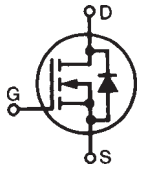
IXYS

TrenchT2™ Power MOSFETs

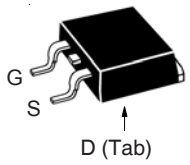
IXTA80N12T2
IXTP80N12T2

V_{DSS} = 120V
I_{D25} = 80A
$R_{DS(on)}$ ≤ 17mΩ

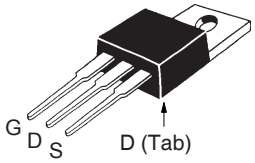
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier



TO-263AA (IXTA)



TO-220AB (IXTP)



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

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	120	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	120	V
V_{GSS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	80	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	200	A
I_A	T_C = 25°C	40	A
E_{AS}	T_C = 25°C	400	mJ
P_D	T_C = 25°C	325	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
M_d	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-263	2.5	g
	TO-220	3.0	g

Symbol (T_J = 25°C Unless Otherwise Specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	120			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 100μA	2.5		4.5	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			5	μA
	T_J = 150°C			175	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Notes 1, 2			17	mΩ

Features

- International Standard Packages
- 175°C Operating Temperature
- Avalanche Rated
- Low $R_{DS(on)}$
- Fast Intrinsic Rectifier
- High Current Handling Capability

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- Synchronous Rectification
- DC/DC Converters and Off-Line UPS
- Primary- Side Switch
- High Current Switching Applications

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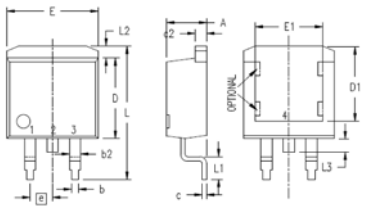
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	36	60		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		4740		pF
C_{oss}			415		pF
C_{rss}			66		pF
$t_{d(on)}$	**Resistive Switching Times**		21		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		14		ns
$t_{d(off)}$	R_G = 10Ω (External)		39		ns
t_f			28		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		80		nC
Q_{gs}			23		nC
Q_{gd}			20		nC
R_{thJC}				0.46	°C/W
R_{thCH}	TO-220		0.50		°C/W

Source-Drain Diode

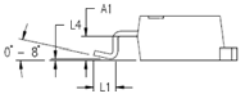
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			80	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			320	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.3	V
t_{rr}	I_F = 0.5 • I_{D25}, V_{GS} = 0V		90		ns
I_{RM}	-di/dt = 100A/μs		4		A
Q_{RM}	V_R = 60V		180		nC

Notes: 1. Pulse test, t ≤ 300μs, 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 Outline

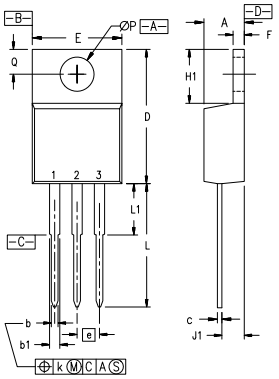


Pins:
1 - Gate
2,4 - Drain
3 - Source



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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 Outline



Pins: 1 - Gate 2 - Drain
3 - Source

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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 4,860,072 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 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25ºC

