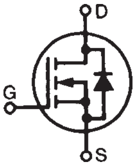
IXYS

TrenchT2™ Power MOSFET

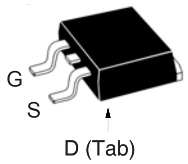
IXTA90N075T2
IXTP90N075T2

V_{DSS} = 75V
I_{D25} = 90A
$R_{DS(on)}$ ≤ 10mΩ

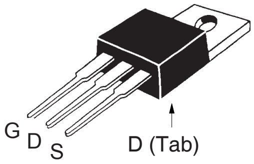
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrnsic Rectifier



TO-263 AA (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	75	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	75	V
V_{GSM}	Transient	± 20	V
I_{D25}	T_C = 25°C	90	A
$I_{L(RMS)}$	External Lead Current Limit	75	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	225	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	1.6mm (0.062in.) from Case for 10s	300	°C
T_{sold}	Plastic Body for 10 seconds	260	°C
M_d	Mounting Torque (TO-220)	1.13 / 10	Nm/lb.in.
Weight	TO-263 TO-220	2.5 3.0	g g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250µA	75			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			250	µA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 0.5 • I_{D25}, Notes 1, 2			10	mΩ

Features

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

Advantages

- Easy to Mount
- Space Savings
- High Power Density
- Synchronous

Applications

- DC-DC Converters
- Battery Chargers
- Synchronous Buck Converter (for Notebook System-Power & General Purpose Point & Load)
- AC Motor Drives
- High Current Switching Applications
- Power Train Management
- Distributed Power Architecture

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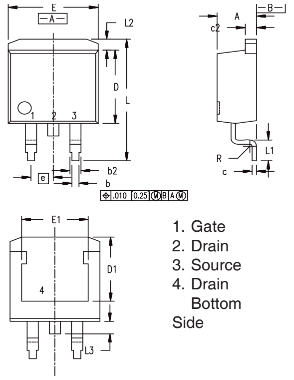
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	28	47		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		3290		pF
C_{oss}			406		pF
C_{rss}			75		pF
$t_{d(on)}$	**Resistive Switching Times** V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A R_G = 5Ω (External)		14		ns
t_r			28		ns
$t_{d(off)}$			35		ns
t_f			20		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		54		nC
Q_{gs}			16		nC
Q_{gd}			11		nC
R_{thJC}				0.82	°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			90	A
I_{SM}	Repetitive, Pulse width limited by T_{JM}			360	A
V_{SD}	I_F = 45A, V_{GS} = 0V, Note 1		0.92	1.10	V
t_{rr}	I_F = 50A, V_{GS} = 0V -di/dt = 100A/μs V_R = 38V		50		ns
I_{RM}			3.7		A
Q_{RM}			93		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.

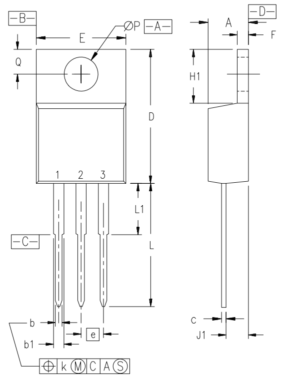
TO-263 (IXTA) Outline



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

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.06	4.83	.160	.190
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.40	0.74	.016	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	8.00	8.89	.280	.320
E	9.65	10.41	.380	.405
E1	6.22	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	0.13	0	.005

TO-220 (IXTP) Outline



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

SYM	INCHES MIN	MAX	MILLIMETERS 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

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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

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Fig. 1. Output Characteristics @ T_J = 25ºC

