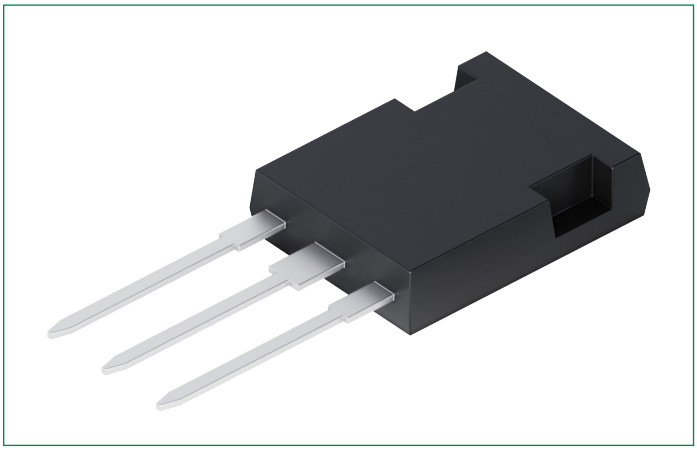
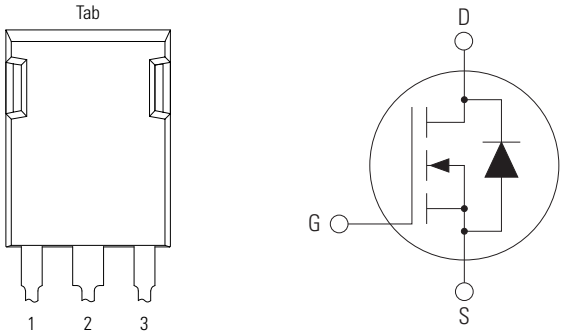
IXTX22N100L

1000 V, 22 A, 600 mΩ, Linear™ Power MOSFET w/ Extended FBSOA

N-Channel Enhancement Mode, Avalanche Rated



Pinout Diagram PLUS247 (IXTX)



1/G: Gate; **2/D:** Drain; **3/S:** Source; **Tab:** Drain

Features

- Designed for Linear Operation
- Avalanche Rated
- Molding Epoxy Meets UL94 V-0 Flammability Classification

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

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

Product Summary

Characteristic	Value	Unit
V_{DSS}	1000	V
I_{D25}	22	A
$R_{DS(on)}$	≤ 600	mΩ

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Maximum Ratings

Symbol	Characteristic	Conditions	Value	Unit
V_{DSS}	Drain-source voltage	T_{vj} = 25 °C to 150 °C	1000	V
V_{GSS}	Gate-source voltage	Continuous	±30	V
V_{GSM}		Transient	±40	
I_D	Drain current	T_c = 25 °C	22	A
I_{DM}	Pulse drain current	T_c = 25 °C, pulse width limited by $T_{vj(max)}$	50	
I_{AS}	Single pulse avalanche current	T_c = 25 °C	22	A
E_{AS}	Single pulse avalanche energy	T_c = 25 °C	1.5	J
P_{tot}	Total power dissipation	T_c = 25 °C	700	W
T_{vj}	Virtual junction temperature range	–	–55 to +150	°C
$T_{vj(max)}$	Maximum virtual junction temperature	–	150	
T_{stg}	Storage temperature range	–	–55 to +150	
T_{sld}	Soldering temperature	–	300	°C
F_C	Mounting force	–	20..120 / 4.5..27	N/lb.
G	Weight	–	6	g

Electrical Characteristics – Static (T_{vj} = 25 °C unless otherwise specified)

Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 1 mA, V_{GS} = 0 V	1000	–	–	V
$V_{GS(th)}$	Gate threshold voltage	I_D = 250 µA, V_{GS} = V_{DS}	3.0	–	5.5	V
I_{GSS}	Gate-source leakage current	V_{DS} = 0 V, V_{GS} = ±30 V	–	–	±200	nA
I_{DSS}	Drain-source leakage current	V_{DS} = V_{DSS}, V_{GS} = 0 V	–	–	50	µA
		V_{DS} = V_{DSS}, V_{GS} = 0 V, T_{vj} = 125 °C	–	–	1	mA
$R_{DS(on)}$	Drain-source on-resistance[1]	V_{GS} = 20 V, I_D = 0.5 × I_{DSS}	–	–	600	mΩ

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

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Electrical Characteristics – Dynamic (T_{vj} = 25 °C unless otherwise specified)

Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
g_{fs}	Transconductance[1]	V_{DS} = 20 V, I_D = 0.5 × I_{DSS}	4.5	7.0	9.5	S
C_{iss}	Input capacitance	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	–	7050	–	pF
C_{oss}	Output capacitance		–	600	–	
C_{rss}	Reverse transfer capacitance		–	100	–	
$t_{d(on)}$	Turn-on delay time	Resistive switching times V_{GS} = 15 V, V_{DS} = 0.5 × V_{DSS}, I_D = 0.5 × I_{DSS}, $R_{G(ext)}$ = 2 Ω	–	36	–	ns
t_r	Rise time		–	35	–	
$t_{d(off)}$	Turn-off delay time		–	80	–	
t_f	Fall time		–	50	–	
Q_G	Total gate charge	V_{GS} = 15 V, V_{DS} = 0.5 × V_{DSS}, I_D = 0.5 × I_{DSS}	–	270	–	nC
Q_{GS}	Gate-source charge		–	70	–	
Q_{GD}	Gate-drain charge		–	110	–	

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

Thermal Specifications

Symbol	Characteristics	Value	Unit
$R_{th(j-c)}$	Thermal resistance, junction to case	0.18	K/W
$R_{th(j-a)}$	Thermal resistance, junction to ambient	0.15	K/W

Safe-Operating-Area Specification

Symbol	Conditions	Value			Unit
		Min.	Typ.	Max.	
SOA	V_{DS} = 800 V, I_D = 0.3 A, T_C = 90 °C , t_p = 5 s	240	–	–	W

Source-Drain Diode Characteristics (T_{vj} = 25°C unless otherwise specified)

Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
I_S	Continuous diode forward current	V_{GS} = 0 V	–	–	22	A
I_{SM}	Diode pulse current	Repetitive, pulse width limited by $T_{vj(max)}$	–	–	50	A
V_{SD}	Diode forward voltage[1]	I_F = I_S, V_{GS} = 0 V	–	–	1.5	V
t_{rr}	Reverse recovery time	I_F = I_S, -di/dt = 100 A/µs, V_R = 100 V, V_{GS} = 0 V	–	1000	–	ns