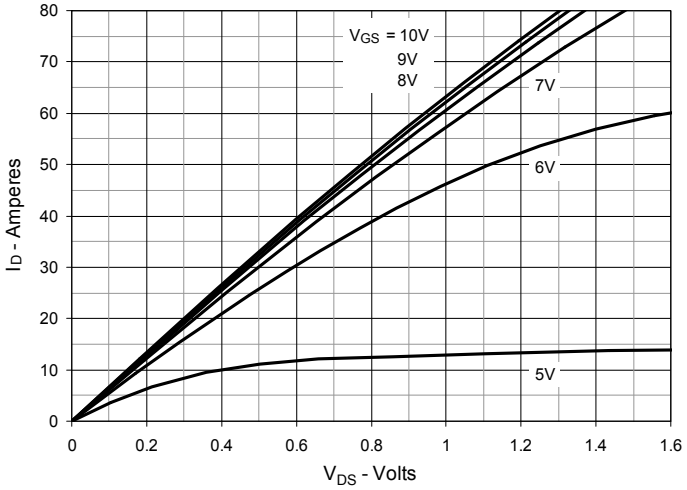


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

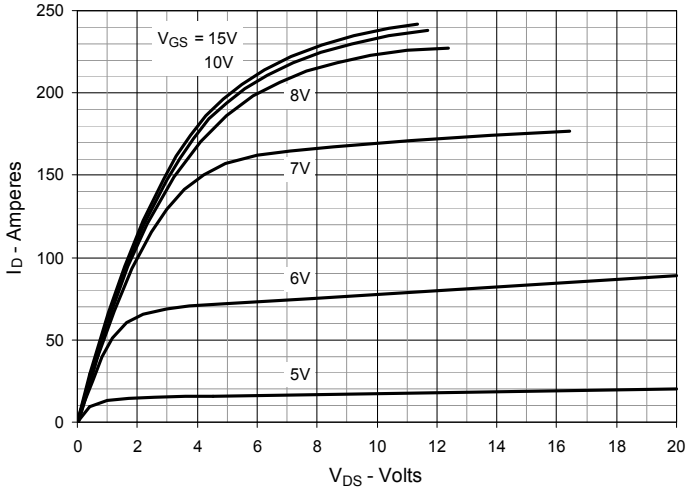


Fig. 3. Output Characteristics @ T_J = 150ºC

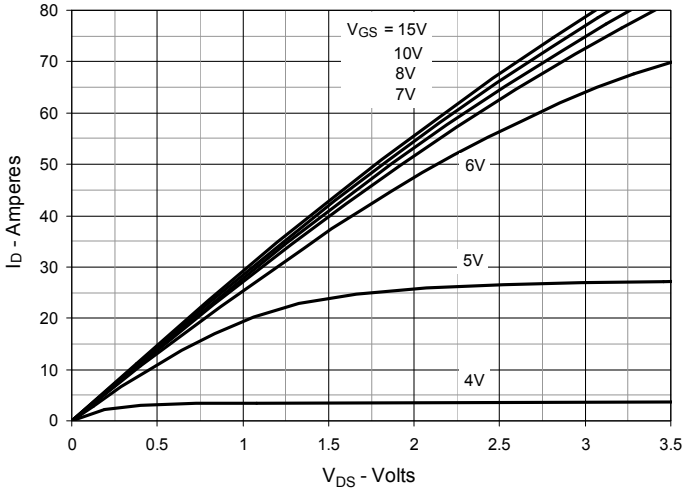


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Junction Temperature

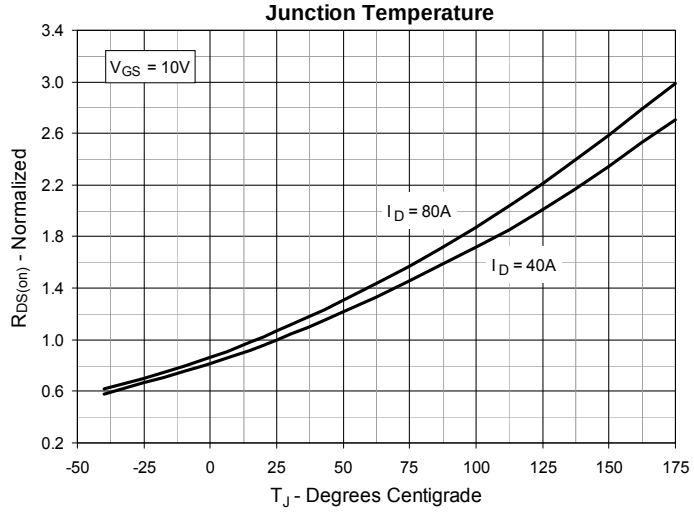


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 40A Value vs. Drain Current

