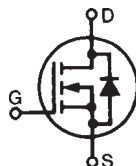


TrenchMV™ Power MOSFET

IXTA60N10T
IXTP60N10T

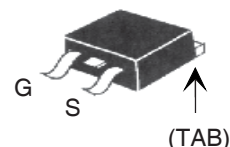
N-Channel Enhancement Mode
Avalanche Rated



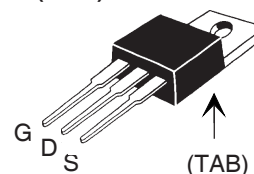
$$\begin{aligned} V_{DSS} &= 100V \\ I_{D25} &= 60A \\ R_{DS(on)} &\leq 18m\Omega \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ\text{C}$ to 175°C	100	V
V_{DGR}	$T_J = 25^\circ\text{C}$ to 175°C , $R_{GS} = 1M\Omega$	100	V
V_{GSM}	Transient	± 30	V
I_{D25}	$T_C = 25^\circ\text{C}$	60	A
I_{DM}	$T_C = 25^\circ\text{C}$, pulse width limited by T_{JM}	180	A
I_A	$T_C = 25^\circ\text{C}$	10	A
E_{AS}	$T_C = 25^\circ\text{C}$	500	mJ
P_D	$T_C = 25^\circ\text{C}$	176	W
T_J		-55 ... +175	$^\circ\text{C}$
T_{JM}		175	$^\circ\text{C}$
T_{stg}		-55 ... +175	$^\circ\text{C}$
T_L	1.6mm (0.062in.) from case for 10s	300	$^\circ\text{C}$
T_{SOLD}	Plastic body for 10 seconds	260	$^\circ\text{C}$
M_d	Mounting torque (TO-220)	1.13/10	Nm/lb.in
Weight	TO-263	2.5	g
	TO-220	3.0	g

TO-263 (IXTA)



TO-220 (IXTP)



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

Features

- International standard packages
- 175°C Operating Temperature
- Avalanche Rated
- Low $R_{DS(on)}$

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- High Current Switching Applications
- Distributed Power Architectures and VRMs
- Electronic Valve Train Systems
- High Voltage Synchronous Rectifier

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 50\mu A$	2.5		4.5 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 150^\circ\text{C}$			1 μA 100 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 25A$, Notes 1, 2		14.8	18 m Ω

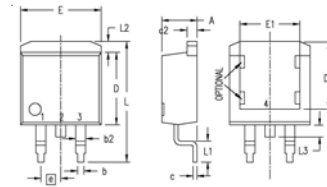
Symbol	Test Conditions	Characteristic Values		
(T _J = 25°C unless otherwise specified)		Min.	Typ.	Max.
g_{fs}	V _{DS} = 10V, I _D = 0.5 • I _{D25} , Note 1	25	42	S
C_{iss}	V _{GS} = 0V, V _{DS} = 25V, f = 1MHz		2650	pF
C_{oss}			335	pF
C_{rss}			60	pF
t_{d(on)}	Resistive Switching Times V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 10A R _G = 15Ω (External)		27	ns
t_r			40	ns
t_{d(off)}			43	ns
t_f			37	ns
Q_{g(on)}	V _{GS} = 10V, V _{DS} = 0.5 • V _{DSS} , I _D = 10A		49	nC
Q_{gs}			15	nC
Q_{gd}			11	nC
R_{thJC}	TO-220		0.50	0.85 °C/W
R_{thCH}				°C/W

Source-Drain Diode

Symbol	Test Conditions T _J = 25°C unless otherwise specified)	Characteristic Values			
		Min.	Typ.	Max.	
I _S	V _{GS} = 0V			60	A
I _{SM}	Repetitive, pulse width limited by T _{JM}			240	A
V _{SD}	I _F = 25A, V _{GS} = 0V, Note 1			1.2	V
t _{rr}	I _F = 0.5 • I _S , V _{GS} = 0V -di/dt = 100A/μs V _R = 0.5 • V _{DSS}		59		ns
I _{RM}			3.8		A
Q _{RM}			112		nC

- Notes: 1. Pulse test, t ≤ 300 μs; duty cycle, d ≤ 2%.
2. On through-hole packages, R_{DS(on)} Kelvin test contact location must be 5mm or less from the package body.

