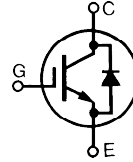


High Voltage, High Gain BIMOSFET™ Monolithic Bipolar MOS Transistor

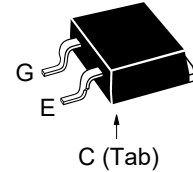
IXBA14N300HV IXBT14N300HV IXBH14N300HV

$V_{CES} = 3000V$
 $I_{C110} = 14A$
 $V_{CE(sat)} \leq 2.7V$

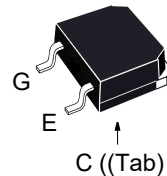


| Symbol | Test Conditions | Maximum Ratings | |
|--|--|------------------------|------------|
| V_{CES} | $T_C = 25^\circ C$ to $150^\circ C$ | 3000 | V |
| V_{CGR} | $T_J = 25^\circ C$ to $150^\circ C$, $R_{GE} = 1M\Omega$ | 3000 | V |
| V_{GES} | Continuous | ± 20 | V |
| V_{GEM} | Transient | ± 30 | V |
| I_{C25} | $T_C = 25^\circ C$ | 38 | A |
| I_{C110} | $T_C = 110^\circ C$ | 14 | A |
| I_{CM} | $T_C = 25^\circ C$, 1ms | 120 | A |
| SSOA (RBSOA) | $V_{GE} = 15V$, $T_{VJ} = 125^\circ C$, $R_G = 20\Omega$ Clamped Inductive Load | $I_{CM} = 120$ 1500 | A V |
| T_{SC} (SCSOA) | $V_{GE} = 15V$, $T_J = 125^\circ C$, $R_G = 82\Omega$, $V_{CE} = 1500V$, Non-Repetitive | 10 | μs |
| P_c | $T_C = 25^\circ C$ | 200 | 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} | Plastic Body for 10s | 260 | $^\circ C$ |
| F_c | Mounting Force (TO-263HV) | 10..65 / 2.2..14.6 | N/lb |
| M_d | Mounting Torque (TO-247HV) | 1.13/10 | Nm/lb.in |
| Weight | TO-263HV | 2.5 | g |
| | TO-268HV | 4.0 | g |
| | TO-247HV | 6.0 | g |

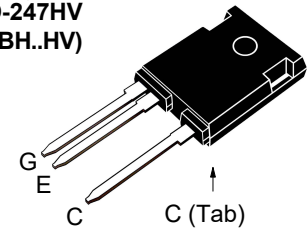
TO-263HV
(IXBA..HV)



TO-268HV
(IXBT..HV)



TO-247HV
(IXBH..HV)



G = Gate C = Collector
E = Emitter Tab = Collector

Features

- High Voltage Packages
- High Blocking Voltage
- Anti-Parallel Diode
- Low Conduction Losses

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

| Symbol | Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified) | Characteristic Values | | |
|---------------|---|-----------------------|------------|---------------------------|
| | | Min. | Typ. | Max. |
| BV_{CES} | $I_C = 250\mu A$, $V_{GE} = 0V$ | 3000 | | V |
| $V_{GE(th)}$ | $I_C = 250\mu A$, $V_{CE} = V_{GE}$ | 3.0 | | V |
| I_{CES} | $V_{CE} = 0.8 \cdot V_{CES}$, $V_{GE} = 0V$ $T_J = 125^\circ C$ | | | 25 μA 750 μA |
| I_{GES} | $V_{CE} = 0V$, $V_{GE} = \pm 20V$ | | | ± 100 nA |
| $V_{CE(sat)}$ | $I_C = 14A$, $V_{GE} = 15V$, Note 1 $T_J = 125^\circ C$ | | 2.2 2.7 | V V |

| Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | | Characteristic Values | | |
|--|---|-----------------------|------|-------------------------|
| | | Min. | Typ. | Max. |
| g_{fs} | $I_C = 14\text{A}, V_{CE} = 10\text{V}$, Note 1 | 8 | 13 | S |
| C_{ies} | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | | 1275 | pF |
| C_{oes} | | | 50 | pF |
| C_{res} | | | 18 | pF |
| Q_g | $I_C = 14\text{A}, V_{GE} = 15\text{V}, V_{CE} = 1500\text{V}$ | | 62 | nC |
| Q_{ge} | | | 7 | nC |
| Q_{gc} | | | 30 | nC |
| $t_{d(on)}$ | Resistive Switching Times, $T_J = 25^\circ\text{C}$ $I_C = 14\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 960\text{V}, R_G = 20\Omega$ | | 40 | ns |
| t_r | | | 380 | ns |
| $t_{d(off)}$ | | | 166 | ns |
| t_f | | | 1900 | ns |
| $t_{d(on)}$ | Resistive Switching Times, $T_J = 125^\circ\text{C}$ $I_C = 14\text{A}, V_{GE} = 15\text{V}$ $V_{CE} = 960\text{V}, R_G = 20\Omega$ | | 64 | ns |
| t_r | | | 746 | ns |
| $t_{d(off)}$ | | | 180 | ns |
| t_f | | | 1730 | ns |
| R_{thJC} | TO-247HV | | | 0.62 $^\circ\text{C/W}$ |
| R_{thCS} | | | 0.21 | $^\circ\text{C/W}$ |

Reverse Diode

| Symbol Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified) | | Characteristic Values | | |
|--|---|-----------------------|------|---------------|
| | | Min. | Typ. | Max. |
| V_F | $I_F = 14\text{A}, V_{GE} = 0\text{V}$ | | | 2.7 V |
| t_{rr} | $I_F = 7\text{A}, V_{GE} = 0\text{V}, -di_F/dt = 100\text{A}/\mu\text{s}$ | | 1.4 | μs |
| I_{RM} | | | 23 | A |
| Q_{RM} | $V_R = 100\text{V}, V_{GE} = 0\text{V}$ | | 16 | μC |

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 7,157,338B2
 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. Output Characteristics @ $T_J = 25^\circ\text{C}$

