



**THE DATASHEET OF
IXTY12N06T**

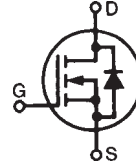


TrenchMV™ Power MOSFET

IXTU12N06T IXTY12N06T

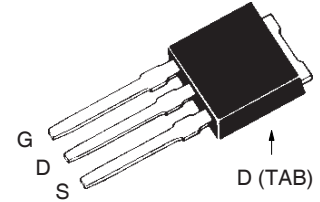
$V_{DSS} = 60V$
 $I_{D25} = 12A$
 $R_{DS(on)} \leq 85m\Omega$

N-Channel Enhancement Mode
Avalanche Rated

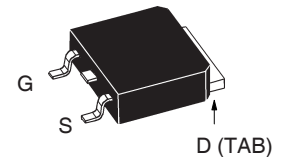


Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $175^\circ C$	60	V
V_{DGR}	$T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$	60	V
V_{GSM}	Transient	± 20	V
I_{D25}	$T_C = 25^\circ C$	12	A
I_{DM}	$T_C = 25^\circ C$, pulse width limited by T_{JM}	30	A
I_{LRMS}	Package Current Limit, RMS TO-252	25	A
I_{AR}	$T_C = 25^\circ C$	3	A
E_{AS}	$T_C = 25^\circ C$	20	mJ
P_D	$T_C = 25^\circ C$	33	W
T_J		-55 ... +175	$^\circ C$
T_{JM}		175	$^\circ C$
T_{stg}		-55 ... +175	$^\circ C$
T_L	Maximum lead temperature for soldering	300	$^\circ C$
T_{SOLD}	1.6 mm (0.062 in.) from case for 10s	260	$^\circ C$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight	TO-251	0.40	g
	TO-252	0.35	g

TO-251 (IXTU)



TO-252 (IXTY)



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

Features

- Ultra-low On Resistance
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
 - easy to drive and to protect
- 175 $^\circ C$ Operating Temperature

Advantages

- Easy to mount
- Space savings
- High power density

Applications

- Automotive
 - Motor Drives
 - 42V Power Bus
 - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary Switch for 24V and 48V Systems
- High Current Switching Applications

Symbol	Test Conditions ($T_J = 25^\circ C$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	60		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 25\mu A$	2.0		4.0 V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 50 nA
I_{DSS}	$V_{DS} = V_{DSS}$ $V_{GS} = 0V$ $T_J = 150^\circ C$			1 μA 100 μA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 0.5 \cdot I_{D25}$, Notes 1, 2			85 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 0.5 \cdot I_{D25}, \text{Notes 1}$	2.9	4.7	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		256	pF
C_{oss}			46	pF
C_{rss}			10.4	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 6\text{A}$ $R_G = 50\Omega$ (External)		12	ns
t_r			29	ns
$t_{d(off)}$			29	ns
t_f			18	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 6\text{A}$		3.4	nC
Q_{gs}			1.0	nC
Q_{gd}			0.9	nC
R_{thJC}				4.5 $^\circ\text{C/W}$

Source-Drain Diode		Characteristic Values		
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, unless otherwise specified)	Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			12 A
I_{SM}	Repetitive, pulse width limited by T_{JM}			48 A
V_{SD}	$I_F = 6\text{A}, V_{GS} = 0\text{V}, \text{Note 1}$			1.2 V
t_{rr}	$I_F = 6\text{A}, V_{GS} = 0\text{V}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 30\text{V}$		30	ns
I_{RM}			1.34	A

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

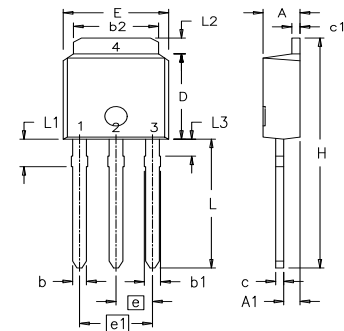
PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

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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

