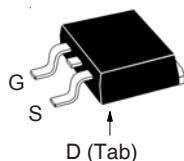


Trench Gate Power MOSFET

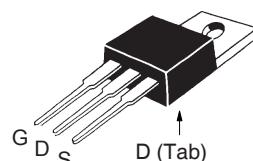
**IXTA50N25T IXTQ50N25T
IXTP50N25T IXTH50N25T**

N-Channel Enhancement Mode

TO-263 AA (IXTA)

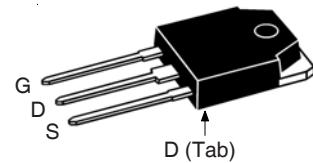


TO-220AB (IXTP)

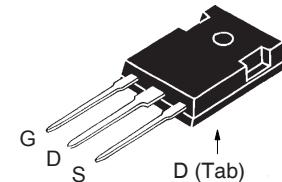


V_{DSS} = 250V
 I_{D25} = 50A
 $R_{DS(on)}$ ≤ 60mΩ

TO-3P (IXTQ)



TO-247 (IXTH)



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

Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ\text{C}$ to 150°C	250		V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 150°C , $R_{GS} = 1\text{M}\Omega$	250		V
V_{GSM}	Transient	± 30		V
I_{D25}	$T_C = 25^\circ\text{C}$	50		A
I_{DM}	$T_C = 25^\circ\text{C}$, Pulse Width Limited by T_{JM}	130		A
I_A	$T_C = 25^\circ\text{C}$	5		A
E_{AS}	$T_C = 25^\circ\text{C}$	1.5		J
P_D	$T_C = 25^\circ\text{C}$	400		W
T_J		-55 ... +150		°C
T_{JM}		150		°C
T_{stg}		-55 ... +150		°C
T_L	1.6mm (0.062in.) from Case for 10s Plastic Body for 10 s	300 260		°C
M_d	Mounting Torque (TO-220, TO-3P &TO-247)	1.13 / 10		Nmlb.in.
F_c	Mounting Force (TO-263)	10..65 / 2.2..14.6		N/lb.
Weight	TO-263 TO-220 TO-3P TO-247	2.5 3.0 5.5 6.0		g

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ .	Max.
IV_{DSS}	$V_{GS} = 0\text{V}$, $I_D = 1\text{mA}$	250		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1\text{mA}$	3.0		5.0 V
I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$		± 100 nA	
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0\text{V}$ $T_J = 125^\circ\text{C}$		1 μA 150 μA	
$R_{DS(on)}$	$V_{GS} = 10\text{V}$, $I_D = 0.5 \cdot I_{D25}$, Note 1		60 mΩ	

Features

- Avalanche Rated
- High Current Handling Capability
- Fast Intrinsic Rectifier
- Low $R_{DS(on)}$

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

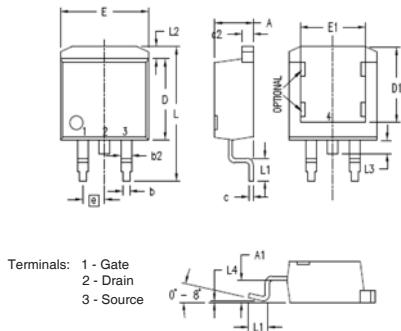
- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- DC Choppers
- AC and DC Motor Drives
- Uninterrupted Power Supplies
- High Speed Power Switching Applications

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	58	S
C_{iss} C_{oss} C_{rss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$	4000		pF
		410		pF
		60		pF
$t_{d(on)}$ t_r $t_{d(off)}$ t_f	Resistive Switching Times $V_{GS} = 15\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$ $R_G = 3.3\Omega$ (External)	14		ns
		25		ns
		47		ns
		25		ns
$Q_{g(on)}$ Q_{gs} Q_{gd}	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 0.5 \cdot I_{D25}$	78		nC
		19		nC
		22		nC
R_{thJC}			0.31	°C/W
R_{thCH}	(TO-220) (TO-3P & TO-247)	0.50 0.25		°C/W °C/W

