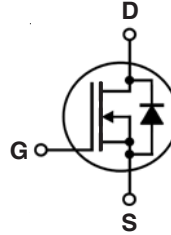


Depletion Mode MOSFET

IXTH16N50D2 IXTT16N50D2

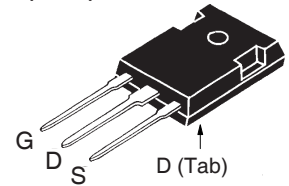
$V_{DSX} = 500V$
 $I_{D(on)} \geq 16A$
 $R_{DS(on)} \leq 300m\Omega$

N-Channel

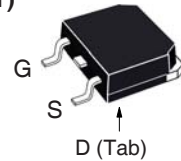


| Symbol | Test Conditions | Maximum Ratings | |
|------------|---|-----------------|------------|
| V_{DSX} | $T_J = 25^\circ C$ to $150^\circ C$ | 500 | V |
| V_{DGX} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$ | 500 | V |
| V_{GSX} | Continuous | ± 20 | V |
| V_{GSM} | Transient | ± 30 | V |
| P_D | $T_C = 25^\circ C$ | 695 | W |
| T_J | | - 55 ... +150 | $^\circ C$ |
| T_{JM} | | 150 | $^\circ C$ |
| T_{stg} | | - 55 ... +150 | $^\circ C$ |
| T_L | Maximum Lead Temperature for Soldering | 300 | $^\circ C$ |
| T_{SOLD} | 1.6 mm (0.062in.) from Case for 10s | 260 | $^\circ C$ |
| M_d | Mounting Torque (TO-247) | 1.13 / 10 | Nm/lb.in. |
| Weight | TO-247 | 6 | g |
| | TO-268 | 4 | g |

TO-247 (IXTH)



TO-268 (IXTT)



G = Gate D = Drain
 S = Source Tab = Drain

Features

- Normally ON Mode
- International Standard Packages
- Molding Epoxies Meet UL94V-0 Flammability Classification

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Audio Amplifiers
- Start-up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

| Symbol | Test Conditions ($T_J = 25^\circ C$, Unless Otherwise Specified) | Characteristic Values | | |
|----------------|---|-----------------------|------|---------------------------|
| | | Min. | Typ. | Max. |
| BV_{DSX} | $V_{GS} = -5V$, $I_D = 250\mu A$ | 500 | | V |
| $V_{GS(off)}$ | $V_{DS} = 25V$, $I_D = 4mA$ | - 2.0 | | V |
| I_{GSX} | $V_{GS} = \pm 20V$, $V_{DS} = 0V$ | | | ± 100 nA |
| $I_{DSX(off)}$ | $V_{DS} = V_{DSX}$, $V_{GS} = -5V$ $T_J = 125^\circ C$ | | | 10 μA 150 μA |
| $R_{DS(on)}$ | $V_{GS} = 0V$, $I_D = 8A$, Note 1 | | | 300 m Ω |
| $I_{D(on)}$ | $V_{GS} = 0V$, $V_{DS} = 25V$, Note 1 | 16 | | A |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 30\text{V}, I_D = 8\text{A}$, Note 1 | 7 | 12 | S |
| C_{iss} | $V_{GS} = -10\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$ | | 5250 | pF |
| C_{oss} | | | 515 | pF |
| C_{rss} | | | 130 | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = \pm 5\text{V}, V_{DS} = 250\text{V}, I_D = 8\text{A}$ $R_G = 3.3\Omega$ (External) | | 50 | ns |
| t_r | | | 173 | ns |
| $t_{d(off)}$ | | | 203 | ns |
| t_f | | | 220 | ns |
| $Q_{g(on)}$ | $V_{GS} = \pm 5\text{V}, V_{DS} = 250\text{V}, I_D = 8\text{A}$ | | 199 | nC |
| Q_{gs} | | | 18 | nC |
| Q_{gd} | | | 100 | nC |
| R_{thJC} | TO-247 | | | 0.18 $^\circ\text{C/W}$ |
| R_{thCS} | | | 0.21 | $^\circ\text{C/W}$ |

