

**TrenchT2™ GigaMOS™
Power MOSFET**
IXTZ550N055T2

$$V_{DSS} = 55V$$

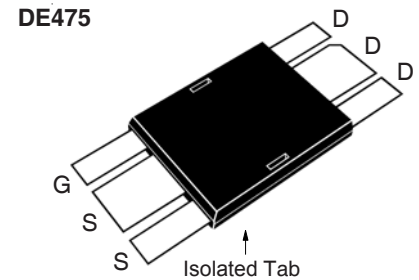
$$I_{D25} = 550A$$

$$R_{DS(on)} \leq 1.0m\Omega$$

(Electrically Isolated Tab)

 N-Channel Enhancement Mode
 Avalanche Rated
 Fast Intrinsic Diode

Symbol	Test Conditions	Maximum Ratings		
V_{DSS}	$T_J = 25^\circ C$ to $175^\circ C$	55	V	
V_{DGR}	$T_J = 25^\circ C$ to $175^\circ C$, $R_{GS} = 1M\Omega$	55	V	
V_{GSS}	Continuous	± 20	V	
V_{GSM}	Transient	± 30	V	
I_{D25}	$T_C = 25^\circ C$	550	A	
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	1650	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


 G = Gate D = Drain
 S = Source

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 ($T_J = 25^\circ C$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$	55		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2.0		4.0 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			1.0 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}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		40	nF
C_{oss}			4970	pF
C_{rss}			1020	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)		45	ns
t_r			40	ns
$t_{d(off)}$			90	ns
t_f			230	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{DSS}$		595	nC
Q_{gs}			150	nC
Q_{gd}			163	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	$V_{GS} = 0\text{V}$			550 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			1700 A
V_{SD}	$I_F = 100\text{A}, V_{GS} = 0\text{V}$, Note 1			1.2 V
t_{rr}	$I_F = 100\text{A}, V_{GS} = 0\text{V}$ $-di/dt = 100\text{A}/\mu\text{s}$ $V_R = 27.5\text{V}$		100	ns
I_{RM}			5	A
Q_{RM}			250	nC

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

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered	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
by one or more of the following U.S. patents:	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	