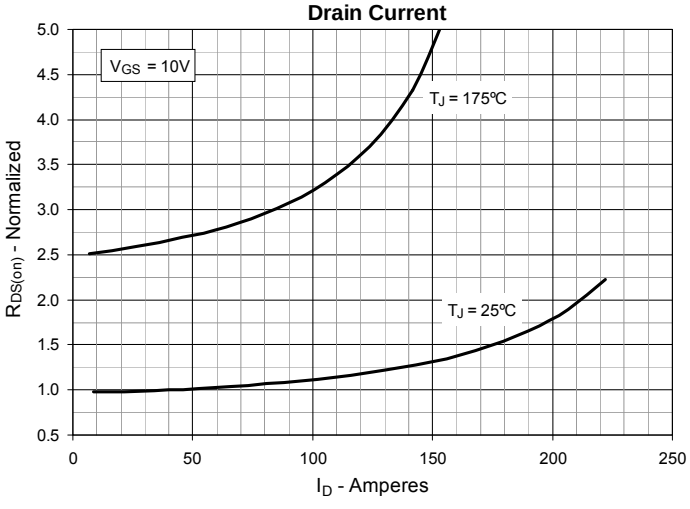
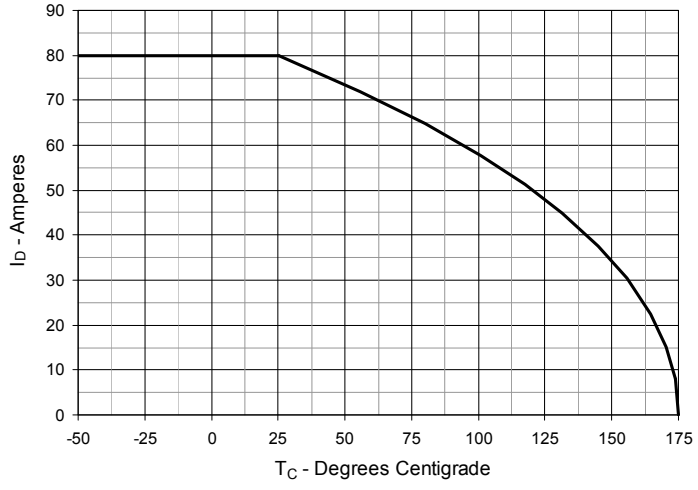