Safe-Operating-Area Specification

| Symbol | Test Conditions | Characteristic Values | | |
|--------|--|-----------------------|------|------|
| | | Min. | Typ. | Max. |
| SOA | $V_{DS} = 500\text{V}, I_D = 0.5\text{A}, T_C = 75^\circ\text{C}, t_p = 5\text{s}$ | 250 | | W |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|----------|--|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| V_{SD} | $I_F = 16\text{A}, V_{GS} = -10\text{V}$, Note 1 | | 0.8 | 1.3 V |
| t_{rr} | $I_F = 8\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = -10\text{V}$ | | 695 | ns |
| I_{RM} | | | 20 | A |
| Q_{RM} | | | 7 | μC |

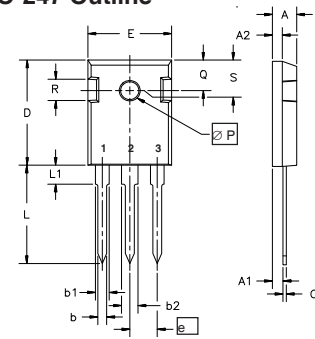
Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

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 | |

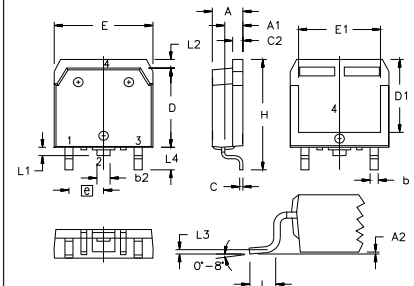
TO-247 Outline



Terminals: 1 - Gate
2 - Drain
3 - Source

| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.7 | 5.3 | .185 | .209 |
| A ₁ | 2.2 | 2.54 | .087 | .102 |
| A ₂ | 2.2 | 2.6 | .059 | .098 |
| b | 1.0 | 1.4 | .040 | .055 |
| b ₁ | 1.65 | 2.13 | .065 | .084 |
| b ₂ | 2.87 | 3.12 | .113 | .123 |
| C | .4 | .8 | .016 | .031 |
| D | 20.80 | 21.46 | .819 | .845 |
| E | 15.75 | 16.26 | .610 | .640 |
| e | 5.20 | 5.72 | 0.205 | 0.225 |
| L | 19.81 | 20.32 | .780 | .800 |
| L ₁ | | 4.50 | | .177 |
| ∅P | 3.55 | 3.65 | .140 | .144 |
| Q | 5.89 | 6.40 | 0.232 | 0.252 |
| R | 4.32 | 5.49 | .170 | .216 |
| S | 6.15 | BSC | 242 | BSC |

TO-268 Outline



Terminals: 1 - Gate
2 - Drain
3 - Source
Tab - Drain

| SYM | INCHES | | MILLIMETERS | |
|----------------|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .193 | .201 | 4.90 | 5.10 |
| A ₁ | .106 | .114 | 2.70 | 2.90 |
| A ₂ | .001 | .010 | 0.02 | 0.25 |
| b | .045 | .057 | 1.15 | 1.45 |
| b ₂ | .075 | .083 | 1.90 | 2.10 |
| C | .016 | .026 | 0.40 | 0.65 |
| C ₂ | .057 | .063 | 1.45 | 1.60 |
| D | .543 | .551 | 13.80 | 14.00 |
| D ₁ | .488 | .500 | 12.40 | 12.70 |
| E | .624 | .632 | 15.85 | 16.05 |
| E ₁ | .524 | .535 | 13.30 | 13.60 |
| e | .215 BSC | | 5.45 BSC | |
| H | .736 | .752 | 18.70 | 19.10 |
| L | .094 | .106 | 2.40 | 2.70 |
| L ₁ | .047 | .055 | 1.20 | 1.40 |
| L ₂ | .039 | .045 | 1.00 | 1.15 |
| L ₃ | .010 BSC | | 0.25 BSC | |
| L ₄ | .150 | .161 | 3.80 | 4.10 |

