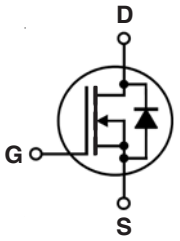
IXYS

Depletion Mode MOSFET

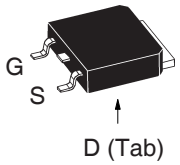
IXTY01N100D
IXTU01N100D
IXTP01N100D

V_{DSX} = 1000V
$R_{DS(on)}$ ≤ 80Ω

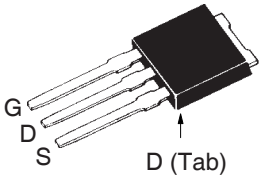
N-Channel



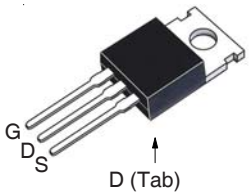
TO-252 (IXTY)



TO-251 (IXTU)



TO-220 (IXTP)



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSX}	T_J = 25°C to 150°C	1000	V
V_{DGX}	T_J = 25°C to 150°C	1000	V
V_{GSX}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{DM}	T_C = 25°C, Pulse Width Limited by T_J	400	mA
P_D	T_C = 25°C	25	W
	T_A = 25°C	1.1	W
T_J		- 55 ... +150	°C
T_{JM}		150	°C
T_{stg}		- 55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-252	0.35	g
	TO-251	0.40	g
	TO-220	3.00	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSX}	V_{GS} = -10V, I_D = 25μA	1000			V
$V_{GS(off)}$	V_{DS} = 25V, I_D = 25μA	- 2.0		- 4.5	V
I_{GSX}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
$I_{DSX(off)}$	V_{DS} = V_{DSX}, V_{GS} = -10V			10	μA
	T_J = 125°C			250	μA
$R_{DS(on)}$	V_{GS} = 0V, I_D = 50mA, Note 1		50	80	Ω
$I_{D(on)}$	V_{GS} = 0V, V_{DS} = 25V, Note 1		400		mA

Features

- Normally ON Mode
- International Standard Packages
- Low $R_{DS(on)}$ HDMOS™ Process
- Rugged Polysilicon Gate Cell Structure
- Fast Switching Speed

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Level Shifting
- Triggers
- Solid State Relays
- Current Regulators

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 100V, I_D = 100mA, Note 1	100	200		mS
C_{iss}	V_{GS} = -10V, V_{DS} = 25V, f = 1MHz		100		pF
C_{oss}			12		pF
C_{rss}			2		pF
$t_{d(on)}$	**Resistive Switching Times**		7		ns
t_r	V_{GS} = ±5V, V_{DS} = 50V, I_D = 50mA		10		ns
$t_{d(off)}$	R_G = 30Ω (External)		34		ns
t_f			64		ns
$Q_{g(on)}$	V_{GS} = ±5V, V_{DS} = 500V, I_D = 50mA		5.8		nC
Q_{gs}			3.6		nC
Q_{gd}			0.4		nC
R_{thJC}				5.0	°C/W
R_{thCS}	TO-220		0.50		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_{SD}	I_F = 100mA, V_{GS} = -10V, Note 1			1.5	V
t_{rr}	I_F = 750mA, -di/dt = 100A/µs V_R = 25V, V_{GS} = -10V			1.5	µs

