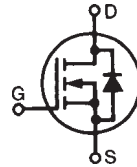


**Linear™ Power MOSFET
w/ Extended FBSOA**

**IXTK17N120L
IXTX17N120L**

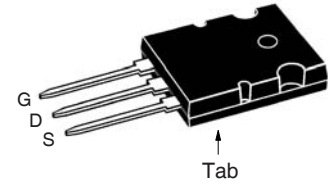
V_{DSS} = 1200V
I_{D25} = 17A
R_{DS(on)} ≤ 900mΩ

N-Channel Enhancement Mode
 Avalanche Rated
 Guaranteed FBSOA

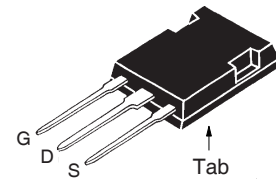


| Symbol | Test Conditions | Maximum Ratings | |
|-------------------|---|-------------------|-----------|
| V _{DSS} | T _J = 25°C to 150°C | 1200 | V |
| V _{DGR} | T _J = 25°C to 150°C, R _{GS} = 1MΩ | 1200 | V |
| V _{GSS} | Continuous | ±30 | V |
| V _{GSM} | Transient | ±40 | V |
| I _{D25} | T _C = 25°C | 17 | A |
| I _{DM} | T _C = 25°C, pulse width limited by T _{JM} | 34 | A |
| I _A | T _C = 25°C | 8.5 | A |
| E _{AS} | T _C = 25°C | 2.5 | J |
| P _D | T _C = 25°C | 700 | W |
| T _J | | -55...+150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55...+150 | °C |
| T _L | 1.6mm (0.063 in.) from case for 10s | 300 | °C |
| T _{SOLD} | Plastic body for 10s | 260 | °C |
| M _d | Mounting torque (IXTK) | 1.13/10 | Nm/lb.in. |
| F _C | Mounting Force (IXTX) | 20..120 / 4.5..27 | N/lb. |
| Weight | TO-264 | 10 | g |
| | PLUS247 | 6 | g |

TO-264 (IXTK)



PLUS247 (IXTX)



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

Features

- Designed for Linear Operations
- Guaranteed FBSOA at 60°C
- Avalanche Rated
- Low R_{DS(on)} HDMOS™ Process
- Molding Epoxies Meet UL94 V-0 Flammability Classification

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Programmable Loads
- Current Regulators
- DC-DC Convertors
- Battery Chargers
- DC Choppers
- Temperature and Lighting Controls

| Symbol | Test Conditions (T _J = 25°C, Unless Otherwise Specified) | Characteristic Values | | |
|---------------------|---|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| BV _{DSS} | V _{GS} = 0V, I _D = 1mA | 1200 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 3.0 | | 6.0 V |
| I _{GSS} | V _{GS} = ±30V, V _{DS} = 0V | | | ±200 nA |
| I _{DSS} | V _{DS} = V _{DSS} , V _{GS} = 0V T _J = 125°C | | | 50 μA 2 mA |
| R _{DS(on)} | V _{GS} = 20V, I _D = 0.5 • I _{DSS} , Note 1 | | | 900 mΩ |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | | |
|--------------|--|--|------|------|--------------------|
| | | Min. | Typ. | Max. | |
| g_{fs} | $V_{DS} = 20\text{V}$, $I_D = 0.5 \cdot I_{DSS}$, Note 1 | 3.5 | 5.0 | 6.5 | S |
| C_{iss} | $V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$ | | 8300 | | pF |
| C_{oss} | | | 520 | | pF |
| C_{rss} | | | 90 | | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{DSS}$ $R_G = 2\Omega$ (External) | | 42 | | ns |
| t_r | | | 31 | | ns |
| $t_{d(off)}$ | | | 110 | | ns |
| t_f | | | 83 | | ns |
| $Q_{g(on)}$ | | $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{DSS}$ | | 155 | |
| Q_{gs} | | | 41 | | nC |
| Q_{gd} | | | 60 | | nC |
| R_{thJC} | | | | 0.18 | $^\circ\text{C/W}$ |
| R_{thCS} | | | 0.15 | | $^\circ\text{C/W}$ |