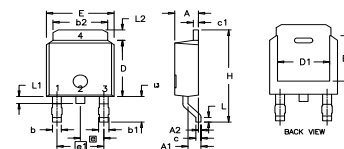
TO-251 (IXTU) Outline



1. Gate 2. Drain
3. Source 4. Drain

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.19	2.38	.086	.094
A1	0.89	1.14	0.35	.045
b	0.64	0.89	.025	.035
b1	0.76	1.14	.030	.045
b2	5.21	5.46	.205	.215
c	0.46	0.58	.018	.023
c1	0.46	0.58	.018	.023
D	5.97	6.22	.235	.245
E	6.35	6.73	.250	.265
e	2.28	BSC	.090	BSC
e1	4.57	BSC	.180	BSC
H	17.02	17.78	.670	.700
L	8.89	9.65	.350	.380
L1	1.91	2.28	.075	.090
L2	0.89	1.27	.035	.050

TO-252 (IXTY) Outline



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

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
A2	0	0.13	0	0.005
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.32	5.21	0.170	0.205
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	2.28	BSC	0.090	BSC
e1	4.57	BSC	0.180	BSC
H	9.40	10.42	0.370	0.410
L	0.51	1.02	0.020	0.040
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	2.54	2.92	0.100	0.115

Fig. 1. Output Characteristics @ 25°C

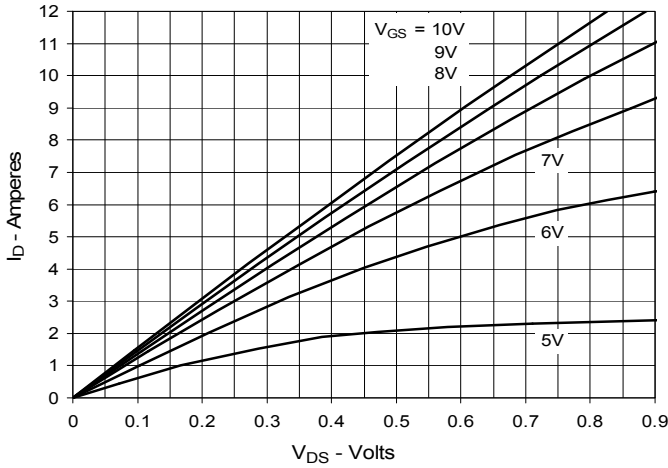


Fig. 2. Extended Output Characteristics @ 25°C

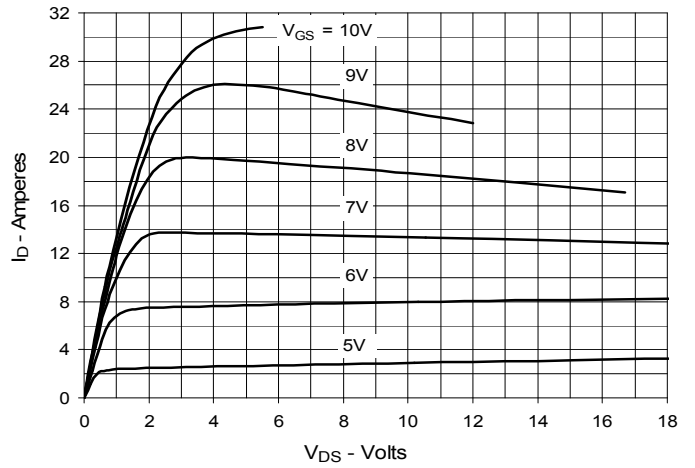


Fig. 3. Output Characteristics @ 150°C

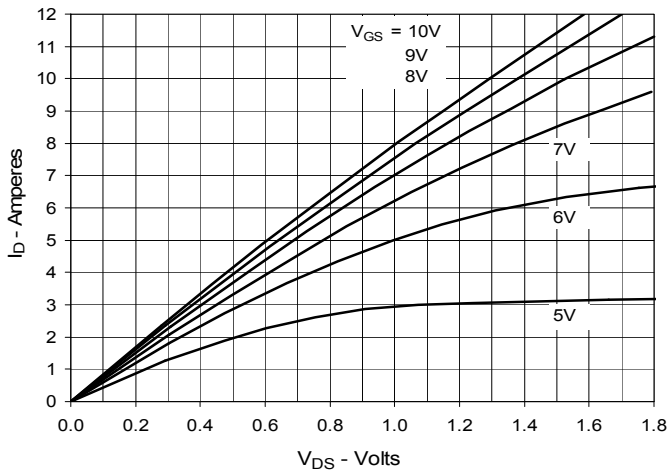


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 6A$ Value vs. Junction Temperature

