

TrenchT2™
GigaMOS™ HiperFET™
Power MOSFET

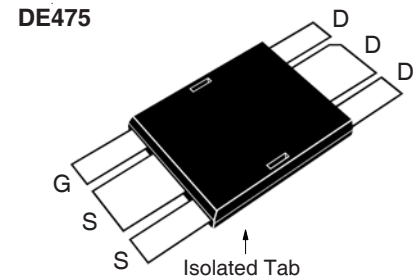
IXFZ520N075T2

$V_{DSS} = 75V$
 $I_{D25} = 420A$
 $R_{DS(on)} \leq 1.6m\Omega$

(Electrically Isolated Tab)



N-Channel Enhancement Mode
 Avalanche Rated
 Fast Intrinsic Diode



G = Gate D = Drain
 S = Source

Symbol	Test Conditions	Maximum Ratings		
		Value	Unit	
V_{DSS}	$T_J = 25^\circ C$ to $175^\circ C$	75	V	
V_{DGR}	$T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$	75	V	
V_{GSS}	Continuous	± 20	V	
V_{GSM}	Transient	± 30	V	
I_{D25}	$T_C = 25^\circ C$	420	A	
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	1560	A	
I_A	$T_C = 25^\circ C$	200	A	
E_{AS}	$T_C = 25^\circ C$	3	J	
P_D	$T_C = 25^\circ C$	600	W	
T_J		-55 ... +175	$^\circ C$	
T_{JM}		175	$^\circ C$	
T_{stg}		-55 ... +175	$^\circ C$	
V_{ISOL}	50/60 Hz, RMS	$t = 1$ minute	2500	V~
	$I_{ISOL} \leq 1mA$	$t = 1$ second	3000	V~
T_L	1.6mm (0.062 in.) from Case for 10s	300	$^\circ C$	
T_{SOLD}	Plastic Body for 10s	260	$^\circ C$	
V_{ISOL}	50/60 Hz, 1 Minute	2500	V~	
F_C	Mounting Force	20..120 / 4.5..27	N/lb.	
Weight		3	g	

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Substrate
 - Excellent Thermal Transfer
 - Increased Temperature and Power Cycling Capability
 - High Isolation Voltage (2500V~)
- 175°C Operating Temperature
- Very High Current Handling Capability
- Fast Intrinsic Diode
- Avalanche Rated
- Very Low $R_{DS(on)}$

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Applications

- DC-DC Converters and Off-Line UPS
- Primary-Side Switch
- High Speed Power Switching Applications

Symbol	Test Conditions	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 3mA$	75		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 8mA$	2.0		V
I_{GSS}	$V_{GS} = \pm 20V$, $V_{DS} = 0V$			± 200 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$	$T_J = 150^\circ C$		10 μA
				1.5 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 100A$, Note 1			1.6 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}$, $I_D = 60\text{A}$, Note 1	95	160	S
C_{iss}	$V_{GS} = 0\text{V}$, $V_{DS} = 25\text{V}$, $f = 1\text{MHz}$		41	nF
C_{oss}			4150	pF
C_{rss}			530	pF
R_{GI}	Gate Input Resistance		1.36	Ω
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 200\text{A}$ $R_G = 1\Omega$ (External)		48	ns
t_r			36	ns
$t_{d(off)}$			80	ns
t_f			35	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}$, $V_{DS} = 0.5 \cdot V_{DSS}$, $I_D = 260\text{A}$		545	nC
Q_{gs}			177	nC
Q_{gd}			135	nC
R_{thJC}				0.25 $^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			520 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			1600 A
V_{SD}	$I_F = 100\text{A}$, $V_{GS} = 0\text{V}$, Note 1			1.25 V
t_{rr}	$I_F = 150\text{A}$, $V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 37.5\text{V}$			150 ns
I_{RM}			7	A
Q_{RM}			357	nC

Note 1. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

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	4,931,844	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
4,860,072	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	

