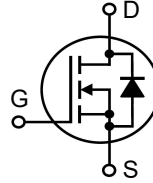


Linear™
Power MOSFET
w/Extended FBSOA

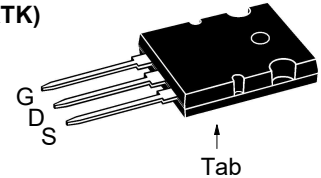
IXTK8N150L
IXTX8N150L

V_{DSS} = 1500V
I_{D25} = 8A
R_{DS(on)} ≤ 3.6Ω

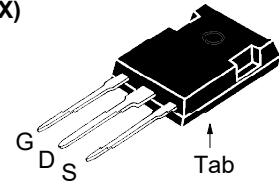
N-Channel Enhancement Mode
 Guaranteed FBSOA



TO-264
(IXTK)



PLUS247
(IXTX)



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

| Symbol | Test Conditions | Maximum Ratings | |
|------------------|--------------------------------------------------------------------------------|------------------|----------|
| V _{DSS} | T _J = 25°C to 150°C | 1500 | V |
| V _{DGR} | T _J = 25°C to 150°C, R _{GS} = 1MΩ | 1500 | V |
| V _{GSS} | Continuous | ±30 | V |
| V _{GSM} | Transient | ±40 | V |
| I _{D25} | T _C = 25°C | 8 | A |
| I _{DM} | T _C = 25°C, Pulse Width Limited by T _{JM} | 20 | A |
| P _D | T _C = 25°C | 700 | W |
| T _J | | -55 to +150 | °C |
| T _{JM} | | 150 | °C |
| T _{stg} | | -55 to +150 | °C |
| T _L | Maximum Lead Temperature for Soldering 1.6 mm (0.062 in.) from Case for 10s | 300 | °C |
| M _d | Mounting Torque (TO-264) | 1.13/10 | Nm/lb.in |
| F _C | Mounting Force (PLUS247) | 20..120 /4.5..27 | N/lb |
| Weight | TO-264 | 10 | g |
| | PLUS247 | 6 | g |

Features

- Designed for Linear Operations
- International Standard Packages
- Guaranteed FBSOA at 60°C
- Molding Epoxies Meet UL94 V-0 Flammability Classification

Applications

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

Advantages

- Easy to Mount
- Space Savings
- High Power Density

| Symbol | Test Conditions (T _J = 25°C, Unless Otherwise Specified) | Characteristic Values | | |
|---------------------|-------------------------------------------------------------------------------------|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| BV _{DSS} | V _{GS} = 0V, I _D = 1mA | 1500 | | V |
| V _{GS(th)} | V _{DS} = V _{GS} , I _D = 250μA | 5.0 | | 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 3 mA |
| R _{DS(on)} | V _{GS} = 20V, I _D = 0.5 • I _{D25} , Note 1 | | | 3.6 Ω |

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|-------|
| | | Min. | Typ. | Max. |
| g_{fs} | $V_{DS} = 50\text{V}$, $I_D = 0.5 \cdot I_{D25}$, Note 1 | 1.4 | 2.3 | 3.2 S |
| C_{iss} | $V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$ | | 8000 | pF |
| C_{oss} | | | 405 | pF |
| C_{rss} | | | 70 | pF |
| $t_{d(on)}$ | Resistive Switching Times $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 2\Omega$ (External) | | 36 | ns |
| t_r | | | 18 | ns |
| $t_{d(off)}$ | | | 90 | ns |
| t_f | | | 95 | ns |
| $Q_{g(on)}$ | $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ | | 250 | nC |
| Q_{gs} | | | 80 | nC |
| Q_{gd} | | | 116 | nC |
| R_{thJC} | | 0.15 | 0.18 $^\circ\text{C/W}$ | |
| R_{thCS} | | | $^\circ\text{C/W}$ | |

Safe Operating Area Specification

| Symbol | Test Conditions | Characteristic Values | | |
|------------|--------------------------------------------------------------------------------------------|-----------------------|------|------|
| | | Min. | Typ. | Max. |
| SOA | $V_{DS} = 1\text{kV}$, $I_D = 0.5\text{A}$, $T_C = 60^\circ\text{C}$, $T_p = 3\text{s}$ | 500 | | W |

Source-Drain Diode

| Symbol | Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified) | Characteristic Values | | |
|----------|-----------------------------------------------------------------------------|-----------------------|------|-------|
| | | Min. | Typ. | Max. |
| I_s | $V_{GS} = 0\text{V}$ | | | 8 A |
| I_{SM} | Repetitive, Pulse Width Limited by T_{JM} | | | 32 A |
| V_{SD} | $I_F = 8\text{A}$, $V_{GS} = 0\text{V}$, Note 1 | | | 1.2 V |
| t_{rr} | $I_F = I_s$, $-di/dt = 100\text{A}/\mu\text{s}$, $V_R = 100\text{V}$ | | 1700 | ns |

Note: 1. Pulse Test, $t \leq 300\mu\text{s}$; Duty Cycle, $d \leq 2\%$.