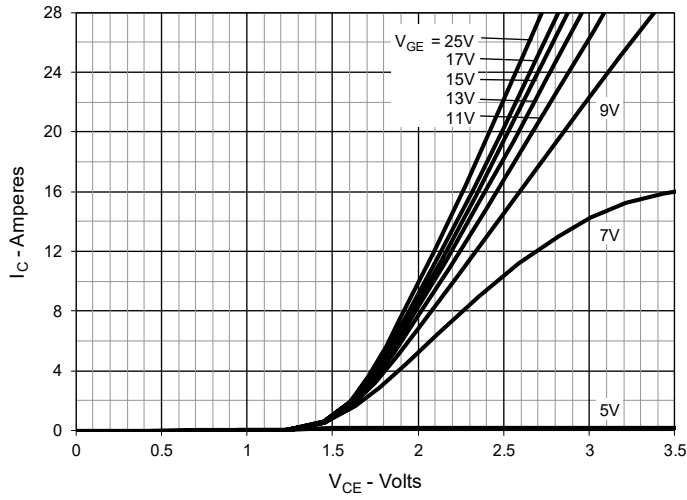


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

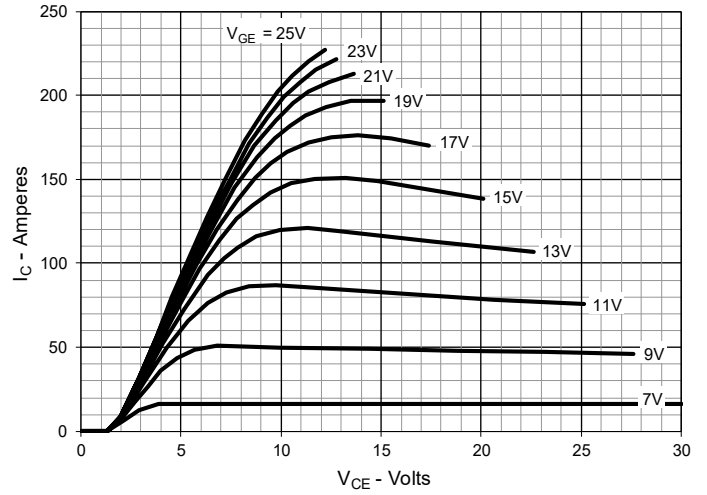


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

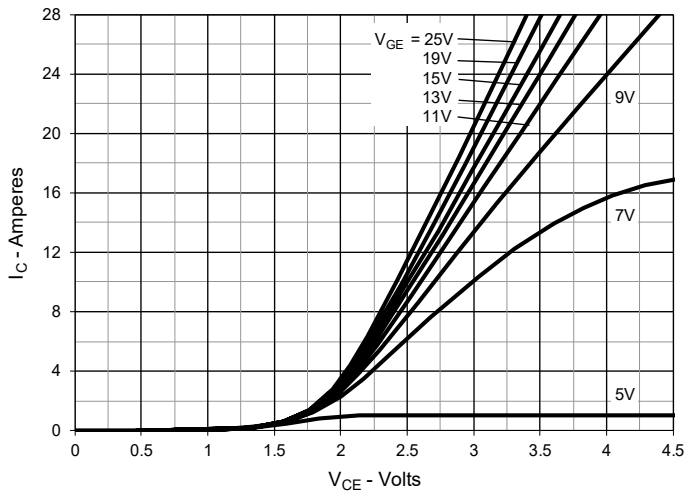


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

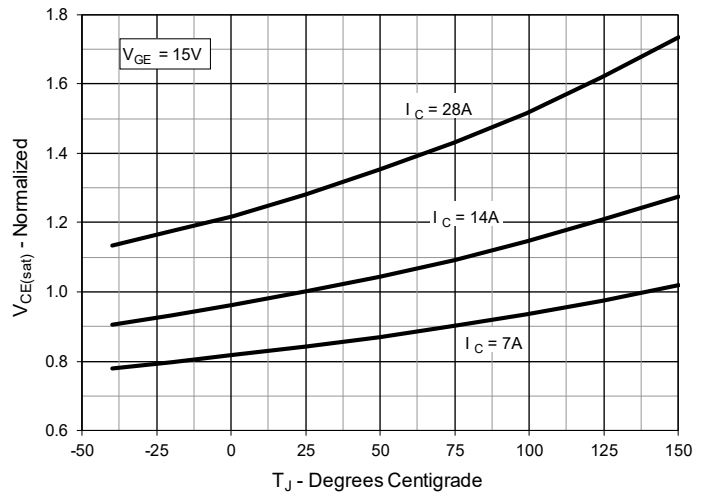


