IXYS

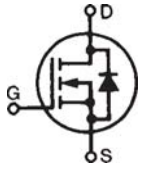
Advance Technical Information

Depletion Mode MOSFET

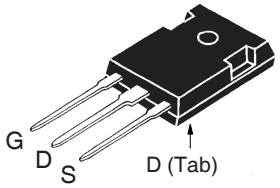
IXTH16N10D2
IXTT16N10D2

V_{DSX} = 100V
$I_{D(on)}$ ≥ 16A
$R_{DS(on)}$ ≤ 64mΩ

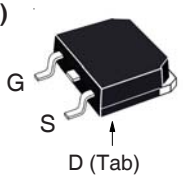
N-Channel



TO-247 (IXTH)



TO-268 (IXTT)



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSX}	T_J = 25°C to 150°C	100	V
V_{DGX}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	100	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	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque (TO-247)	1.13 / 10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	4	g

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.	
BV_{DSX}	V_{GS} = - 5V, I_D = 250μA	100			V
$V_{GS(off)}$	V_{DS} = 25V, I_D = 1mA	- 2.0		- 4.0	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			75	μA
$R_{DS(on)}$	V_{GS} = 0V, I_D = 8A, Note 1			64	mΩ
$I_{D(on)}$	V_{GS} = 0V, V_{DS} = 25V, Note 1	16			A

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	11	S
C_{iss}	V_{GS} = -10V, V_{DS} = 25V, f = 1MHz		5700	pF
C_{oss}			1980	pF
C_{rss}			940	pF
$t_{d(on)}$	**Resistive Switching Times**		45	ns
t_r	V_{GS} = ± 5V, V_{DS} = 50V, I_D = 8A		43	ns
$t_{d(off)}$	R_G = 3.3Ω (External)		340	ns
t_f			70	ns
$Q_{g(on)}$	V_{GS} = ± 5V, V_{DS} = 50V, I_D = 8A		225	nC
Q_{gs}			22	nC
Q_{gd}			126	nC
R_{thJC}				0.18 °C/W
R_{thCS}			0.21	°C/W

Safe-Operating-Area Specification

Symbol	Test Conditions	Characteristic Values Min.	Typ.	Max.
SOA	V_{DS} = 100V, I_D = 4.2A, T_C = 75°C, tp = 5s	420		W

Source-Drain Diode

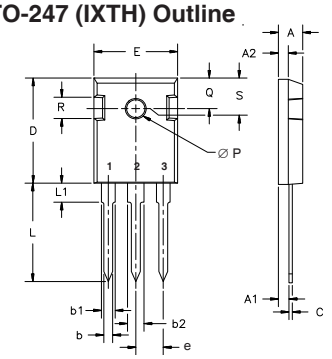
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
V_{SD}	I_F = 16A, V_{GS} = -10V, Note 1		0.80	1.30 V
t_{rr}	I_F = 8A, -di/dt = 100A/μs		205	ns
I_{RM}	V_R = 100V, V_{GS} = -10V		8.50	A
Q_{RM}			0.88	μC

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

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

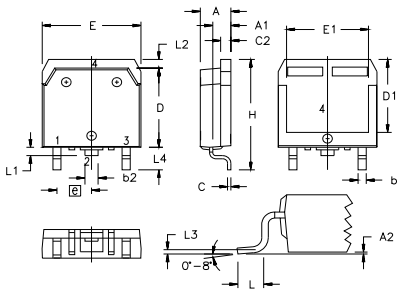
TO-247 (IXTH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source

Dim.	Millimeter Min.	Max.	Inches 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-268 (IXTT) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

SYM	INCHES MIN	MAX	MILLIMETERS 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

