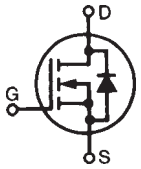
# IXYS

# High Voltage Power MOSFET

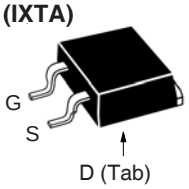
## IXTA05N100HV
## IXTA05N100
## IXTP05N100

$V_{DSS}$ = 1000V
$I_{D25}$ = 750mA
$R_{DS(on)}$ ≤ 17Ω

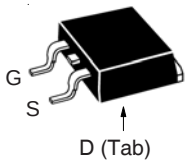
N-Channel Enhancement Mode
Avalanche Rated



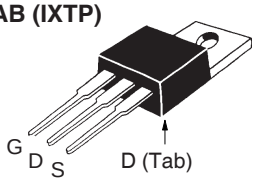

**TO-263HV (IXTA)**




**TO-263 AA (IXTA)**




**TO-220AB (IXTP)**




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

| Symbol | Test Conditions | Maximum Ratings | |
|---|---|---|---|
| $V_{DSS}$ | $T_J$ = 25°C to 150°C | 1000 | V |
| $V_{DGR}$ | $T_J$ = 25°C to 150°C, $R_{GS}$ = 1MΩ | 1000 | V |
| $V_{GSS}$ | Continuous | ±30 | V |
| $V_{GSM}$ | Transient | ±40 | V |
| $I_{D25}$ | $T_C$ = 25°C | 750 | mA |
| $I_{DM}$ | $T_C$ = 25°C, Pulse Width Limited by $T_{JM}$ | 3 | A |
| $I_A$ | $T_C$ = 25°C | 1 | A |
| $E_{AS}$ | $T_C$ = 25°C | 100 | mJ |
| dv/dt | $I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J$ =150°C | 3 | V/ns |
| $P_D$ | $T_C$ = 25°C | 40 | W |
| $T_J$ | | -55 ... +150 | °C |
| $T_{JM}$ | | 150 | °C |
| $T_{stg}$ | | -55 ... +150 | °C |
| $T_L$ | Maximum Lead Temperature for Soldering | 300 | °C |
| $T_{SOLD}$ | 1.6 mm (0.062in.) from Case for 10s | 260 | °C |
| $M_d$ | Mounting Torque (TO-220) | 1.13 / 10 | Nm/lb.in |
| Weight | TO-220 | 3.0 | g |
| | TO-263 | 2.5 | g |
| | TO-263HV | 2.5 | g |

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $BV_{DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 1000 | | | V |
| $V_{GS(th)}$ | $V_{DS} = V_{GS}$, $I_D$ = 250μA | 2.5 | | 4.5 | V |
| $I_{GSS}$ | $V_{GS}$ = ± 30V, $V_{DS}$ = 0V | | | ±100 | nA |
| $I_{DSS}$ | $V_{DS} = V_{DSS}$, $V_{GS}$ = 0V | | | 25 | μA |
| | $T_J$ = 125°C | | | 500 | μA |
| $R_{DS(on)}$ | $V_{GS}$ = 10V, $I_D$ = 375mA, Note 1 | | | 17 | Ω |

### Features

- High Voltage Package (TO-263HV)
- Fast Switching Times
- Avalanche Rated
- $R_{ds(on)}$ HDMOS™ Process
- Rugged Polysilicon Gate Cell structure
- Extended FBSOA

### Advantages

- High Power Density
- Space Savings

### Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Flyback Inverters
- DC Choppers

