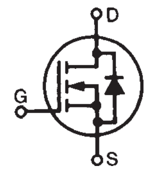
IXYS

TrenchT2™ Power MOSFET

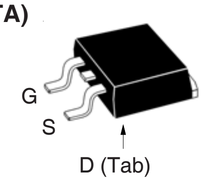
IXTA120N075T2
IXTP120N075T2

V_{DSS} = 75V
I_{D25} = 120A
$R_{DS(on)}$ ≤ 7.7mΩ

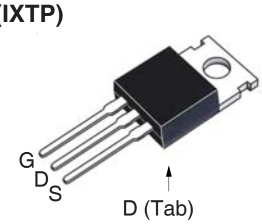
N-Channel Enhancement Mode
Avalanche Rated



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	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	120	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	300	A
I_A	T_C = 25°C	60	A
E_{AS}	T_C = 25°C	600	mJ
P_D	T_C = 25°C	250	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	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			5	μA
	T_J = 150°C			150	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 60A, Notes 1 & 2			7.7	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

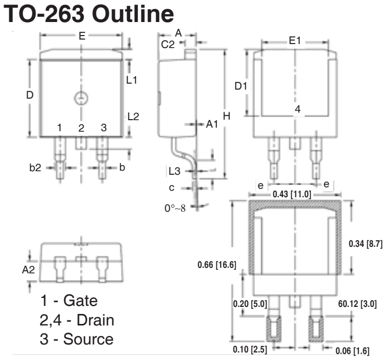
Symbol	Test Conditions	Characteristic Values		
(T_J = 25°C Unless Otherwise Specified)		Min.	Typ.	Max.
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	38	62	S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		4740	pF
C_{oss}			585	pF
C_{rss}			75	pF
$t_{d(on)}$	**Resistive Switching Times**		13	ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 60A		33	ns
$t_{d(off)}$	R_G = 5Ω (External)		21	ns
t_f			18	ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 60A		78	nC
Q_{gs}			24	nC
Q_{gd}			23	nC
R_{thJC}				0.62 °C/W
R_{thCS}	TO-220		0.50	°C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values		
(T_J = 25°C Unless Otherwise Specified)		Min.	Typ.	Max.
I_S	V_{GS} = 0V			120 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			480 A
V_{SD}	I_F = 60A, V_{GS} = 0V, Note 1			1.3 V
t_{rr}	I_F = 60A, V_{GS} = 0V,		50	ns
I_{RM}	-di/dt = 100A/µs, V_R = 37V		4	A
Q_{RM}			100	nC

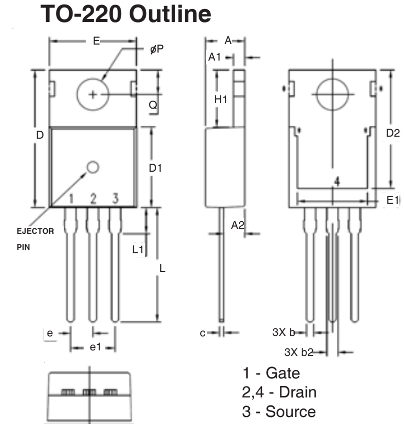
Notes: 1. Pulse test, t ≤ 300µs; duty cycle, d ≤ 2%.
2. On through-hole packages, $R_{DS(on)}$ Kelvin test contact location must be 5mm or less from the package body.

TO-263 Outline



SYM	INCHES		MILLIMETER	
	MIN	MAX	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		MILLIMETERS	
	MIN	MAX	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

