IXYS

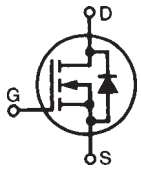
Preliminary Technical Information

TrenchMV™ Power MOSFET

IXTA182N055T7

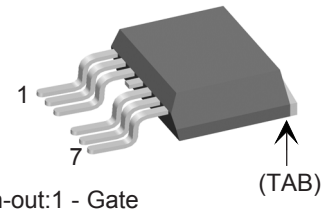
V_{DSS} = 55 V
I_{D25} = 182 A
$R_{DS(on)}$ ≤ 5.0 mΩ

N-Channel Enhancement Mode
Avalanche Rated



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25° C to 175° C	55	V
V_{DGR}	T_J = 25° C to 175° C; R_{GS} = 1 MΩ	55	V
V_{GSM}	Transient	± 20	V
I_{D25}	T_C = 25° C	182	A
I_{LRMS}	Package Current Limit, RMS	160	A
I_{DM}	T_C = 25° C, pulse width limited by T_{JM}	490	A
I_{AR}	T_C = 25° C	25	A
E_{AS}	T_C = 25° C	1.0	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$ $T_J \le$175° C, R_G = 5 Ω	3	V/ns
P_D	T_C = 25° C	360	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 seconds	260	°C
Weight		3	g

TO-263 (7-lead) (IXTA..7)



Pin-out: 1 - Gate
2, 3 - Source
4 - NC (cut)
5,6,7 - Source
TAB (8) - Drain

Symbol (T_J = 25° C unless otherwise specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	55			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250 μA	2.0		4.0	V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0 V			± 100	nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V			5	μA
	T_J = 150° C			250	μA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = 25 A, Note 1		3.5	5.0	mΩ

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

Advantages
- Easy to mount
- Space savings
- High power density

Applications
- Automotive
  - Motor Drives
  - High Side Switch
  - 12V Battery
  - ABS Systems
- DC/DC Converters and Off-line UPS
- Primary- Side Switch
- High Current Switching Applications

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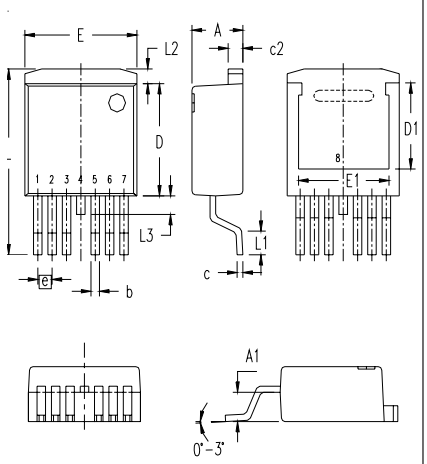
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 60 A, Note 1	65	100		S
C_{iss}			4850		pF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		954		pF
C_{rss}			212		pF
$t_{d(on)}$	**Resistive Switching Times**		36		ns
t_r	V_{GS} = 10 V, V_{DS} = 30 V, I_D = 25 A		35		ns
$t_{d(off)}$	R_G = 5 Ω (External)		53		ns
t_f			38		ns
$Q_{g(on)}$			114		nC
Q_{gs}	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 25 A		30		nC
Q_{gd}			32		nC
R_{thJC}				0.42	°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			182	A
I_{SM}	Pulse width limited by T_{JM}			490	A
V_{SD}	I_F = 25 A, V_{GS} = 0 V, Note 1			1.0	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/μs V_R = 25 V, V_{GS} = 0 V		70		ns

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

TO-263 (7-lead) (IXTA...7) Outline



Pins: 1 - Gate
2, 3 - Source
4 - Drain
5,6,7 - Source
Tab (8) - Drain

SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.170	.185	4.30	4.70
A1	.085	.104	2.15	2.65
b	.026	.035	0.65	0.90
c	.016	.024	0.40	0.60
c2	.049	.055	1.25	1.40
D	.355	.370	9.00	9.40
D1	.272	.280	6.90	7.10
E	.386	.402	9.80	10.20
E1	.311	.319	7.90	8.10
e	.050 BSC		1.27BSC	
L	.591	.614	15.00	15.60
L1	.091	.110	2.30	2.80
L2	.039	.059	1.00	1.50
L3	.000	.059	0.00	1.50

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.