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

Fig. 1. Output Characteristics @ T_J = 25ºC

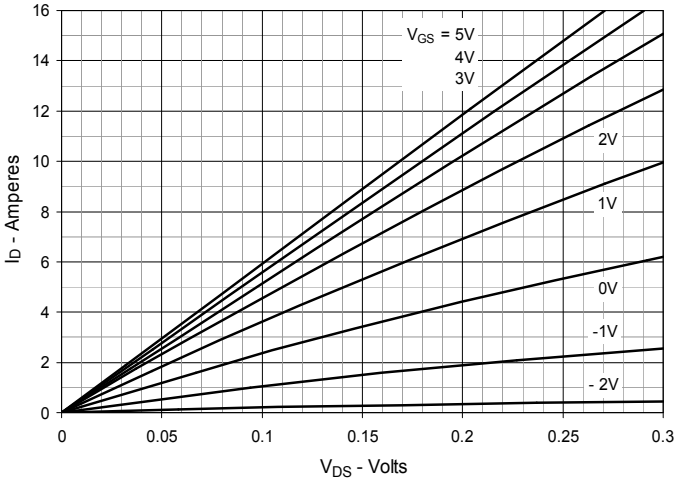


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

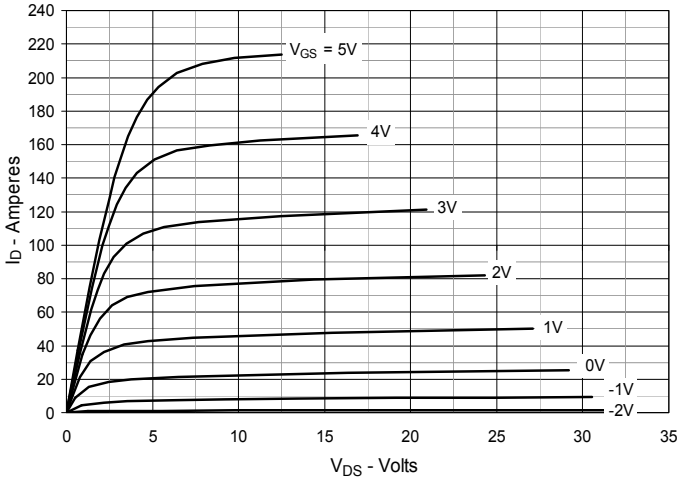


Fig. 3. Output Characteristics @ T_J = 125ºC

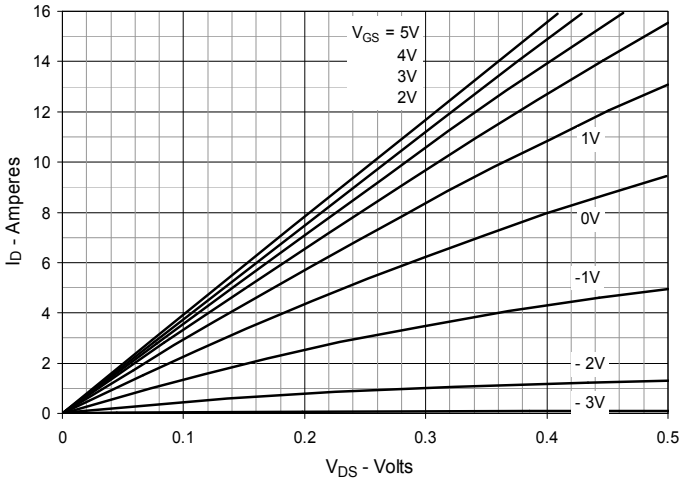


Fig. 4. Drain Current @ T_J = 25ºC

