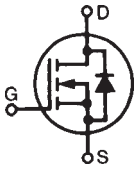
IXYS

TrenchT2™ Power MOSFET

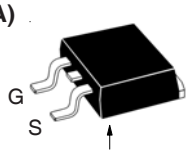
IXTA110N055T2
IXTP110N055T2

V_{DSS} = 55V
I_{D25} = 110A
$R_{DS(on)}$ ≤ 6.6mΩ

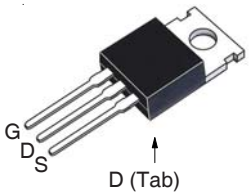
N-Channel Enhancement Mode
Avalanche Rated



TO-263 (IXTA)



TO-220 (IXTP)



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

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} = 1MΩ	55	V
V_{GSM}	Transient	±20	V
I_{D25}	T_C = 25°C	110	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	300	A
I_A	T_C = 25°C	50	A
E_{AS}	T_C = 25°C	400	mJ
P_D	T_C = 25°C	180	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}	1.6 mm (0.062in.) from Case for 10s	260	°C
F_C	Mounting Force (TO-263)	10..65 / 2.2..14.6	N/lb
M_d	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in
Weight	TO-263	2.5	g
	TO-220	3.0	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	55			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			±200	nA
I_{DSS}	V_{DS} = V_{DSS}, V_{GS} = 0V			2	μA
	T_J = 150°C			200	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A, Notes 1 & 2		5.5	6.6	mΩ

Features

- International Standard Packages
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier
  175°C Operating Temperature
- High Current Handling Capability
- ROHS Compliant
- High Performance Trench
  Technology for extremely low $R_{DS(on)}$

Advantages

- High Power Density
- Easy to Mount
- Space Savings

Applications

- Automotive Engine Control
- Synchronous Buck Converter
  (for Notebook SystemPower &
  General Purpose Point & Load)
- DC/DC Converters
- High Current Switching Applications
- Power Train Management
- Distributed Power Architecture

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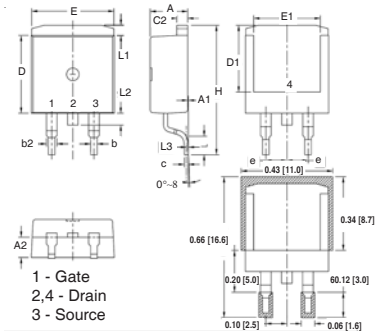
Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 55A, Note 1	30	49		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3060		pF
C_{oss}			497		pF
C_{rss}			105		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 30V, I_D = 25A R_G = 5Ω (External)		18		ns
t_r			25		ns
$t_{d(off)}$			40		ns
t_f			23		ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		57		nC
Q_{gs}			16		nC
Q_{gd}			11		nC
R_{thJC}				0.82	°C/W
R_{thCS}	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			110	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			300	A
V_{SD}	I_F = 25A, V_{GS} = 0V, Note 1		0.84	1.00	V
t_{rr}	I_F = 50A, V_{GS} = 0V, -di/dt = 100A/µs, V_R = 27V		38		ns
I_{RM}			2.4		A
Q_{RM}			46		nC

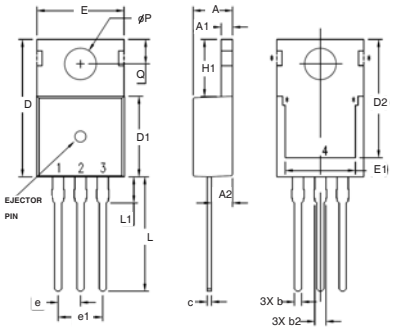
Notes: 1. Pulse test, t ≤ 300µs; duty cycle, d ≤ 2%.
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

TO-263 Outline



SYM	INCHES MIN	MAX	MILLIMETER MIN	MAX
A	.170	.185	4.30	4.70
A1	.000	.008	0.00	0.20
A2	.091	.098	2.30	2.50
b	.028	.035	0.70	0.90
b2	.046	.060	1.18	1.52
C	.018	.024	0.45	0.60
C2	.049	.060	1.25	1.52
D	.340	.370	8.63	9.40
D1	.300	.327	7.62	8.30
E	.380	.410	9.65	10.41
E1	.270	.330	6.86	8.38
e	.100 BSC		2.54 BSC	
H	.580	.620	14.73	15.75
L	.075	.105	1.91	2.67
L1	.039	.060	1.00	1.52
L2	—	.070	—	1.77
L3	.010 BSC		0.254 BSC	

