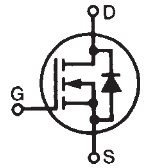
Preliminary Technical Information

Trench Gate Power MOSFET
(Electrically Isolated Back Surface)

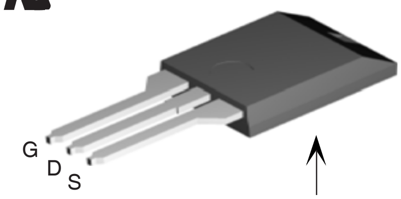
IXTC96N25T

V_{DSS} = 250V
I_{D25} = 40A
$R_{DS(on)}$ ≤ 31mΩ

N-Channel Enhancement Mode
Avalanche Rated



ISOPLUS220 (IXTC)
E153432



G = Gate D = Drain
S = Source

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	250	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	250	V
V_{GSM}	Transient	± 30	V
I_{D25}	T_C = 25°C	40	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	230	A
I_{AS}	T_C = 25°C	5	A
E_{AS}	T_C = 25°C	2	J
P_D	T_C = 25°C	147	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from case for 10s	300	°C
T_{SOLD}	Plastic body for 10 seconds	260	°C
V_{ISOL}	50/60Hz, t = 1 minute, I_{ISOL} < 1mA, RMS	2500	V
F_C	Mounting force	11..65 / 2.5..14.6	N/lb.
Weight		2	g

Features

- Silicon chip on Direct-Copper-Bond substrate
- Isolated mounting surface
- 2500V electrical isolation
- Low drain to tab capacitance (< 30pF)

Advantages

- Easy assembly
- Space savings
- High power density

Applications

- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control
- Uninterruptible power supplies
- High speed power switching applications

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 250μA	250			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1mA	3		5	V
I_{GSS}	V_{GS} = ± 20V, V_{DS} = 0V			± 200	nA
I_{DSS}	V_{DS} = V_{DSS} V_{GS} = 0V T_J = 125°C			5 250	μA μA
$R_{DS(on)}$	V_{GS} = 10V, I_D = 48A, Note 1		27	31	mΩ

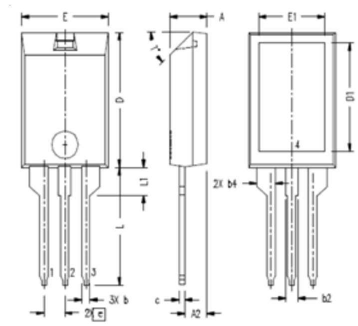
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10V, I_D = 48A, Note 1	50	82		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		6100		pF
C_{oss}			625		pF
C_{rss}			75		pF
$t_{d(on)}$	**Resistive Switching Times**		20		ns
t_r	V_{GS} = 15V, V_{DS} = 0.5 • V_{DSS}, I_D = 48A		22		ns
$t_{d(off)}$	R_G = 2.5Ω (External)		59		ns
t_f			28		ns
$Q_{g(on)}$	V_{GS}= 10V, V_{DS} = 0.5 V_{DSS}, I_D = 48A		114		nC
Q_{gs}			33		nC
Q_{gd}			34		nC
R_{thJC}				0.85	°C/W
R_{thCS}			0.21		°C/W

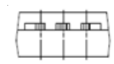
Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Min.	Typ.	Max.	
I_S	V_{GS} = 0V			96	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			300	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 48A, -di/dt = 250A/µs		158		ns
I_{RM}	V_R = 100V, V_{GS} = 0V		23		A
Q_{RM}			1.8		µC

Notes: 1. Pulse test: t ≤ 300µs; duty cycle, d ≤ 2%.