Fig. 1. Output Characteristics @ $T_J = 25^oC$

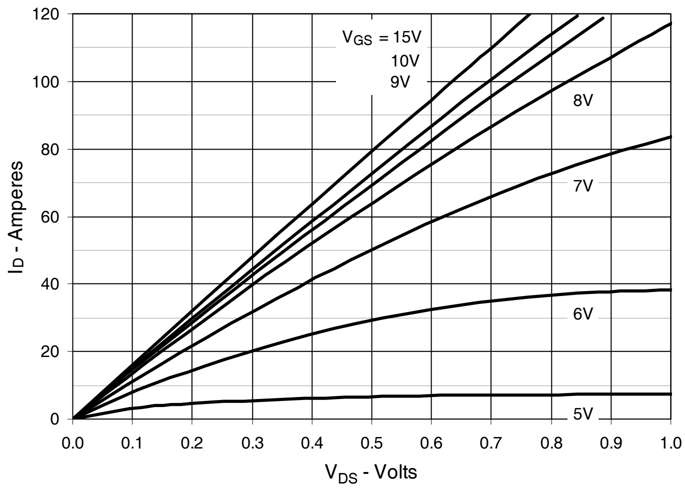


Fig. 2. Extended Output Characteristics @ $T_J = 25^oC$

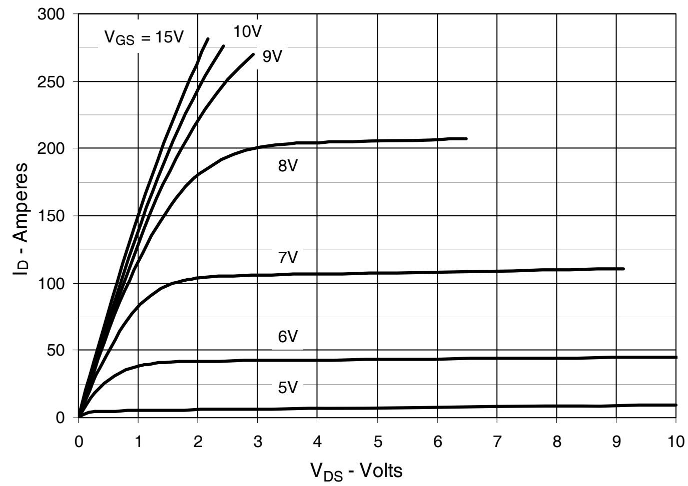


Fig. 3. Output Characteristics @ $T_J = 150^oC$

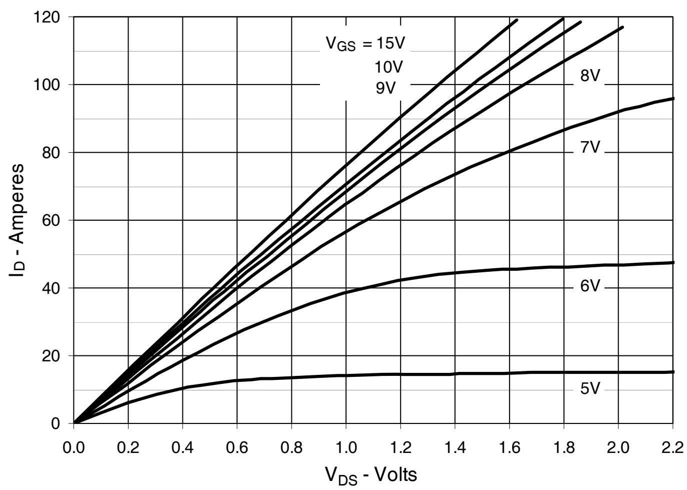


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 60A Value vs. Junction Temperature

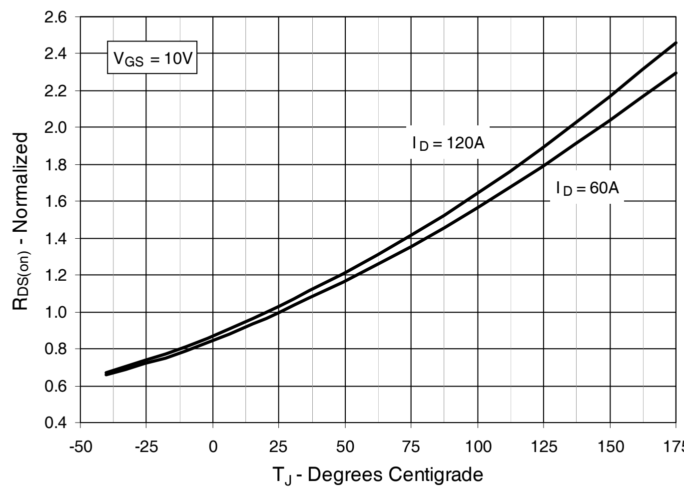


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 60A Value vs. Drain Current