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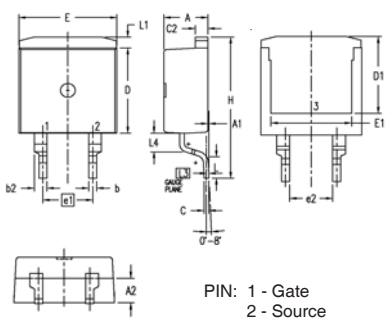
| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $g_{fs}$ | $V_{DS}$ = 20V, $I_D$ = 500mA, Note 1 | 0.55 | 0.93 | | S |
| $C_{iss}$ | $V_{GS}$ = 0V, $V_{DS}$ = 25V, f = 1MHz | | 260 | | pF |
| $C_{oss}$ | | | 22 | | pF |
| $C_{rss}$ | | | 8 | | pF |
| $t_{d(on)}$ | **Resistive Switching Times** | | 11 | | ns |
| $t_r$ | $V_{GS}$ = 10V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 1A | | 19 | | ns |
| $t_{d(off)}$ | $R_G$ = 47Ω (External) | | 40 | | ns |
| $t_f$ | | | 28 | | ns |
| $Q_{g(on)}$ | $V_{GS}$ = 10V, $V_{DS}$ = 0.5 • $V_{DSS}$, $I_D$ = 1A | | 7.8 | | nC |
| $Q_{gs}$ | | | 1.4 | | nC |
| $Q_{gd}$ | | | 4.1 | | nC |
| $R_{thJC}$ | | | | 3.1 | °C/W |
| $R_{thCS}$ | (TO-220) | | 0.50 | | °C/W |

**Source-Drain Diode**

| Symbol | Test Conditions ($T_J$ = 25°C, Unless Otherwise Specified) | Characteristic Values Min. | Typ. | Max. | |
|---|---|---|---|---|---|
| $I_S$ | $V_{GS}$ = 0V | | | 750 | mA |
| $I_{SM}$ | Repetitive, Pulse Width Limited by $T_{JM}$ | | | 3 | A |
| $V_{SD}$ | $I_F$ = $I_S$, $V_{GS}$ = 0V, Note 1 | | | 1.5 | V |
| $t_{rr}$ | $I_F$ = $I_S$, -di/dt = 100A/μs<br>$V_R$ = 100V, $V_{GS}$ = 0V | | 710 | | ns |

Note 1: Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.

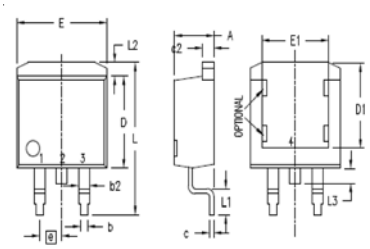
**TO-263HV Outline**



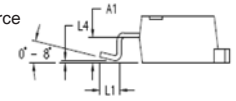
PIN: 1 - Gate
2 - Source
3 - Drain

| SYM | INCHES MIN | INCHES MAX | MILLIMETER MIN | MILLIMETER MAX |
|---|---|---|---|---|
| A | .170 | .185 | 4.30 | 4.70 |
| A1 | .000 | .008 | 0.00 | 0.20 |
| A2 | .091 | .098 | 2.30 | 2.50 |
| b | .028 | .035 | 0.70 | 0.90 |
| b2 | .046 | .054 | 1.18 | 1.38 |
| C | .018 | .024 | 0.45 | 0.60 |
| C2 | .049 | .055 | 1.25 | 1.40 |
| D | .354 | .370 | 9.00 | 9.40 |
| D1 | .311 | .327 | 7.90 | 8.30 |
| E | .386 | .402 | 9.80 | 10.20 |
| E1 | .307 | .323 | 7.80 | 8.20 |
| e1 | .200 BSC | | 5.08 BSC | |
| (e2) | .163 | .174 | 4.13 | 4.43 |
| H | .591 | .614 | 15.00 | 15.60 |
| L | .079 | .102 | 2.00 | 2.60 |
| L1 | .039 | .055 | 1.00 | 1.40 |
| L3 | .010 BSC | | 0.254 BSC | |
| (L4) | .071 | .087 | 1.80 | 2.20 |