Safe Operating Area Specification

| Symbol | Test Conditions | Characteristic Values | | |
|--------|---|-----------------------|------|------|
| | | Min. | Typ. | Max. |
| SOA | $V_{DS} = 800\text{V}$, $I_D = 0.3\text{A}$, $T_C = 60^\circ\text{C}$, $t_p = 3\text{s}$ | 240 | | W |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | | |
|----------|---|-----------------------|------|------|----|
| | | Min. | Typ. | Max. | |
| I_S | $V_{GS} = 0\text{V}$ | | | 17 | A |
| I_{SM} | Repetitive, Pulse Width Limited by T_{JM} | | | 50 | A |
| V_{SD} | $I_F = 17\text{A}$, $V_{GS} = 0\text{V}$, Note 1 | | | 1.5 | V |
| t_{rr} | $I_F = I_S$, $-di/dt = 100\text{A}/\mu\text{s}$, $V_R = 100\text{V}$ | | 1830 | | ns |

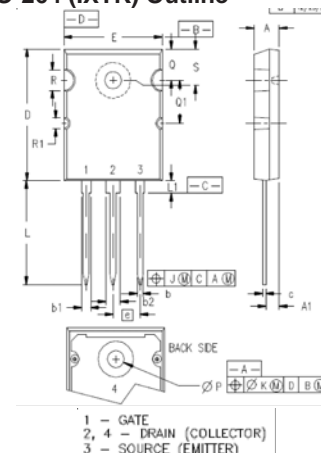
Note: 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

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:

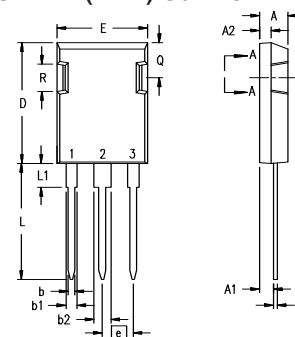
| | | | | | | | | | |
|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|-------------|
| 4,835,592 | 4,931,844 | 5,049,961 | 5,237,481 | 6,162,665 | 6,404,065 B1 | 6,683,344 | 6,727,585 | 7,005,734 B2 | 7,157,338B2 |
| 4,850,072 | 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-264 (IXTK) Outline



| SYM | INCHES | | MILLIMETERS | |
|-----|---------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .185 | .209 | 4.70 | 5.31 |
| A1 | .102 | .118 | 2.59 | 3.00 |
| b | .037 | .055 | 0.94 | 1.40 |
| b1 | .087 | .102 | 2.21 | 2.59 |
| b2 | .110 | .126 | 2.79 | 3.20 |
| c | .017 | .029 | 0.43 | 0.74 |
| D | 1.007 | 1.047 | 25.58 | 26.59 |
| E | .760 | .799 | 19.30 | 20.29 |
| e | .215BSC | | 5.46 BSC | |
| J | .000 | .010 | 0.00 | 0.25 |
| K | .000 | .010 | 0.00 | 0.25 |
| L | .779 | .842 | 19.79 | 21.39 |
| L1 | .087 | .102 | 2.21 | 2.59 |
| ØP | .122 | .138 | 3.10 | 3.51 |
| Q | .240 | .256 | 6.10 | 6.50 |
| Q1 | .330 | .346 | 8.38 | 8.79 |
| ØR | .155 | .187 | 3.94 | 4.75 |
| ØR1 | .085 | .093 | 2.16 | 2.36 |
| S | .243 | .253 | 6.17 | 6.43 |

PLUS 247™ (IXTX) Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

| Dim. | Millimeter | | Inches | |
|----------------|------------|-------|----------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.83 | 5.21 | .190 | .205 |
| A ₁ | 2.29 | 2.54 | .090 | .100 |
| A ₂ | 1.91 | 2.16 | .075 | .085 |
| b | 1.14 | 1.40 | .045 | .055 |
| b ₁ | 1.91 | 2.13 | .075 | .084 |
| b ₂ | 2.92 | 3.12 | .115 | .123 |
| C | 0.61 | 0.80 | .024 | .031 |
| D | 20.80 | 21.34 | .819 | .840 |
| E | 15.75 | 16.13 | .620 | .635 |
| e | 5.45 BSC | | .215 BSC | |
| L | 19.81 | 20.32 | .780 | .800 |
| L1 | 3.81 | 4.32 | .150 | .170 |
| Q | 5.59 | 6.20 | .220 | 0.244 |
| R | 4.32 | 4.83 | .170 | .190 |