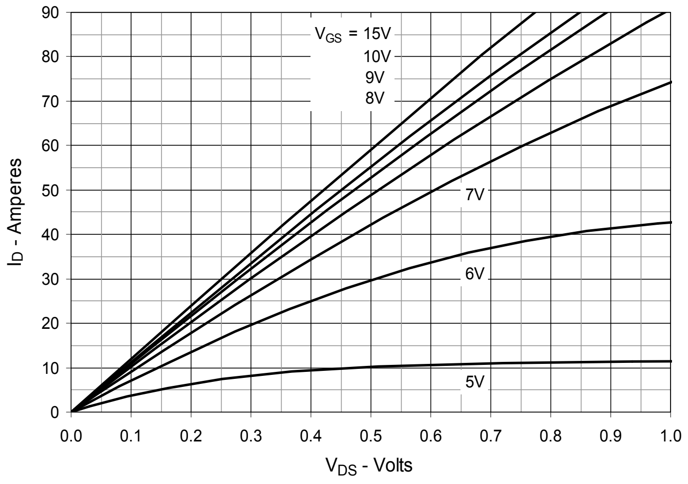

Fig. 2. Extended Output Characteristics @ T_J = 25ºC

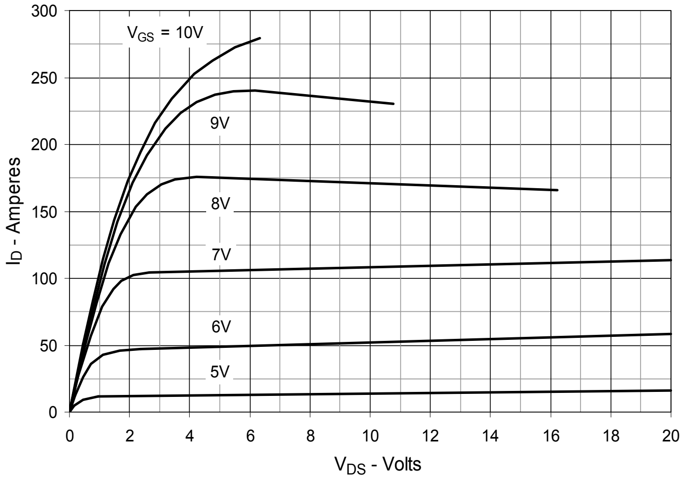

Fig. 3. Output Characteristics @ T_J = 150ºC

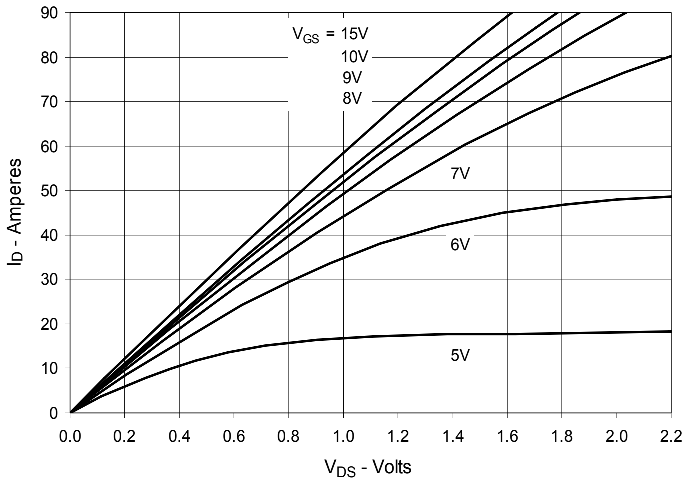

Fig. 4. $R_{DS(on)}$ Normalized to I_D = 45A Value vs. Junction Temperature

