

# High Voltage Depletion Mode MOSFET

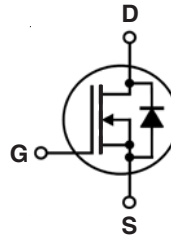
## IXTA08N100D2HV

$$V_{DSX} = 1000V$$

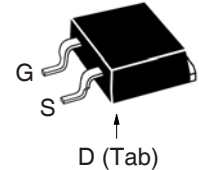
$$I_{D(on)} \geq 800mA$$

$$R_{DS(on)} \leq 21\Omega$$

N-Channel



TO-263HV



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

Symbol	Test Conditions	Maximum Ratings	
$V_{DSX}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	1000	V
$V_{DGX}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ , $R_{GS} = 1M\Omega$	1000	V
$V_{GSX}$	Continuous	$\pm 20$	V
$V_{GSM}$	Transient	$\pm 30$	V
$P_D$	$T_C = 25^\circ\text{C}$	60	W
$T_J$		- 55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		- 55 ... +150	$^\circ\text{C}$
$T_L$	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
$T_{SOLD}$	1.6 mm (0.062in.) from Case for 10s	260	$^\circ\text{C}$
$F_C$	Mounting Force	10..65 / 22..14.6	N/lb
<b>Weight</b>		2.5	g

### Features

- High Voltage Package
- Normally ON Mode
- International Standard Package
- Molding Epoxies Meet UL94 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 ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$BV_{DSX}$	$V_{GS} = -5V$ , $I_D = 25\mu\text{A}$	1000		V
$V_{GS(off)}$	$V_{DS} = 25V$ , $I_D = 25\mu\text{A}$	- 2.0		V
$I_{GSX}$	$V_{GS} = \pm 20V$ , $V_{DS} = 0V$			$\pm 50$ nA
$I_{DSX(off)}$	$V_{DS} = V_{DSX}$ , $V_{GS} = -5V$ $T_J = 125^\circ\text{C}$			1 $\mu\text{A}$ 15 $\mu\text{A}$
$R_{DS(on)}$	$V_{GS} = 0V$ , $I_D = 400mA$ , Note 1			21 $\Omega$
$I_{D(on)}$	$V_{GS} = 0V$ , $V_{DS} = 50V$ , Note 1	800		mA

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$g_{fs}$	$V_{DS} = 30\text{V}$ , $I_D = 400\text{mA}$ , Note 1	330	560	mS
$C_{iss}$	$V_{GS} = -10\text{V}$ , $V_{DS} = 25\text{V}$ , $f = 1\text{MHz}$		325	pF
$C_{oss}$			24	pF
$C_{rss}$			6.5	pF
$t_{d(on)}$	<b>Resistive Switching Times</b> $V_{GS} = \pm 5\text{V}$ , $V_{DS} = 500\text{V}$ , $I_D = 400\text{mA}$ $R_G = 10\Omega$ (External)		28	ns
$t_r$			57	ns
$t_{d(off)}$			34	ns
$t_f$			48	ns
$Q_{g(on)}$	$V_{GS} = \pm 5\text{V}$ , $V_{DS} = 500\text{V}$ , $I_D = 400\text{mA}$		14.6	nC
$Q_{gs}$			1.2	nC
$Q_{gd}$			8.3	nC
$R_{thJC}$				2.08 $^\circ\text{C/W}$

### Safe-Operating-Area Specification

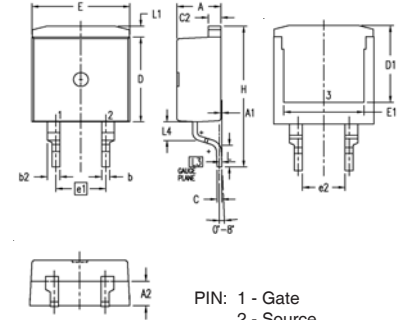
Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
SOA	$V_{DS} = 800\text{V}$ , $I_D = 45\text{mA}$ , $T_C = 75^\circ\text{C}$ , $T_p = 5\text{s}$	36		W

