IXYS

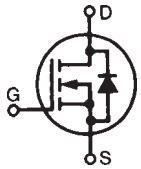
Advance Technical Information

TrenchT2™ GigaMOS™ Power MOSFET

IXTZ550N055T2

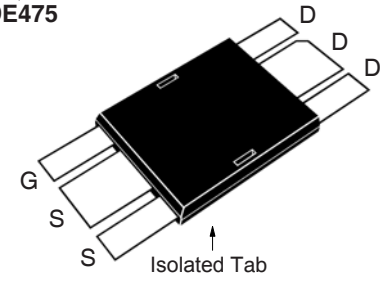
V_{DSS} = 55V
I_{D25} = 550A
$R_{DS(on)}$ ≤ 1.0mΩ

(Electrically Isolated Tab)



N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

DE475



G = Gate D = Drain
S = Source

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 175°C		55	V
V_{DGR}	T_J = 25°C to 175°C, R_{GS} = 1MΩ		55	V
V_{GSS}	Continuous		±20	V
V_{GSM}	Transient		±30	V
I_{D25}	T_C = 25°C		550	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		1650	A
I_A	T_C = 25°C		200	A
E_{AS}	T_C = 25°C		3	J
P_D	T_C = 25°C		600	W
T_J			-55 ... +175	°C
T_{JM}			175	°C
T_{stg}			-55 ... +175	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 minute	2500	V~
	I_{ISOL} ≤ 1mA	t = 1 second	3000	V~
T_L	1.6mm (0.062 in.) from Case for 10s		300	°C
T_{SOLD}	Plastic Body for 10s		260	°C
V_{ISOL}	50/60 Hz, 1 Minute		2500	V~
F_C	Mounting Force		20..120 / 4.5..27	N/lb.
Weight			3	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	55			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			10	μA
	T_J = 150°C			1.5	mA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 100A, Note 1			1.0	mΩ

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°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 60A, Note 1	95	160		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		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} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 200A R_G = 1Ω (External)		45		ns
t_r			40		ns
$t_{d(off)}$			90		ns
t_f			230		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{DSS}		595		nC
Q_{gs}			150		nC
Q_{gd}			163		nC
R_{thJC}				0.25	°C/W
R_{thCS}			0.15		°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			550	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			1700	A
V_{SD}	I_F = 100A, V_{GS} = 0V, Note 1			1.2	V
t_{rr}	I_F = 100A, V_{GS} = 0V -di/dt = 100A/μs V_R = 27.5V		100		ns
I_{RM}			5		A
Q_{RM}			250		nC

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 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.