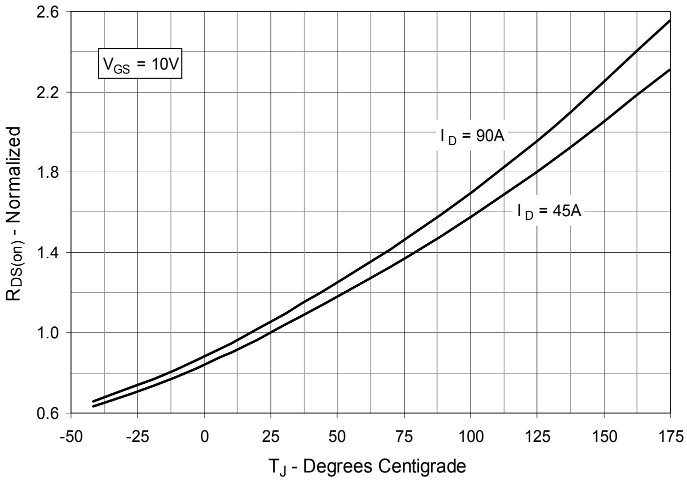

Fig. 5. $R_{DS(on)}$ Normalized to I_D = 45A Value vs. Drain Current

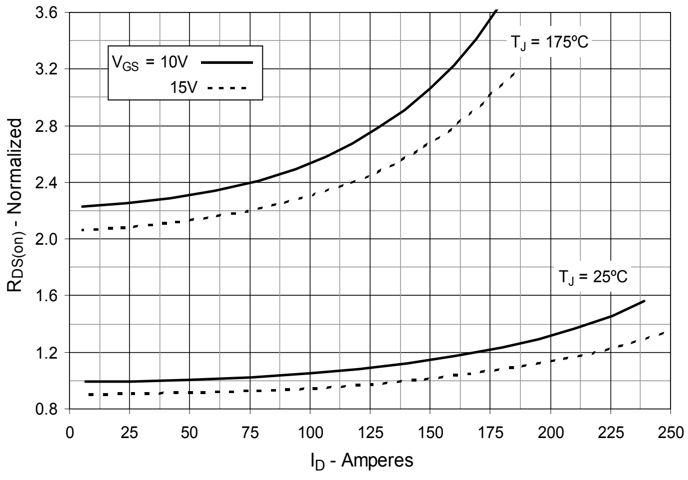

Fig. 6. Drain Current vs. Case Temperature

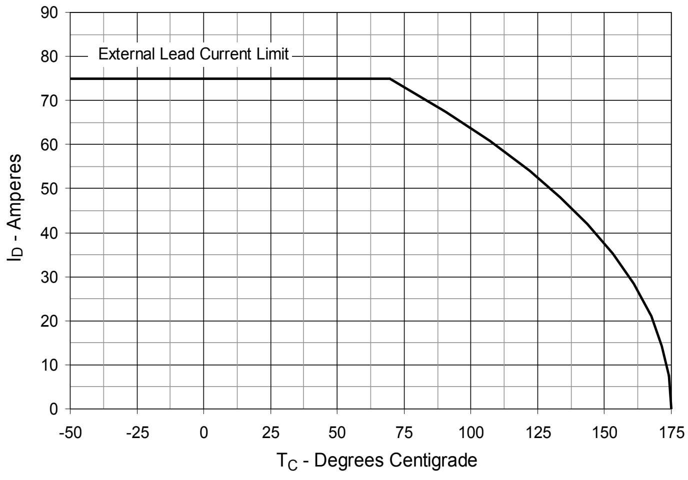