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

Fig. 1. Output Characteristics @ T_J = 25°C

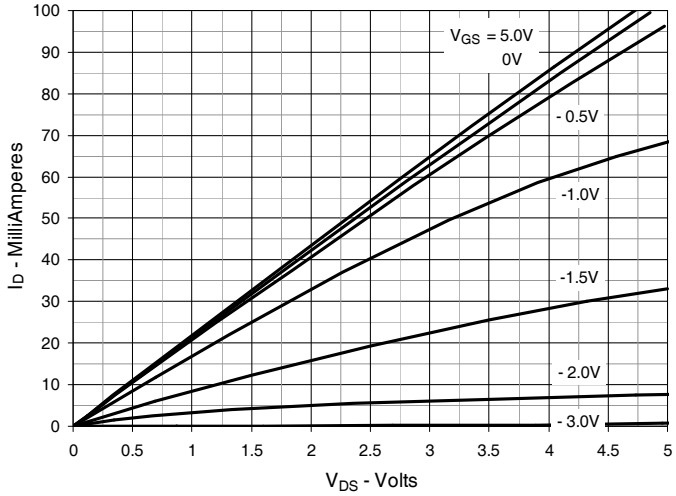


Fig. 2. Output Characteristics @ T_J = 125°C

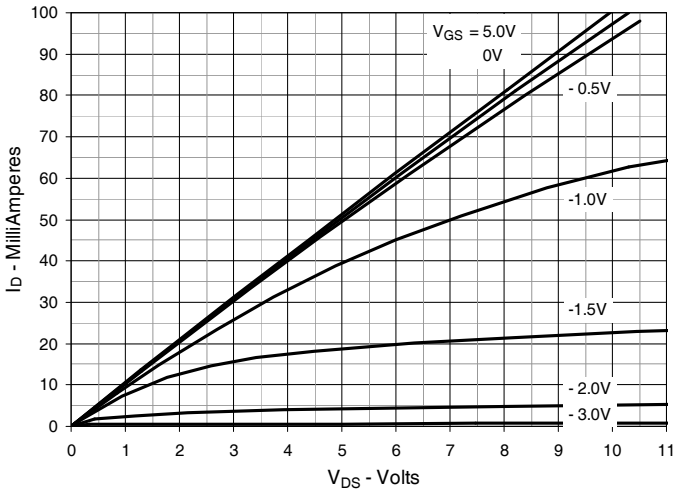


Fig. 3. Drain Current @ T_J = 25°C