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

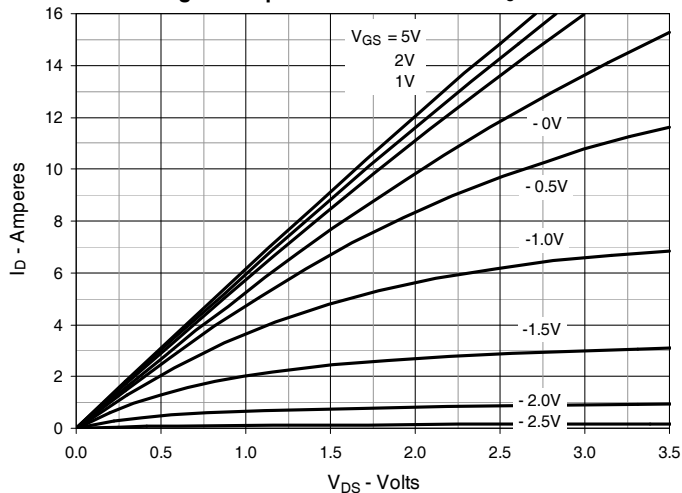


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

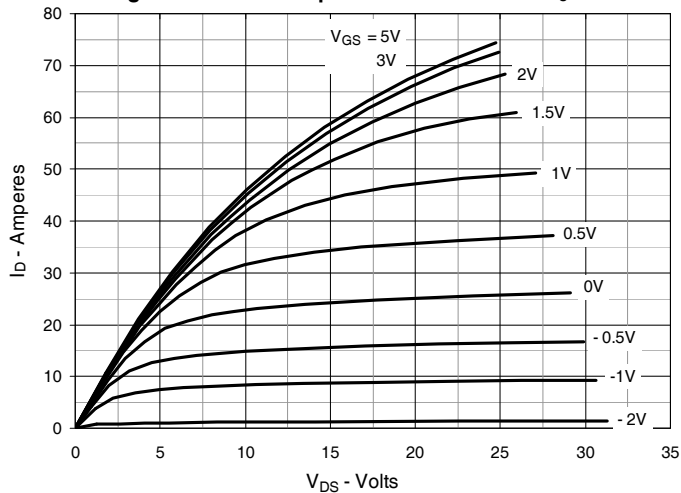


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

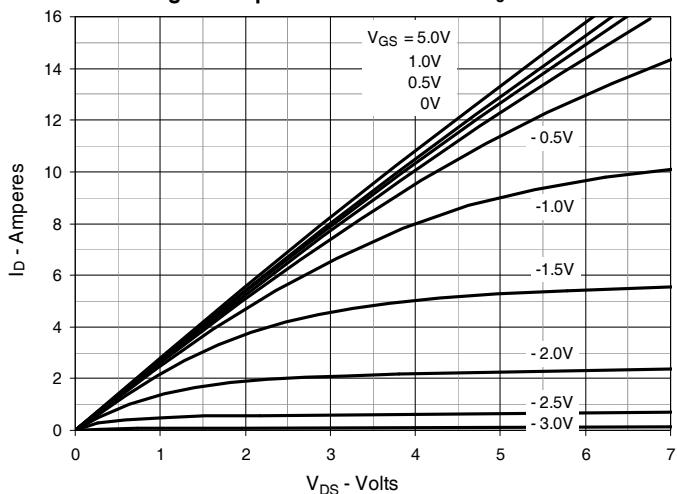


Fig. 4. Drain Current @ $T_J = 25^\circ\text{C}$