Littelfuse reserves the right to change limits, test conditions, and dimensions.

| | | | | | | | | | | |
|-----------------------------------------------|-----------|-----------|-----------|-----------|--------------|--------------|--------------|--------------|--------------|--------------|
| IXYS MOSFETs and IGBTs are covered | 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 | 7,157,338 B2 |
| by one or more of the following U.S. patents: | 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. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

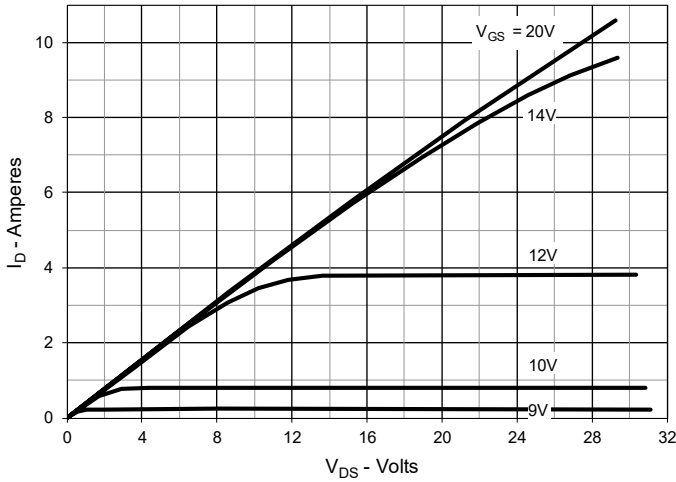


Fig. 2. Output Characteristics @ $T_J = 125^\circ\text{C}$

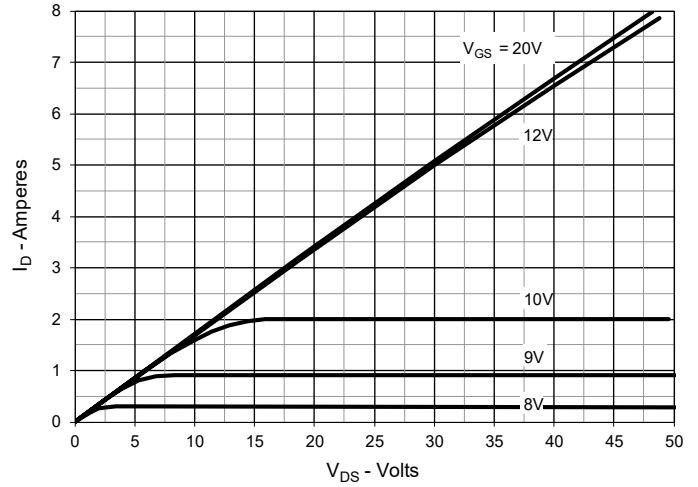


Fig. 3. $R_{DS(on)}$ Normalized to $I_D = 4\text{A}$ Value vs. Junction Temperature

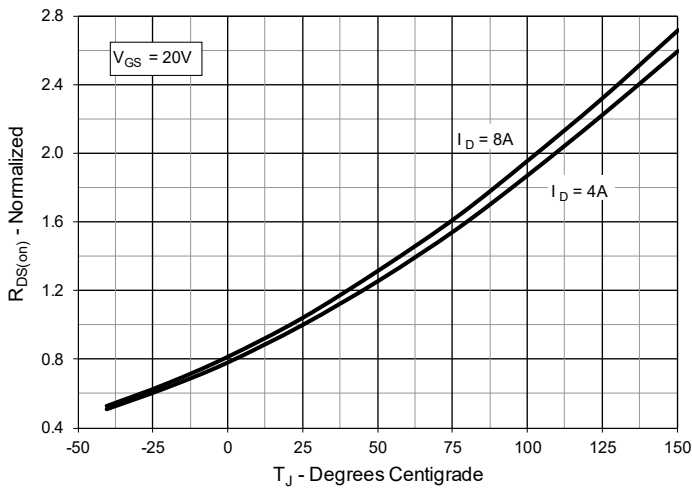


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 4\text{A}$ Value vs. Drain Current

