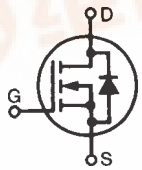
IXYS

HiPerFET™ MOSFET Q2-Class

IXFR 38N80Q2

V_{DSS} = 800 V
I_{D25} = 28 A
$R_{DS(on)}$ = 240 mΩ
$t_{rr} \leq$ 250 ns

(Electrically Isolated Back Surface)

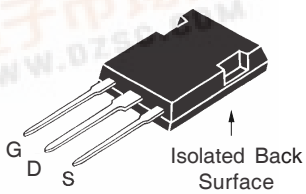


Preliminary Data Sheet

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	800	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	800	V
V_{GS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	28	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	150	A
I_{AR}	T_C = 25°C	38	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	416	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
V_{ISOL}	50/60 Hz, RMS, t = 1 min	2500	V~
	I_{SOL} = 1mA, t = 1 s	3000	V~
F_C	Mounting Force		
Weight		5	g

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
V_{DSS}	V_{GS} = 0 V, I_D = 3mA	800			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			50	µA
	$V_{DS} = V_{DSS}$, V_{GS} = 0 V, T_J = 125°C			2	mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			240	mΩ

ISOPLUS247 (IXFR)



G = Gate D = Drain
S = Source

Features

- Double metal process for low gate resistance
- Silicon chip on DCB substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Epoxy meet UL 94 V-0, flammability classification
- Avalanche energy and current rated
- Fast intrinsic Rectifier

Advantages

- Easy assembly
- Space savings
- High power density

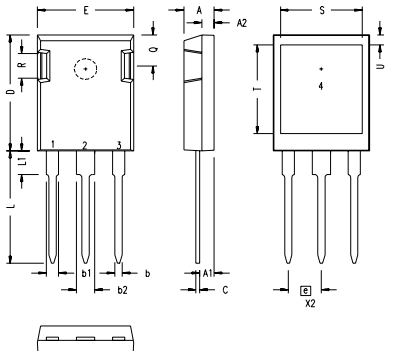
Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = I_T, pulse test	25	37		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		8340		pF
C_{oss}			890		pF
C_{rss}			175		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T R_G = 1.0 Ω (External),		20		ns
t_r			16		ns
$t_{d(off)}$			60		ns
t_f			12		ns
$Q_{g(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T		190		nC
Q_{gs}			44		nC
Q_{gd}			88		nC
R_{thJC}				0.3	K/W
R_{thCK}			0.15		K/W

Source-Drain Diode

Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	min.	typ.	max.	
I_S	V_{GS} = 0 V			38	A
I_{SM}	Repetitive; pulse width limited by T_{JM}			150	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

Notes: 1. Test current I_T = 19A
2. See IXFK38N80Q2 data sheet for characteristic curves