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

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Characteristic Curves

Fig. 1. Output Characteristics @ T_{vj} = 25 °C

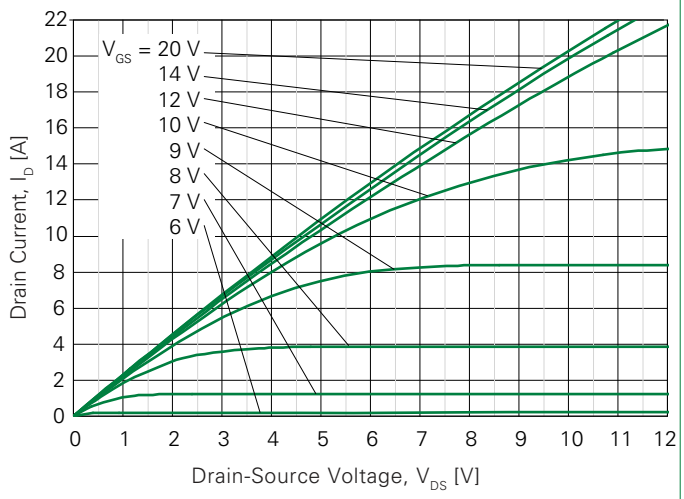


Fig. 2. Extended Output Characteristics @ T_{vj} = 25 °C

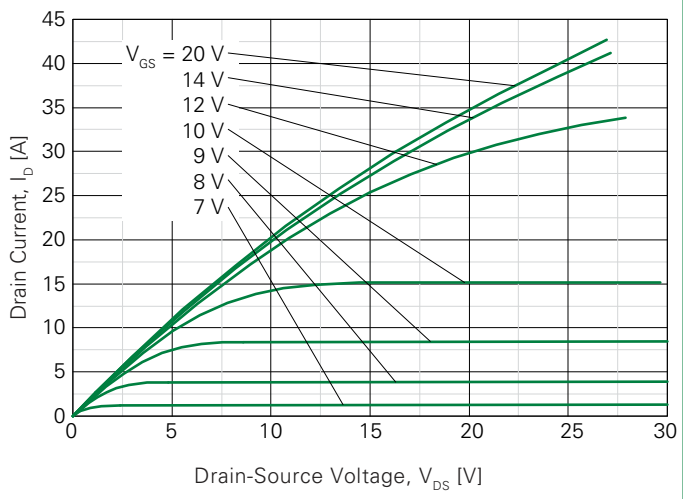


Fig. 3. Output Characteristics @ T_{vj} = 125 °C