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

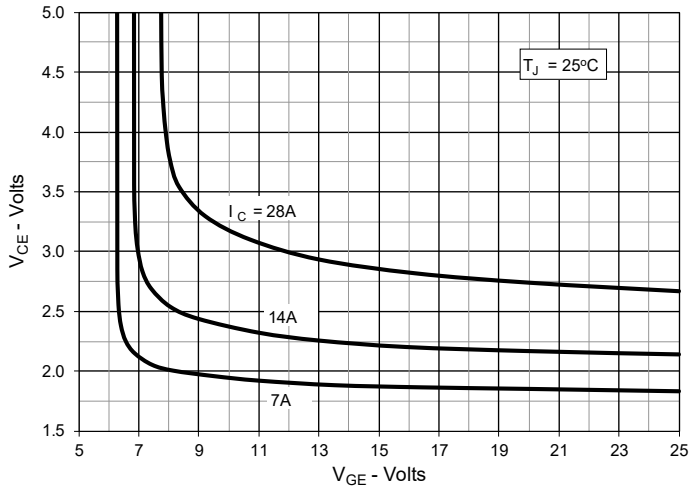


Fig. 6. Input Admittance

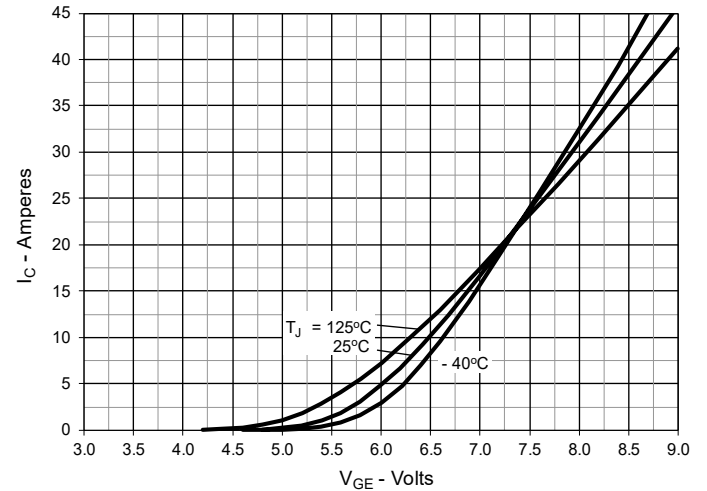


Fig. 7. Transconductance

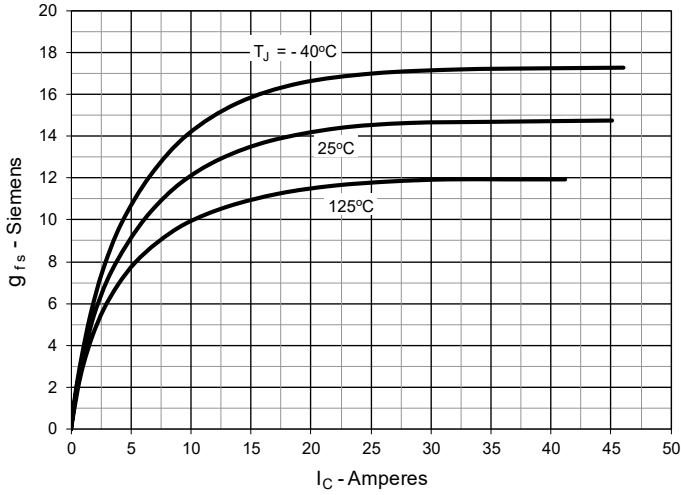


Fig. 8. Forward Voltage Drop of Intrinsic Diode