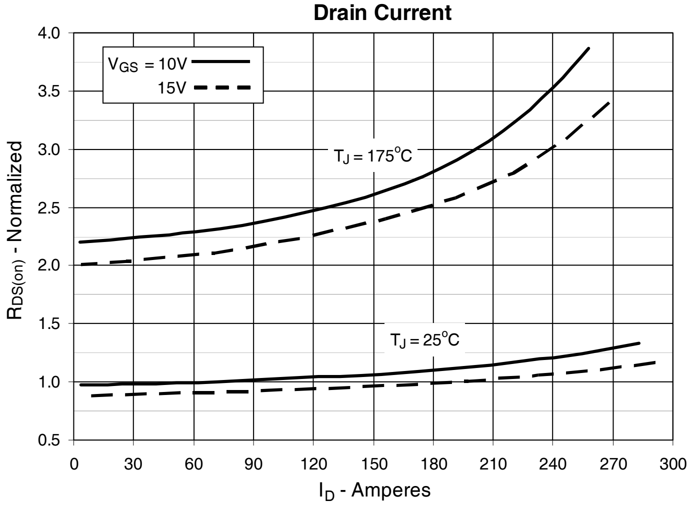


Fig. 6. Drain Current vs. Case Temperature

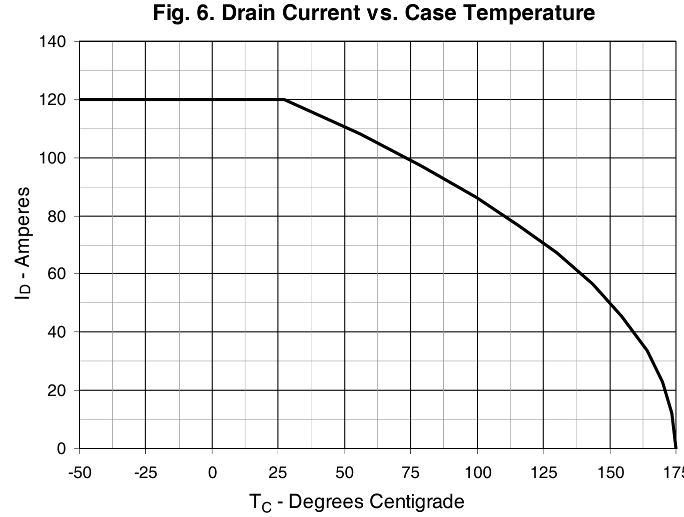


Fig. 7. Input Admittance

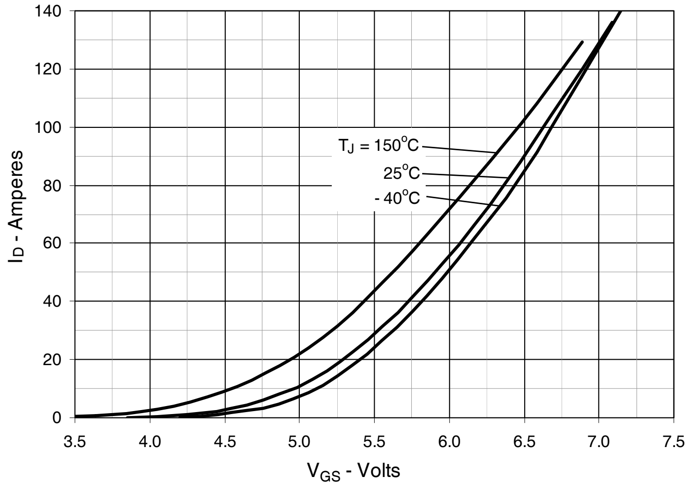


Fig. 8. Transconductance

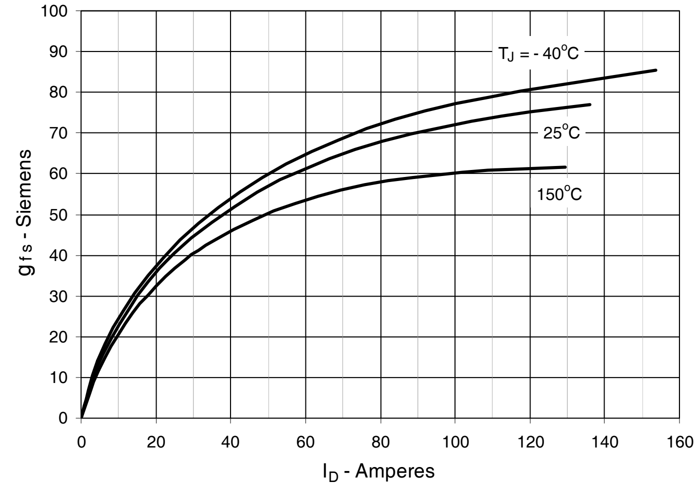


Fig. 9. Forward Voltage Drop of Intrinsic Diode

