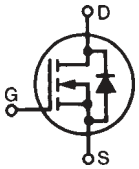
IXYS

TrenchMV™ Power MOSFET

IXTC180N085T

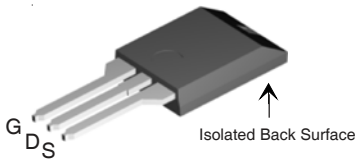
V_{DSS} = 85V
I_{D25} = 110A
$R_{DS(on)}$ ≤ 6.1mΩ

(Electrically Isolated Back) Surface)



N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Rectifier

ISOPLUS220
E153432



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C	85	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ	85	V
V_{GSM}	Transient	±20	V
I_{D25}	T_C = 25°C	110	A
I_{LRMS}	Lead Current Limit, RMS	75	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	480	A
I_A	T_C = 25°C	25	A
E_{AS}	T_C = 25°C	1.0	J
P_D	T_C = 25°C	150	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 Plastic Body for 10 seconds	300 260	°C °C
V_{ISOL}	50/60Hz, t = 1 minute, I_{ISOL} < 1mA, RMS	2500	V
M_d	Mounting Force	11..65 / 2.5..14.6	N/lb.
Weight		2	g

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	85			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			250	μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 25A, Notes 1, 2			6.1	mΩ

Features

- International Standard Package
- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V Electrical Isolation
- 175°C Operating Temperature
- Avalanche Rated
- Fast Intrinsic Rectifier
- Low $R_{DS(on)}$

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

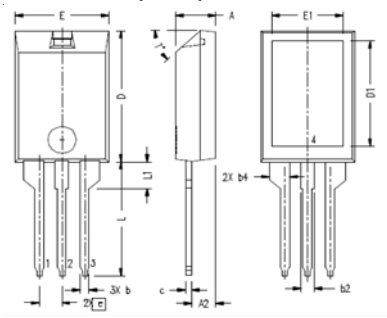
- Automotive
  - Motor Drives
  - DC/DC Conversion
  - 42V Power Bus
  - ABS Systems
- DC/DC Converters and Off-Line UPS
- Primary Switch for 24V and 48V Systems
- High Current Switching Applications
- Distributed Power Architechtures and VRMs
- Electronic Valve Train Systems
- High Voltage Synchronous Recifiers

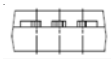
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	75	120		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		8800		pF
C_{oss}			950		pF
C_{rss}			110		pF
$t_{d(on)}$	**Resistive Switching Times**		32		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		70		ns
$t_{d(off)}$	R_G = 5Ω (External)		55		ns
t_f			65		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 25A		170		nC
Q_{gs}			40		nC
Q_{gd}			50		nC
R_{thJC}					1.0 °C/W
R_{thCH}			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			180	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			480	A
V_{SD}	I_F = 25A, V_{GS} = 0V, Note 1			1.0	V
t_{rr}	I_F = 90A, V_{GS} = 0V, -di/dt = 100A/μs		63		ns
I_{RM}	V_R = 40V		4.1		A
Q_{RM}			129		nC

ISOPLUS220 (IXTC) Outline





1. Gate 2. Drain
3. Source

Note: Bottom heatsink (Pin 4) is electrically isolated from Pins 1,2, and 3.

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.157	.197	4.00	5.00
A2	.098	.118	2.50	3.00
b	.035	.051	0.90	1.30
b2	.049	.065	1.25	1.65
b4	.093	.100	2.35	2.55
c	.028	.039	0.70	1.00
D	.591	.630	15.00	16.00
D1	.472	.512	12.00	13.00
E	.394	.433	10.00	11.00
E1	.295	.335	7.50	8.50
e	.100 BASIC		2.55 BASIC	
L	.512	.571	13.00	14.50
L1	.118	.138	3.00	3.50
T°			42.5°	47.5°

Notes: 1. Pulse Test: t ≤ 300 μs, Duty Cycle d ≤ 2 %.
2. Drain and Source Kelvin Contacts must be Located Less than 5 mm from the Plastic Body.