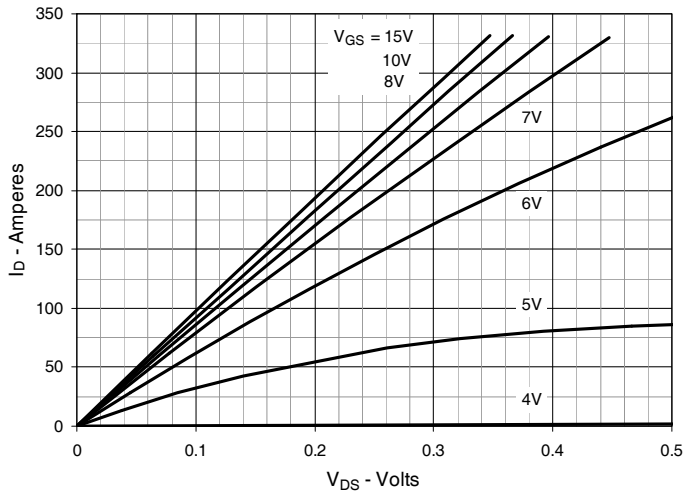
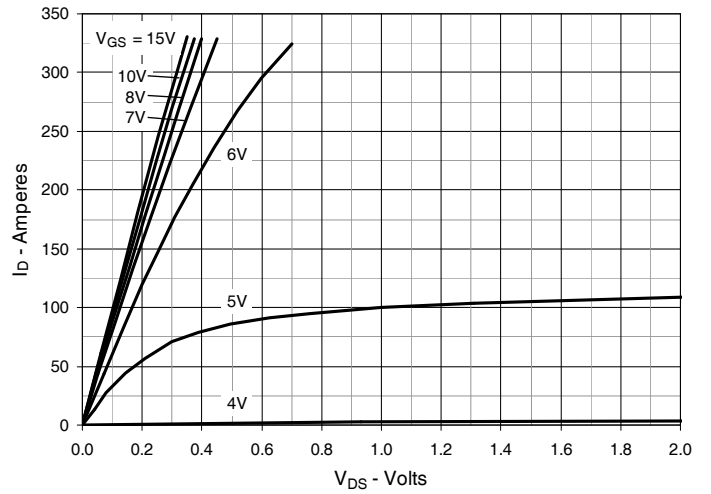
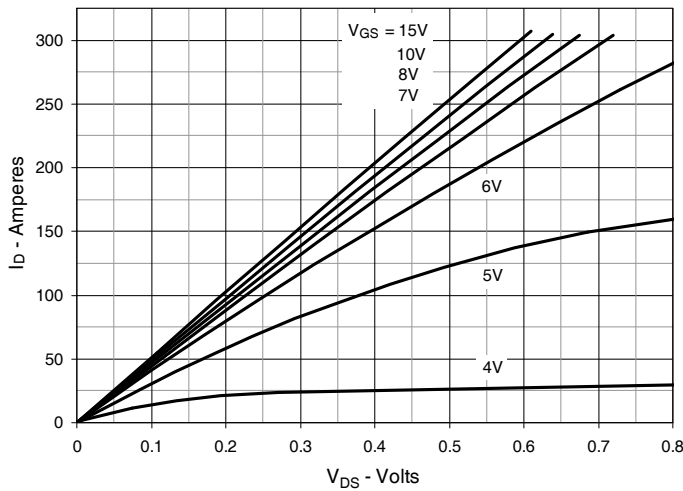
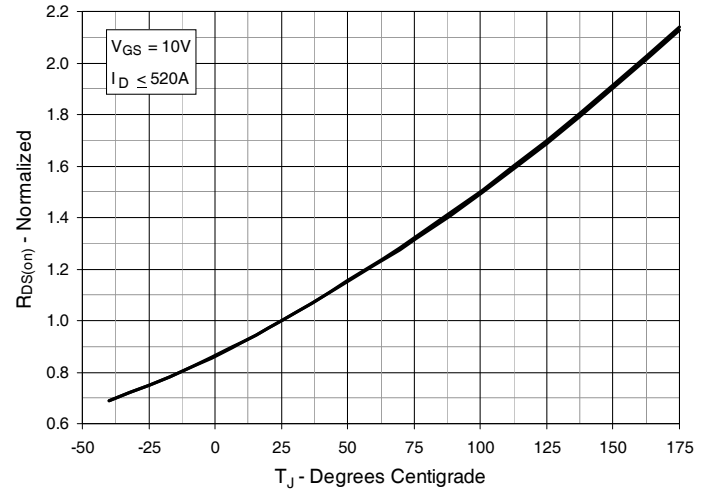
