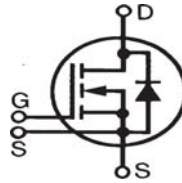


LinearL2™
Power MOSFET
w/Extended FBSOA

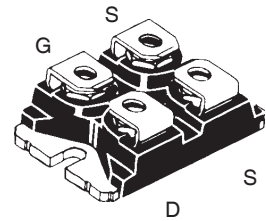
IXTN60N50L2

$V_{DSS} = 500V$
 $I_{D25} = 53A$
 $R_{DS(on)} \leq 100m\Omega$

N-Channel Enhancement Mode
 Extended FBSOA



miniBLOC, SOT-227
 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} | $T_C = 25^\circ C$ | 53 | A |
| I_{DM} | $T_C = 25^\circ C$, pulse width limited by T_{JM} | 150 | A |
| I_A | $T_C = 25^\circ C$ | 60 | A |
| E_{AS} | $T_C = 25^\circ C$ | 3 | J |
| P_D | $T_C = 25^\circ C$ | 735 | 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~ |
| | $I_{ISOL} \leq 1mA$ $t = 1$ second | 3000 | V~ |
| M_d | Mounting torque | 1.5/13 | Nm/lb.in |
| | Terminal Connection torque | 1.3/11.5 | Nm/lb.in |
| Weight | | 30 | g |

Features

- Designed for linear operation
- International standard package
- Molding epoxy meets UL94 V-0 flammability classification
- miniBLOC with Aluminium nitride isolation
- Guaranteed FBSOA at $75^\circ C$

Applications

- Programmable loads
- Current regulators
- DC-DC converters
- Battery chargers
- DC choppers
- Temperature and lighting controls

Advantages

- Easy to mount
- Space savings
- High power density

| Symbol | Test Conditions ($T_J = 25^\circ C$, unless otherwise specified) | Characteristic Values | | |
|--------------|---|-----------------------|------|----------------|
| | | Min. | Typ. | Max. |
| BV_{DSS} | $V_{GS} = 0V$, $I_D = 1mA$ | 500 | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D = 250\mu A$ | 2.5 | | 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 |
| | | | | 5 mA |
| $R_{DS(on)}$ | $V_{GS} = 10V$, $I_D = 30A$, Note 1 | | | 100 m Ω |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | | |
|--------------|---|-----------------------|------|------|--------------------|
| | | Min. | Typ. | Max. | |
| g_{fs} | $V_{DS} = 10\text{V}, I_D = 30\text{A}$, Note 1 | 18 | 25 | 32 | S |
| C_{iss} | $V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$ | | 24 | | nF |
| C_{oss} | | | 1325 | | pF |
| C_{rss} | | | 172 | | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 15\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 30\text{A}$ $R_G = 0.5\Omega$ (External) | | 40 | | ns |
| t_r | | | 40 | | ns |
| $t_{d(off)}$ | | | 165 | | ns |
| t_f | | | 38 | | ns |
| $Q_{g(on)}$ | $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 30\text{A}$ | | 610 | | nC |
| Q_{gs} | | | 130 | | nC |
| Q_{gd} | | | 365 | | nC |
| R_{thJC} | | | | 0.17 | $^\circ\text{C/W}$ |
| R_{thCS} | | 0.05 | | | $^\circ\text{C/W}$ |

Safe Operating Area Specification

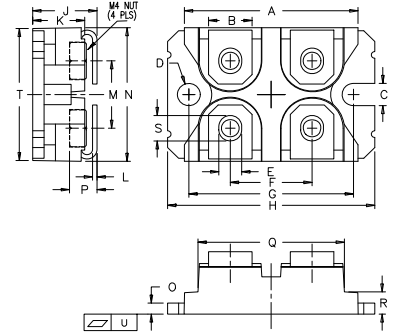
| Symbol | Test Conditions | Min. | Typ. | Max. |
|--------|--|------|------|------|
| SOA | $V_{DS} = 400\text{V}, I_D = 0.9\text{A}, T_C = 75^\circ\text{C}, t_p = 3\text{s}$ | 360 | | W |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified) | Characteristic Values | | | |
|----------|---|-----------------------|------|------|---------------|
| | | Min. | Typ. | Max. | |
| I_S | $V_{GS} = 0\text{V}$ | | | 60 | A |
| I_{SM} | Repetitive, pulse width limited by T_{JM} | | | 240 | A |
| V_{SD} | $I_F = I_S, V_{GS} = 0\text{V}$, Note 1 | | | 1.5 | V |
| t_{rr} | $I_F = 60\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ | | 980 | | ns |
| I_{RM} | | | | 73 | |
| Q_{RM} | $V_R = 100\text{V}, V_{GS} = 0\text{V}$ | | 35.8 | | μC |