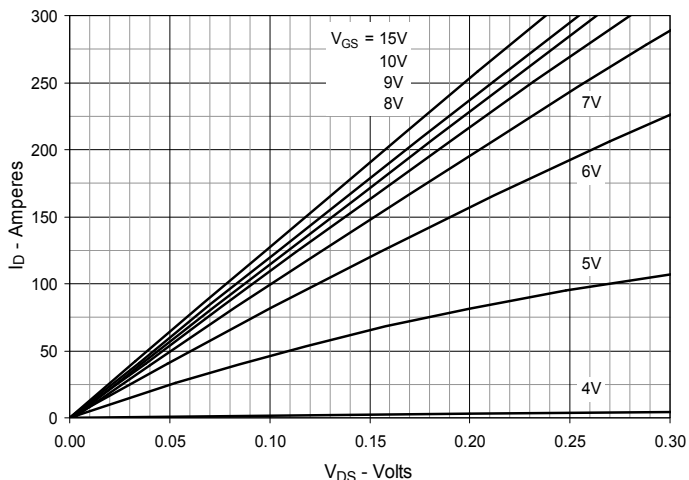
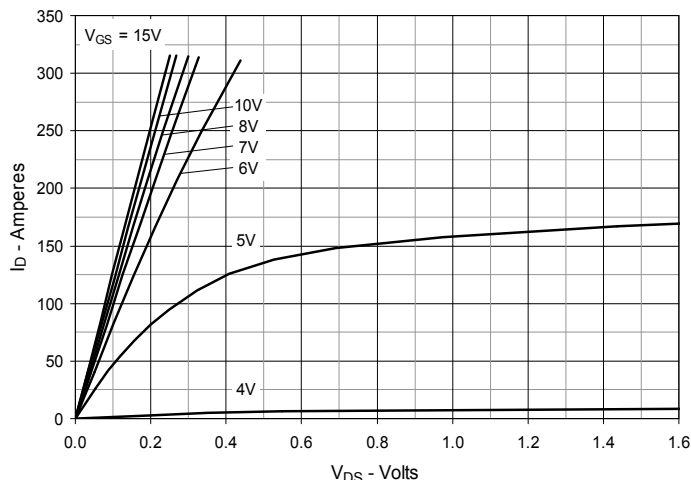
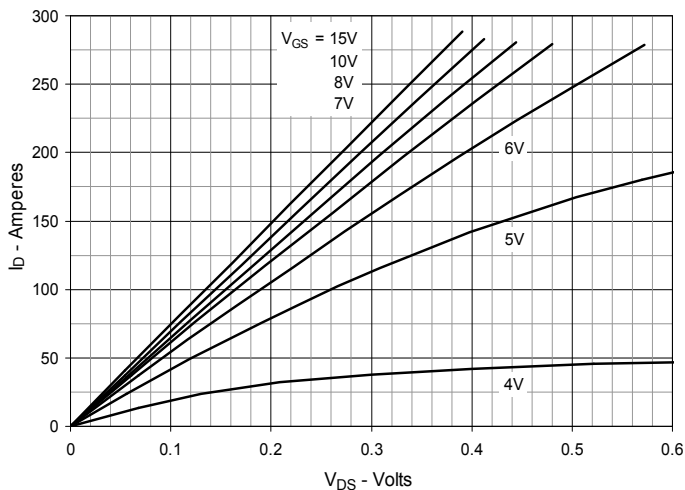
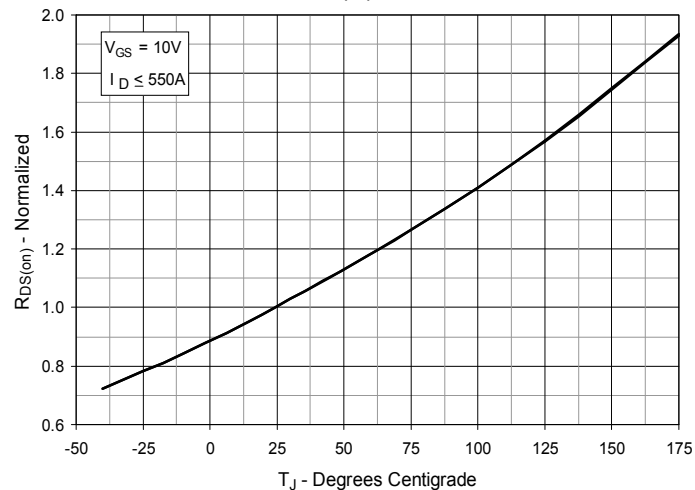
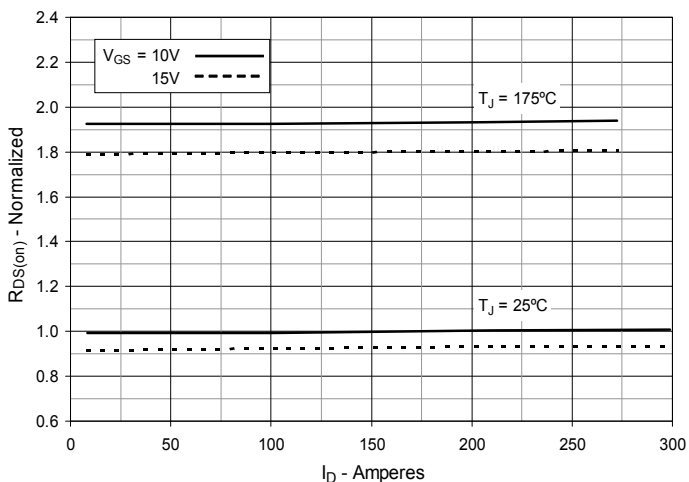
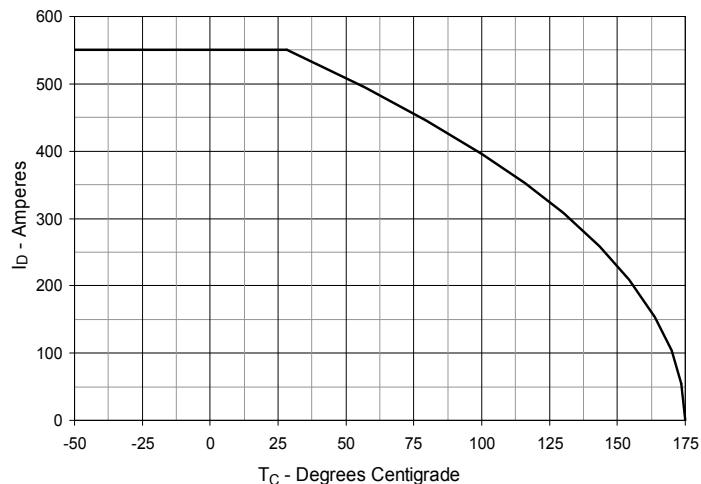
Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