TO-220 Outline



SYM	INCHES MIN	MAX	MILLIMETERS MIN	MAX
A	.169	.185	4.30	4.70
A1	.047	.055	1.20	1.40
A2	.079	.106	2.00	2.70
b	.024	.039	0.60	1.00
b2	.045	.057	1.15	1.45
c	.014	.026	0.35	0.65
D	.587	.626	14.90	15.90
D1	.335	.370	8.50	9.40
(D2)	.500	.531	12.70	13.50
E	.382	.406	9.70	10.30
(E1)	.283	.323	7.20	8.20
e	.100 BSC		2.54 BSC	
e1	.200 BSC		5.08 BSC	
H1	.244	.268	6.20	6.80
L	.492	.547	12.50	13.90
L1	.110	.154	2.80	3.90
ØP	.134	.150	3.40	3.80
Q	.106	.126	2.70	3.20

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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 6,404,065B1 6,683,344 6,727,585 7,005,734B2 7,157,338B2 4,860,072 5,017,508 5,063,307 5,381,025 6,259,123B1 6,534,343 6,710,405B2 6,759,692 7,063,975B2 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728B1 6,583,505 6,710,463 6,771,478B2 7,071,537

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Fig. 1. Output Characteristics @ T_J = 25°C

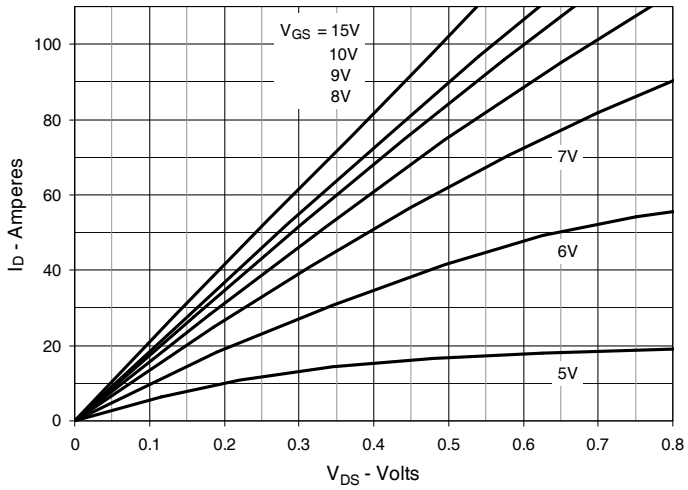

Fig. 2. Extended Output Characteristics @ T_J = 25°C