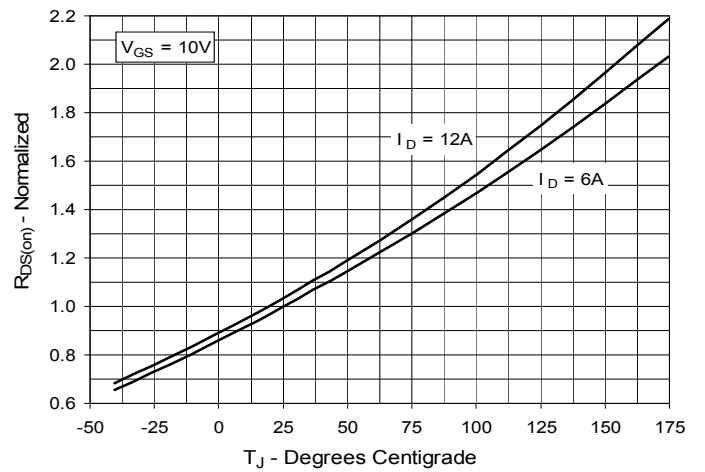


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 6A$ Value vs. Drain Current

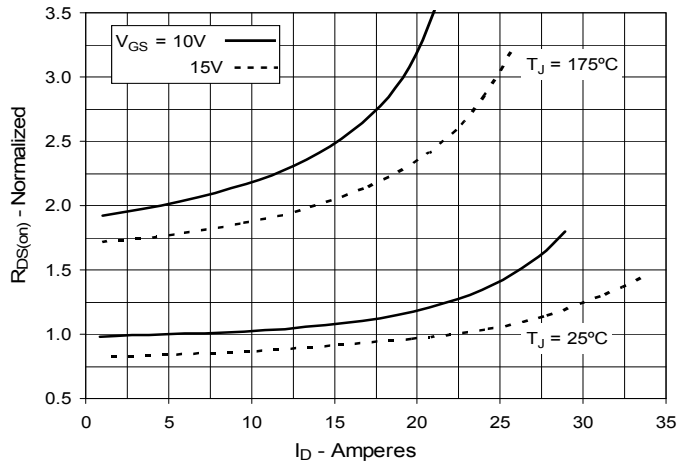


Fig. 6. Drain Current vs. Case Temperature

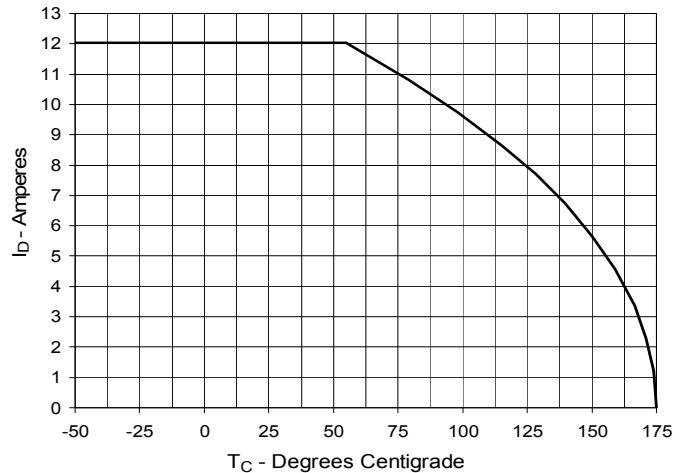


Fig. 7. Input Admittance

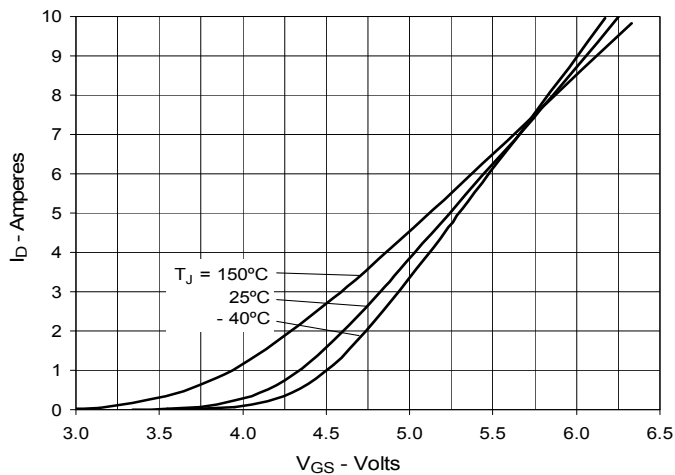


