IXYS

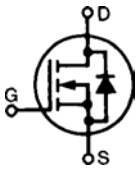
HiPerFET™ Power MOSFETs ISOPLUS247™
(Electrically Isolated Back Surface)

IXFR 21N100Q

V_{DSS} = 1000 V
I_{D25} = 18 A
$R_{DS(on)}$ = 0.50 Ω

$t_{rr} \leq$ 250 ns

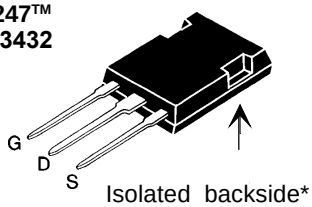
N-Channel Enhancement Mode, Low Q_g,
High dv/dt, Low t_{rr}, HDMOS™ Family



Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	1000	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	1000	V
V_{GS}	Continuous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	18	A
I_{DM}	T_C = 25°C, Note 1	84	A
I_{AR}	T_C = 25°C	21	A
E_{AR}	T_C = 25°C	60	mJ
E_{AS}	T_C = 25°C	2.5	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	10	V/ns
P_D	T_C = 25°C	350	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~
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 = 1mA	1000		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 4mA	3		5 V
I_{GSS}	V_{GS} = ±20 V, V_{DS} = 0			±100 nA
I_{DSS}	$V_{DS} = V_{DSS}$ V_{GS} = 0 V T_J = 125°C			100 µA 2 mA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = I_T$ Notes 2, 3			0.5 Ω

ISOPLUS 247™
E153432



Isolated backside*

G = Gate D = Drain
S = Source

* Patent pending

Features
- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- IXYS advanced low Q_g process
- Low gate charge and capacitances
  - easier to drive
  - faster switching
- Low drain to tab capacitance(<30pF)
- Low $R_{DS\ (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Rated for Unclamped Inductive Load Switching (UIS)
- Fast intrinsic Rectifier

Applications
- DC-DC converters
- Battery chargers
- Switched-mode and resonant-mode power supplies
- DC choppers
- AC motor control

Advantages
- Easy assembly
- Space savings
- High power density

© 2003 IXYS All rights reserved

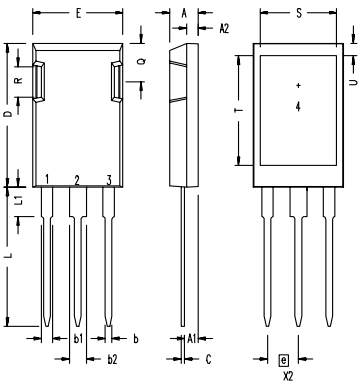
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	V_{DS} = 10 V; I_D = I_T Notes 2, 3	16	22		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		5900		pF
C_{oss}			550		pF
C_{rss}			90		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 • V_{DSS}, I_D = I_T R_G = 1 Ω (External), Notes 2, 3		21		ns
t_r			18		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 Notes 2, 3		170		nC
Q_{GS}			38		nC
Q_{GD}			75		nC
R_{thJC}				0.35	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			21	A
I_{SM}	Repetitive; Note 1			84	A
V_{SD}	I_F = I_T, V_{GS} = 0 V, Notes 2, 3			1.5	V
t_{rr}	I_F = I_S,-di/dt = 100 A/µs, V_R = 100 V			250	ns
Q_{RM}			1.4		µC
I_{RM}			8		A

Note: 1. Pulse width limited by T_{JM}
2. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %
3. I_T = 10.5A

ISOPLUS 247 OUTLINE





1 Gate, 2 Drain (Collector)
3 Source (Emitter)
4 no connection

Dim.	Millimeter Min.	Max.	Inches 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
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	.244
R	4.32	4.83	.170	.190

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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025

