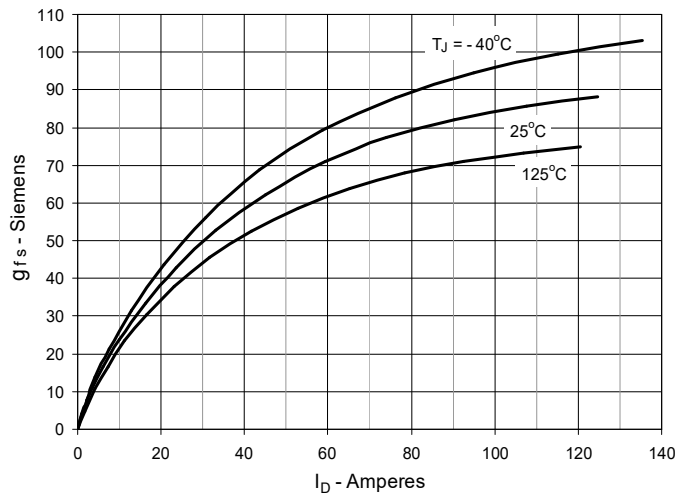
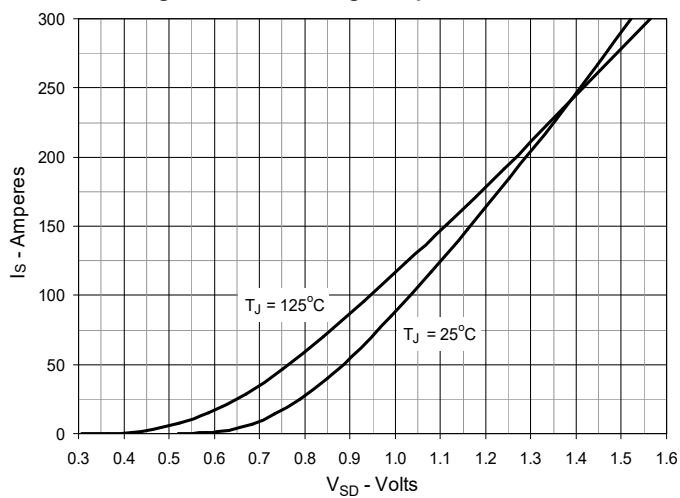
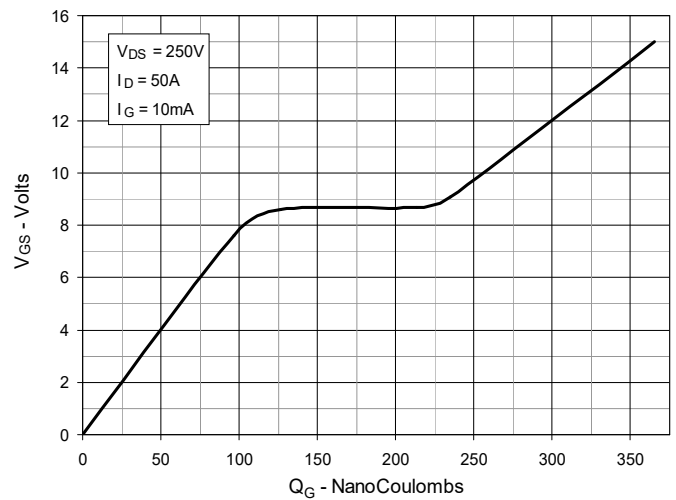
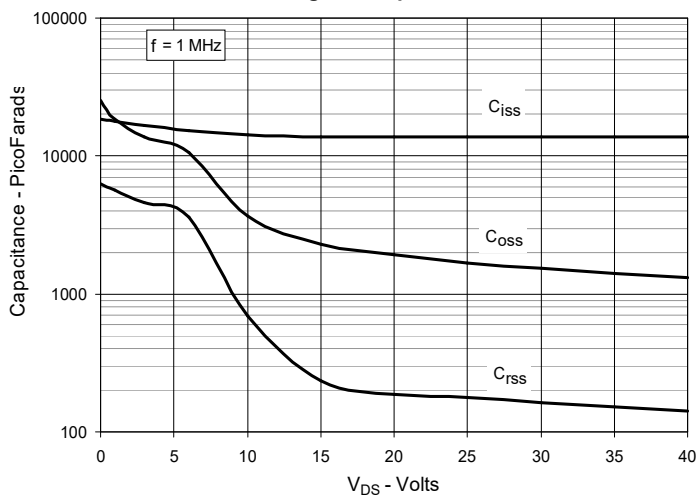
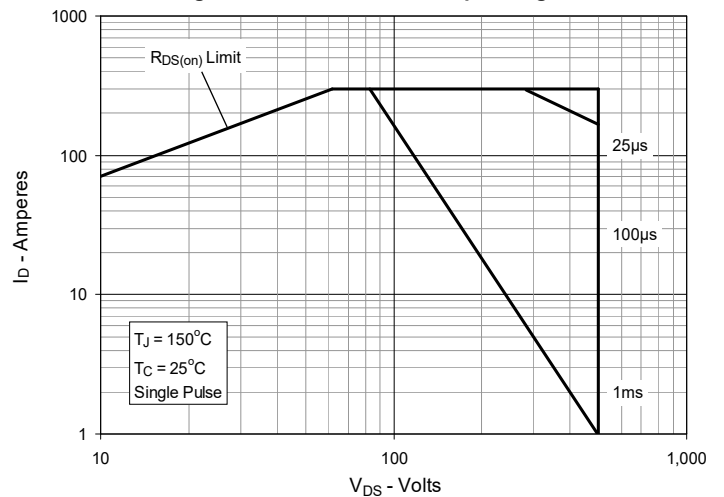
