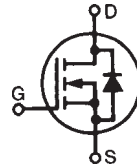


**LinearL2™ Power
MOSFET w/Extended
FBSOA**
**IXTK90N25L2
IXTX90N25L2**

 N-Channel Enhancement Mode
Avalanche Rated


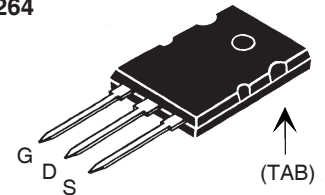
$$V_{DSS} = 250V$$

$$I_{D25} = 90A$$

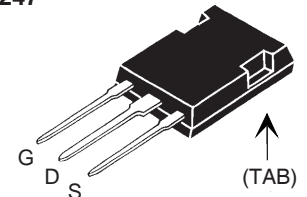
$$R_{DS(on)} \leq 33m\Omega$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	250	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	250	V
V_{GSS}	Continuous	± 20	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ C$	90	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	360	A
I_A	$T_C = 25^\circ C$	45	A
E_{AS}	$T_C = 25^\circ C$	3	J
P_D	$T_C = 25^\circ C$	960	W
T_J		-55...+150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55...+150	$^\circ C$
T_L	1.6mm (0.063 in.) from case for 10s	300	$^\circ C$
T_{SOLD}	Plastic body for 10s	260	$^\circ C$
M_d	Mounting torque (IXTK)	1.13/10	Nm/lb.in.
F_c	Mounting Force (IXTX)	20..120 / 4.5..27	N/lb.
Weight	TO-264	10	g
	PLUS247	6	g

TO-264



PLUS247



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

Features

- Designed for linear operation
- International standard packages
- Avalanche rated
- Guaranteed FBSOA at $75^\circ C$

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- Solid state circuit breakers
- Soft start controls
- Linear amplifiers
- Programmable loads
- Current regulators

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 1mA$	250		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 3mA$	2.0		V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$			50 μA
	$V_{GS} = 0V$ $T_J = 125^\circ C$			2.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Note 1			33 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
g_{fs}	$V_{DS} = 10\text{V}$, $I_D = 0.5 \cdot I_{D25}$, Note 1	35	50	65	S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		23		nF
C_{oss}			2140		pF
C_{rss}			360		pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 1\Omega$ (External)		50		ns
t_r			175		ns
$t_{d(off)}$			40		ns
t_f			160		ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$		640		nC
Q_{gs}			125		nC
Q_{gd}			385		nC
R_{thJC}				0.13	$^\circ\text{C/W}$
R_{thCS}				0.15	$^\circ\text{C/W}$

Safe Operating Area Specification

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 250\text{V}$, $I_D = 2.3\text{A}$, $T_C = 75^\circ\text{C}$, $T_p = 5\text{s}$	575		W

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
I_S	$V_{GS} = 0\text{V}$			90	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			360	A
V_{SD}	$I_F = 45\text{A}$, $V_{GS} = 0\text{V}$, Note 1			1.5	V
t_{rr}	$I_F = 45\text{A}$, $-di/dt = 100\text{A}/\mu\text{s}$, $V_R = 80\text{V}$, $V_{GS} = 0\text{V}$		266		ns
I_{RM}			23		A
Q_{RM}			3.0		μC

Notes: 1. Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.

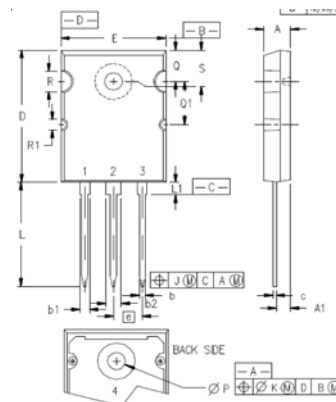
PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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

IXYS MOSFETs and IGBTs are covered 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338 B2
by one or more of the following U.S. patents: 4,850,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2
4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6,771,478 B2 7,071,537

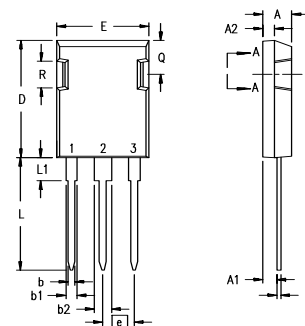
TO-264 (IXTK) Outline



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	.215 BSC		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