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

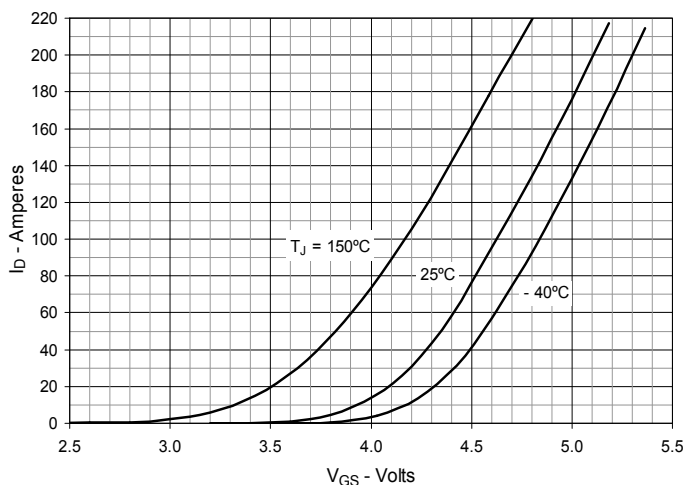


Fig. 8. Transconductance

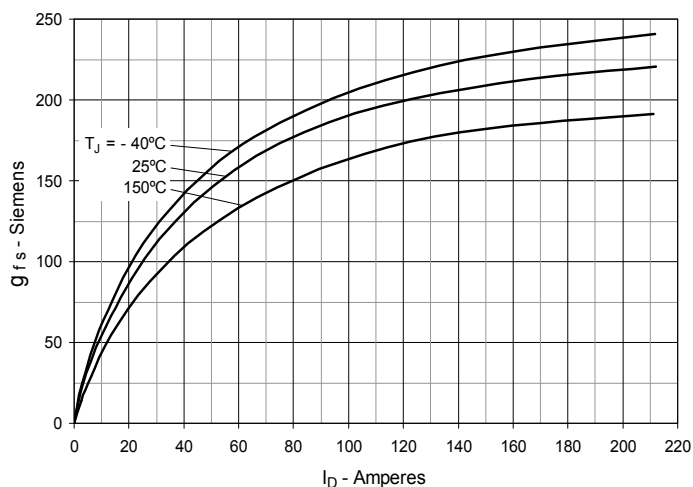


Fig. 9. Forward Voltage Drop of Intrinsic Diode

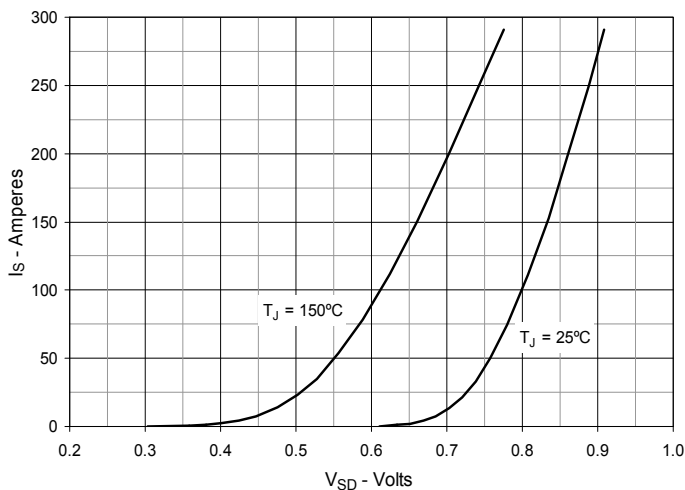