Fig. 1. Output Characteristics @ 25ºC

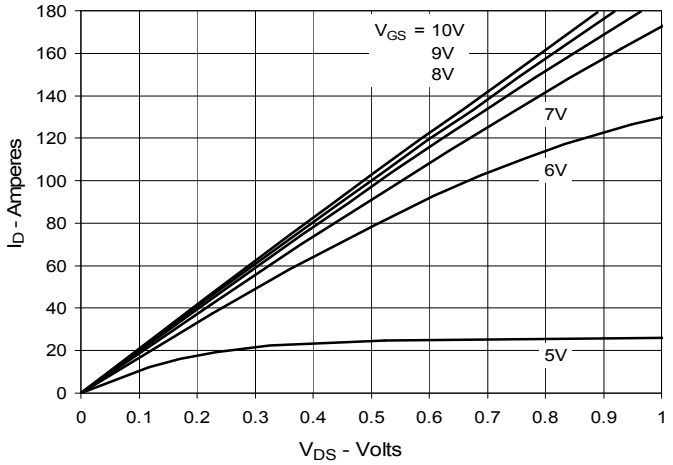


Fig. 2. Extended Output Characteristics @ 25ºC

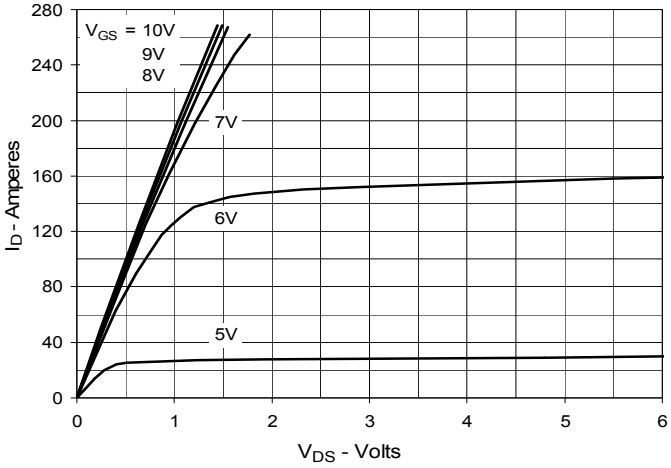


Fig. 3. Output Characteristics @ 150ºC

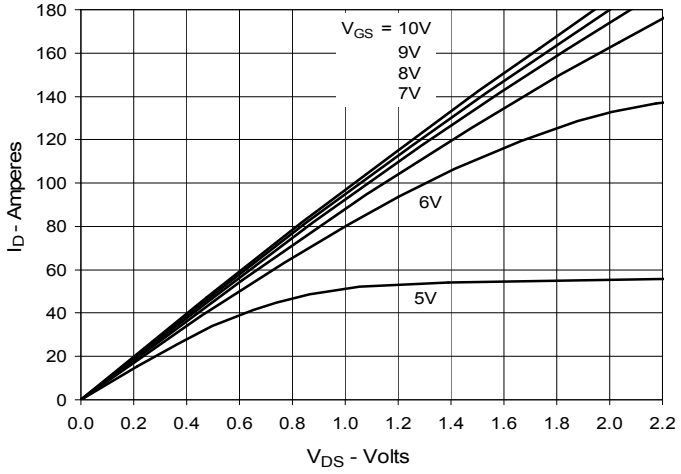


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 90A Value vs. Junction Temperature

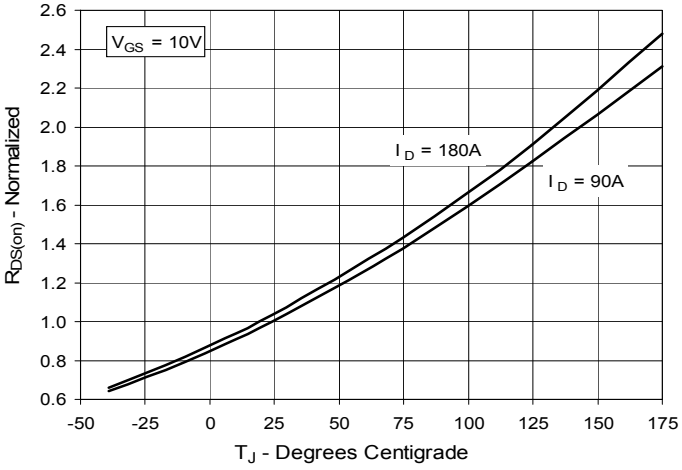


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 90A Value vs. Drain Current