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°

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ 25ºC

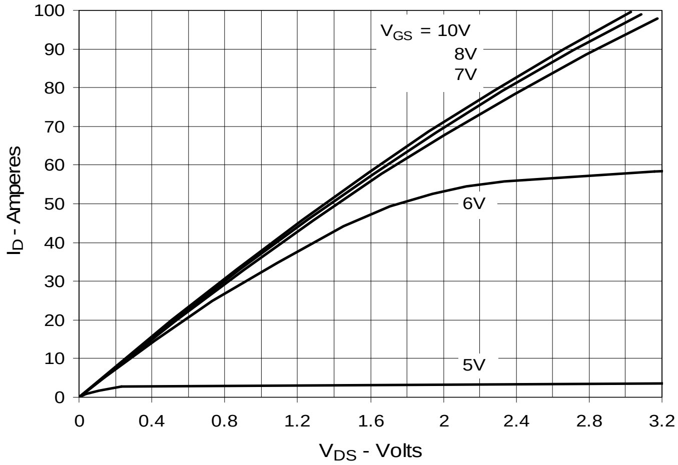


Fig. 2. Extended Output Characteristics @ 25ºC

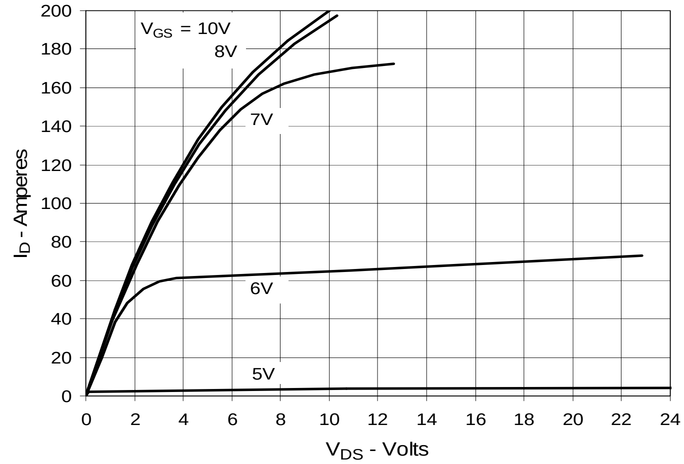


Fig. 3. Output Characteristics @ 125ºC

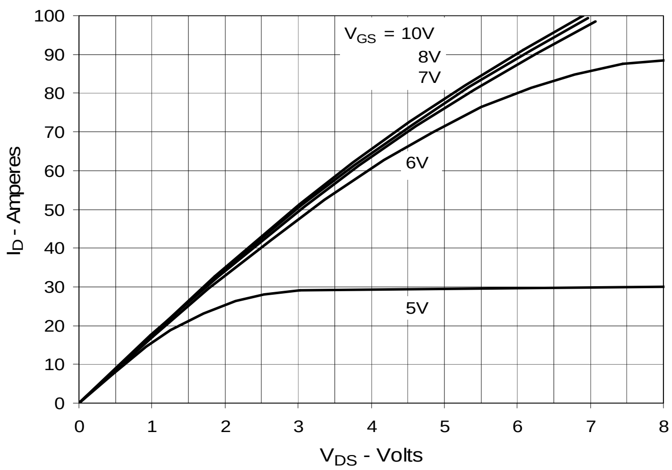


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 48A Value vs. Junction Temperature

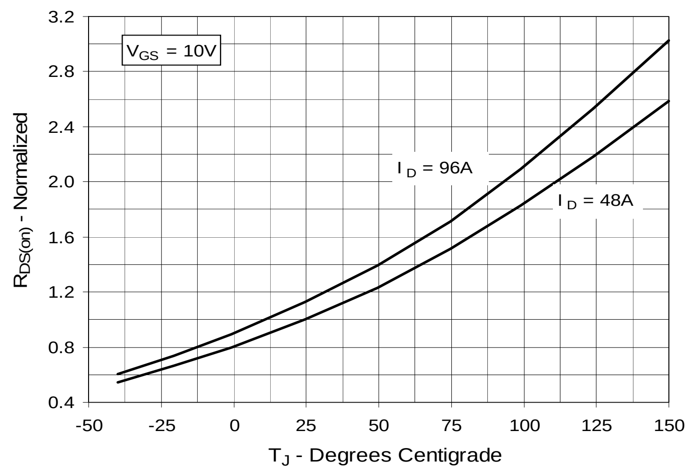


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 48A Value vs. Drain Current