ISOPLUS247 Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

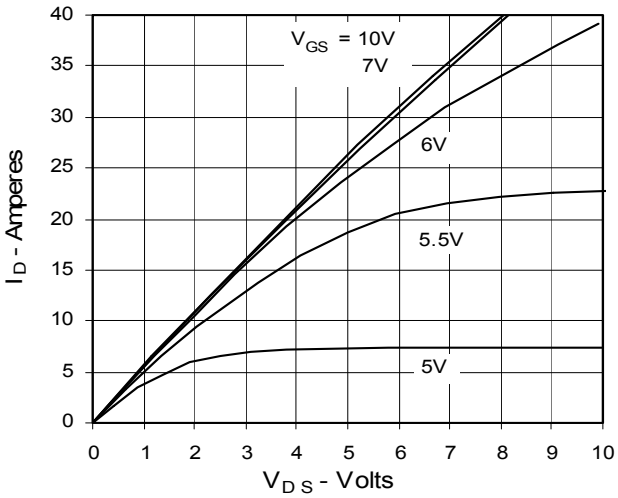


Fig. 2. Extended Output Characteristics @ 25ºC

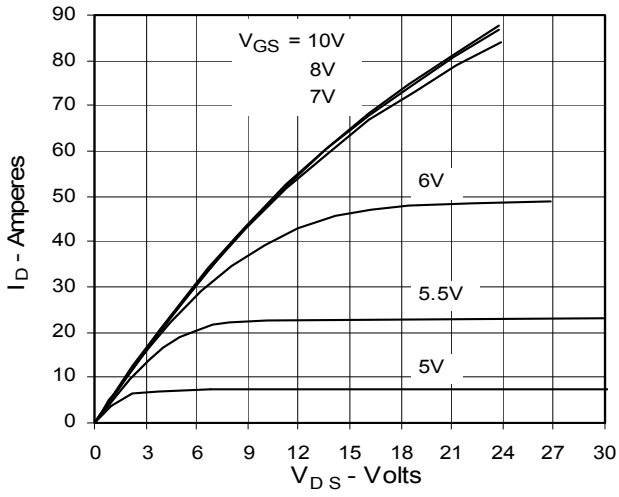


Fig. 3. Output Characteristics @ 125ºC

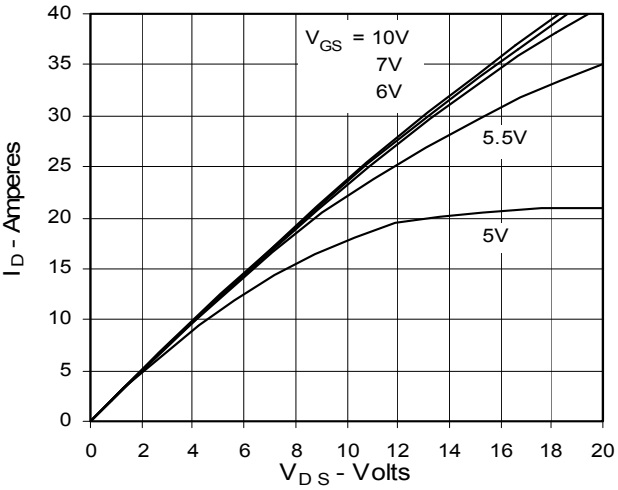


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