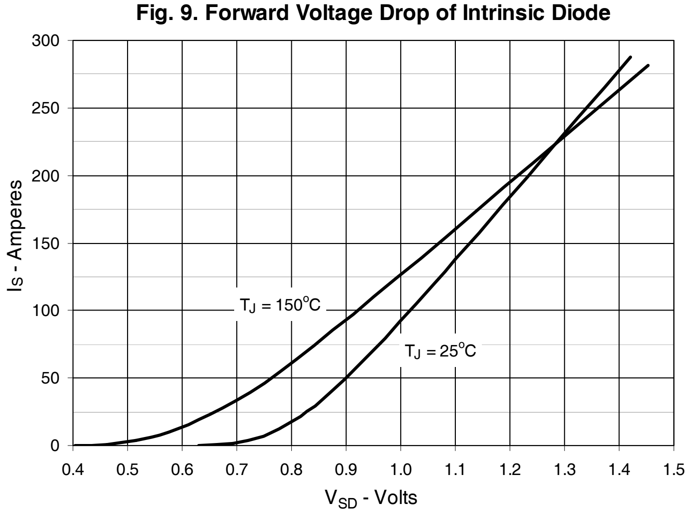


Fig. 10. Gate Charge

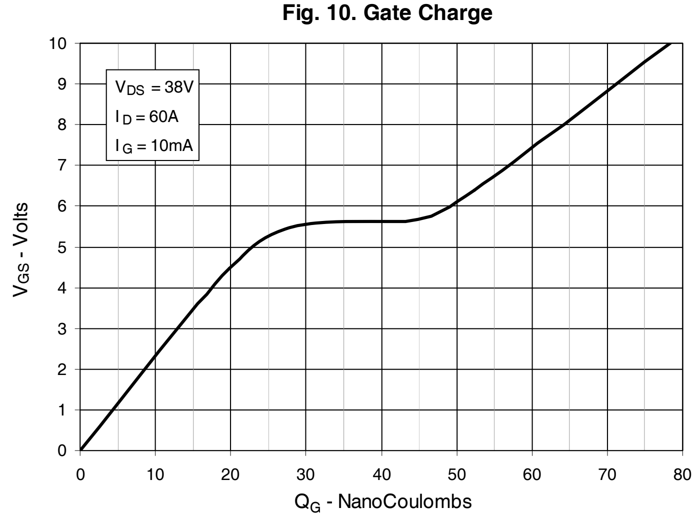


Fig. 11. Capacitance

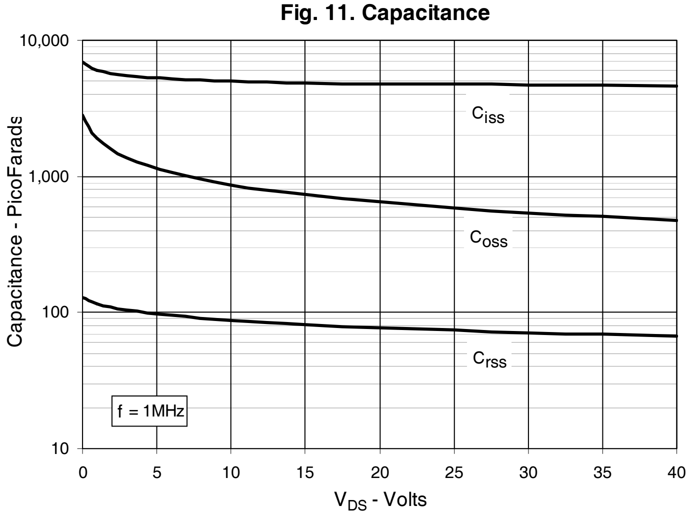


Fig. 12. Forward-Bias Safe Operating Area

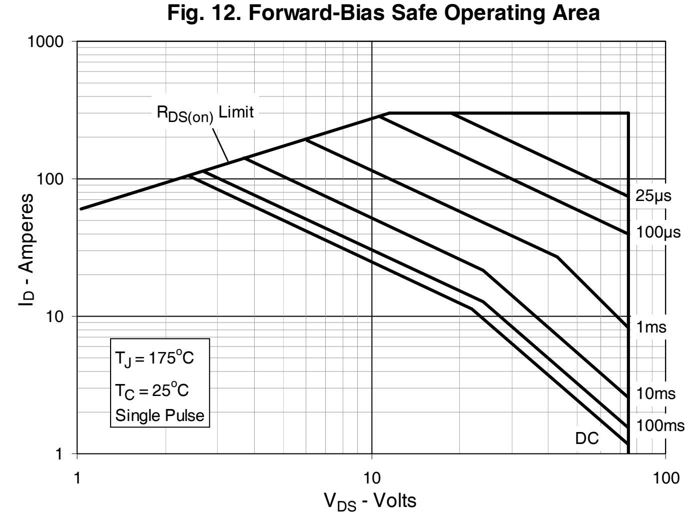


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