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

SOT-227B (IXTN) Outline



(M4 screws (4x) supplied)

| SYM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 1.240 | 1.255 | 31.50 | 31.88 |
| B | .307 | .323 | 7.80 | 8.20 |
| C | .161 | .169 | 4.09 | 4.29 |
| D | .161 | .169 | 4.09 | 4.29 |
| E | .161 | .169 | 4.09 | 4.29 |
| F | .587 | .595 | 14.91 | 15.11 |
| G | 1.186 | 1.193 | 30.12 | 30.30 |
| H | 1.496 | 1.505 | 38.00 | 38.23 |
| J | .460 | .481 | 11.68 | 12.22 |
| K | .351 | .378 | 8.92 | 9.60 |
| L | .030 | .033 | 0.76 | 0.84 |
| M | .496 | .506 | 12.60 | 12.85 |
| N | .990 | 1.001 | 25.15 | 25.42 |
| O | .078 | .084 | 1.98 | 2.13 |
| P | .195 | .235 | 4.95 | 5.97 |
| Q | 1.045 | 1.059 | 26.54 | 26.90 |
| R | .155 | .174 | 3.94 | 4.42 |
| S | .186 | .191 | 4.72 | 4.85 |
| T | .968 | .987 | 24.59 | 25.07 |
| U | -.002 | .004 | -0.05 | 0.1 |

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

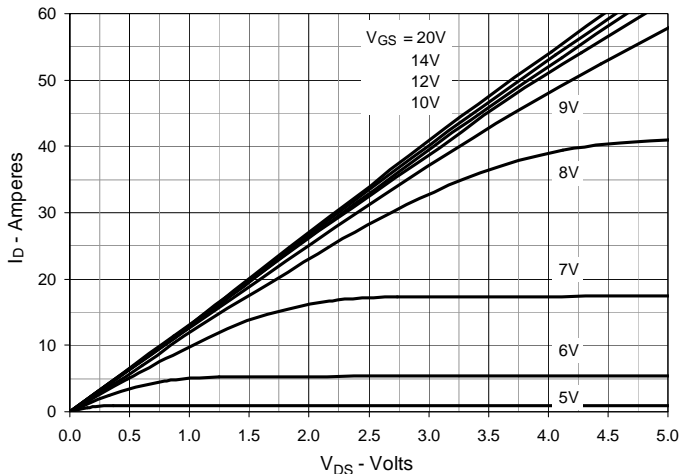


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

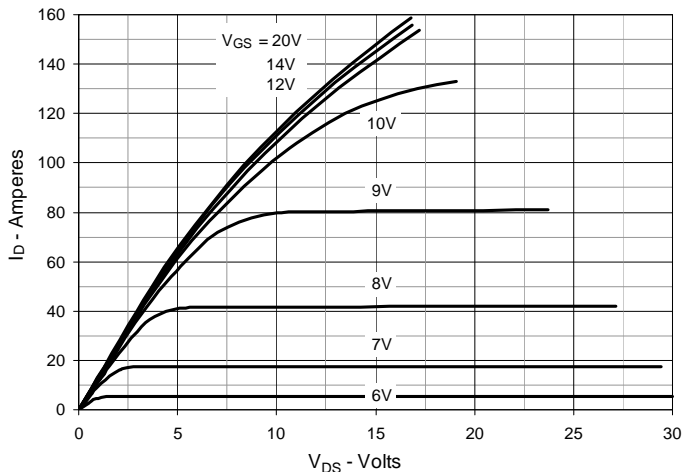


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

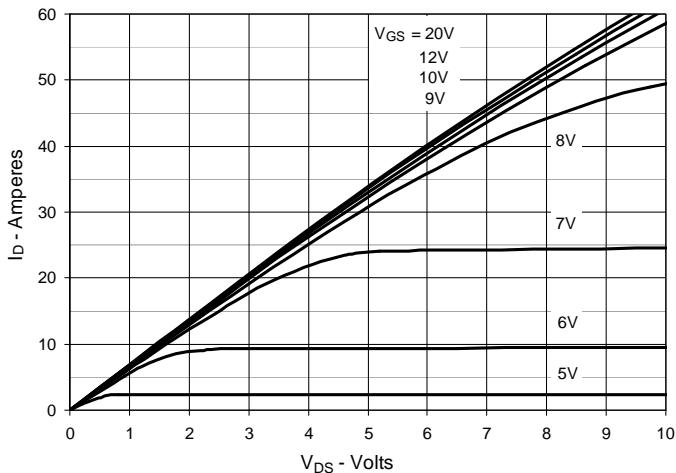


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 30\text{A}$ Value vs. Junction Temperature