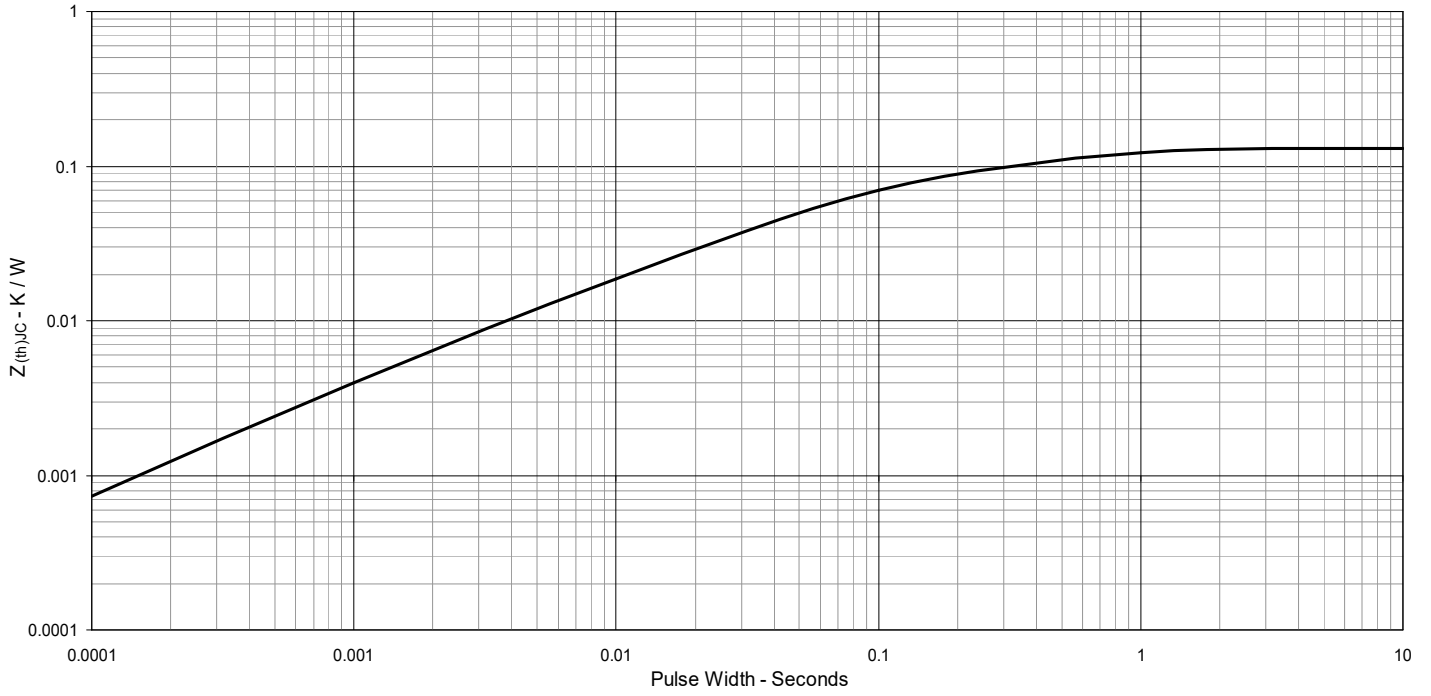
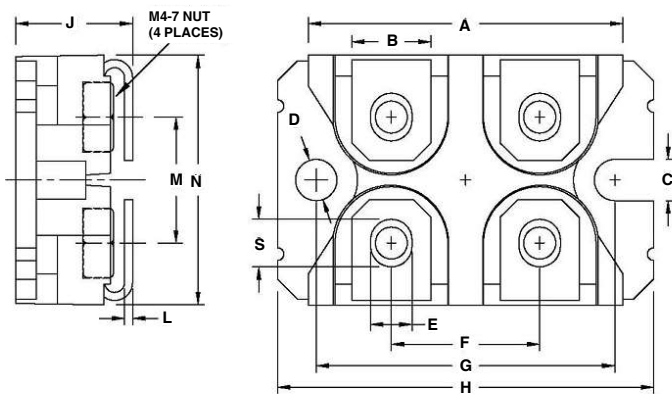
Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Forward-Bias Safe Operating Area