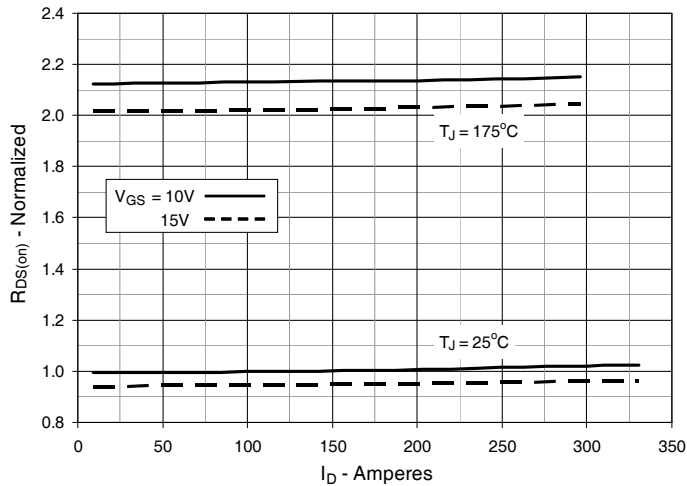
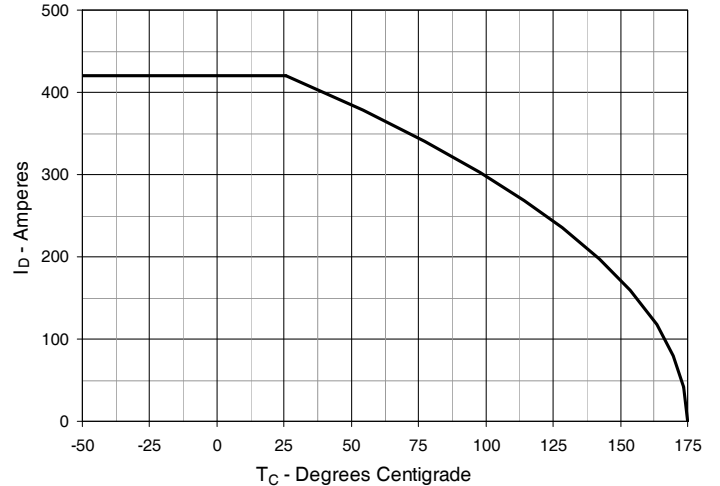
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

Fig. 3. Output Characteristics @ $T_J = 150^\circ\text{C}$

Fig. 4. Normalized $R_{DS(on)}$ vs. Junction Temperature

Fig. 5. Normalized $R_{DS(on)}$ vs. Drain Current

Fig. 6. Drain Current vs. Case Temperature


Fig. 7. Input Admittance

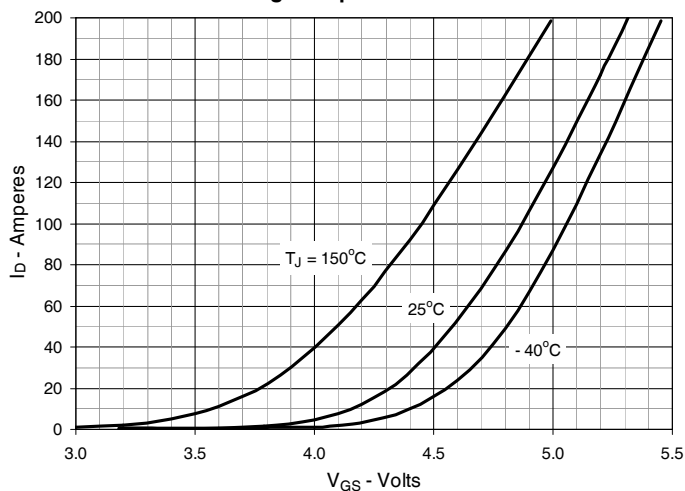


Fig. 8. Transconductance

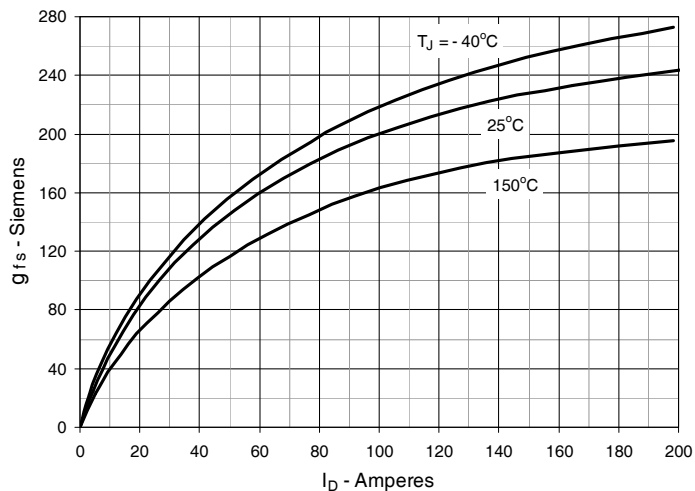


