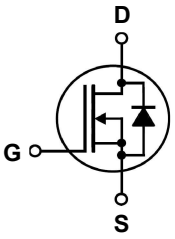
IXYS

Depletion Mode MOSFET

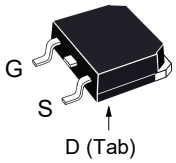
IXTT16N20D2
IXTH16N20D2

V_{DSX} = 200V
$I_{D(on)}$ ≥ 16A
$R_{DS(on)}$ ≤ 95mΩ

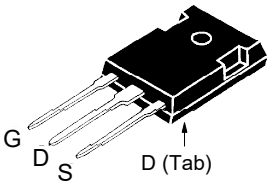
N-Channel



TO-268 (IXTT)



TO-247 (IXTH)



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSX}	T_J = 25°C to 150°C	200	V
V_{DGX}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	200	V
V_{GSX}	Continuous	±20	V
V_{GSM}	Transient	±30	V
P_D	T_C = 25°C	695	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}	Plastic Body for 10s	260	°C
Weight	TO-268	4	g
	TO-247	6	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSX}	V_{GS} = - 5V, I_D = 250μA	200			V
$V_{GS(off)}$	V_{DS} = 25V, I_D = 4mA	- 2.0		- 4.5	V
I_{GSX}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
$I_{DSX(off)}$	V_{DS} = V_{DSX}, V_{GS} = - 5V			5	μA
	T_J = 125°C			100	μA
$R_{DS(on)}$	V_{GS} = 0V, I_D = 8A, Note 1			95	mΩ
$I_{D(on)}$	V_{GS} = 0V, V_{DS} = 25V, Note 1	16			A

Features

- Normally ON Mode
- International Standard Packages
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Audio Amplifiers
- Start-up Circuits
- Protection Circuits
- Ramp Generators
- Current Regulators
- Active Loads

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 8A, Note 1	7	12		S
C_{iss}	V_{GS} = -10V, V_{DS} = 25V, f = 1MHz		5500		pF
C_{oss}			1360		pF
C_{rss}			607		pF
$t_{d(on)}$	**Resistive Switching Times**		46		ns
t_r	V_{GS} = ± 5V, V_{DS} = 100V, I_D = 8A		130		ns
$t_{d(off)}$	R_G = 3.3Ω (External)		270		ns
t_f			135		ns
$Q_{g(on)}$	V_{GS} = ± 5V, V_{DS} = 100V, I_D = 8A		208		nC
Q_{gs}			28		nC
Q_{gd}			110		nC
R_{thJC}				0.18	°C/W
R_{thCS}	TO-247		0.21		°C/W

Safe-Operating-Area Specification

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.	
SOA	V_{DS} = 200V, I_D = 2.1A, T_C = 75°C, tp = 5s	420			W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_{SD}	I_F = 16A, V_{GS} = -10V, Note 1		0.8	1.3	V
t_{rr}	I_F = 8A, -di/dt = 100A/μs		265		ns
I_{RM}	V_R = 100V, V_{GS} = -10V		14.3		A
Q_{RM}			1.9		μC