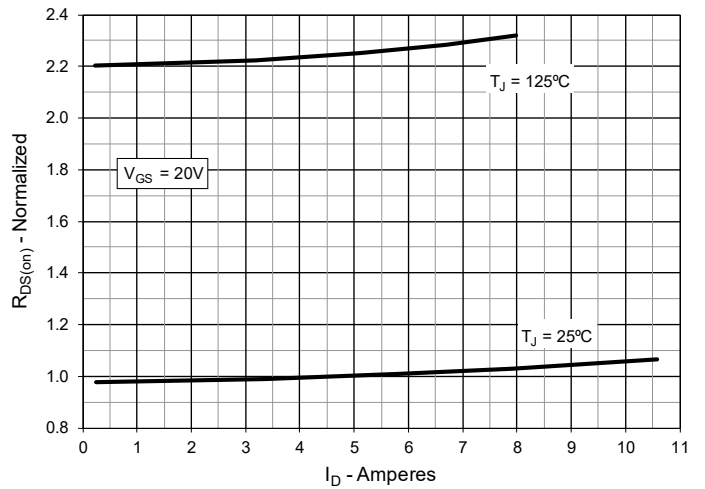


Fig. 5. Maximum Drain Current vs. Case Temperature

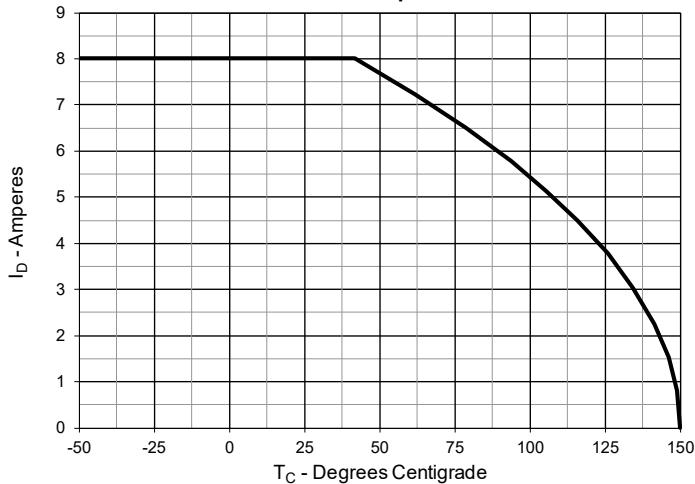


Fig. 6. Input Admittance

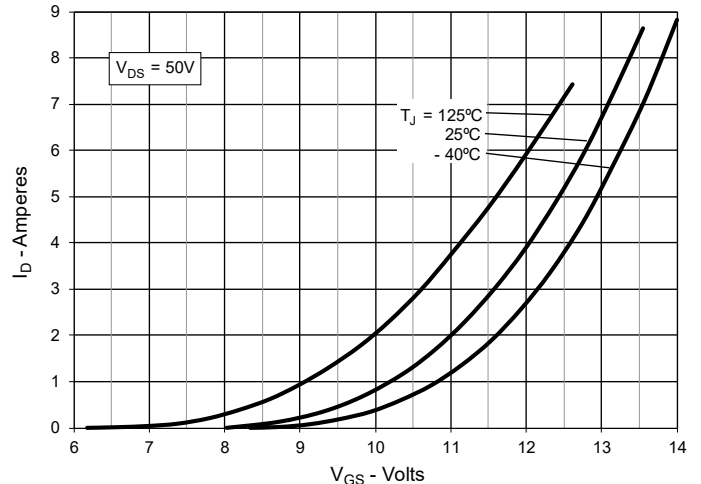