### Source-Drain Diode

Symbol	Test Conditions ( $T_J = 25^\circ\text{C}$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{SD}$	$I_F = 800\text{mA}$ , $V_{GS} = -10\text{V}$ , Note 1		0.8	1.3 V
$t_{rr}$	$I_F = 800\text{mA}$ , $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}$ , $V_{GS} = -10\text{V}$		1.03	$\mu\text{s}$
$I_{RM}$			7.40	A
$Q_{RM}$			3.80	$\mu\text{C}$

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

### TO-263HV Outline



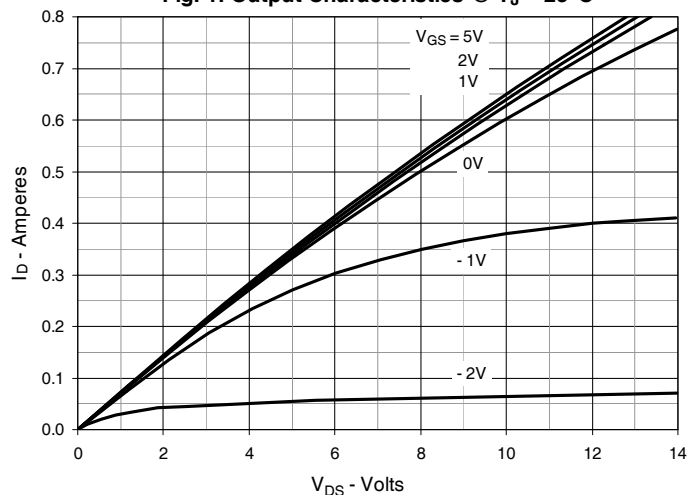
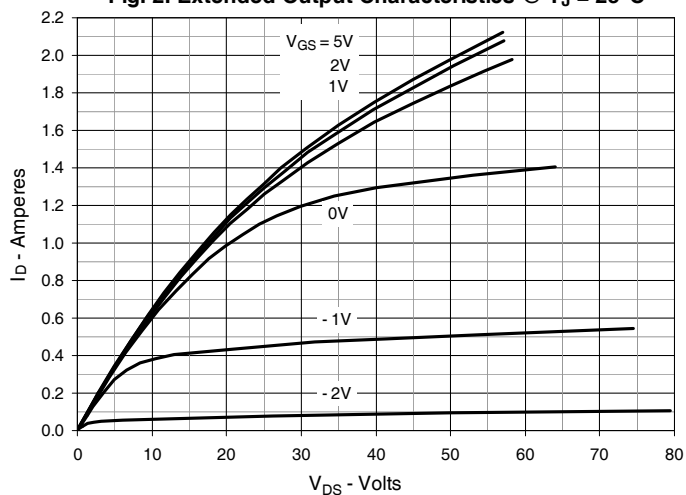
