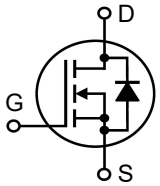
IXYS

Linear™ Power MOSFET w/Extended FBSOA

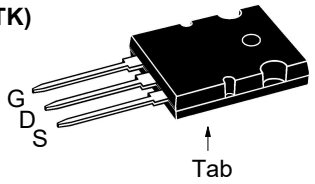
IXTK8N150L
IXTX8N150L

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

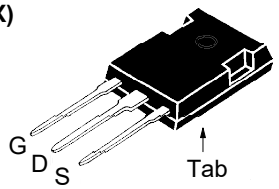
N-Channel Enhancement Mode
Guaranteed FBSOA



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

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		8.0	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			50	μA
	T_J = 125°C			3	mA
$R_{DS(on)}$	V_{GS} = 20V, $I_D = 0.5 \bullet I_{D25}$, Note 1			3.6	Ω

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.	
g_{fs}	V_{DS} = 50V, I_D = 0.5 • I_{D25}, Note 1	1.4	2.3	3.2	S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		8000		pF
C_{oss}			405		pF
C_{rss}			70		pF
$t_{d(on)}$	**Resistive Switching Times**		36		ns
t_r	V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		18		ns
$t_{d(off)}$	R_G = 2Ω (External)		90		ns
t_f			95		ns
$Q_{g(on)}$	V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		250		nC
Q_{gs}			80		nC
Q_{gd}			116		nC
R_{thJC}				0.18	°C/W
R_{thCS}			0.15		°C/W

Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	
SOA	V_{DS} = 1kV, I_D = 0.5A, T_C = 60°C, T_P = 3s	500			W

Source-Drain Diode

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

Note: 1. Pulse Test, t ≤ 300μs; Duty Cycle, d ≤ 2%.