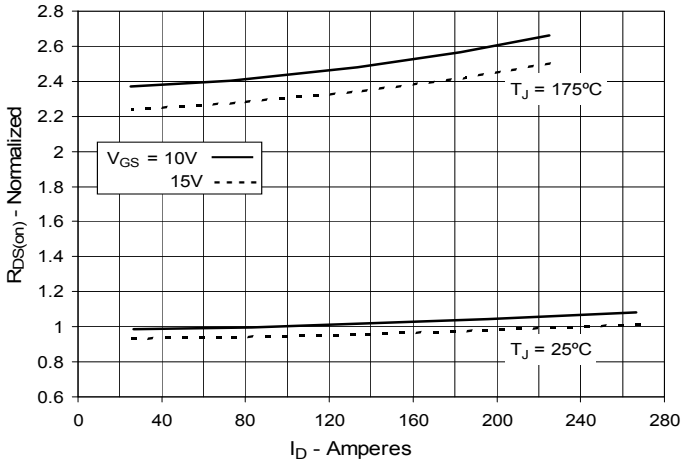


Fig. 6. Drain Current vs. Case Temperature

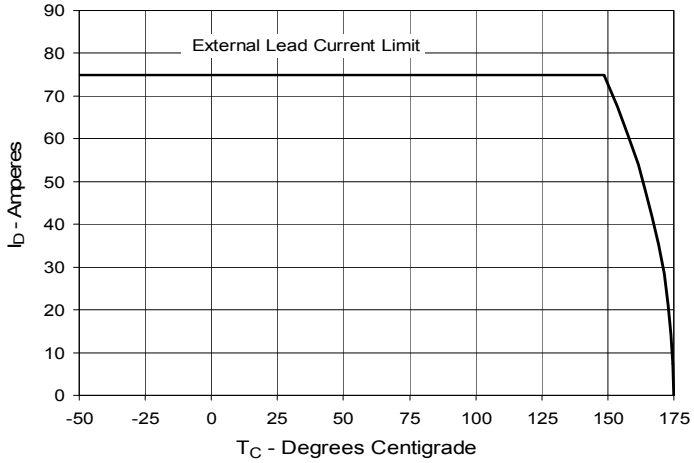


Fig. 7. Input Admittance

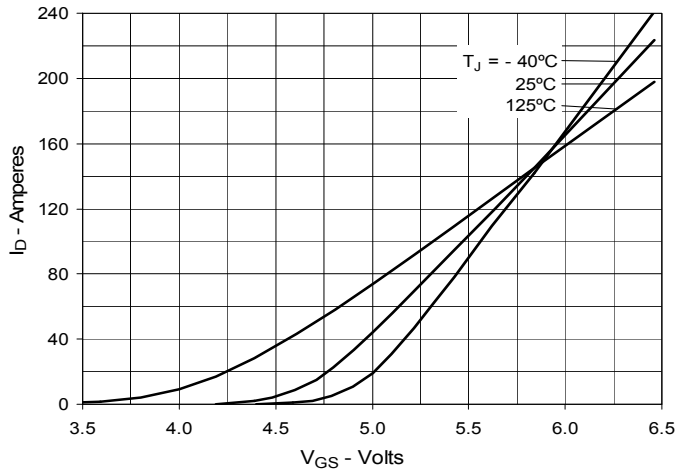


Fig. 8. Transconductance

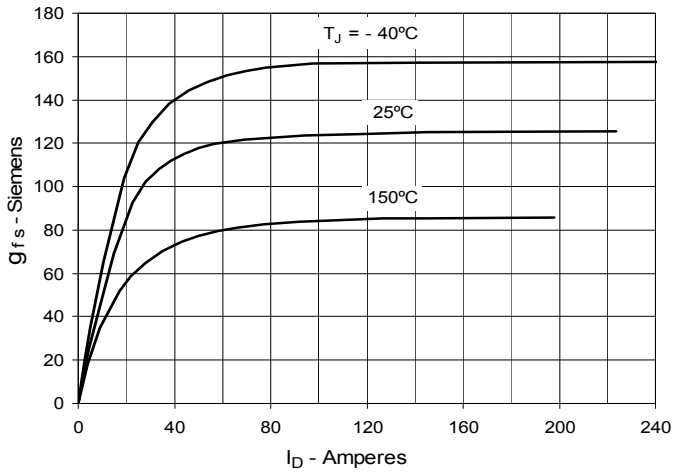


Fig. 9. Forward Voltage Drop of Intrinsic Diode

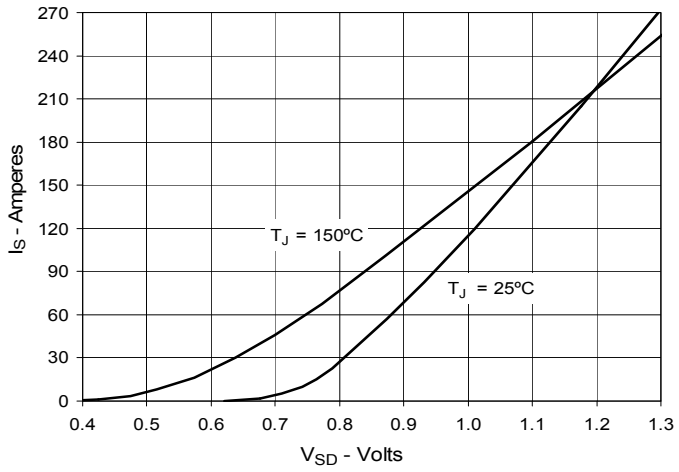


Fig. 10. Gate Charge