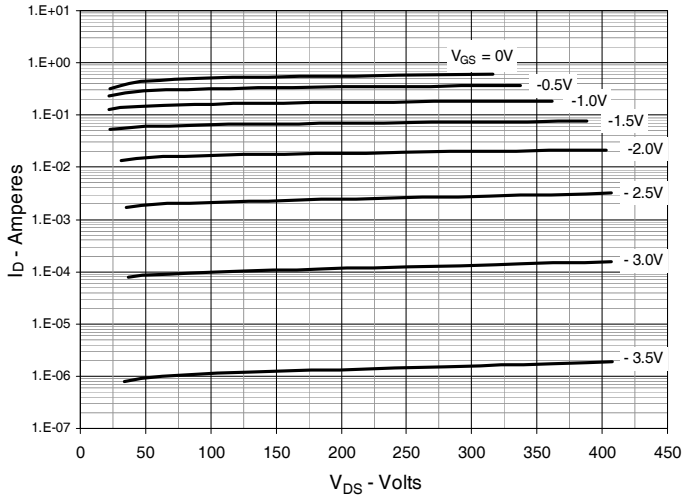


Fig. 4. Drain Current @ T_J = 100°C

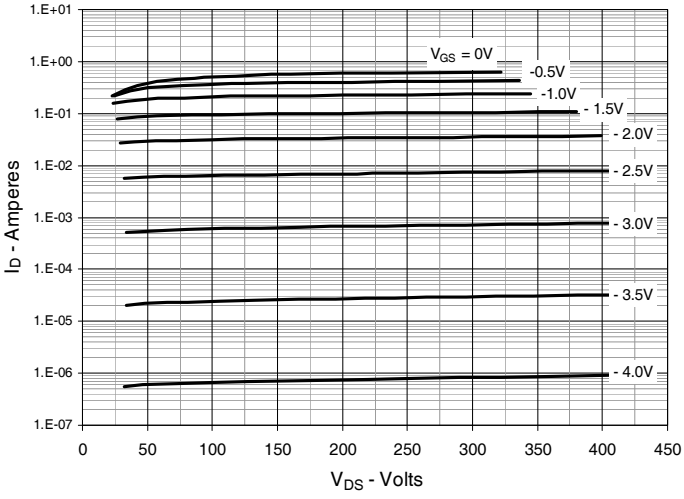


Fig. 5. Dynamic Resistance vs. Gate Voltage

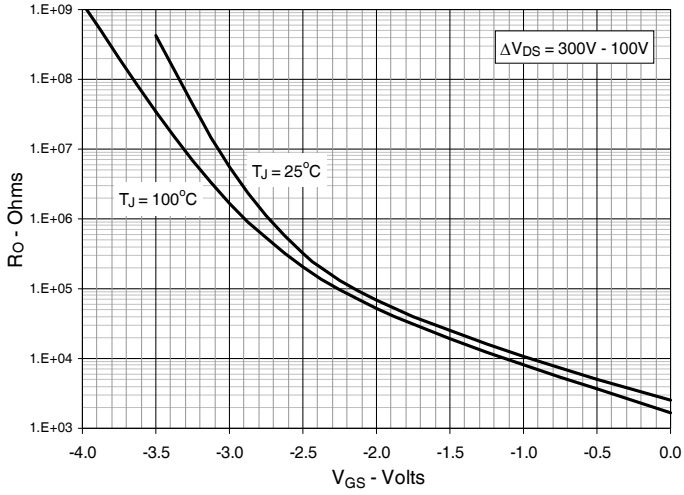


Fig. 6. Normalized $R_{DS(on)}$ vs. Junction Temperature