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

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405B2 6,710,463 6,727,585 6,759,692 6771478 B2 7,005,734 B2 7,063,975 B2 7,071,537

Fig. 1. Output Characteristics @ 25ºC

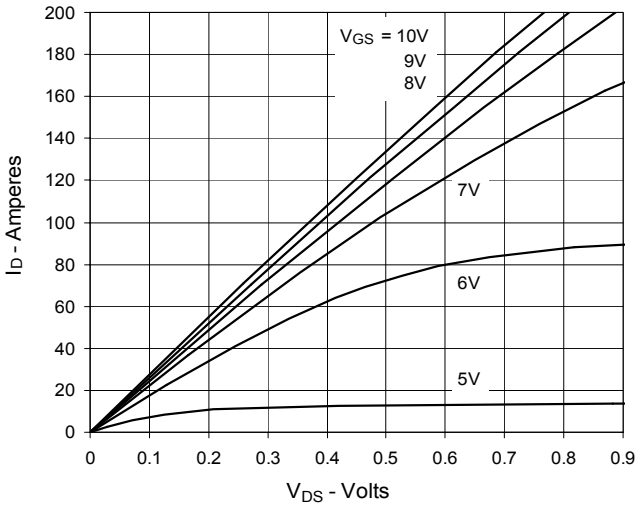


Fig. 2. Extended Output Characteristics @ 25ºC

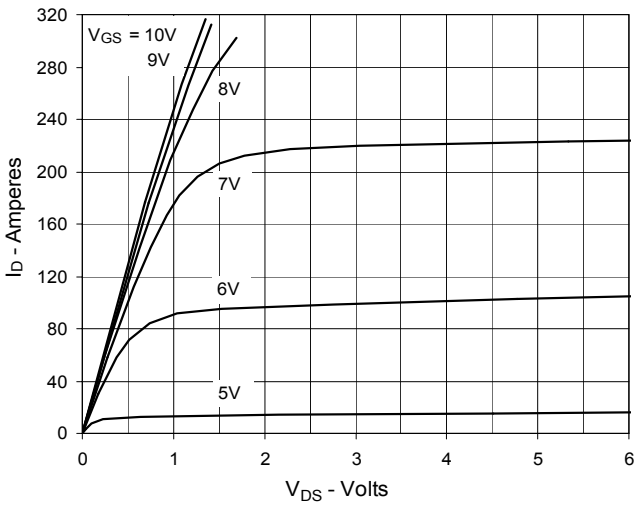


Fig. 3. Output Characteristics @ 150ºC

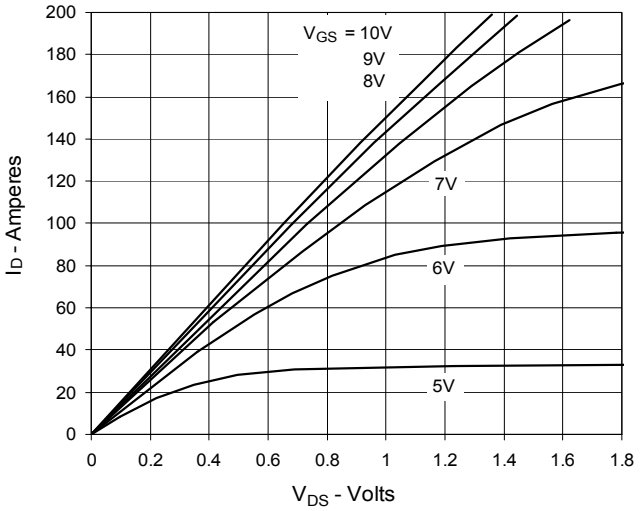


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 91A Value vs. Junction Temperature

