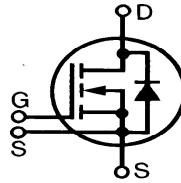


**Q3-Class  
HiperFET™  
Power MOSFET**

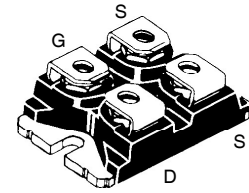
**IXFN44N80Q3**

N-Channel Enhancement Mode  
Fast Intrinsic Rectifier  
Avalanche Rated



$V_{DSS} = 800V$   
 $I_{D25} = 37A$   
 $R_{DS(on)} \leq 190m\Omega$   
 $t_{rr} \leq 300ns$

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 $150^\circ C$                                | 800             | V          |
| $V_{DGR}$     | $T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$          | 800             | V          |
| $V_{GSS}$     | Continuous                                                         | $\pm 30$        | V          |
| $V_{GSM}$     | Transient                                                          | $\pm 40$        | V          |
| $I_{D25}$     | $T_C = 25^\circ C$                                                 | 37              | A          |
| $I_{DM}$      | $T_C = 25^\circ C$ , Pulse Width Limited by $T_{JM}$               | 130             | A          |
| $I_A$         | $T_C = 25^\circ C$                                                 | 44              | A          |
| $E_{AS}$      | $T_C = 25^\circ C$                                                 | 3.5             | J          |
| $dv/dt$       | $I_S \leq I_{DM}$ , $V_{DD} \leq V_{DSS}$ , $T_J \leq 150^\circ C$ | 50              | V/ns       |
| $P_D$         | $T_C = 25^\circ C$                                                 | 780             | 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.  |
| <b>Weight</b> |                                                                    | 30              | g          |

**Features**

- International Standard Package
- Low Intrinsic Gate Resistance
- miniBLOC with Aluminum Nitride Isolation
- Avalanche Rated
- 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<br>( $T_J = 25^\circ C$ Unless Otherwise Specified) | Characteristic Values |      |                      |
|--------------|---------------------------------------------------------------------|-----------------------|------|----------------------|
|              |                                                                     | Min.                  | Typ. | Max.                 |
| $BV_{DSS}$   | $V_{GS} = 0V$ , $I_D = 3mA$                                         | 800                   |      | V                    |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$ , $I_D = 8mA$                                     | 3.5                   |      | 6.5 V                |
| $I_{GSS}$    | $V_{GS} = \pm 30V$ , $V_{DS} = 0V$                                  |                       |      | $\pm 200$ nA         |
| $I_{DSS}$    | $V_{DS} = V_{DSS}$ , $V_{GS} = 0V$<br>$T_J = 125^\circ C$           |                       |      | 50 $\mu A$<br>2.5 mA |
| $R_{DS(on)}$ | $V_{GS} = 10V$ , $I_D = 22A$ , Note 1                               |                       |      | 190 $m\Omega$        |

| Symbol                                        | Test Conditions<br>( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)                                                               | Characteristic Values |       |                    |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------|--------------------|
|                                               |                                                                                                                                         | Min.                  | Typ.  | Max.               |
| $g_{fs}$                                      | $V_{DS} = 20\text{V}, I_D = 22\text{A}$ , Note 1                                                                                        | 22                    | 37    | S                  |
| $C_{iss}$<br>$C_{oss}$<br>$C_{rss}$           | } $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$                                                                            |                       | 10950 | pF                 |
|                                               |                                                                                                                                         |                       | 957   | pF                 |
|                                               |                                                                                                                                         |                       | 95    | pF                 |
| $R_{Gi}$                                      | Gate Input Resistance                                                                                                                   |                       | 0.20  | $\Omega$           |
| $t_{d(on)}$<br>$t_r$<br>$t_{d(off)}$<br>$t_f$ | } <b>Resistive Switching Times</b><br>$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 22\text{A}$<br>$R_G = 1\Omega$ (External) |                       | 45    | ns                 |
|                                               |                                                                                                                                         |                       | 60    | ns                 |
|                                               |                                                                                                                                         |                       | 63    | ns                 |
|                                               |                                                                                                                                         |                       | 20    | ns                 |
| $Q_{g(on)}$<br>$Q_{gs}$<br>$Q_{gd}$           | } $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 22\text{A}$                                                                   |                       | 185   | nC                 |
|                                               |                                                                                                                                         |                       | 67    | nC                 |
|                                               |                                                                                                                                         |                       | 83    | nC                 |
| $R_{thJC}$<br>$R_{thCS}$                      |                                                                                                                                         |                       | 0.16  | $^\circ\text{C/W}$ |
|                                               |                                                                                                                                         | 0.05                  |       | $^\circ\text{C/W}$ |