Fig. 1. Extended Output Characteristics @ T_J = 25ºC

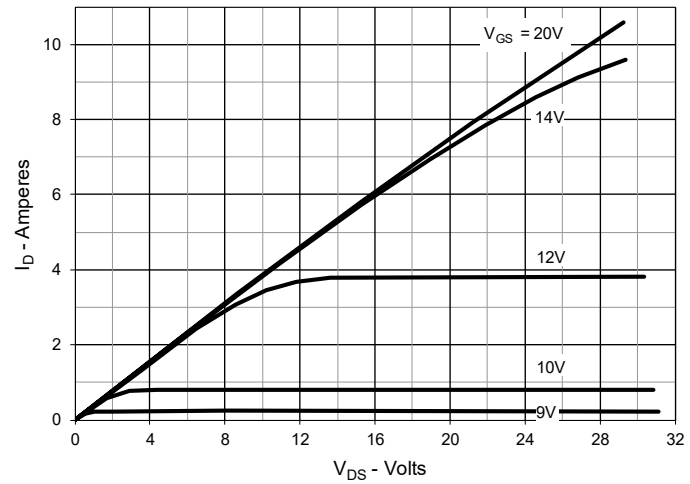


Fig. 2. Output Characteristics @ T_J = 125ºC

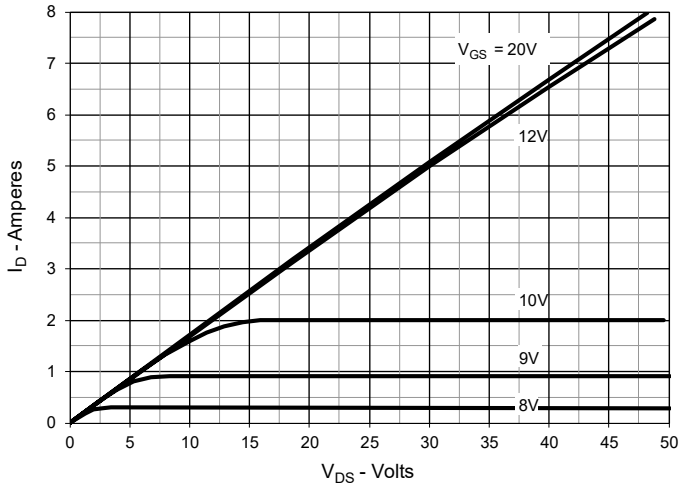


Fig. 3. $R_{DS(on)}$ Normalized to I_D = 4A Value vs. Junction Temperature

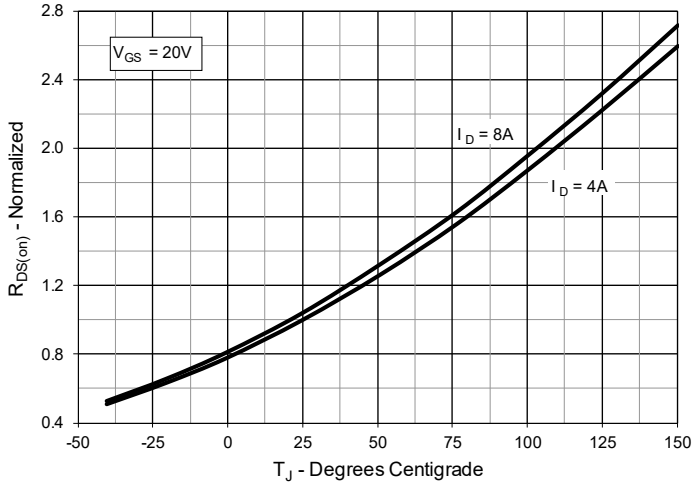


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 4A Value vs. Drain Current