PLUS 247™ (IXTX) Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

Fig. 1. Output Characteristics
@ 25°C

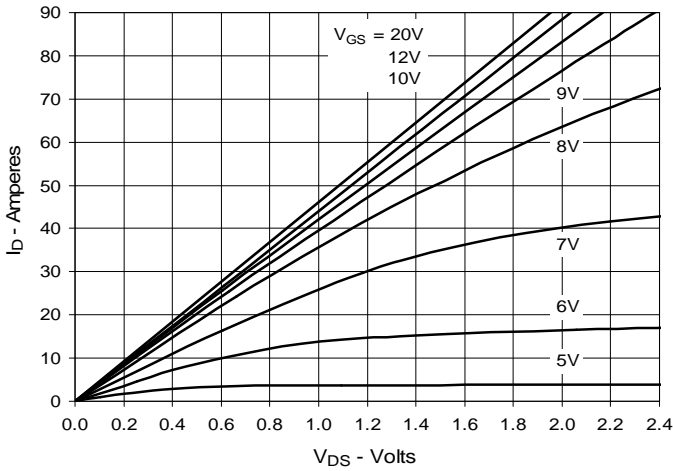


Fig. 2. Extended Output Characteristics
@ 25°C

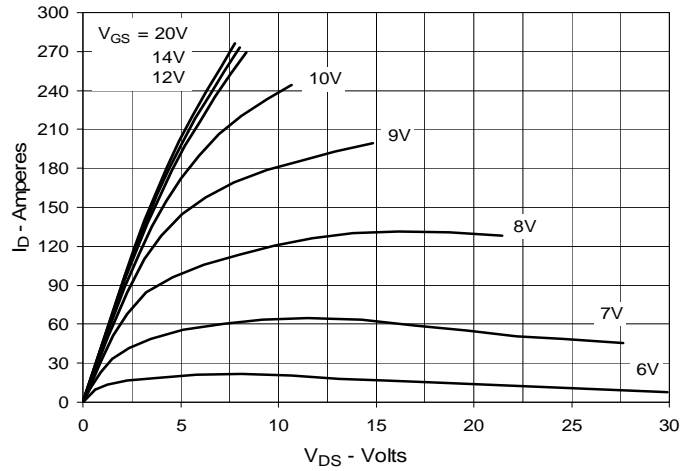


Fig. 3. Output Characteristics
@ 125°C

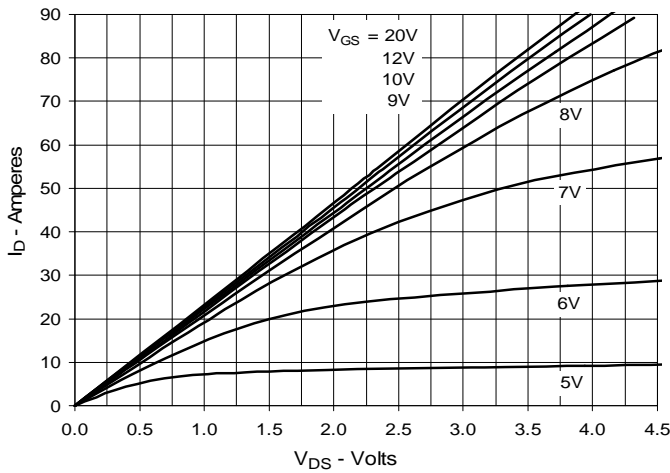


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 45A$ Value
vs. Junction Temperature

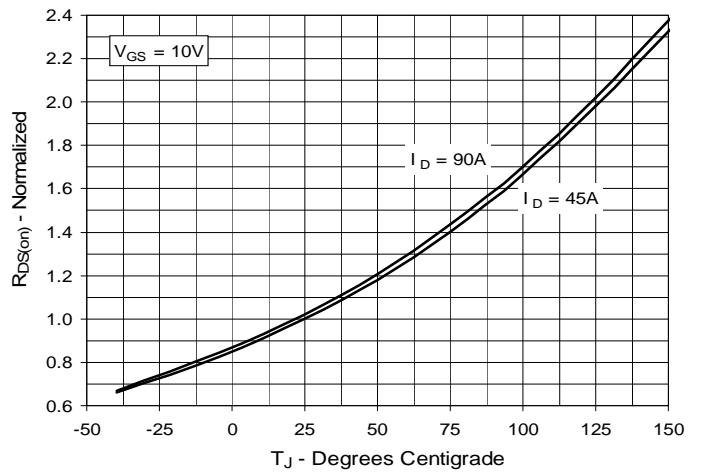


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 45A$ Value
vs. Drain Current