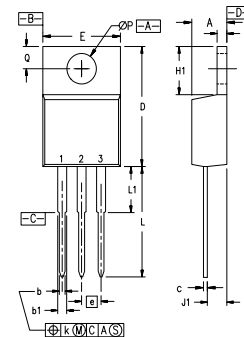
TO-263 (IXTA) Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4, TAB - Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

TO-220 (IXTP) Outline



Pins: 1 - Gate 2 - Drain
3 - Source 4, TAB - Drain

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.170	.190	4.32	4.83
b	.025	.040	0.64	1.02
b1	.045	.065	1.15	1.65
c	.014	.022	0.35	0.56
D	.580	.630	14.73	16.00
E	.390	.420	9.91	10.66
e	.100 BSC		2.54 BSC	
F	.045	.055	1.14	1.40
H1	.230	.270	5.85	6.85
J1	.090	.110	2.29	2.79
k	0	.015	0	0.38
L	.500	.550	12.70	13.97
L1	.110	.230	2.79	5.84
ØP	.139	.161	3.53	4.08
Q	.100	.125	2.54	3.18

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	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	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	

Fig. 1. Output Characteristics
@ 25°C

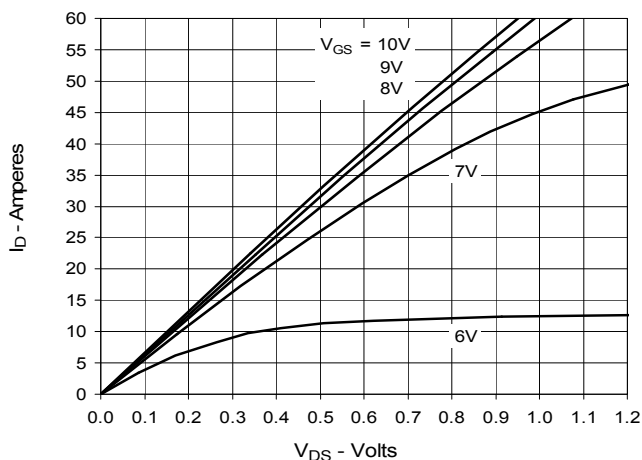


Fig. 2. Extended Output Characteristics
@ 25°C

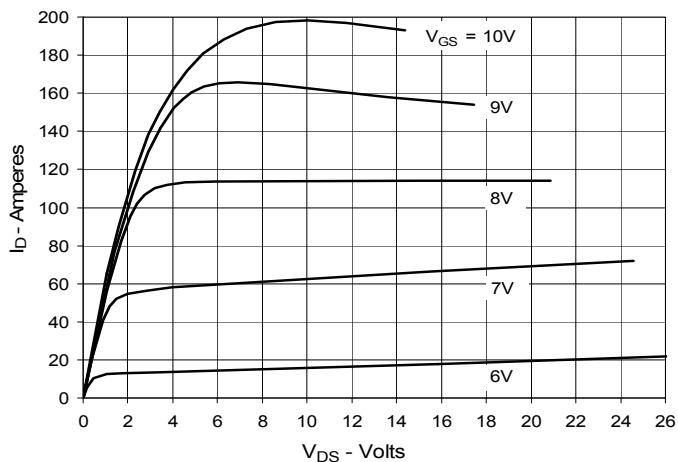


Fig. 3. Output Characteristics
@ 150°C

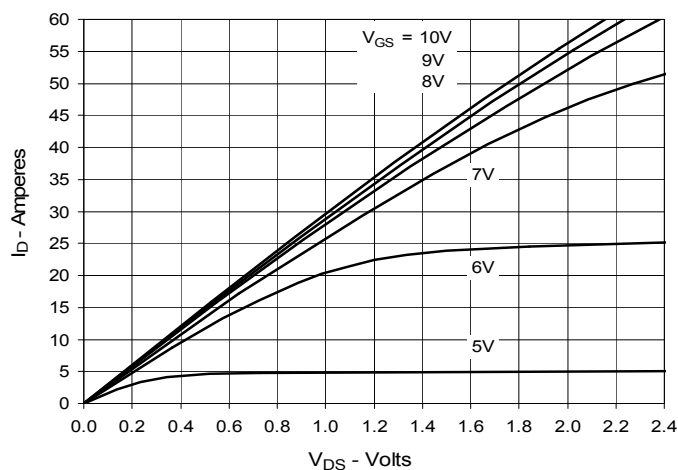


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 30A$ Value
vs. Junction Temperature