Fig. 9. Forward Voltage Drop of Intrinsic Diode

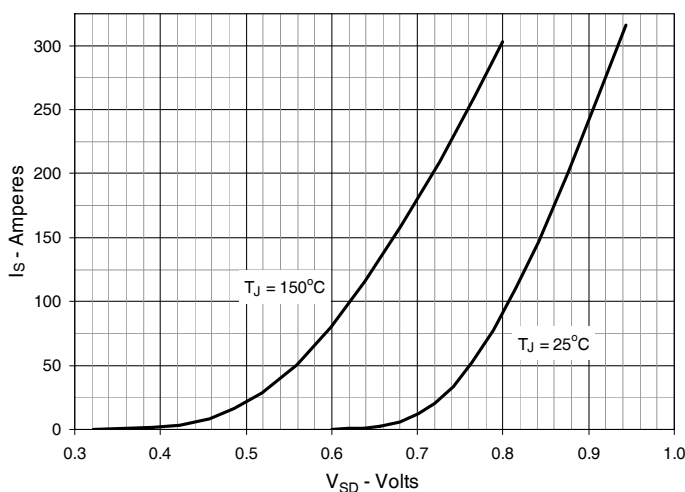


Fig. 10. Gate Charge

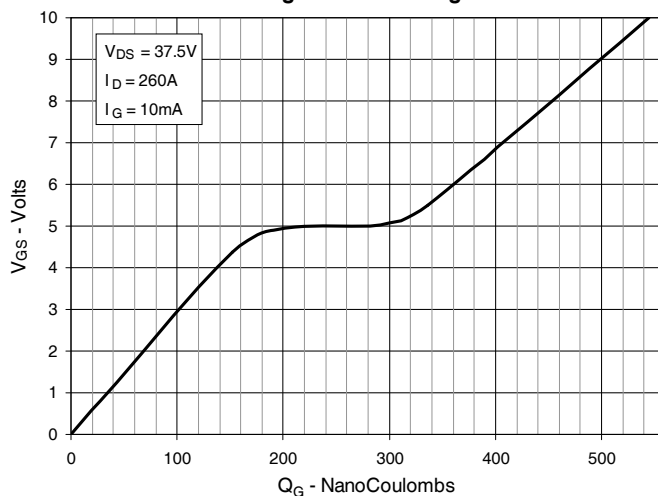


Fig. 11. Capacitance

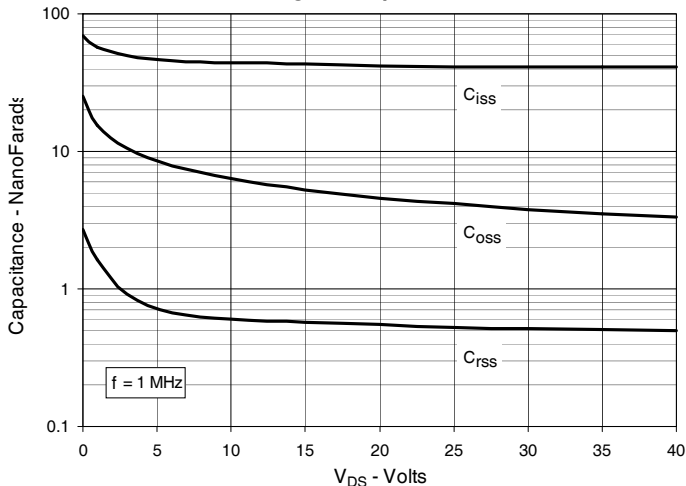


Fig. 12. Forward-Bias Safe Operating Area

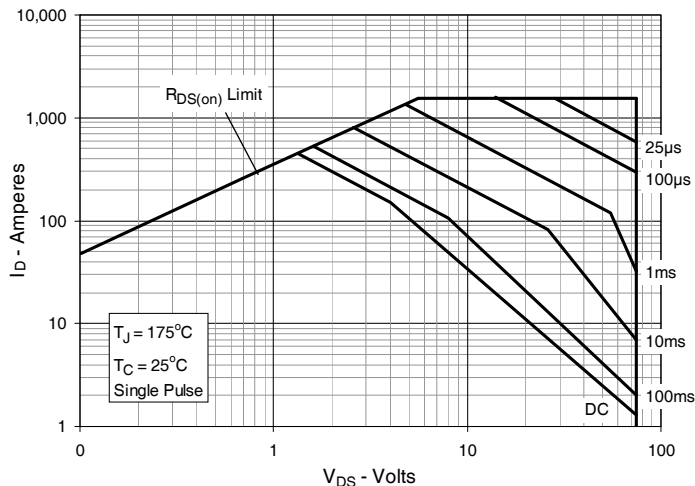


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

