IXYS

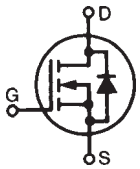
Trench Gate Power MOSFET

IXTQ88N28T

V_{DSS} = 280V
I_{D25} = 88A
$R_{DS(on)}$ ≤ 44mΩ

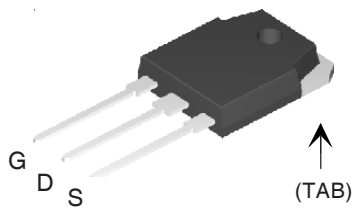
N-Channel Enhancement Mode

For Plasma Display Applications



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	280	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	280	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	88	A
I_{DRMS}	External lead current limit	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	250	A
P_D	T_C = 25°C	625	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum lead temperature for soldering	300	°C
T_{SOLD}	1.6mm (0.062 in.) from case for 10s	260	°C
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		5.5	g

TO-3P (IXTQ)



G = Gate D = Drain
S = Source TAB = Drain

Features

- Trench gate construction for low $R_{DS(on)}$
- International standard package
- Low package inductance
  - easy to drive and to protect

Advantages

- Easy to mount
- Space savings

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
V_{DSS}	V_{GS} = 0 V, I_D =1mA	280			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 1mA	3.0		5.0	V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			1	μA
	T_J = 125°C			200	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5 \bullet I_{D25}$, Note1		38	44	mΩ

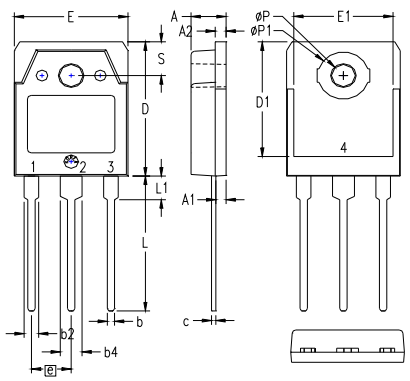
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V, I_D = 0.5 I_{D25}, Note 1	40	66		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		5750		pF
C_{oss}			600		pF
C_{rss}			52		pF
$t_{d(on)}$	**Resistive Switching Times**		38		ns
t_r	V_{GS} = 15 V, V_{DS} = 220 V, I_D = 44A		60		ns
$t_{d(off)}$	R_G = 5Ω (External)		96		ns
t_f			57		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		138		nC
Q_{gs}			48		nC
Q_{gd}			40		nC
R_{thJC}				0.20	°C/W
R_{thCK}			0.25		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values Min.	typ.	Max.	
I_S	V_{GS} = 0 V			88	A
I_{SM}	Repetitive, pulse width limited by T_{JM}			250	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/μs		200		ns
Q_{RM}	V_R = 100 V		2.0		μC

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

TO-3P (IXTQ) Outline



1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – DRAIN (COLLECTOR)

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.791	19.80	20.10
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

All metal area are tin plated.