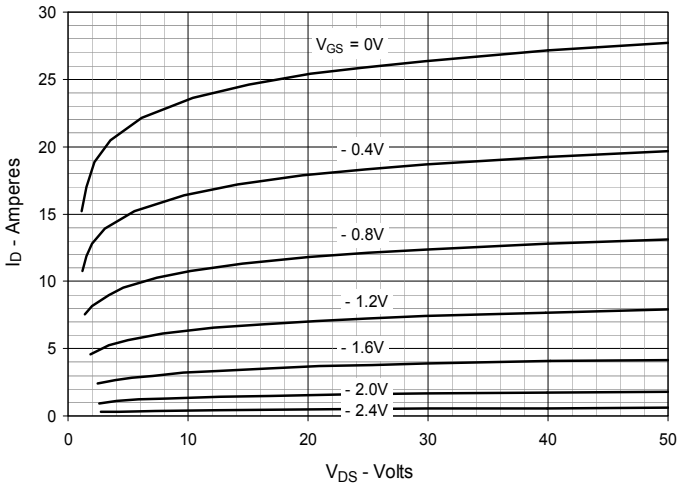


Fig. 5. Drain Current @ T_J = 100ºC

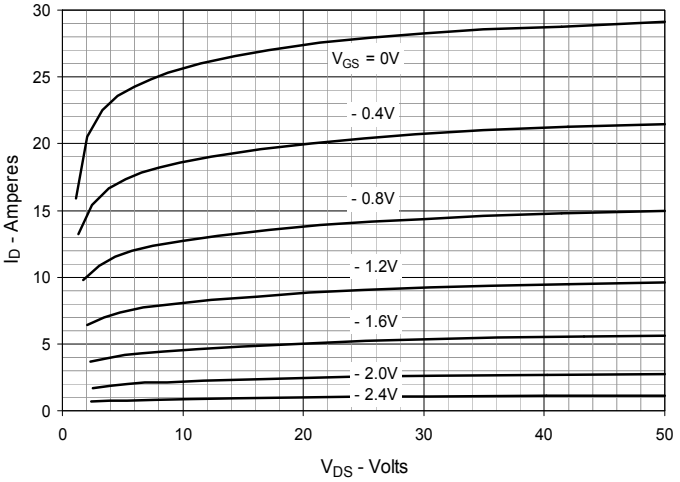


Fig. 6. Dynamic Resistance vs. Gate Voltage

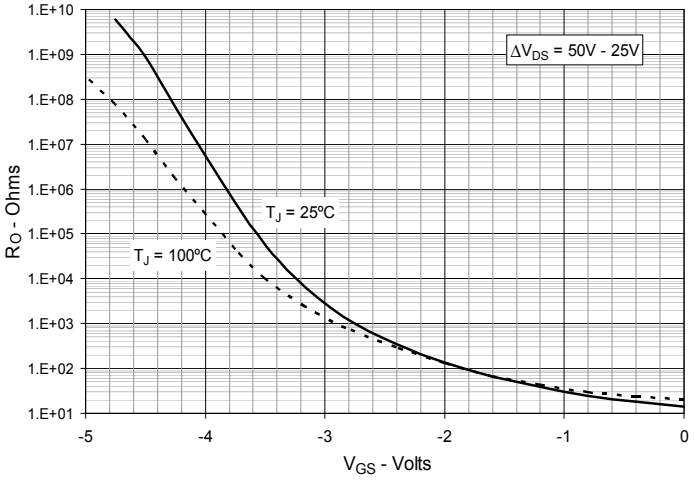


Fig. 7. Normalized $R_{DS(on)}$ vs. Junction Temperature

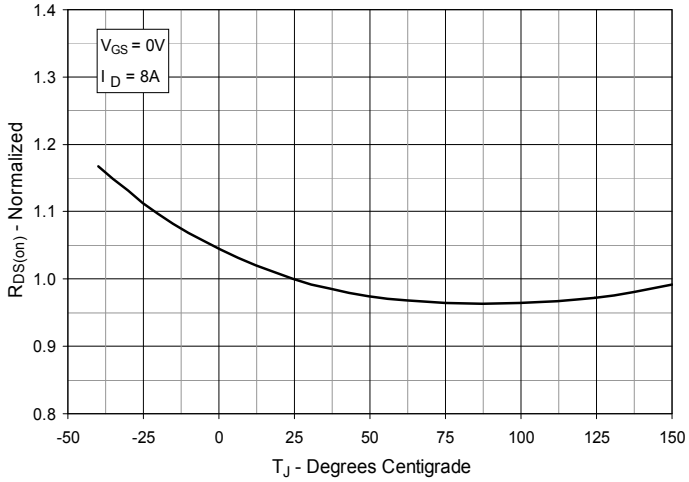


Fig. 8. $R_{DS(on)}$ Normalized to I_D = 8A Value vs. Drain Current