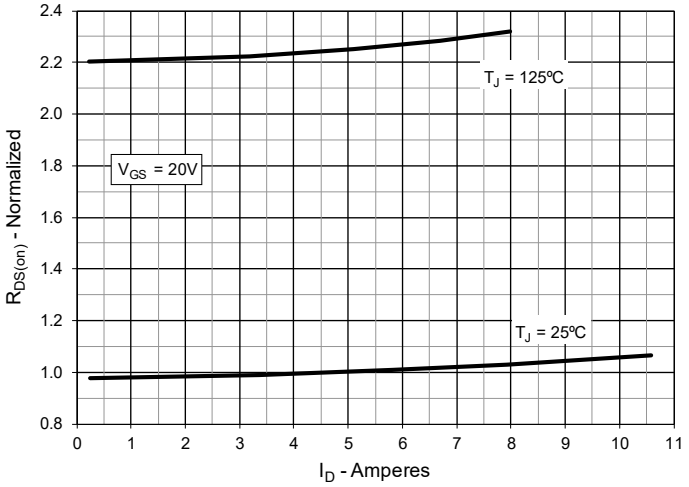


Fig. 5. Maximum Drain Current vs. Case Temperature

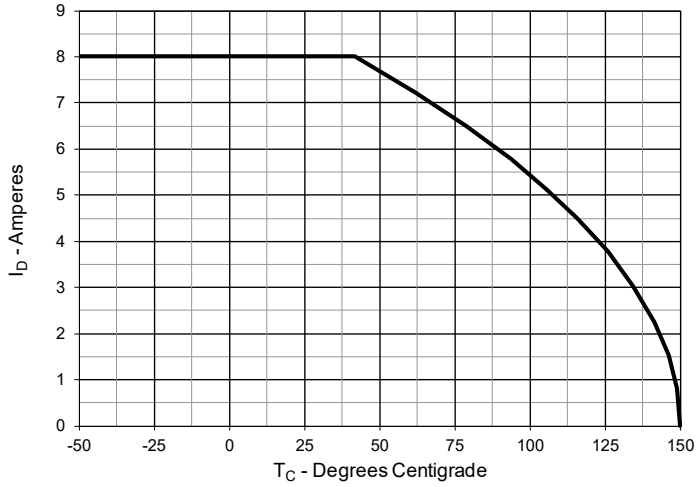


Fig. 6. Input Admittance

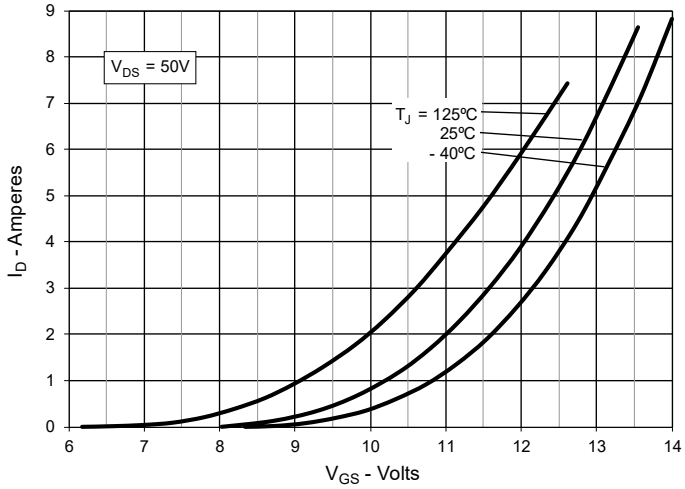


Fig. 7. Transconductance

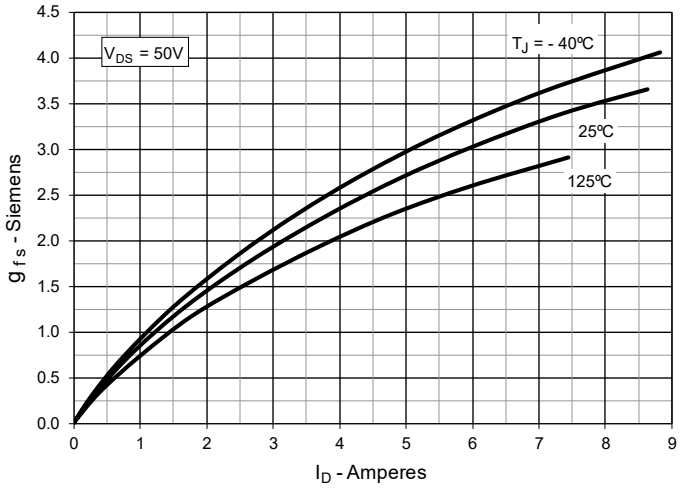


Fig. 8. Forward Voltage Drop of Intrinsic Diode

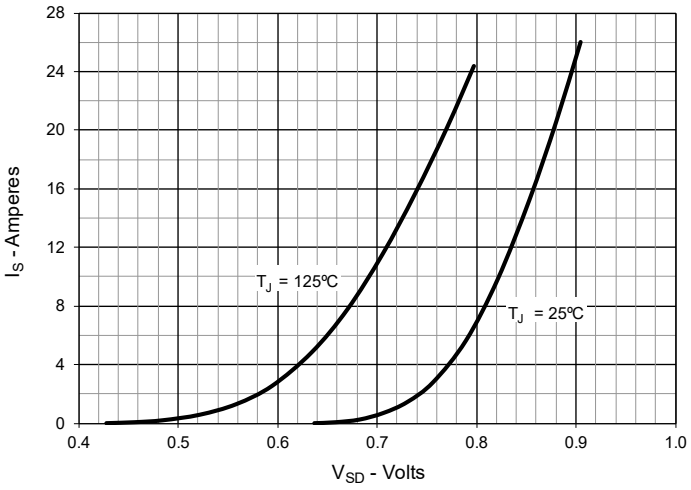