Fig. 1. Output Characteristics @ 25°C

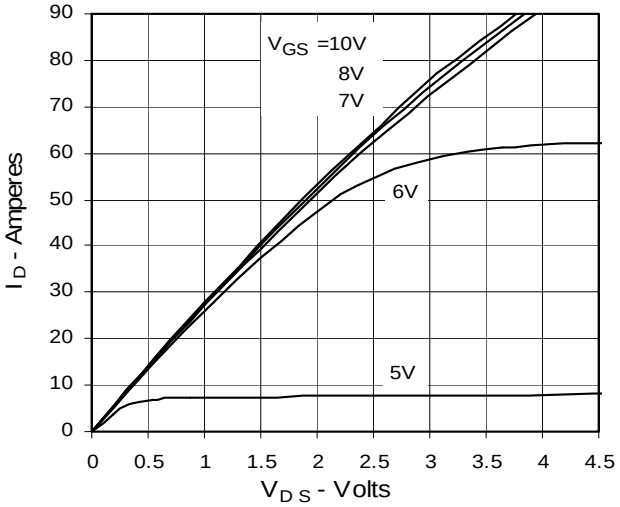


Fig. 2. Extended Output Characteristics @ 25°C

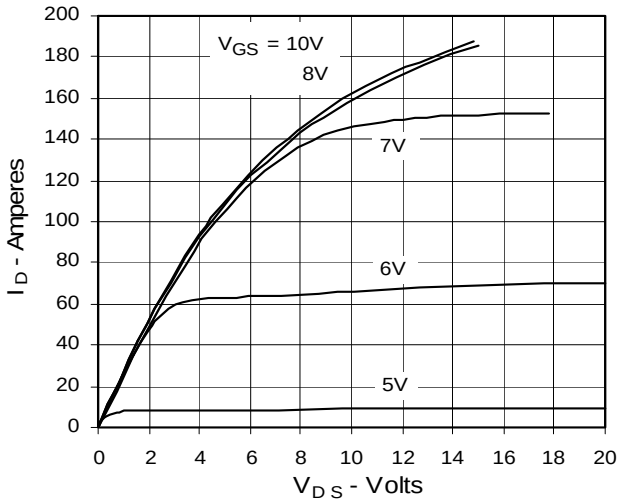


Fig. 3. Output Characteristics @ 125°C

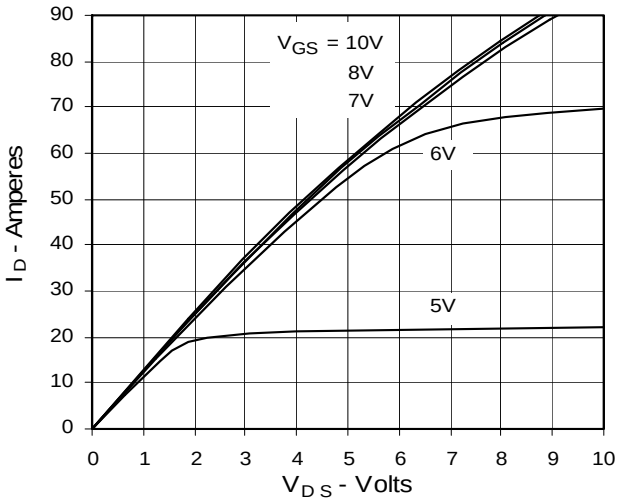


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

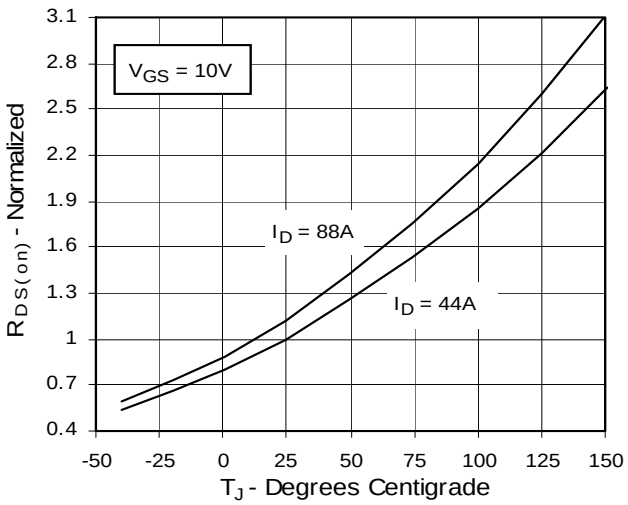


