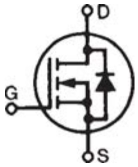
HiPerFET™ Power MOSFETs Q-Class

IXFR 66N50Q2

V_{DSS} = 500 V
I_{D25} = 50 A
$R_{DS(on)}$ = 85 mΩ
t_{rr} ≤ 250 ns

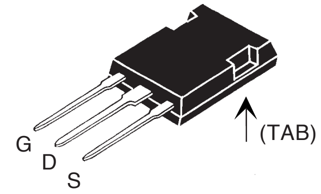
N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low Q_g
Low intrinsic R_g, low t_{rr}



Preliminary Data Sheet

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	500	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	500	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	50	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	264	A
I_{AR}	T_C = 25°C	66	A
E_{AR}	T_C = 25°C	75	mJ
E_{AS}	T_C = 25°C	4.0	J
dv/dt	$I_S \leq I_{DM}$, di/dt ≤ 100 A/µs, $V_{DD} \leq V_{DSS}$, $T_J \leq$ 150°C, R_G = 2 Ω	20	V/ns
P_D	T_C = 25°C	500	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.063 in) from case for 10 s	300	°C
F_C	Mounting force	22...130/5...30	N/lb
Weight		5	g

ISOPLUS247™ (IXFR)



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

Features

- Double metal process for low gate resistance
- International standard packages
- Epoxy meet UL 94 V-0, flammability classification
- Avalanche energy and current rated
- Fast intrinsic Rectifier

Advantages

- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions		Characteristic Values (T_J = 25°C unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3mA		500			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8 mA		2.0		4.5	V
I_{GSS}	V_{GS} = ±30 V_{DC}, V_{DS} = 0				±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V	T_J = 25°C T_J = 125°C			50 2	µA mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$ Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %				85	mΩ

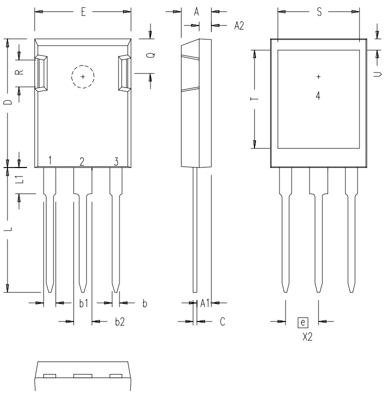
Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; $I_D = I_T$, pulse test	30	44		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		6800		pF
C_{oss}			1200		pF
C_{rss}			270		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 ï V_{DSS}, $I_D = I_T$ R_G = 1.0 Ω (External),		32		ns
t_r			16		ns
$t_{d(off)}$			60		ns
t_f			10		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 ï V_{DSS}, $I_D = I_T$		199		nC
Q_{gs}			42		nC
Q_{gd}			92		nC
R_{thJC}				0.25	K/W
R_{thCK}			0.15		K/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
I_S	V_{GS} = 0 V			66	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			264	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			1.5	V
t_{rr}	I_F = 25A, -di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			1		µC
I_{RM}			10		A