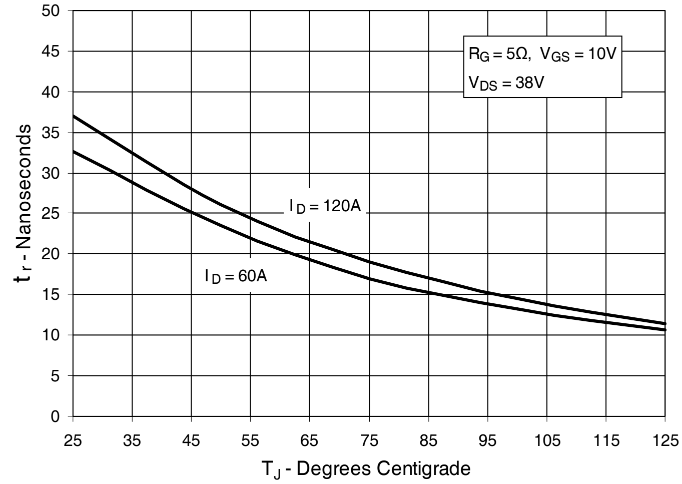


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

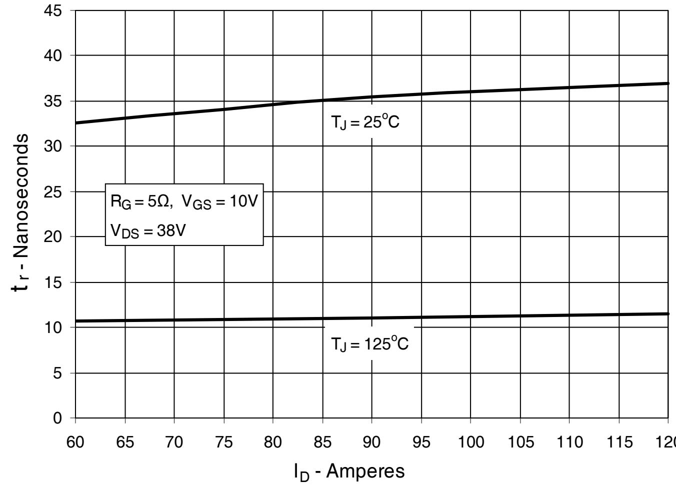


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

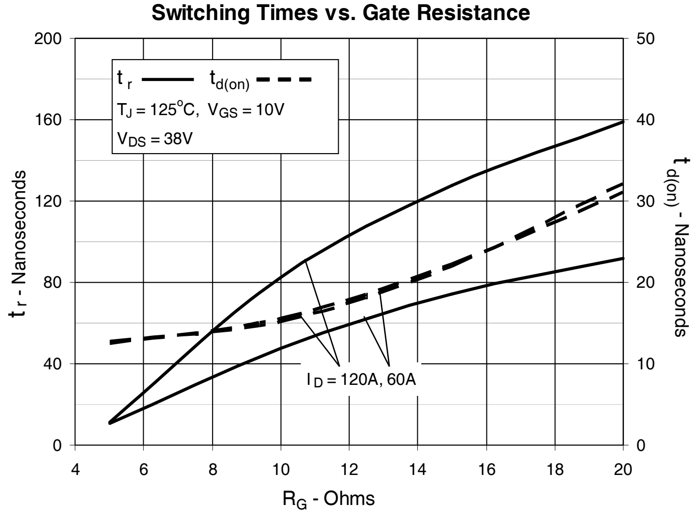


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