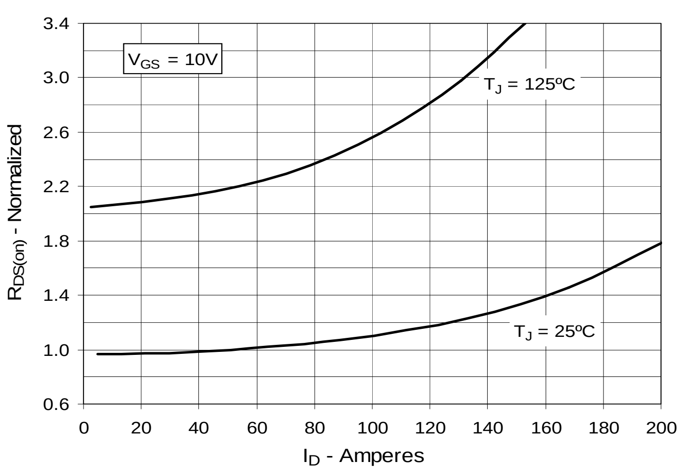


Fig. 6. Maximum Drain Current vs. Case Temperature

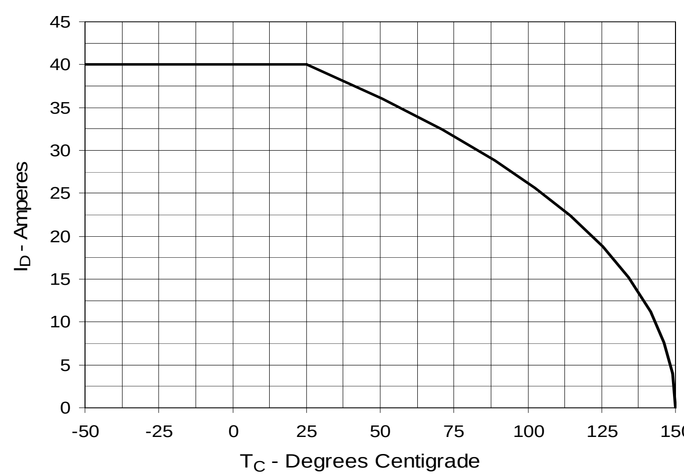


Fig. 7. Input Admittance

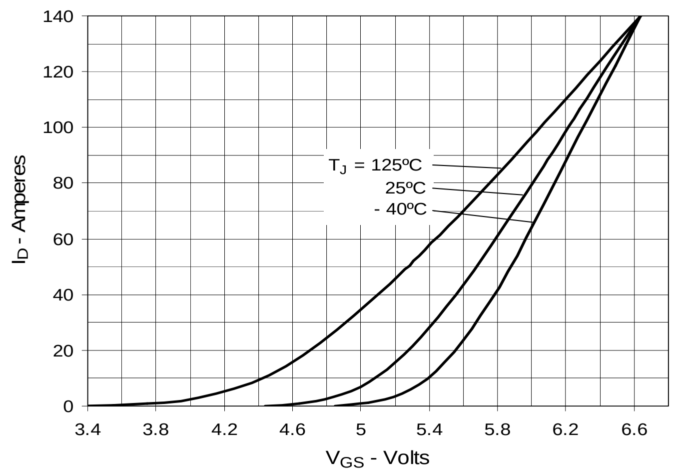


Fig. 8. Transconductance

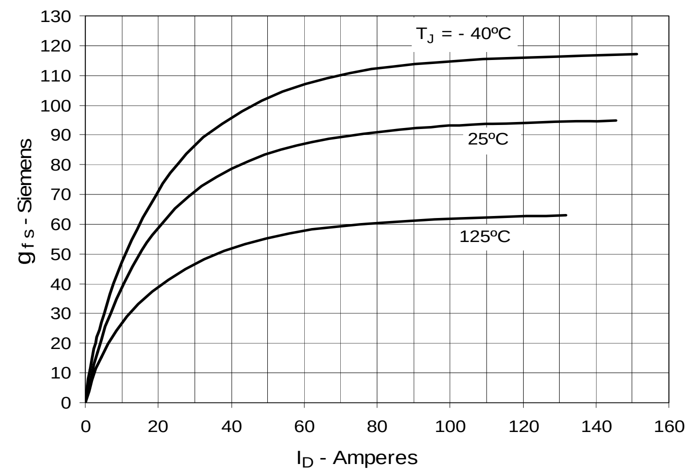


Fig. 9. Forward Voltage Drop of Intrinsic Diode

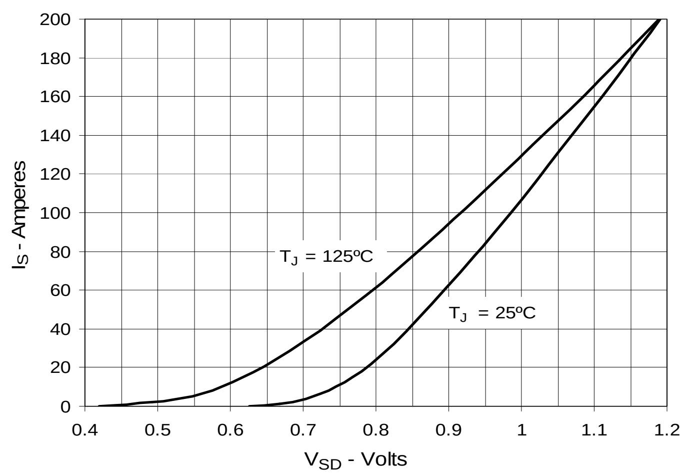


Fig. 10. Gate Charge