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

Fig. 1. Output Characteristics @ T_J = 25ºC

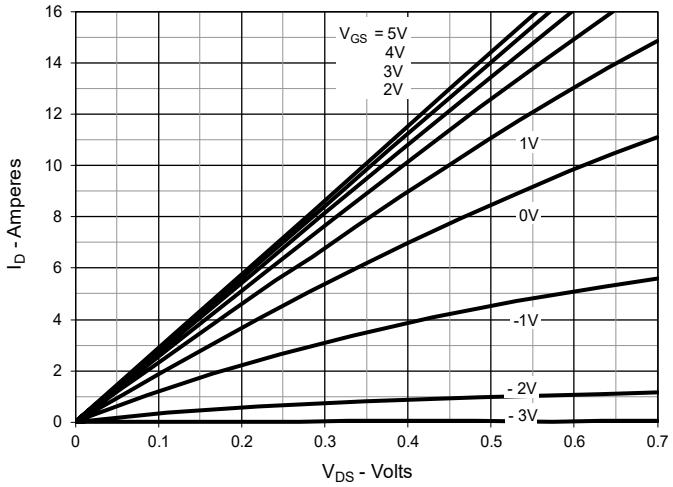


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

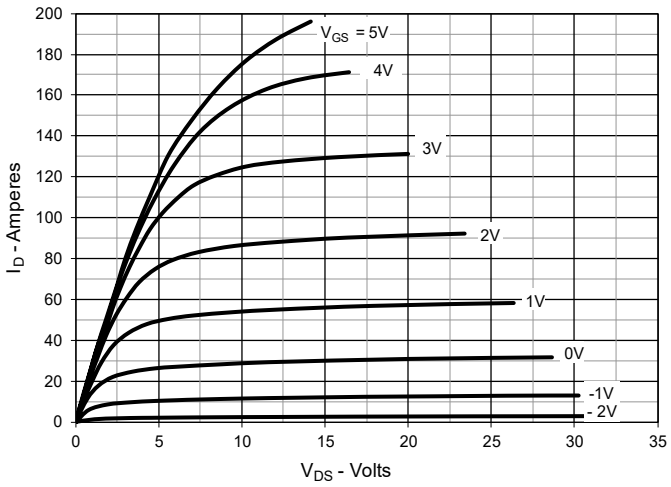


Fig. 3. Output Characteristics @ T_J = 125ºC

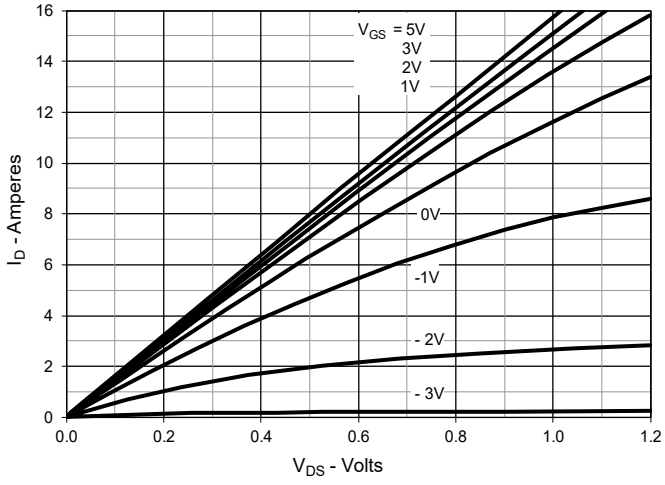