Fig. 10. Gate Charge

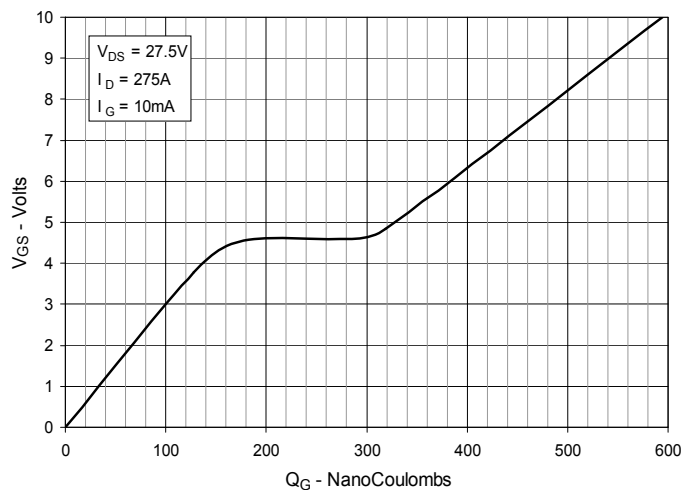


Fig. 11. Capacitance

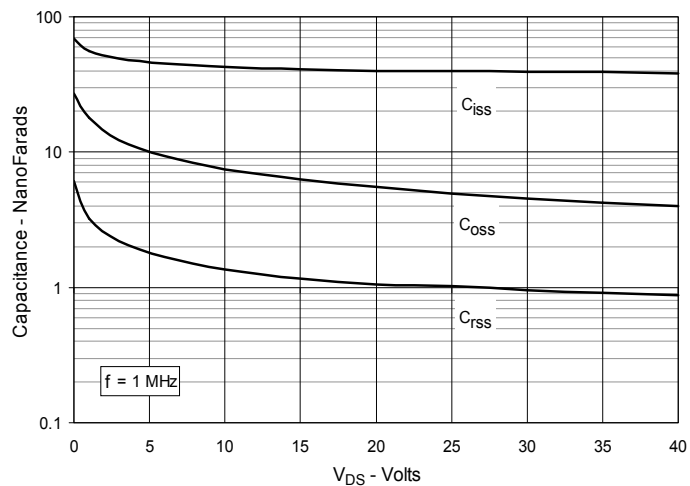


Fig. 12. Forward-Bias Safe Operating Area

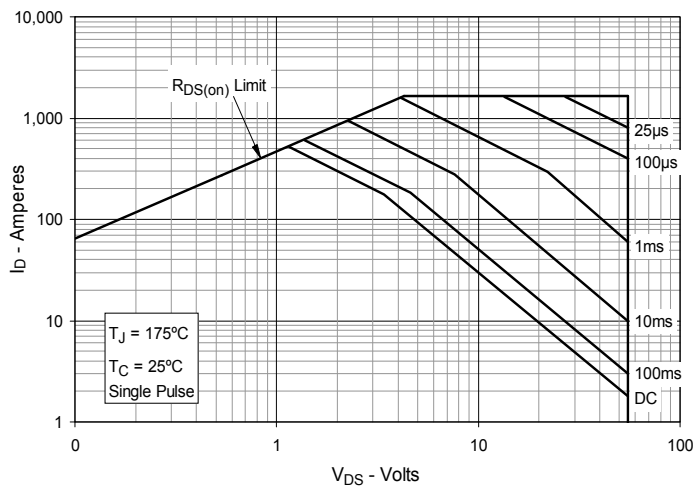


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