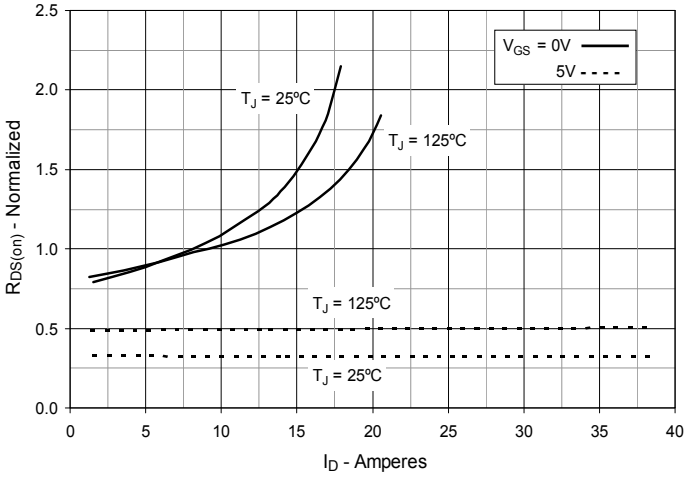


Fig. 9. Input Admittance

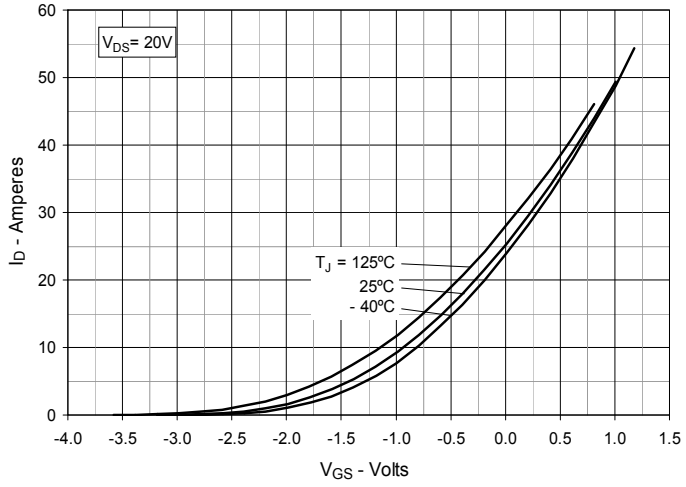


Fig. 10. Transconductance

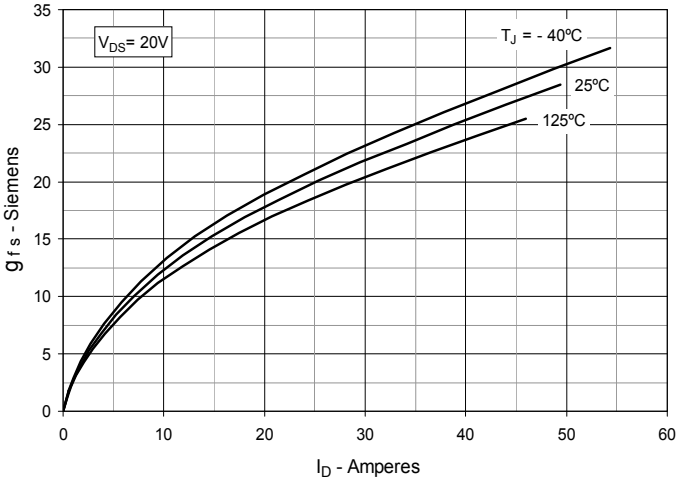


Fig. 11. Normalized Breakdown and Threshold Voltages vs. Junction Temperature

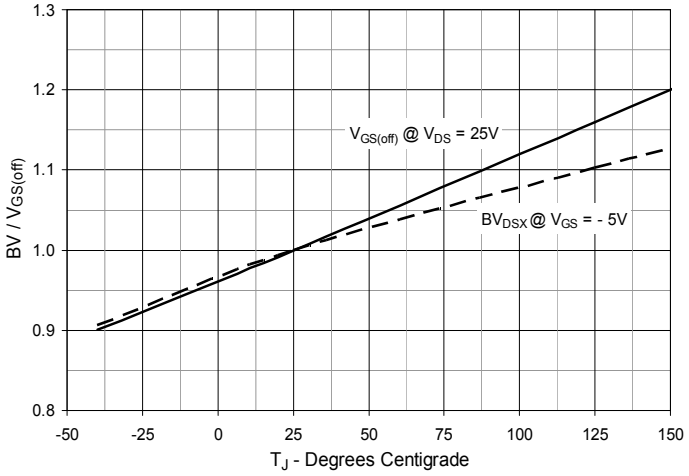


Fig. 12. Forward Voltage Drop of Intrinsic Diode

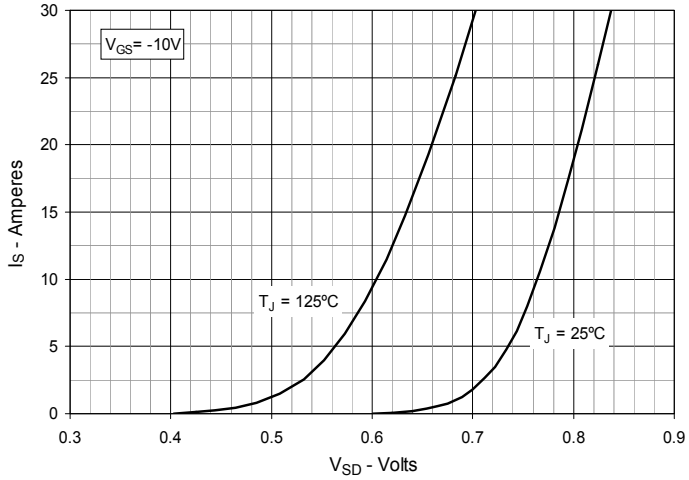