Fig. 4. Drain Current @ T_J = 25ºC

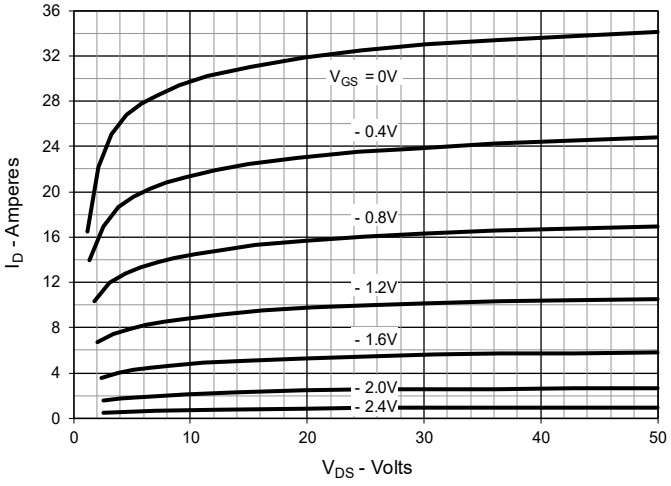


Fig. 5. Drain Current @ T_J = 100ºC

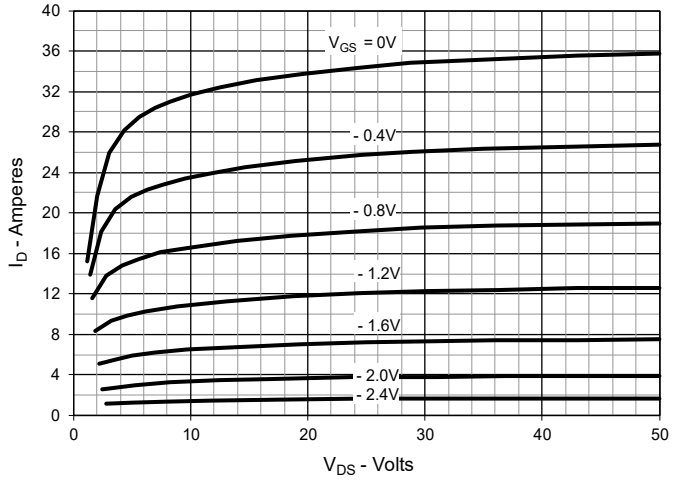


Fig. 6. Dynamic Resistance vs. Gate Voltage

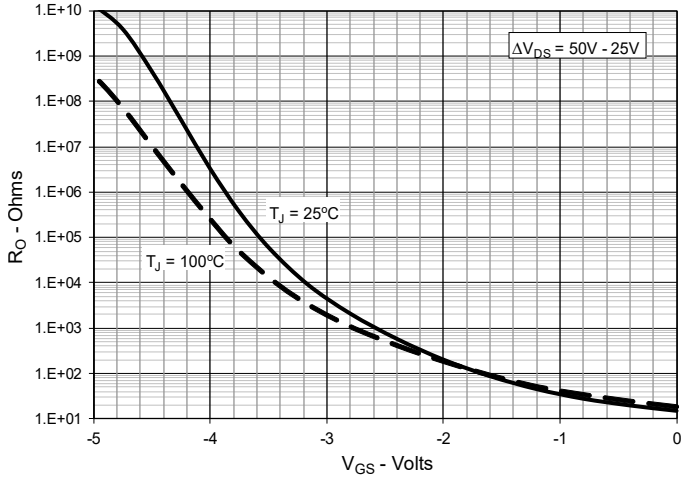


Fig. 7. Normalized $R_{DS(on)}$ vs. Junction Temperature

