High Voltage Power MOSFET
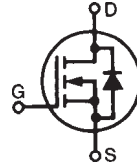
IXTA02N250HV

V_{DSS} = 2500V
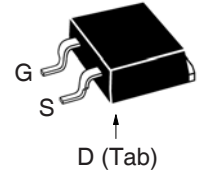I_{D25} = 200mA
$R_{DS(on)}$ ≤ 450Ω

N-Channel Enhancement Mode
Fast Intrinsic Diode

TO-263AB

D (Tab)

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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	2500	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	2500	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	200	mA
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	600	mA
P_D	T_C = 25°C	83	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
F_C	Mounting Force	11..65 / 25..14.6	N/lb.
Weight		2.5	g

Features

- High Voltage package
- High Blocking Voltage
- Fast Intrinsic Diode
- Low Package Inductance

Advantages

- Easy to Mount
- Space Savings

Applications

- High Voltage Power Supplies
- Capacitor Discharge
- Pulse Circuits

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	V_{GS} = 0V, I_D = 250µA	2500		V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	2.5		4.5 V
I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100 nA
I_{DSS}	V_{DS} = 0.8 • V_{DSS}, V_{GS} = 0V			5 µA
	T_J = 125°C			500 µA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 50mA, Note 1			450 Ω

IXYS

IXTA02N250HV

Symbol	Test Conditions (T$_J$ = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g$_{fs}$	V$_{DS}$ = 100V, I$_D$ = 0.5 • I$_{D25}$, Note 1	88	145	mS
C$_{iss}$	V$_{GS}$ = 0V, V$_{DS}$ = 25V, f = 1MHz		116	pF
C$_{oss}$			8	pF
C$_{rss}$			3	pF
t$_{d(on)}$	**Resistive Switching Times**		19	ns
t$_r$	V$_{GS}$ = 10V, V$_{DS}$ = 0.5 • V$_{DSS}$, I$_D$ = 0.5 • I$_{D25}$		19	ns
t$_{d(off)}$	R$_G$ = 100Ω (External)		32	ns
t$_f$			33	ns
Q$_{g(on)}$	V$_{GS}$ = 10V, V$_{DS}$ = 0.5 • V$_{DSS}$, I$_D$ = 0.5 • I$_{D25}$		7.4	nC
Q$_{gs}$			0.7	nC
Q$_{gd}$			5.3	nC
R$_{thJC}$				1.5 °C/W

TO-263AB (VHV) Outline

PIN: 1 - Gate
2 - Source
3 - Drain

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

Source-Drain Diode

Symbol	Test Conditions (T$_J$ = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I$_s$	V$_{GS}$ = 0V			200 mA
I$_{SM}$	Repetitive, Pulse Width Limited by T$_{JM}$			800 mA
V$_{SD}$	I$_F$ = 100mA, V$_{GS}$ = 0V, Note 1			2.0 V
t$_{rr}$	I$_F$ = 200mA, -di/dt = 50A/μs, V$_R$ = 100V		1.5	μs

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

*Additional provisions for lead to lead voltage isolation are required at V$_{DS}$ > 1200V.

