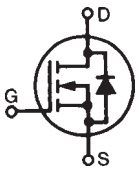
IXYS

PolarHT™ Power MOSFET

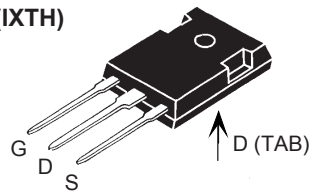
IXTH 88N30P
IXTK 88N30P
IXTQ 88N30P
IXTT 88N30P

V_{DSS} = 300 V
I_{D25} = 88 A
$R_{DS(on)}$ ≤ 40 mΩ

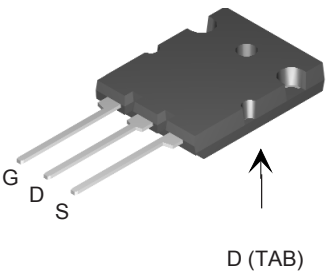
N-Channel Enhancement Mode
Avalanche Rated



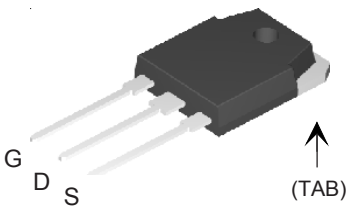
TO-247 (IXTH)



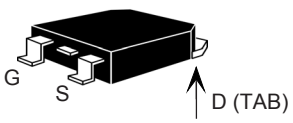
TO-264 (IXTK)



TO-3P (IXTQ)



TO-268 (IXTT)



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	300	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	300	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	88	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	220	A
I_{AR}	T_C = 25°C	60	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	2.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$ T_J ≤150°C, R_G = 4 Ω	10	V/ns
P_D	T_C = 25°C	600	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°C
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	TO-247	6.0	g
	TO-264	10	g
	TO-3P & TO-268	5.5	g

Symbol (T_J = 25°C, unless otherwise specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	300			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V T_J = 125°C			100 1	μA mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 0.5 I_{D25} Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			40	mΩ

G = Gate D = Drain
S = Source TAB = Drain

Features
- International standard package
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages
- Easy to mount
- Space savings
- High power density

© 2006 IXYS All rights reserved

Symbol	Test Conditions	Characteristic Values (T_J = 25° C unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 0.5 I_{D25}, pulse test	45	60		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		6300		pF
C_{oss}			950		pF
C_{rss}			190		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 60 A R_G = 3.3 Ω (External)		25		ns
t_r			24		ns
$t_{d(off)}$			96		ns
t_f			25		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		180		nC
Q_{gs}			44		nC
Q_{gd}			90		nC
R_{thJC}				0.21°	C/W
R_{thCS}	TO-247 and TO-3P		0.21		°C/W
R_{thCS}	TO-264		0.15		°C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25° C, unless otherwise specified) Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			88	A
I_{SM}	Repetitive			220	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Pulse test, t ≤300 μs, duty cycle d≤ 2 %			1.5	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/μs		250		ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		3.3		μC

Characteristic Curves

Fig. 1. Output Characteristics @ 25ºC

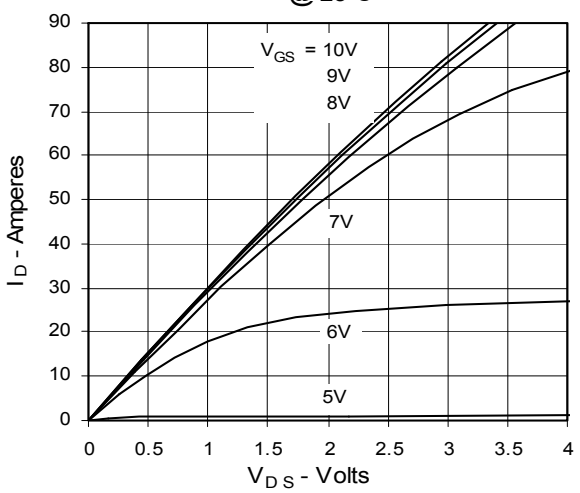
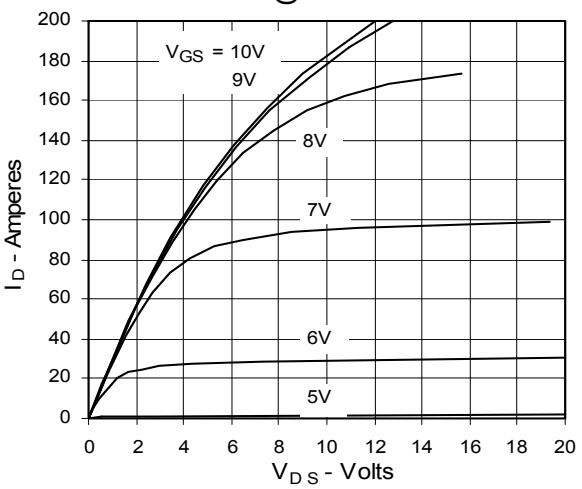