**TO-263AA Outline**

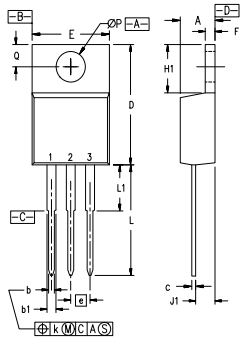


PIN: 1 - Gate
2,4 - Source
3 - Drain



| SYM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX |
|---|---|---|---|---|
| A | .160 | .190 | 4.06 | 4.83 |
| A1 | .080 | .110 | 2.03 | 2.79 |
| b | .020 | .039 | 0.51 | 0.99 |
| b2 | .045 | .055 | 1.14 | 1.40 |
| c | .016 | .029 | 0.40 | 0.74 |
| c2 | .045 | .055 | 1.14 | 1.40 |
| D | .340 | .380 | 8.64 | 9.65 |
| D1 | .315 | .350 | 8.00 | 8.89 |
| E | .380 | .410 | 9.65 | 10.41 |
| E1 | .245 | .320 | 6.22 | 8.13 |
| e | .100 BSC | | 2.54 BSC | |
| L | .575 | .625 | 14.61 | 15.88 |
| L1 | .090 | .110 | 2.29 | 2.79 |
| L2 | .040 | .055 | 1.02 | 1.40 |
| L3 | .050 | .070 | 1.27 | 1.78 |
| L4 | 0 | .005 | 0 | 0.13 |

**TO-220AB Outline**



Pins: 1 - Gate 2 - Drain
3 - Source

| SYM | INCHES MIN | INCHES MAX | MILLIMETERS MIN | MILLIMETERS MAX |
|---|---|---|---|---|
| A | .170 | .190 | 4.32 | 4.83 |
| b | .025 | .040 | 0.64 | 1.02 |
| b1 | .045 | .065 | 1.15 | 1.65 |
| c | .014 | .022 | 0.35 | 0.56 |
| D | .580 | .630 | 14.73 | 16.00 |
| E | .390 | .420 | 9.91 | 10.66 |
| e | .100 BSC | | 2.54 BSC | |
| F | .045 | .055 | 1.14 | 1.40 |
| H1 | .230 | .270 | 5.85 | 6.85 |
| J1 | .090 | .110 | 2.29 | 2.79 |
| k | 0 | .015 | 0 | 0.38 |
| L | .500 | .550 | 12.70 | 13.97 |
| L1 | .110 | .230 | 2.79 | 5.84 |
| ØP | .139 | .161 | 3.53 | 4.08 |
| Q | .100 | .125 | 2.54 | 3.18 |

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 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