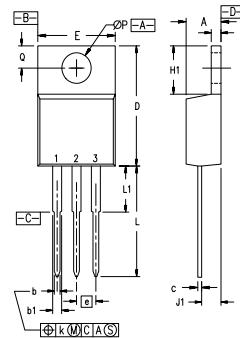
Source-Drain Diode

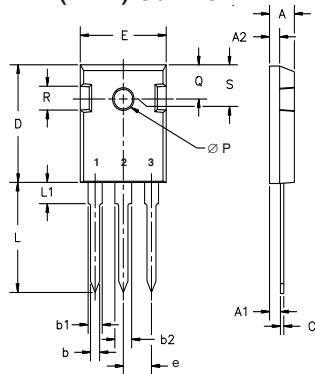
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ .	Max.
I_s	$V_{GS} = 0\text{V}$		50	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}		200	A
V_{SD}	$I_F = I_S$, $V_{GS} = 0\text{V}$, Note 1		1.5	V
t_{rr} I_{RM} Q_{RM}	$I_F = 25\text{A}$, $-di/dt = 250\text{A}/\mu\text{s}$ $V_R = 100\text{V}$, $V_{GS} = 0\text{V}$	166		ns
		23		A
		1.9		μC

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

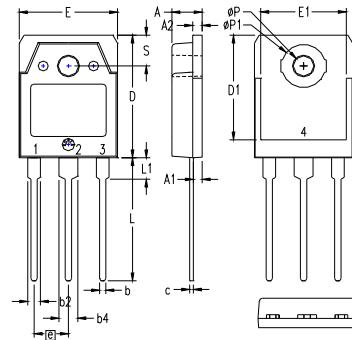
TO-263 (IXTA) Outline


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.160	.190	4.06	4.83
A1	.080	.110	2.03	2.79
b	.020	.039	0.51	0.99
b2	.045	.055	1.14	1.40
c	.016	.029	0.40	0.74
c2	.045	.055	1.14	1.40
D	.340	.380	8.64	9.65
D1	.315	.350	8.00	8.89
E	.380	.410	9.65	10.41
E1	.245	.320	6.22	8.13
e	.100 BSC		2.54 BSC	
L	.575	.625	14.61	15.88
L1	.090	.110	2.29	2.79
L2	.040	.055	1.02	1.40
L3	.050	.070	1.27	1.78
L4	0	.005	0	0.13

TO-220 (IXTP) Outline

 Pins: 1 - Gate 2 - Drain
 3 - Source

TO-247 (IXTH) Outline

 Terminals: 1 - Gate 2 - Drain
 3 - Source

Dim.	Millimeter		Inches	
	Min.	Max.	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-3P (IXTQ) Outline

 Terminals: 1 - Gate 2 - Drain
 3 - Source

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.799	19.80	20.30
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e		215 BSC		5.45 BSC
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
ØP	.126	.134	3.20	3.40
ØP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