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

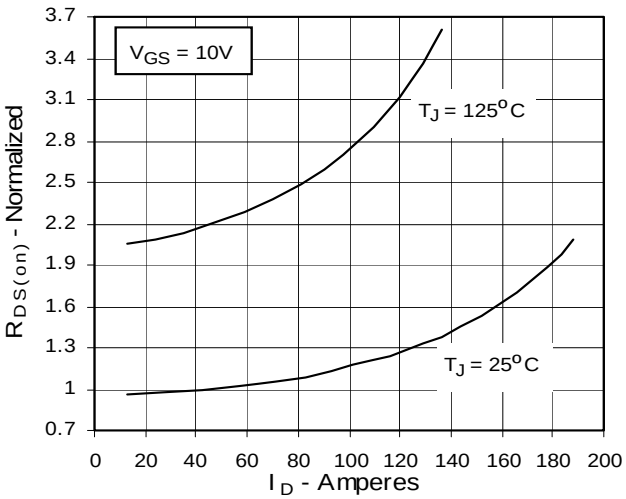


Fig. 6. Drain Current vs. Case Temperature

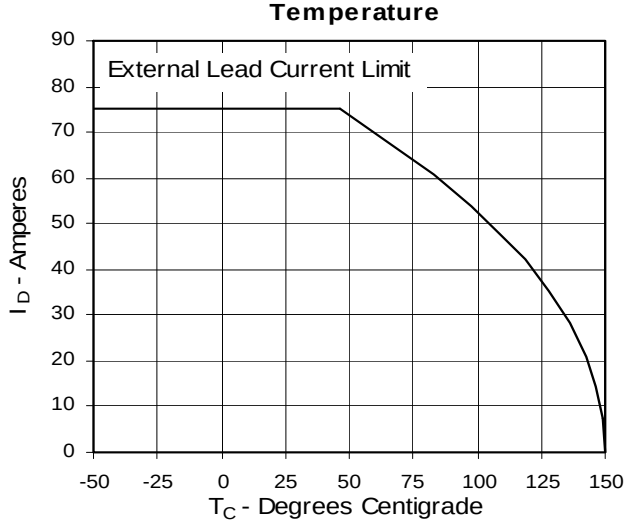


Fig. 7. Input Admittance

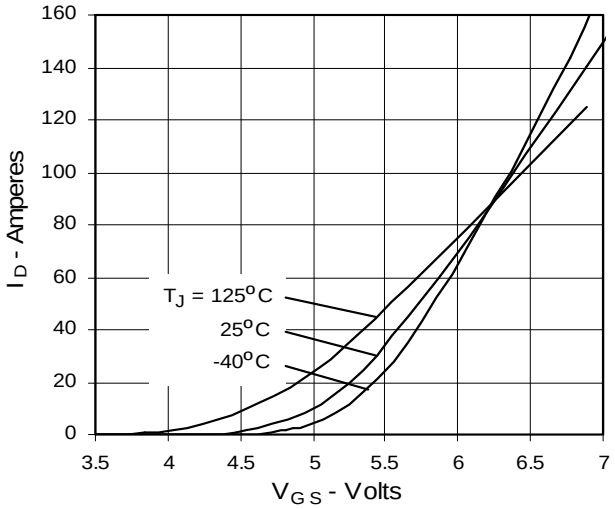


Fig. 8. Transconductance

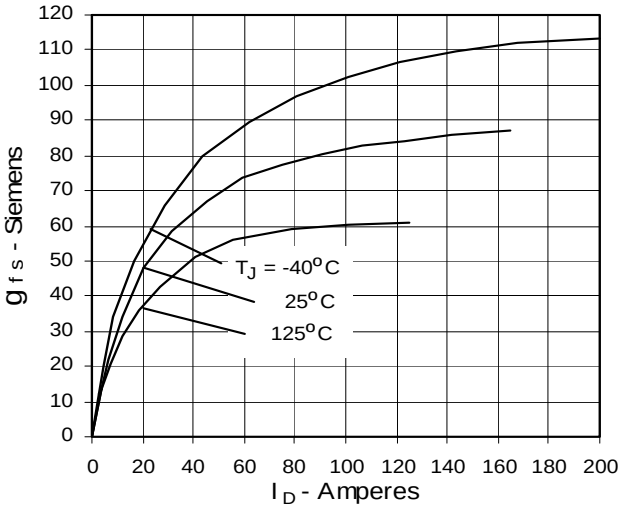