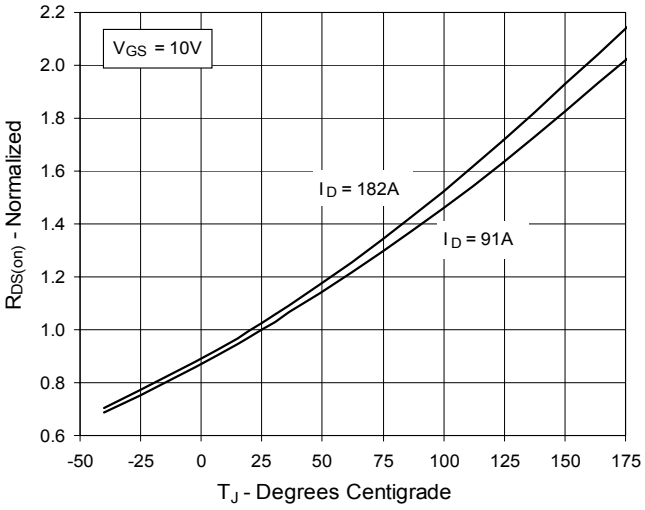


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 91A Value vs. Drain Current

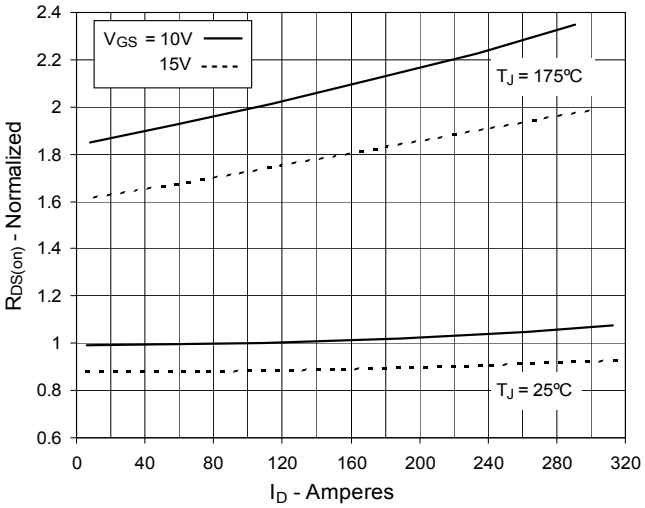
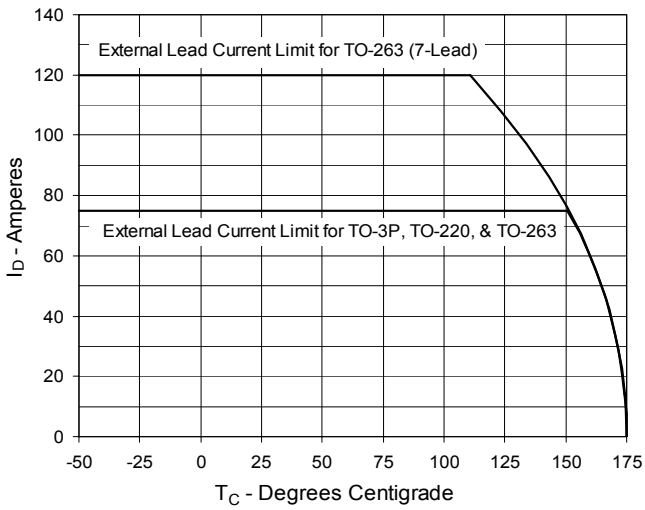