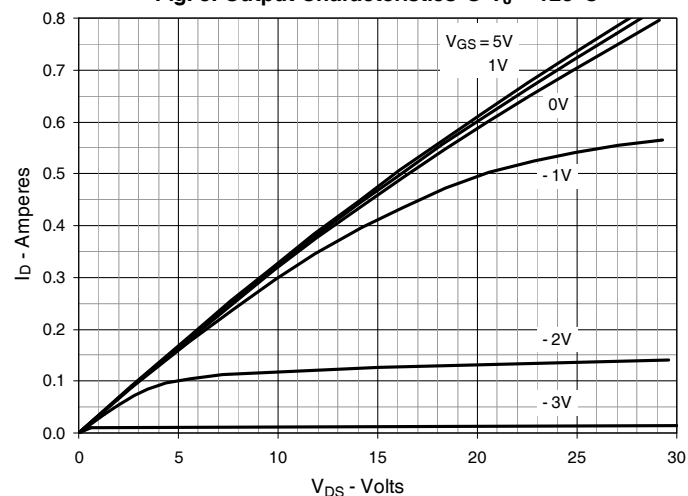
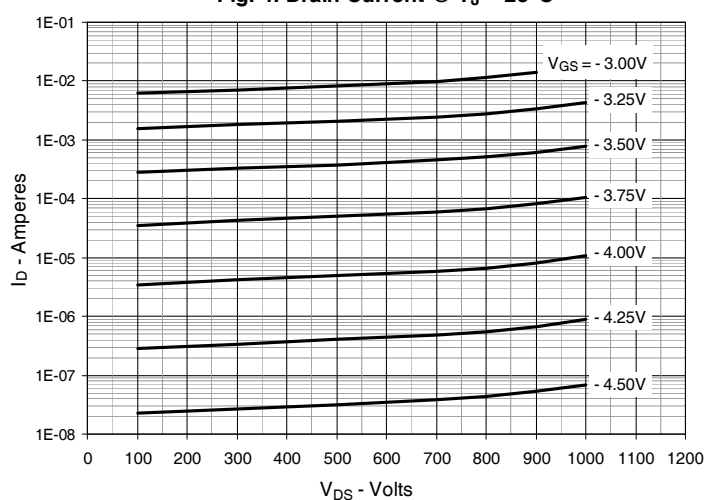
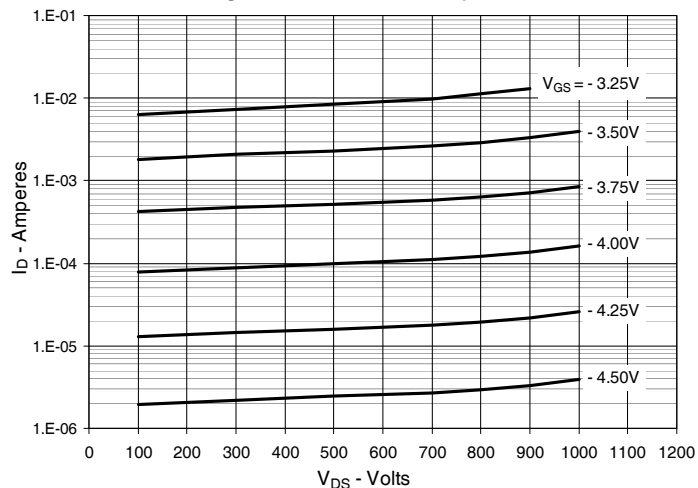
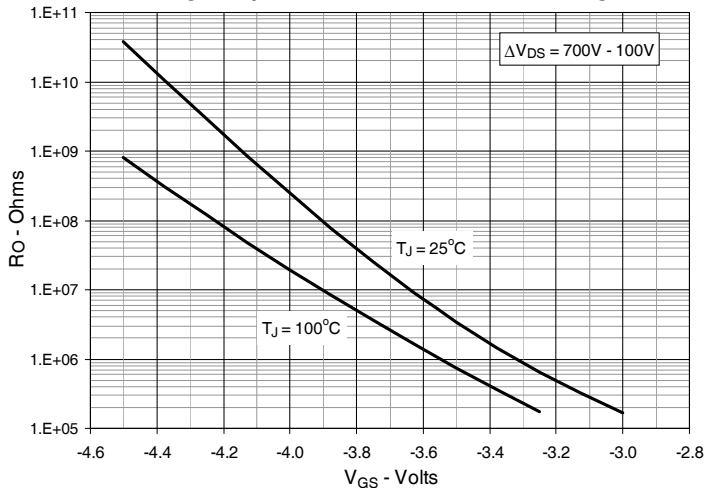
SYM	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.054	1.18	1.38
C	.018	.024	0.45	0.60
C2	.049	.055	1.25	1.40
D	.354	.370	9.00	9.40
D1	.311	.327	7.90	8.30
E	.386	.402	9.80	10.20
E1	.307	.323	7.80	8.20
e1	.200	BSC	5.08	BSC
(e2)	.163	.174	4.13	4.43
H	.591	.614	15.00	15.60
L	.079	.102	2.00	2.60
L1	.039	.055	1.00	1.40
L3	.010	BSC	0.254	BSC
(L4)	.071	.087	1.80	2.20