**Source-Drain Diode**

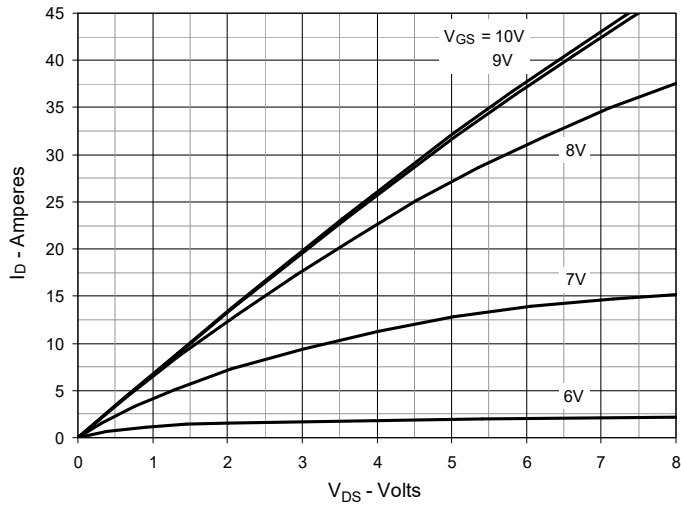
| Symbol                           | Test Conditions<br>( $T_J = 25^\circ\text{C}$ Unless Otherwise Specified)                         | Characteristic Values |      |               |
|----------------------------------|---------------------------------------------------------------------------------------------------|-----------------------|------|---------------|
|                                  |                                                                                                   | Min.                  | Typ. | Max.          |
| $I_S$                            | $V_{GS} = 0\text{V}$                                                                              |                       |      | 44 A          |
| $I_{SM}$                         | Repetitive, Pulse Width Limited by $T_{JM}$                                                       |                       |      | 176 A         |
| $V_{SD}$                         | $I_F = I_S, V_{GS} = 0\text{V}$ , Note 1                                                          |                       |      | 1.4 V         |
| $t_{rr}$<br>$Q_{RM}$<br>$I_{RM}$ | } $I_F = 22\text{A}, -di/dt = 100\text{A}/\mu\text{s}$<br>$V_R = 100\text{V}, V_{GS} = 0\text{V}$ |                       |      | 300 ns        |
|                                  |                                                                                                   |                       | 1.8  | $\mu\text{C}$ |
|                                  |                                                                                                   |                       | 13.4 | A             |

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

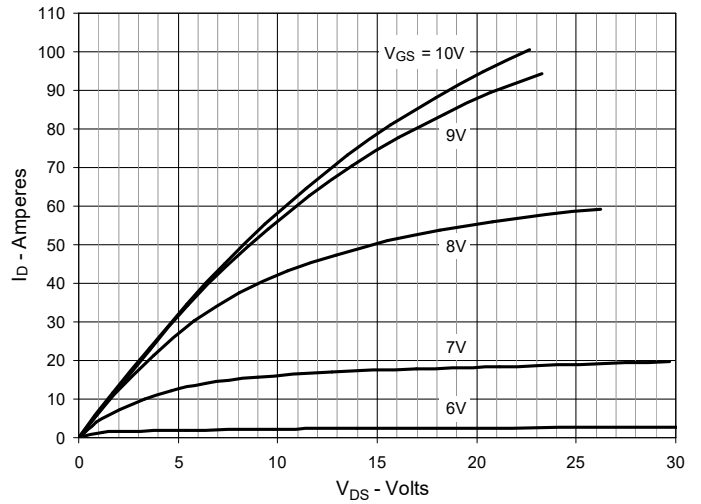
IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

|                                                                                     |           |           |           |           |              |              |              |              |              |             |
|-------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| IXYS MOSFETs and IGBTs are covered<br>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    |             |