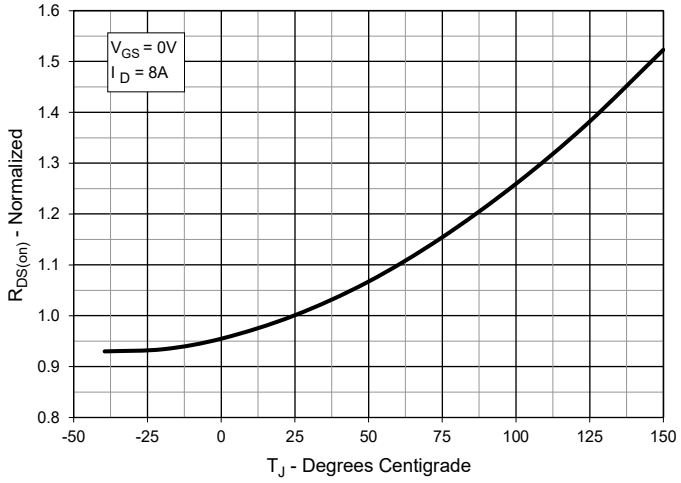


Fig. 8. $R_{DS(on)}$ Normalized to I_D = 8A Value vs. Drain Current

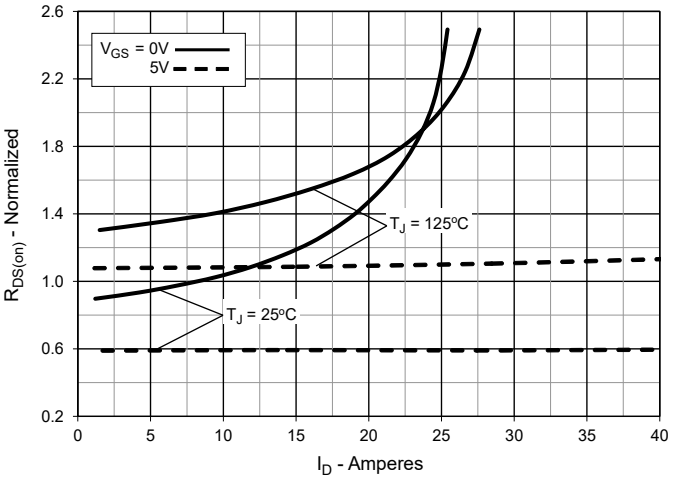


Fig. 9. Input Admittance

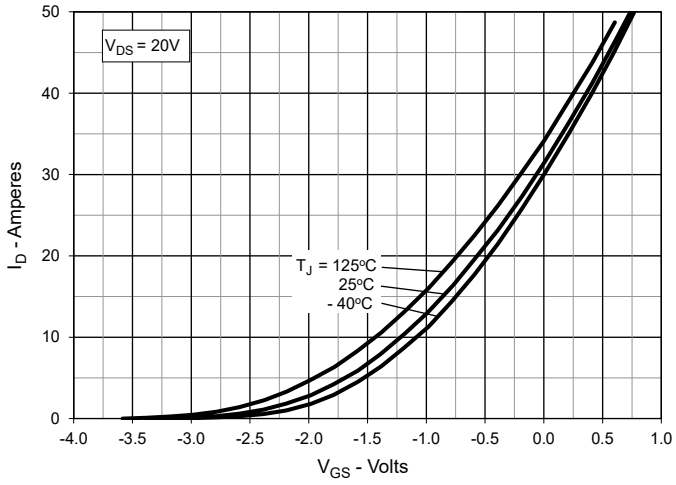


Fig. 10. Transconductance

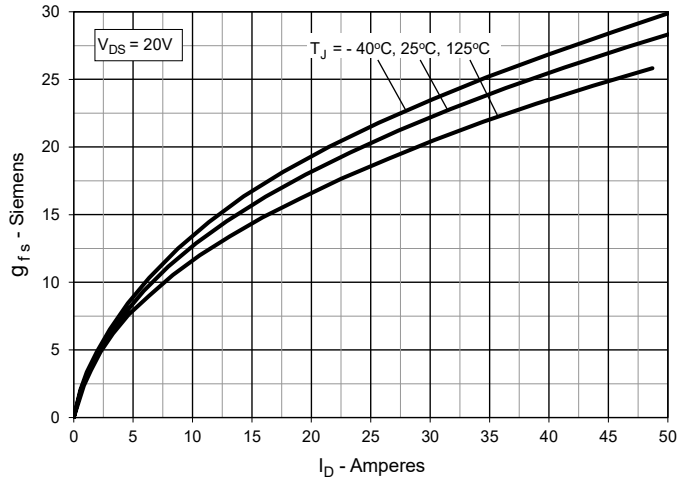


