

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

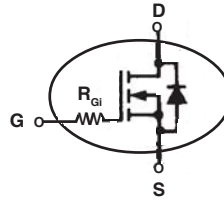
**IXTK80N30L2**  
**IXTX80N30L2**

$$V_{DSS} = 300V$$

$$I_{D25} = 80A$$

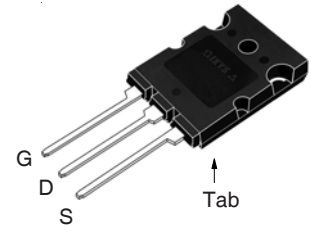
$$R_{DS(on)} \leq 38m\Omega$$

N-Channel Enhancement Mode  
 Avalanche Rated

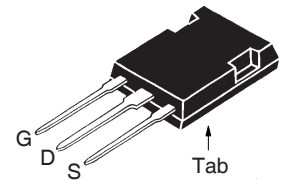


Symbol	Test Conditions	Maximum Ratings	
$V_{DSS}$	$T_J = 25^\circ C$ to $150^\circ C$	300	V
$V_{DGR}$	$T_J = 25^\circ C$ to $150^\circ C$ , $R_{GS} = 1M\Omega$	300	V
$V_{GSS}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$I_{D25}$	$T_C = 25^\circ C$	80	A
$I_{DM}$	$T_C = 25^\circ C$ , Pulse Width Limited by $T_{JM}$	200	A
$I_A$	$T_C = 25^\circ C$	80	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	$^\circ C$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ C$
$T_{SOLD}$	1.6 mm (0.062in.) from Case for 10s	260	$^\circ C$
$M_d$	Mounting Torque (TO-264)	1.13/10	Nm/lb.in
$F_C$	Mounting Force (PLUS247)	20..120 / 4.5..27	N/lb
<b>Weight</b>	TO-264	10	g
	PLUS247	6	g

TO-264 (IXTK)



PLUS247 (IXTX)



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 ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSS}$	$V_{GS} = 0V$ , $I_D = 1mA$	300		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$ , $I_D = 3mA$	2.5		4.5 V
$I_{GSS}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 200$ nA
$I_{DSS}$	$V_{DS} = V_{DSS}$ , $V_{GS} = 0V$ $T_J = 125^\circ C$			10 $\mu A$ 250 $\mu A$
$R_{DS(on)}$	$V_{GS} = 10V$ , $I_D = 0.5 \cdot I_{D25}$ , Note 1	30	38	m $\Omega$

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	24	36	48
$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		19.1	nF
$C_{oss}$			1760	pF
$C_{rss}$			490	pF
$R_{Gi}$	Integrated Gate Input Resistor		0.88	$\Omega$
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\Omega$ (External)		40	ns
$t_r$			180	ns
$t_{d(off)}$			174	ns
$t_f$			67	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		660	nC
$Q_{gs}$			107	nC
$Q_{gd}$			364	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.
<b>SOA</b>	$V_{DS} = 300\text{V}, I_D = 1.9\text{A}, T_C = 75^\circ\text{C}, T_p = 5\text{s}$	570		W

**Source-Drain Diode**

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$I_S$	$V_{GS} = 0\text{V}$			80
$I_{SM}$	Repetitive, pulse Width Limited by $T_{JM}$			320
$V_{SD}$	$I_F = I_S, V_{GS} = 0\text{V}$ , Note 1			1.4
$t_{rr}$	$I_F = 40\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$		485	ns
$Q_{RM}$			10	$\mu\text{C}$
$I_{RM}$			42	A

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

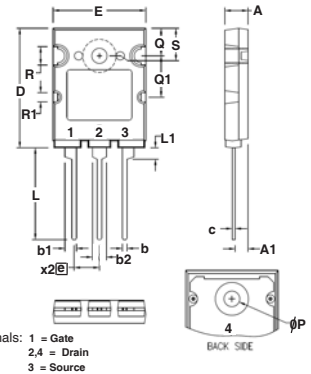
**ADVANCE TECHNICAL INFORMATION**

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.