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

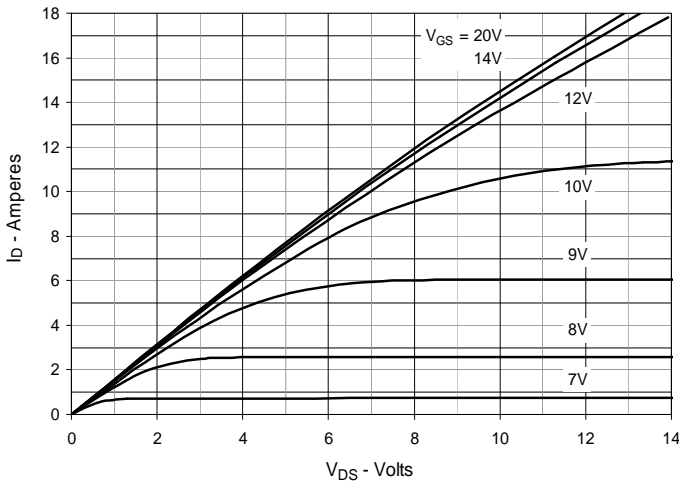


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

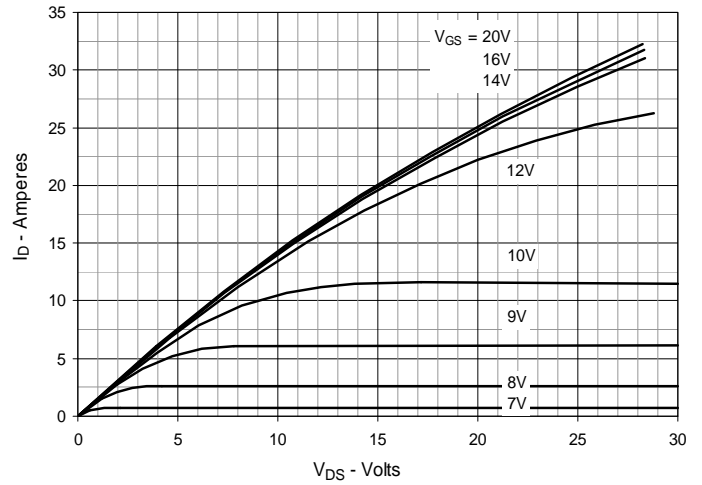


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

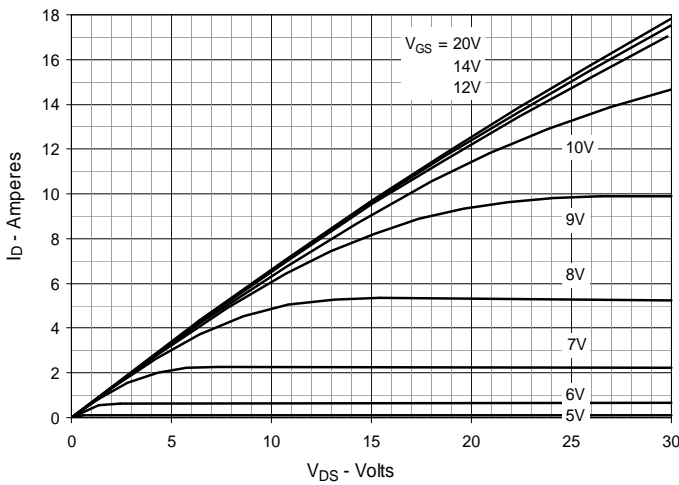


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 8.5\text{A}$ Value vs. Junction Temperature

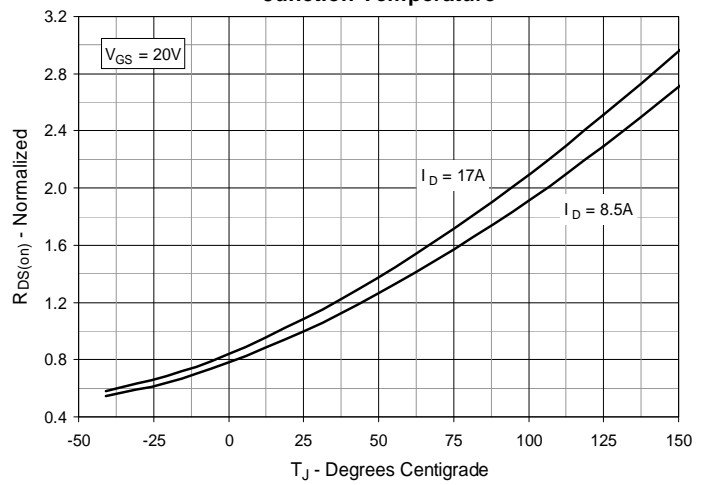


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 8.5\text{A}$ Value vs. Drain Current