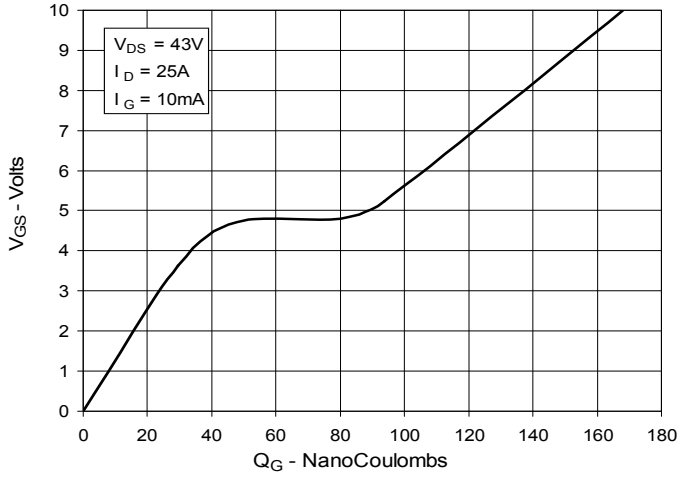


Fig. 11. Capacitance

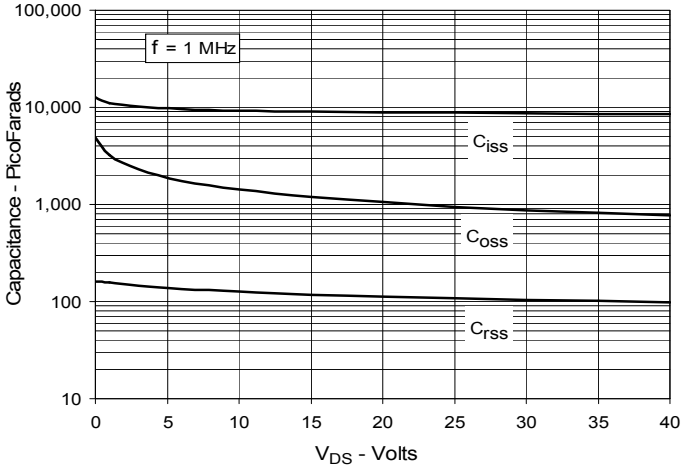


Fig. 12. Maximum Transient Thermal Impedance

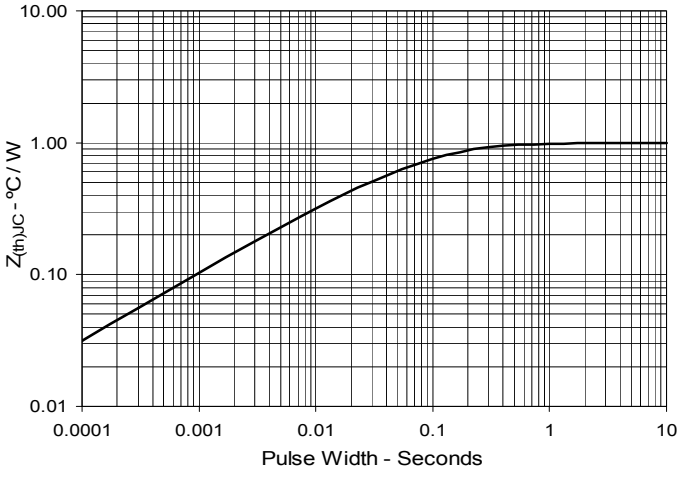


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

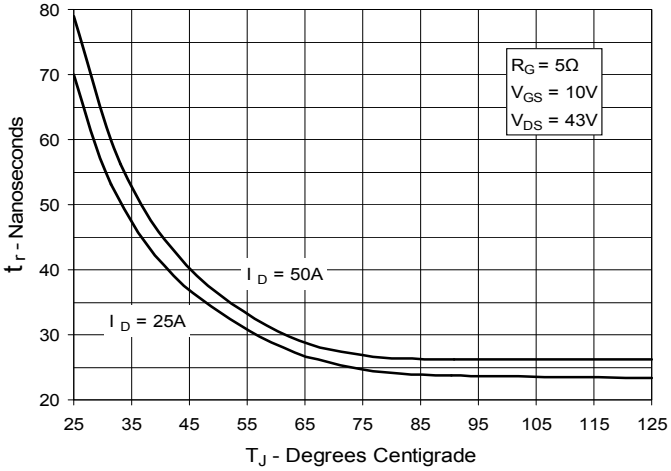


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