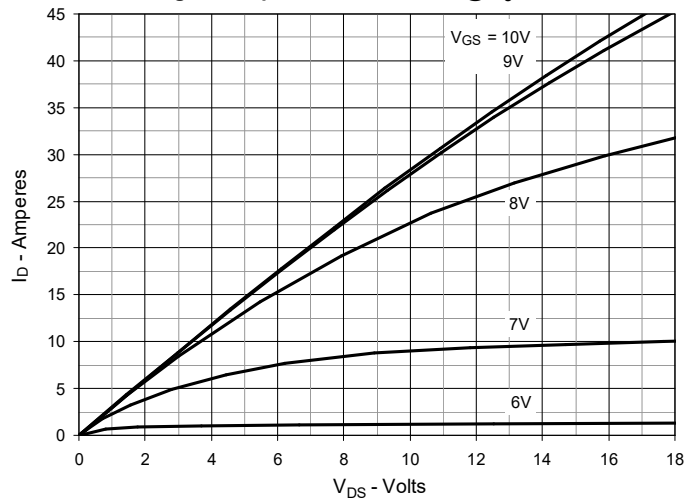
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



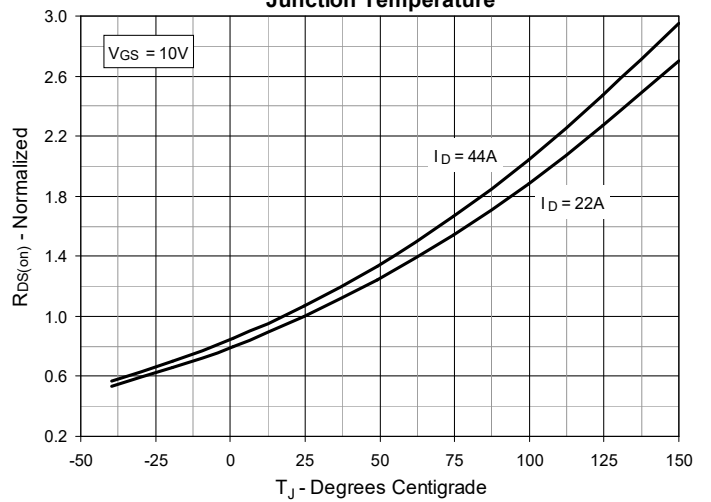
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



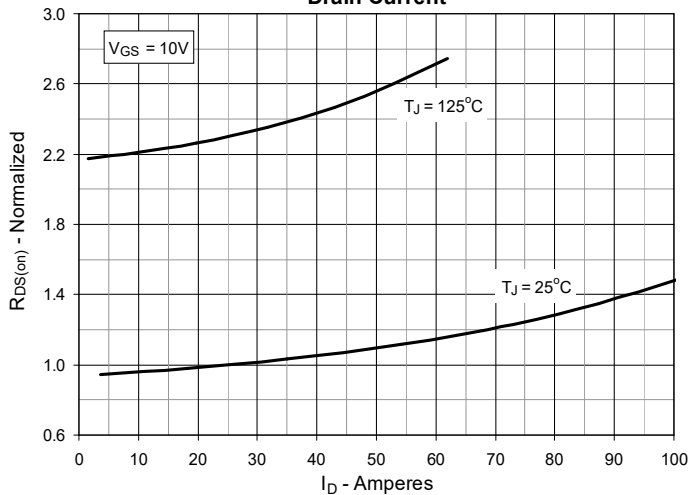
**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$**



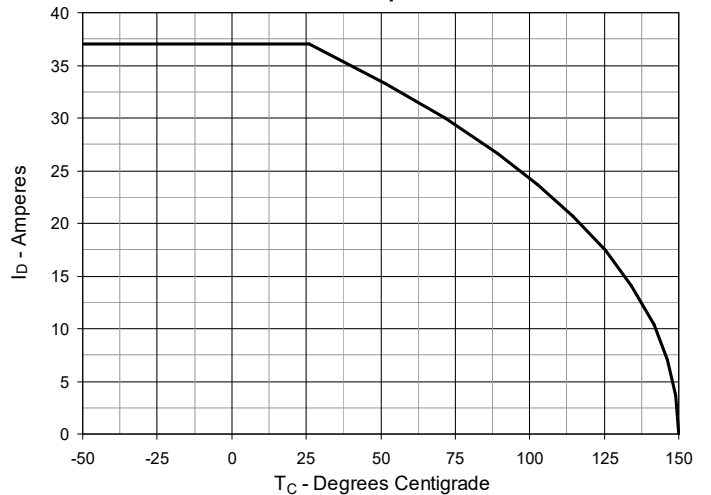
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 22\text{A}$  Value vs. Junction Temperature**



**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 22\text{A}$  Value vs. Drain Current**



**Fig. 6. Maximum Drain Current vs. Case Temperature**



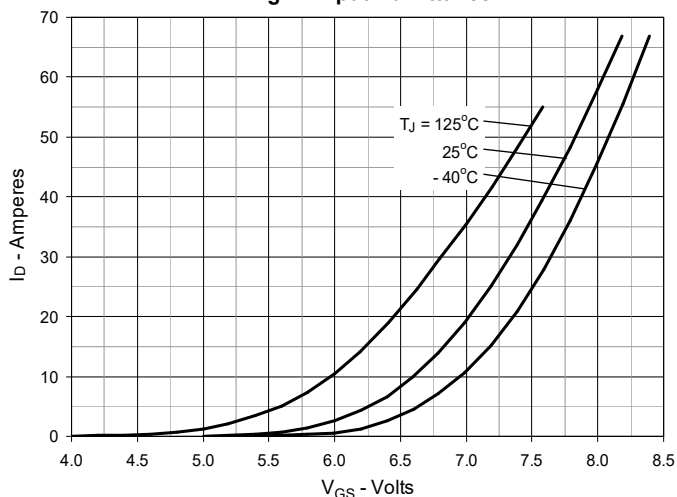