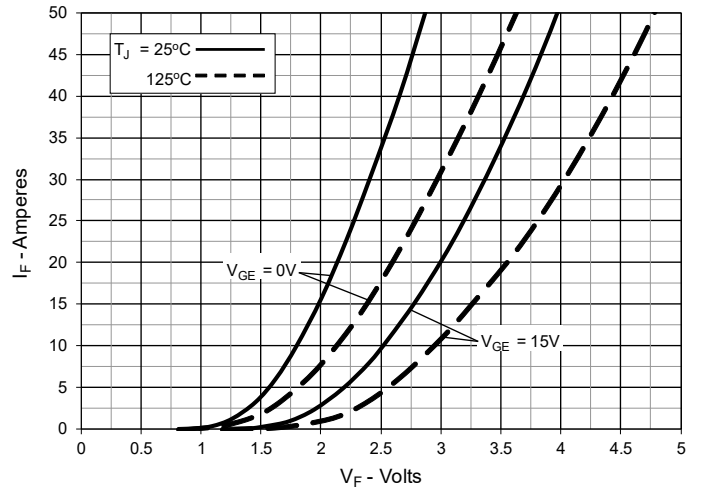


Fig. 9. Gate Charge

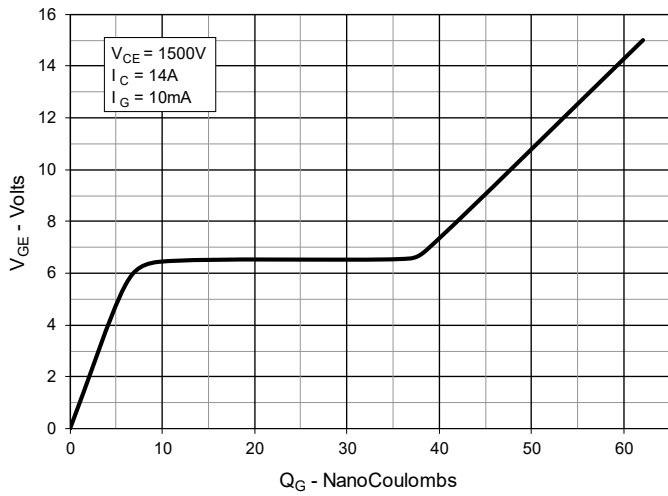


Fig. 10. Capacitance

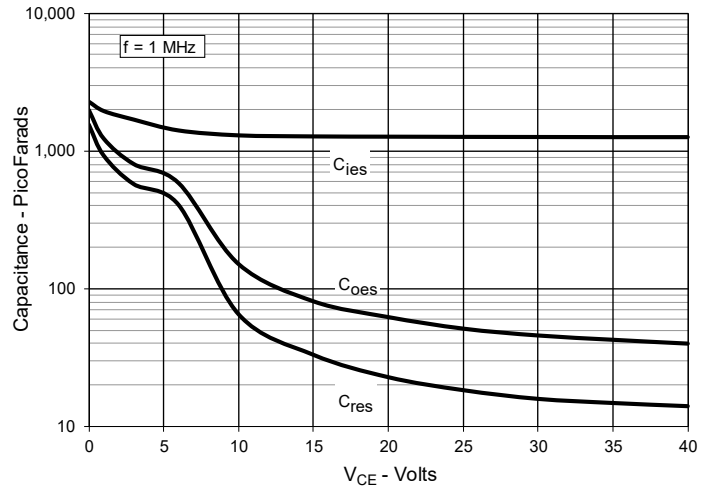


Fig. 11. Reverse-Bias Safe Operating Area

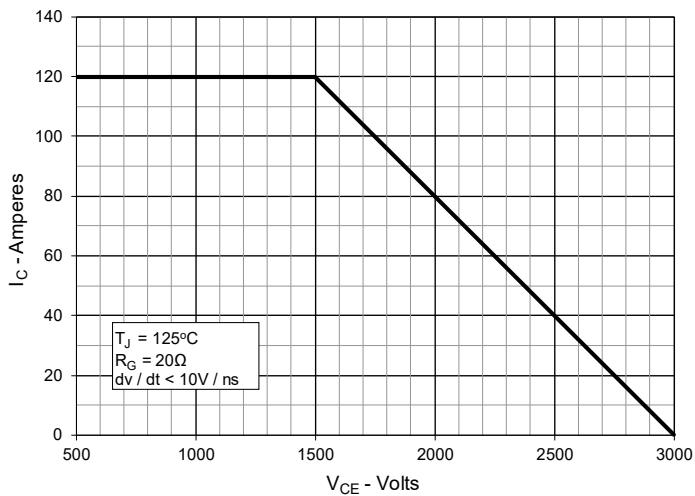
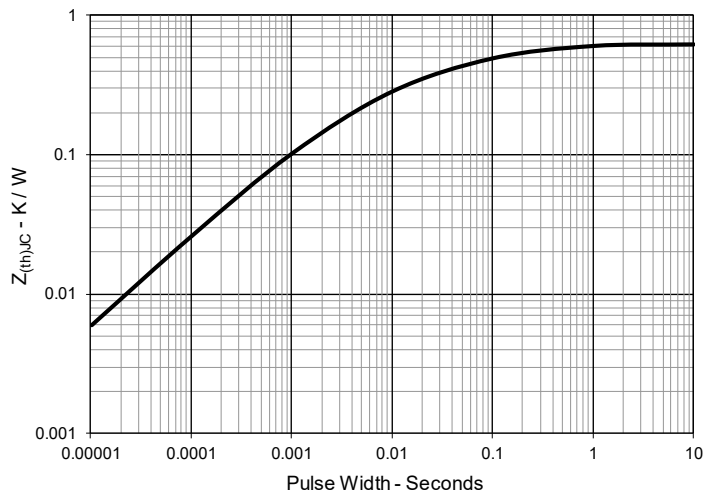
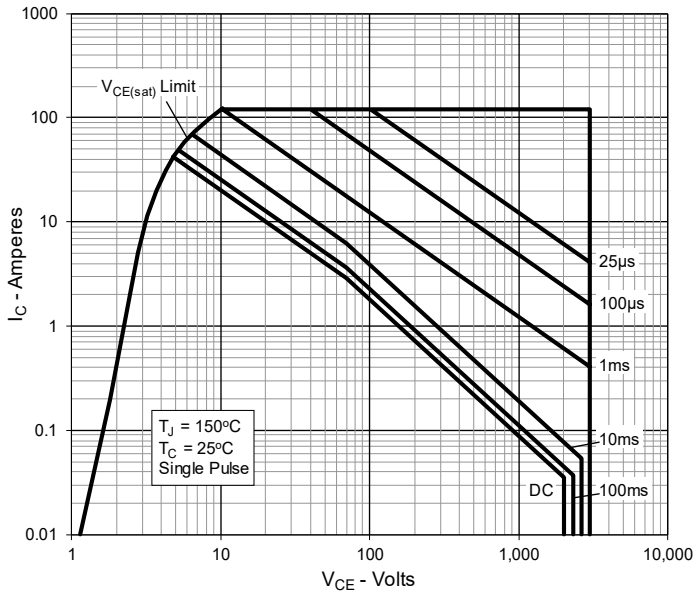