Fig. 2. Extended Output Characteristics @ 25ºC



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

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 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 6,710,405B2 6,710,463 6,727,585 6,759,692 6771478 B2

Fig. 3. Output Characteristics @ 125ºC

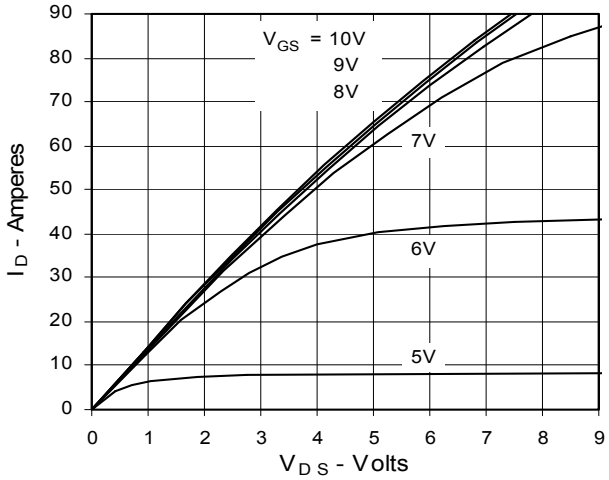


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

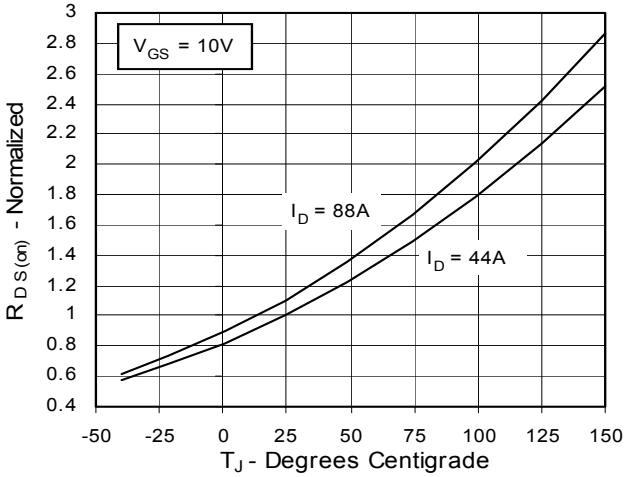


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

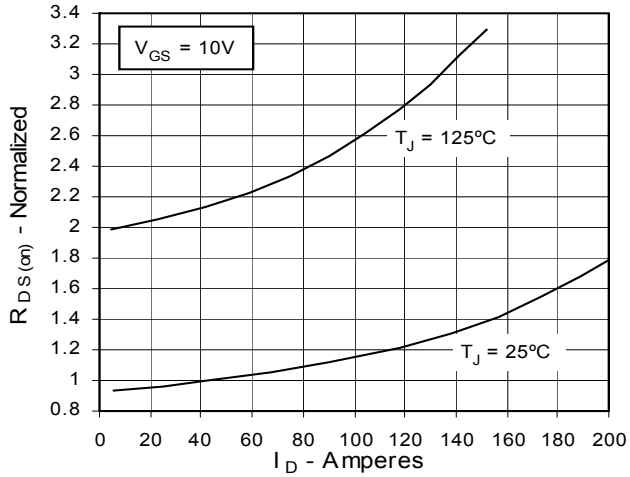


Fig. 6. Drain Current vs. Case Temperature

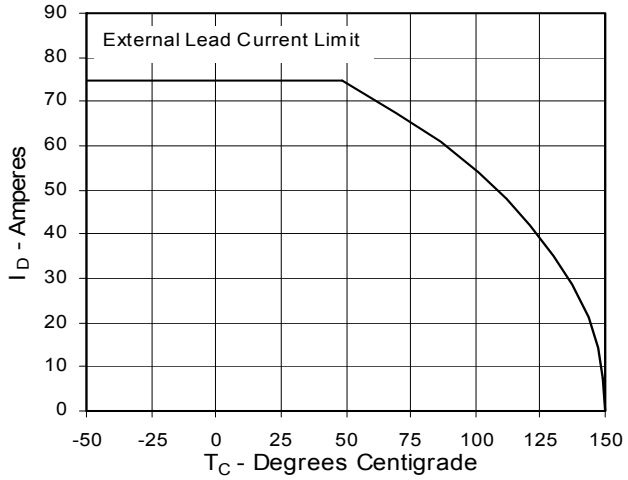


Fig. 7. Input Admittance

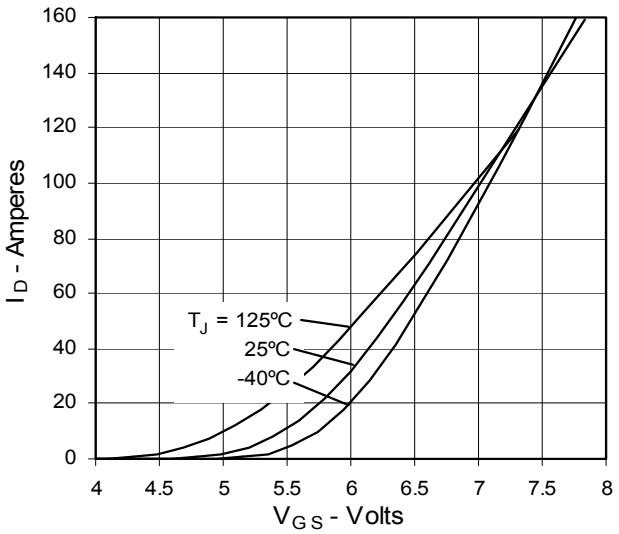
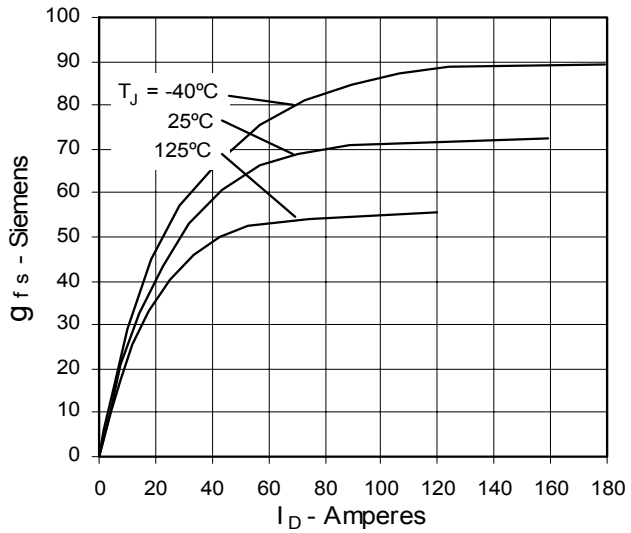