Fig. 1. Output Characteristics @ T_J = 25ºC

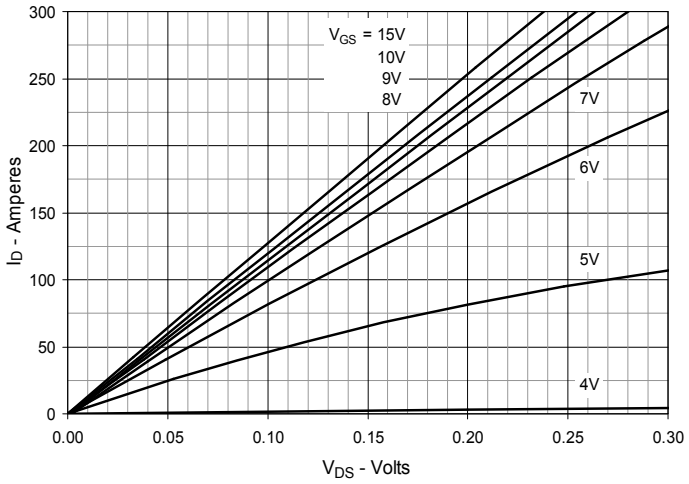


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

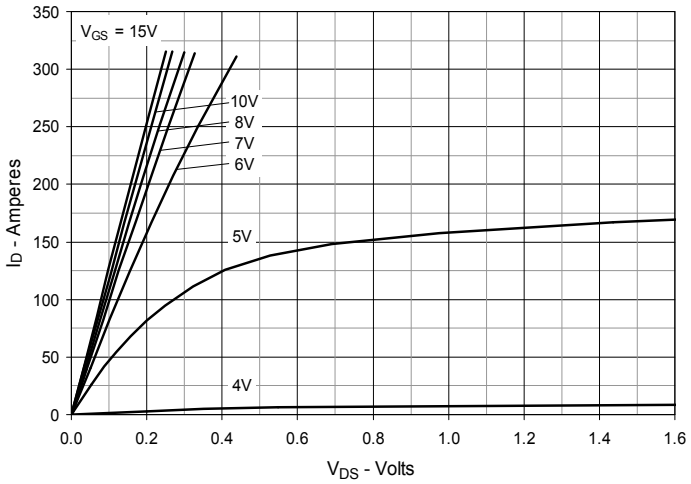


Fig. 3. Output Characteristics @ T_J = 150ºC

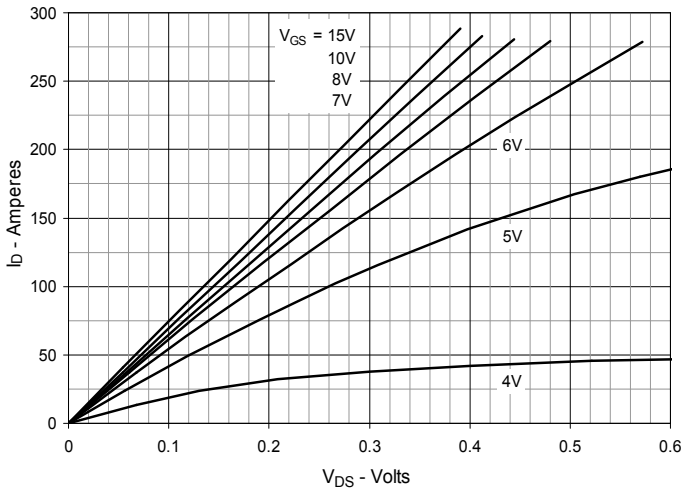


Fig. 4. Normalized $R_{DS(on)}$ vs. Junction Temperature