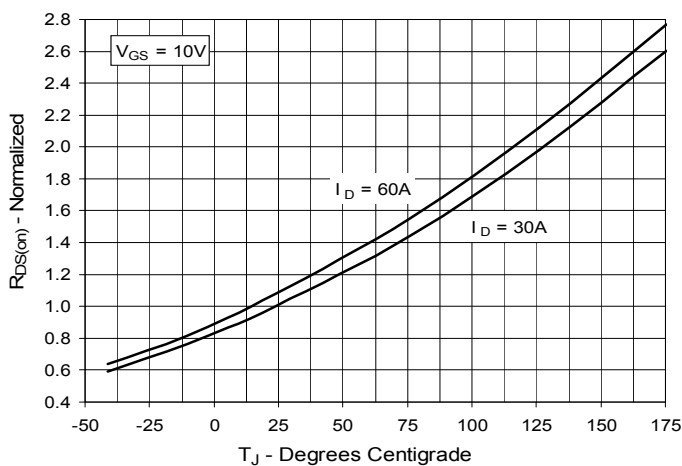


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 30A$ Value
vs. Drain Current

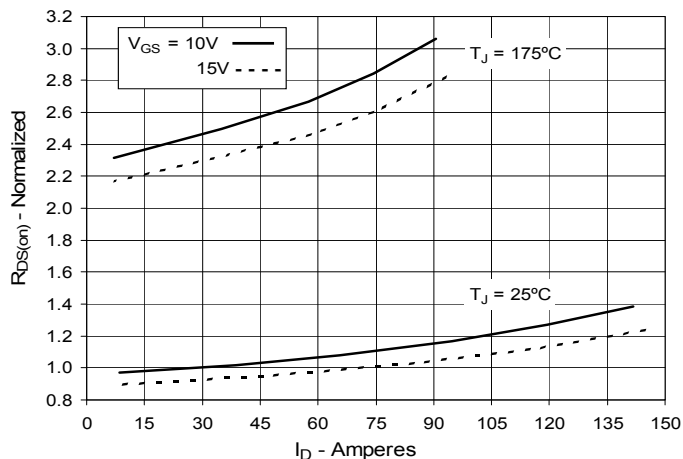


Fig. 6. Drain Current vs. Case Temperature

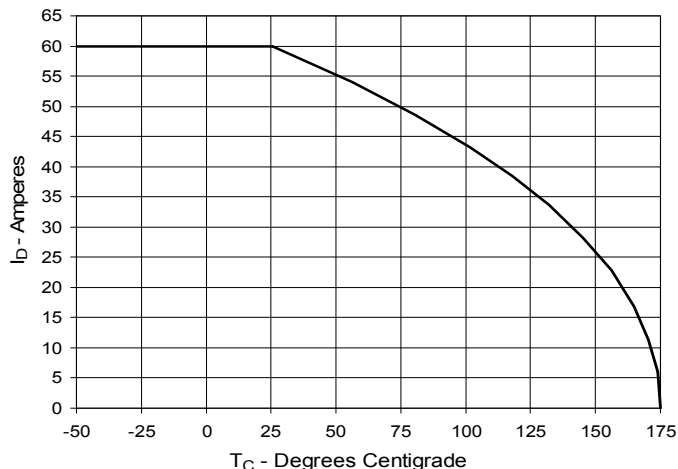


Fig. 7. Input Admittance