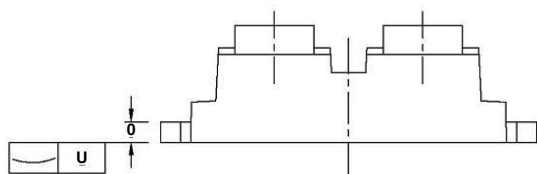
Fig. 13. Maximum Transient Thermal Impedance



SOT-227 Outline


| SYM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.224 | 1.260 | 31.10 | 32.00 |
| B | .303 | .327 | 7.70 | 8.30 |
| C | .161 | .173 | 4.10 | 4.40 |
| D | .161 | .173 | 4.10 | 4.40 |
| E | .161 | .173 | 4.10 | 4.40 |
| F | .587 | .598 | 14.90 | 15.20 |
| G | 1.181 | 1.201 | 30.00 | 30.50 |
| H | 1.488 | 1.508 | 37.80 | 38.30 |
| J | .461 | .484 | 11.70 | 12.30 |
| L | .030 | .033 | 0.75 | 0.85 |
| M | .492 | .512 | 12.50 | 13.00 |
| N | .984 | 1.004 | 25.00 | 25.50 |
| O | .075 | .087 | 1.90 | 2.20 |
| S | .181 | .193 | 4.60 | 4.90 |
| U | .000 | .005 | 0.00 | 0.13 |

- NUT MATERIAL:
 STANDARD - Low carbon steel with Ni plating.
 OPTIONAL: - Brass Nut is available.
 PART NUMBER-BN
- ALL METAL SURFACE ARE PRE NI PLATED EXCEPT TRIM AREA.





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