Fig. 7. Transconductance

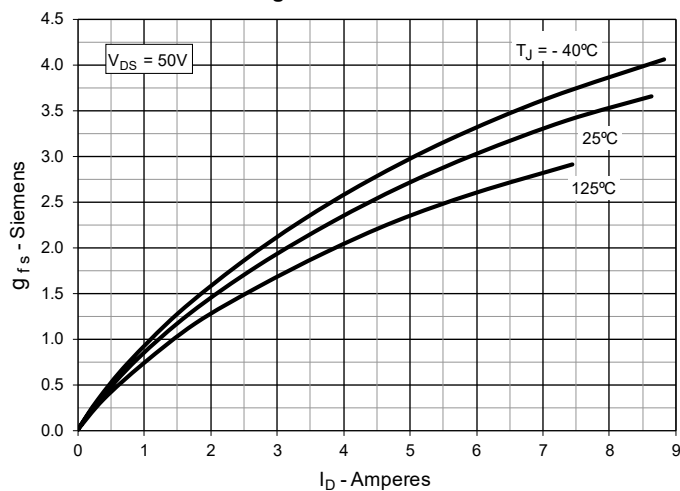


Fig. 8. Forward Voltage Drop of Intrinsic Diode

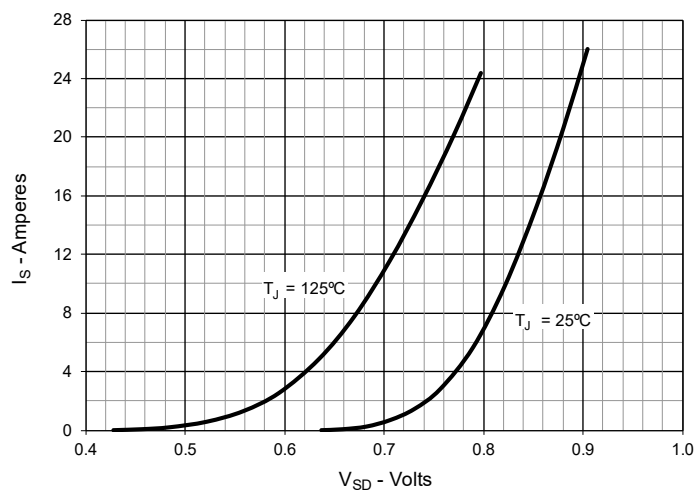


Fig. 9. Gate Charge