**Fig. 1. Output Characteristics @ $T_J$ = 25ºC**

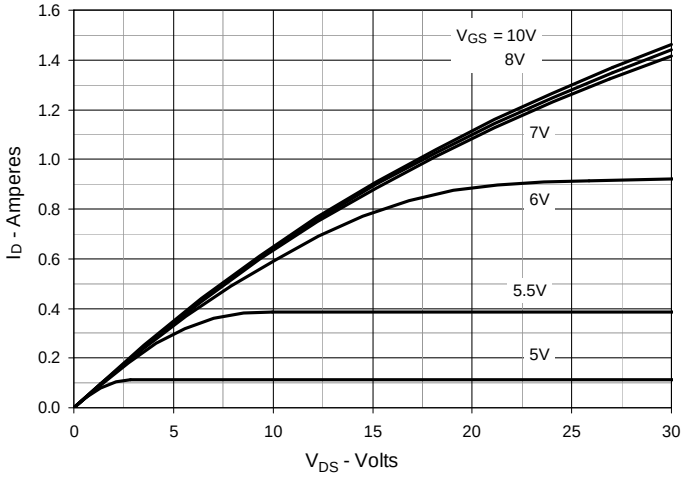



**Fig. 2. Output Characteristics @ $T_J$ = 125ºC**

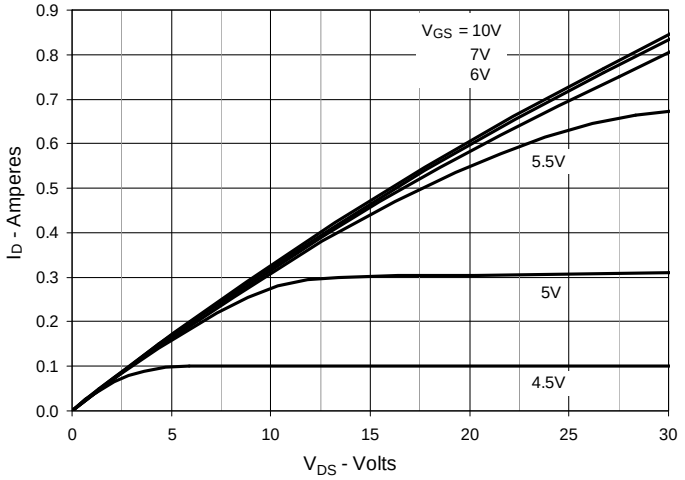



**Fig. 3. $R_{DS(on)}$ Normalized to $I_D$ = 375mA Value vs. Junction Temperature**

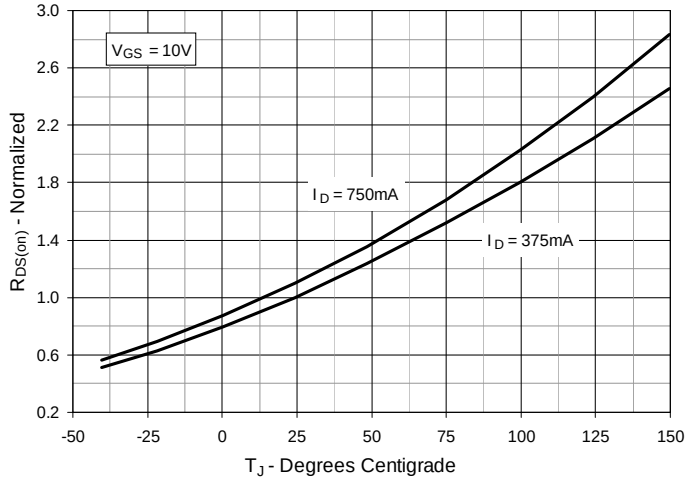