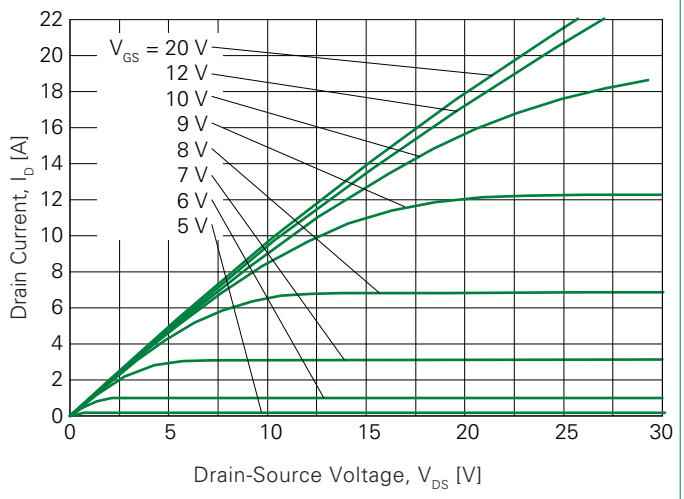


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 11 A Value vs. Junction Temperature

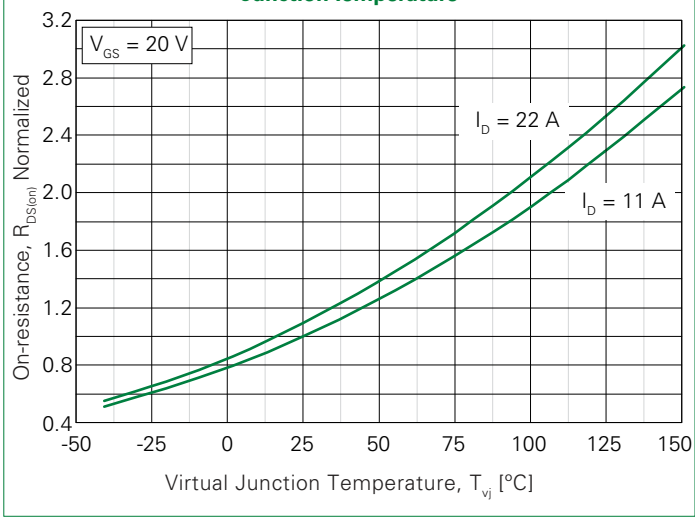


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 11 A Value vs. Drain Current

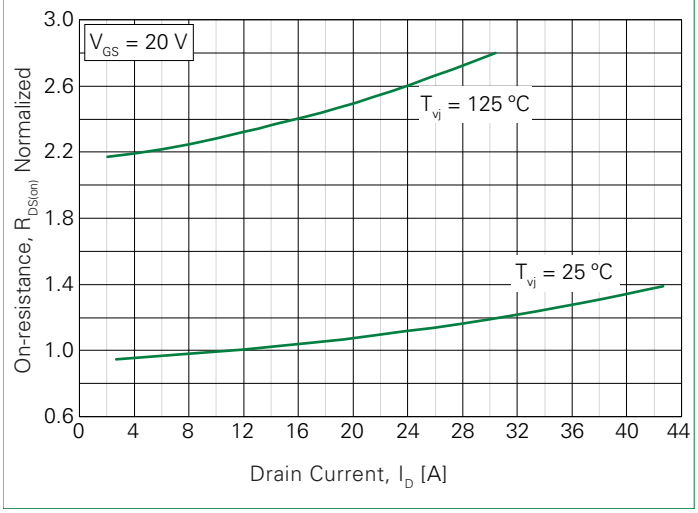
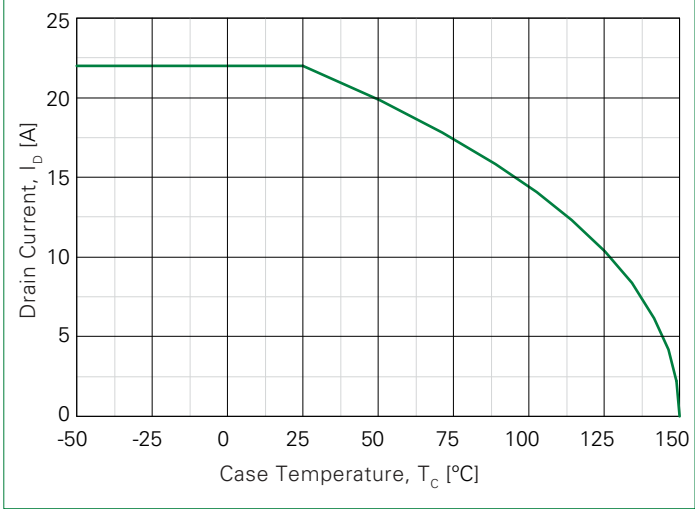