Fig. 8. Transconductance



© 2006 IXYS All rights reserved

Fig. 9. Source Current vs. Source-To-Drain Voltage

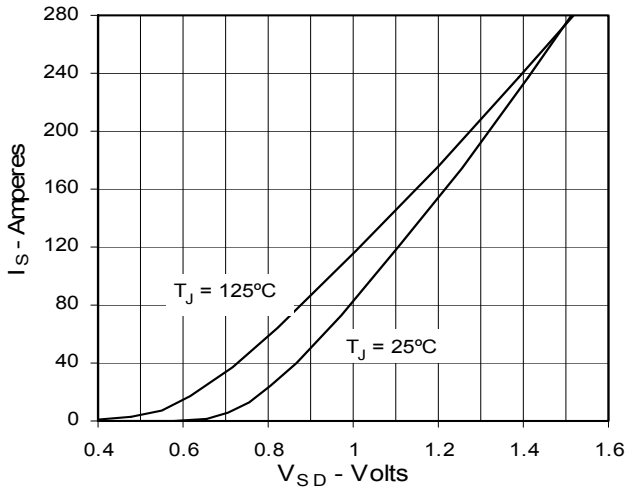


Fig. 10. Gate Charge

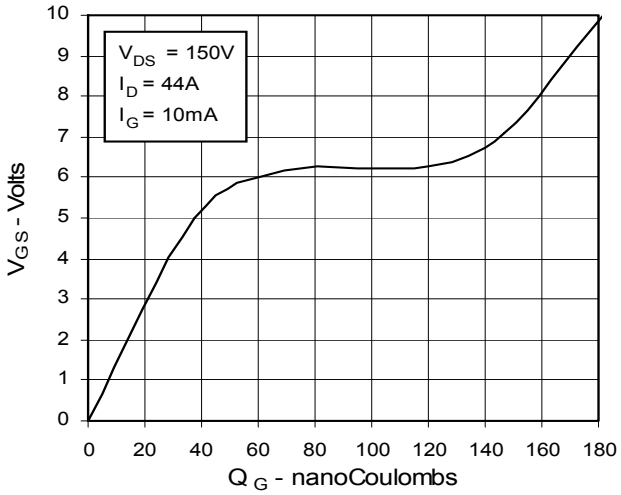


Fig. 11. Capacitance

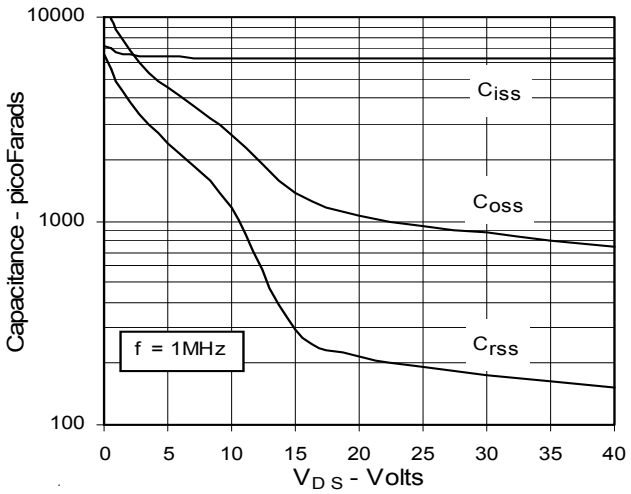


Fig. 12. Forward-Bias Safe Operating Area

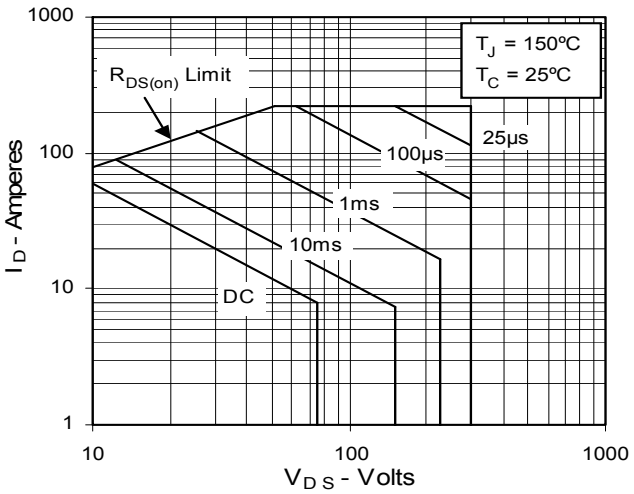
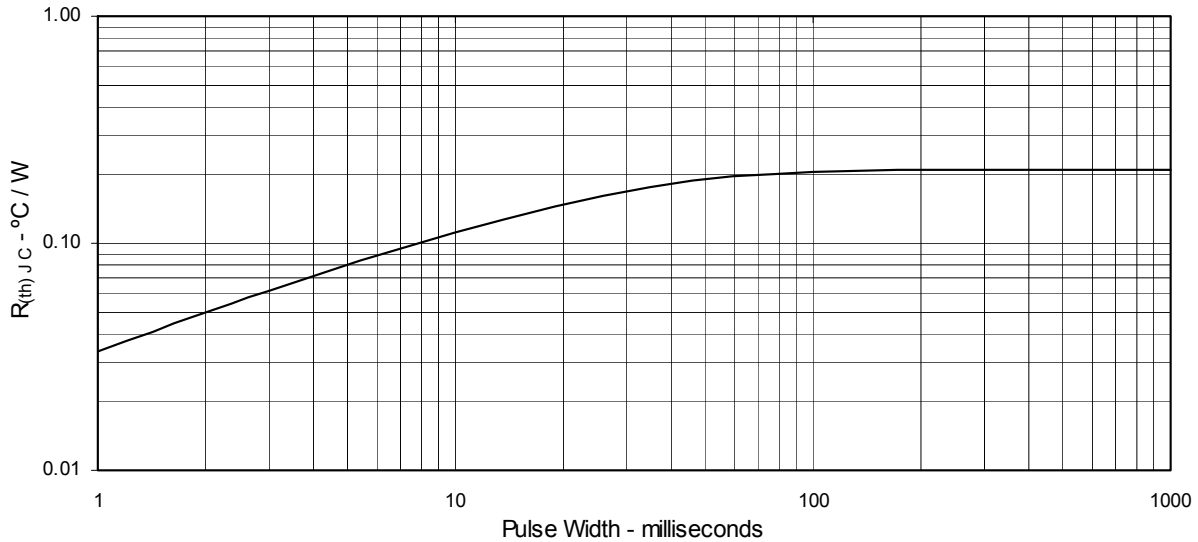
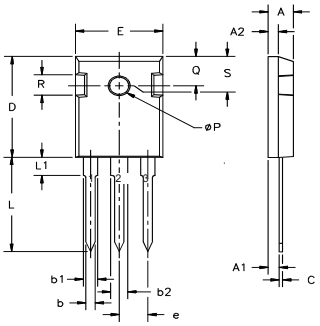


Fig. 13. Maximum Transient Thermal Resistance



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

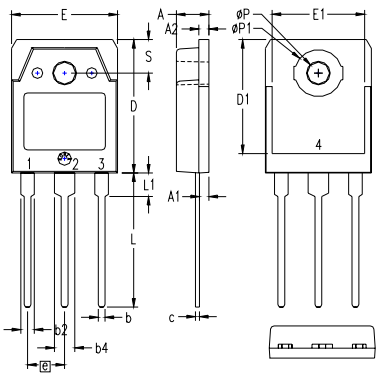
TO-247 (IXTH) Outline



Terminals:
1. Gate 2,4. Drain
3. Source

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

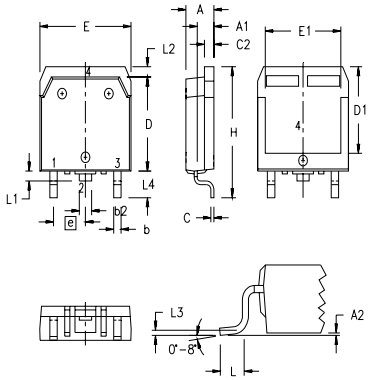
TO-3P (IXTQ) Outline



1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – DRAIN (COLLECTOR)

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.799	19.80	20.30
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

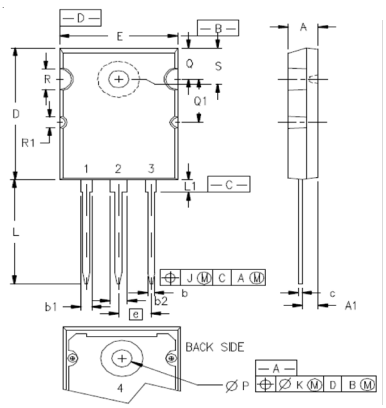
TO-268 (IXTT) Outline



Terminals:
1. Gate 2,4. Drain
3. Source

SYM	INCHES		MILLIMETERS	
	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
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

TO-264 (IXTK) Outline



1 – GATE
2, 4 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)

SYM	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
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

© 2006 IXYS All rights reserved



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.