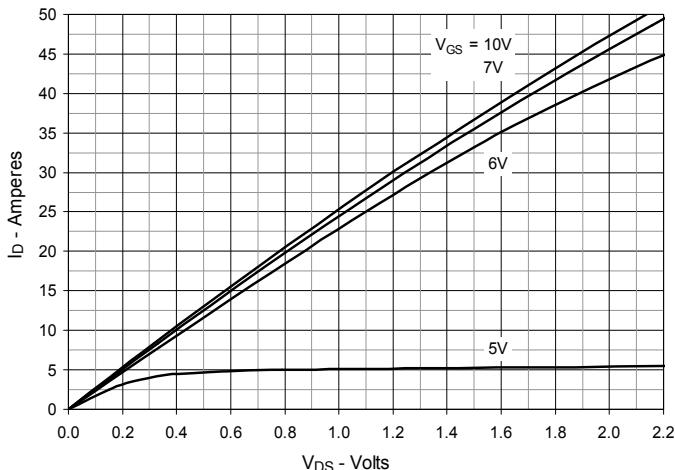
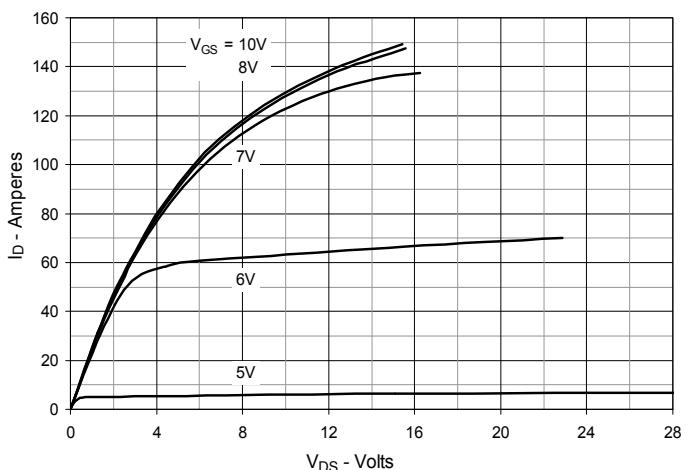
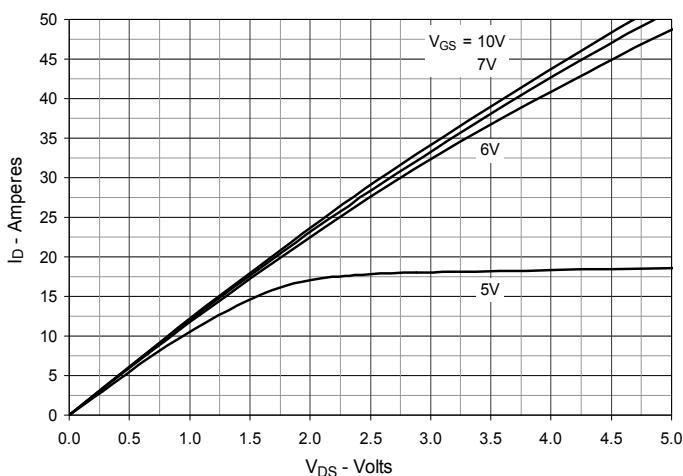
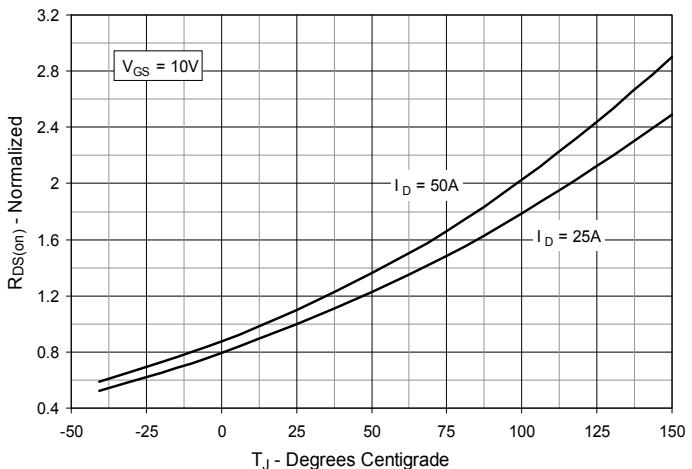
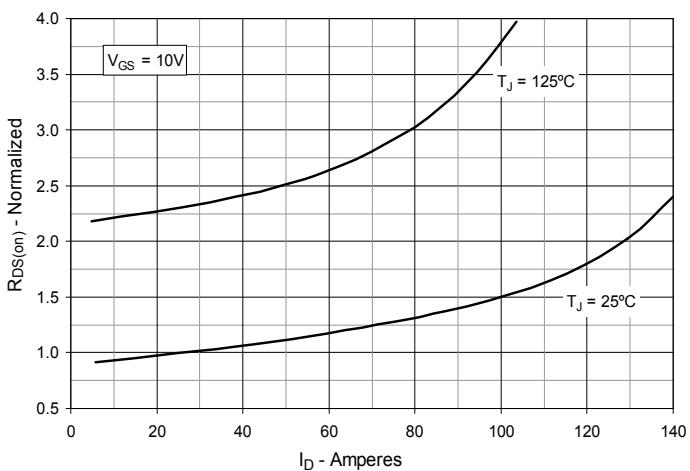
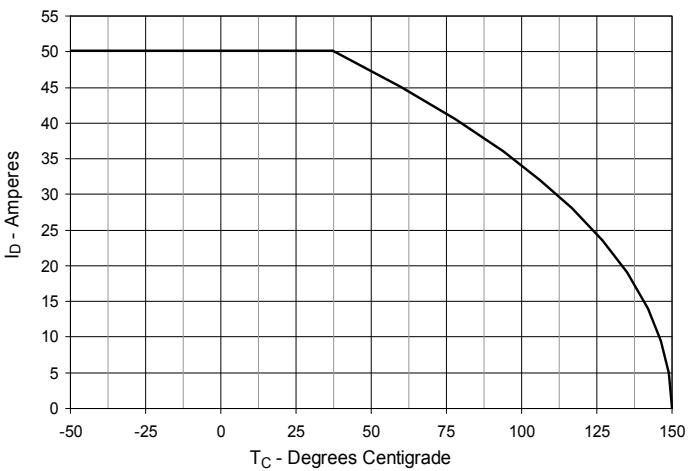
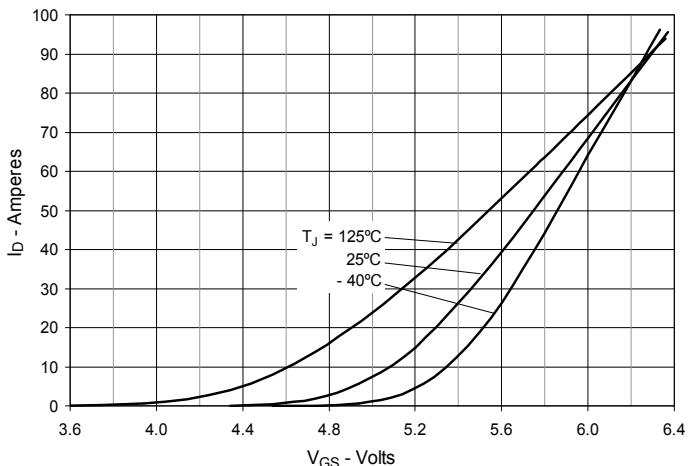
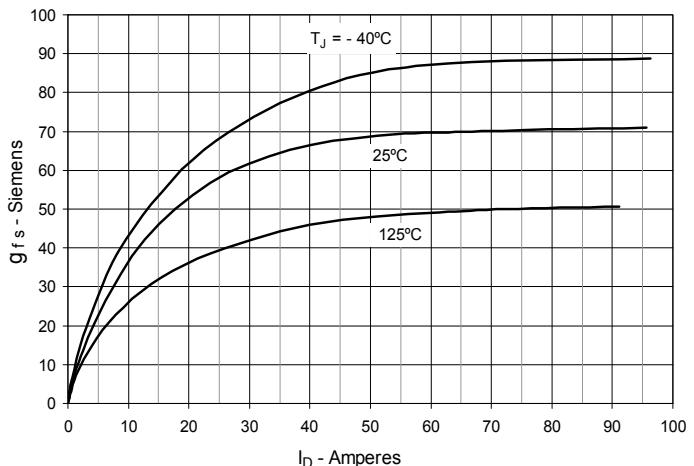
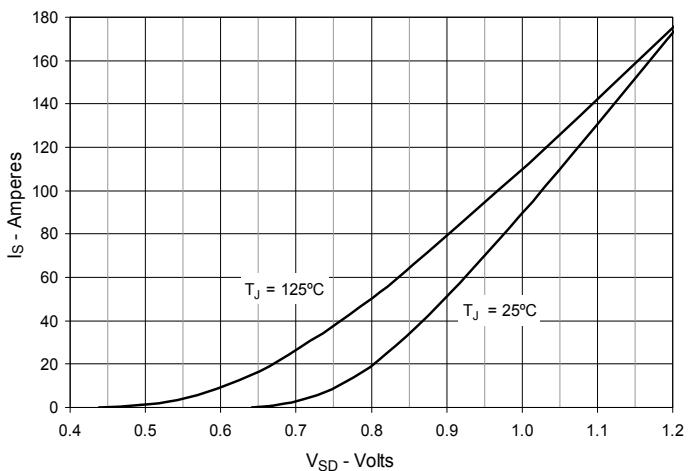
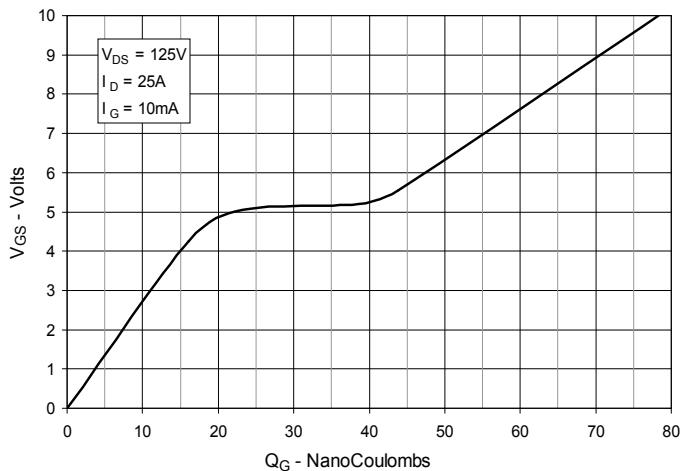