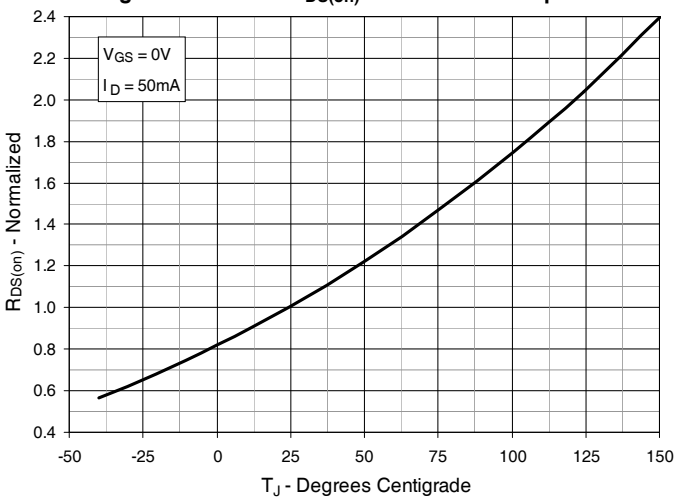


Fig. 7. $R_{DS(on)}$ Normalized to I_D = 50mA Value vs. Drain Current

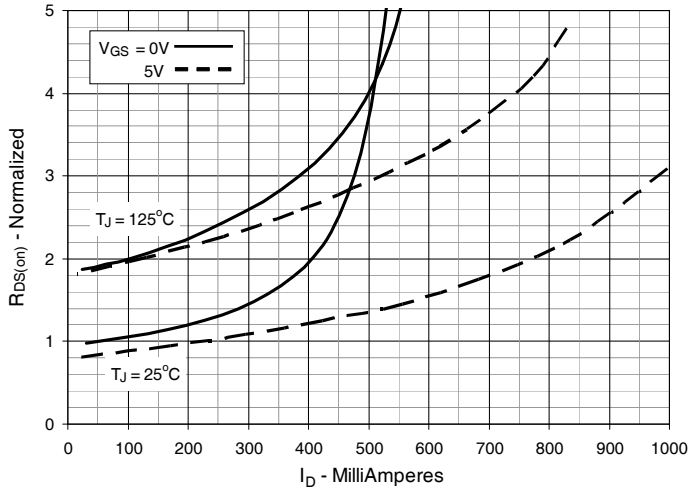


Fig. 8. Input Admittance

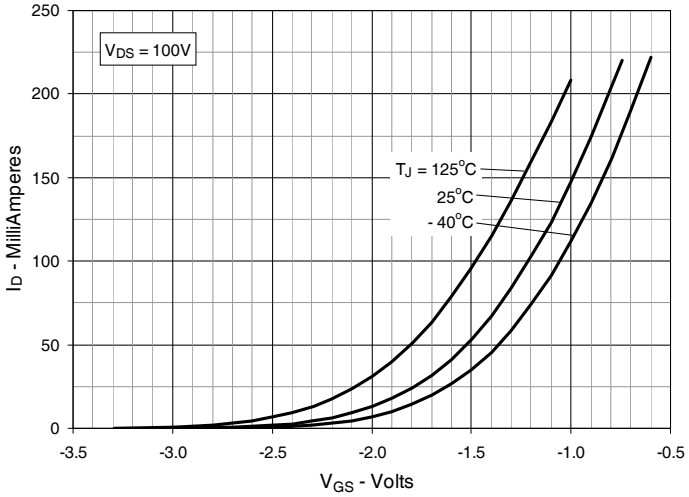


Fig. 9. Transconductance