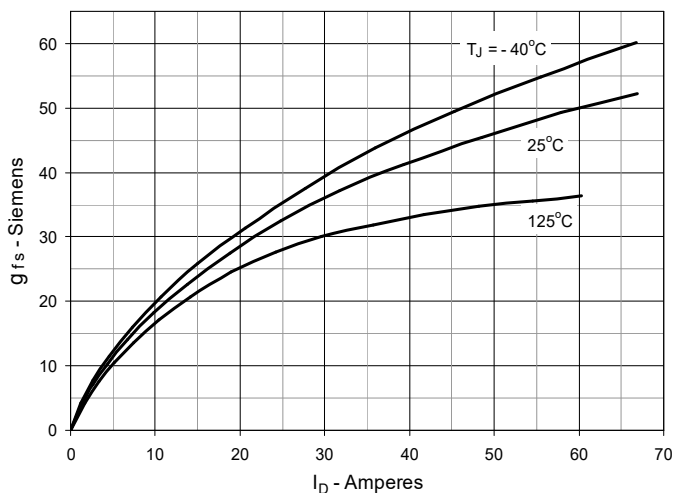
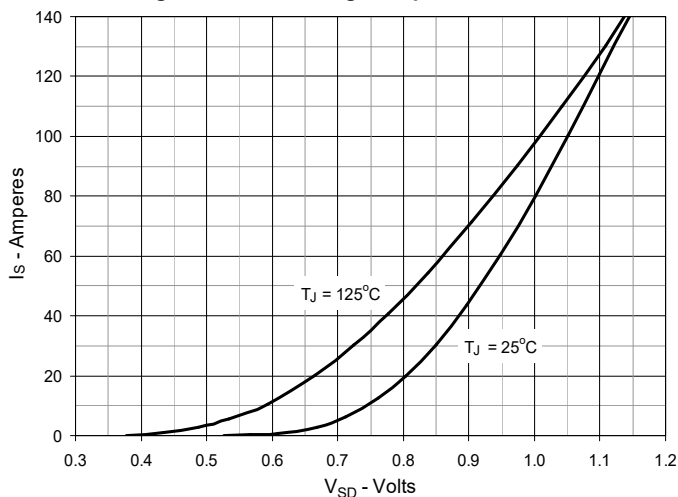
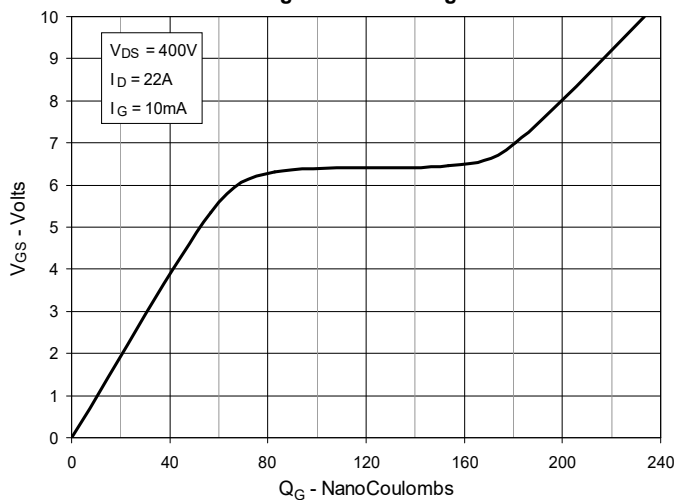
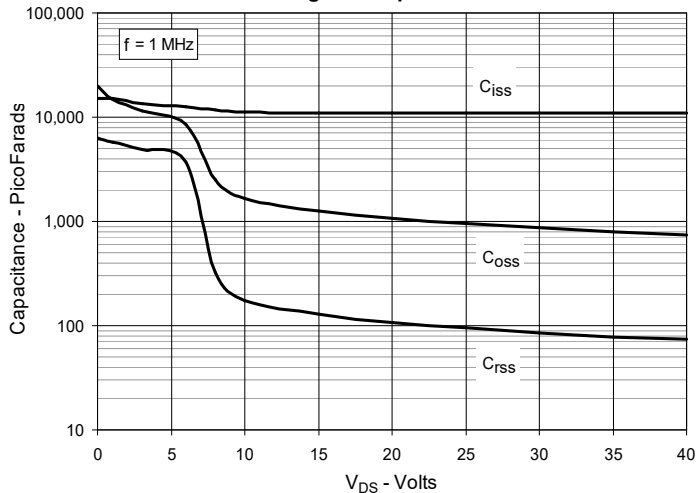
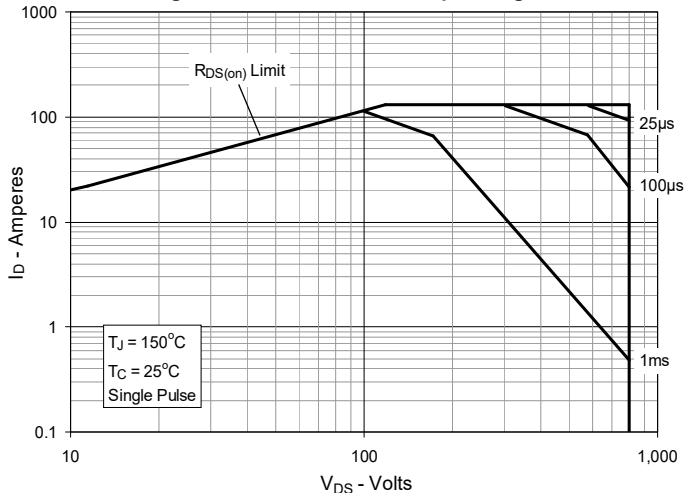
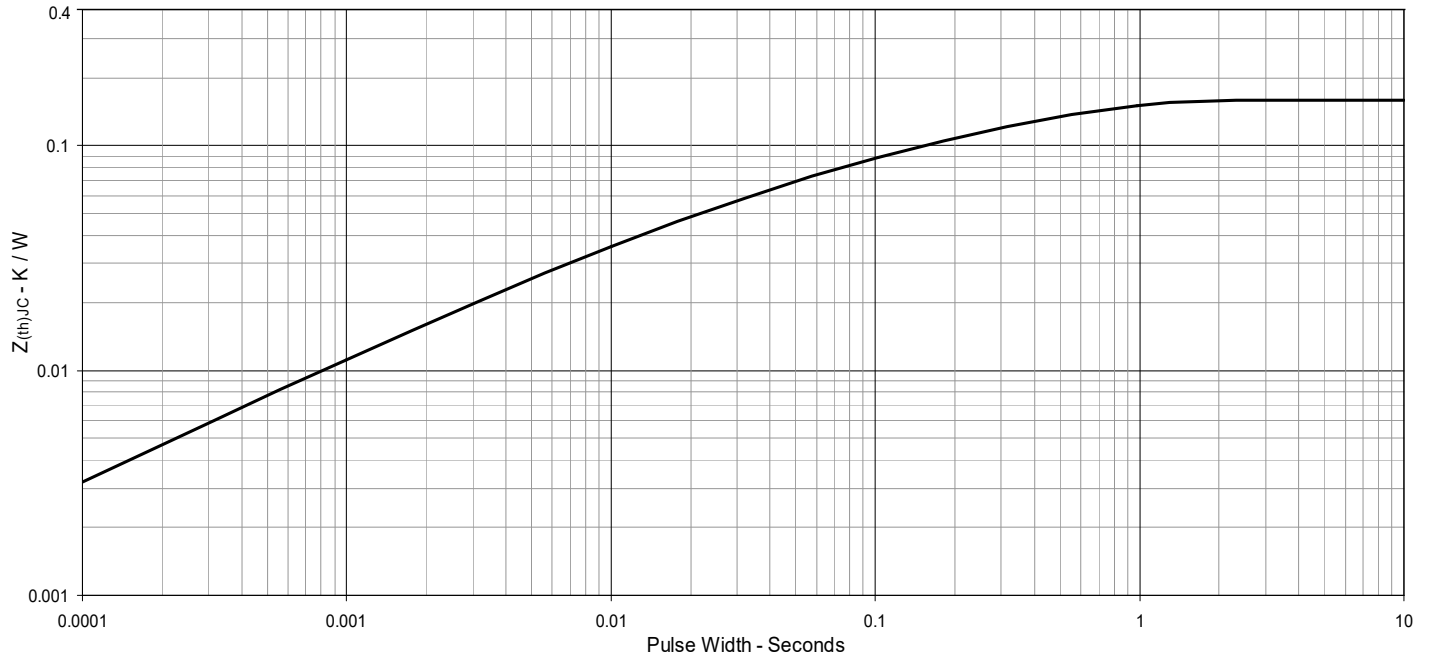
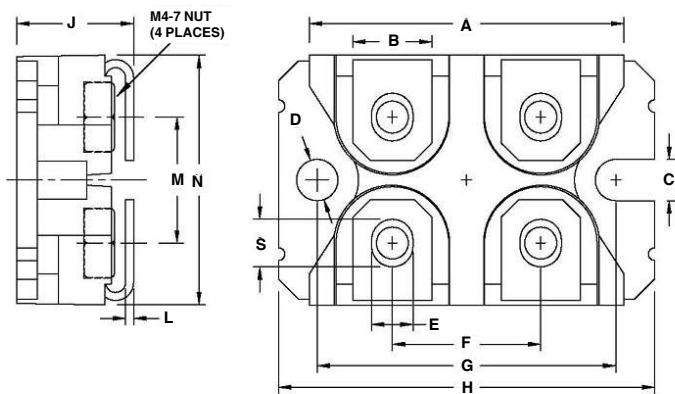
**Fig. 7. Input Admittance**

**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**


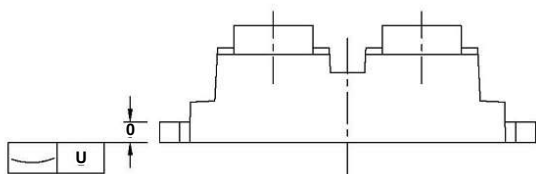
Fig. 13. Maximum Transient Thermal Impedance



**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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