Fig. 8. Transconductance

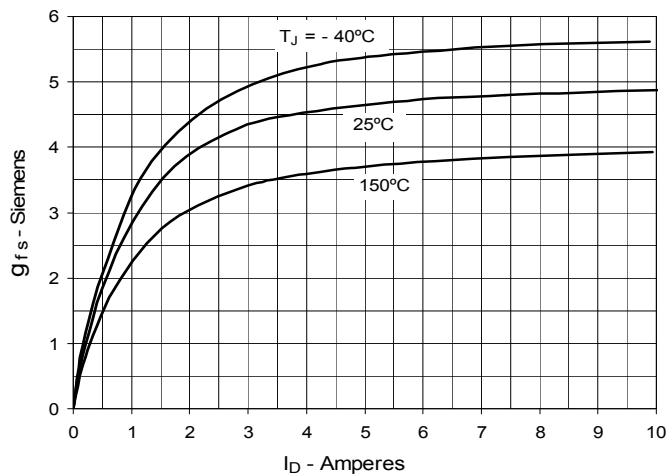


Fig. 9. Forward Voltage Drop of Intrinsic Diode

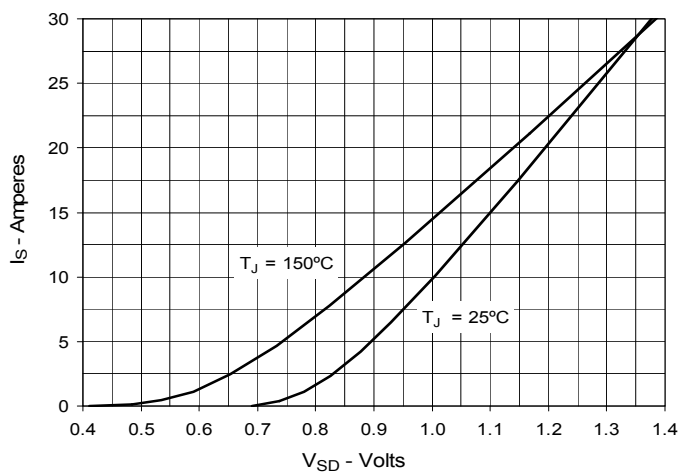


Fig. 10. Gate Charge

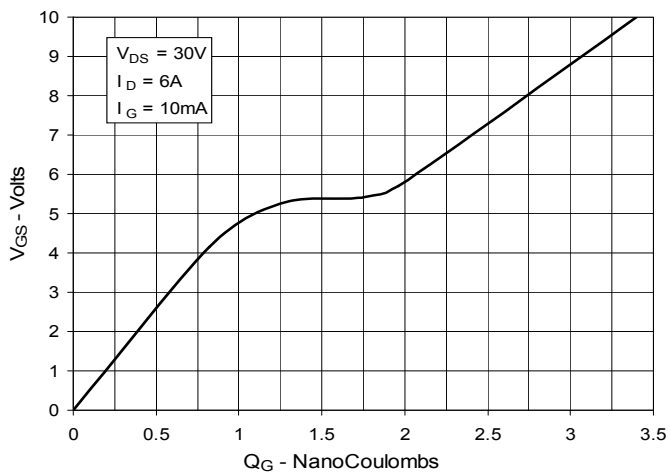


Fig. 11. Capacitance

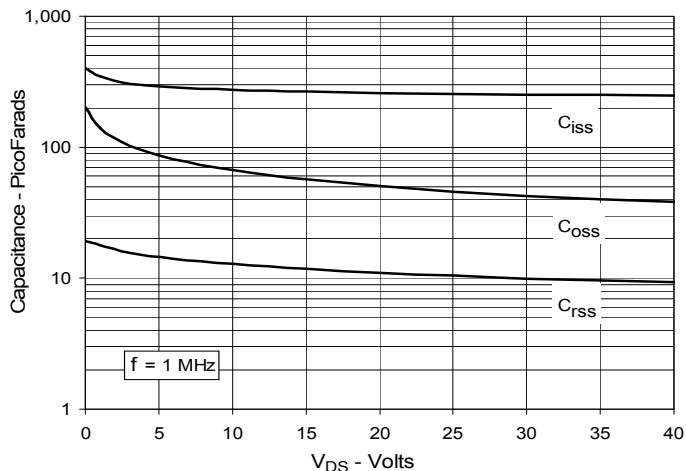


Fig. 12. Maximum Transient Thermal Impedance