**Fig. 4. $R_{DS(on)}$ Normalized to $I_D$ = 375mA Value vs. Drain Current**

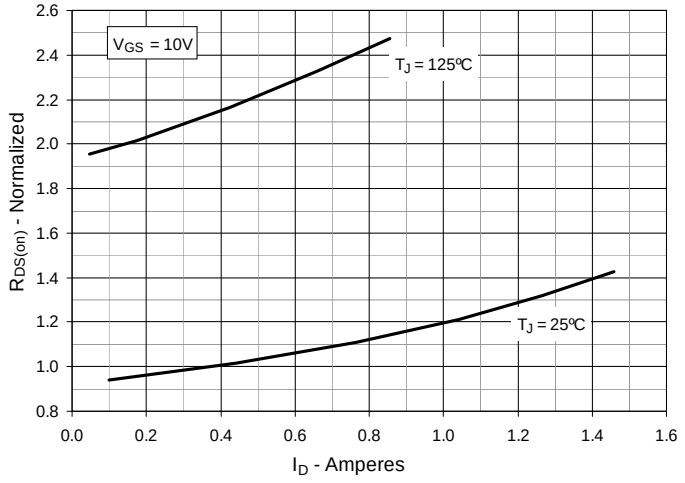



**Fig. 5. Maximum Drain Current vs. Case Temperature**

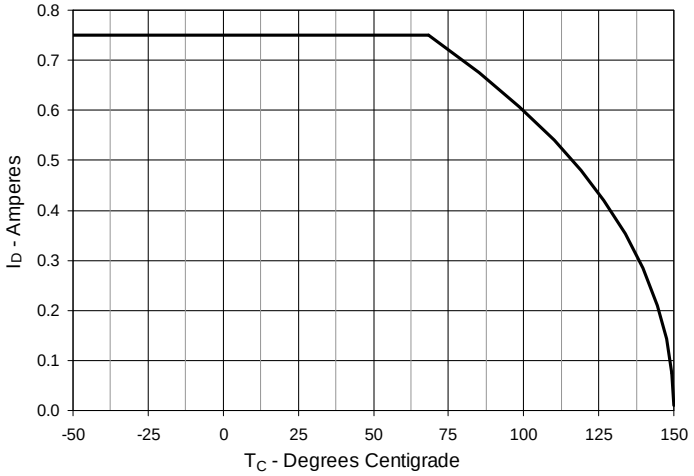
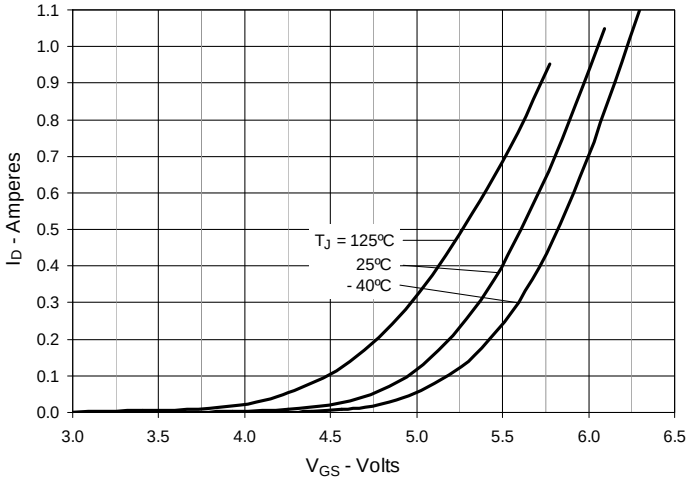



**Fig. 6. Input Admittance**




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**Fig. 7. Transconductance**