Fig. 11. Normalized Breakdown and Threshold Voltages vs. Junction Temperature

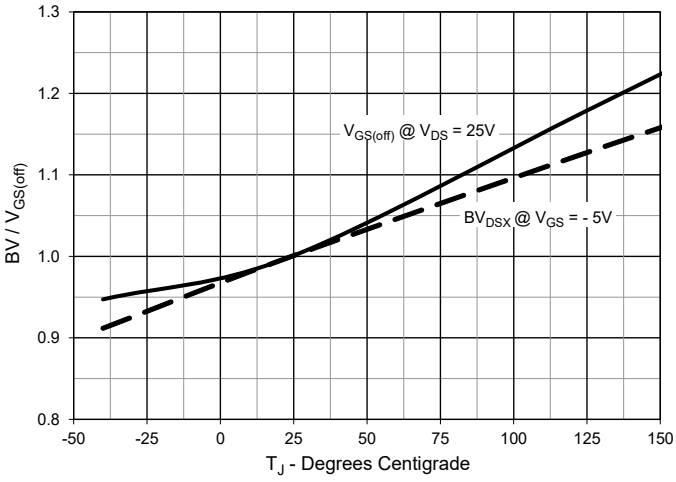


Fig. 12. Forward Voltage Drop of Intrinsic Diode

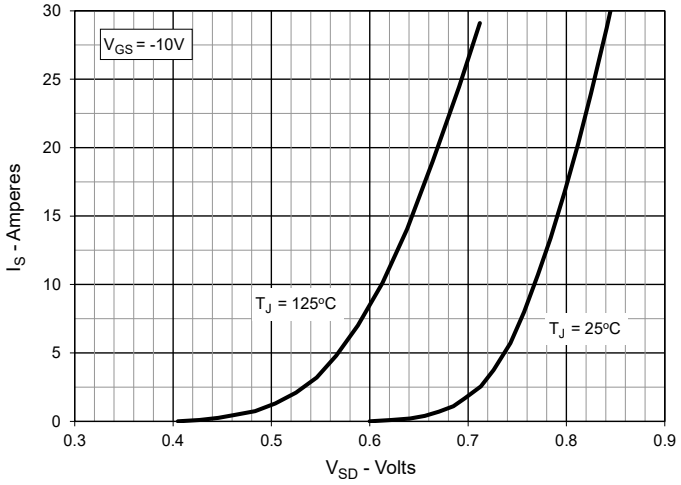


Fig. 13. Capacitance

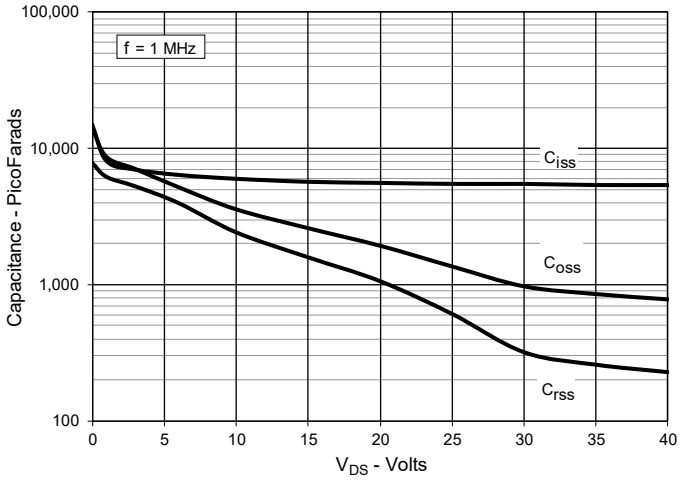


Fig. 14. Gate Charge