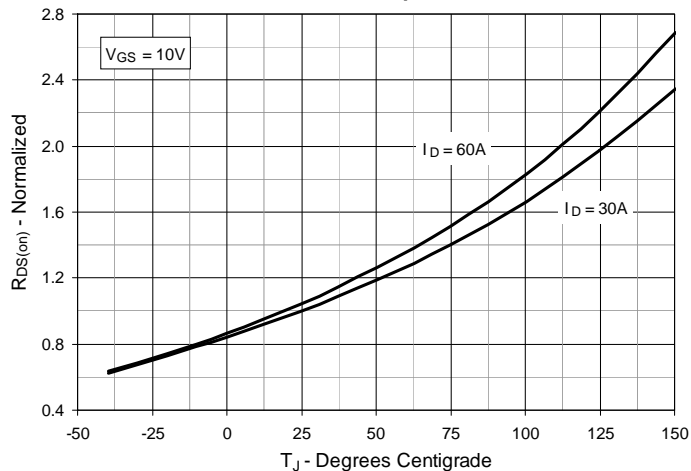


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 30\text{A}$ Value vs. Drain Current

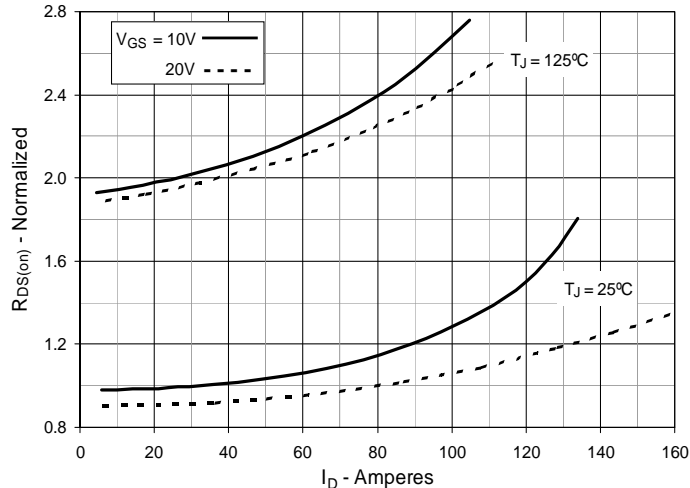


Fig. 6. Maximum Drain Current vs. Case Temperature

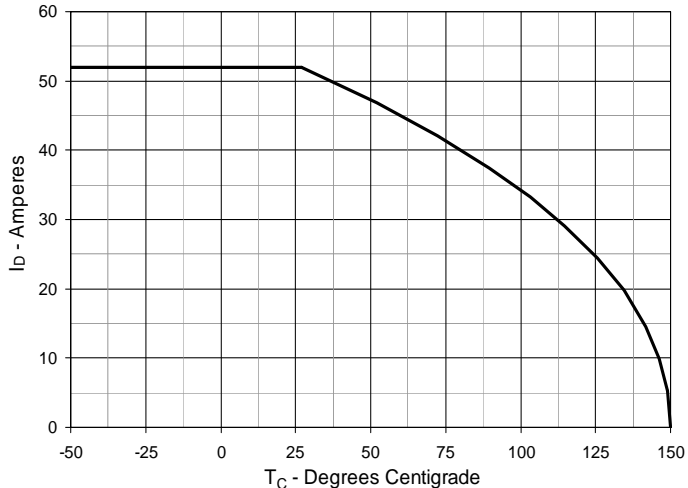


Fig. 7. Input Admittance

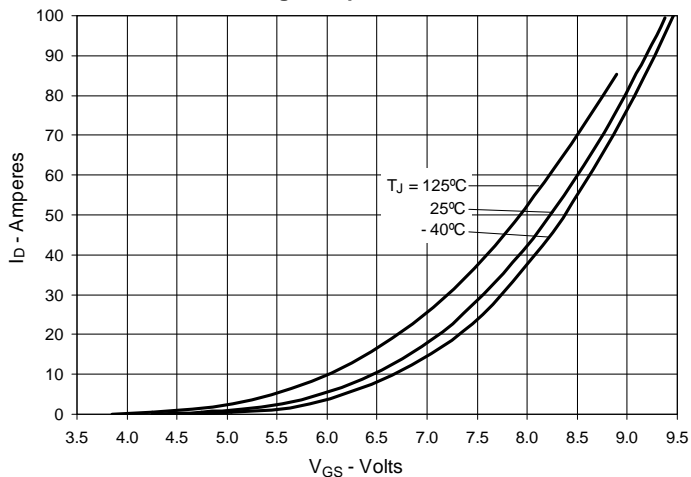