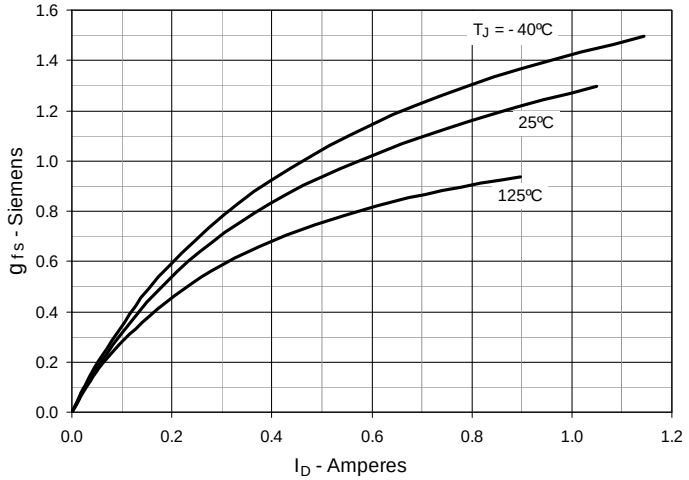



**Fig. 8. Forward Voltage Drop of Intrinsic Diode**

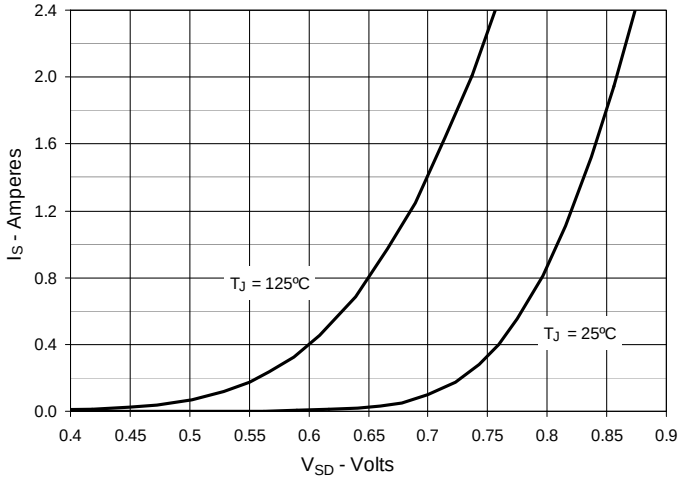



**Fig. 9. Gate Charge**

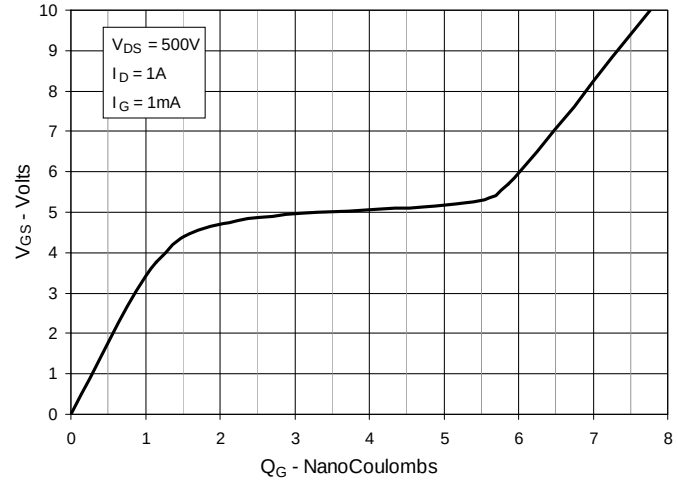



**Fig. 10. Capacitance**

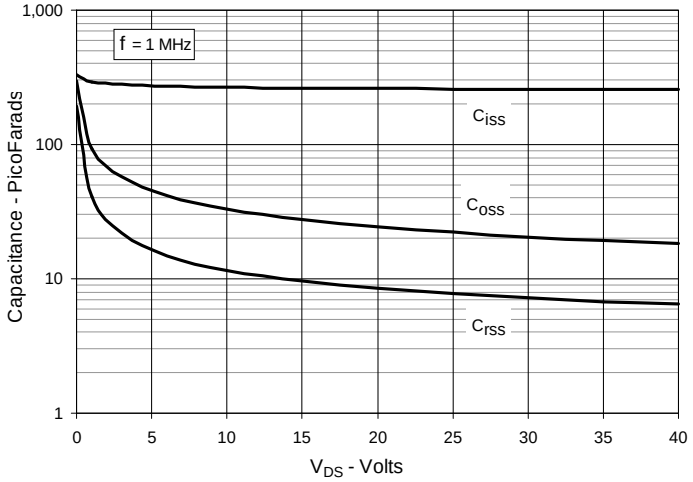



**Fig. 11. Forward-Bias Safe Operating Area @ $T_C$ = 25ºC**

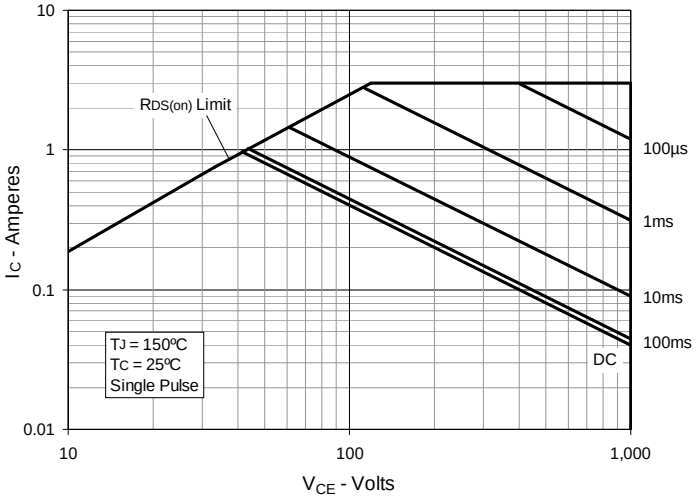