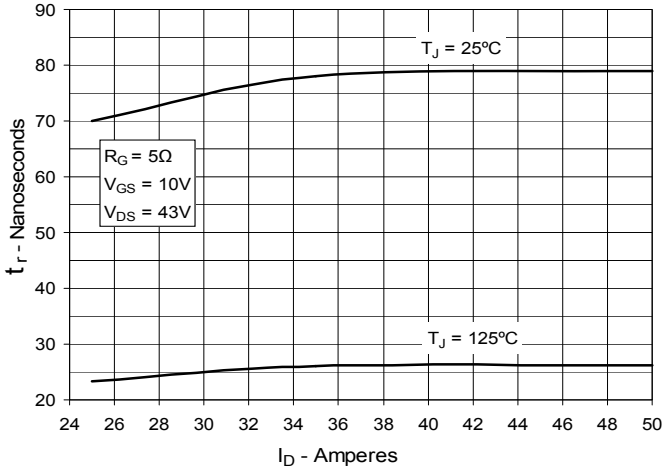


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

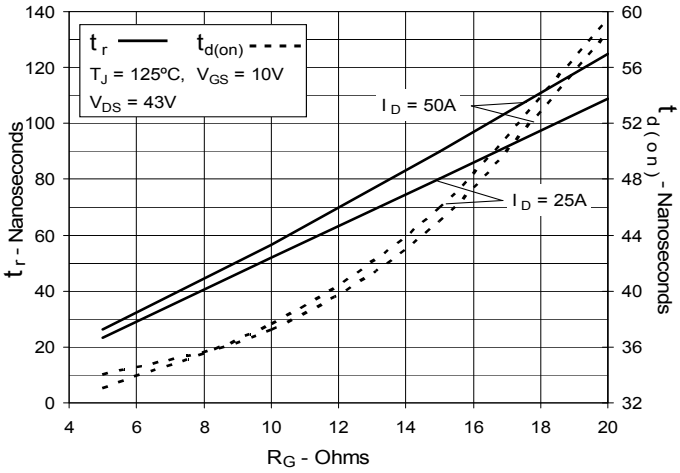


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

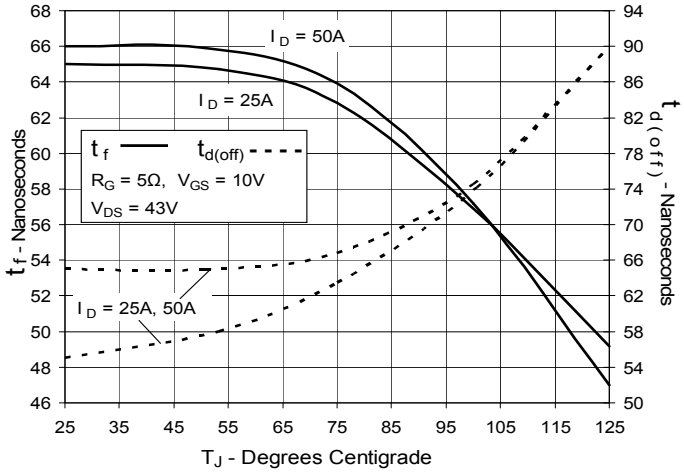


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

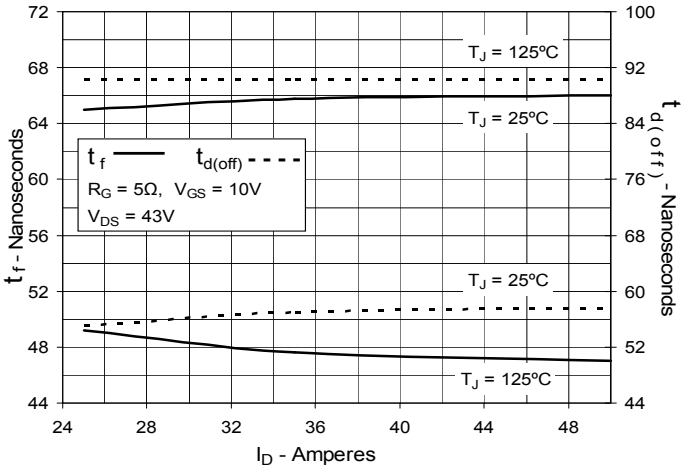


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance