



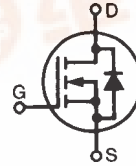
HiPerFET™ Power MOSFETs Q2-Class

IXFK 38N80Q2
IXFN 38N80Q2
IXFX 38N80Q2

V_{DSS} = 800 V
I_{D25} = 38 A
R_{DS(on)} = 220 mΩ

t_{rr} ≤ 250 ns

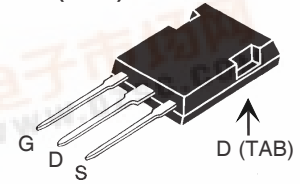
N-Channel Enhancement Mode
Avalanche Rated, High dv/dt, Low Q_g
Low intrinsic R_g



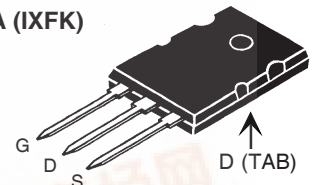
Preliminary Data Sheet

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	38	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 ≤ I _{DM} , di/dt ≤ 100 A/μs, V _{DD} ≤ V _{DSS} , T _J ≤ 150°C, R _G = 2 Ω	20	V/ns
P _D	T _C = 25°C	735	W
T _J		-55 ... +150	°C
T _{JM}		150	°C
T _{stg}		-55 ... +150	°C
T _L	1.6mm (0.063in) from case for 10s (Plus247, TO-264)	300	°C
V _{ISOL}	50/60Hz, RMS t=1 min	SOT-227B	2500 V~
	I _{ISOL} < 1mA t=1s		3000 V~
M _d	Mounting torque	TO-264	0.9/8 Nm/lb.in.
	Terminal torque	SOT-227B	1.5/13 Nm/lb.in.
F _c	Mounting force	PLUS-247	22...130/5...30 N/lb
Weight		PLUS247	g
		TO-264	10 g
		SOT-227B	30 g

PLUS247™ (IXFX)

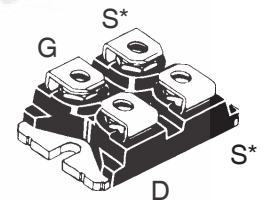


TO-264 AA (IXFK)



miniBLOC, SOT-227 B (IXFN)

E153432



* Either Source terminal can be used as main or Kelvin source terminal

G = Gate D = Drain
S = Source 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
- miniBLOC package version with Aluminum Nitrate isolation

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	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			50 μA
				2 mA
	V _{GS} = 10 V, I _D = 0.5 • I _{D25}			220 mΩ
	Pulse test, t ≤ 300 μs, duty cycle d ≤ 2 %			





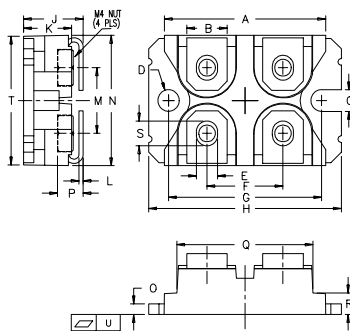
IXFK 38N80Q2 IXFN 38N80Q2 IXFX 38N80Q2

Symbol	Test Conditions	Characteristic Values		
		$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$		
		min.	typ.	max.
g_{fs}	$V_{DS} = 10\text{ V}; I_D = 0.5 \cdot I_{D25}$, pulse test	25	37	S
C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		8340	pF
C_{oss}			890	pF
C_{rss}			175	pF
$t_{d(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1.0\ \Omega$ (External),		20	ns
t_r			16	ns
$t_{d(off)}$			60	ns
t_f			12	ns
$Q_{g(on)}$	$V_{GS} = 10\text{ V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		190	nC
Q_{gs}			44	nC
Q_{gd}			88	nC
R_{thJC}	TO-264		0.17	K/W
R_{thCK}			0.15	K/W

