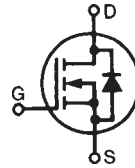


HiPerFET™ Power MOSFET Q2-Class

IXFR40N50Q2

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

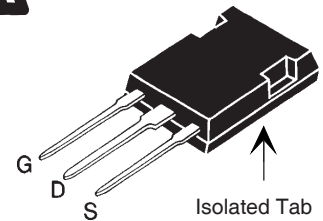


$$\begin{aligned} V_{DSS} &= 500V \\ I_{D25} &= 29A \\ R_{DS(on)} &\leq 170m\Omega \\ t_{rr} &\leq 250ns \end{aligned}$$

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} = 1MΩ	500	V
V _{GSS}	Continuous	± 30	V
V _{GSM}	Transient	± 40	V
I _{D25}	T _C = 25°C	29	A
I _{DM}	T _C = 25°C, pulse width limited by T _{JM}	160	A
I _A	T _C = 25°C	40	A
E _{AS}	T _C = 25°C	2.5	J
dV/dt	I _S ≤ I _{DM} , V _{DD} ≤ V _{DSS} , T _J ≤ 150°C	20	V/ns
P _D	T _C = 25°C	320	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}	Plastic body for 10s	260	°C
V _{ISOL}	50/60 Hz, RMS, 1 minute	2500	V~
F _C	Mounting force	20..120/4.5..27	N/lb.
Weight		5	g

ISOPLUS247 (IXFR)

E153432



G = Gate D = Drain
S = Source

Features

- Double metal process for low gate resistance
- International standard package
- Epoxy meet UL-94 V-0, flammability classification
- Low R_{ds(on)}, low Q_g
- Avalanche energy and current rated
- Fast intrinsic recifier

Applications

- DC-DC converters
- Switched-mode and resonant-mode power supplies, >500kHz switching
- DC choppers
- Pulse generation
- Laser drivers

Advantages

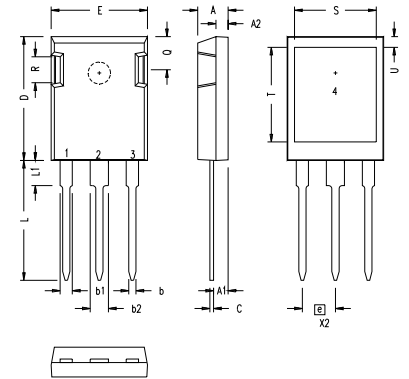
- Easy to mount
- Space savings
- High power density

Symbol	Test Conditions (T _J = 25°C, unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV _{DSS}	V _{GS} = 0V, I _D = 250μA	500		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 4mA	3.0		5.5 V
I _{GSS}	V _{GS} = ± 30V, V _{DS} = 0V			± 200 nA
I _{DSS}	V _{DS} = V _{DSS} V _{GS} = 0V T _J = 125°C			50 μA 2 mA
R _{DS(on)}	V _{GS} = 10V, I _D = 20A, Note 1			170 mΩ

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 20\text{A}$, Note 1	15	28	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		4850	pF
C_{oss}			680	pF
C_{rss}			170	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 20\text{A}$ $R_G = 1\Omega$ (External)		17	ns
t_r			13	ns
$t_{d(off)}$			42	ns
t_f			8	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 20\text{A}$		110	nC
Q_{gs}			25	nC
Q_{gd}			50	nC
R_{thJC}				0.39°C/W
R_{thCS}		0.15		$^\circ\text{C/W}$

Source-Drain Diode		Characteristic Values		
$T_J = 25^\circ\text{C}$ unless otherwise specified)		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			40 A
I_{SM}	Repetitive, pulse width limited by T_{JM}			160 A
V_{SD}	$I_F = I_S, V_{GS} = 0\text{V}$, Note 1			1.5 V
t_{rr}	$I_F = 25\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$			250 ns
Q_{RM}			1	μC
I_{RM}			9	A

ISOPLUS247 (IXFR) 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.

Note 1: Pulse test, $t \leq 300\mu\text{s}$; duty cycle, $d \leq 2\%$.

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

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

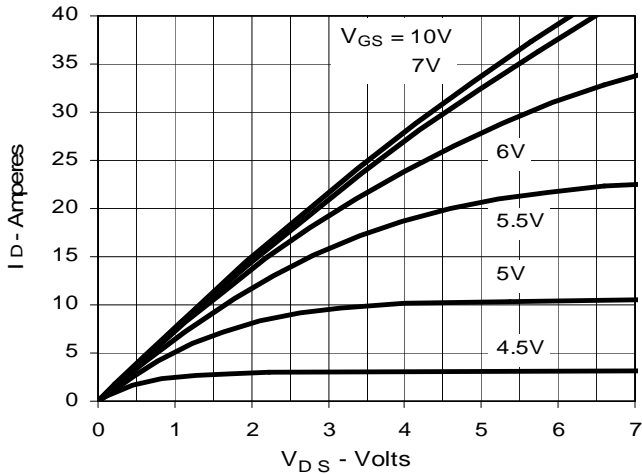
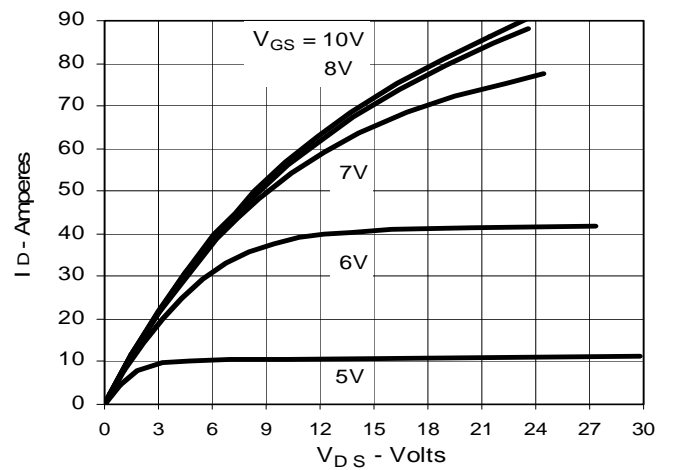
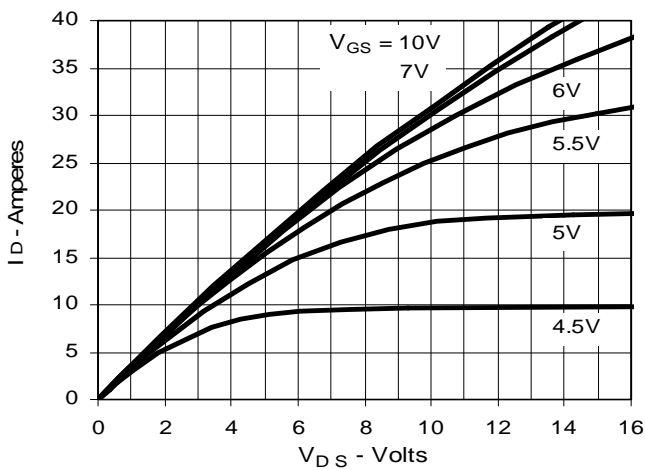
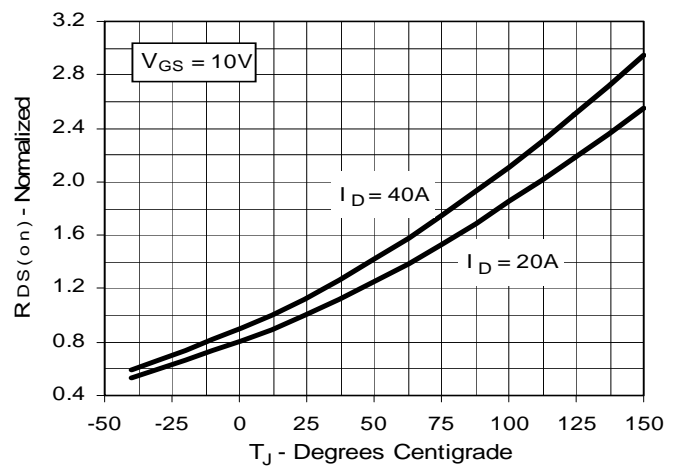
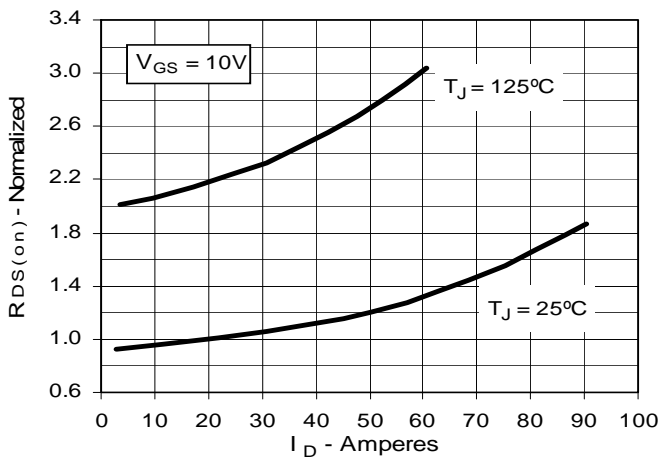
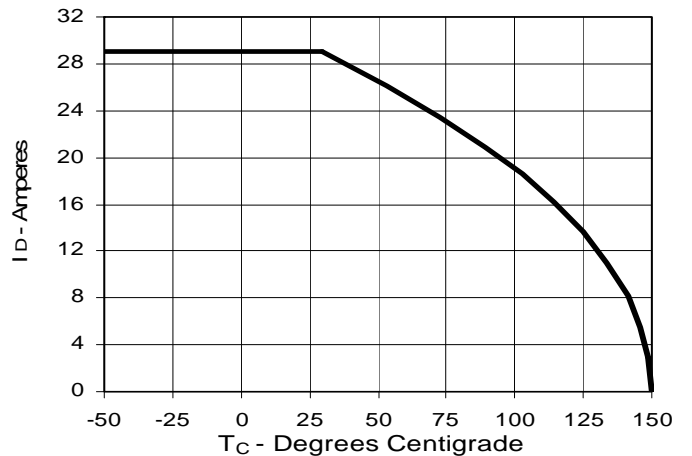
**Fig. 1. Output Characteristics
@ 25°C**

**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


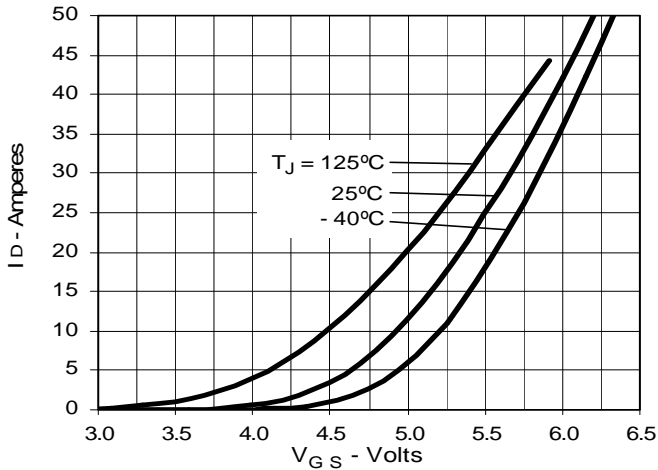
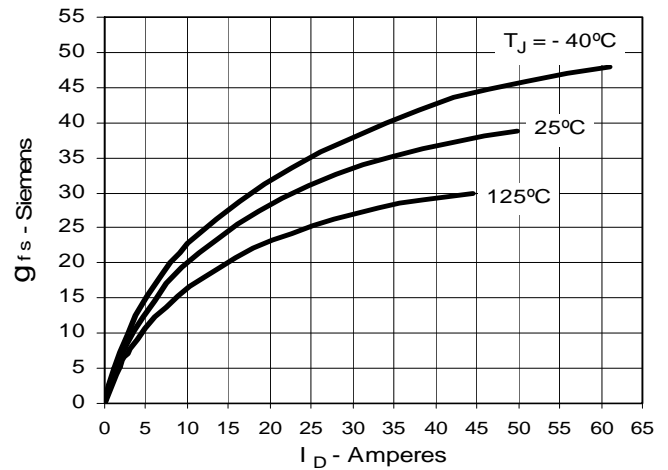
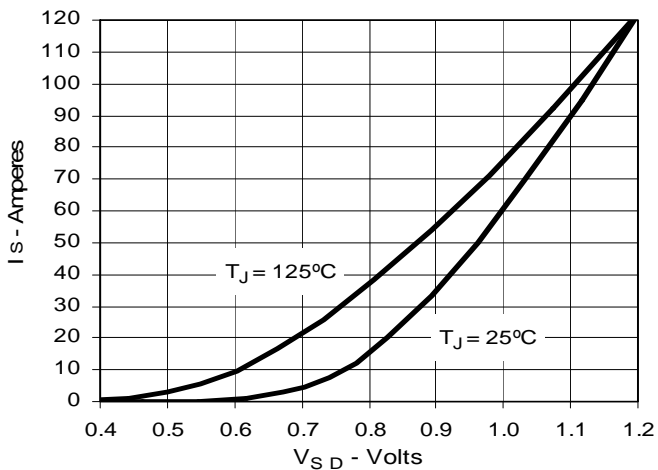
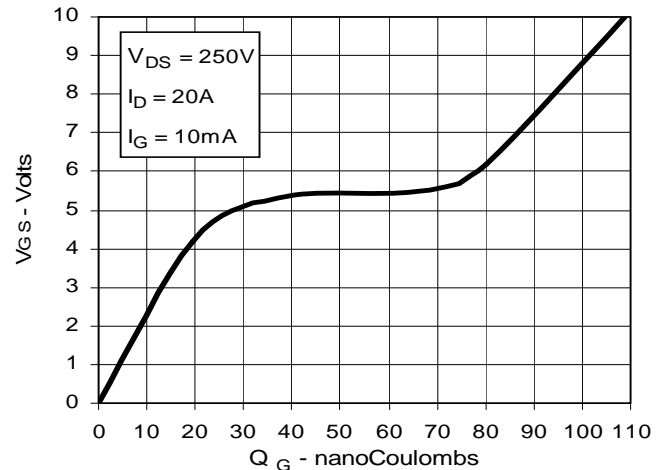
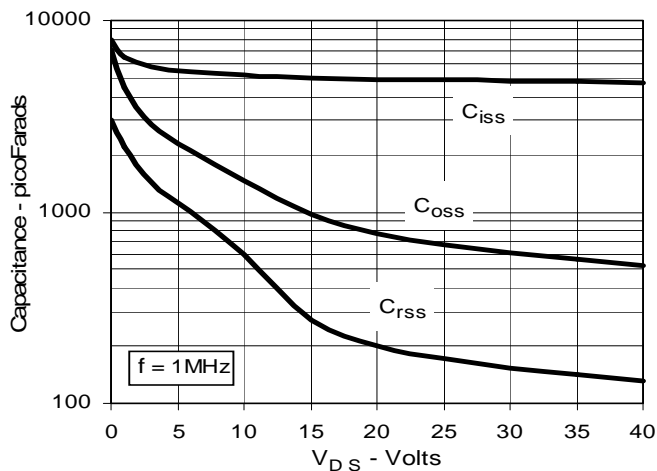
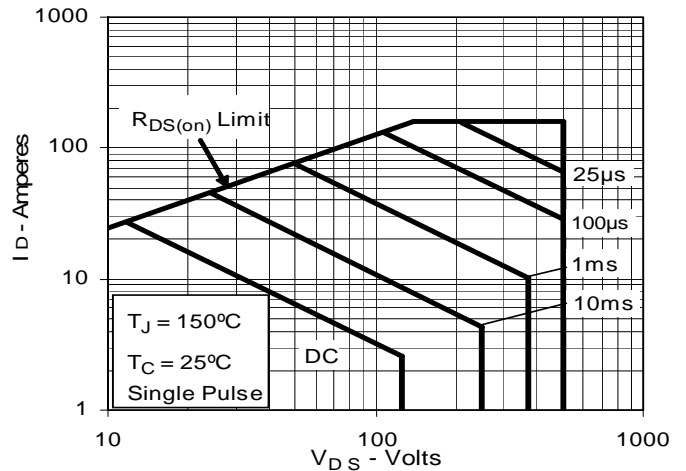
Fig. 7. Input Admittance

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