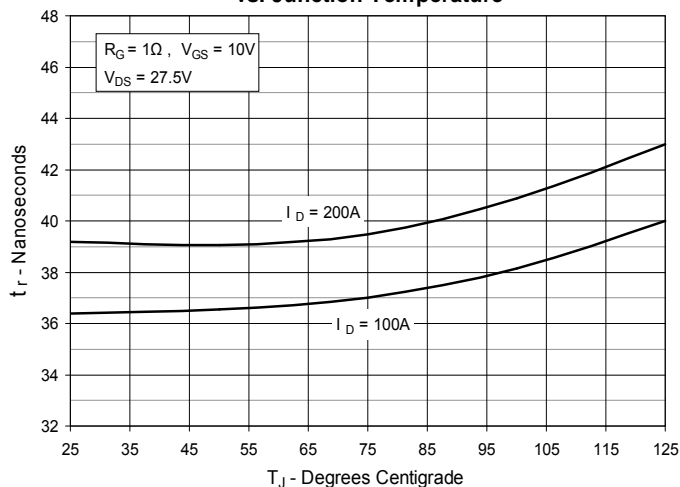


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

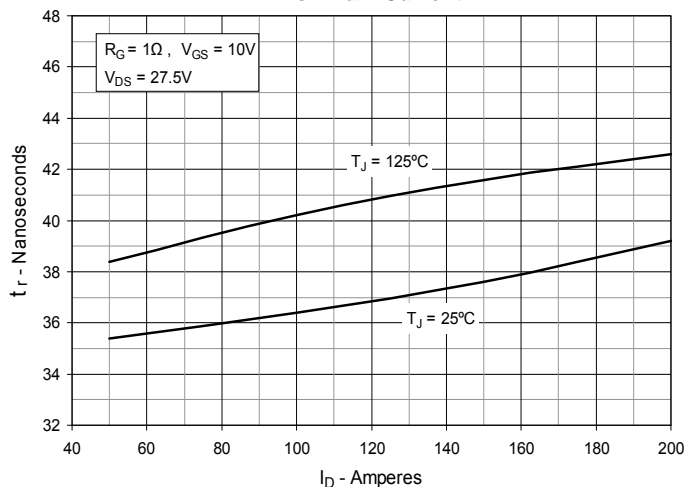


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

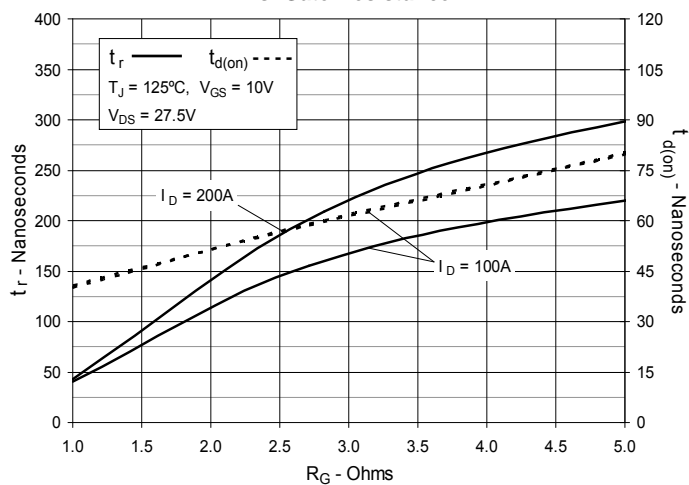