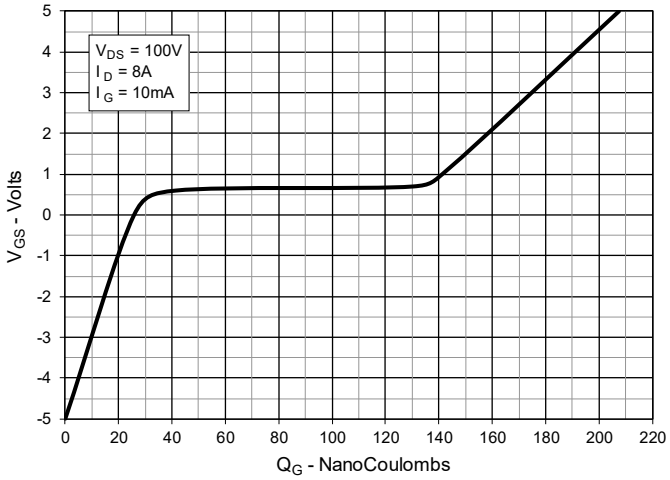


Fig. 15. Forward-Bias Safe Operating Area @ T_C = 25ºC

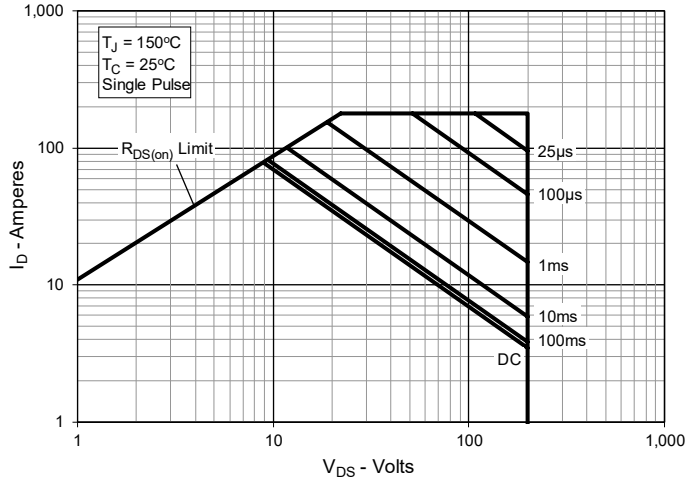


Fig. 16. Forward-Bias Safe Operating Area @ T_C = 75ºC

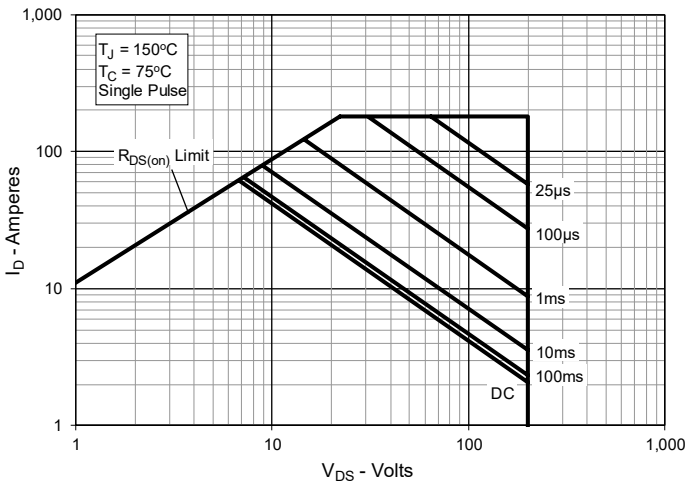
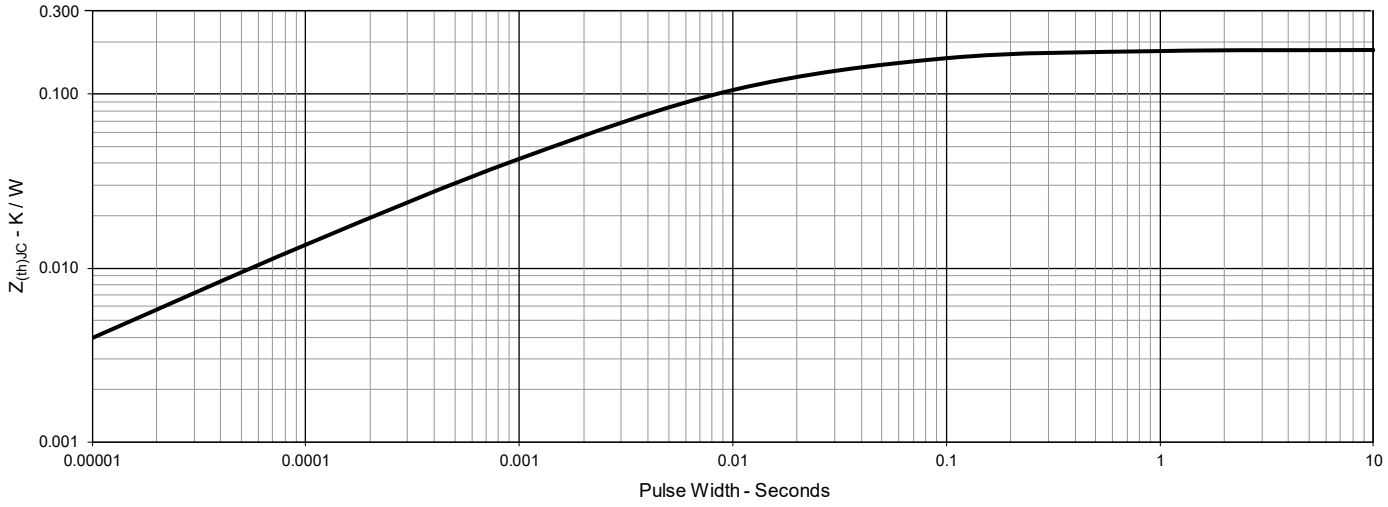
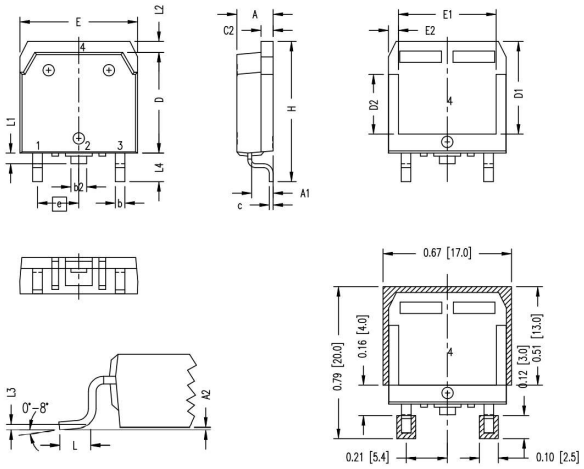