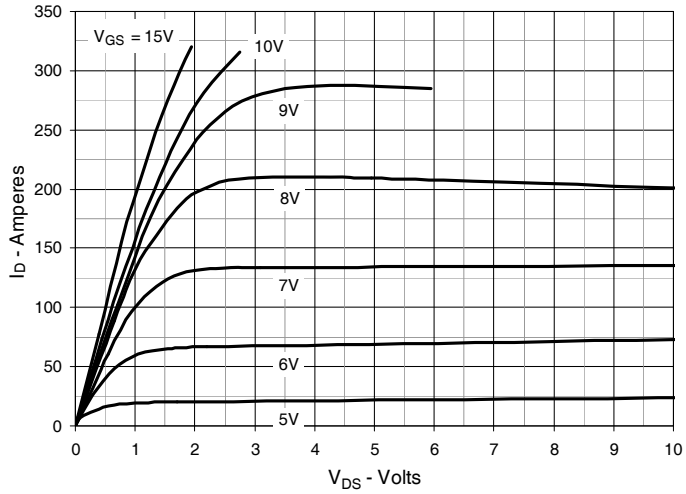

Fig. 3. Output Characteristics @ T_J = 150°C

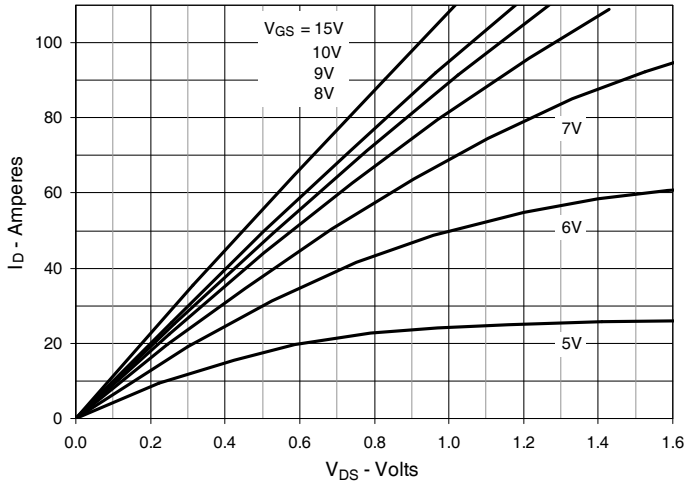

Fig. 4. $R_{DS(on)}$ Normalized to I_D = 55A Value vs. Junction Temperature

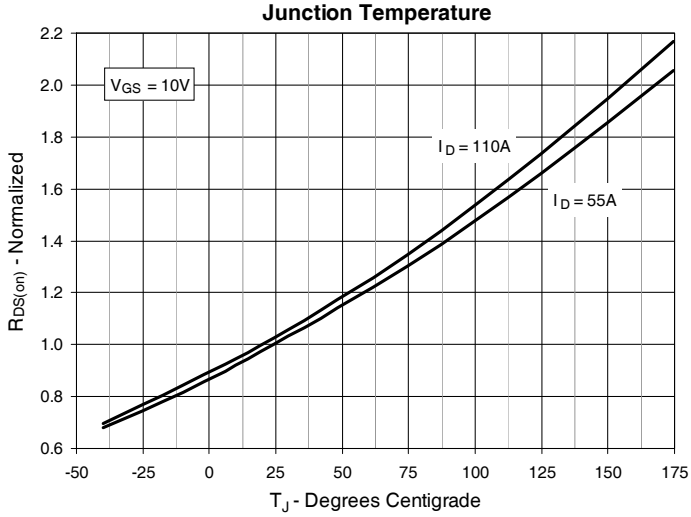

Fig. 5. $R_{DS(on)}$ Normalized to I_D = 55A Value vs. Drain Current

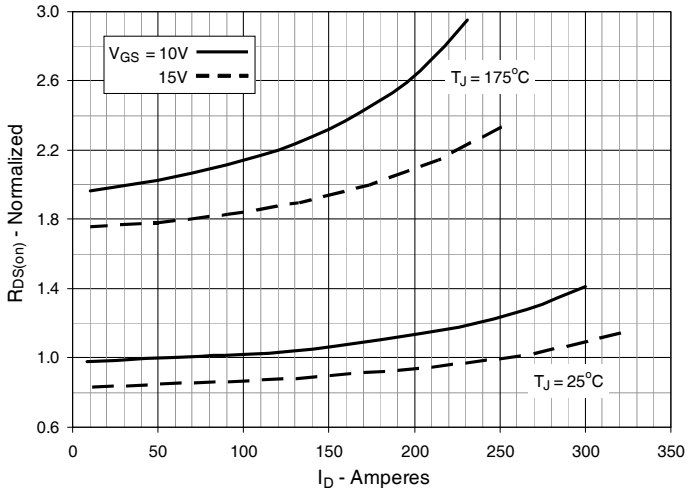

Fig. 6. Drain Current vs. Case Temperature

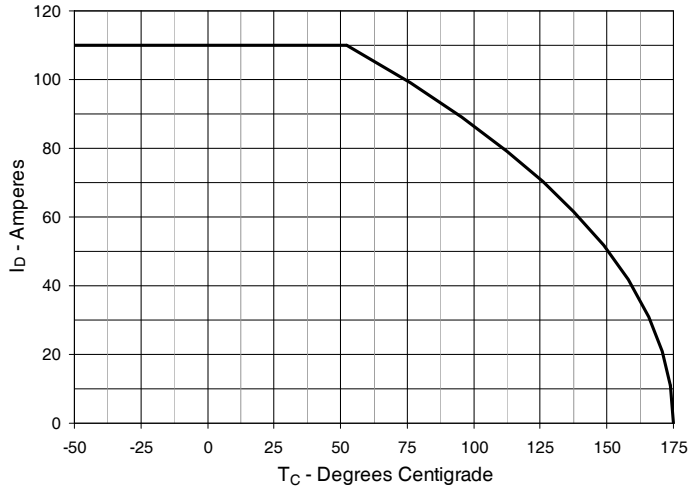

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Fig. 7. Input Admittance