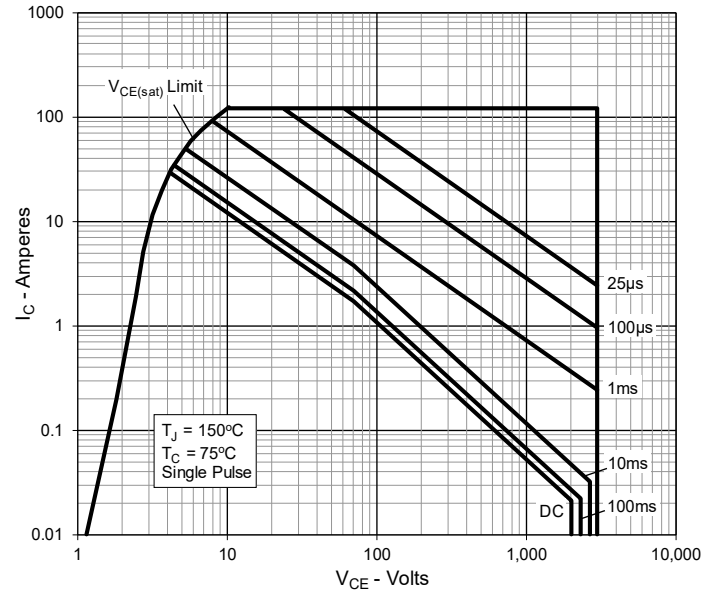
Fig. 12. Maximum Transient Thermal Impedance



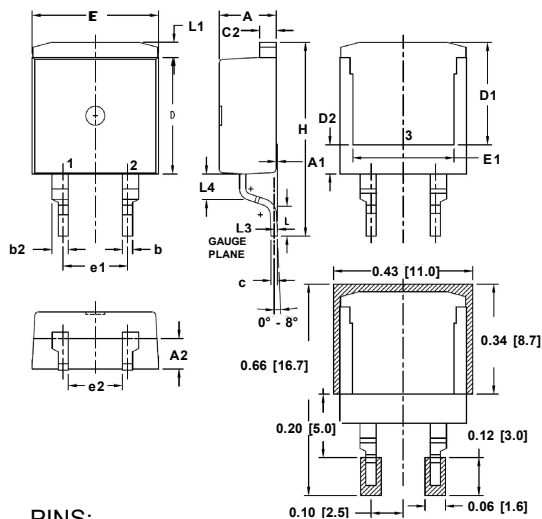
**Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$**



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



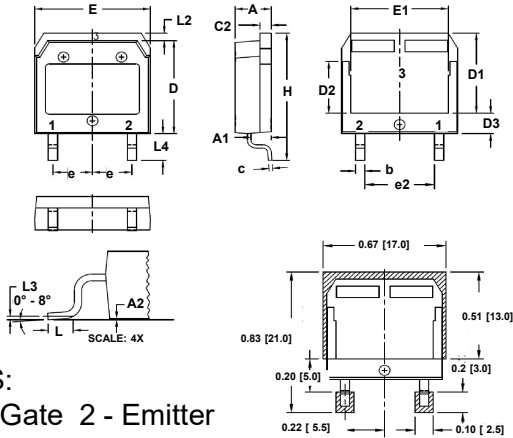
TO-263HV Outline



PINS:
1 - Gate 2 - Emitter
3 - Collector

| SYM | INCHES | | MILLIMETER | |
|------|--------|------|------------|-------|
| | MIN | MAX | MIN | 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 |
| D2 | .083 | .098 | 2.10 | 2.50 |
| 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-268HV