### PRELIMINARY TECHNICAL INFORMATION

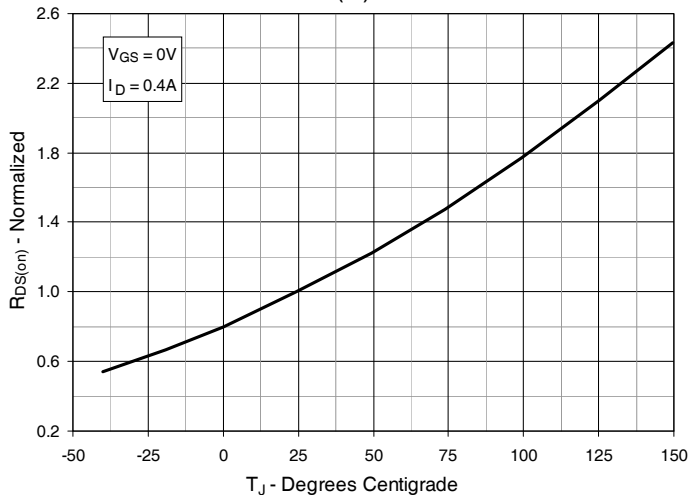
The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test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

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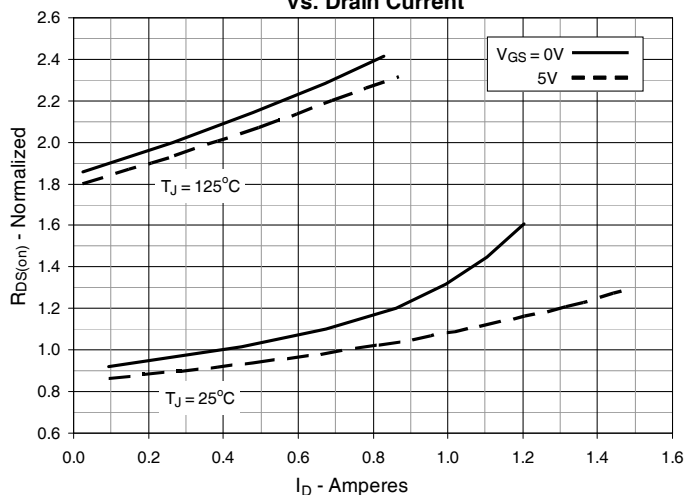
IXYS MOSFETs and IGBTs are covered 4,835,592 4,931,844 5,049,961 5,237,481 6,162,665 6,404,065 B1 6,683,344 6,727,585 7,005,734 B2 7,157,338B2  
by one or more of the following U.S. patents: 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123 B1 6,534,343 6,710,405 B2 6,759,692 7,063,975 B2  
4,881,106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

**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. Drain Current @  $T_J = 25^\circ\text{C}$** 

**Fig. 5. Drain Current @  $T_J = 100^\circ\text{C}$** 

**Fig. 6. Dynamic Resistance vs. Gate Voltage**


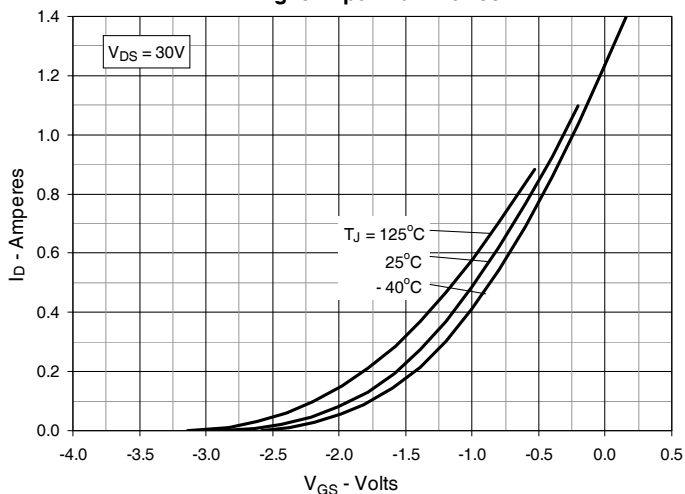
**Fig. 7. Normalized  $R_{DS(on)}$  vs. Junction Temperature**