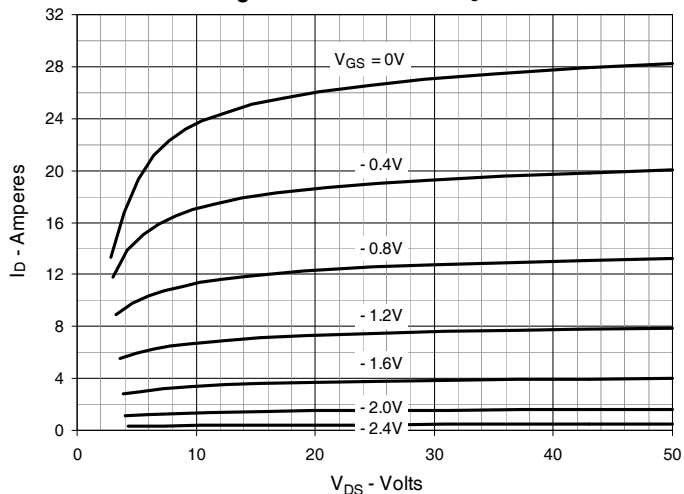


Fig. 5. Drain Current @ $T_J = 100^\circ\text{C}$

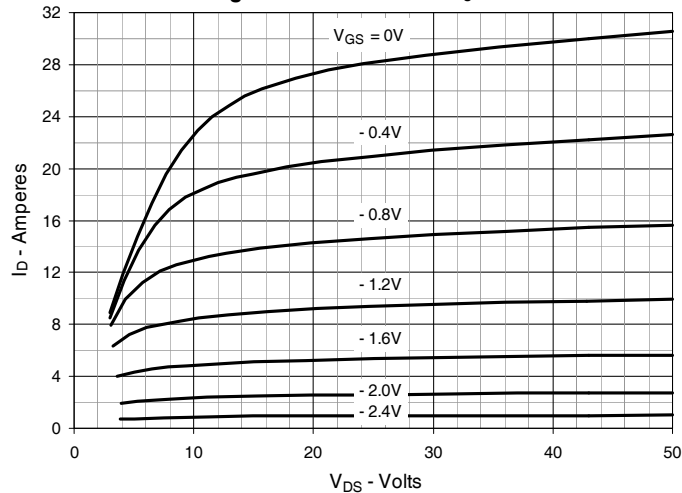


Fig. 6. Dynamic Resistance vs. Gate Voltage

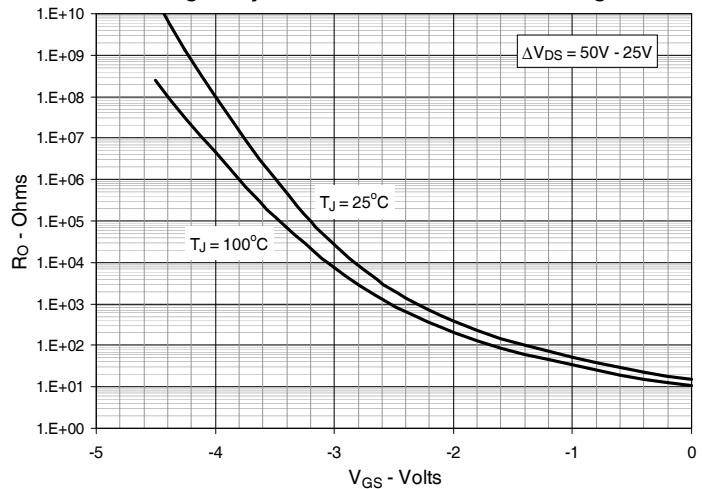


Fig. 7. Normalized $R_{DS(on)}$ vs. Junction Temperature

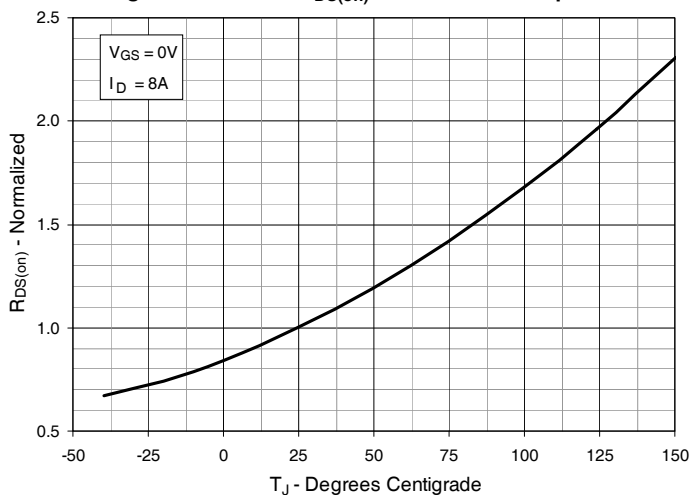