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

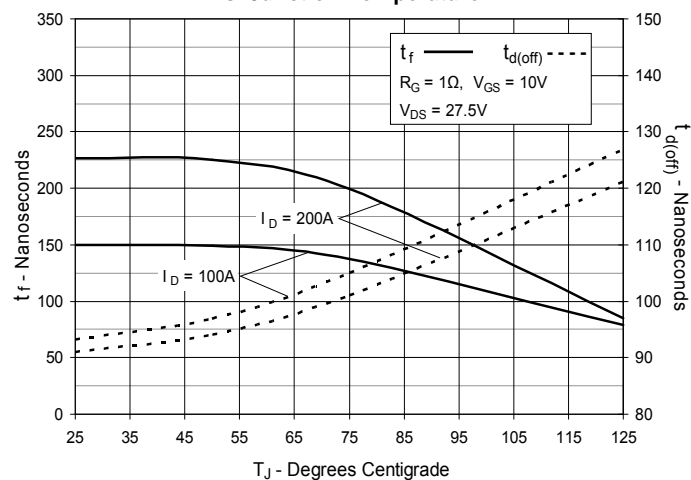


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

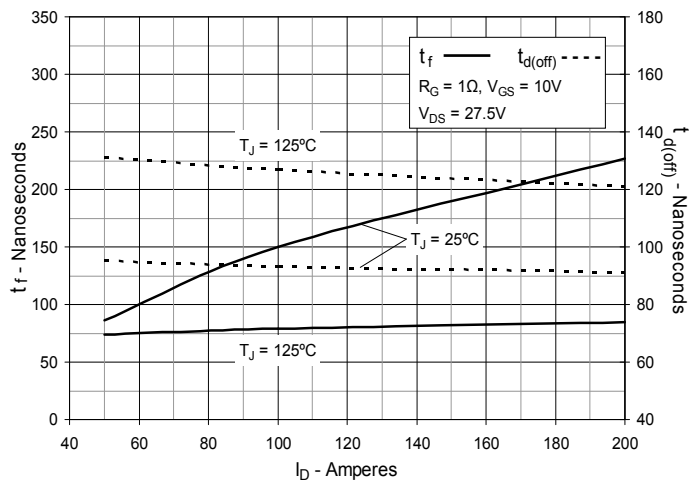


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