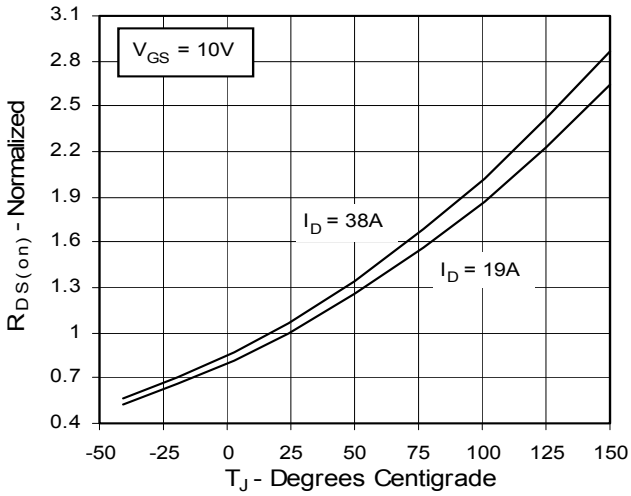


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

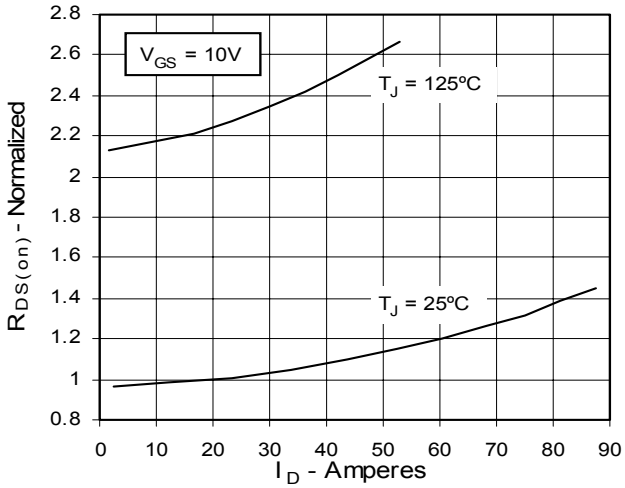


Fig. 6. Drain Current vs. Case Temperature

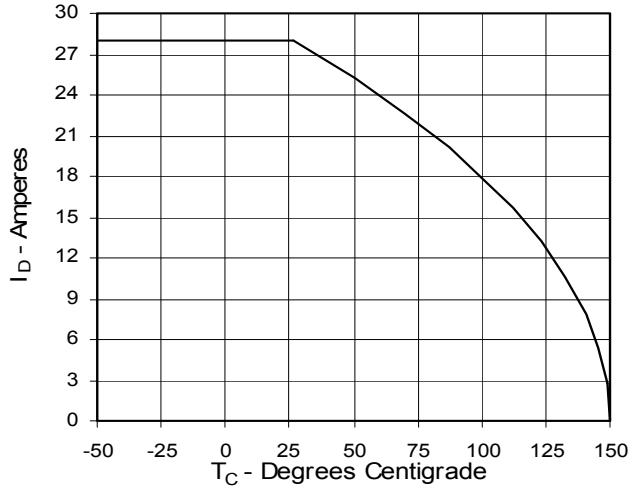


Fig. 7. Input Admittance

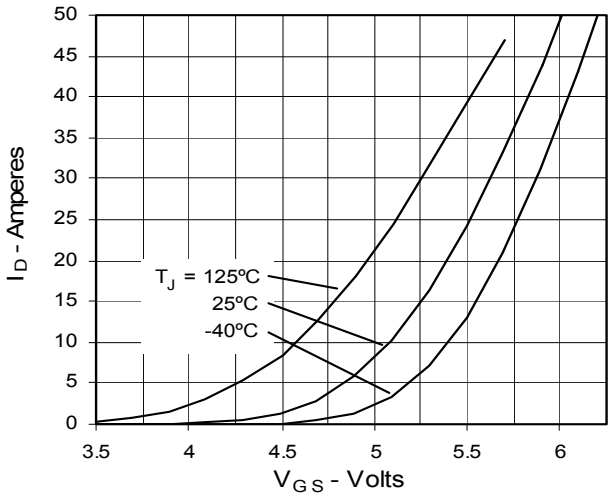


Fig. 8. Transconductance

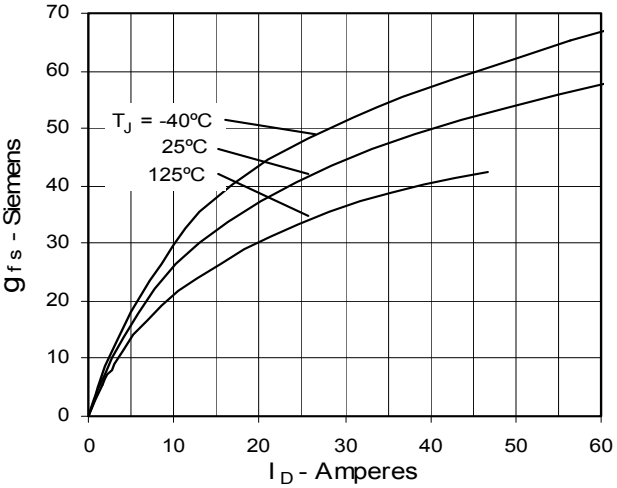