Fig. 6. Maximum Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

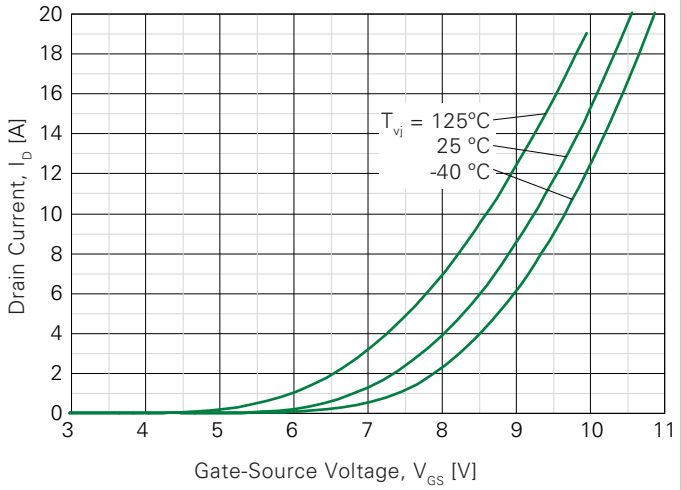


Fig. 8. Transconductance

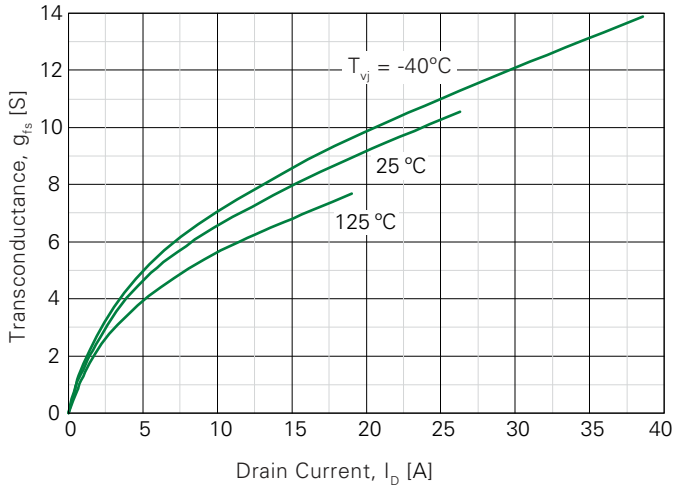


Fig. 9. Forward Voltage Drop of Intrinsic Diode

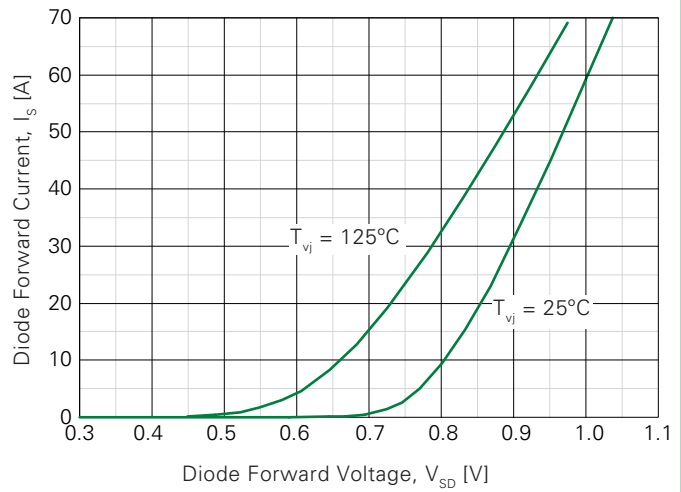


Fig. 10. Gate Charge

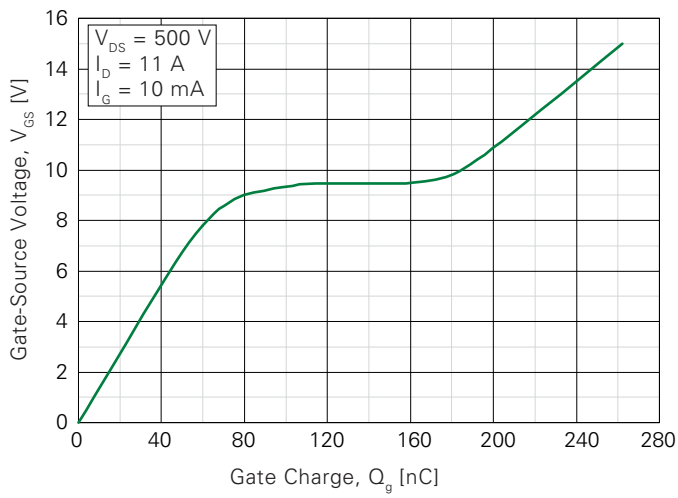


Fig. 11. Capacitance

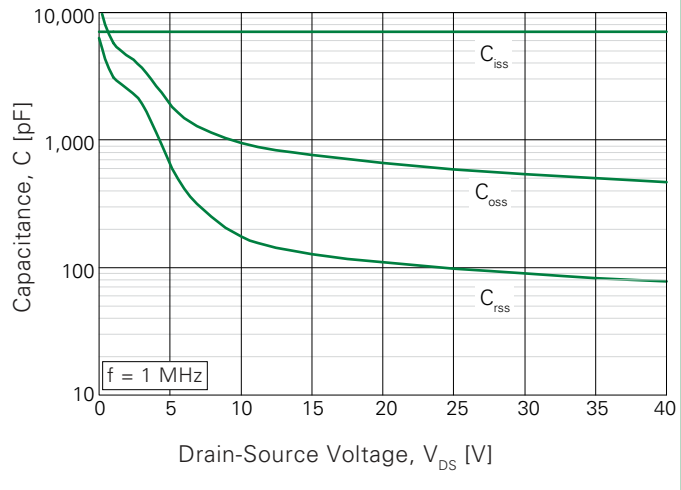
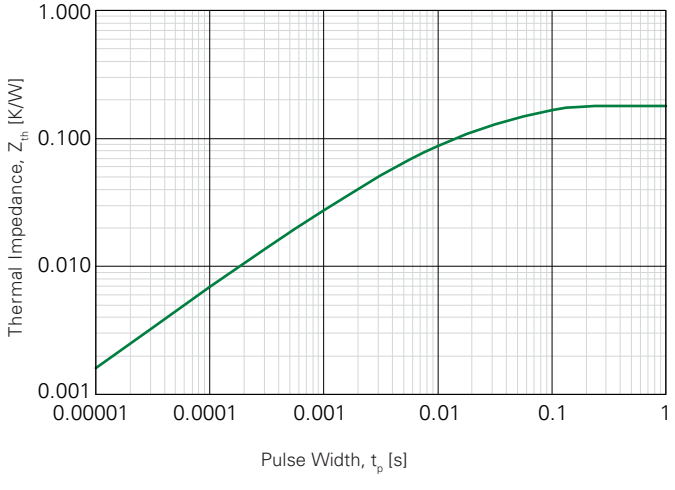


Fig. 12. Maximum Transient Thermal Impedance



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Fig. 13. Forward-Bias Safe Operating Area @ T_c = 25 °C