Note: Test current I_T = 33A

ISOPLUS247 Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

Fig. 1. Output Characteristics @ 25ºC

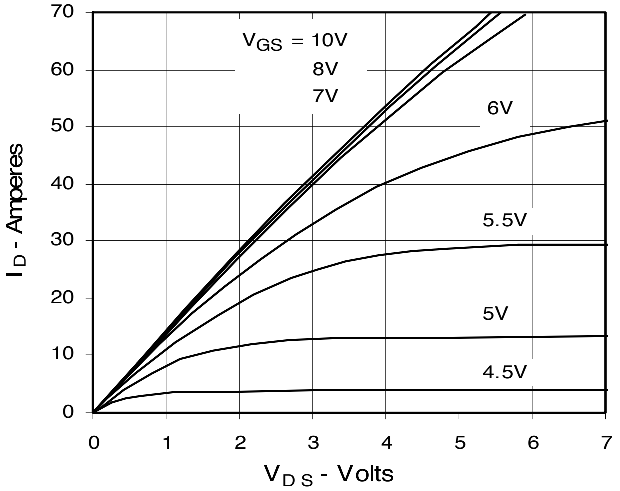


Fig. 2. Extended Output Characteristics @ 25ºC

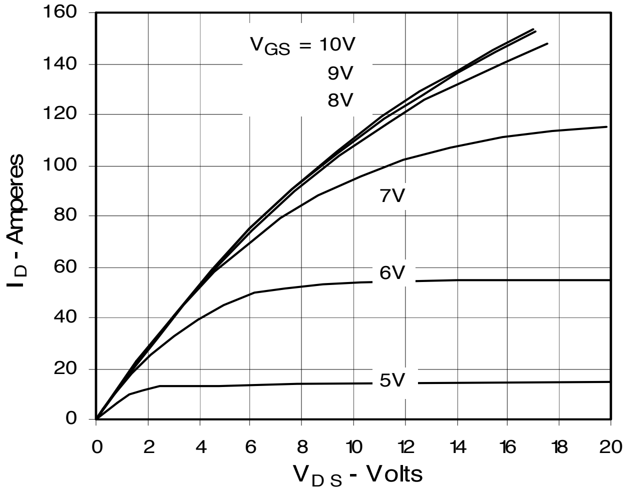


Fig. 3. Output Characteristics @ 125ºC

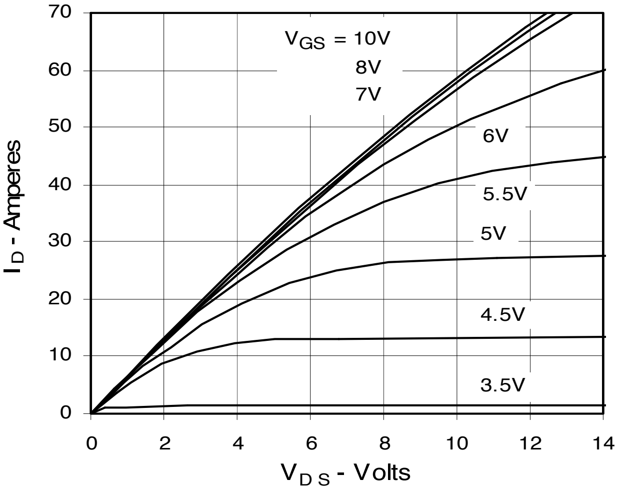


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