## 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.
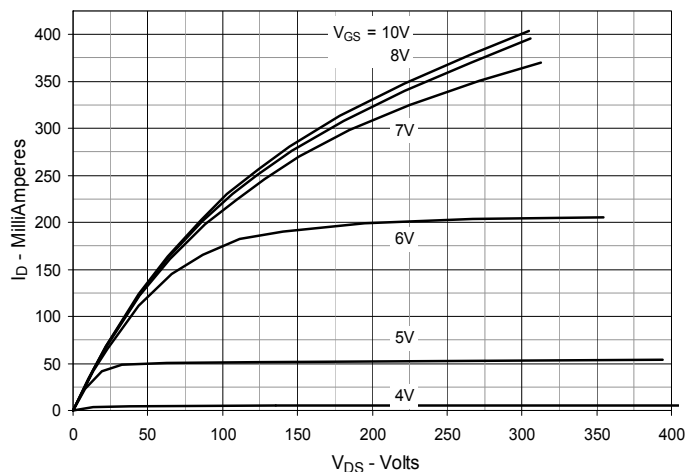

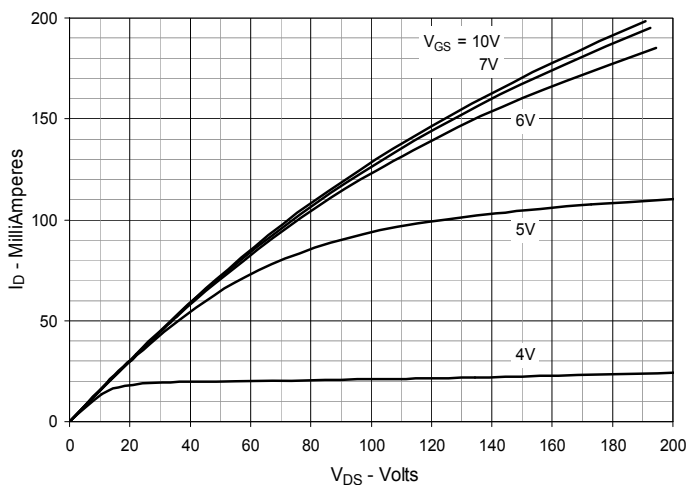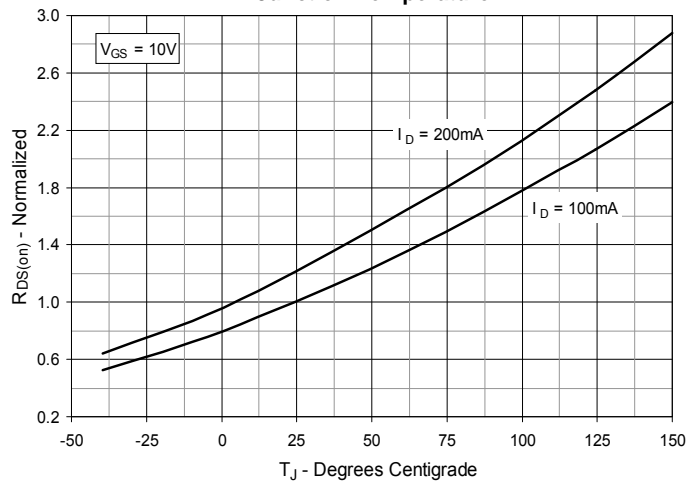
Fig. 1. Output Characteristics @ T$_J$ = 25ºC
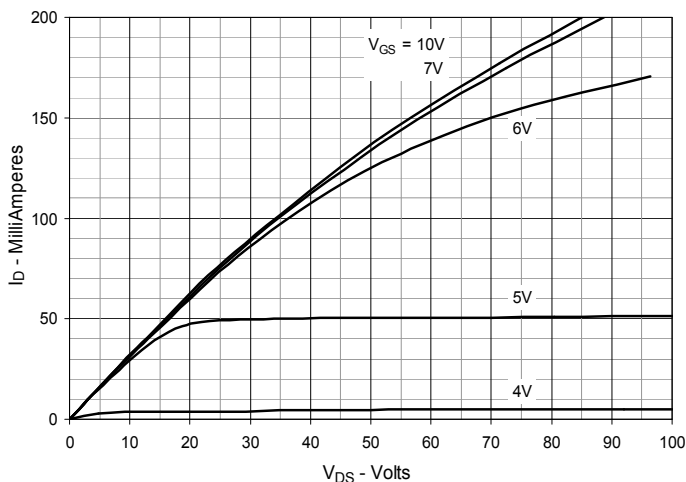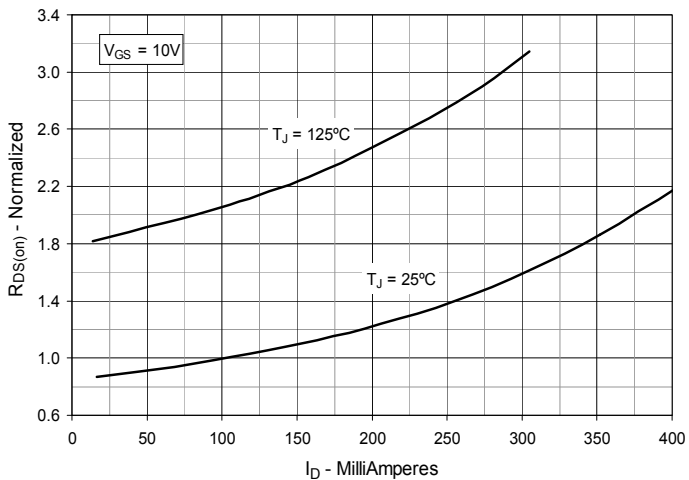