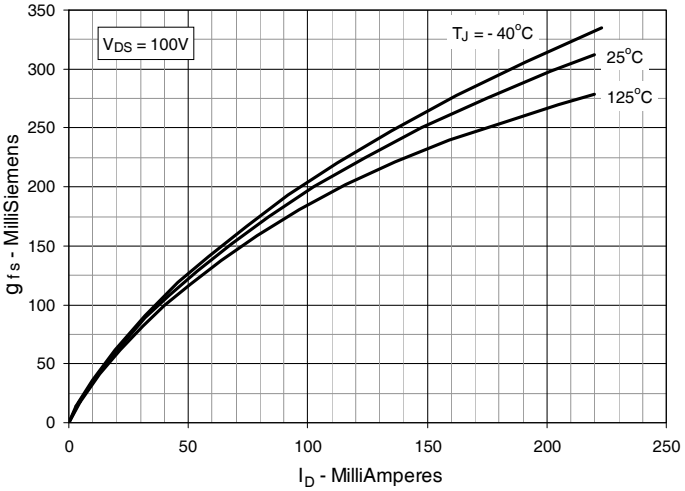


Fig. 10. Forward Voltage Drop of Intrintsic Diode

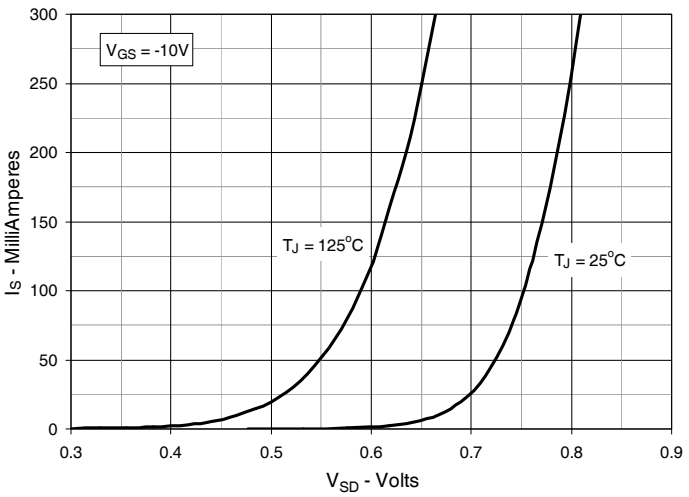


Fig. 11. Capacitance

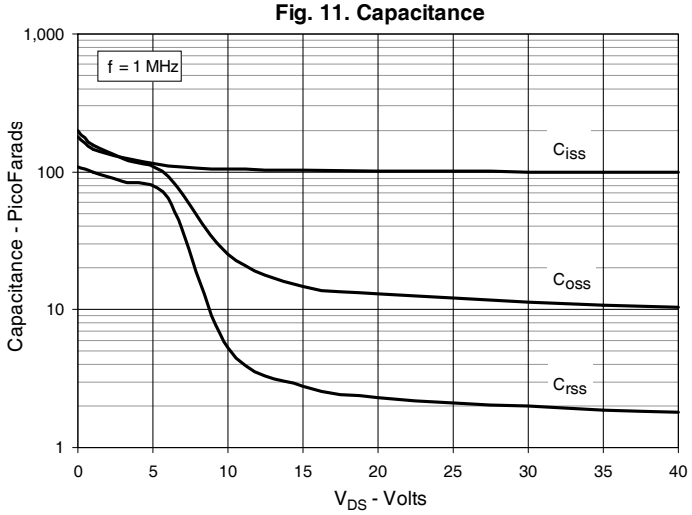


Fig. 12. Gate Charge

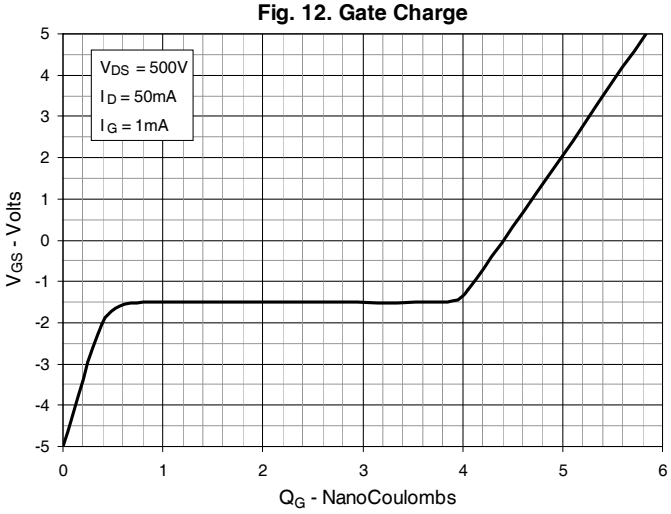