Fig. 9. Source Current vs. Source-To-Drain Voltage

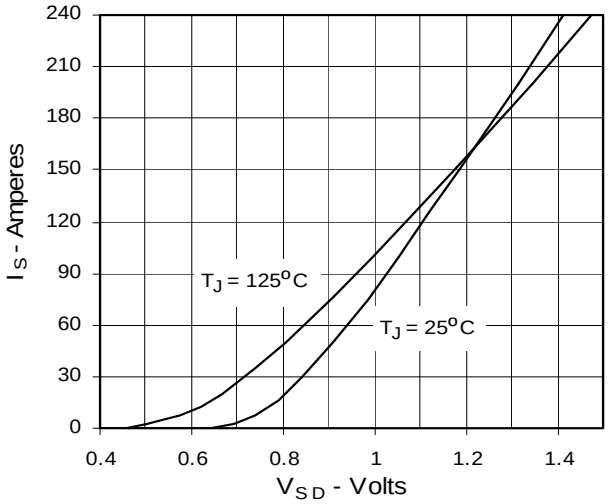


Fig. 10. Gate Charge

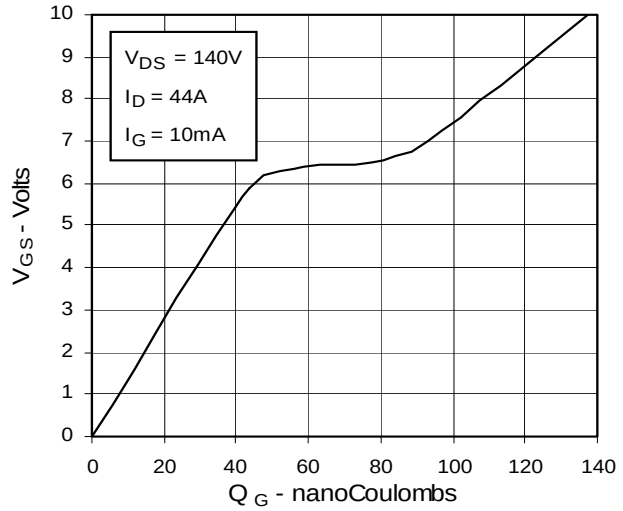


Fig. 11. Capacitance

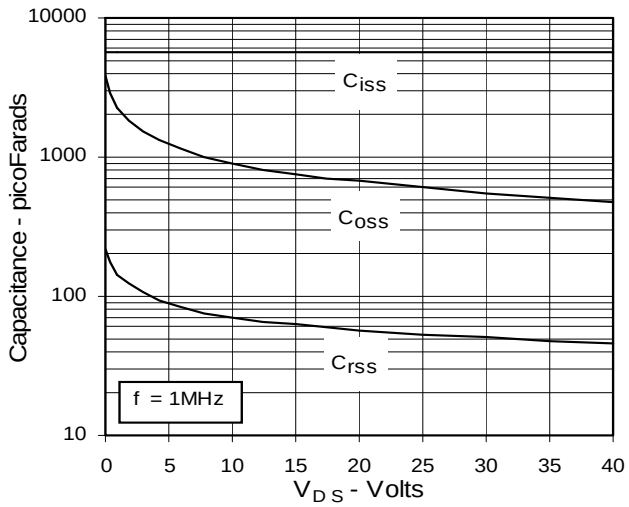


Fig. 12. Forward-Bias Safe Operating Area

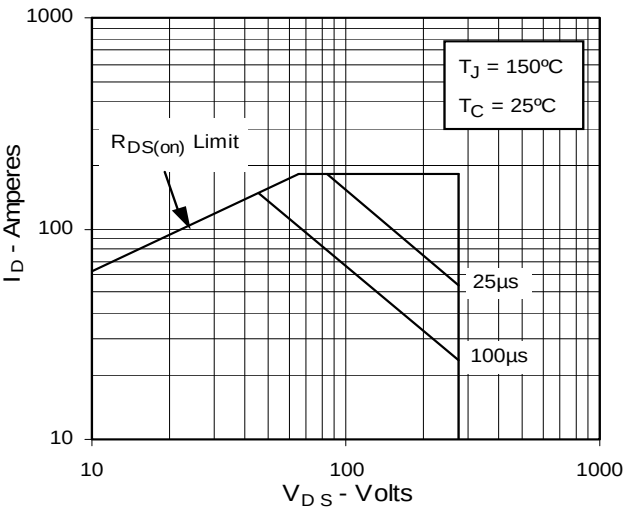


Fig. 13. Maximum Transient Thermal Impedance