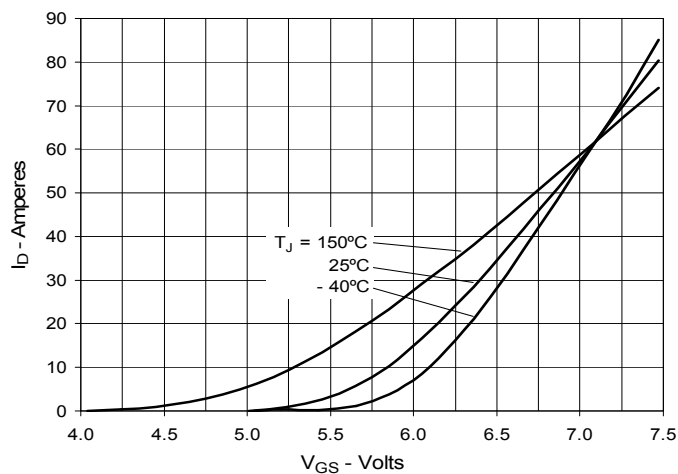


Fig. 8. Transconductance

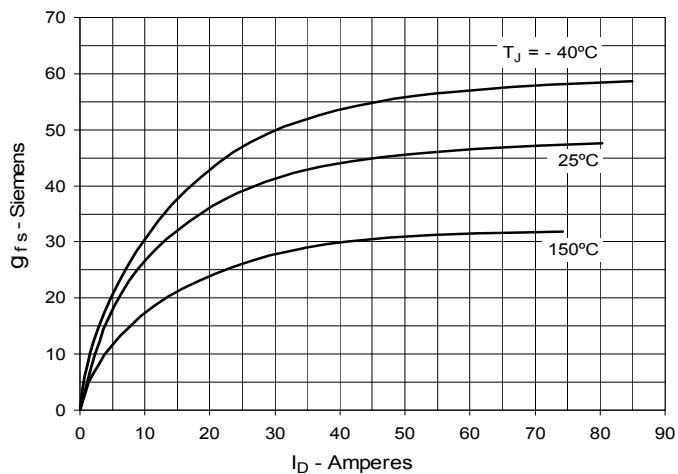


Fig. 9. Forward Voltage Drop of Intrinsic Diode

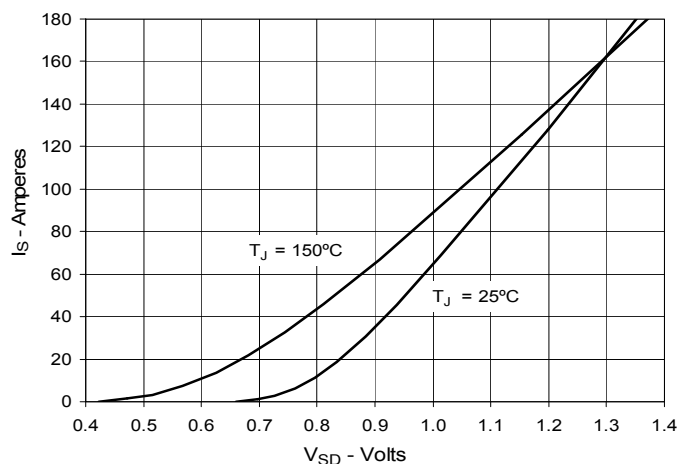


Fig. 10. Gate Charge

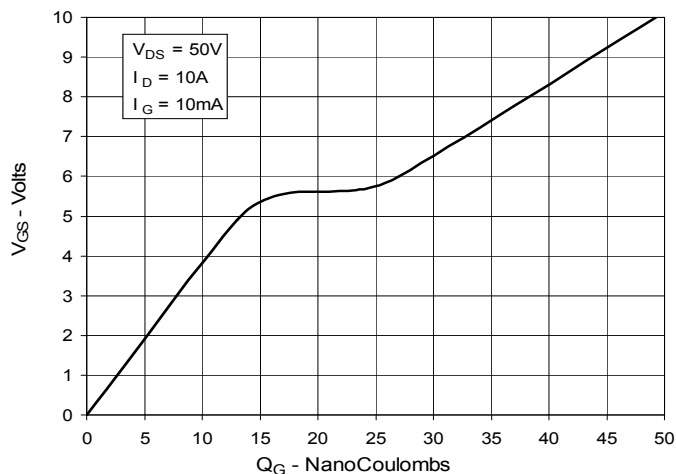