Fig. 13. Forward-Bias Safe Operating Area @ T_C = 25°C

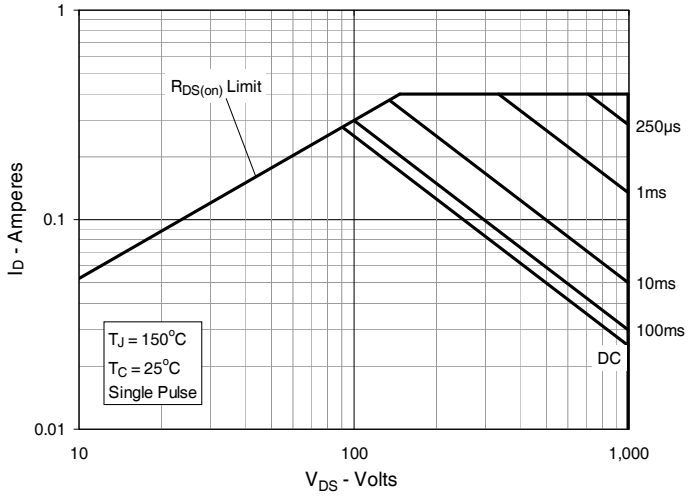


Fig. 14. Forward-Bias Safe Operating Area @ T_C = 75°C

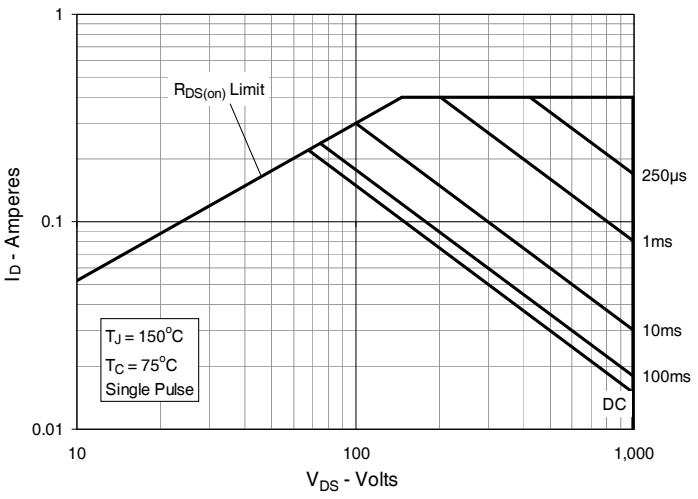
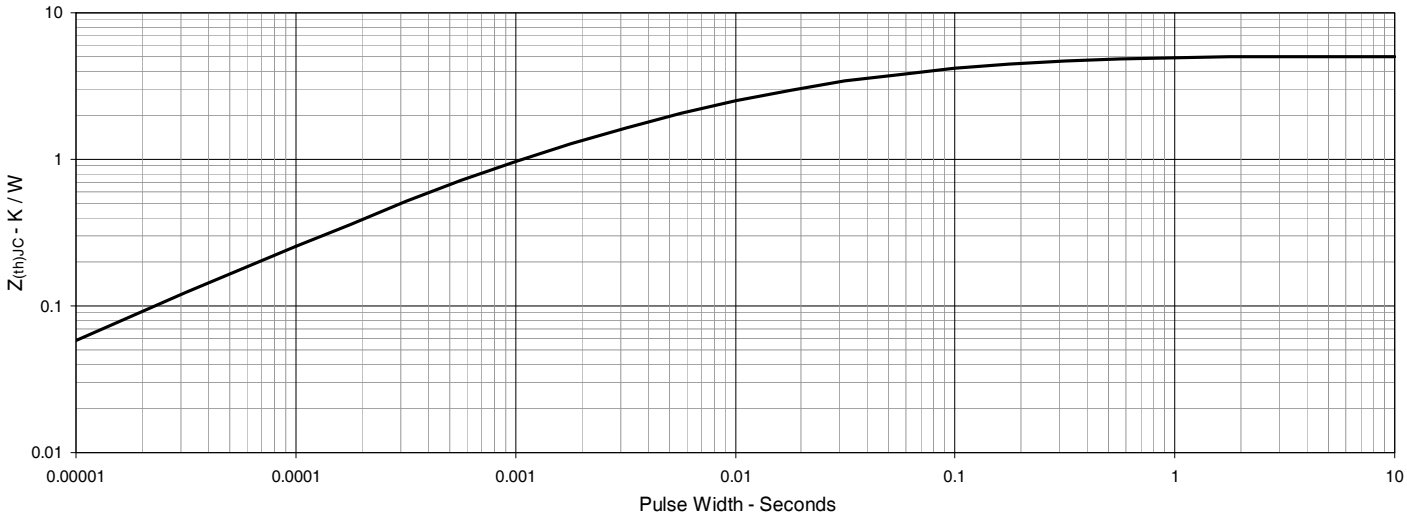
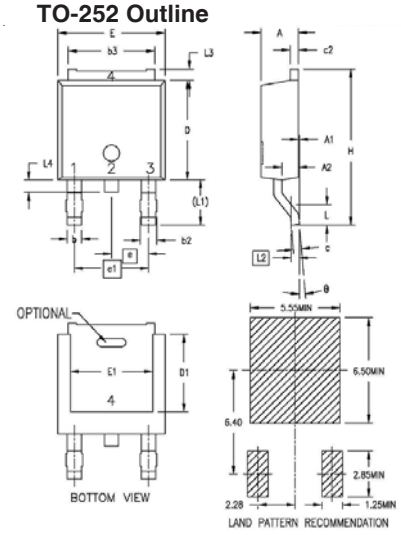