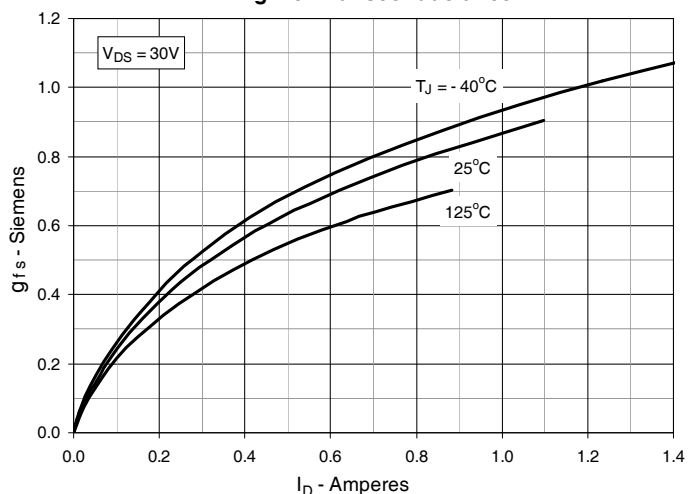
**Fig. 8.  $R_{DS(on)}$  Normalized to  $I_D = 0.4A$  Value vs. Drain Current**



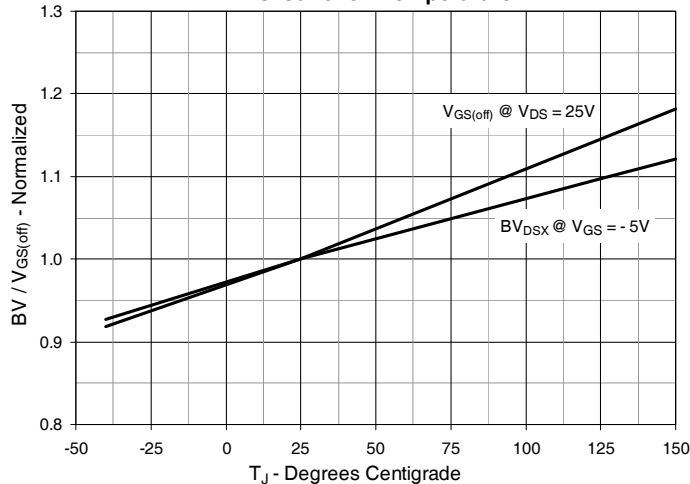
**Fig. 9. Input Admittance**



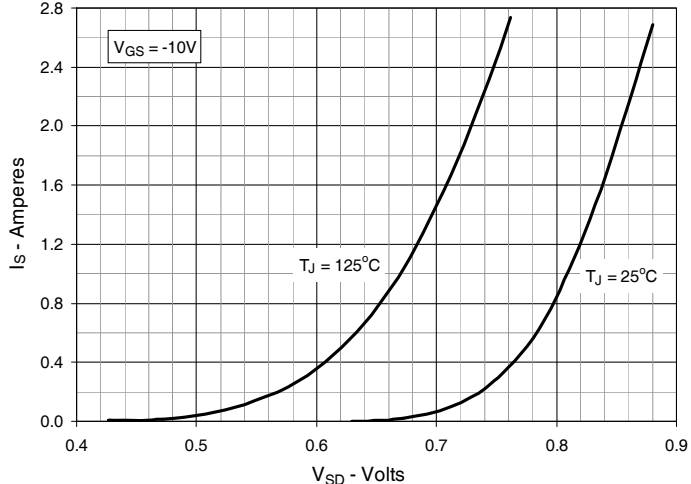
**Fig. 10. Transconductance**



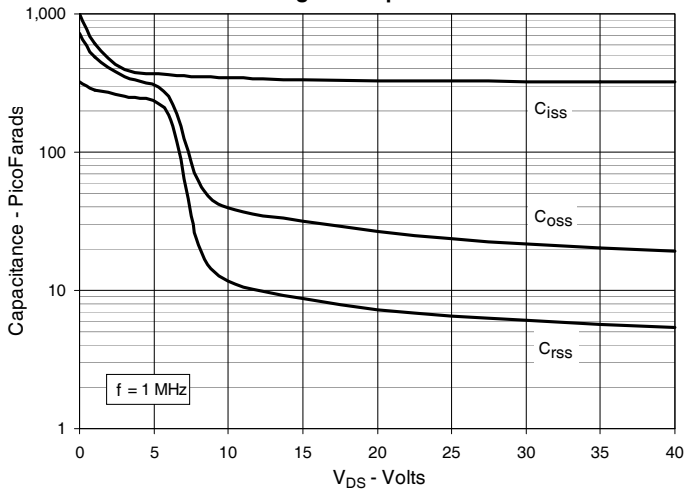
**Fig. 11. Breakdown and Threshold Voltages vs. Junction Temperature**