Fig. 8. $R_{DS(on)}$ Normalized to $I_D = 8A$ Value vs. Drain Current

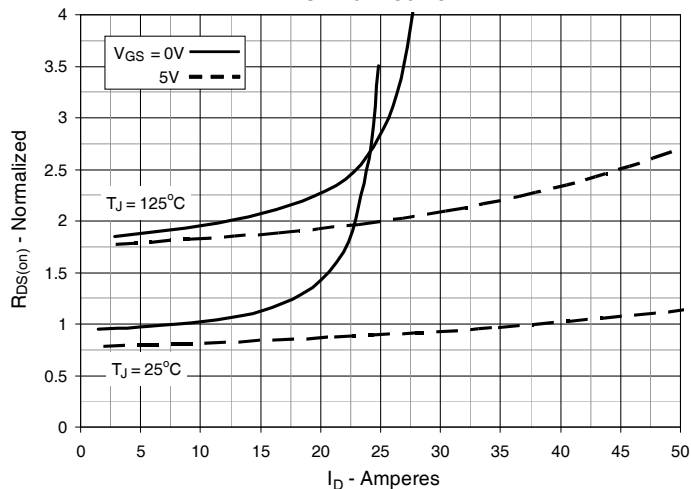


Fig. 9. Input Admittance

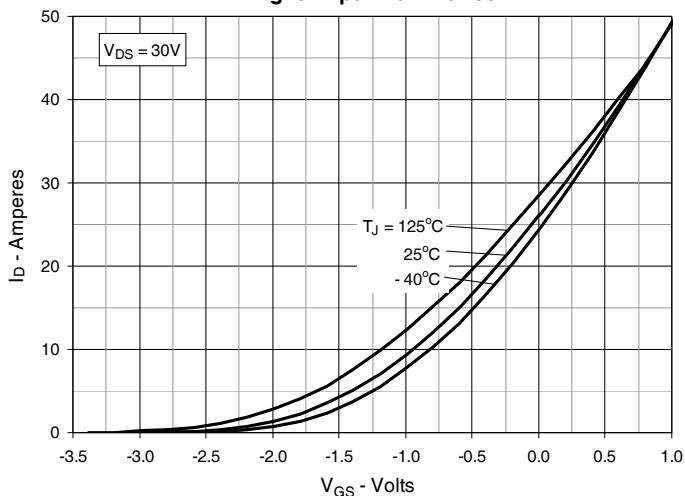


Fig. 10. Transconductance

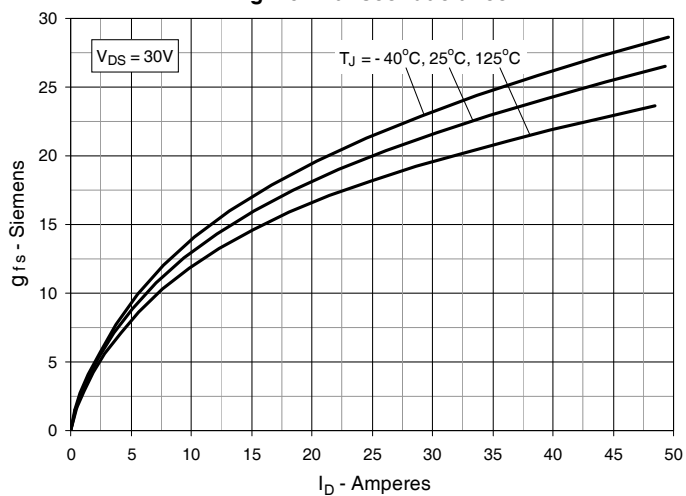


Fig. 11. Breakdown and Threshold Voltages vs. Junction Temperature

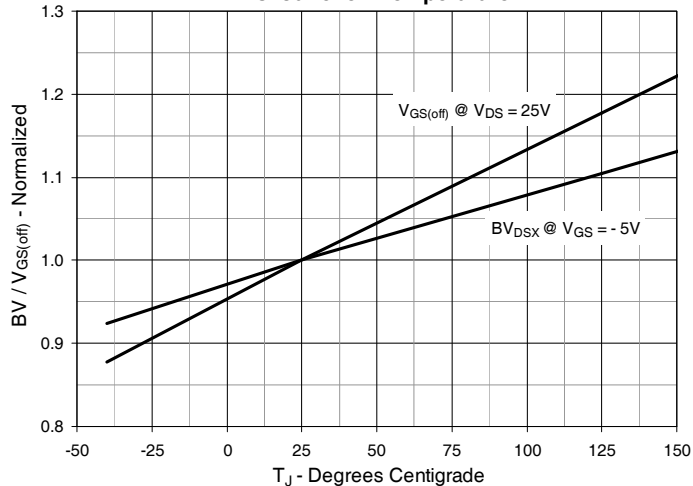