Fig. 6. Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

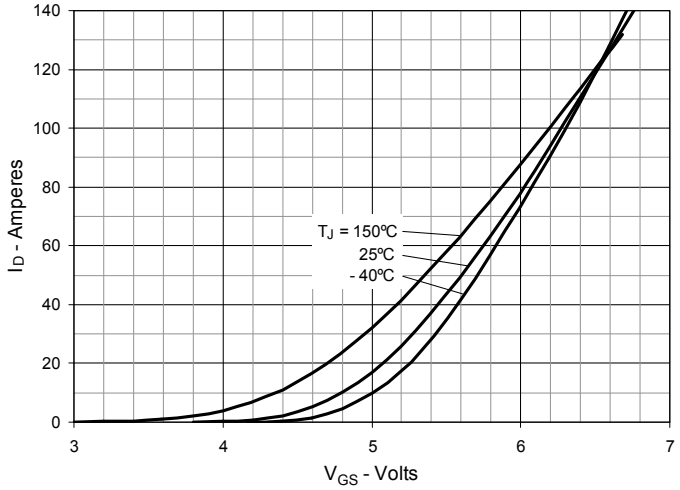


Fig. 8. Transconductance

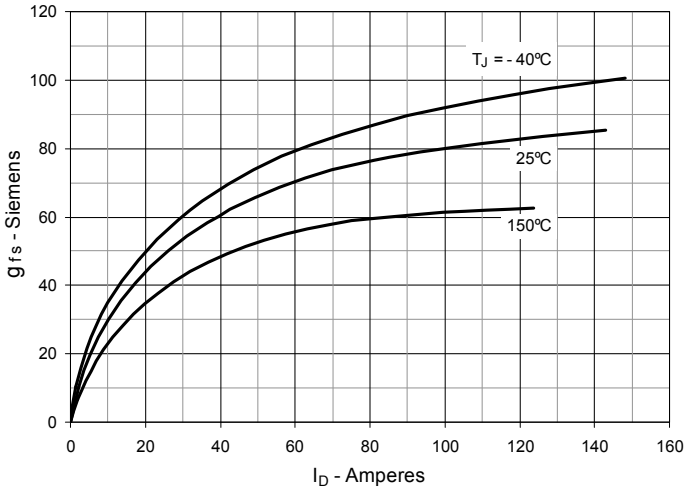


Fig. 9. Forward Voltage Drop of Intrinsic Diode