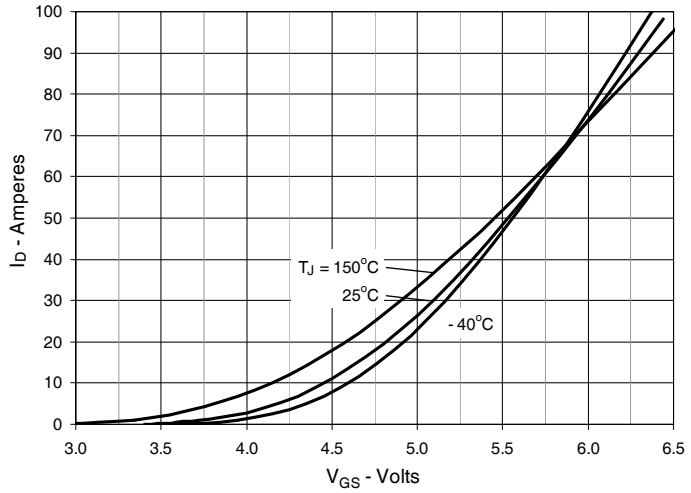

Fig. 8. Transconductance

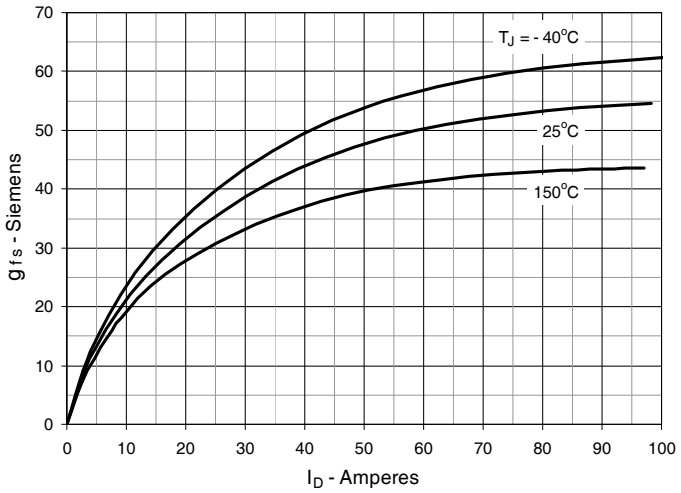

Fig. 9. Forward Voltage Drop of Intrinsic Diode

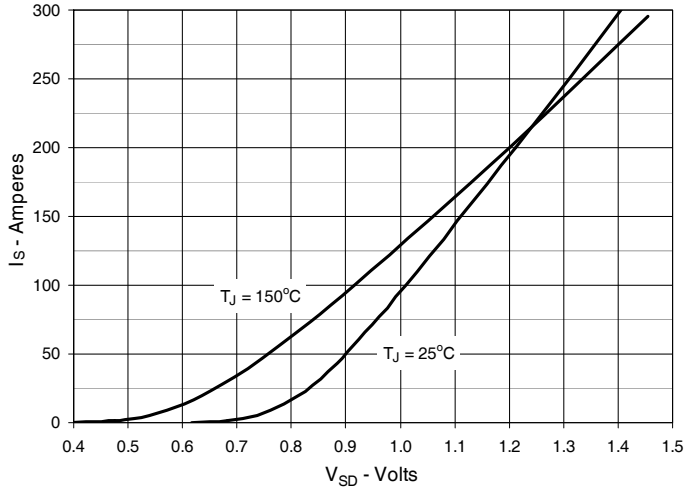

Fig. 10. Gate Charge

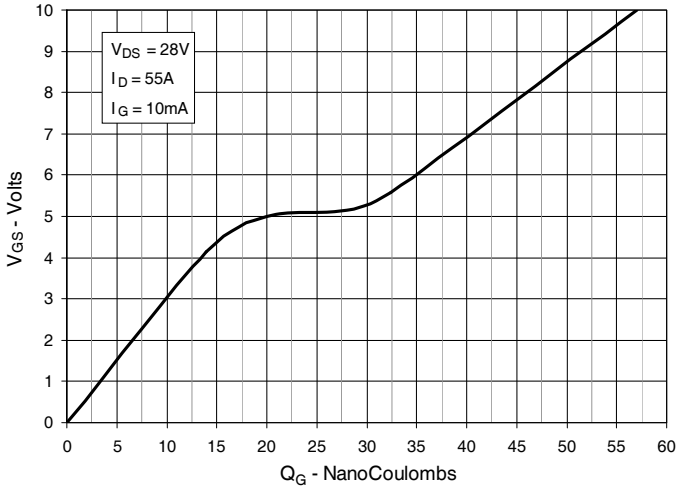

Fig. 11. Capacitance

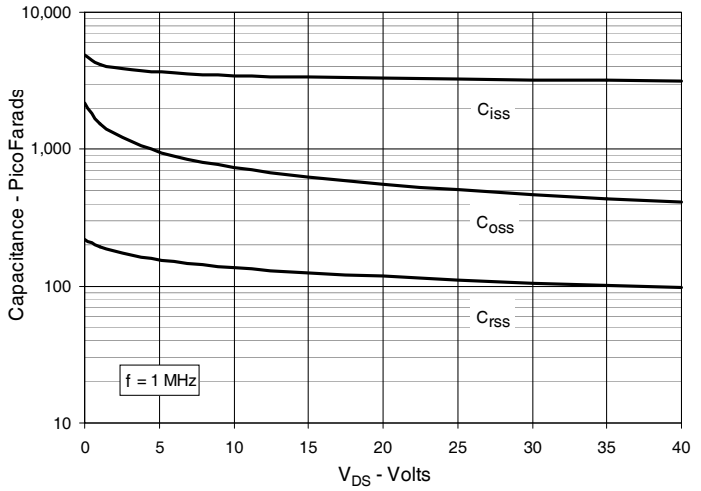

Fig. 12. Forward-Bias Safe Operating Area

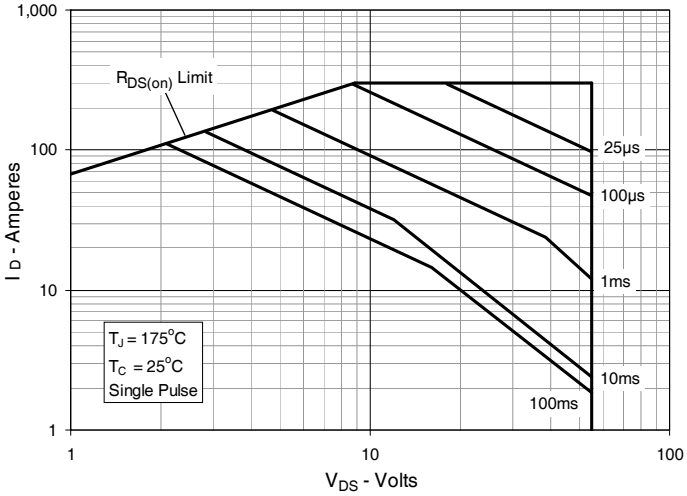

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Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