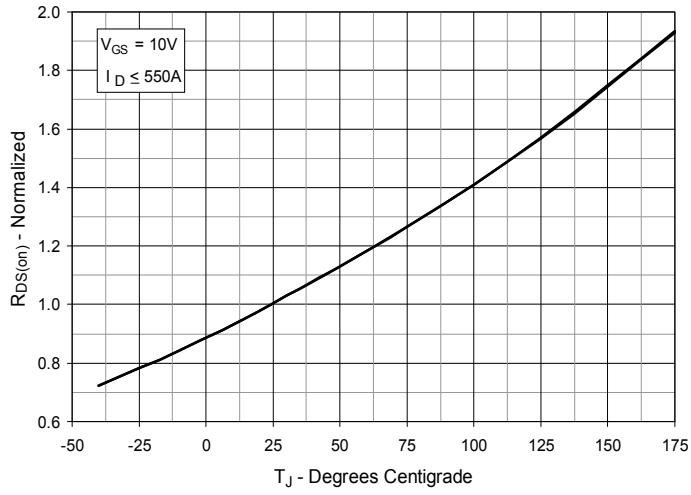


Fig. 5. Normalized $R_{DS(on)}$ vs. Drain Current

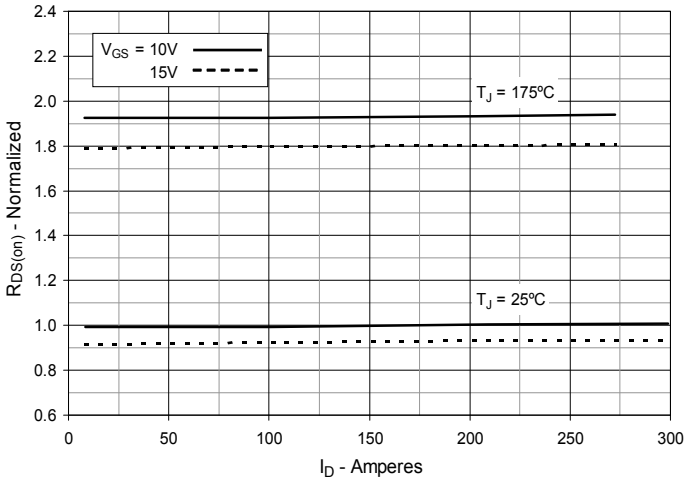


Fig. 6. Drain Current vs. Case Temperature

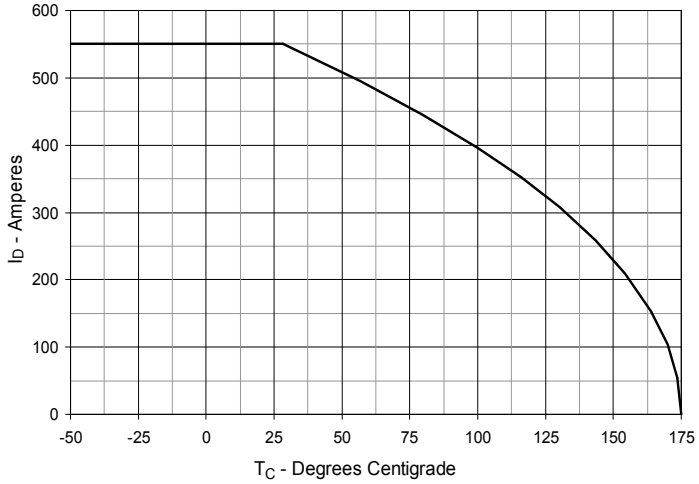


Fig. 7. Input Admittance

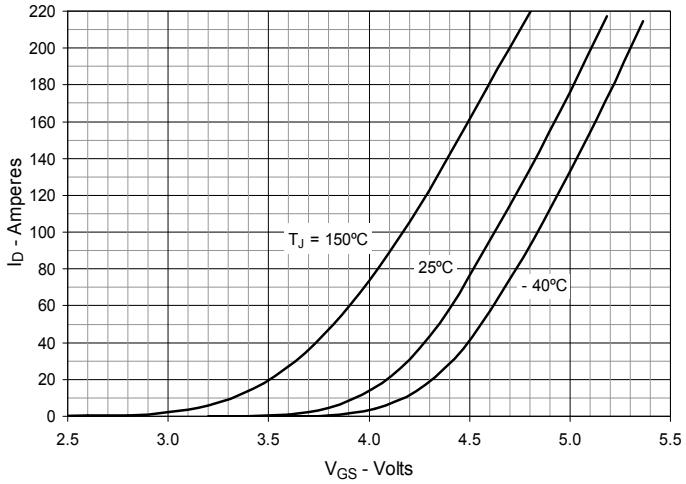