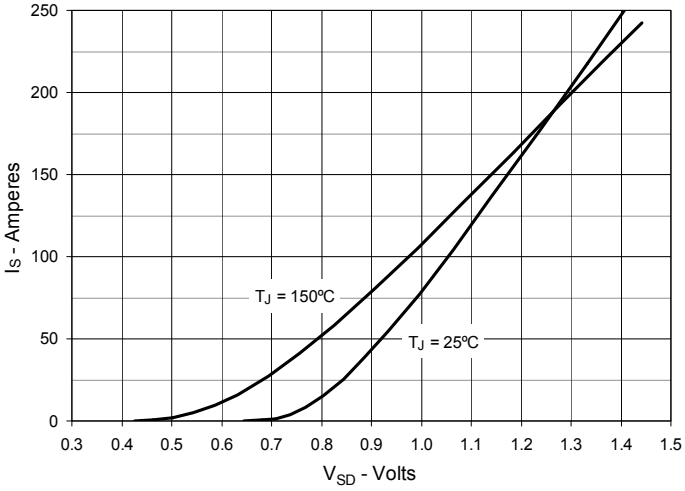


Fig. 10. Gate Charge

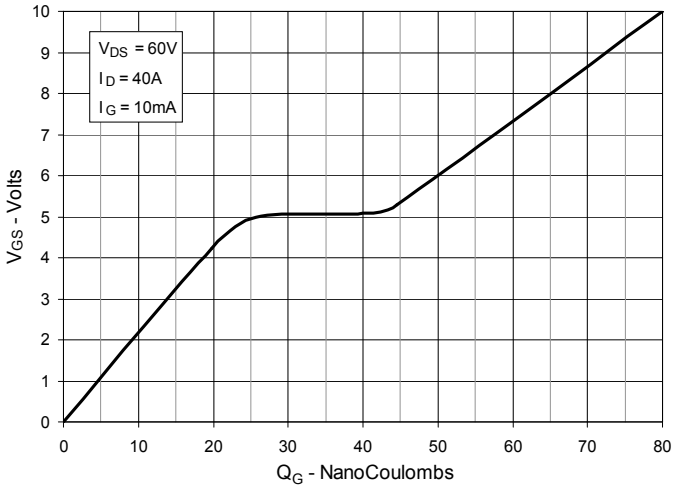


Fig. 11. Capacitance

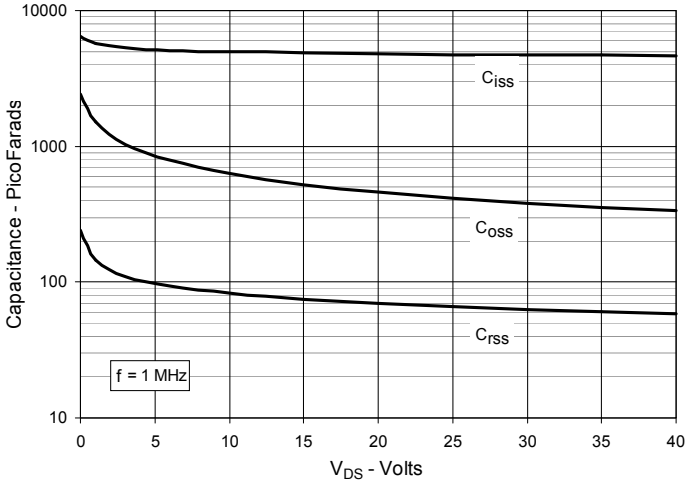
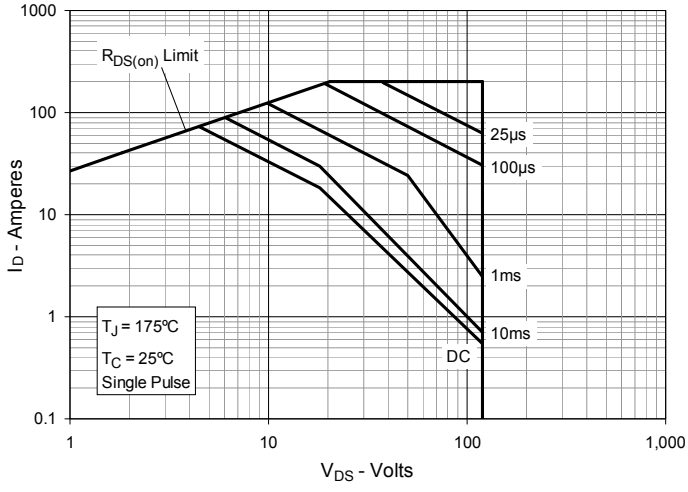