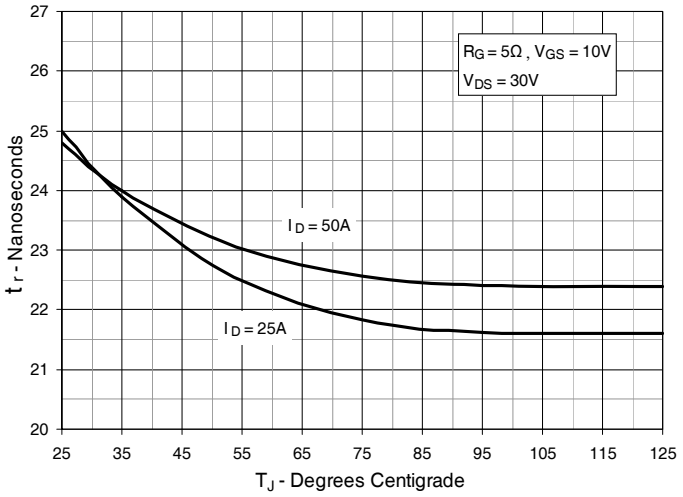

Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

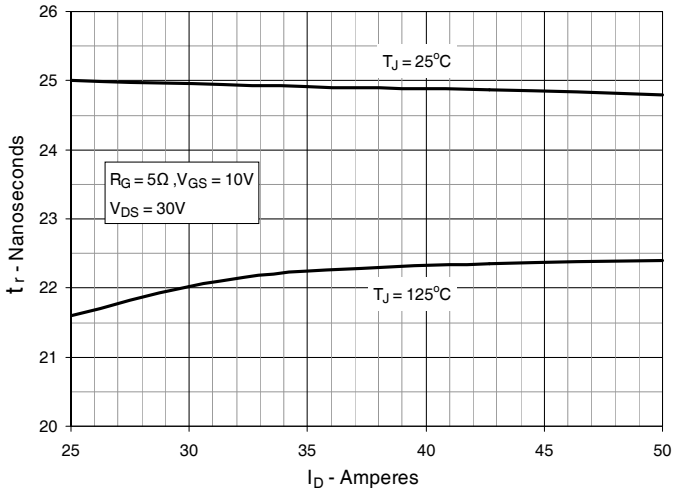

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

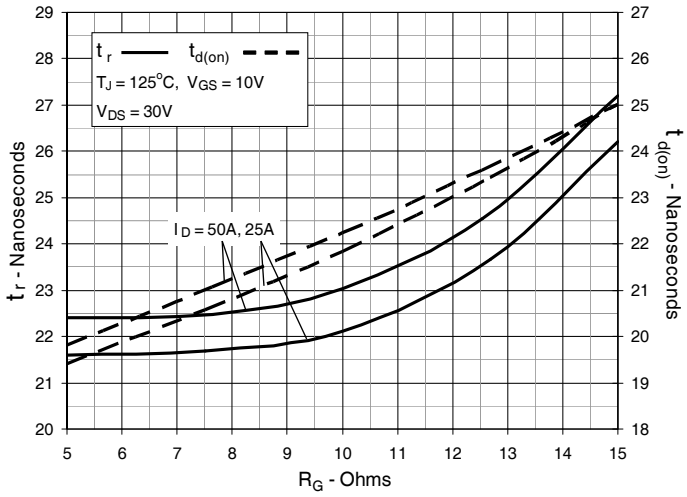

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

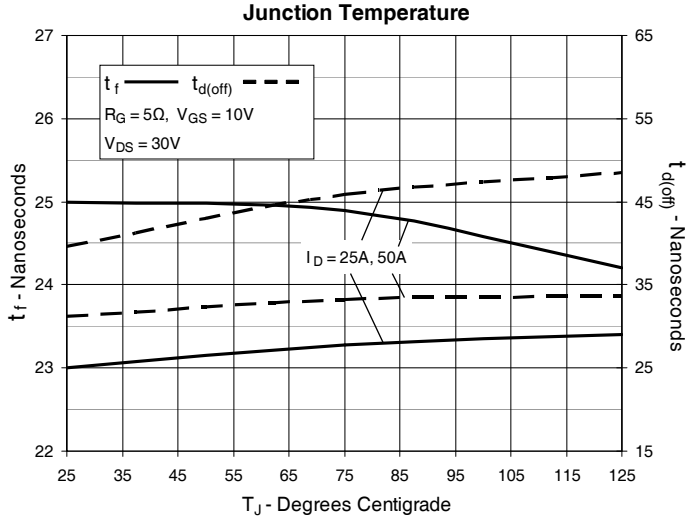

Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