Fig. 15. Maximum Transient Thermal Impedance



TO-252 Outline

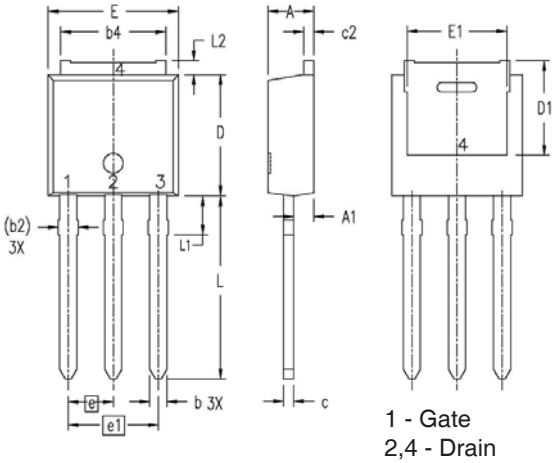


1 - Gate
2,4 - Drain
3 - Source

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.086	.094	2.19	2.38
A1	0	.005	0	0.12
A2	.038	.046	0.97	1.17
b	.025	.035	0.64	0.89
b2	.030	.045	0.76	1.14
b3	.200	.215	5.08	5.46
c	.018	.024	0.46	0.61
c2	.018	.023	0.46	0.58
D	.235	.245	5.97	6.22
D1	.180	.205	4.57	5.21
E	.250	.265	6.35	6.73
E1	.170	.205	4.32	5.21
e	.090 BSC		2.28 BSC	
e1	.180 BSC		4.57 BSC	
H	.370	.410	9.40	10.42
L	.055	.070	1.40	1.78
L1	.100	.115	2.54	2.92
L2	.020 BSC		0.50 BSC	
L3	.025	.040	0.64	1.02
L4	.025	.040	0.64	1.02
θ	0°	10°	0°	10°

NOTE: 1. This drawing comply JEDEC TO-252AA value except L3 dimension.
2. All metal surface are tin plated except trimmed area.

TO-251 Outline

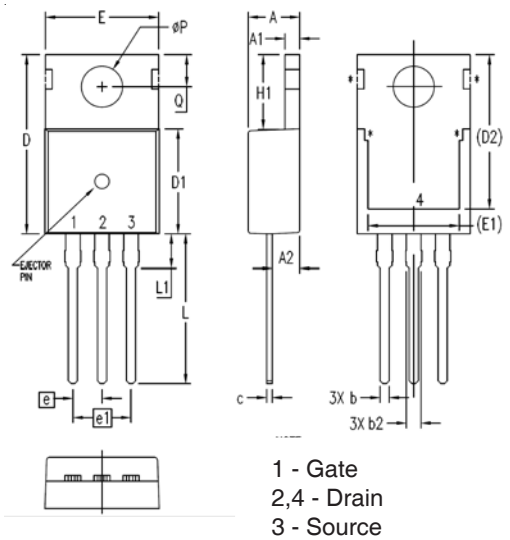


1 - Gate
2,4 - Drain
3 - Source

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.087	.094	2.20	2.40
A1	.032	.048	0.82	1.22
b	.026	.034	0.66	0.86
(b2)	.030	.038	0.76	0.96
b4	.198	.222	5.04	5.64
c	.018	.024	0.45	0.60
c2	.016	.024	0.40	0.60
D	.232	.248	5.90	6.30
(D1)	.179	.195	4.55	4.95
E	.252	.268	6.40	6.80
(E1)	.191	.207	4.85	5.25
e	.090 BSC		2.28 BSC	
e1	.180 BSC		4.57 BSC	
L	.358	.374	9.10	9.50
L1	.063	.079	1.60	2.00
L2	.020	.035	0.50	0.90

NOTE: 1. ALL METAL AREA ARE MATTE PURE TIN PLATED EXCEPT TRIMMED AREA.
2. THESE DIMENSIONS DO NOT INCLUDE PROTRUSIONS OF THE MOLD.
3. THE ( ) MARK IS THE REFERENCE ONLY.

TO-220 Outline



1 - Gate
2,4 - Drain
3 - Source

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.169	.185	4.30	4.70
A1	.047	.055	1.20	1.40
A2	.079	.106	2.00	2.70
b	.024	.039	0.60	1.00
b2	.045	.057	1.15	1.45
c	.014	.026	0.35	0.65
D	.587	.626	14.90	15.90
D1	.335	.370	8.50	9.40
(D2)	.500	.531	12.70	13.50
E	.382	.406	9.70	10.30
(E1)	.283	.323	7.20	8.20
e	.100 BSC		2.54 BSC	
e1	.200 BSC		5.08 BSC	
H1	.244	.268	6.20	6.80
L	.492	.547	12.50	13.90
L1	.110	.154	2.80	3.90
ØP	.134	.150	3.40	3.80
Q	.106	.126	2.70	3.20

NOTE:
1. All metal surface are matte pure tin plated except trimmed area.