Fig. 12. Forward-Bias Safe Operating Area



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

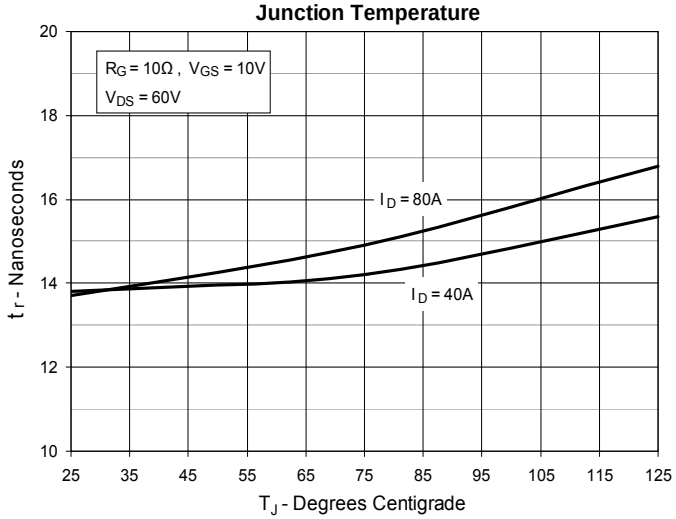


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

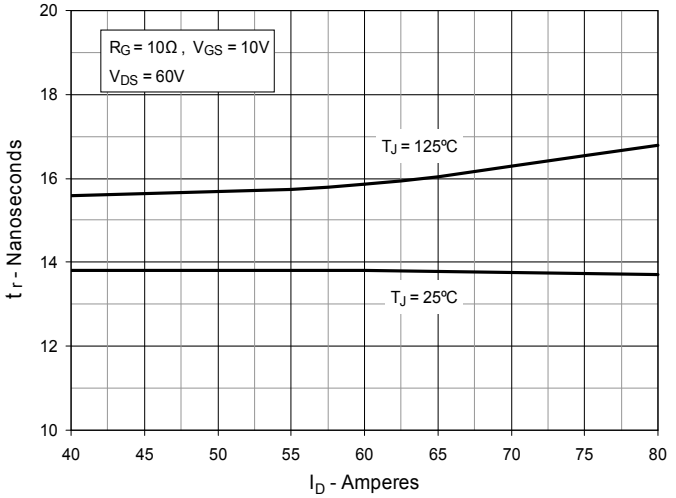


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

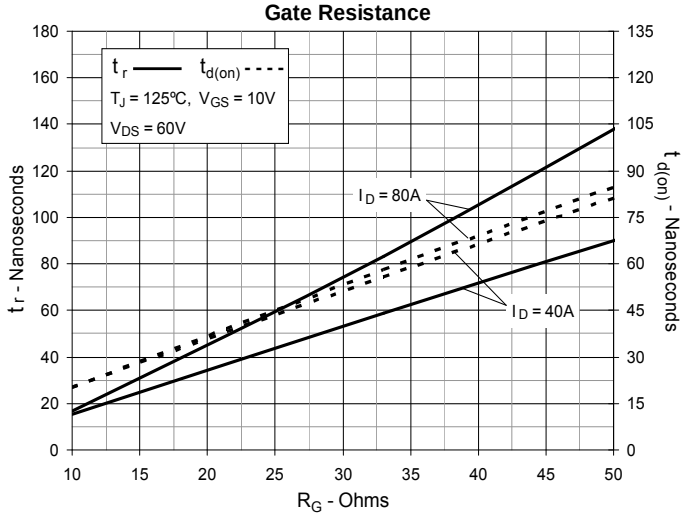


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

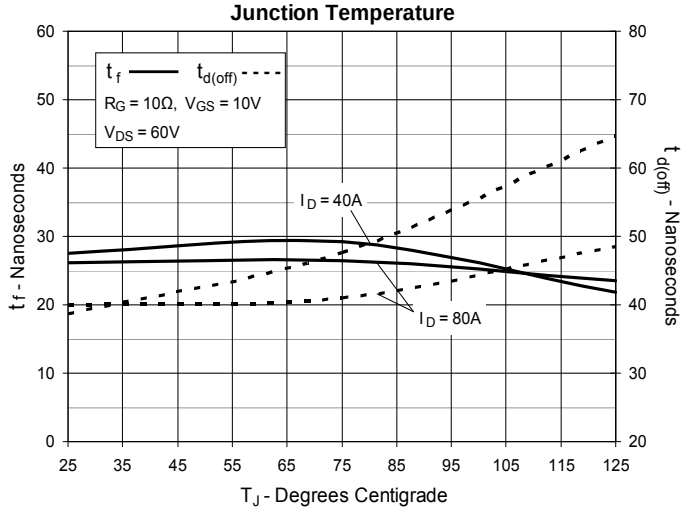