Fig. 11. Capacitance

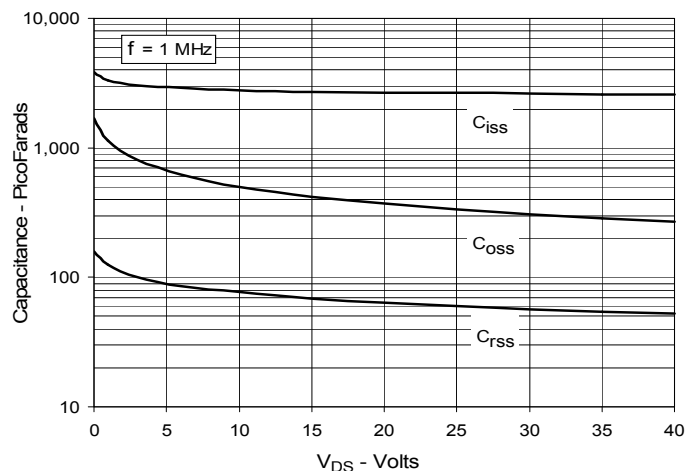
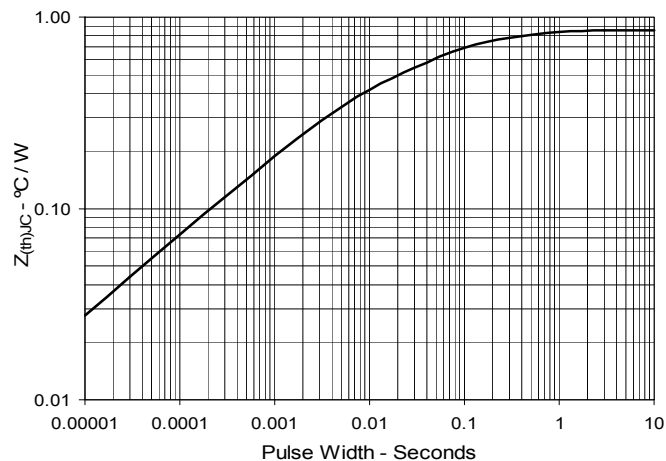
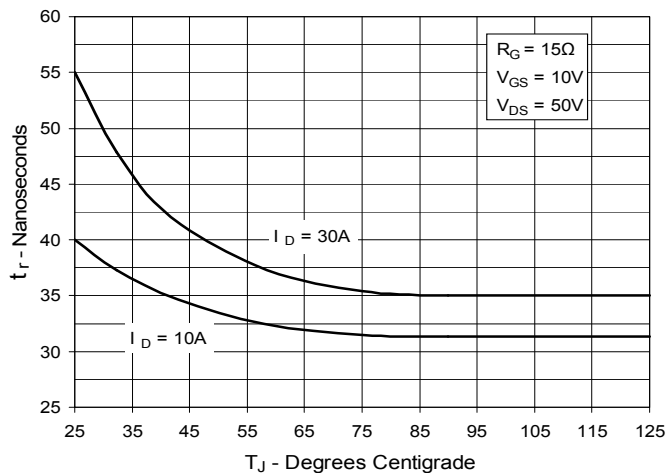
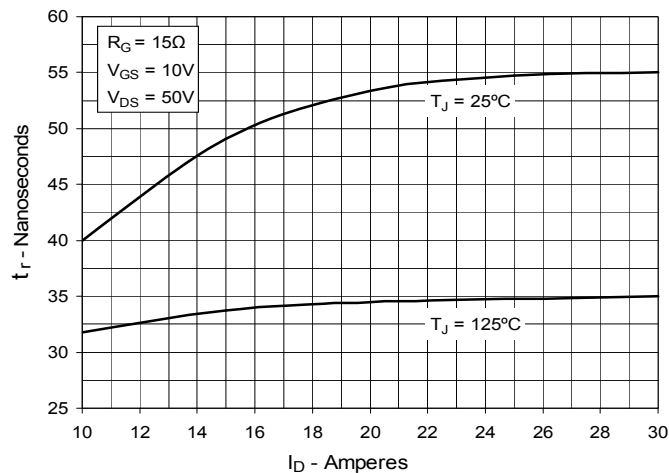
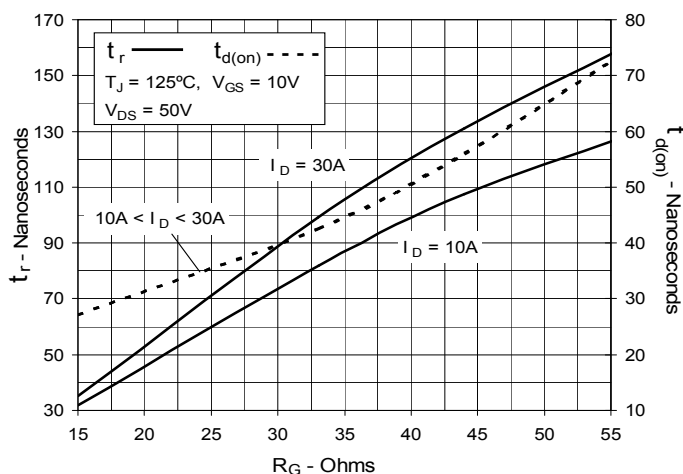
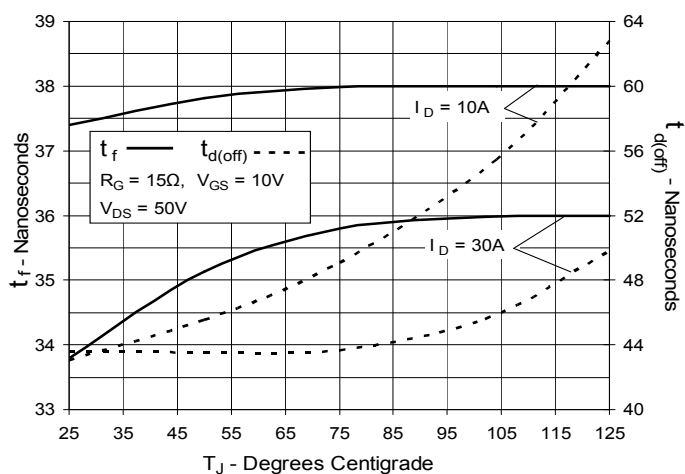
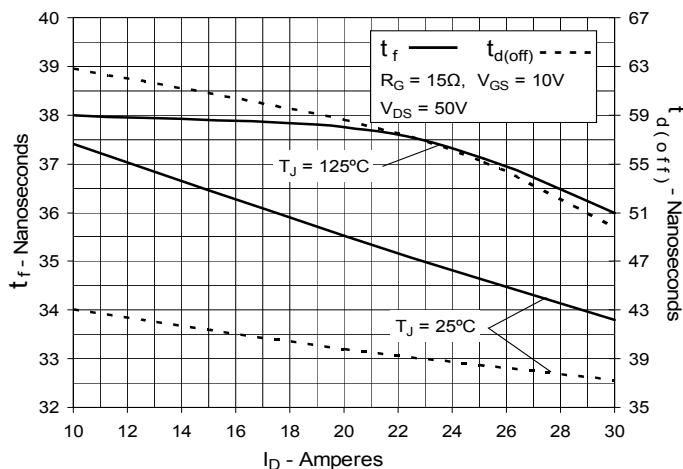
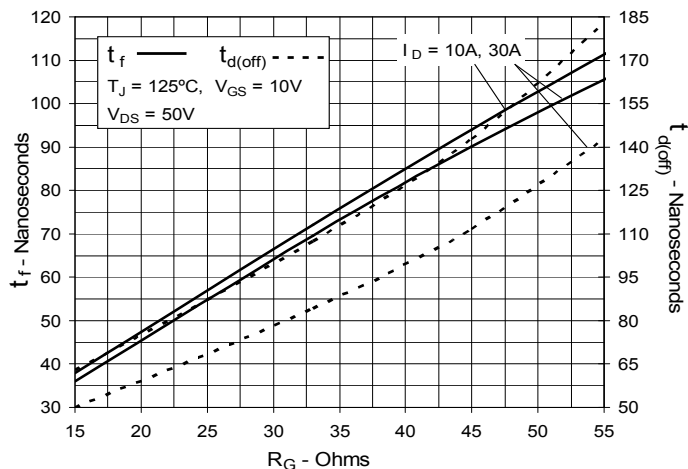


Fig. 12. Maximum Transient Thermal Impedance



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

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


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