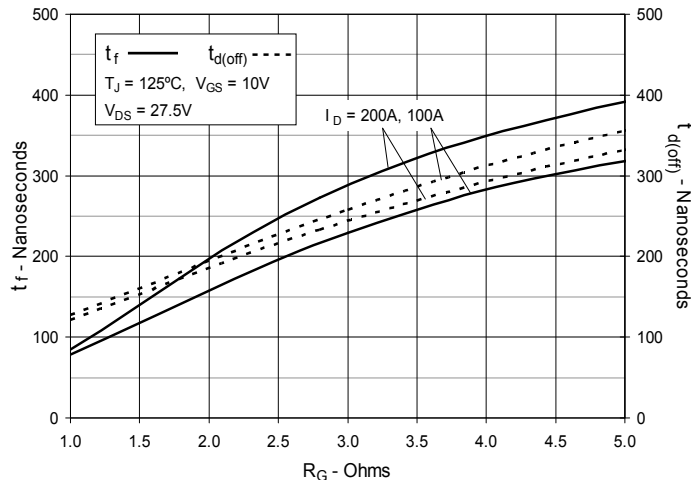
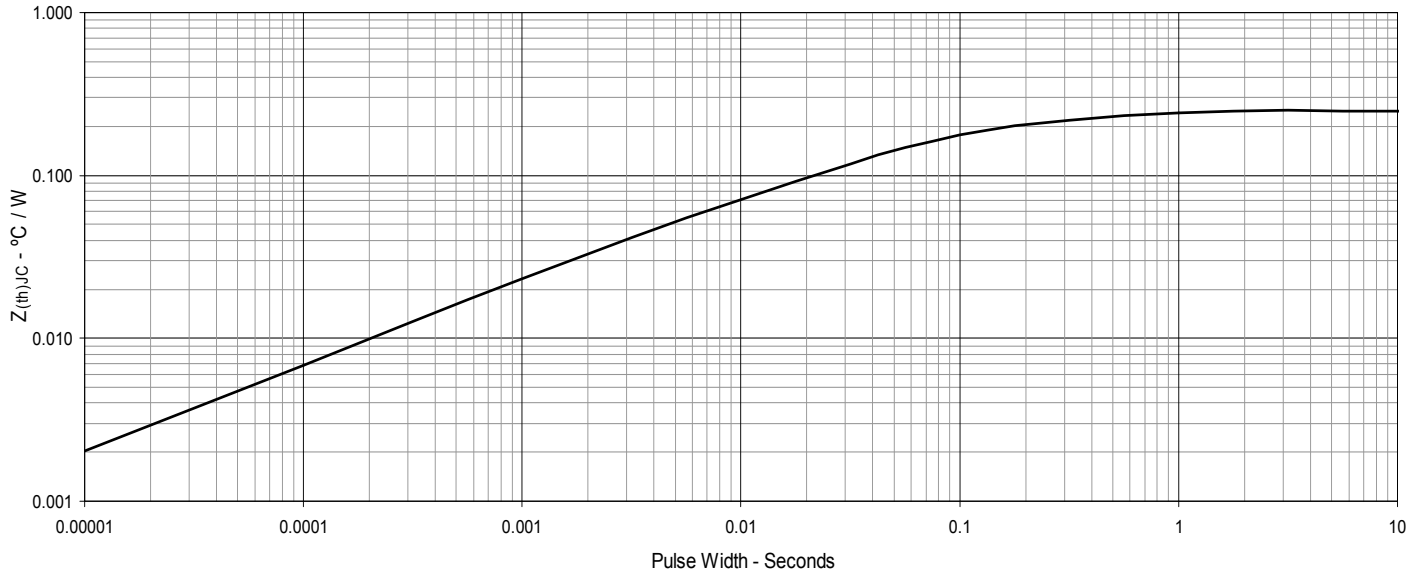
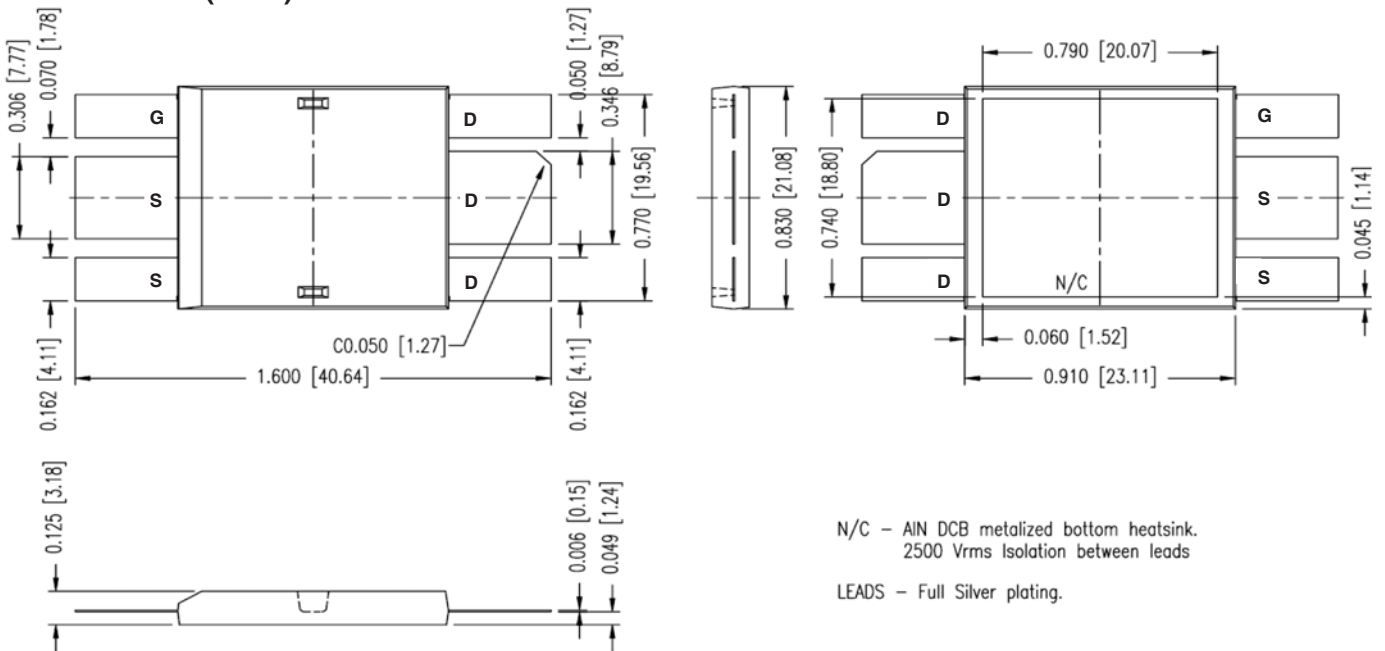


Fig. 19. Maximum Transient Thermal Impedance



DE475 (IXTZ) Outline





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