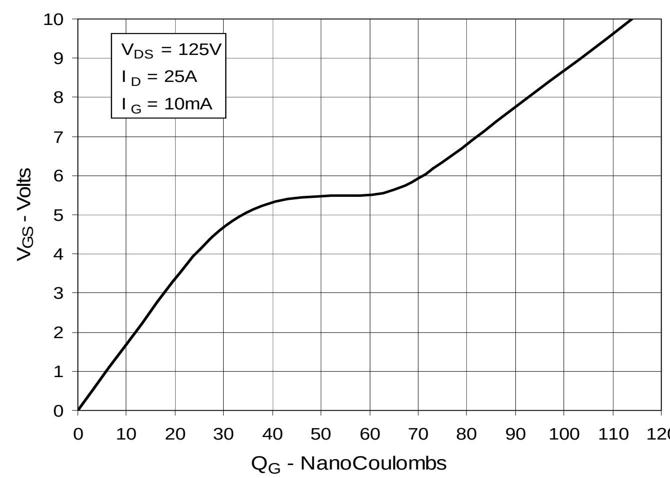


Fig. 11. Capacitance

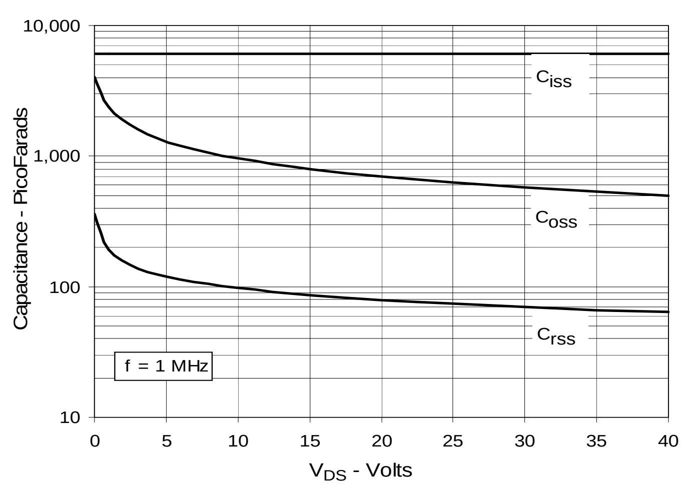


Fig. 12. Maximum Transient Thermal Impedance

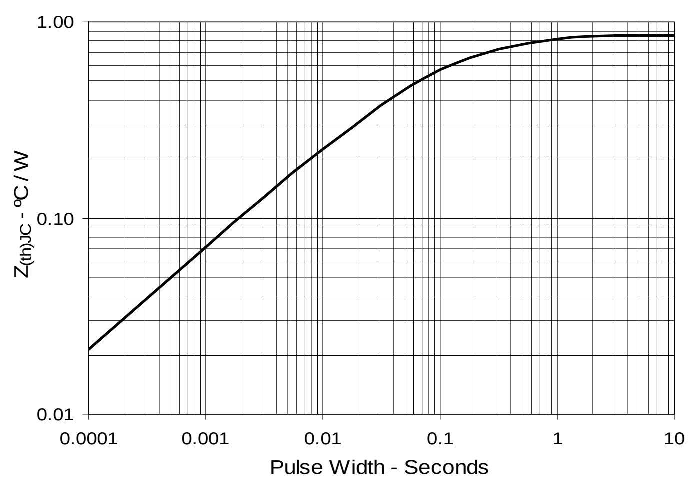


Fig. 13. Resistive Turn-on Rise Time vs. Junction Temperature

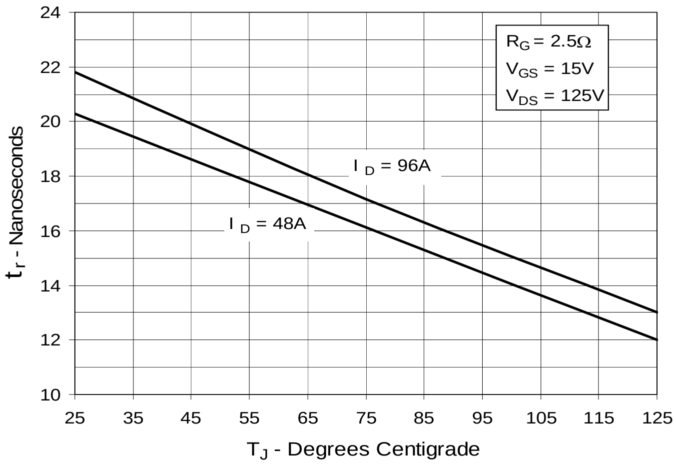


Fig. 14. Resistive Turn-on Rise Time vs. Drain Current

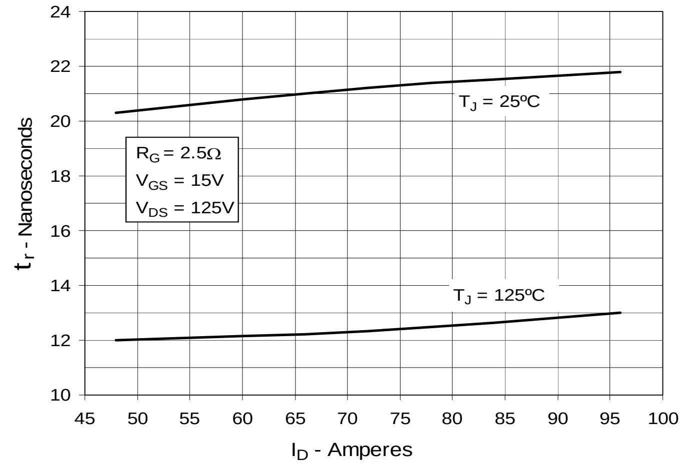