Fig. 2. Extended Output Characteristics @ T$_J$ = 25ºC
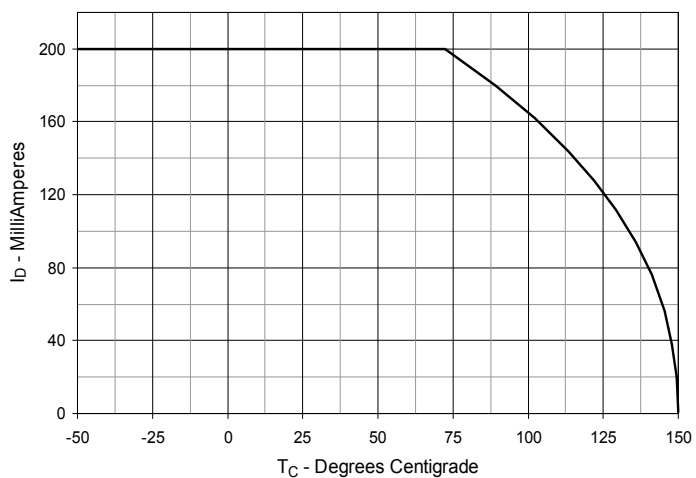

Fig. 3. Output Characteristics @ T$_J$ = 125ºC

Fig. 4. R$_{DS(on)}$ Normalized to I$_D$ = 100mA Value vs. Junction Temperature

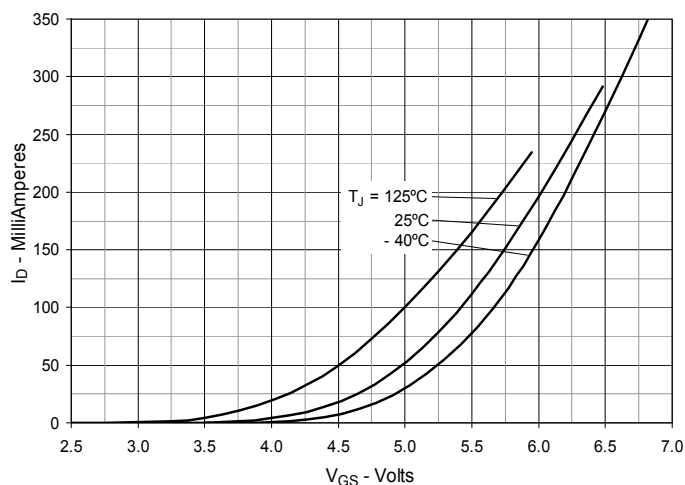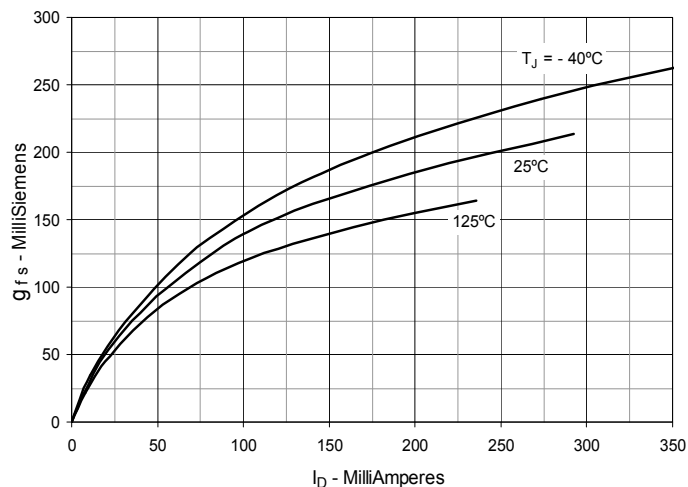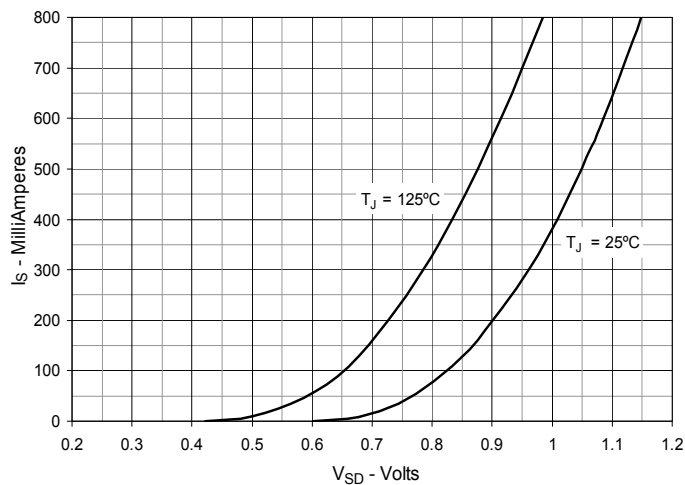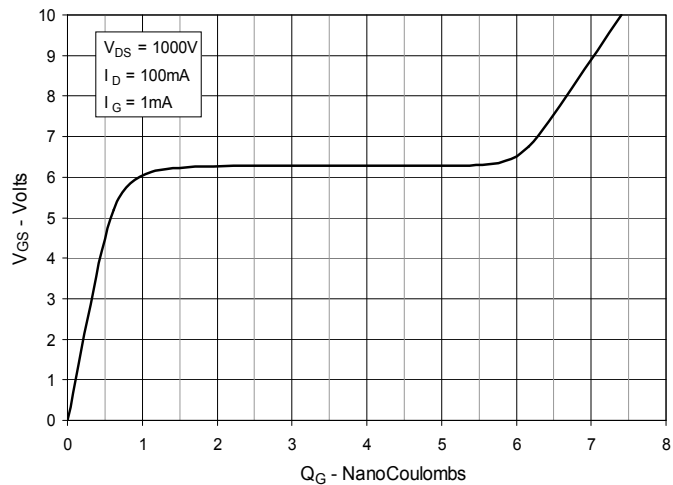