Fig. 12. Forward Voltage Drop of Intrinsic Diode

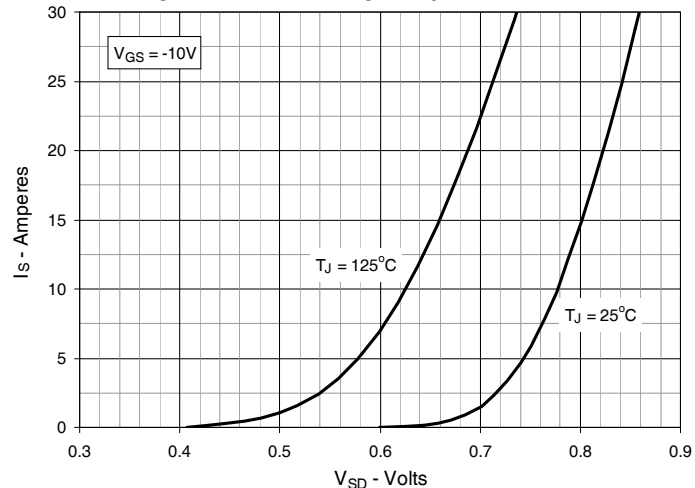


Fig. 13. Capacitance

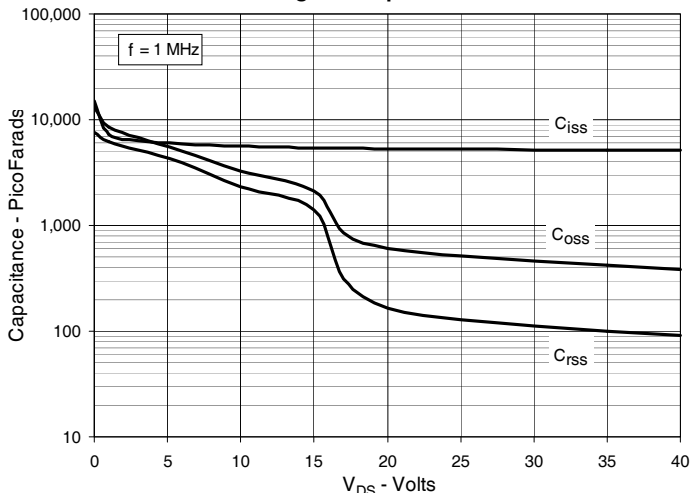


Fig. 14. Gate Charge

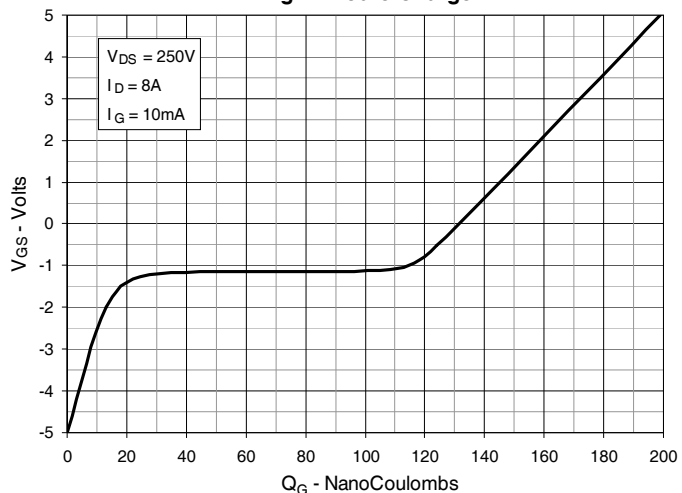


Fig. 15. Forward-Bias Safe Operating Area @ $T_C = 25^\circ\text{C}$

@ $T_C = 25^\circ\text{C}$