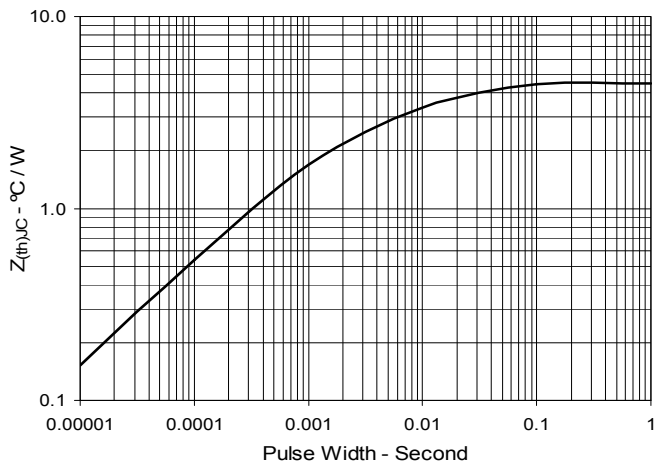


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

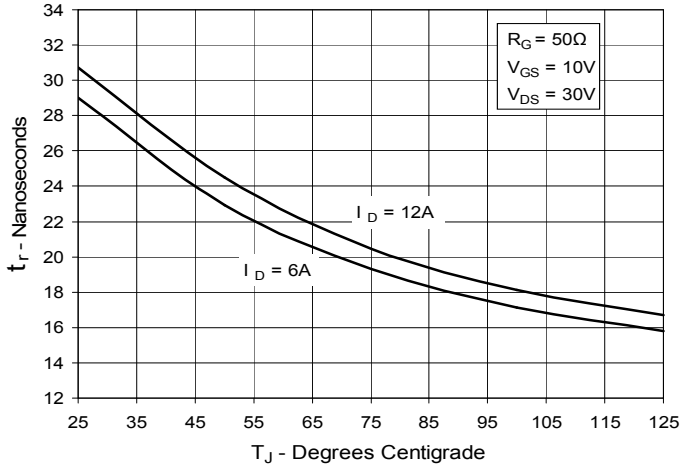


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

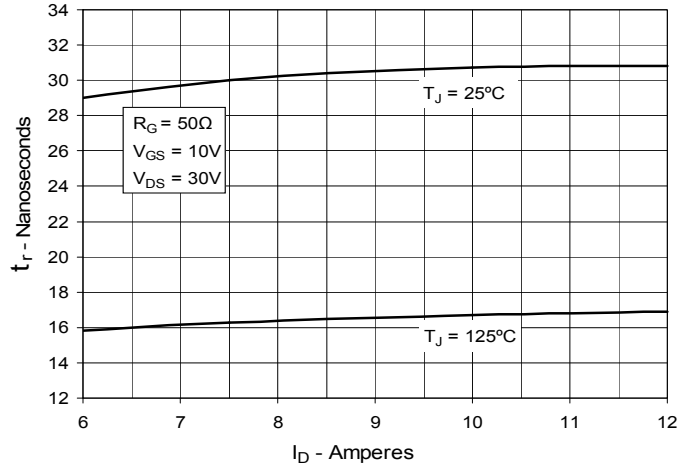


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

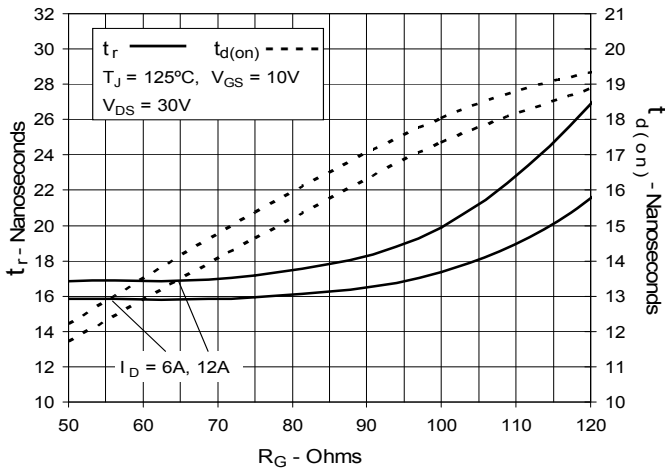


