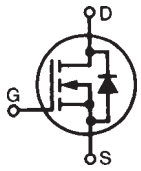
IXYS

HiPerFET™ Power MOSFET Q2-Class

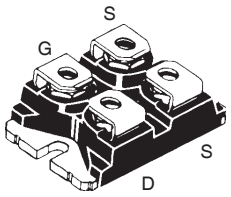
IXFN70N60Q2

V_{DSS} = 600V
I_{D25} = 70A
$R_{DS(on)}$ ≤ 88mΩ
t_{rr} ≤ 250ns



N-Channel Enhancement Mode
Avalanche Rated, Low Q_g, Low Intrinsic R_g
High dV/dt, Low t_{rr}

miniBLOC, SOT-227 B
E153432



G = Gate D = Drain
S = Source

Either Source terminal at miniBLOC can be used as Main or Kelvin Source

Symbol	Test Conditions		Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C		600	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ		600	V
V_{GSS}	Continuous		±30	V
V_{GSM}	Transient		±40	V
I_{D25}	T_C = 25°C		70	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}		280	A
I_A	T_C = 25°C		70	A
E_{AS}	T_C = 25°C		5	J
dV/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$		20	V/ns
P_D	T_C = 25°C		890	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
V_{ISOL}	50/60Hz, RMS	t = 1min	2500	V~
	$I_{ISOL} \le$ 1mA	t = 1s	3000	V~
M_d	Mounting Torque		1.5/13	Nm/lb.in.
	Terminal Connection Torque		1.3/11.5	Nm/lb.in.
Weight			30	g

Features

- Double Metal Process for Low Gate Resistance
- miniBLOC, with Aluminium Nitride Isolation
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier

Applications

- DC-DC Converters
- Switched-Mode and Resonant-Mode Power Supplies
- DC Choppers
- Pulse Generators

Advantages

- Easy to Mount
- Space Savings
- High Power Density

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0V, I_D = 1mA	600			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 8mA	3.0		5.5	V
I_{GSS}	V_{GS} = ±30V, V_{DS} = 0V			±200	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0V			50	μA
	T_J = 125°C			3	mA
$R_{DS(on)}$	V_{GS} = 10V, $I_D = 0.5 \bullet I_{D25}$, Note 1			88	mΩ

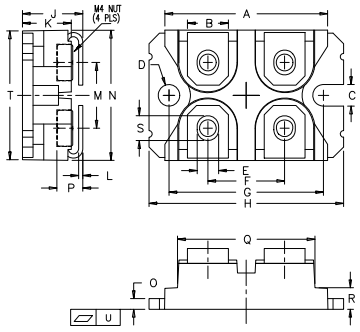
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 10V, I_D = 0.5 • I_{D25}, Note 1	36	50		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		12		nF
C_{oss}			1340		pF
C_{rss}			345		pF
$t_{d(on)}$	**Resistive Switching Times**		26		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 35A		25		ns
$t_{d(off)}$	R_G = 1Ω (External)		60		ns
t_f			12		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 0.5 • I_{D25}		265		nC
Q_{gs}			57		nC
Q_{gd}			120		nC
R_{thJC}				0.14	°C/W
R_{thCS}			0.05		°C/W

Source-Drain Diode

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
I_S	V_{GS} = 0V			70	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			280	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 25A, -di/dt = 100A/μs			250	ns
Q_{RM}	V_R= 100V, V_{GS} = 0V		1.2		μC
I_{RM}			8.0		A

Notes1: Pulse Test, t ≤ 300μs; Duty Cycle, d ≤ 2%.

SOT-227B Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS 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

Ordering Information

The IXFN70N60Q2 is also available with brass capture nuts in place of the normal Zinc coated steel capture nuts. The ordering part number is IXFN70N60Q2-BN.

Fig. 1. Output Characteristics @ 25ºC

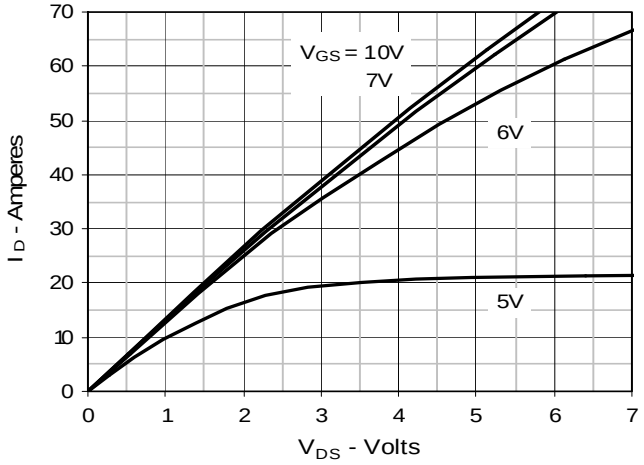


Fig. 2. Extended Output Characteristics @ 25ºC

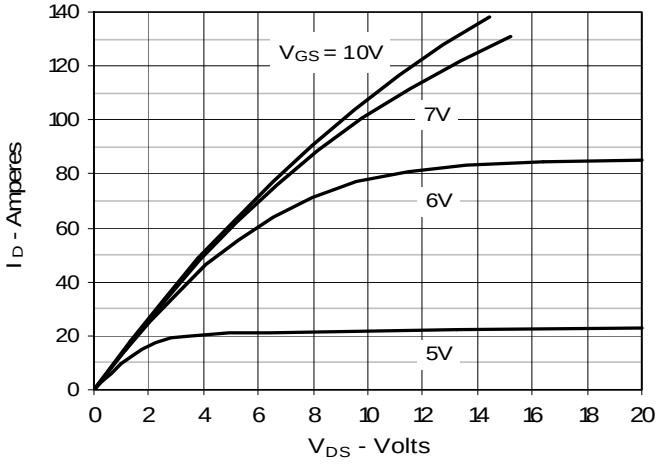


Fig. 3. Output Characteristics @ 125ºC

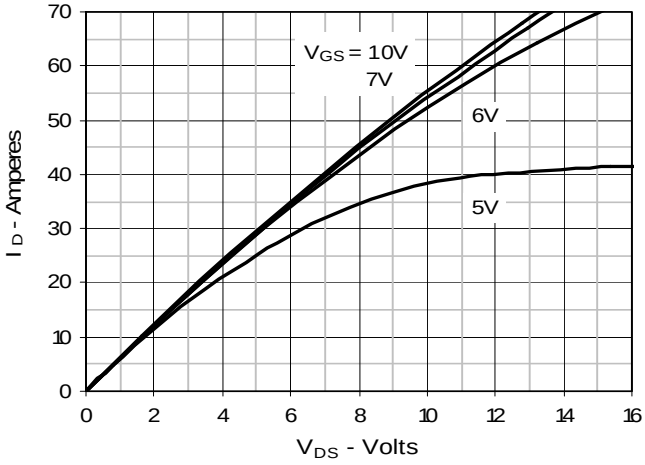


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

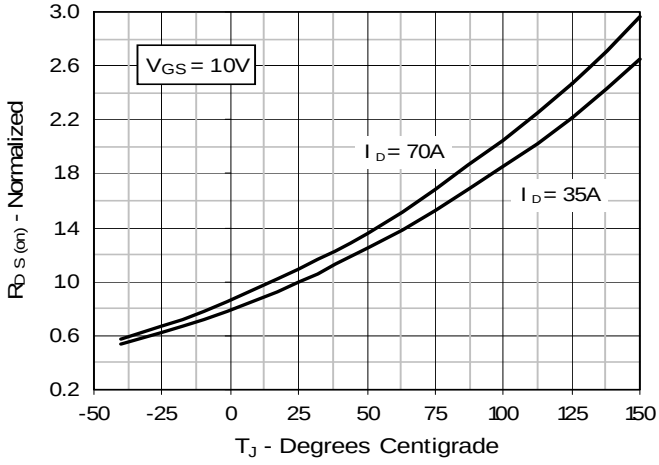


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

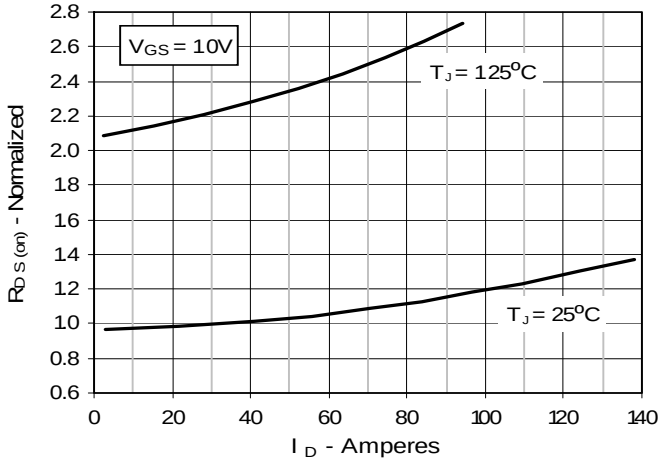


Fig. 6. Drain Current vs. Case Temperature

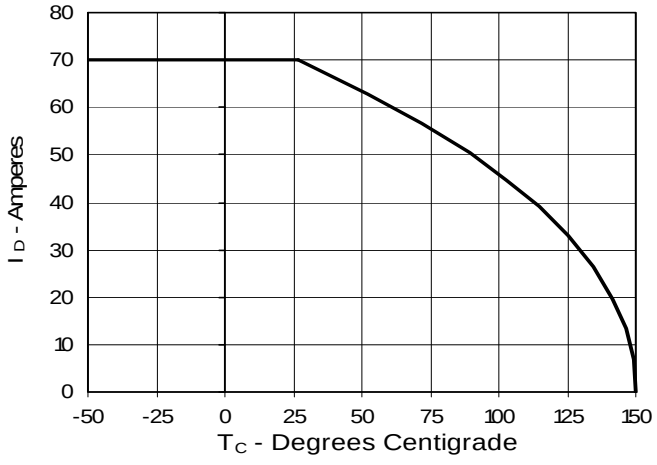


Fig. 7. Input Admittance

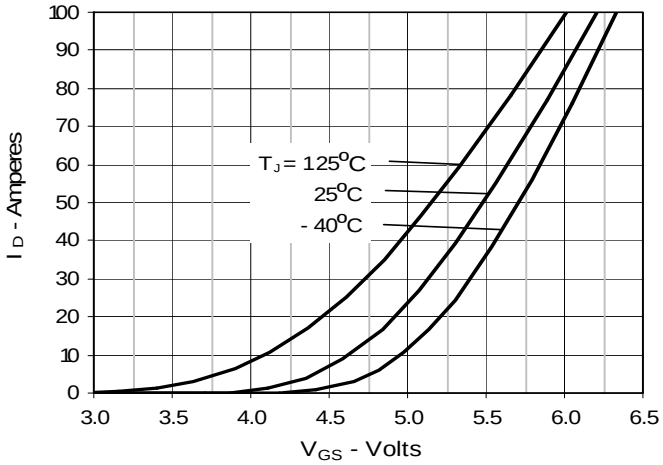


Fig. 8. Transconductance

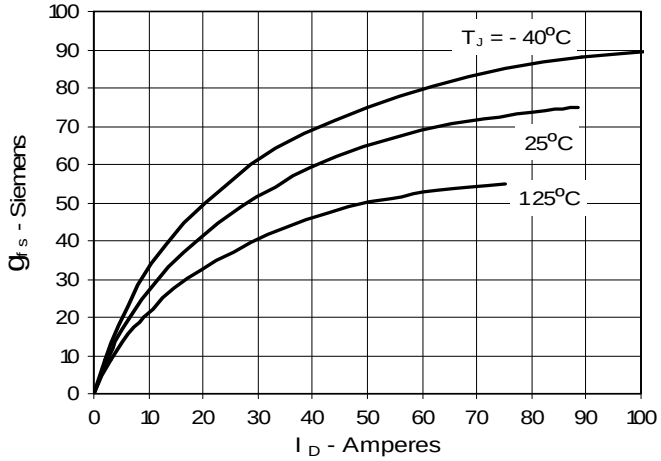


Fig. 9. Source Current vs. Source-To-Drain Voltage

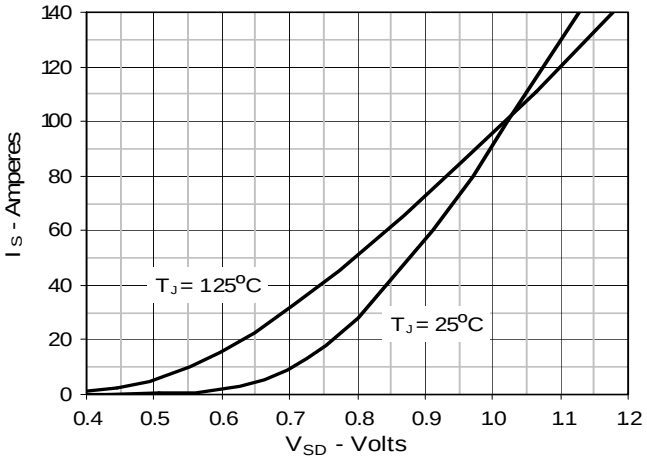


Fig. 10. Gate Charge

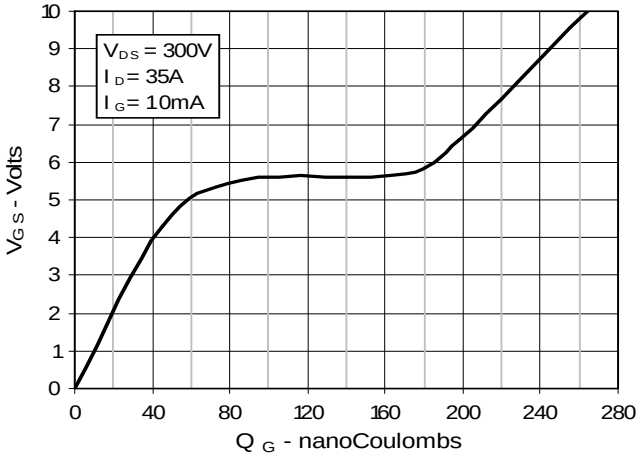


Fig. 11. Capacitance

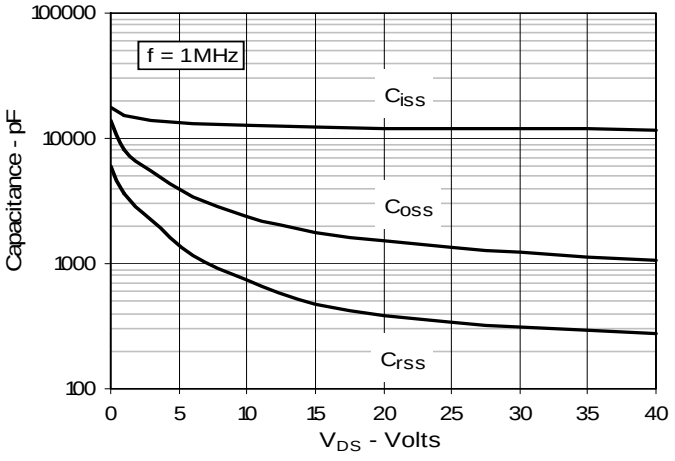


Fig. 12. Maximum Transient Thermal Impedance