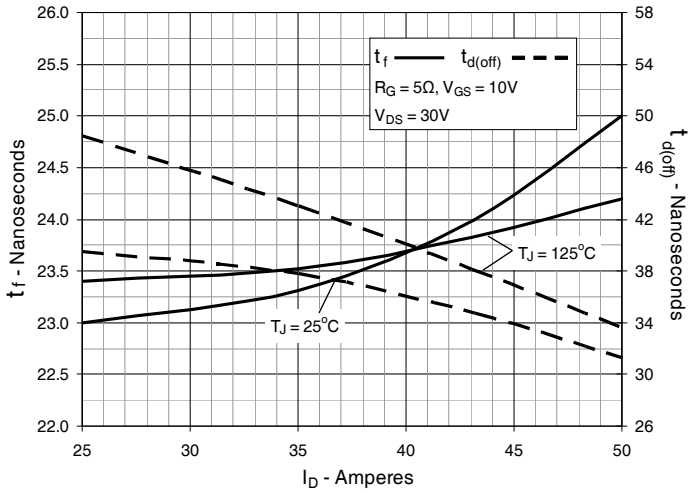

Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

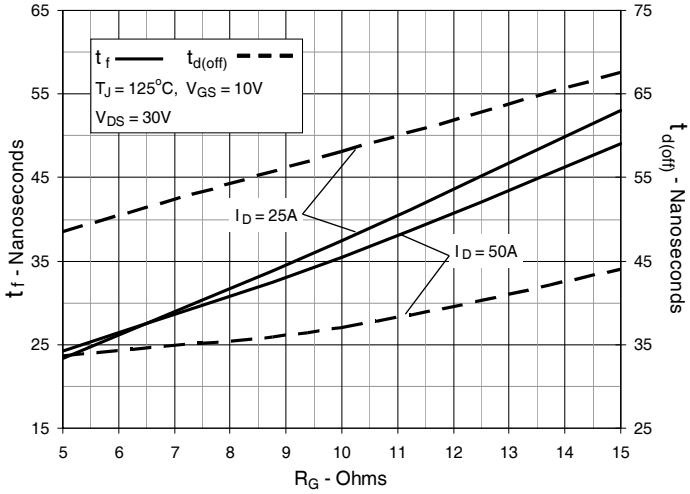

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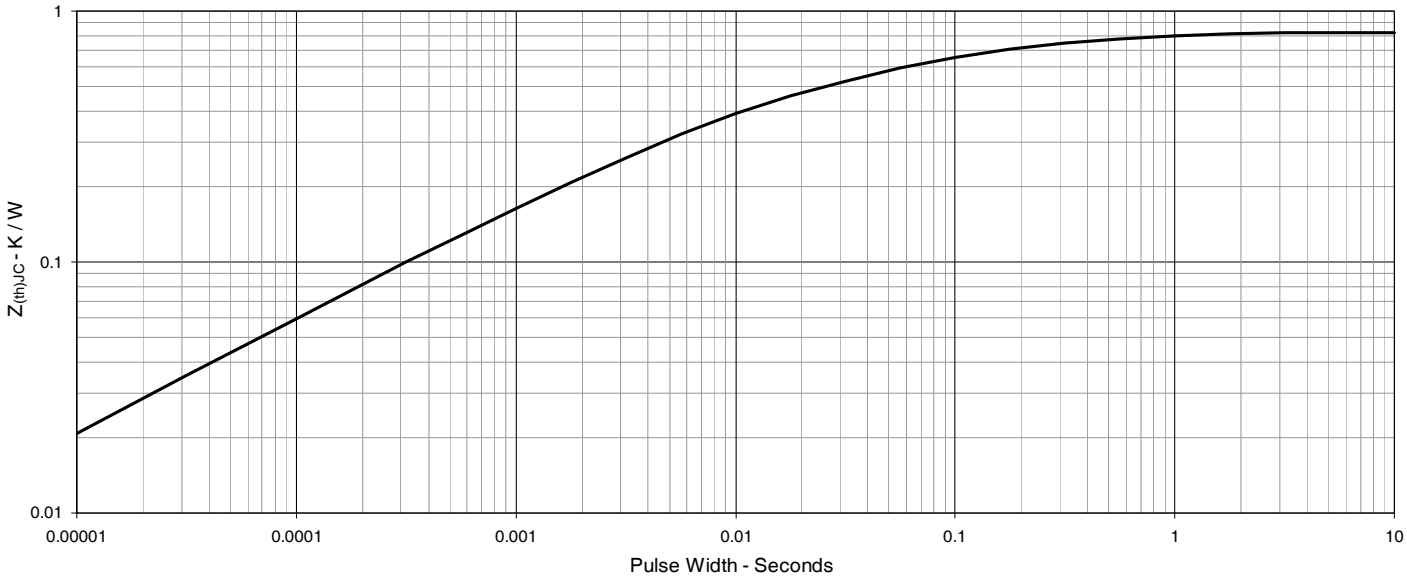
Fig. 19. Maximum Transient Thermal Impedance



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