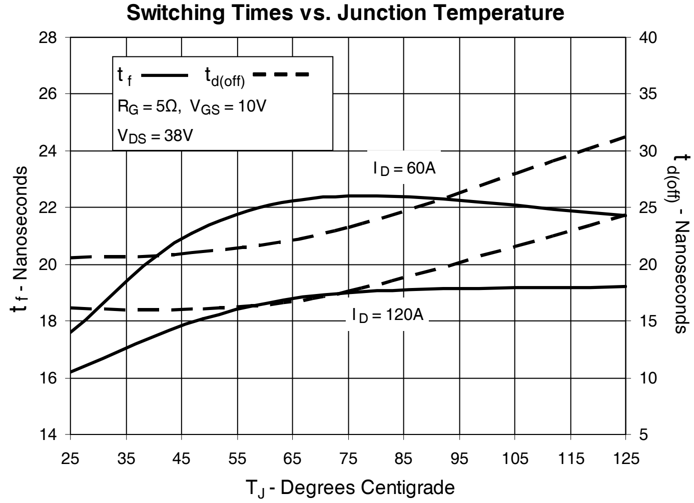


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

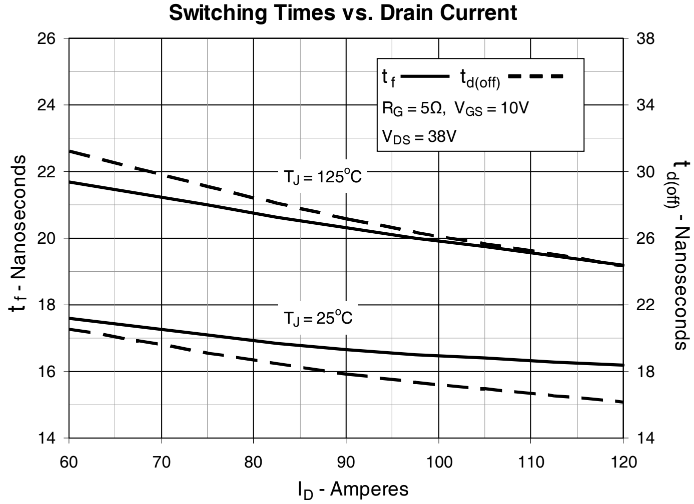


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

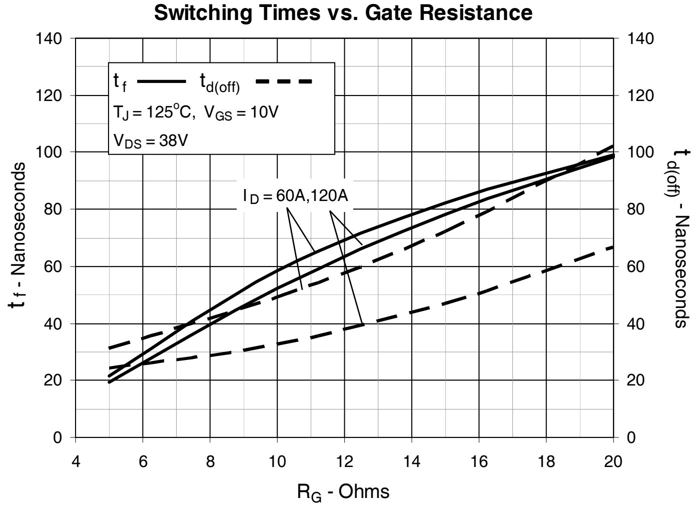


Fig. 19. Maximum Transient Thermal Impedance