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065B1	6,683,344	6,727,585	7,005,734B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123B1	6,534,343	6,710,405B2	6,759,692	7,063,975B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728B1	6,583,505	6,710,463	6,771,478B2	7,071,537	

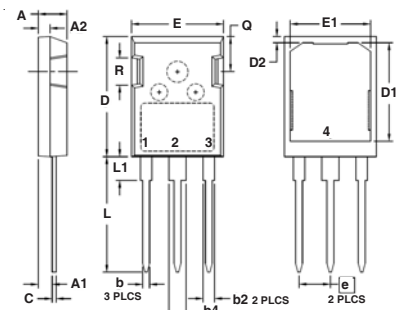
**TO-264 Outline**



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

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.209	4.70	5.30
A1	.102	.118	2.60	3.00
b	.035	.049	0.90	1.25
b1	.091	.106	2.30	2.70
b2	.110	.126	2.80	3.20
c	.020	.033	0.50	0.85
D	1.012	1.035	25.70	26.30
E	.776	.799	19.70	20.30
e	.215BSC		5.46 BSC	
L	.768	.807	19.50	20.50
L1	.091	.106	2.30	2.70
$\phi P$	.122	.138	3.10	3.50
Q	.228	.244	5.80	6.20
Q1	.346	.362	8.80	9.20
$\phi R$	.150	.165	3.80	4.20
$\phi R1$	.071	.087	1.80	2.20
S	.228	.244	5.80	6.20

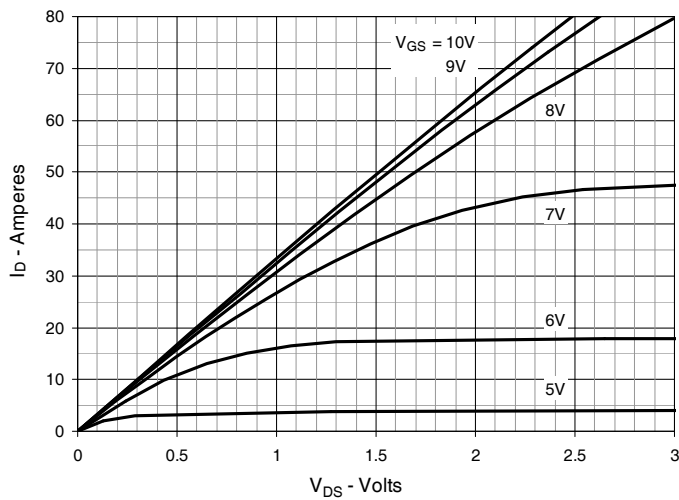
**PLUS 247™ Outline**



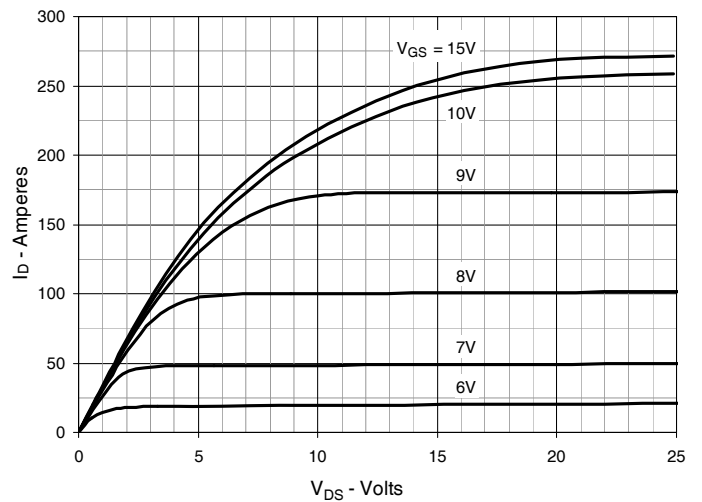
Terminals: 1 - Gate  
2,4 - Drain  
3 - Source

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b2	.075	.087	1.91	2.20
b4	.115	.126	2.92	3.20
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
D1	.650	.690	16.51	17.53
D2	.035	.050	0.89	1.27
E	.620	.635	15.75	16.13
E1	.520	.560	13.08	14.22
e	.215 BSC		5.45 BSC	
L	.780	.810	19.81	20.57
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83