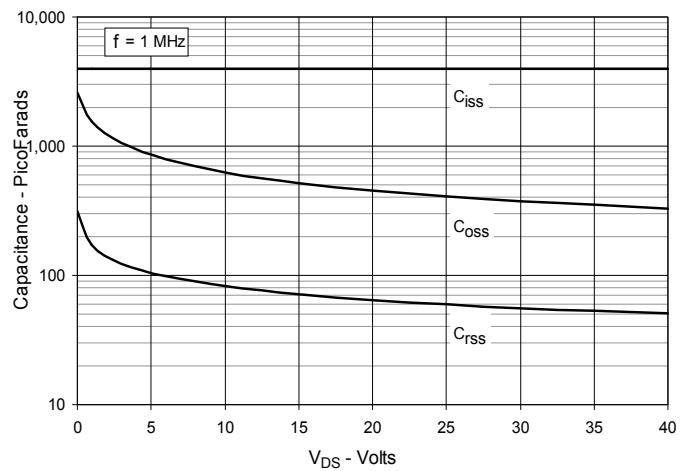
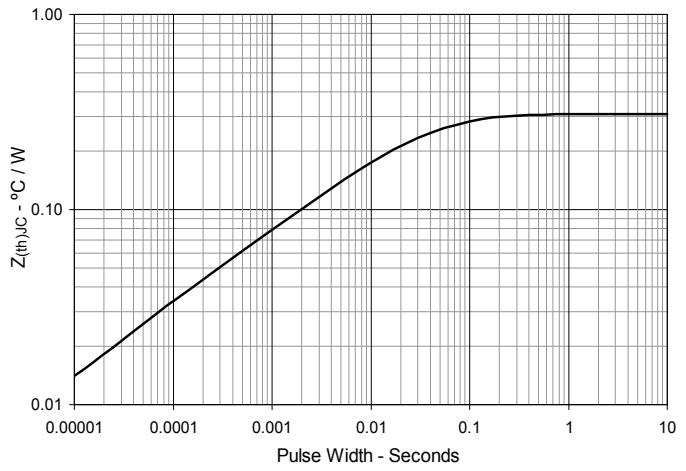
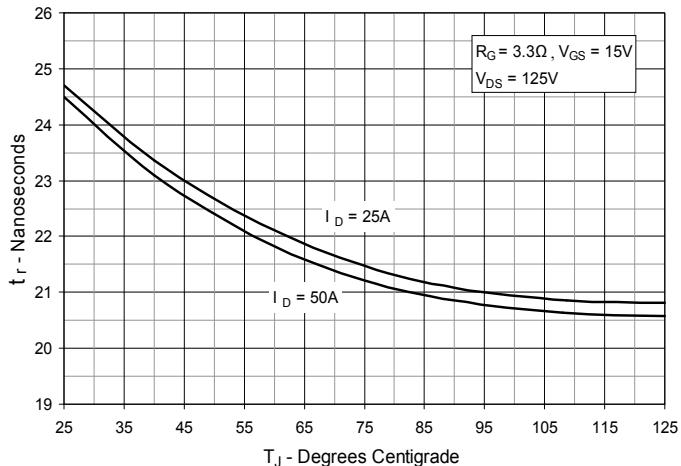
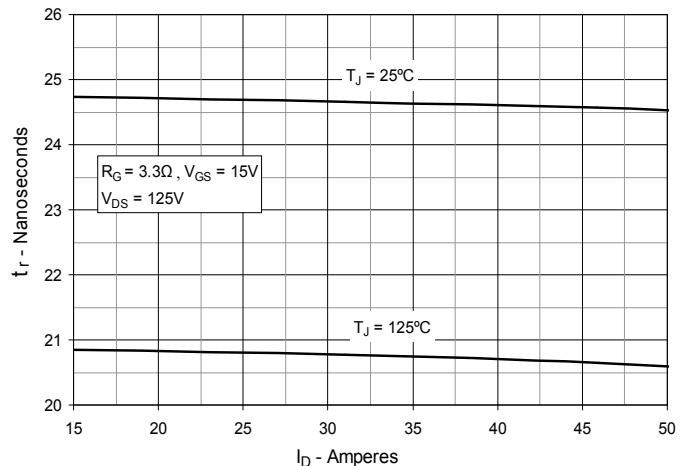
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