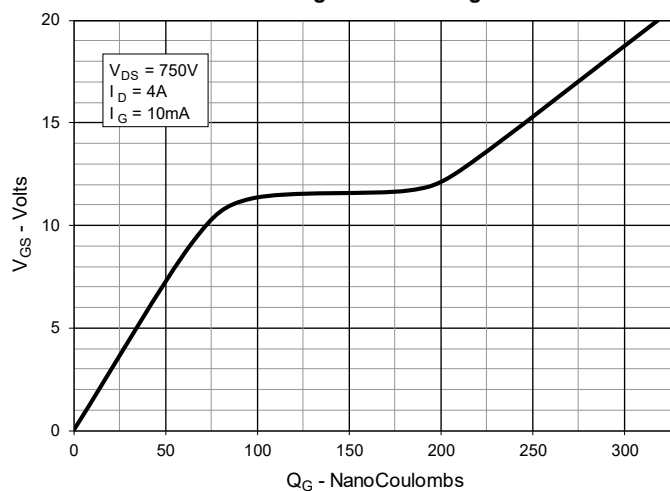


Fig. 10. Capacitance

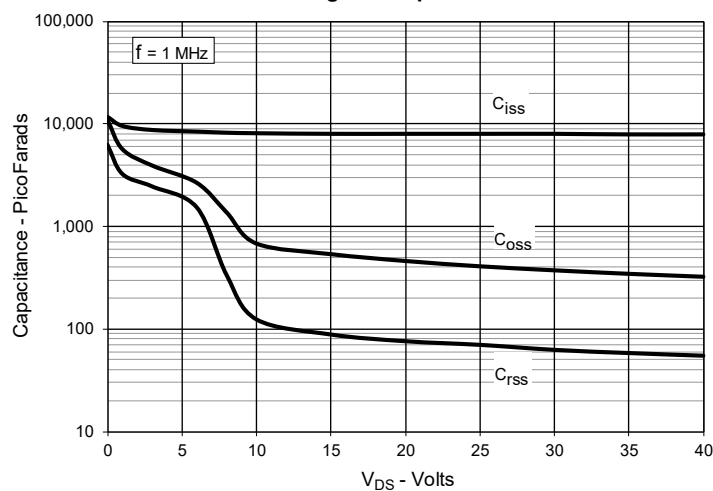
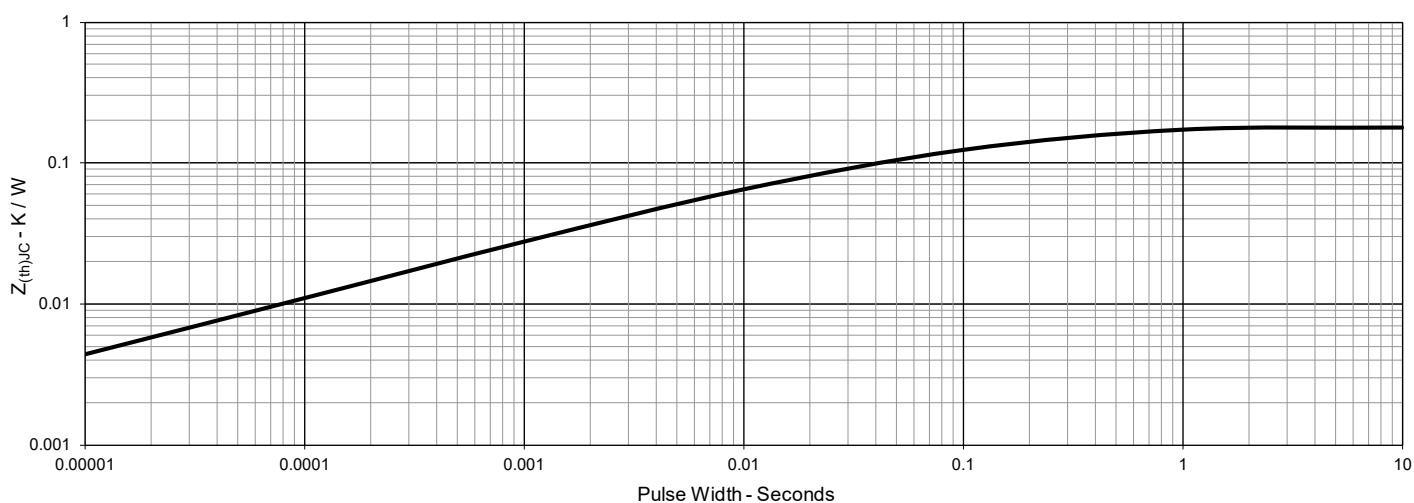
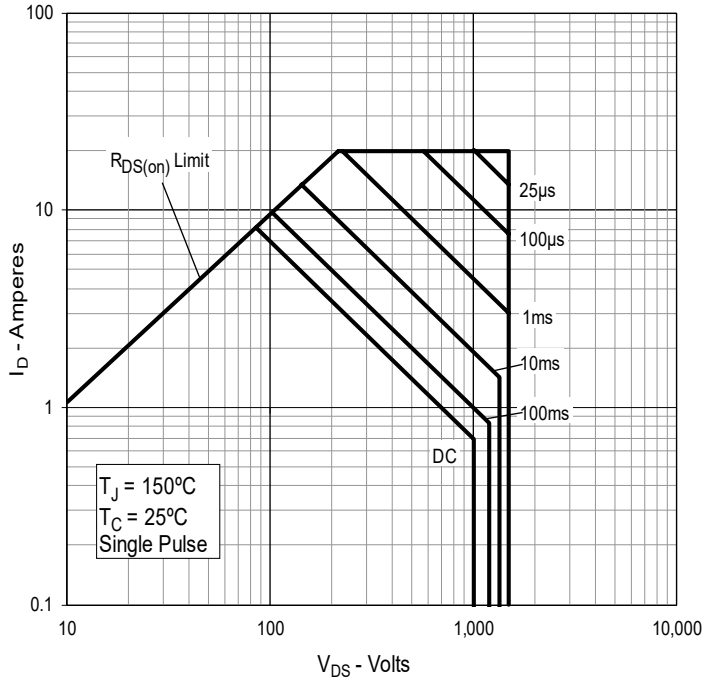