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

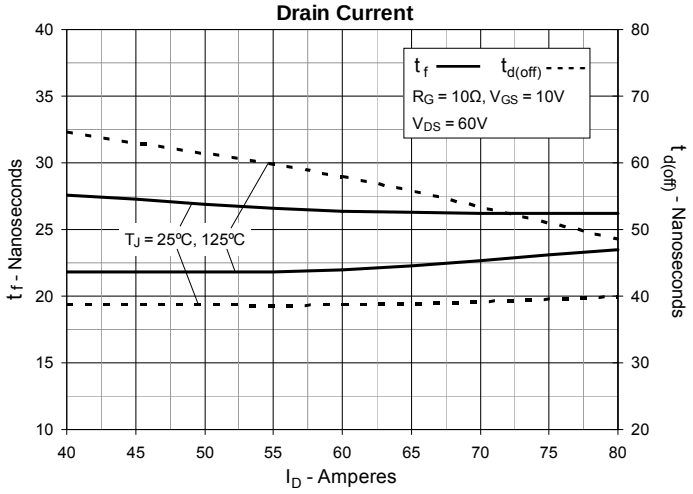
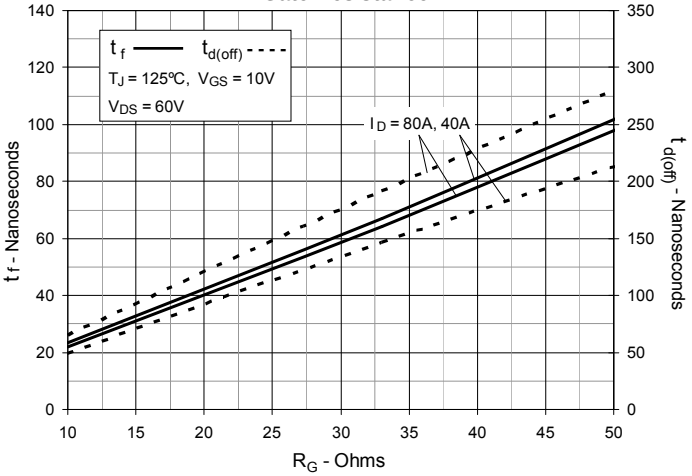
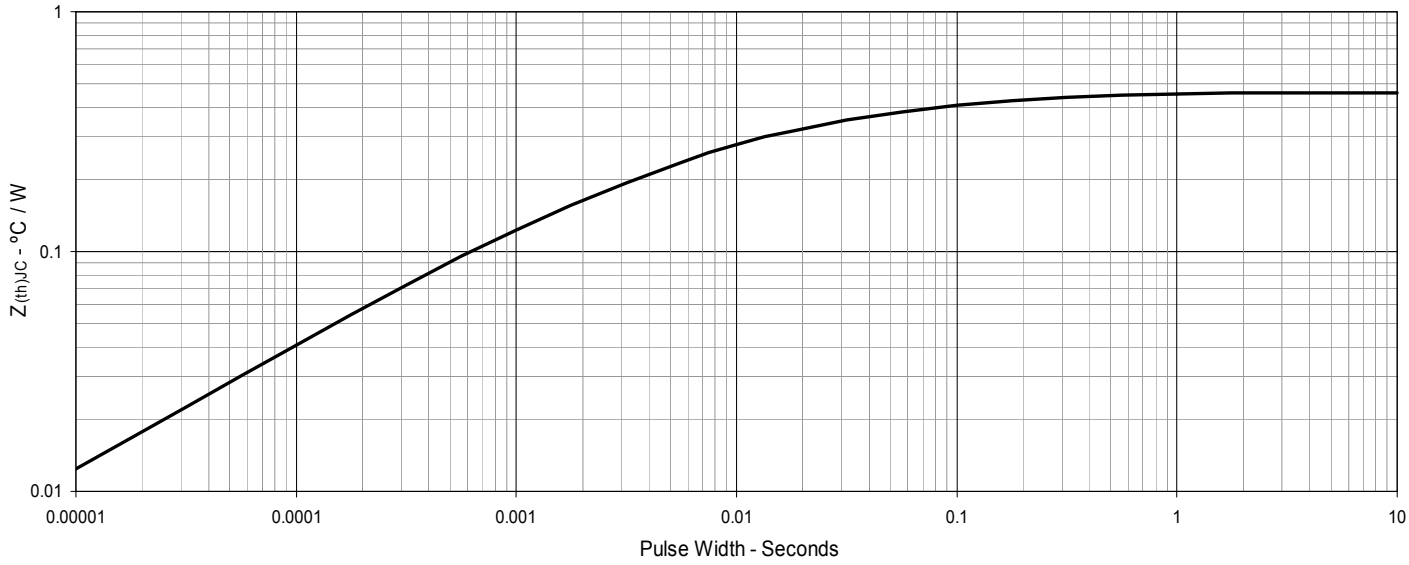


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance



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Fig. 19. Maximum Transient Thermal Impedance





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