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 $I_D = 25\text{A}$ Value vs. Junction Temperature

Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 25\text{A}$ 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


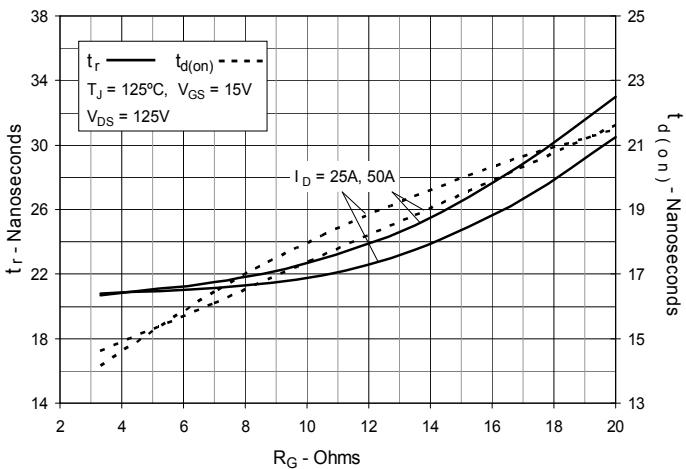
**Fig. 13. Resistive Turn-on
Rise Time vs. Junction Temperature**



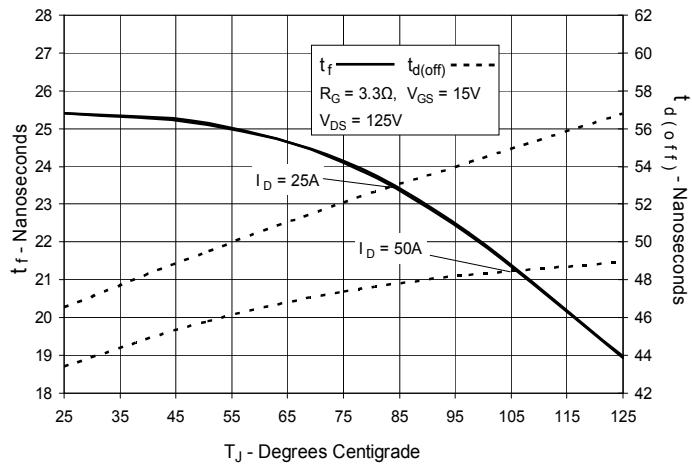
**Fig. 14. Resistive Turn-on
Rise Time vs. Drain Current**



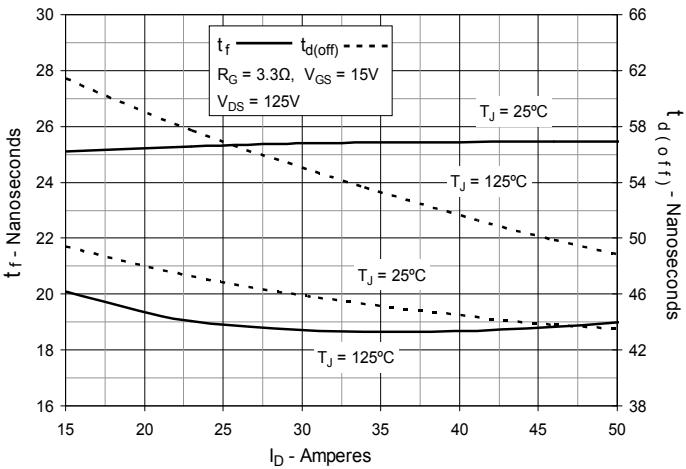
**Fig. 15. Resistive Turn-on
Switching Times vs. Gate Resistance**



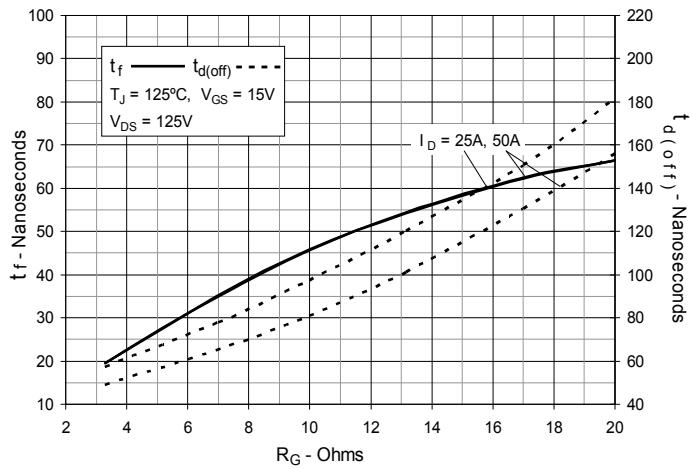
**Fig. 16. Resistive Turn-off
Switching Times vs. Junction Temperature**



**Fig. 17. Resistive Turn-off
Switching Times vs. Drain Current**



**Fig. 18. Resistive Turn-off
Switching Times vs. Gate Resistance**



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



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