Fig. 9. Gate Charge

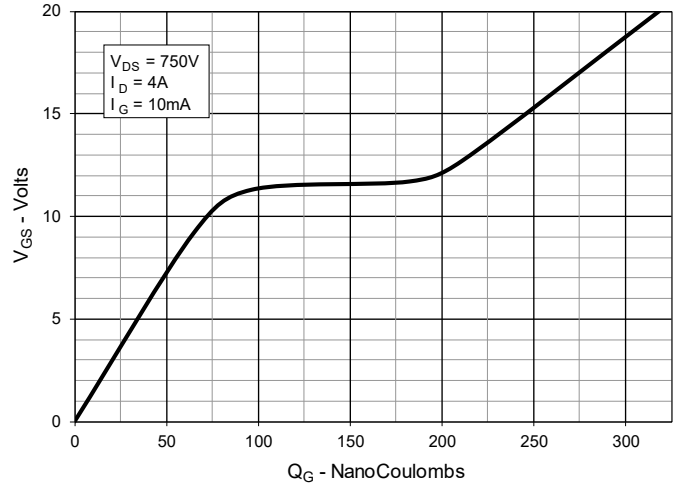


Fig. 10. Capacitance

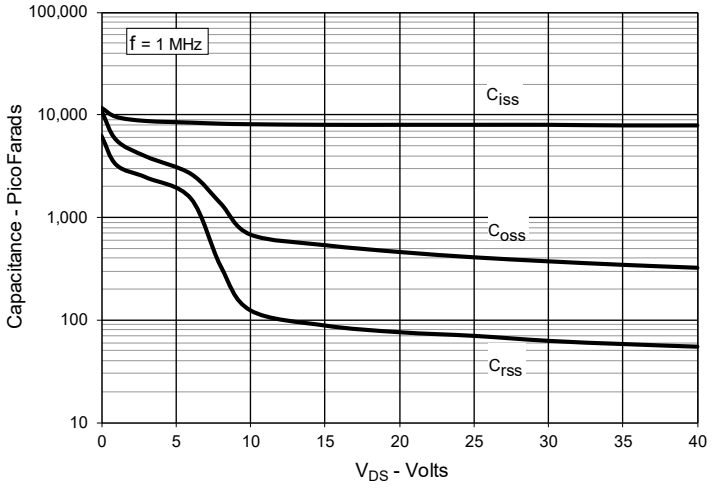


Fig. 11. Maximum Transient Thermal Impedance

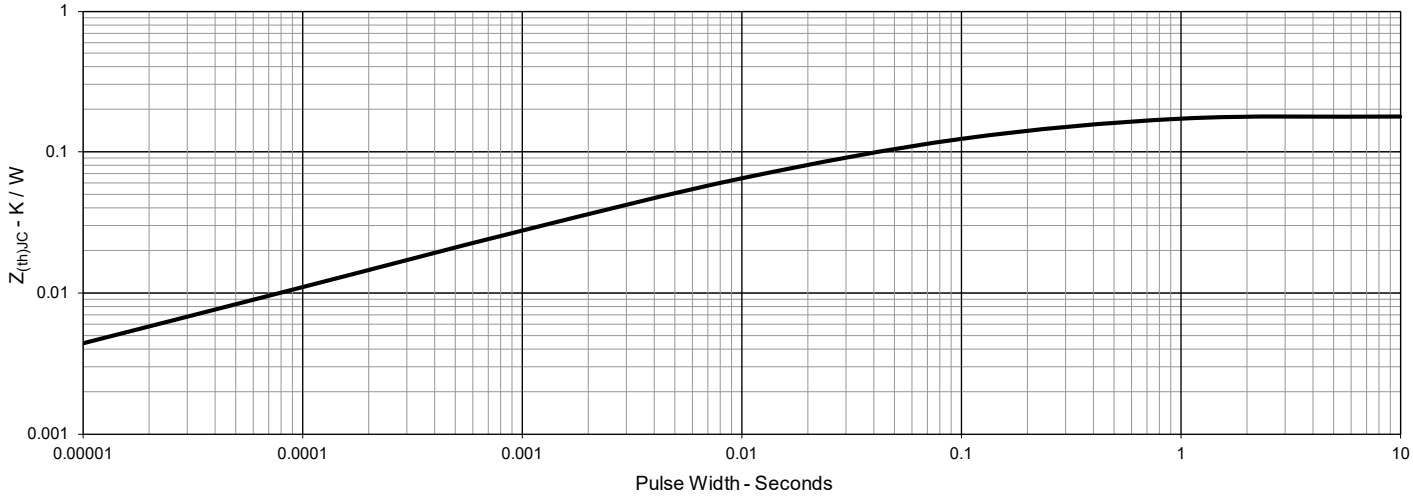


Fig. 12. Forward-Bias Safe Operating Area @ T_C = 25ºC

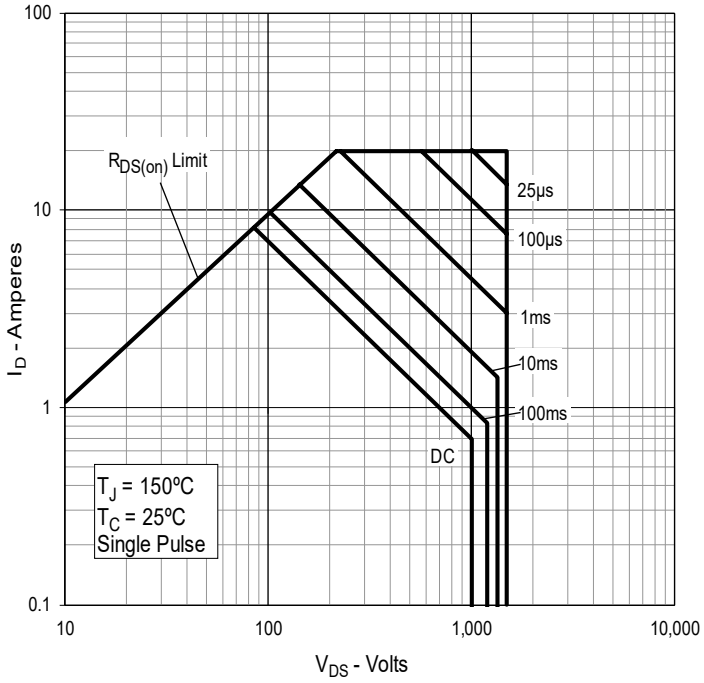
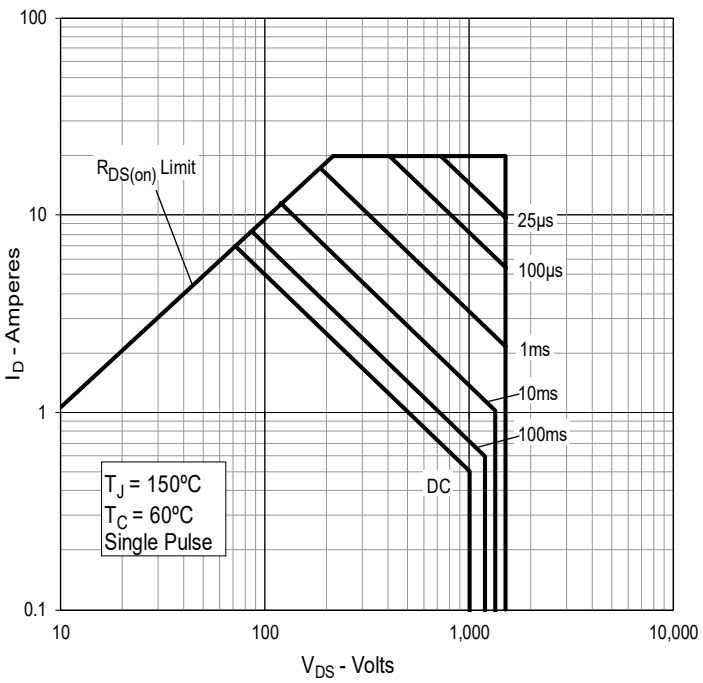