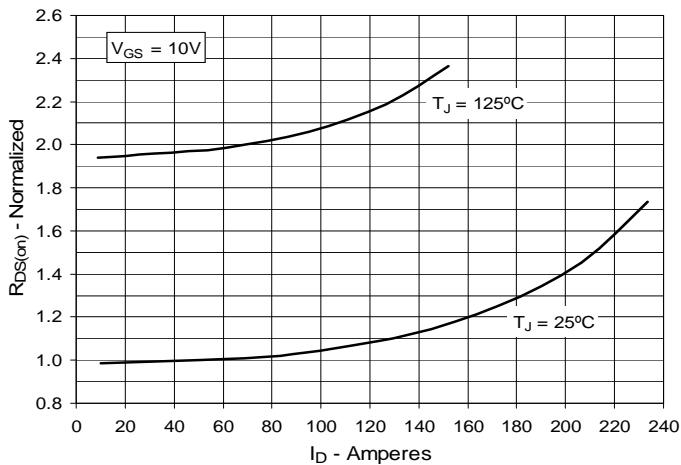


Fig. 6. Maximum Drain Current vs.
Case Temperature

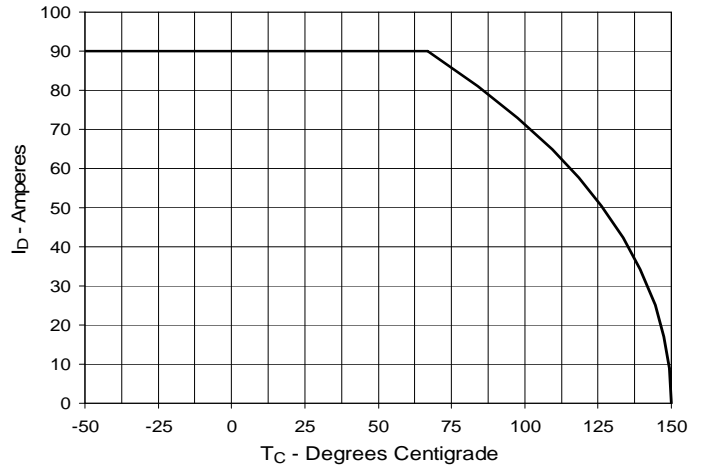


Fig. 7. Input Admittance

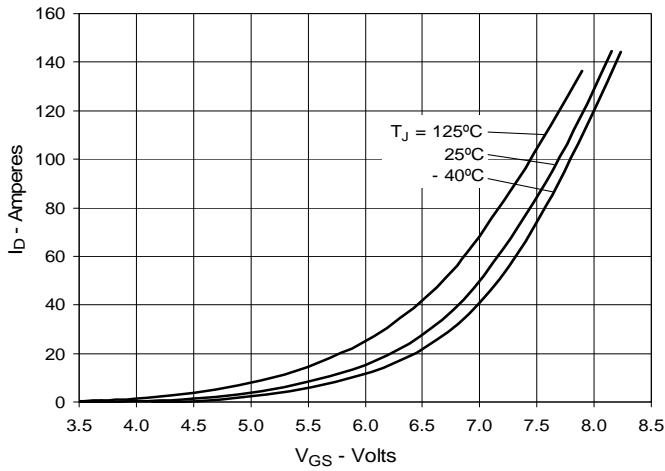


Fig. 8. Transconductance

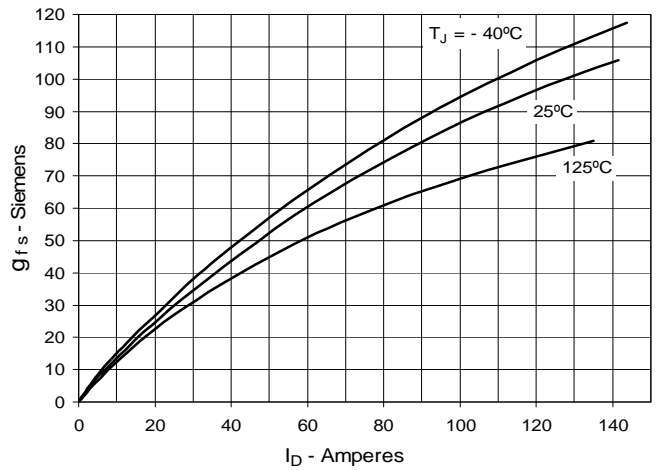