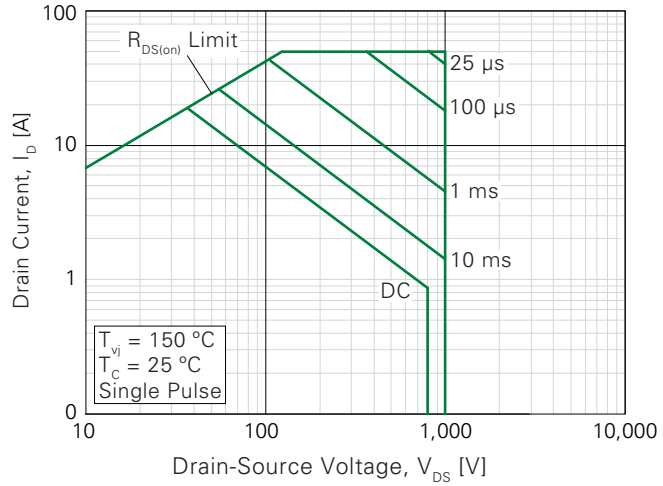
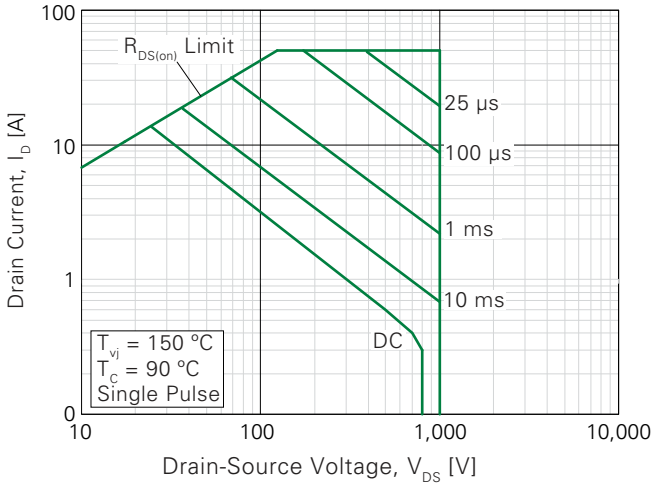
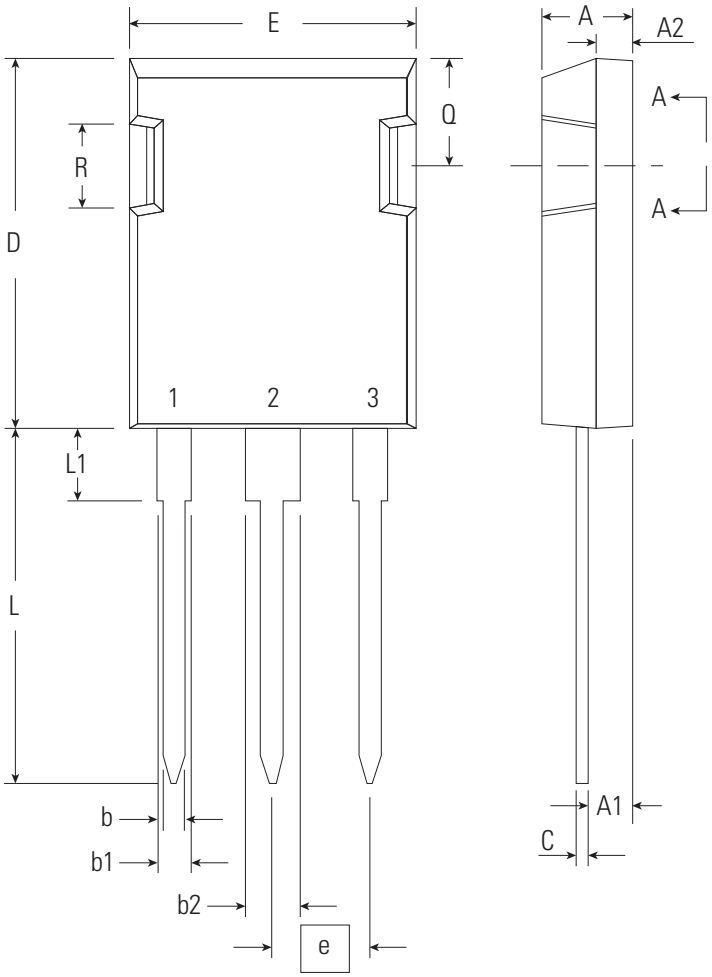


Fig. 14. Forward-Bias Safe Operating Area @ T_c = 90°



Part Outline Drawing (PLUS247)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b1	1.91	2.13	0.075	0.084
b2	2.92	3.12	0.115	0.123
C	0.61	0.80	0.024	0.031
D	20.80	21.34	0.819	0.840
E	15.75	16.13	0.620	0.635
e	5.45 BSC		0.215 BSC	
L	19.81	20.32	0.780	0.800
L1	3.81	4.32	0.150	0.170
Q	5.59	6.20	0.220	0.244
R	4.32	4.83	0.170	0.190

1 - Gate
2 - Drain
3 - Source

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