Source-Drain Diode

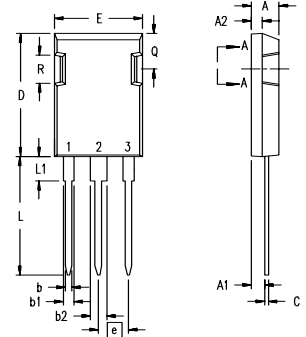
Symbol	Test Conditions	Characteristic Values		
		$(T_J = 25^\circ\text{C}, \text{ unless otherwise specified})$		
		min.	typ.	max.
I_S	$V_{GS} = 0\text{ V}$			38 A
I_{SM}	Repetitive; pulse width limited by T_{JM}			150 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{ V}$, Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $d \leq 2\%$			1.5 V
t_{rr}	$I_F = 25\text{ A}, -di/dt = 100\text{ A}/\mu\text{s}, V_R = 100\text{ V}$			250 ns
Q_{RM}			1	μC
I_{RM}			10	A

SOT-227B miniBLOC Outline



SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.240	1.255	31.50	31.88
B	.307	.323	7.80	8.20
C	.161	.169	4.09	4.29
D	.161	.169	4.09	4.29
E	.161	.169	4.09	4.29
F	.587	.595	14.91	15.11
G	1.186	1.193	30.12	30.30
H	1.496	1.505	38.00	38.23
J	.460	.481	11.68	12.22
K	.351	.378	8.92	9.60
L	.030	.033	0.76	0.84
M	.496	.506	12.60	12.85
N	.990	1.001	25.15	25.42
O	.078	.084	1.98	2.13
P	.195	.235	4.95	5.97
Q	1.045	1.059	26.54	26.90
R	.155	.174	3.94	4.42
S	.186	.191	4.72	4.85
T	.968	.987	24.59	25.07
U	-.002	.004	-0.05	0.1

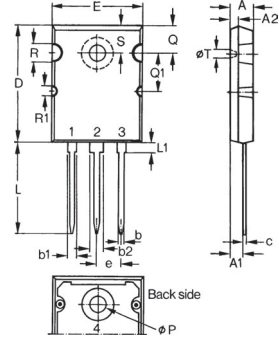
PLUS 247™ Outline



- Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)
4 - Drain (Collector)

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A ₁	2.29	2.54	.090	.100
A ₂	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b ₁	1.91	2.13	.075	.084
b ₂	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L ₁	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

TO-264 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A ₁	2.54	2.89	.100	.114
A ₂	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b ₁	2.39	2.69	.094	.106
b ₂	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L ₁	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q ₁	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R ₁	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