Fig. 6. Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

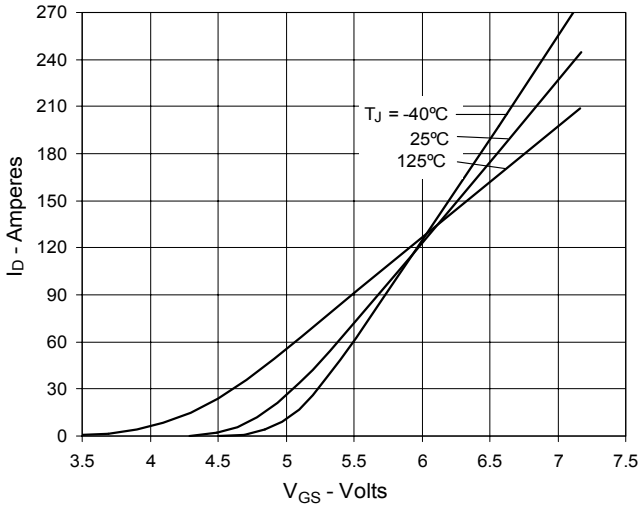


Fig. 8. Transconductance

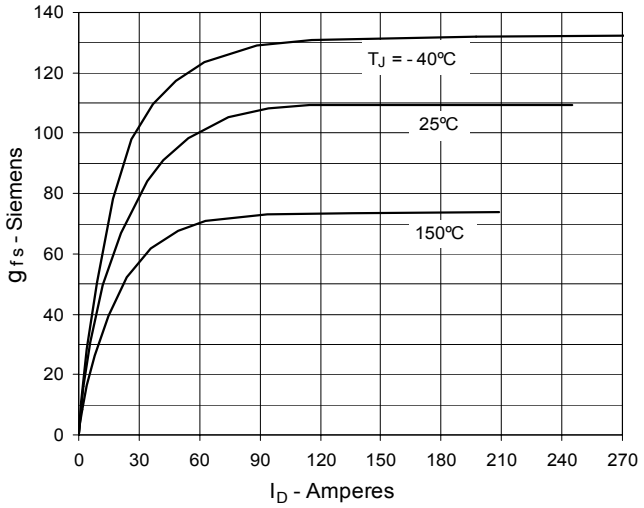


Fig. 9. Forward Voltage Drop of Intrinsic Diode