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Fig. 7. Input Admittance

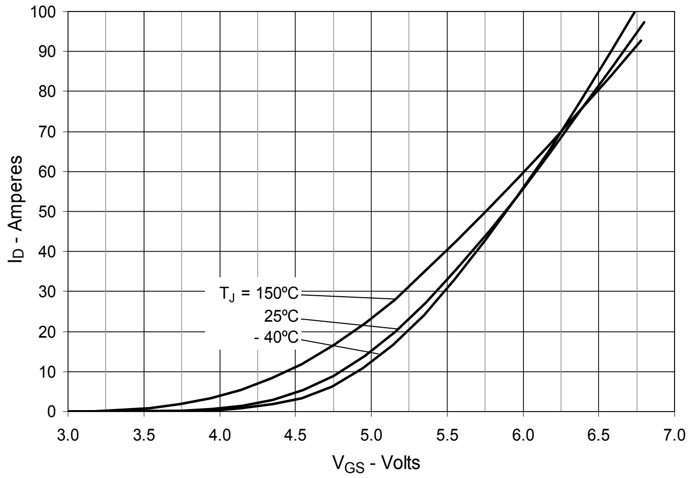

Fig. 8. Transconductance

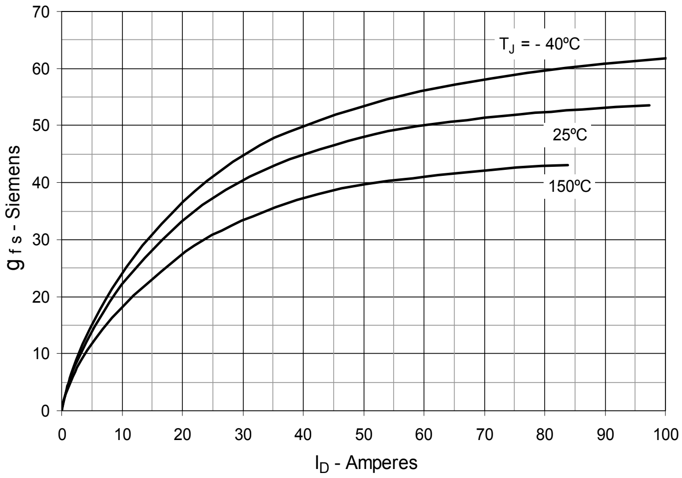

Fig. 9. Forward Voltage Drop of Intrinsic Diode

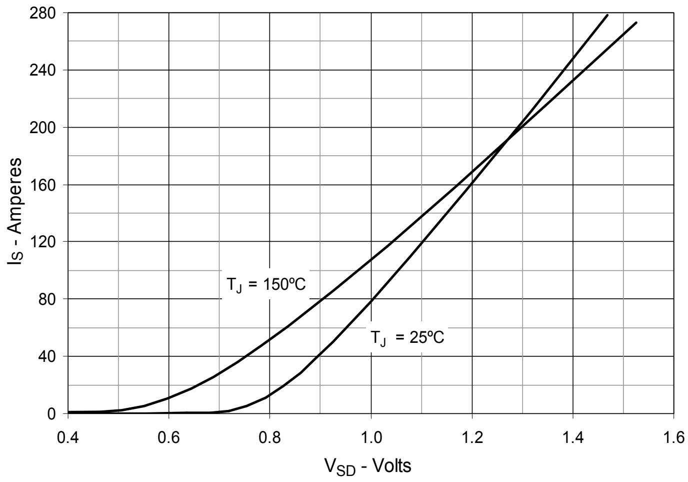

Fig. 10. Gate Charge