Fig. 8. Transconductance

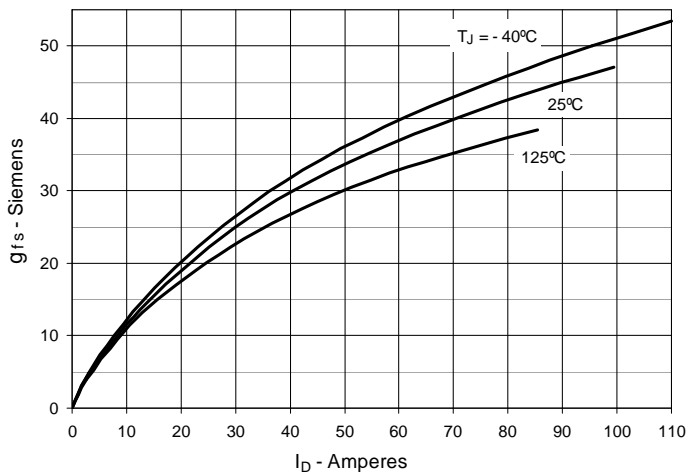


Fig. 9. Forward Voltage Drop of Intrinsic Diode

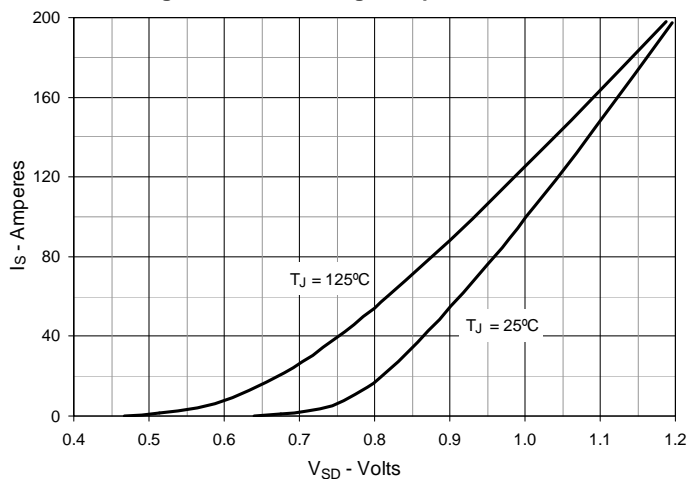


Fig. 10. Gate Charge

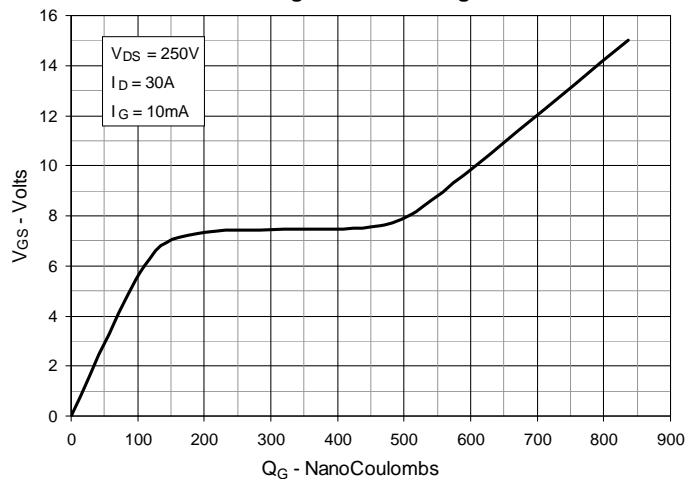


Fig. 11. Capacitance

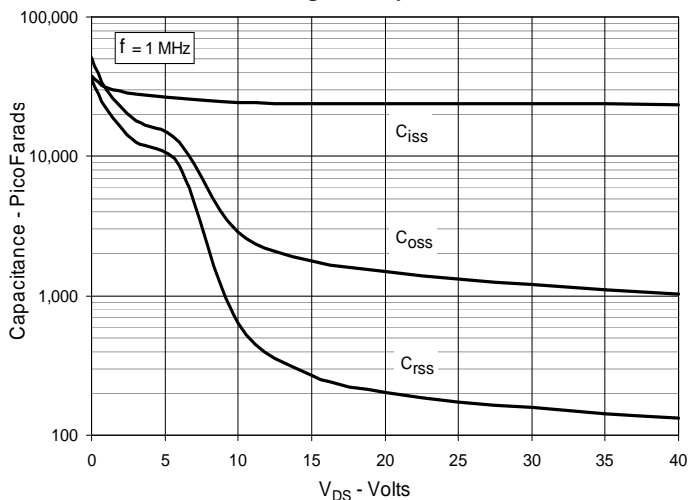


Fig. 12. Maximum Transient Thermal Impedance