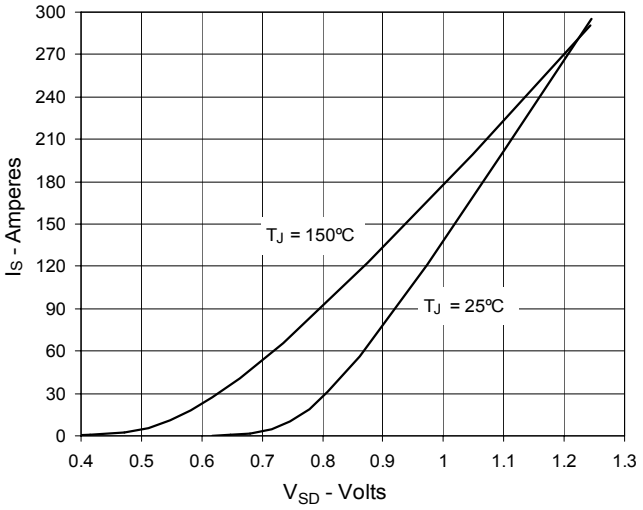


Fig. 10. Gate Charge

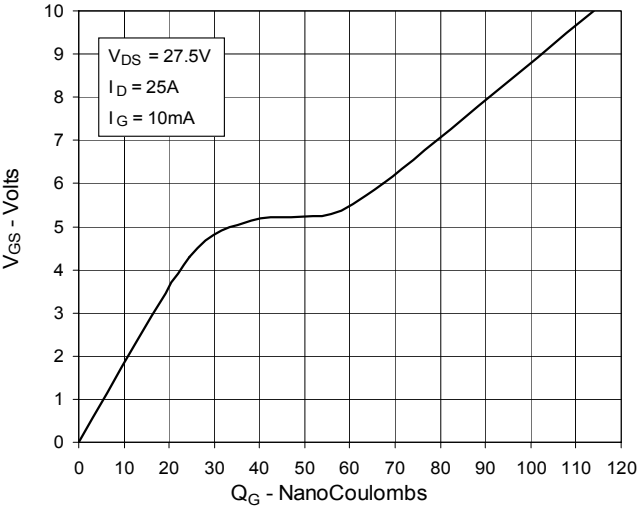


Fig. 11. Capacitance

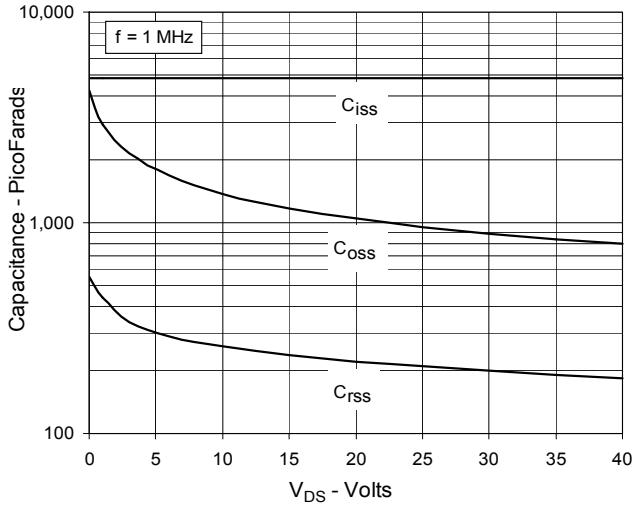
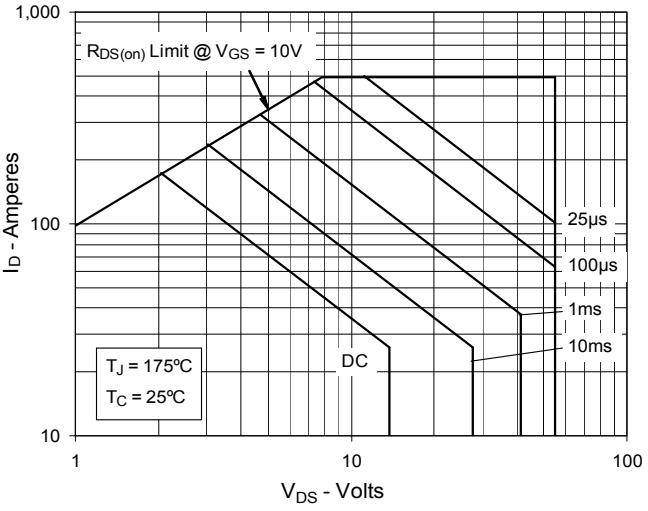