Fig. 9. Forward Voltage Drop of Intrinsic Diode

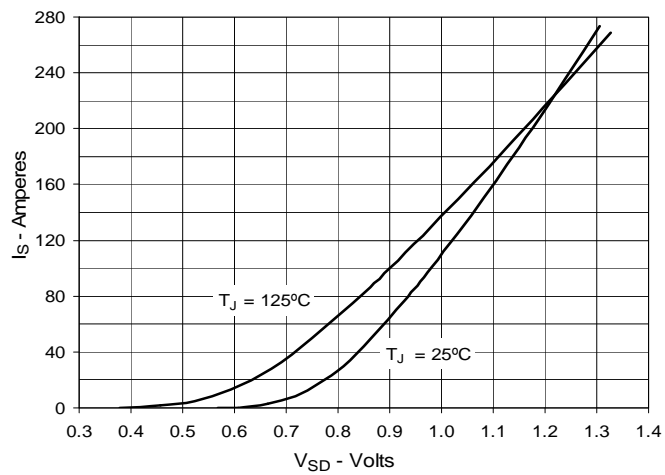


Fig. 10. Gate Charge

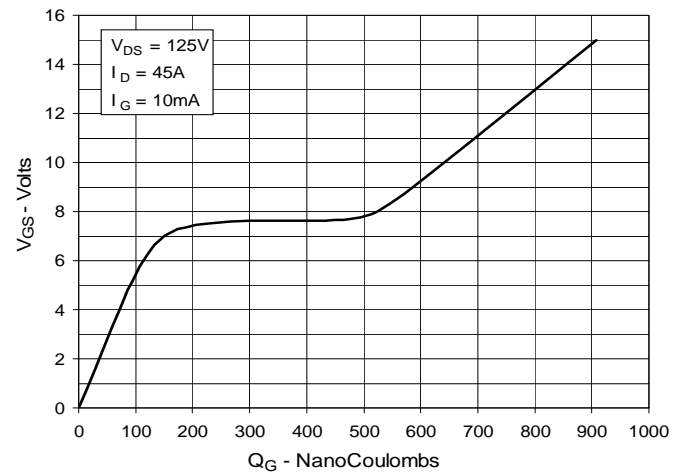


Fig. 11. Capacitance

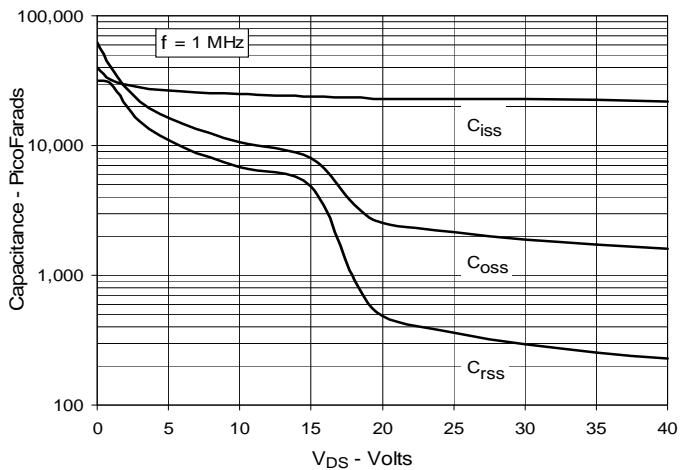
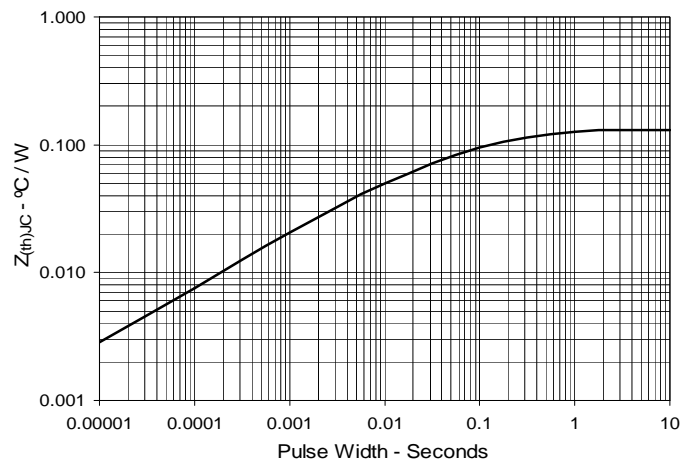
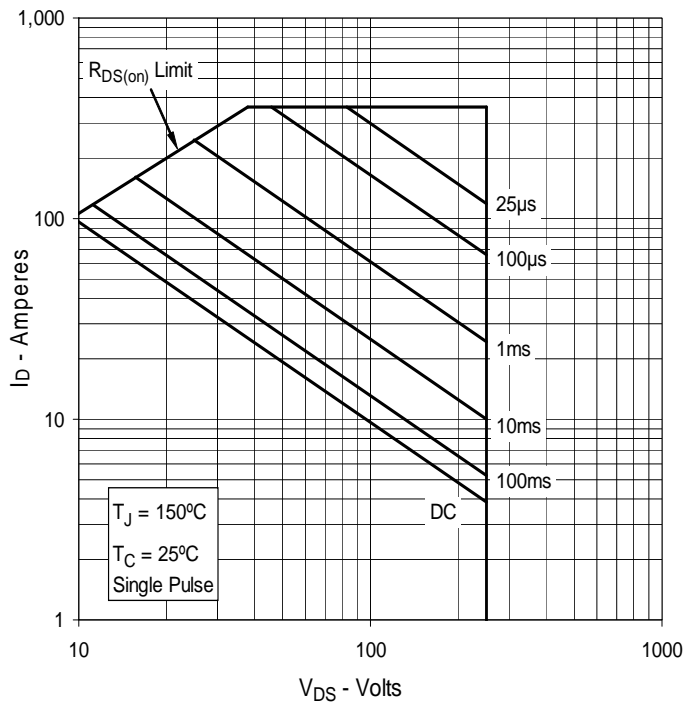