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

Fig. 1. Output Characteristics @ 25°C

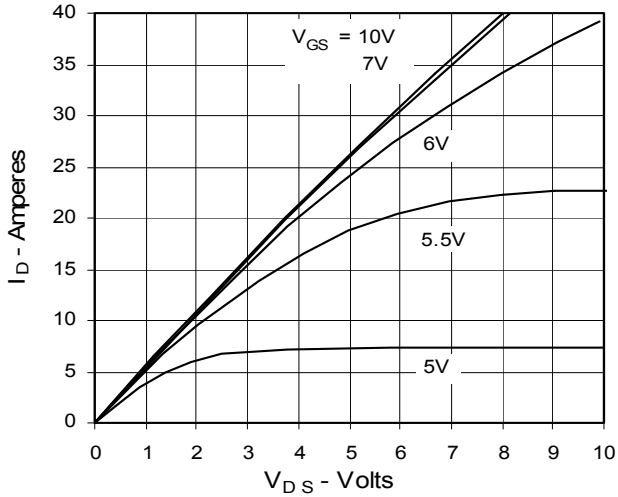


Fig. 2. Extended Output Characteristics @ 25°C

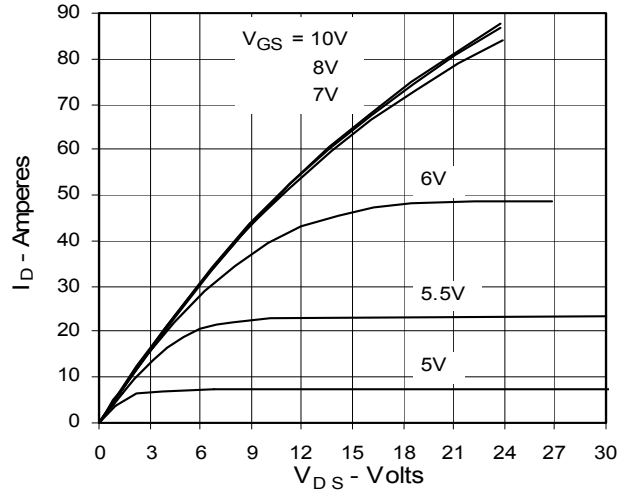


Fig. 3. Output Characteristics @ 125°C

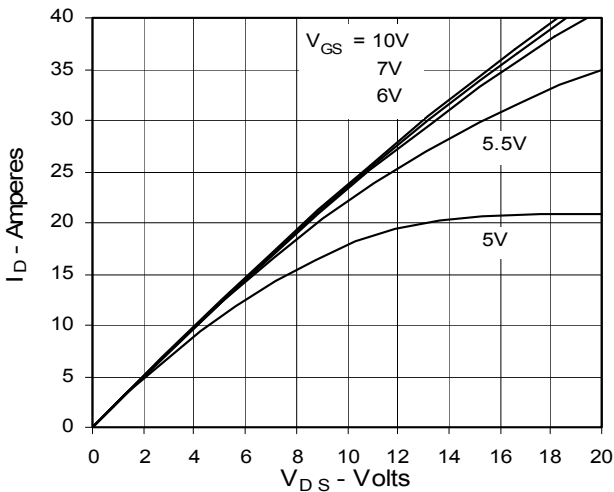


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

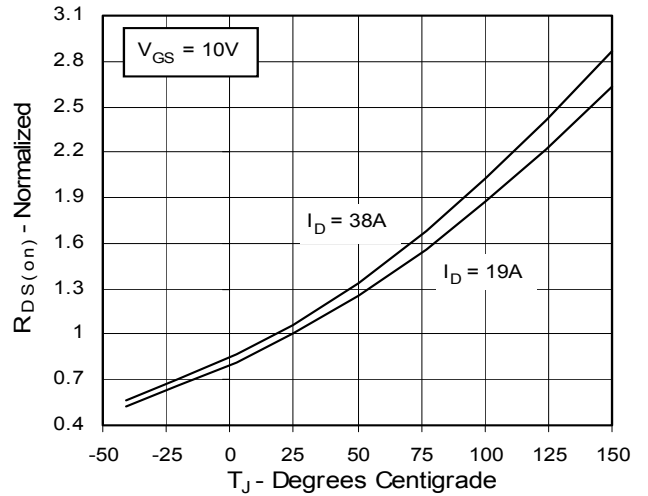


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

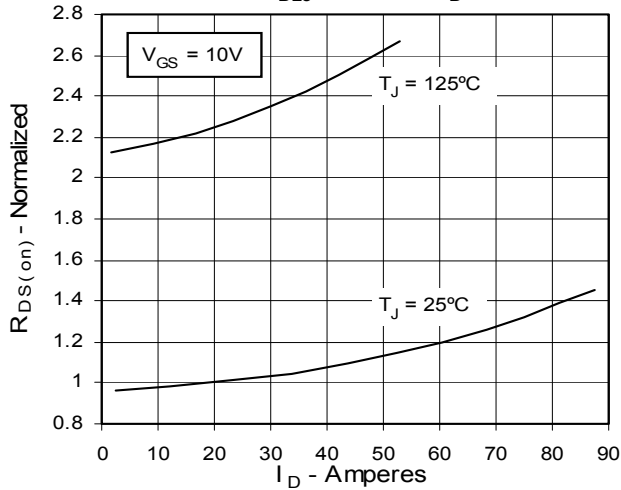


Fig. 6. Drain Current vs. Case Temperature

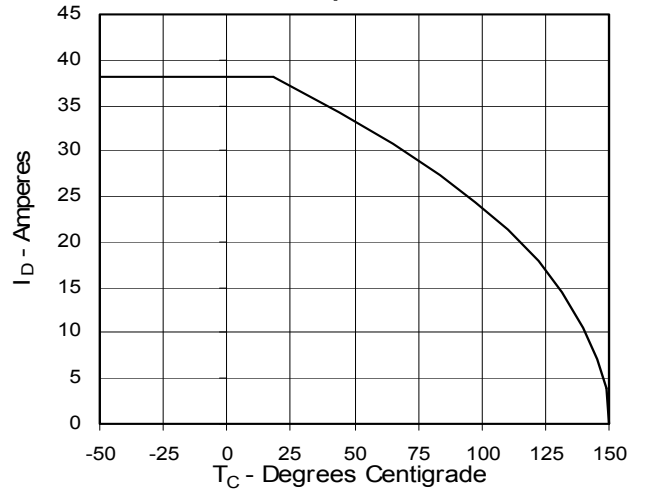


Fig. 7. Input Admittance

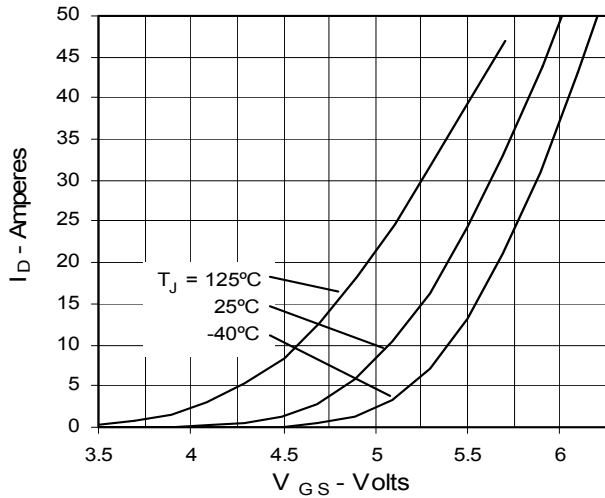


Fig. 8. Transconductance

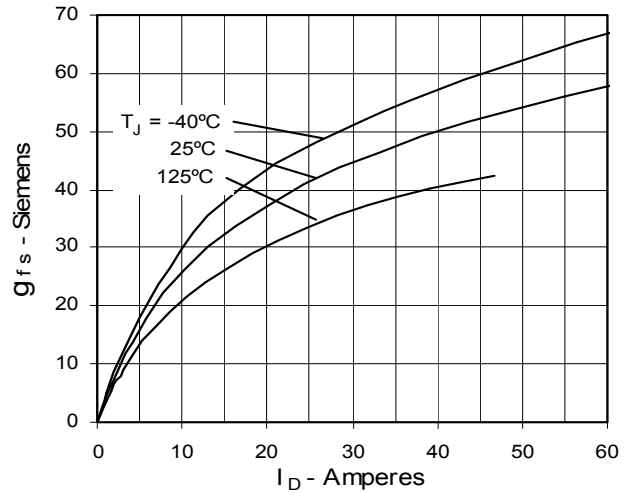


Fig. 9. Source Current vs. Source-To-Drain Voltage

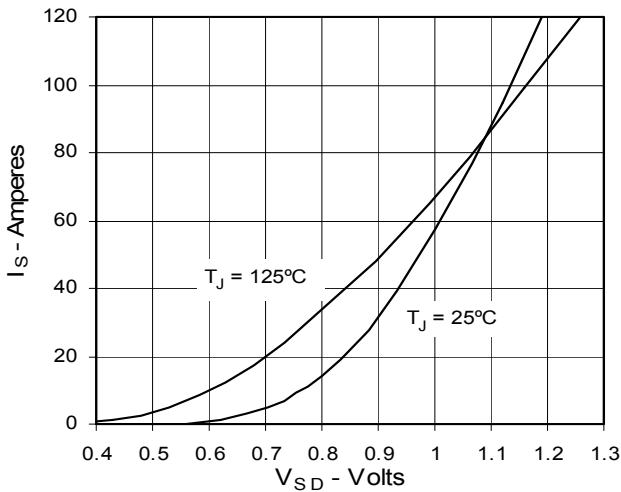


Fig. 10. Gate Charge

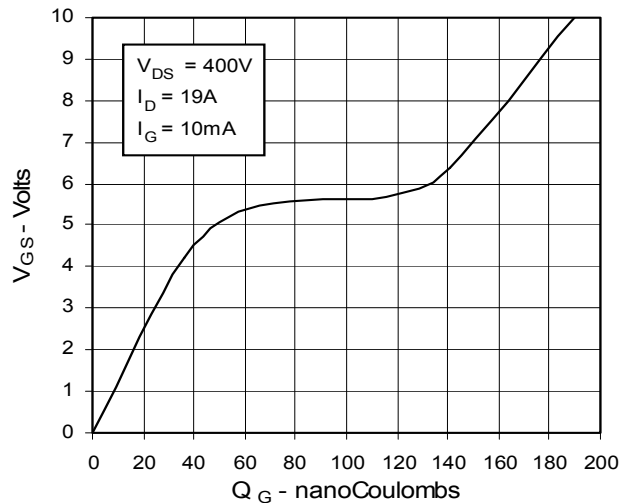


Fig. 11. Capacitance

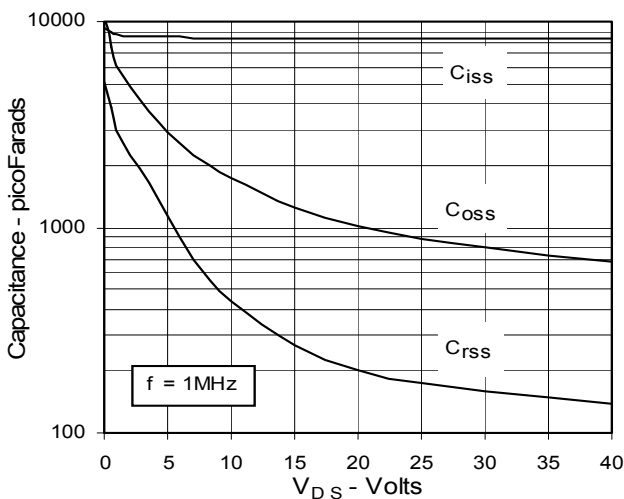


Fig. 12. Forward-Bias Safe Operating Area

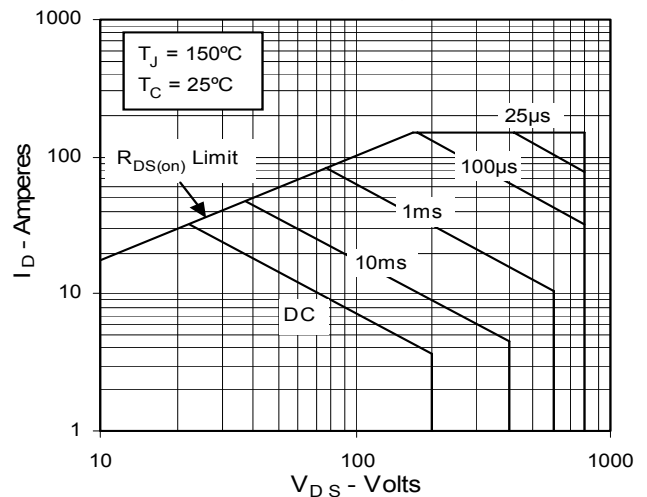


Fig. 13. Maximum Transient Thermal Resistance