Fig. 12. Forward-Bias Safe Operating Area



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

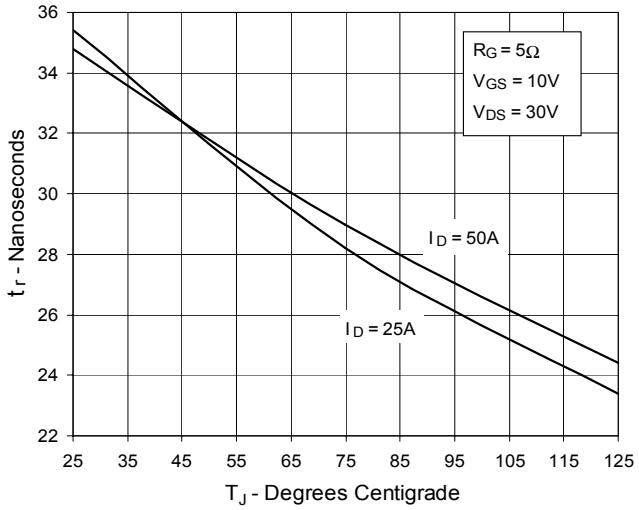


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

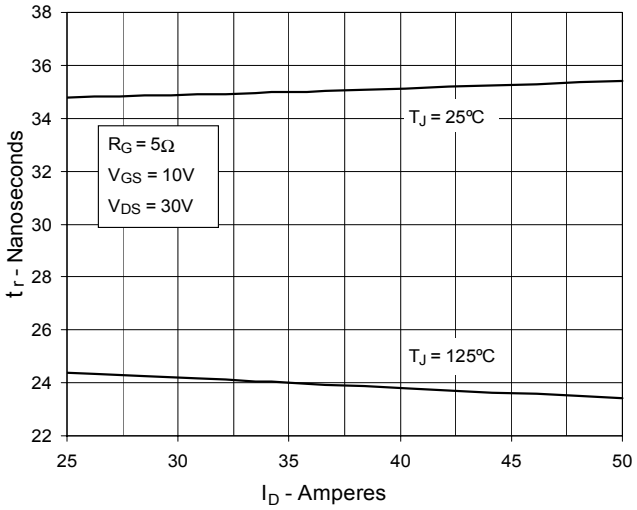


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

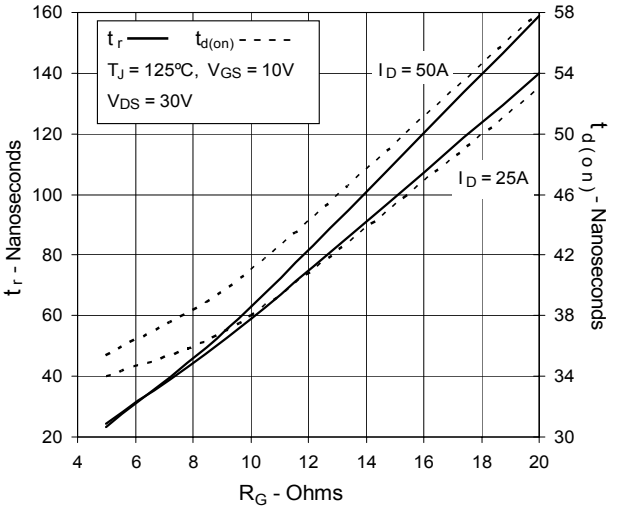


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