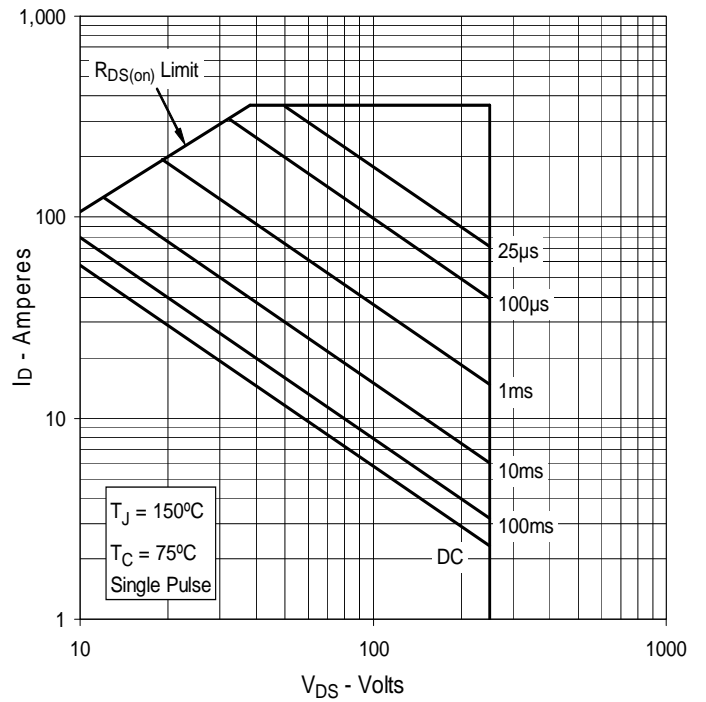
Fig. 12. Maximum Transient Thermal Impedance



**Fig. 13. Forward-Bias Safe Operating Area
@ $T_C = 25^\circ\text{C}$**



**Fig. 14. Forward-Bias Safe Operating Area
@ $T_C = 75^\circ\text{C}$**



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