Fig. 13. Capacitance

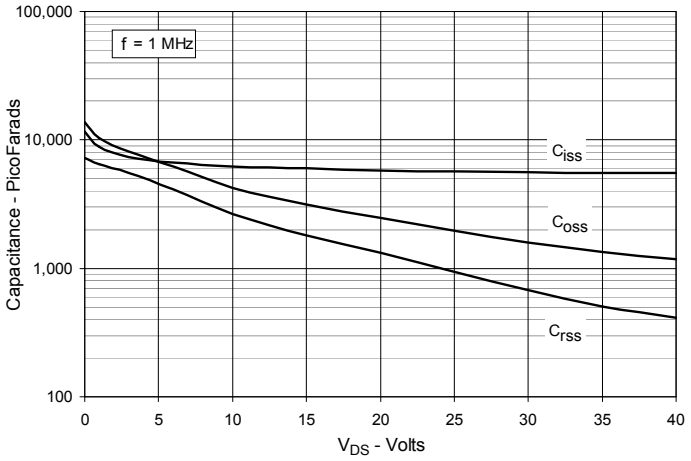


Fig. 14. Gate Charge

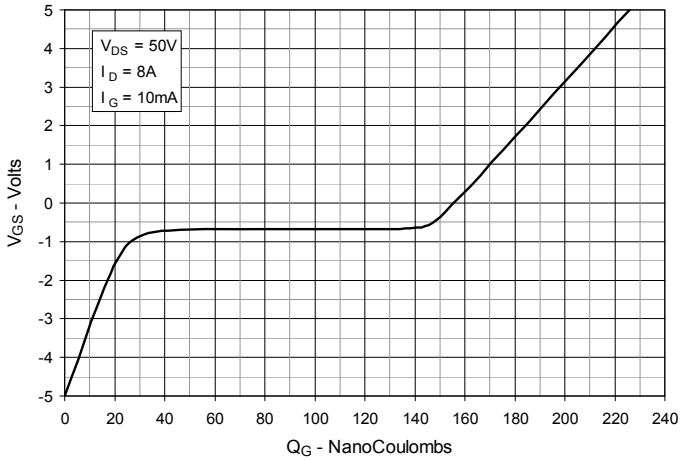


Fig. 15. Forward-Bias Safe Operating Area @ T_C = 25ºC

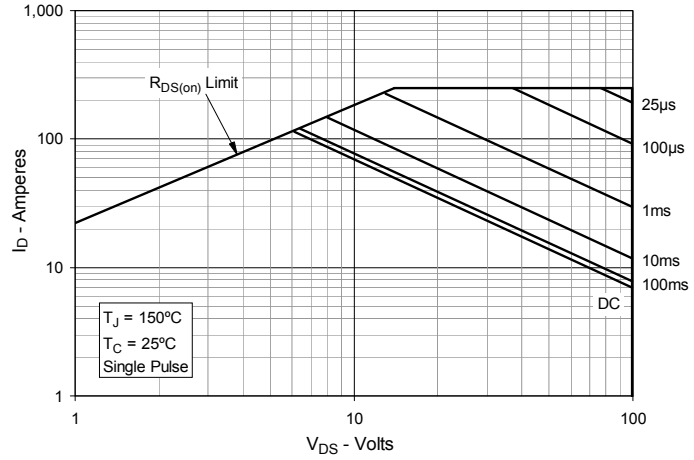


Fig. 16. Forward-Bias Safe Operating Area @ T_C = 75ºC

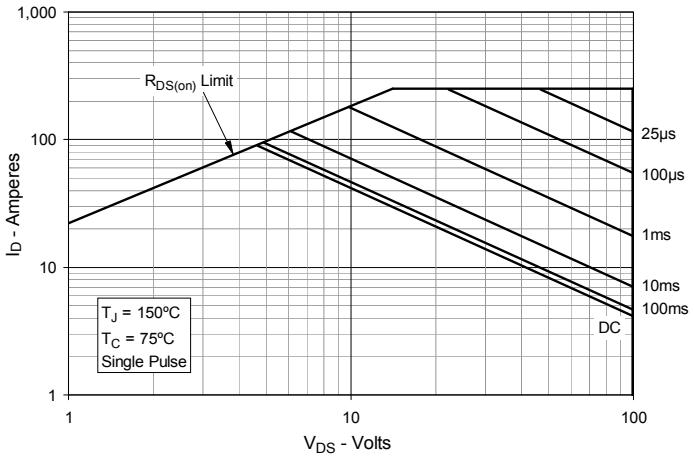


Fig. 17. Maximum Transient Thermal Impedance