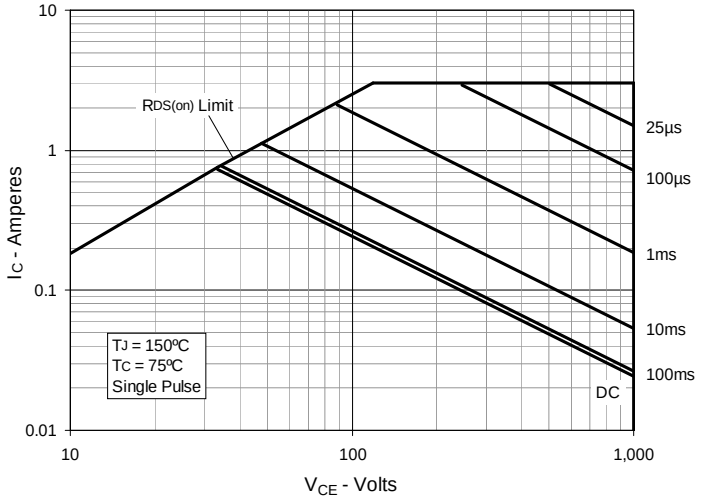
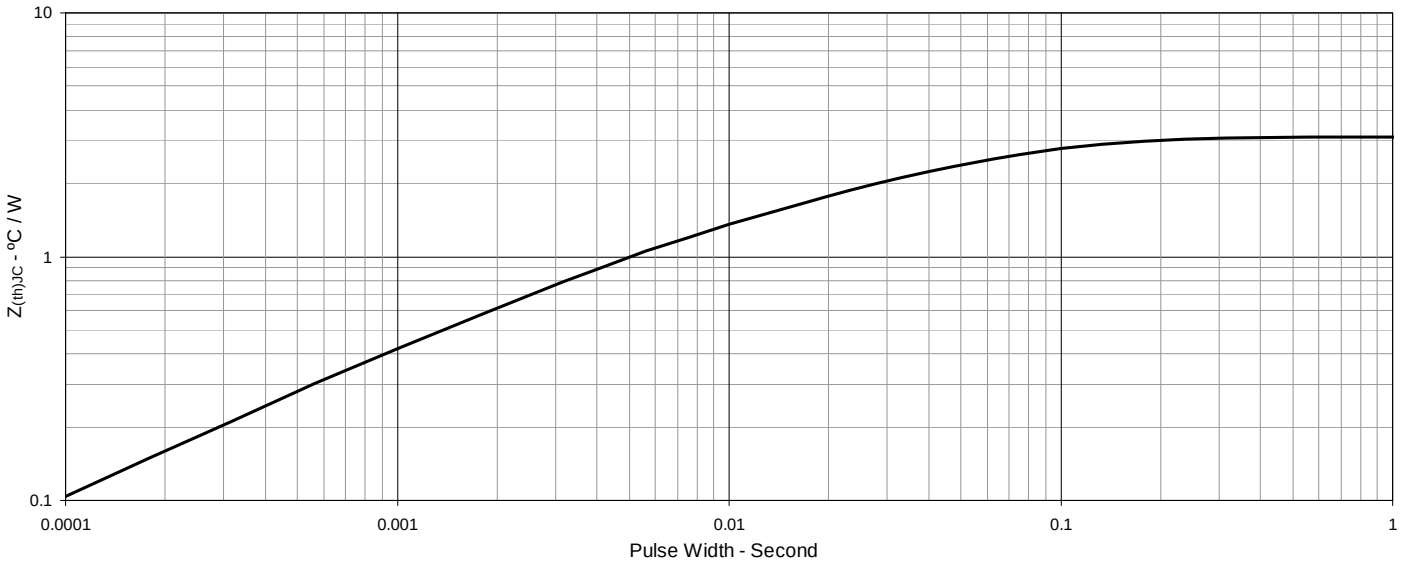



**Fig. 12. Forward-Bias Safe Operating Area @ $T_C$ = 75ºC**




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**Fig. 13. Maximum Transient Thermal Impedance**




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