Fig. 15. Resistive Turn-on Switching Times vs. Gate Resistance

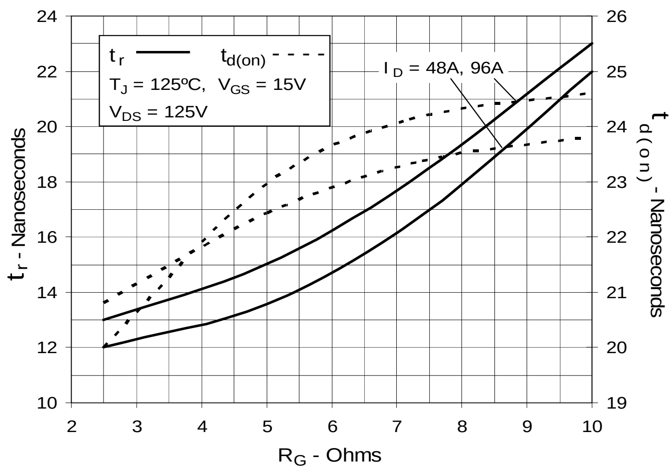


Fig. 16. Resistive Turn-off Switching Times vs. Junction Temperature

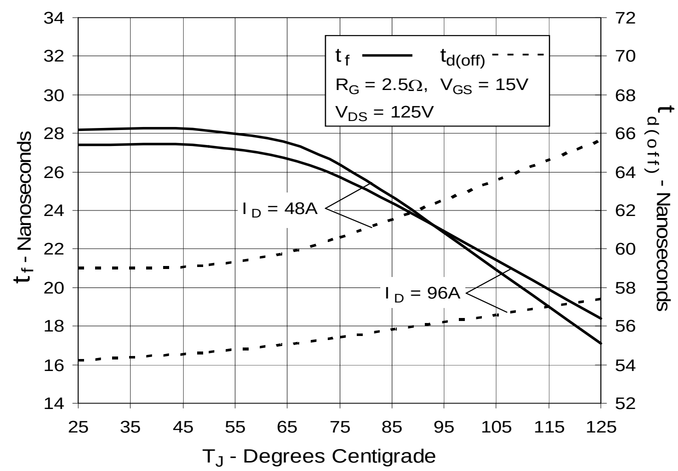


Fig. 17. Resistive Turn-off Switching Times vs. Drain Current

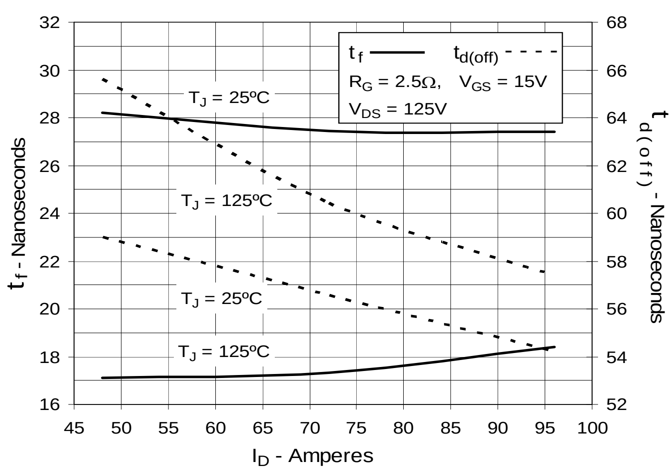


Fig. 18. Resistive Turn-off Switching Times vs. Gate Resistance