Fig. 9. Source Current vs. Source-To-Drain Voltage

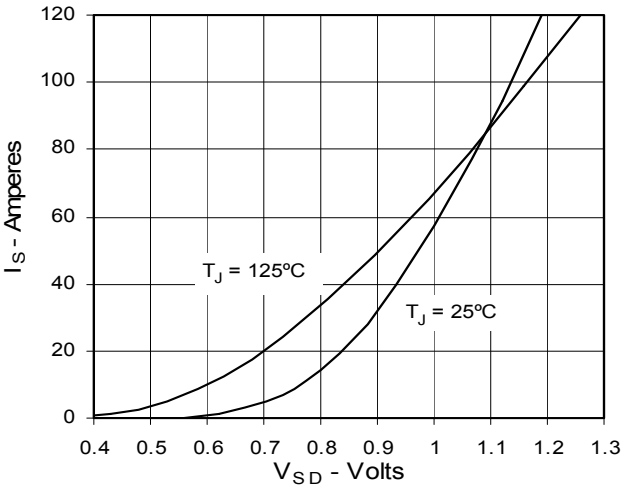


Fig. 10. Gate Charge

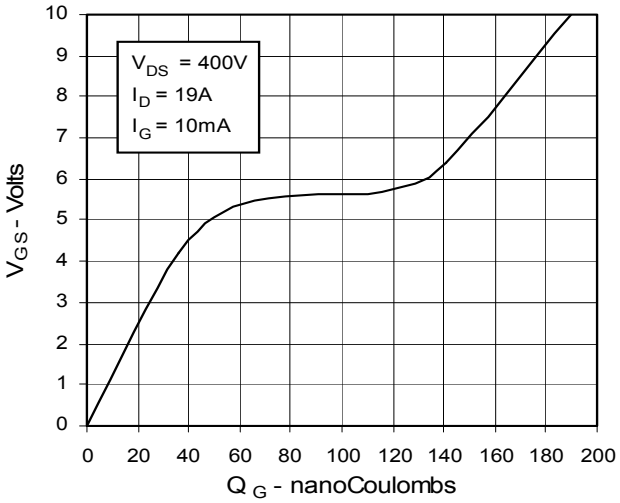


Fig. 11. Capacitance

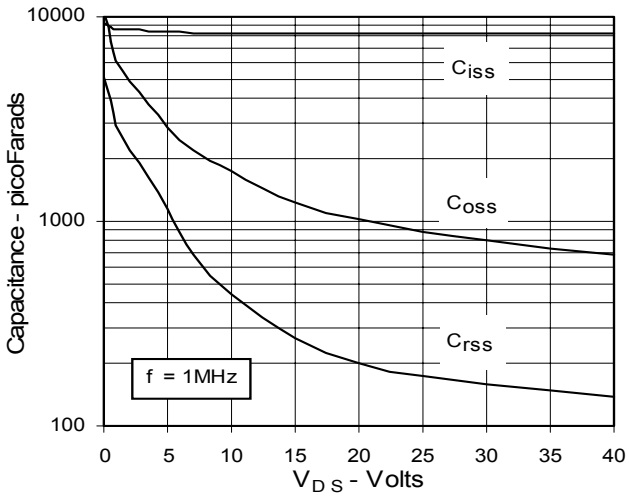


Fig. 12. Forward-Bias Safe Operating Area

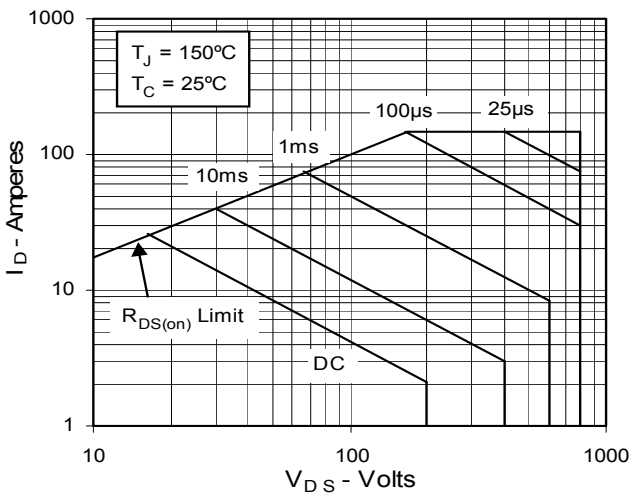


Fig. 13. Maximum Transient Thermal Resistance