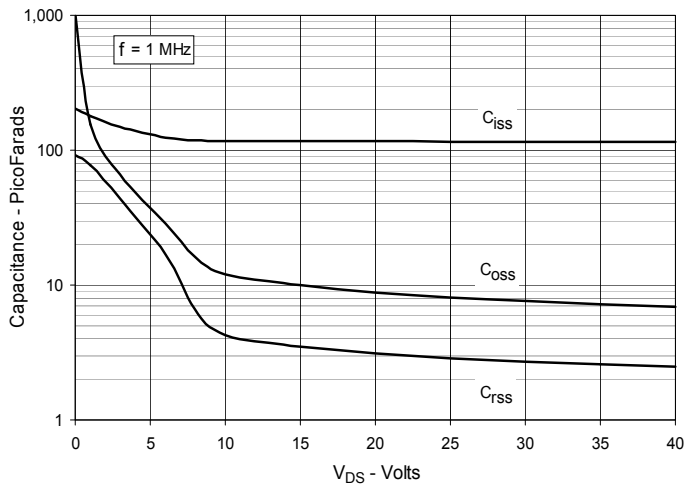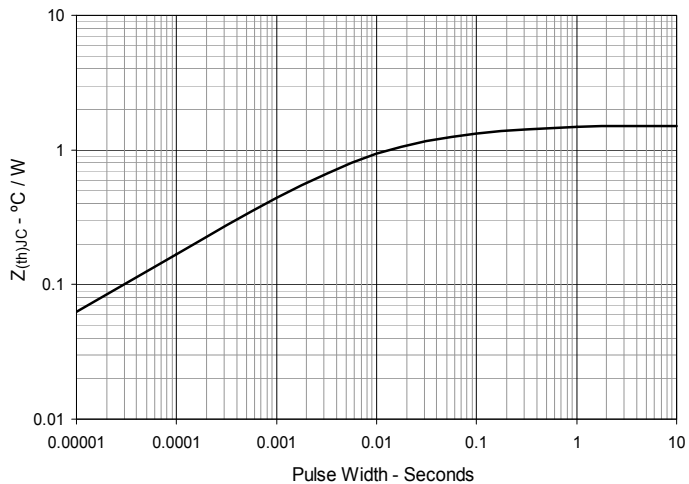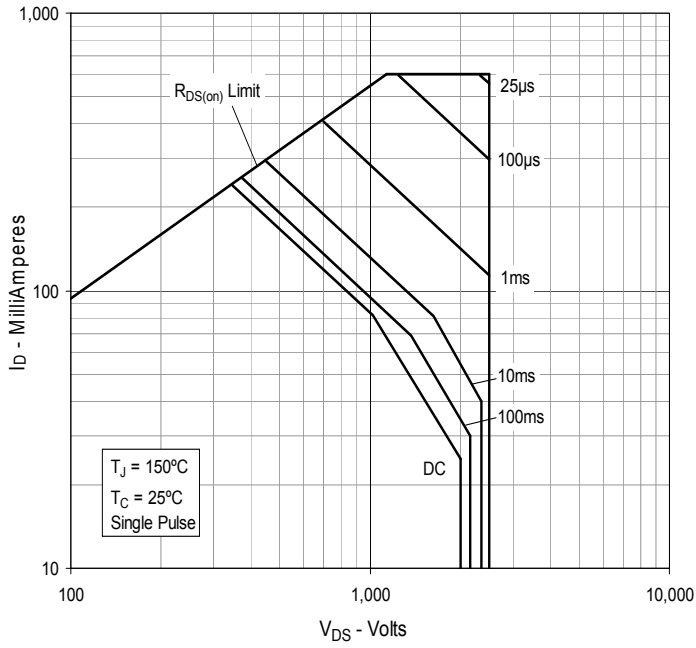**Fig. 5. R$_{DS(on)}$ Normalized to I$_D$ = 100mA Value vs. Drain Current**
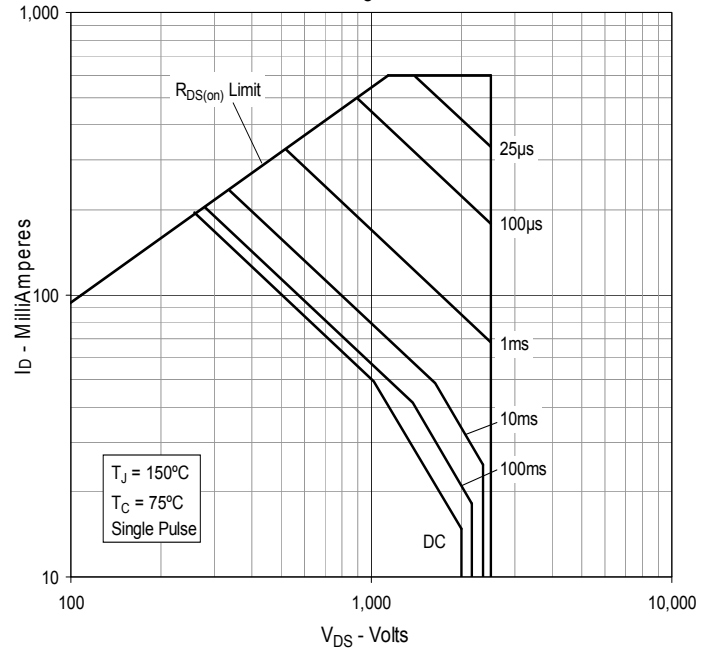

Fig. 6. Maximum Drain Current vs. Case Temperature

Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

$V_{DS} = 1000V$
$I_D = 100mA$
$I_G = 1mA$

Fig. 11. Capacitance

f = 1 MHz

C_{iss}

C_{oss}

C_{rss}

Fig. 12. Maximum Transient Thermal Impedance

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

Fig. 13. Forward-Bias Safe Operating Area

@ T$_C$ = 25ºC

Fig. 14. Forward-Bias Safe Operating Area

@ T$_C$ = 75ºC

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