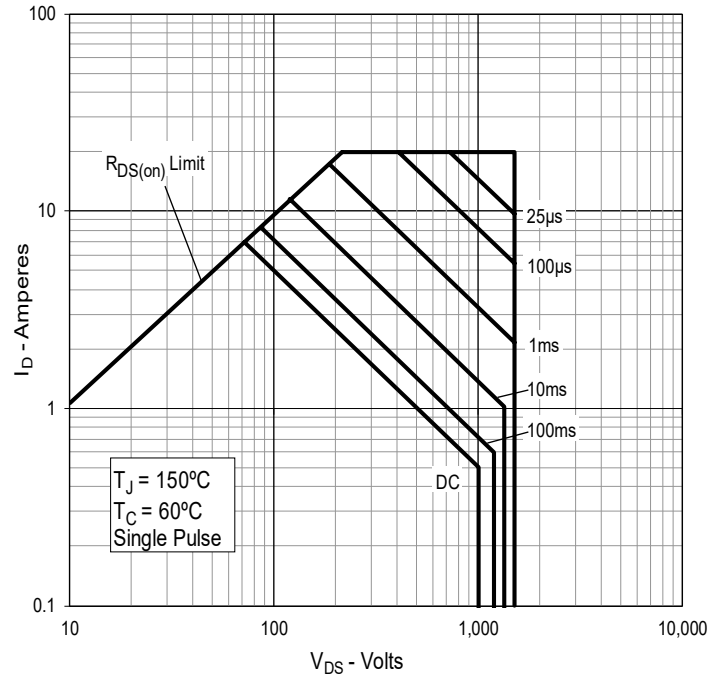
Fig. 11. Maximum Transient Thermal Impedance



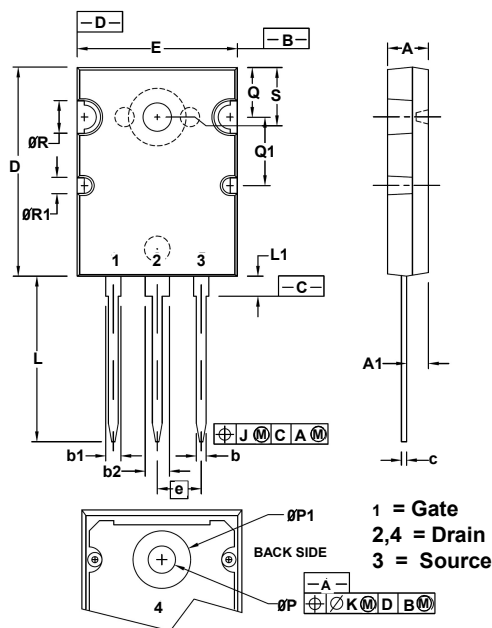
**Fig. 12. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$**



**Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 60^\circ\text{C}$**

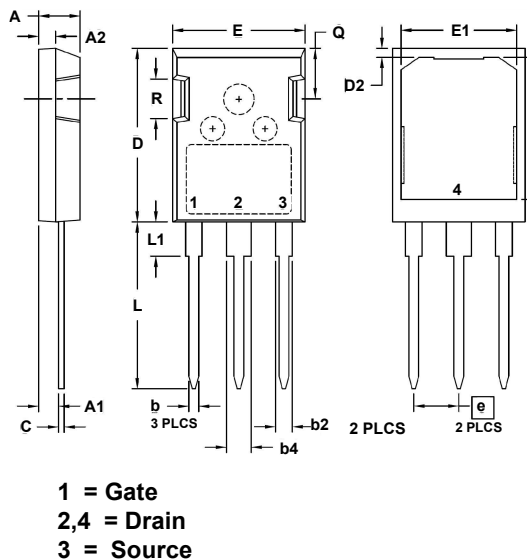


TO-264 Outline



| SYMBOL | 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 | .215 BSC | | 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 |
| øP1 | .270 | .290 | 6.86 | 7.37 |
| 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 |

PLUS247™ Outline



| SYM | INCHES | | MILLIMETERS | |
|-----|----------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .190 | .205 | 4.83 | 5.21 |
| A1 | .090 | .100 | 2.29 | 2.54 |
| A2 | .075 | .085 | 1.91 | 2.16 |
| b | .045 | .055 | 1.14 | 1.40 |
| b2 | .075 | .087 | 1.91 | 2.20 |
| b4 | .115 | .126 | 2.92 | 3.20 |
| C | .024 | .031 | 0.61 | 0.80 |
| D | .819 | .840 | 20.80 | 21.34 |
| D1 | .650 | .690 | 16.51 | 17.53 |
| D2 | .035 | .050 | 0.89 | 1.27 |
| E | .620 | .635 | 15.75 | 16.13 |
| E1 | .520 | .560 | 13.08 | 14.22 |
| e | .215 BSC | | 5.45 BSC | |
| L | .780 | .810 | 19.81 | 20.57 |
| L1 | .150 | .170 | 3.81 | 4.32 |
| Q | .220 | .244 | 5.59 | 6.20 |
| R | .170 | .190 | 4.32 | 4.83 |



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