Fig. 8. Transconductance

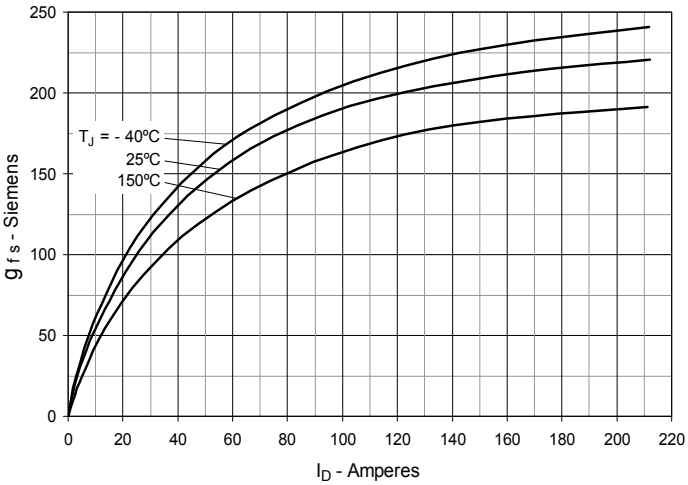


Fig. 9. Forward Voltage Drop of Intrinsic Diode

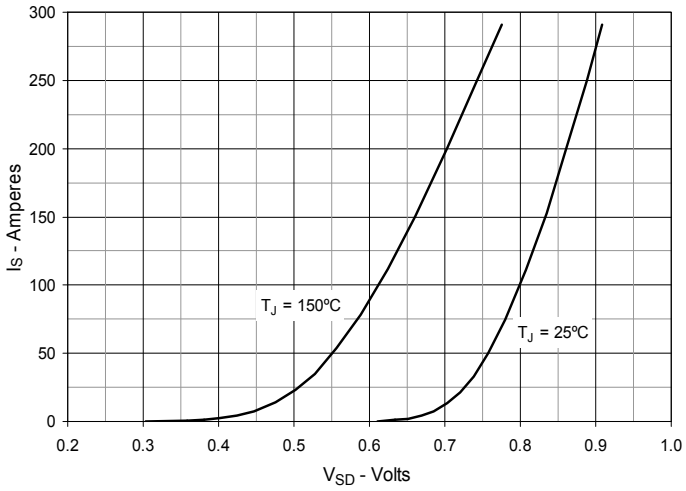


Fig. 10. Gate Charge

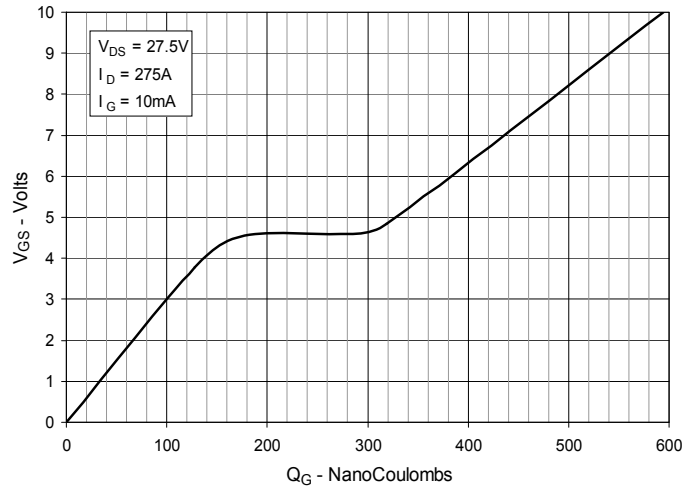


Fig. 11. Capacitance

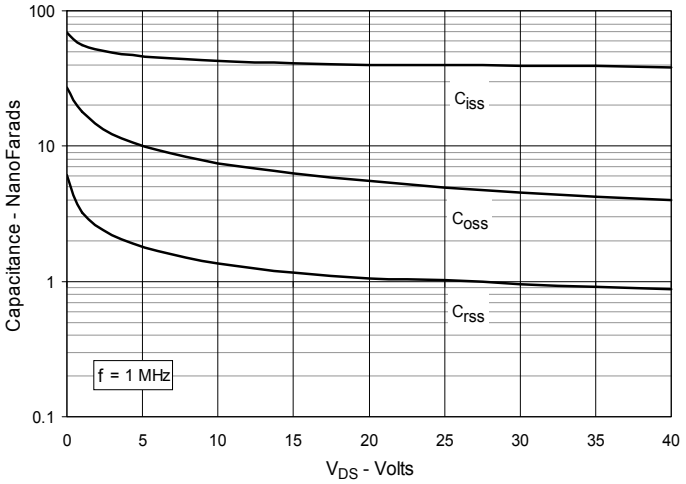