Fig. 17. Maximum Transient Thermal Impedance



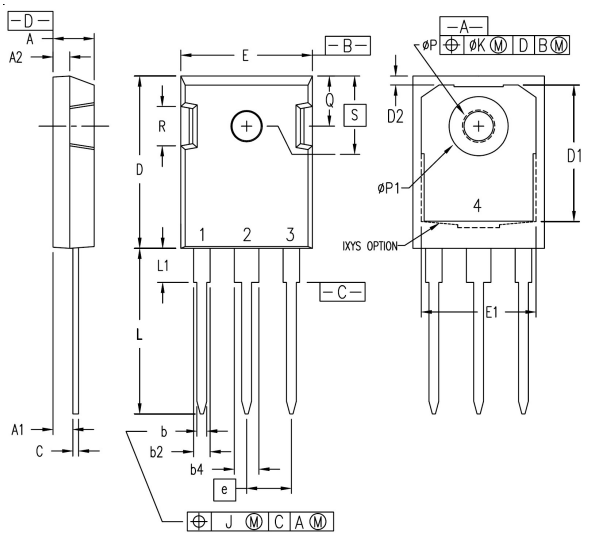
TO-268 Outline



1 - Gate
2,4 - Drain
3 - Source

SYM	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.193	0.201	4.90	5.10
A1	0.106	0.114	2.70	2.90
A2	0.001	0.010	0.02	0.25
b	0.045	0.057	1.15	1.45
b2	0.075	0.083	1.90	2.10
c	0.016	0.026	0.40	0.65
C2	0.057	0.063	1.45	1.60
D	0.543	0.551	13.80	14.00
D1	0.488	0.500	12.40	12.70
D2	0.320	0.335	8.13	8.50
E	0.624	0.632	15.85	16.05
E1	0.524	0.535	13.30	13.60
E2	0.045	0.055	1.14	1.39
e	0.215	BSC	5.45	BSC
H	0.736	0.752	18.70	19.10
L	0.094	0.106	2.40	2.70
L1	0.047	0.055	1.20	1.40
L2	0.039	0.045	1.000	1.15
L3	0.010	BSC	0.25	BSC
L4	0.150	0.161	3.80	4.10

TO-247 Outline



1 - Gate
2,4 - Drain
3 - Source

SYM	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.190	0.205	4.83	5.21
A1	0.090	0.100	2.29	2.54
A2	0.075	0.085	1.91	2.16
b	0.045	0.055	1.14	1.40
b2	0.075	0.087	1.91	2.20
b4	0.115	0.126	2.92	3.20
C	0.024	0.031	0.61	0.80
D	0.819	0.840	20.80	21.34
D1	0.650	0.690	16.51	17.53
D2	0.035	0.050	0.89	1.27
E	0.620	0.635	15.57	16.13
E1	0.545	0.565	13.84	14.35
e	0.215 BSC		5.45 BSC	
J	- -	0.010	- -	0.250
K	- -	0.025	- -	0.640
L	0.780	0.810	19.81	20.57
L1	0.150	0.170	3.81	4.32
ØP	0.140	0.144	3.55	3.65
ØP1	0.275	0.290	6.99	7.37
Q	0.220	0.244	5.59	6.20
R	0.170	0.190	4.32	4.83
S	0.242 BSC		6.15 BSC	