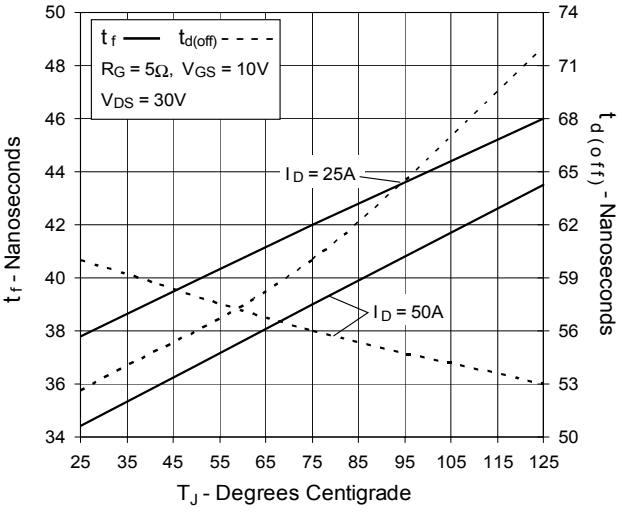


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

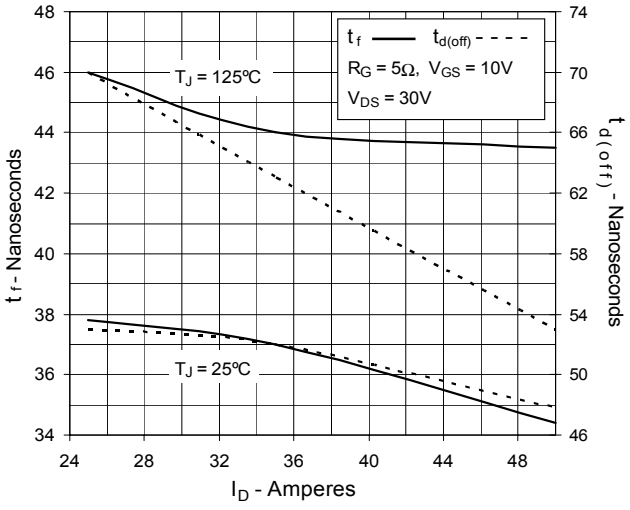
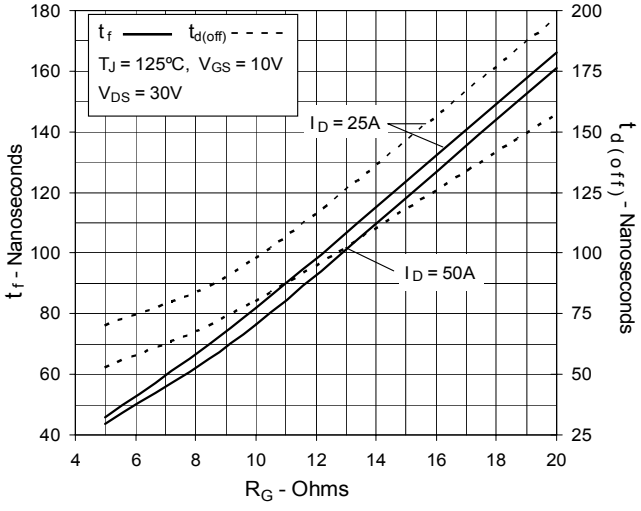
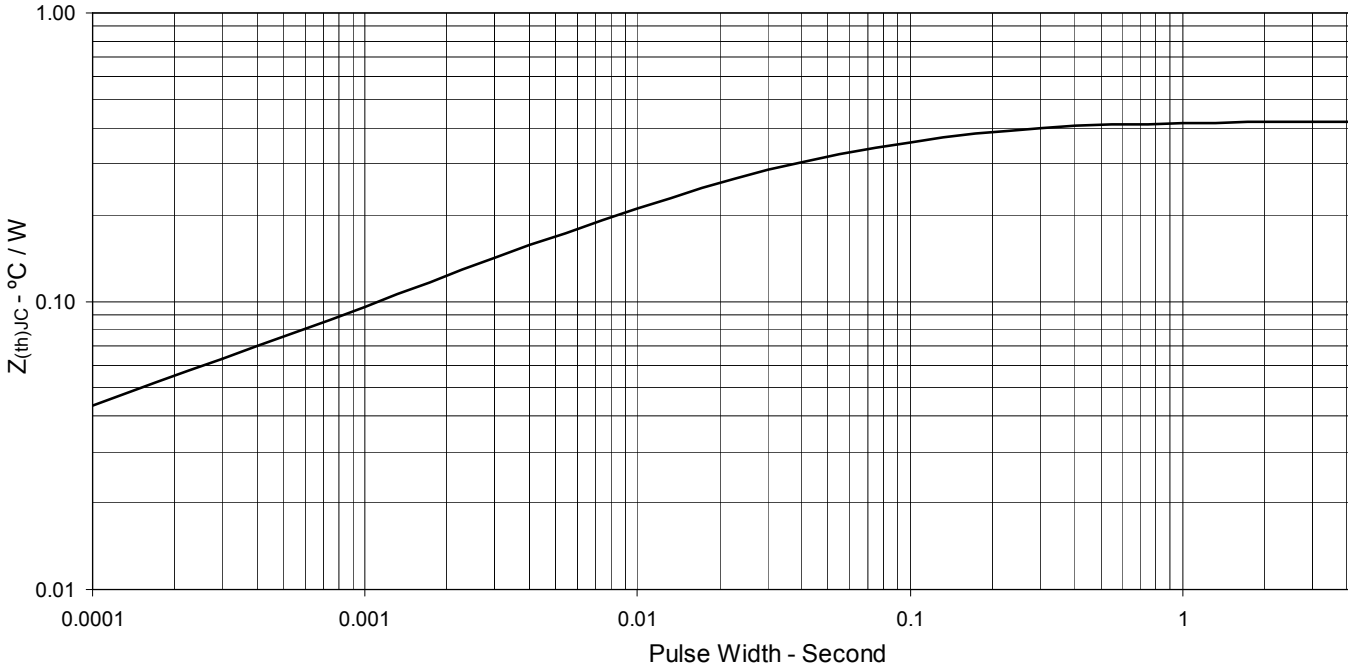


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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Fig. 19. Maximum Transient Thermal Impedance



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