Fig. 12. Forward-Bias Safe Operating Area

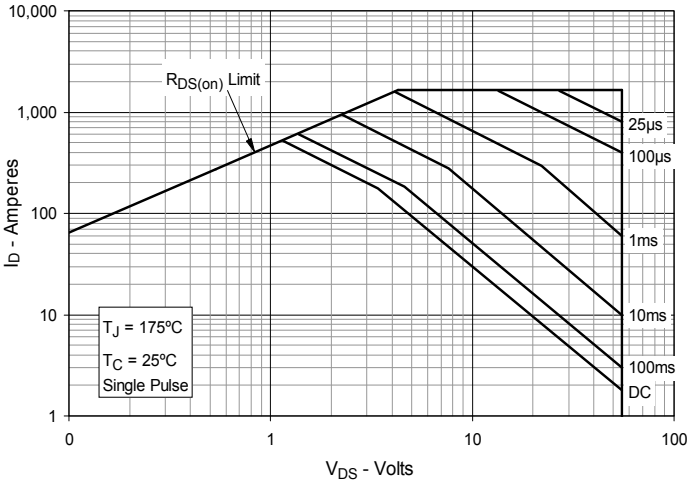


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

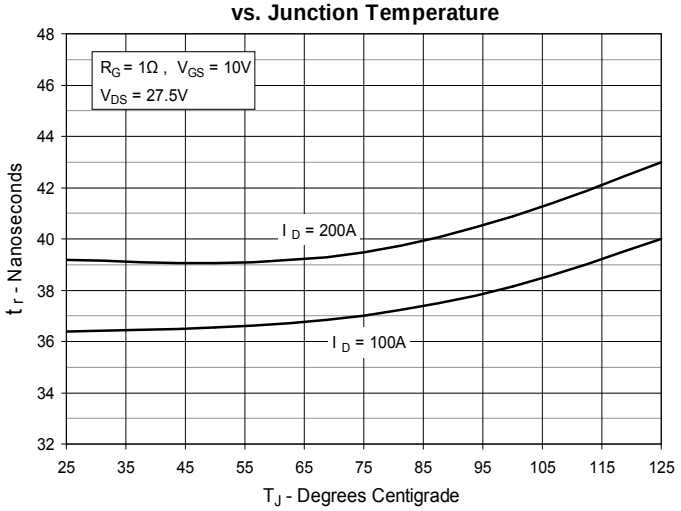


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

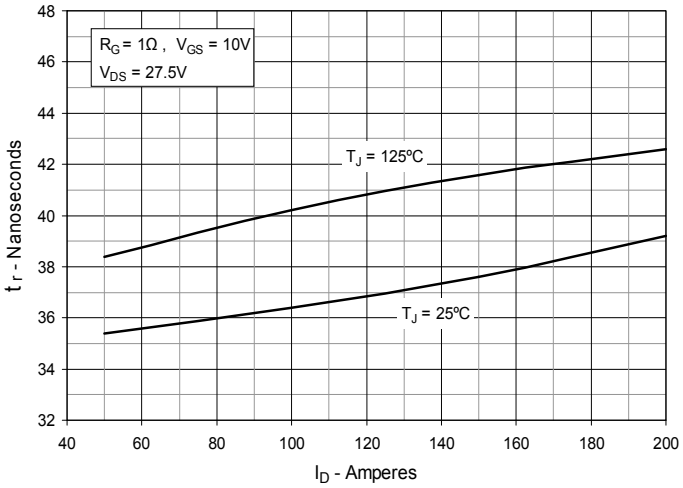


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