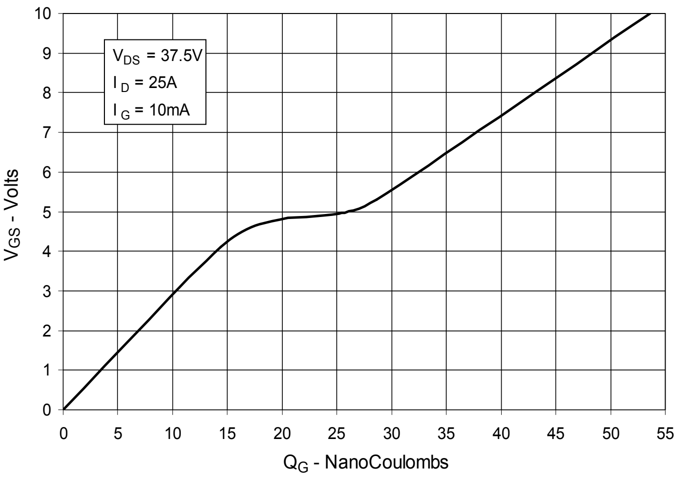

Fig. 11. Capacitance

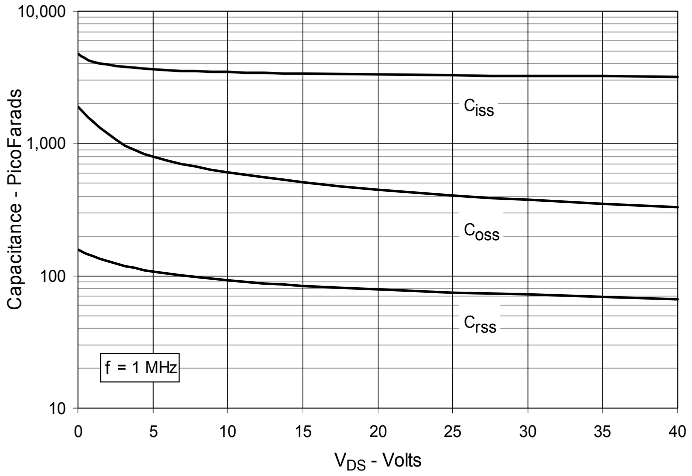

Fig. 12. Forward-Bias Safe Operating Area

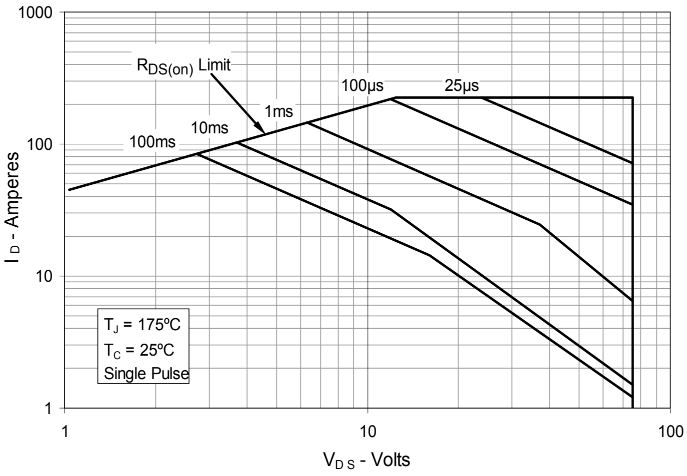

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Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