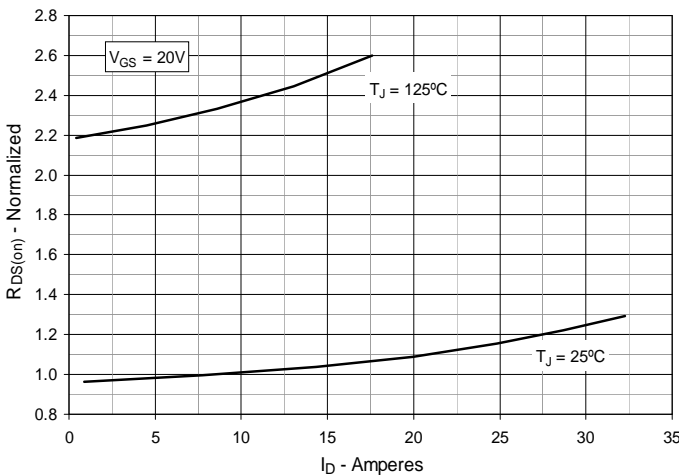


Fig. 6. Maximum Drain Current vs. Case Temperature

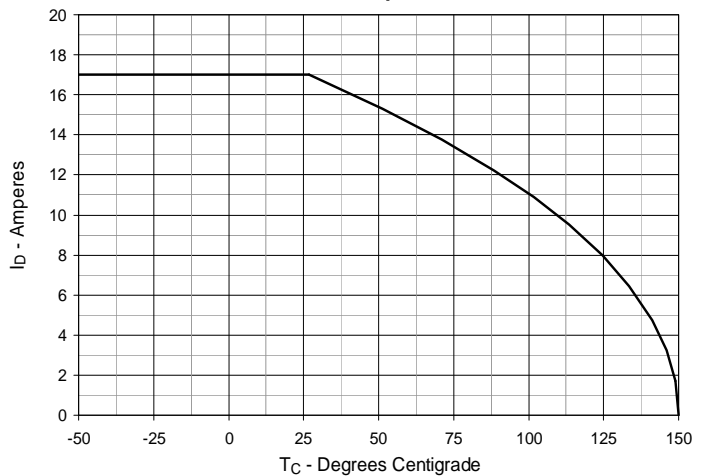


Fig. 7. Input Admittance

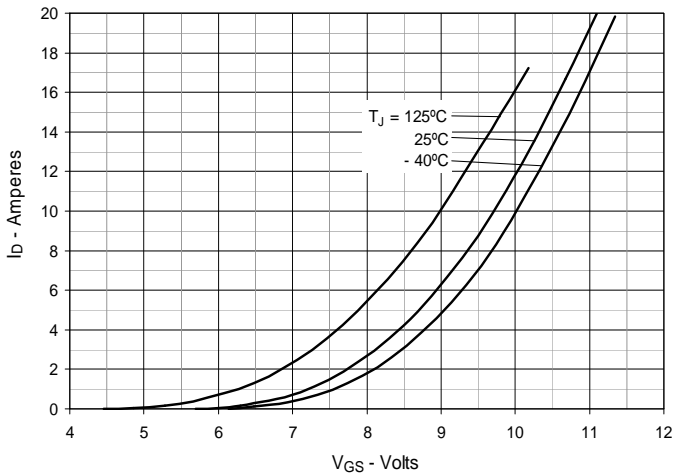


Fig. 8. Transconductance

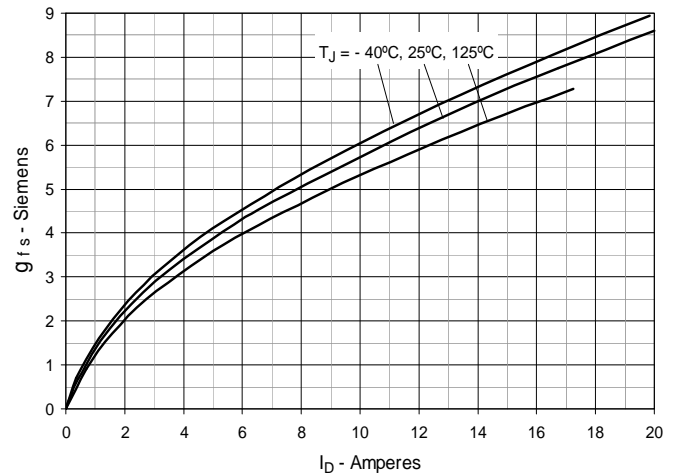


Fig. 9. Forward Voltage Drop of Intrinsic Diode