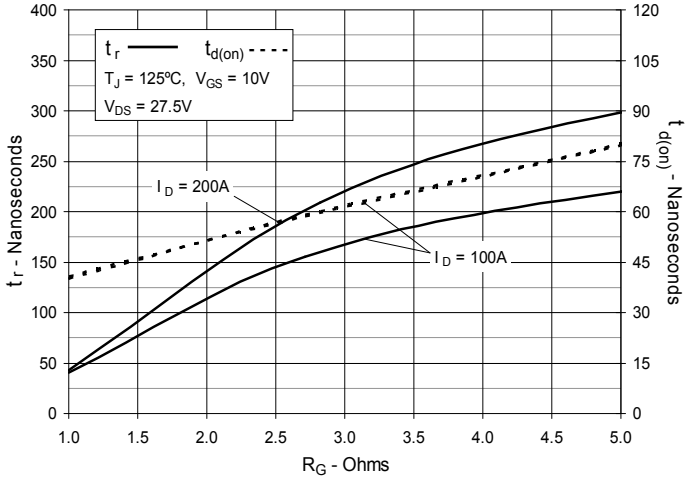


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

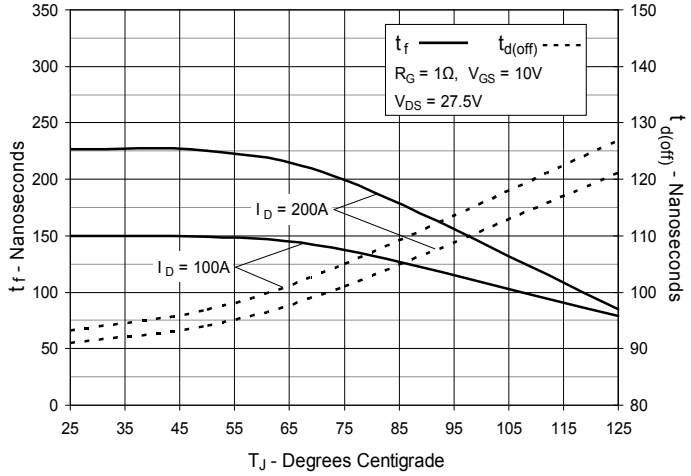


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

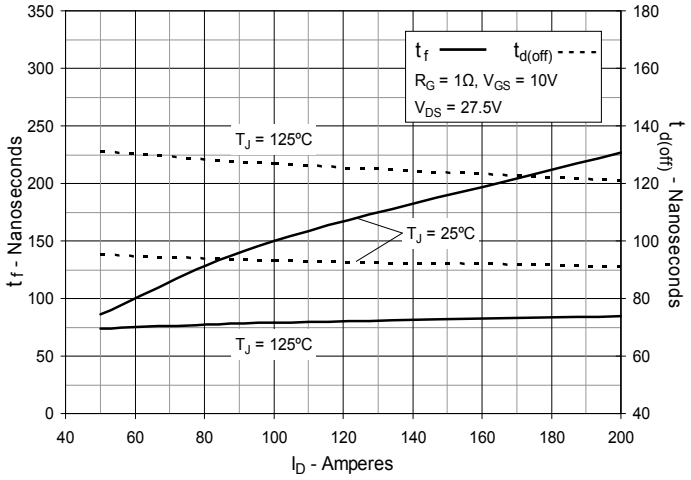


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance

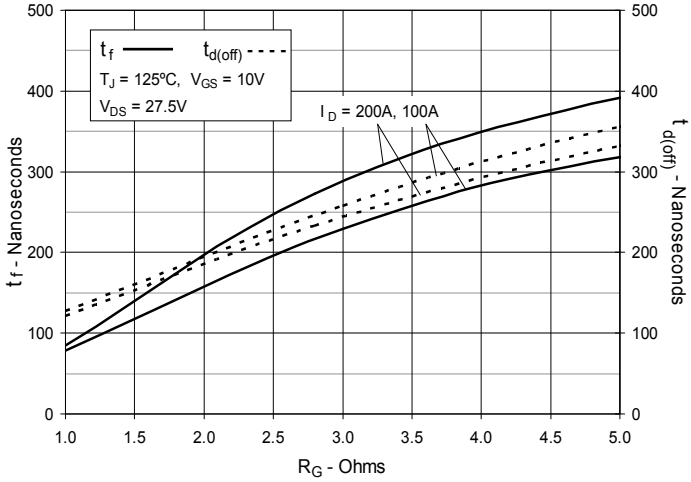
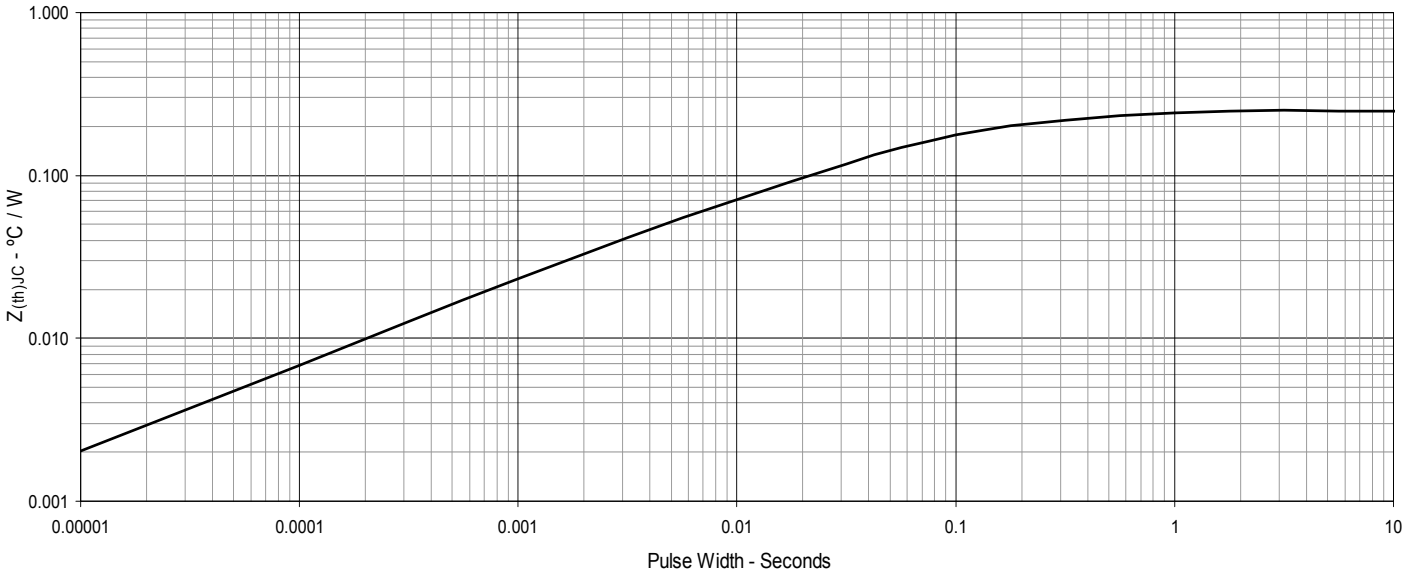
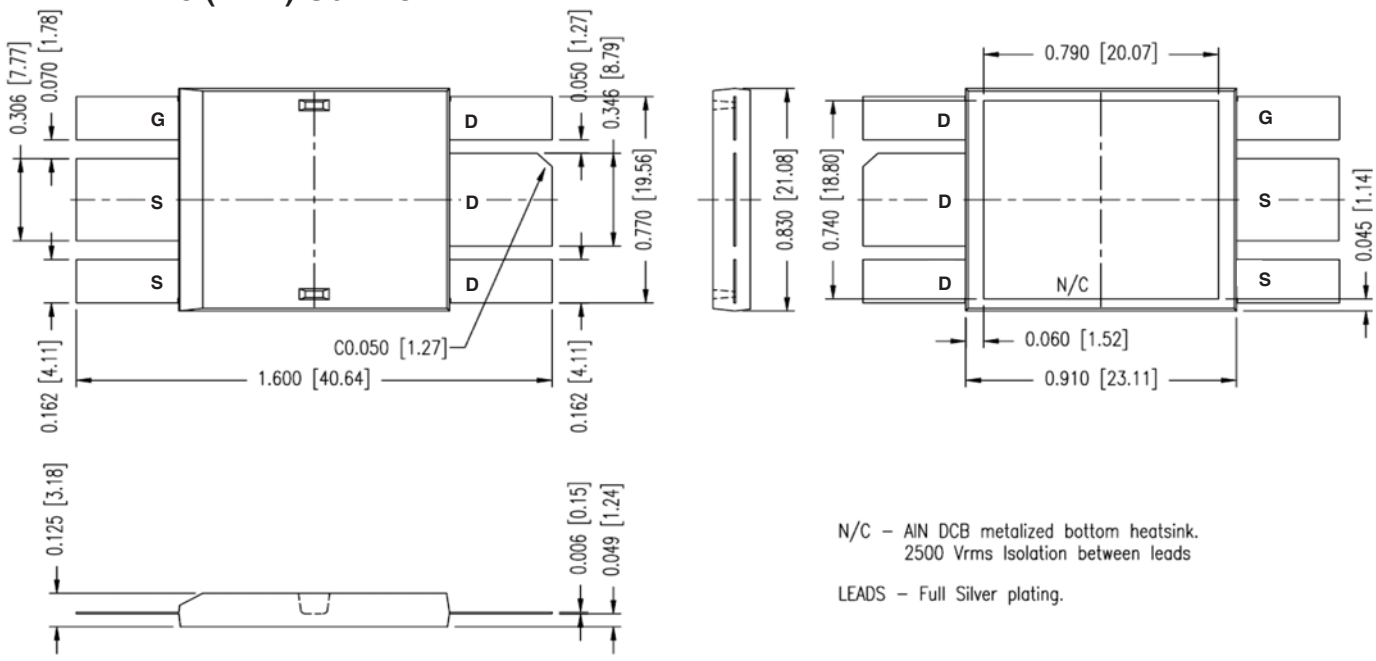


Fig. 19. Maximum Transient Thermal Impedance



DE475 (IXTZ) Outline



N/C – AlN DCB metalized bottom heatsink.
2500 Vrms Isolation between leads

LEADS – Full Silver plating.