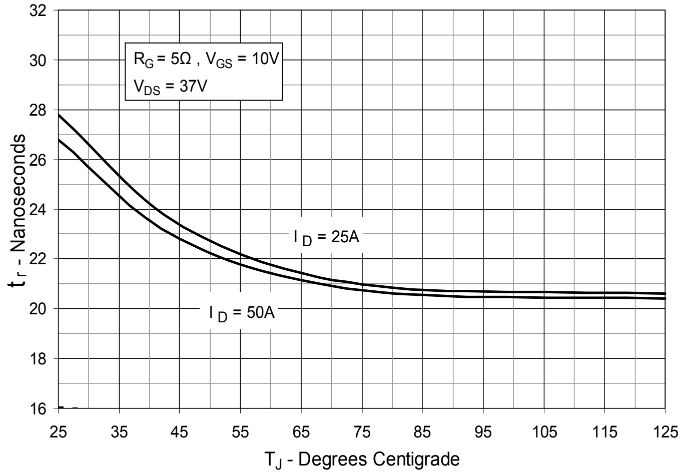

Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

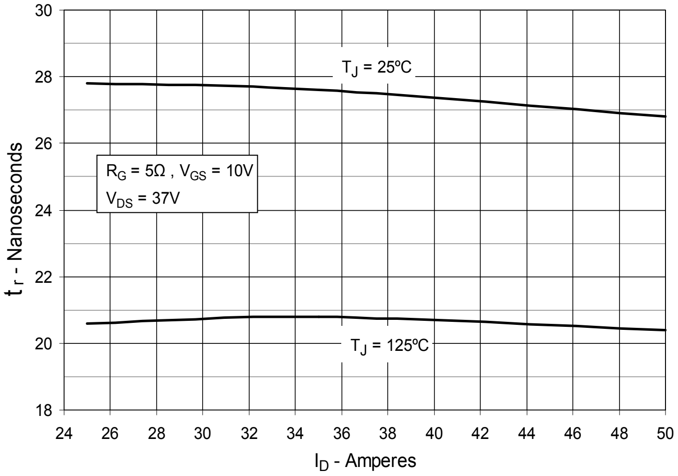

Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

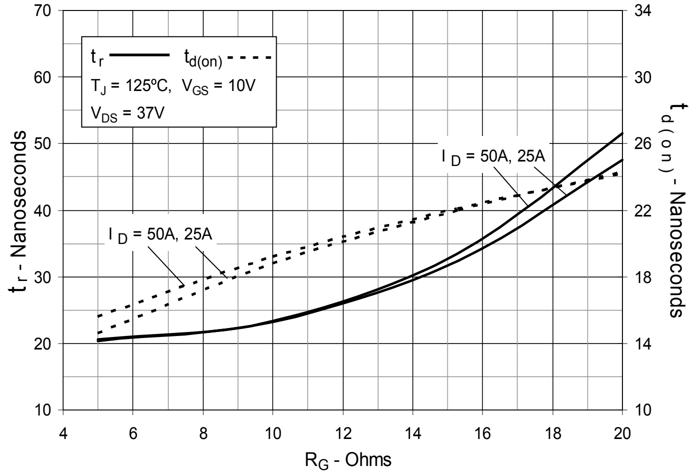

Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

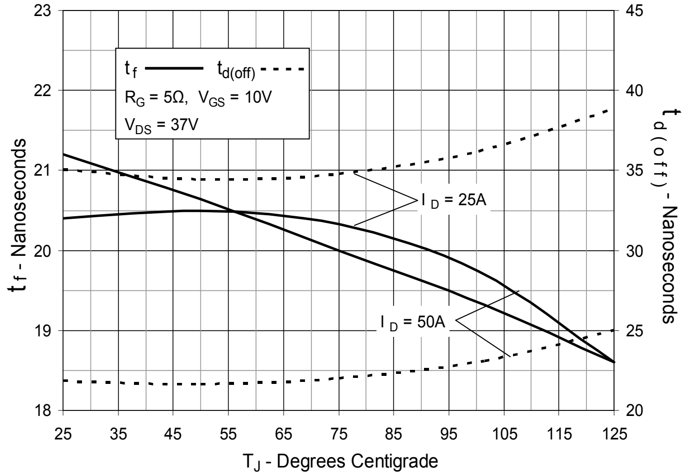

Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