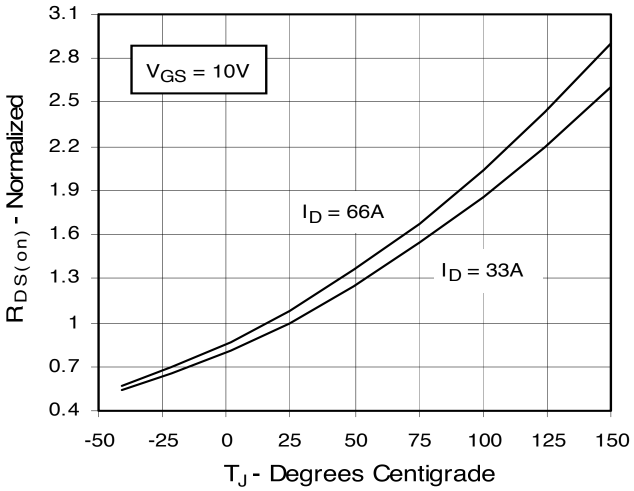


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

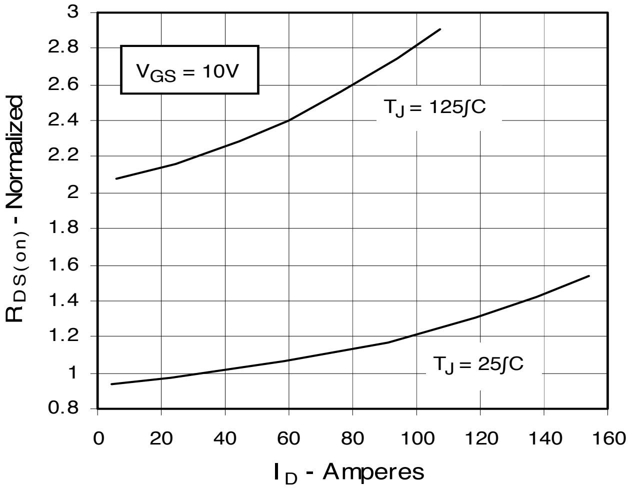


Fig. 6. Drain Current vs. Case Temperature

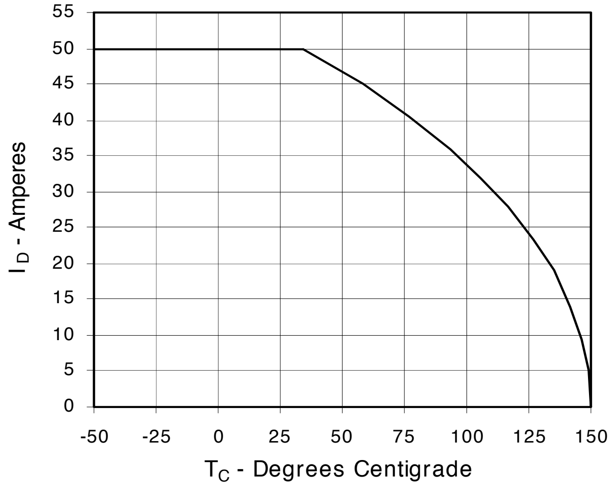


Fig. 7. Input Admittance

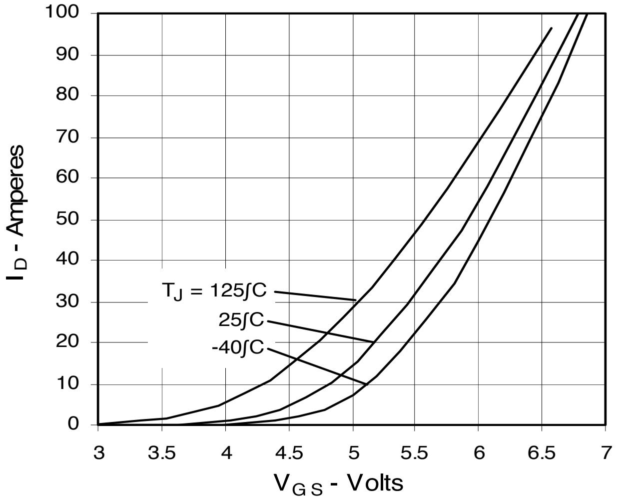


Fig. 8. Transconductance

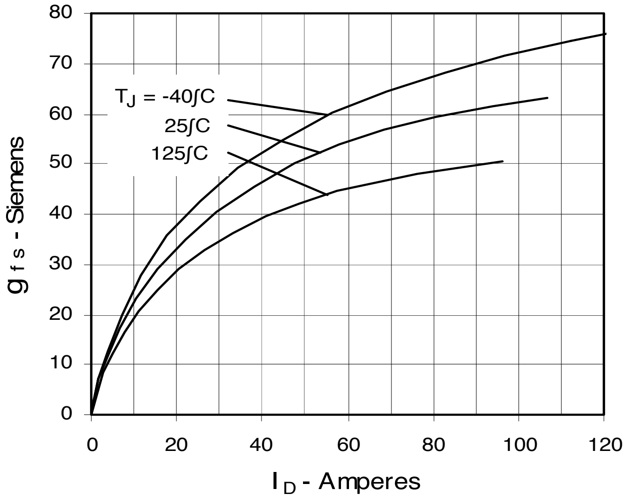


Fig. 9. Source Current vs. Source-To-Drain Voltage