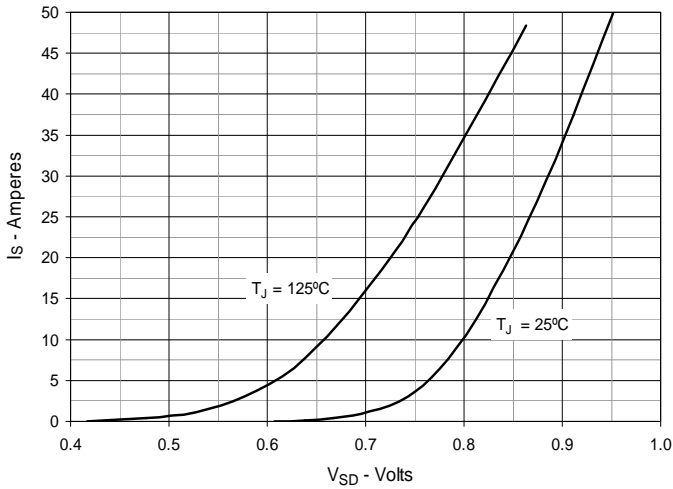


Fig. 10. Gate Charge

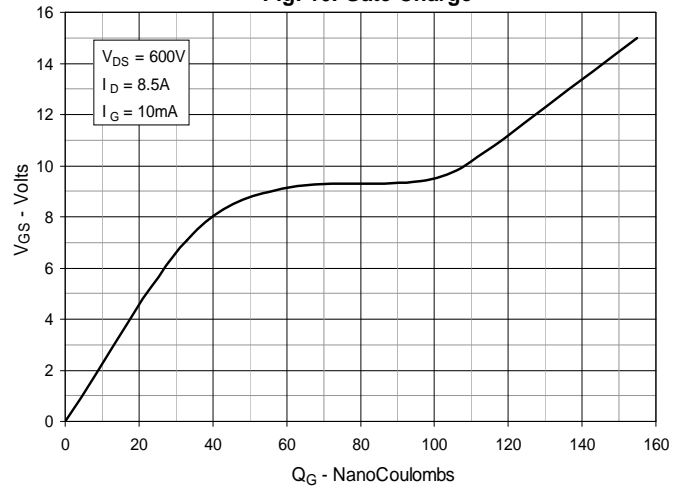


Fig. 11. Capacitance

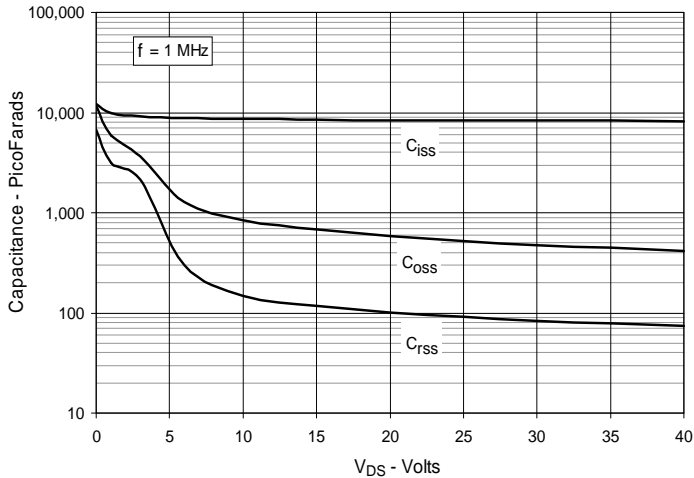
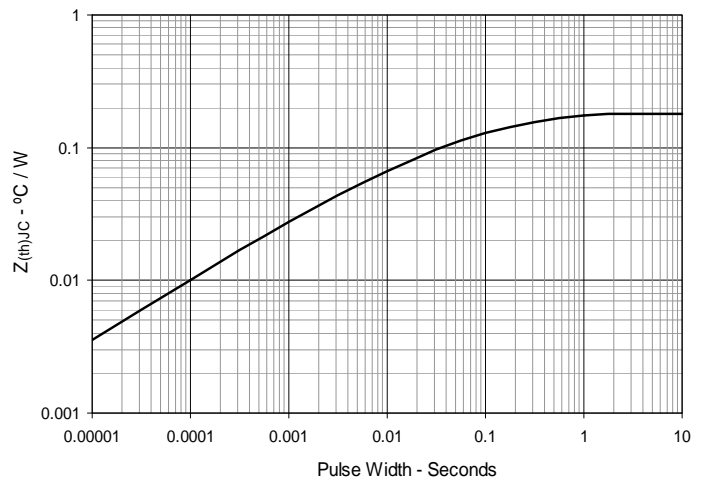
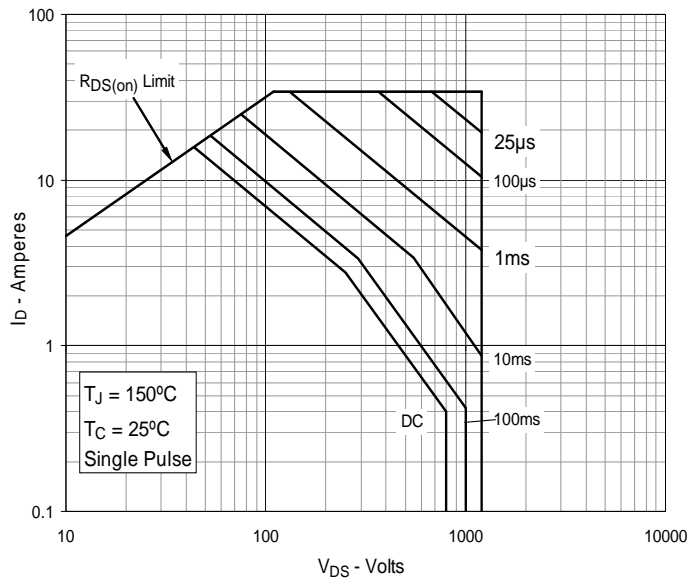


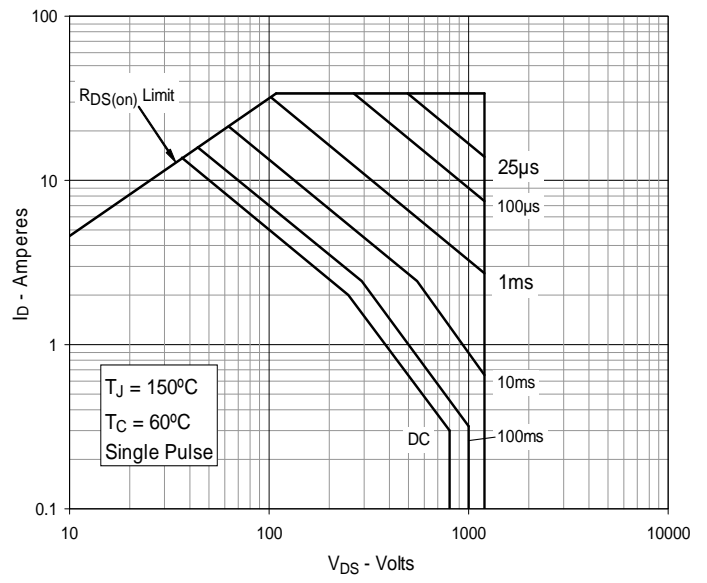
Fig. 12. Maximum Transient Thermal Impedance



**Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$**



**Fig. 14. Forward-Bias Safe Operating Area
@ $T_C = 60^\circ\text{C}$**





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[JANTX2N6784U](#) [JANTXV2N5416U4](#) [SQM110N05-06L-GE3](#) [SIHF35N60E-GE3](#) [2SK2614\(TE16L1,Q\)](#)