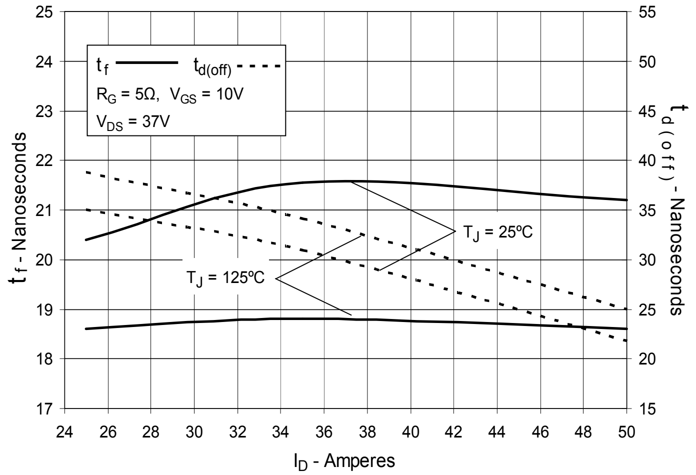

Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

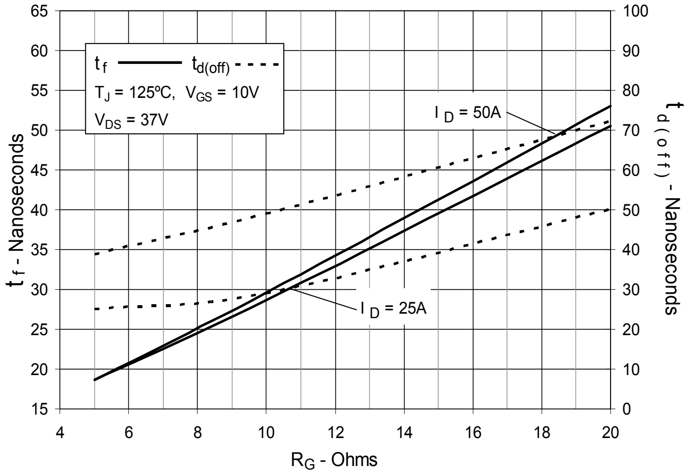

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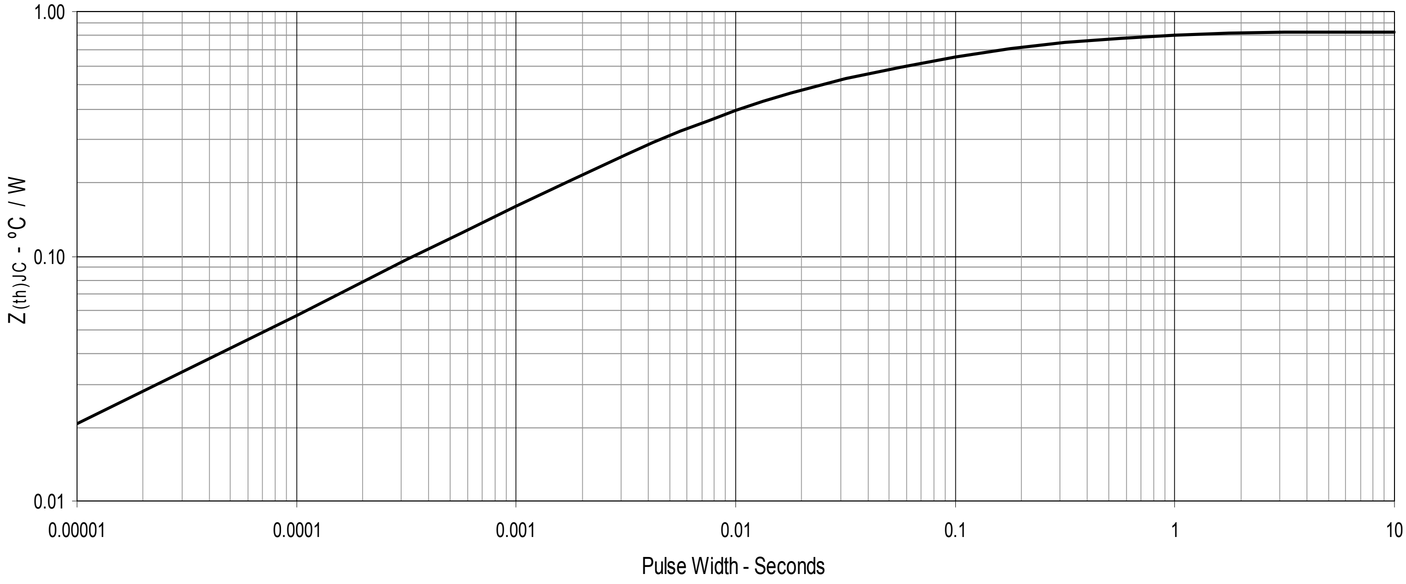
Fig. 19. Maximum Transient Thermal Impedance



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