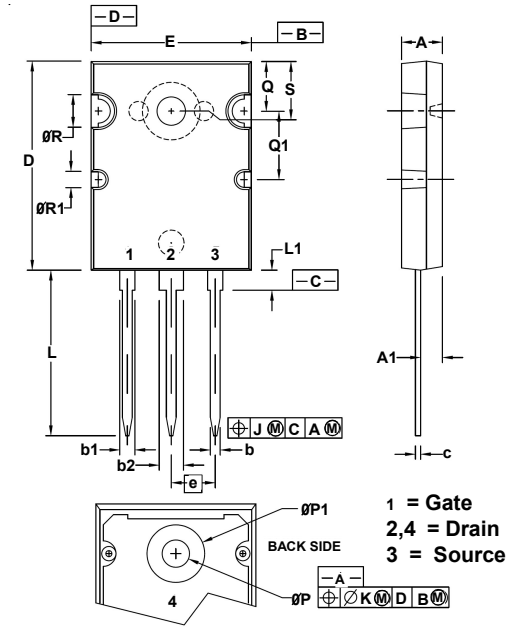


Fig. 13. Forward-Bias Safe Operating Area @ T_C = 60ºC



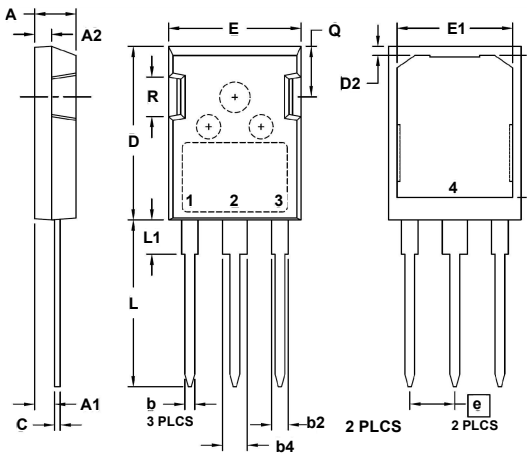
TO-264 Outline



1 = Gate
2,4 = Drain
3 = Source

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	.215BSC		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



1 = Gate
2,4 = Drain
3 = Source

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