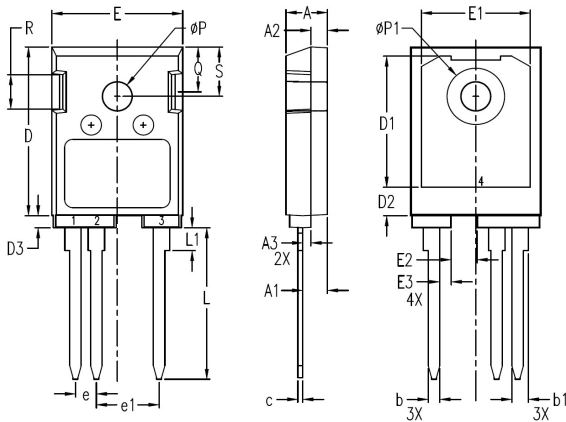


PINS:

- 1 - Gate 2 - Emitter
- 3 - Collector

| SYM | INCHES | | MILLIMETER | |
|------|--------|------|------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .193 | .201 | 4.90 | 5.10 |
| A1 | .106 | .114 | 2.70 | 2.90 |
| A2 | .001 | .010 | 0.02 | 0.25 |
| b | .045 | .057 | 1.15 | 1.45 |
| C | .016 | .026 | 0.40 | 0.65 |
| C2 | .057 | .063 | 1.45 | 1.60 |
| D | .543 | .551 | 13.80 | 14.00 |
| D1 | .465 | .476 | 11.80 | 12.10 |
| D2 | .295 | .307 | 7.50 | 7.80 |
| D3 | .114 | .126 | 2.90 | 3.20 |
| E | .624 | .632 | 15.85 | 16.05 |
| E1 | .524 | .535 | 13.30 | 13.60 |
| e | .215 | BSC | 5.45 | BSC |
| (e2) | .374 | .386 | 9.50 | 9.80 |
| H | .736 | .752 | 18.70 | 19.10 |
| L | .067 | .079 | 1.70 | 2.00 |
| L2 | .039 | .045 | 1.00 | 1.15 |
| L3 | .010 | BSC | 0.25 | BSC |
| L4 | .150 | .161 | 3.80 | 4.10 |

TO-247HV



PINS:

- 1 - Gate 2 - Emitter
- 3,4 - Collector

| SYM | INCHES | | MILLIMETERS | |
|-----|--------|------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | .193 | .201 | 4.90 | 5.10 |
| A1 | .114 | .122 | 2.90 | 3.10 |
| A2 | .075 | .083 | 1.90 | 2.10 |
| A3 | .035 | .043 | 0.90 | 1.10 |
| b | .053 | .059 | 1.35 | 1.50 |
| b1 | .075 | .083 | 1.90 | 2.10 |
| c | .022 | .030 | 0.55 | 0.75 |
| D | .819 | .843 | 20.80 | 21.40 |
| D1 | .638 | .646 | 16.20 | 16.40 |
| D2 | .134 | .146 | 3.40 | 3.70 |
| D3 | .055 | .063 | 1.40 | 1.60 |
| E | .622 | .638 | 15.80 | 16.20 |
| E1 | .520 | .528 | 13.20 | 13.40 |
| E2 | .118 | .126 | 3.00 | 3.20 |
| E3 | .051 | .059 | 1.30 | 1.50 |
| e | .100 | BSC | 2.54 | BSC |
| e1 | .300 | BSC | 7.62 | BSC |
| L | .724 | .748 | 18.40 | 19.00 |
| L1 | .106 | .118 | 2.70 | 3.00 |
| øP | .138 | .142 | 3.50 | 3.60 |
| øP1 | .272 | .280 | 6.90 | 7.10 |
| Q | .216 | .224 | 5.50 | 5.70 |
| R | .165 | .169 | 4.20 | 4.30 |
| S | .240 | .248 | 6.10 | 6.30 |



Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.