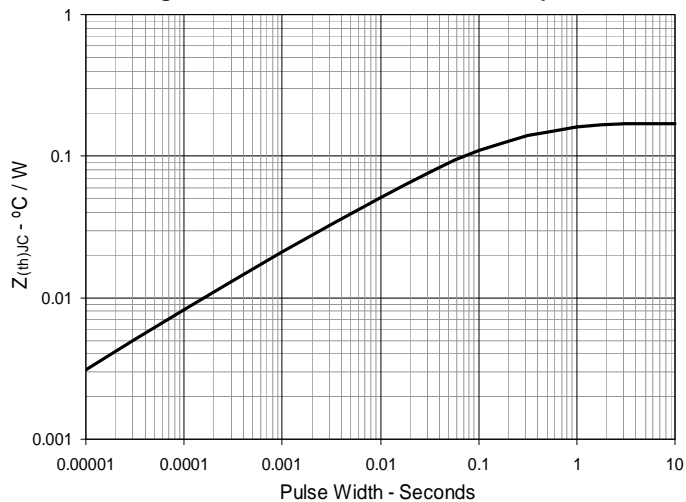


Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$

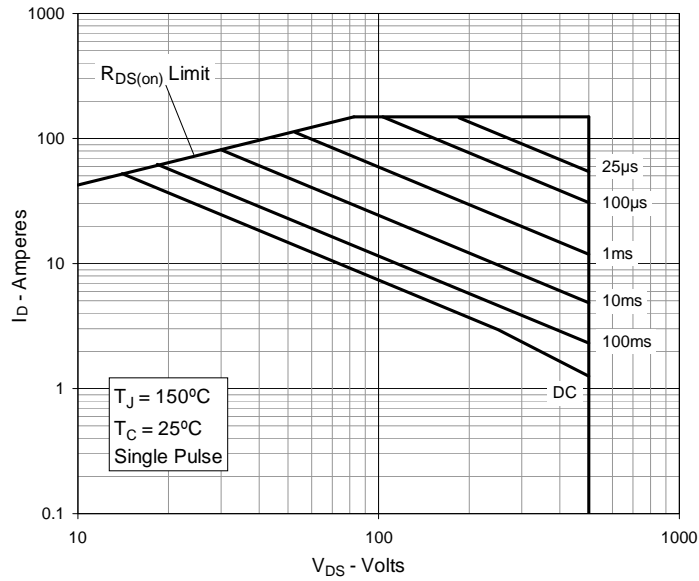
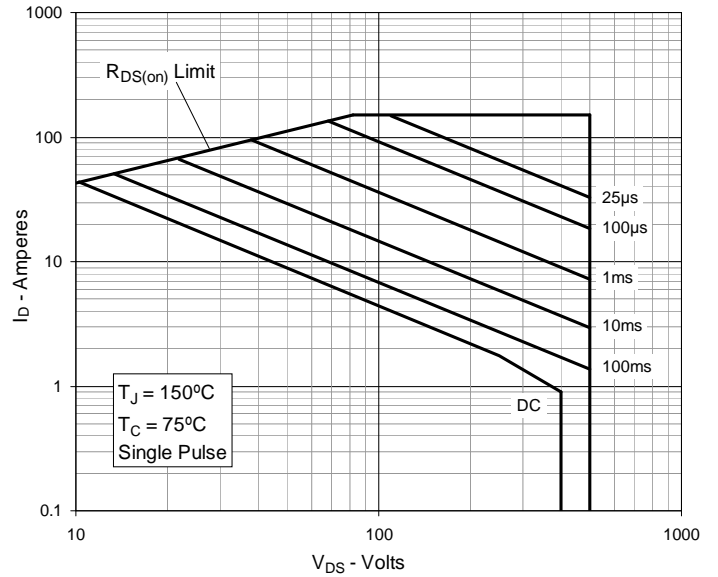


Fig. 14. Forward-Bias Safe Operating Area
@ $T_C = 75^\circ\text{C}$





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