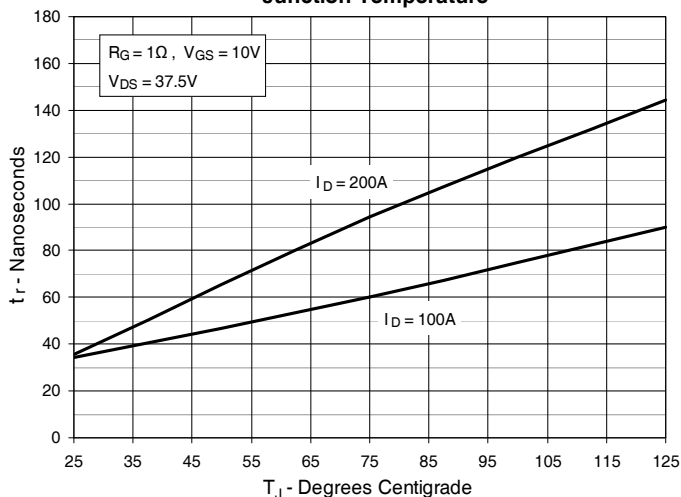


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

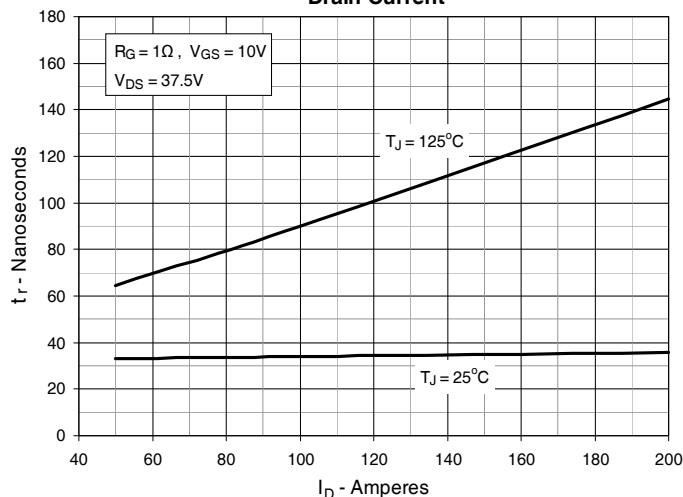


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

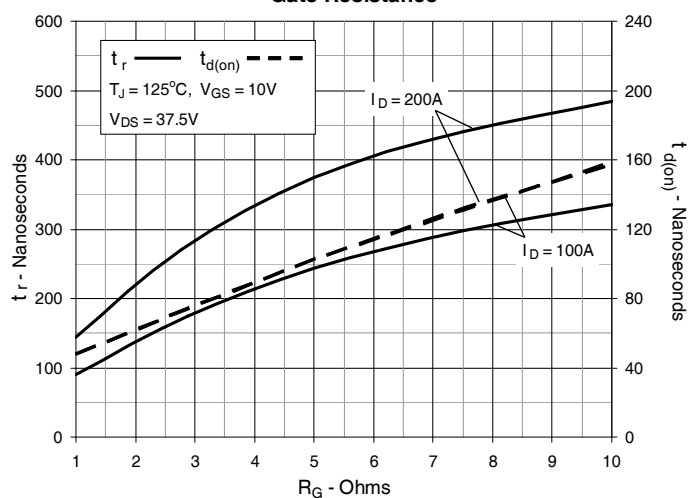


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

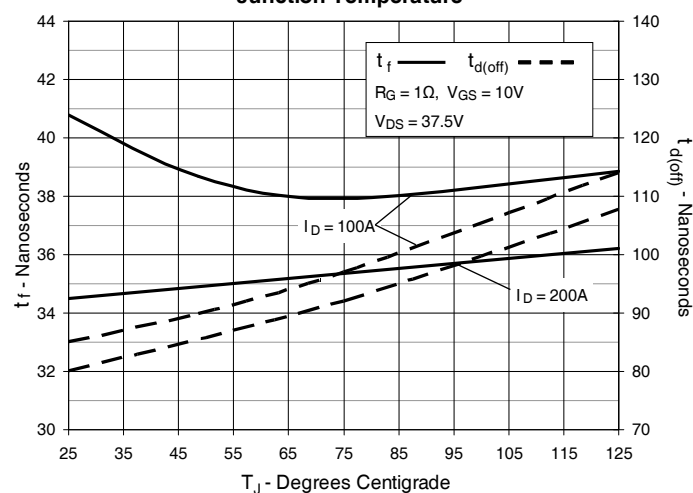


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