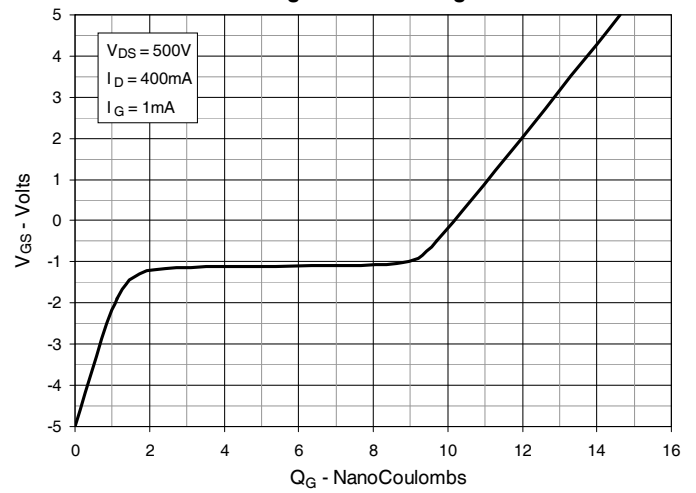
**Fig. 12. Forward Voltage Drop of Intrinsic Diode**



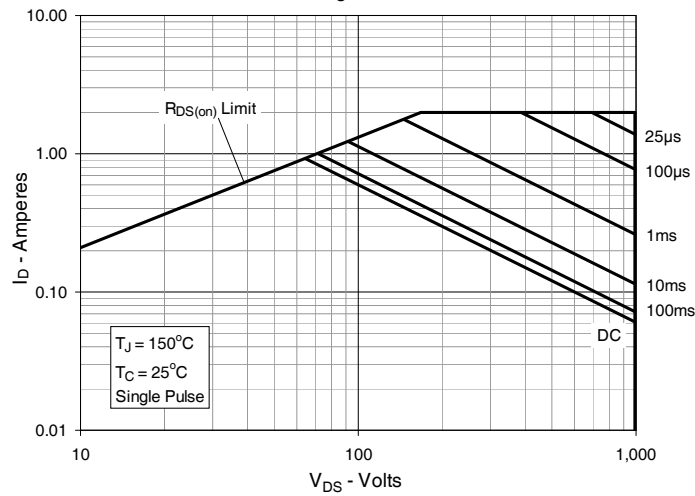
**Fig. 13. Capacitance**



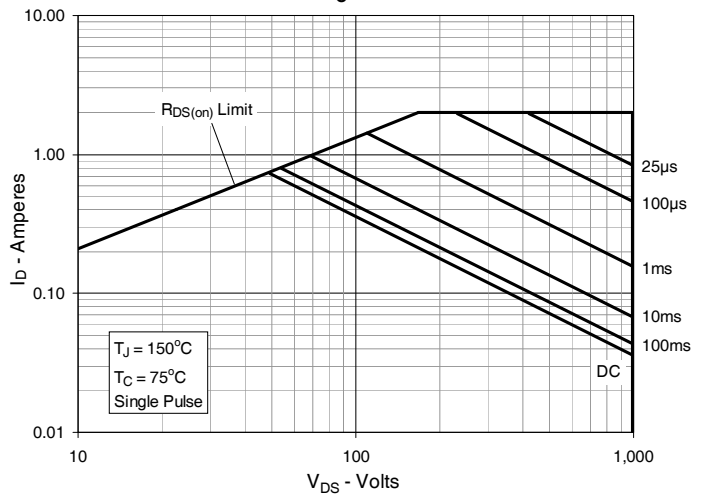
**Fig. 14. Gate Charge**



**Fig. 15. Forward-Bias Safe Operating Area @ T\_C = 25°C**



**Fig. 16. Forward-Bias Safe Operating Area @ T\_C = 75°C**



**Fig. 17. Maximum Transient Thermal Impedance**