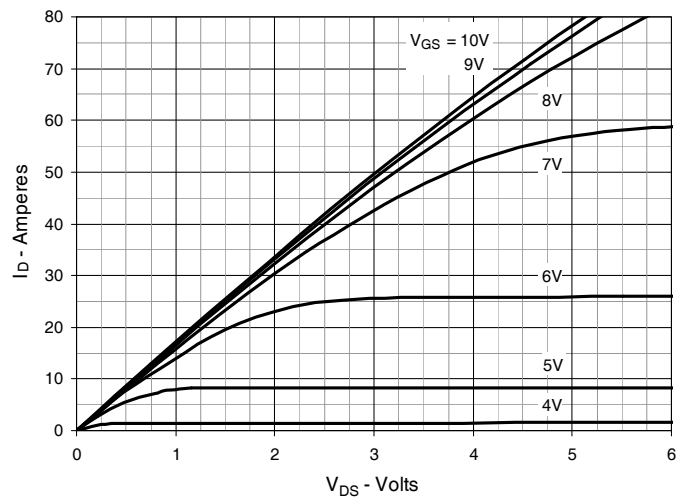
**Fig. 1. Output Characteristics @  $T_J = 25^\circ\text{C}$**



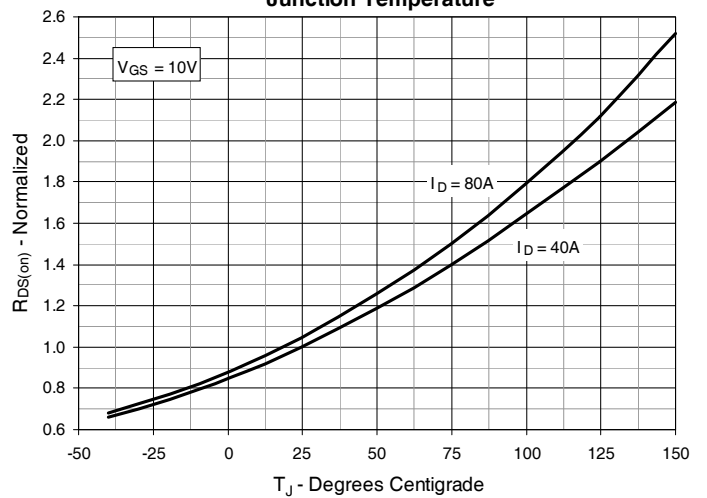
**Fig. 2. Extended Output Characteristics @  $T_J = 25^\circ\text{C}$**



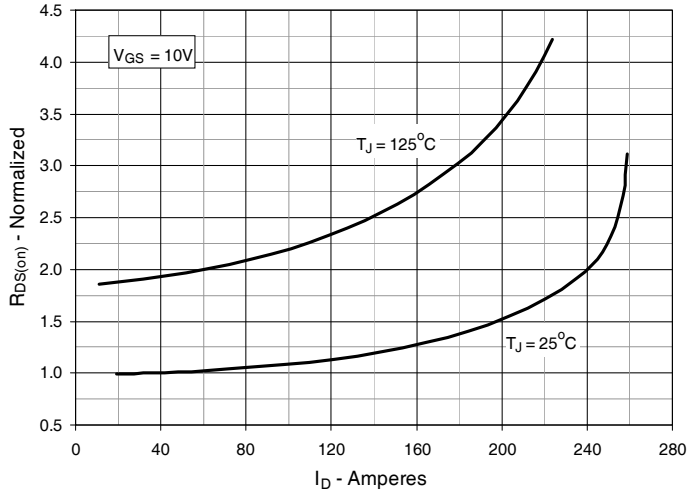
**Fig. 3. Output Characteristics @  $T_J = 125^\circ\text{C}$**



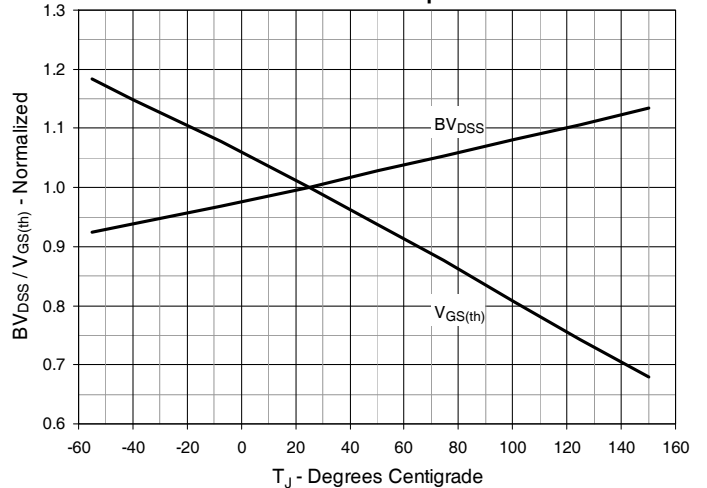
**Fig. 4.  $R_{DS(on)}$  Normalized to  $I_D = 40\text{A}$  Value vs. Junction Temperature**



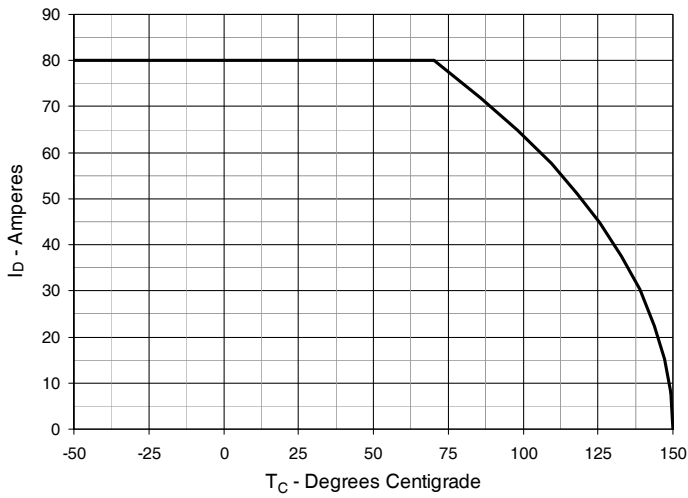
**Fig. 5.  $R_{DS(on)}$  Normalized to  $I_D = 40\text{A}$  Value vs. Drain Current**



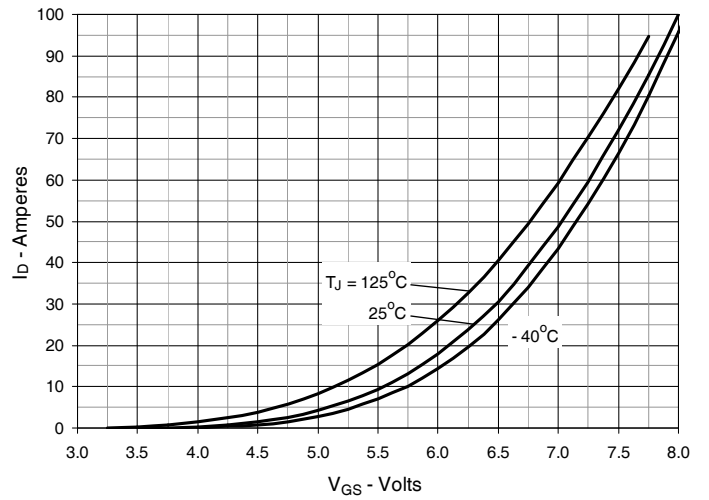
**Fig. 6. Normalized Breakdown & Threshold Voltages vs. Junction Temperature**



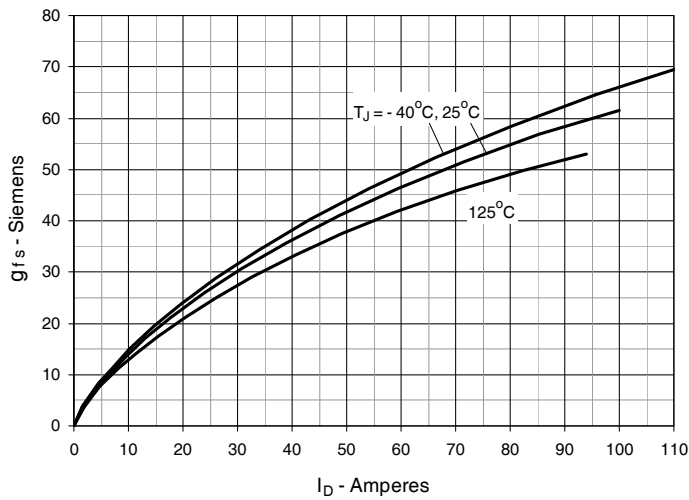
**Fig. 7. Maximum Drain Current vs. Case Temperature**



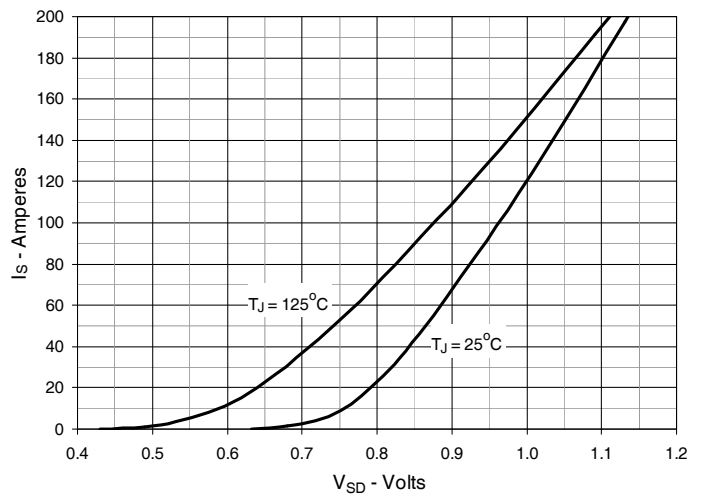
**Fig. 8. Input Admittance**



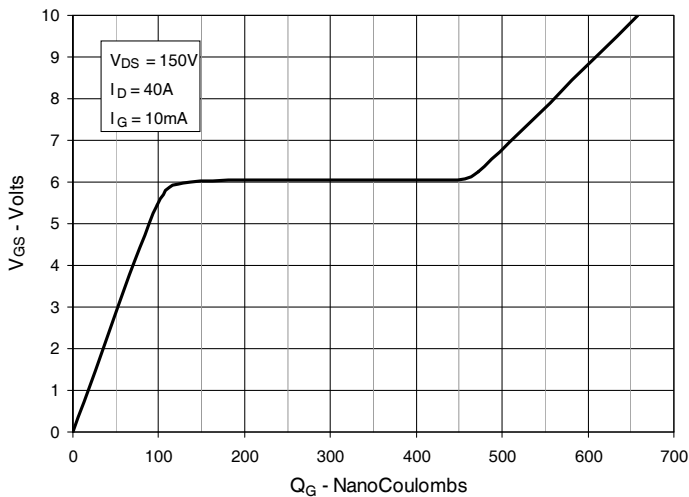
**Fig. 9. Transconductance**



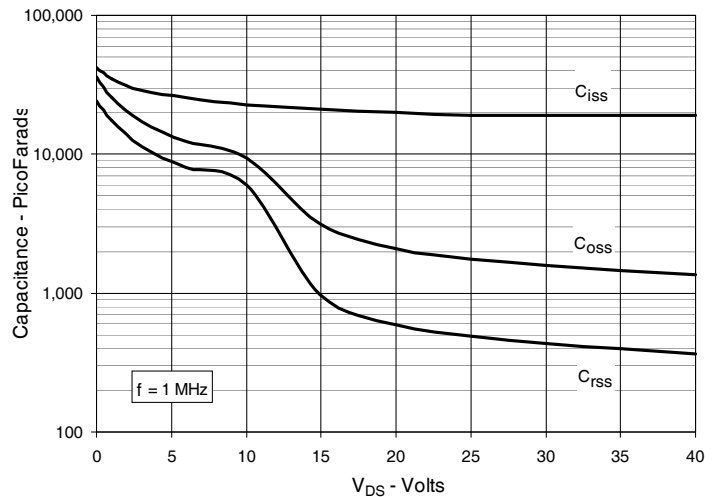
**Fig. 10. Forward Voltage Drop of Intrinsic Diode**



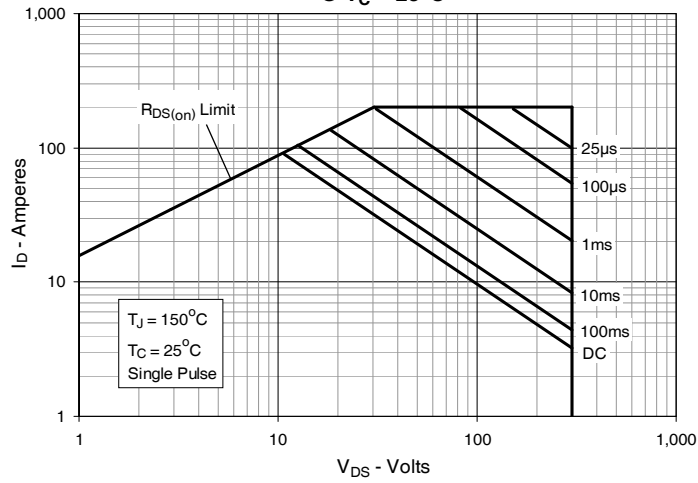
**Fig. 11. Gate Charge**



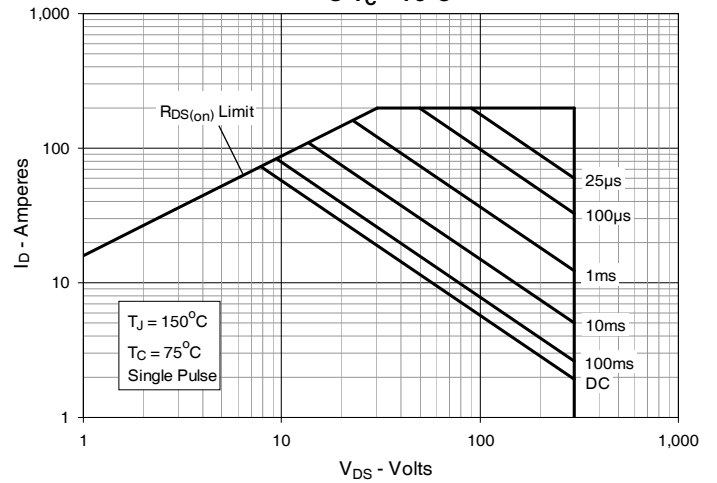
**Fig. 12. Capacitance**



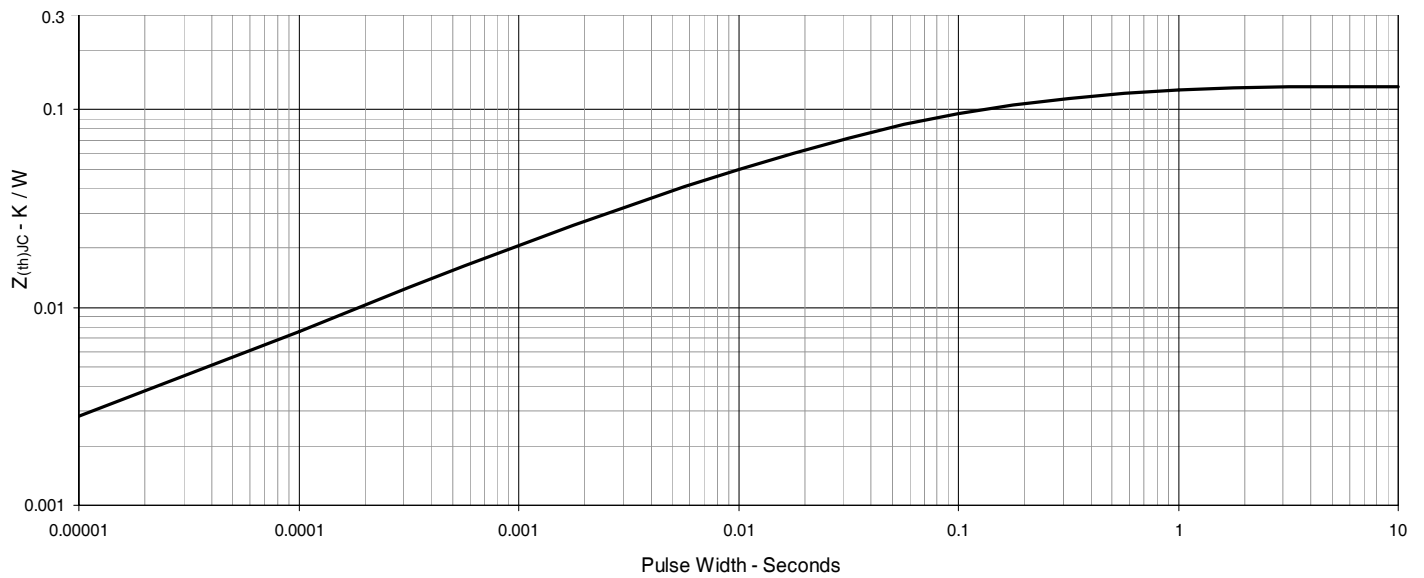
**Fig. 13. Forward-Bias Safe Operating Area**  
@  $T_C = 25^\circ\text{C}$



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



**Fig. 15. Maximum Transient Thermal Impedance**





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