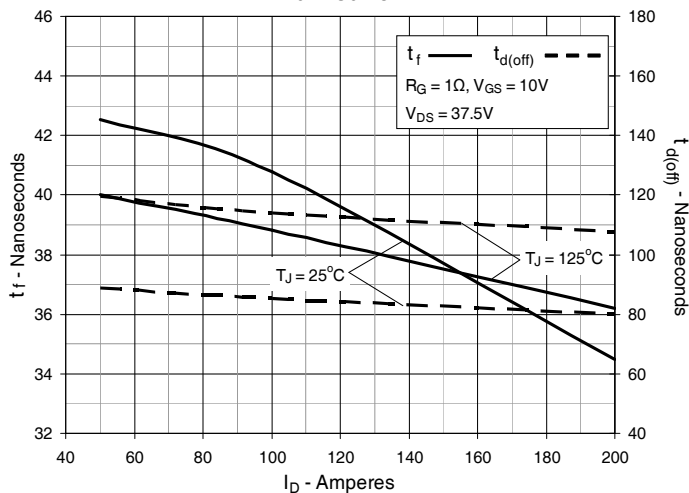


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

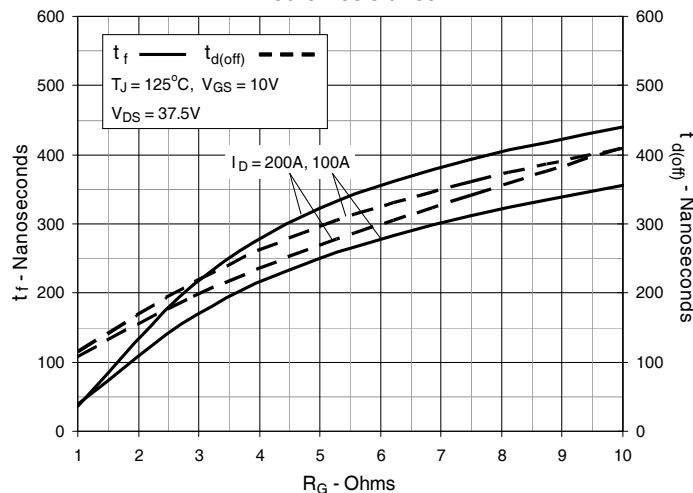
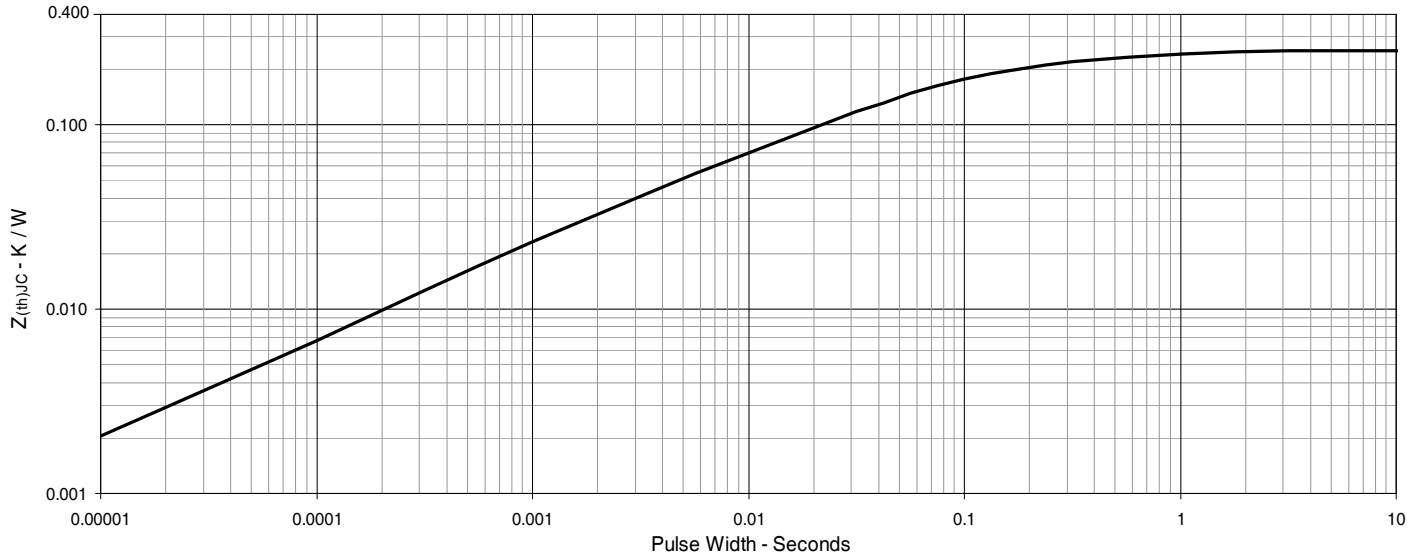
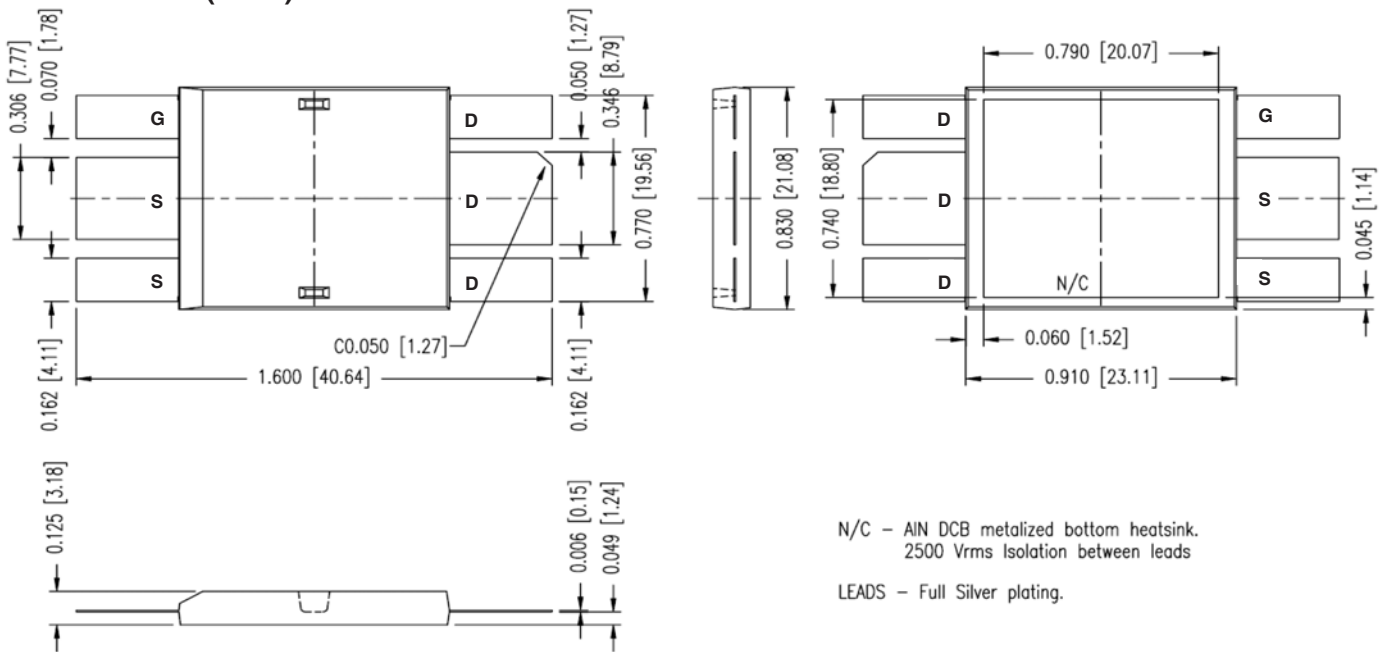


Fig. 19. Maximum Transient Thermal Impedance



DE475 (IXFZ) Outline





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