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

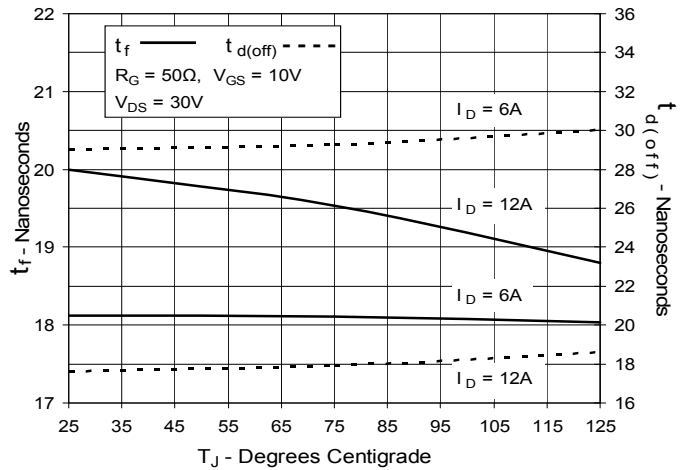


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

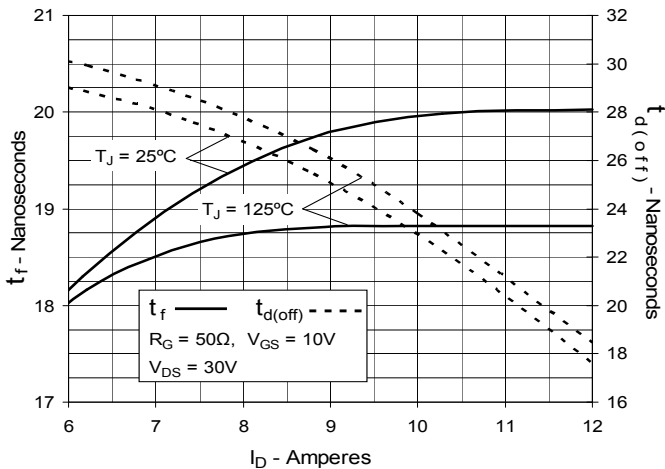
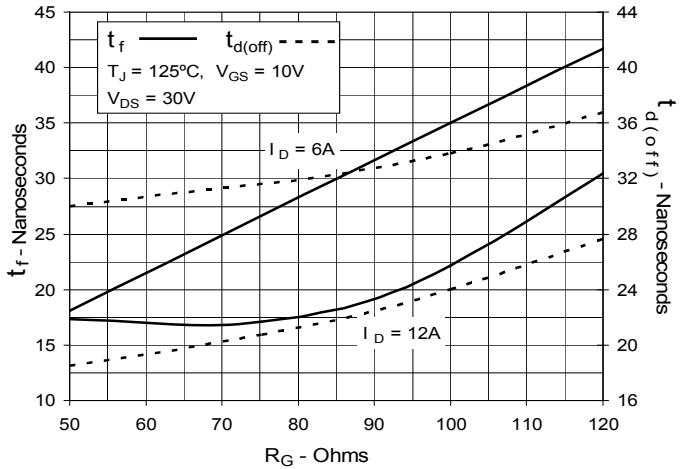


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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