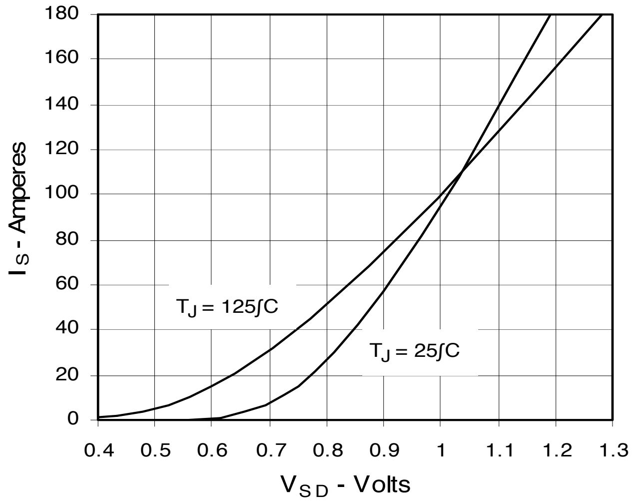


Fig. 10. Gate Charge

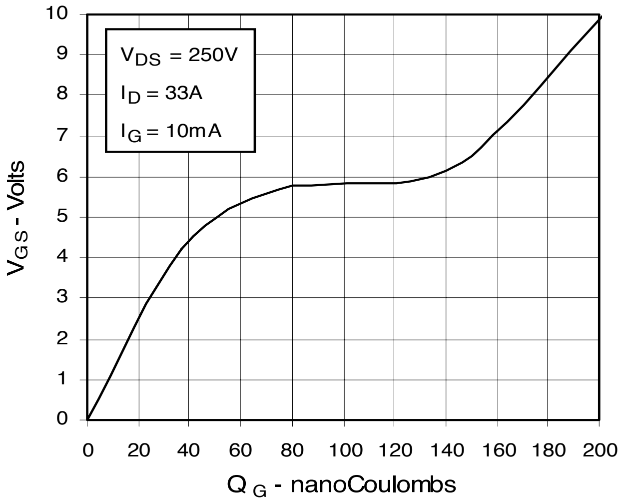


Fig. 11. Capacitance

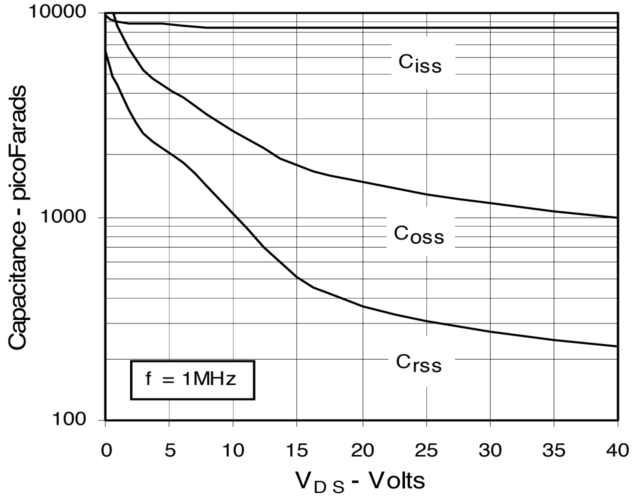
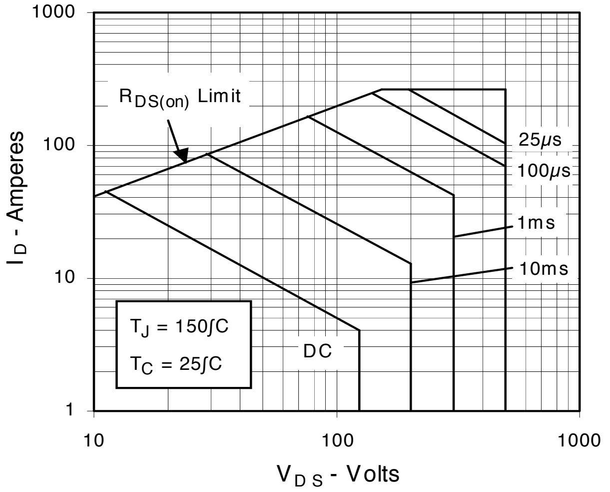


Fig. 12. Forward-Bias Safe Operating Area



IXYS reserves the right to change limits, test conditions, and dimensions.

Fig. 13. Maximum Transient Thermal Resistance