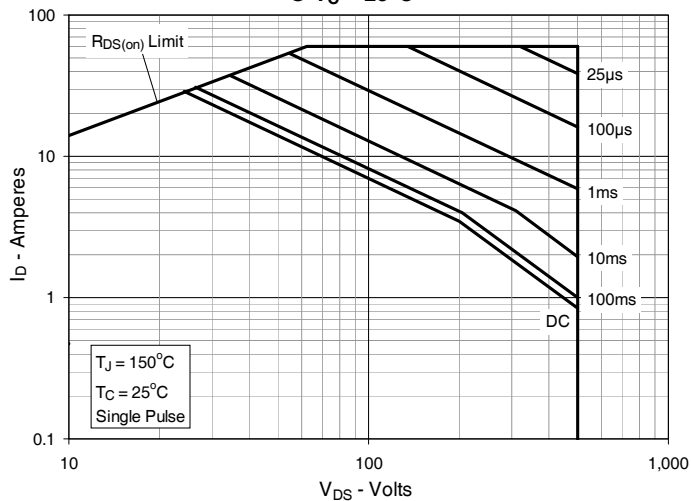


Fig. 16. Forward-Bias Safe Operating Area @ $T_C = 75^\circ\text{C}$

@ $T_C = 75^\circ\text{C}$

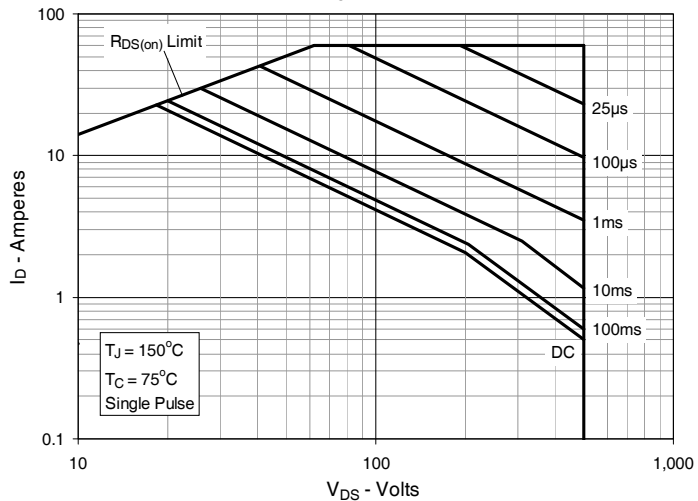
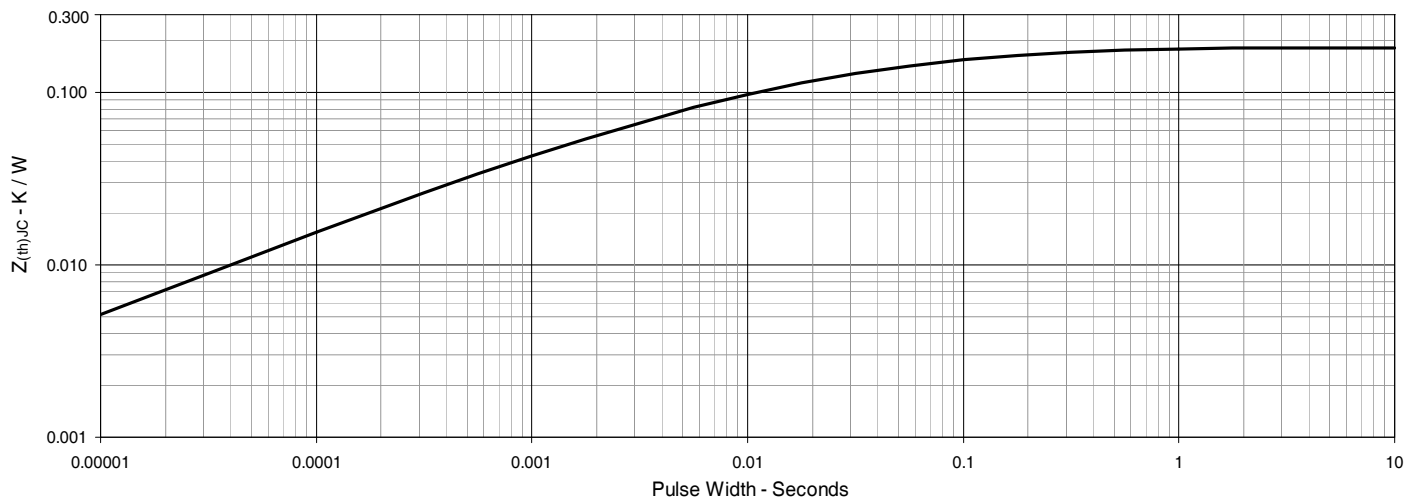


Fig. 17. Maximum Transient Thermal Impedance



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[DMN1006UCA6-7](#) [DMN16M9UCA6-7](#)