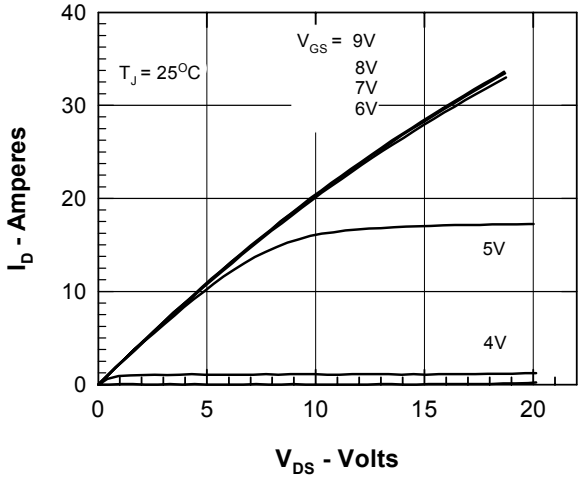


Fig.1 Output Characteristics @ T_j = 25°C

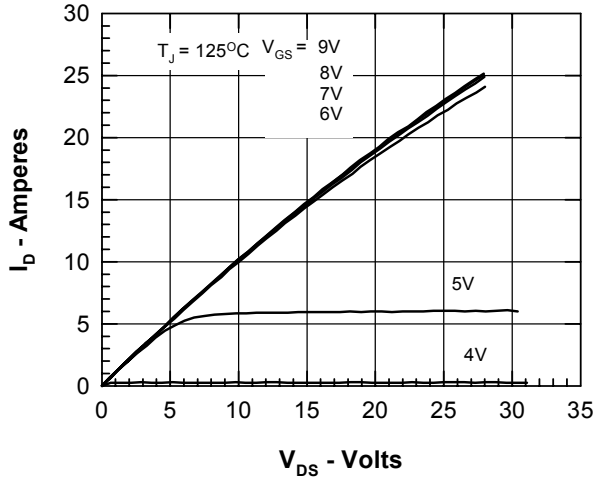


Fig.2 Output Characteristics @ T_j = 125°C

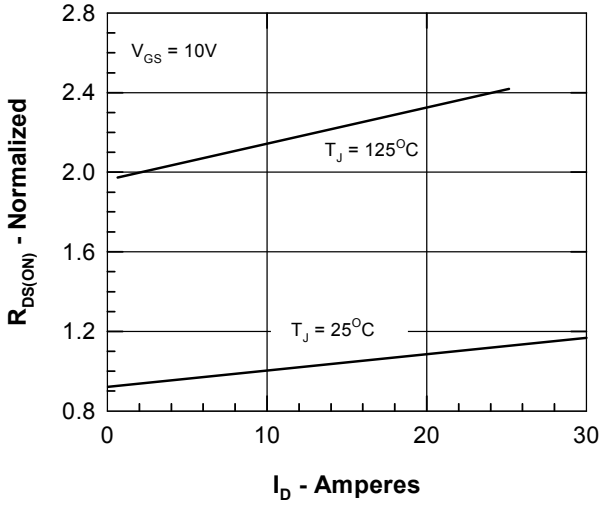


Fig.3 $R_{DS(on)}$ vs. Drain Current

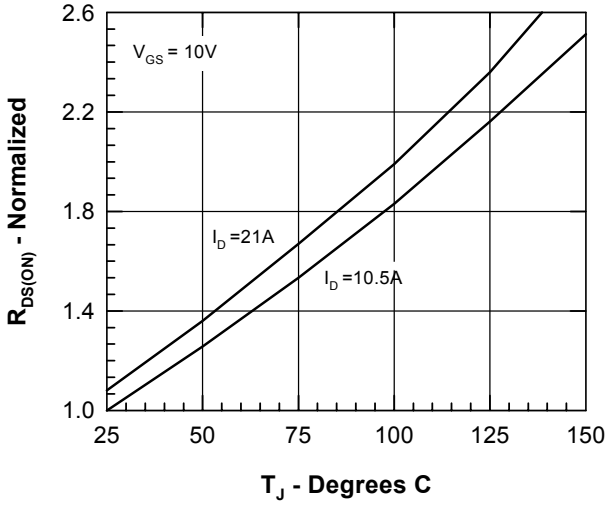


Fig.4 Temperature Dependence of Drain to Source Resistance

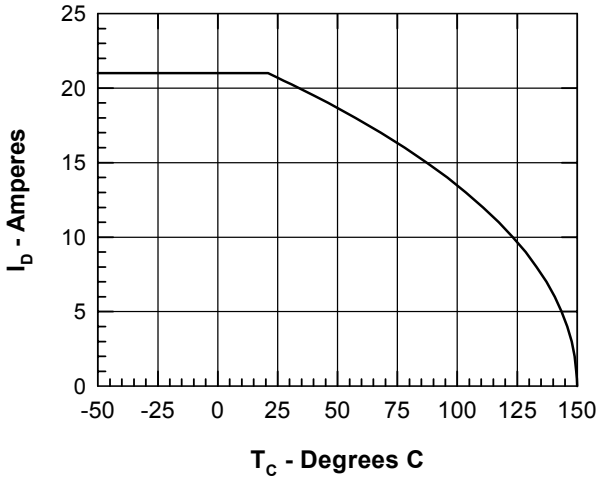


Fig.5 Drain Current vs. Case Temperature

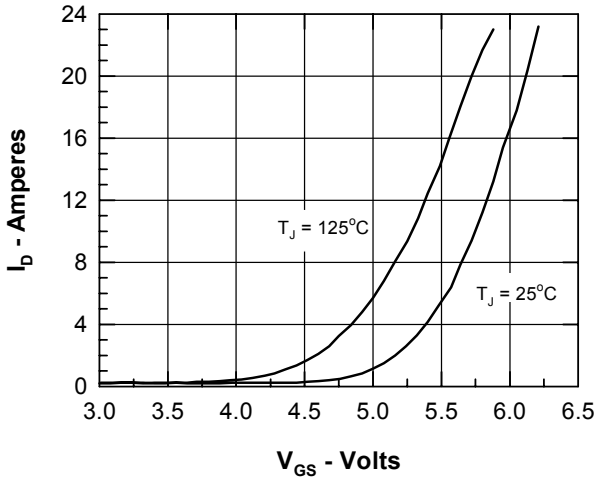


Fig.6 Drain Current vs Gate Source Voltage

© 2003 IXYS All rights reserved

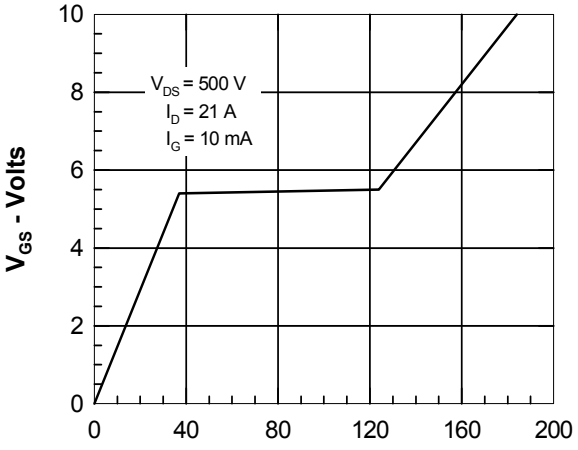


Fig. 7 Gate Charge Characteristic Curve

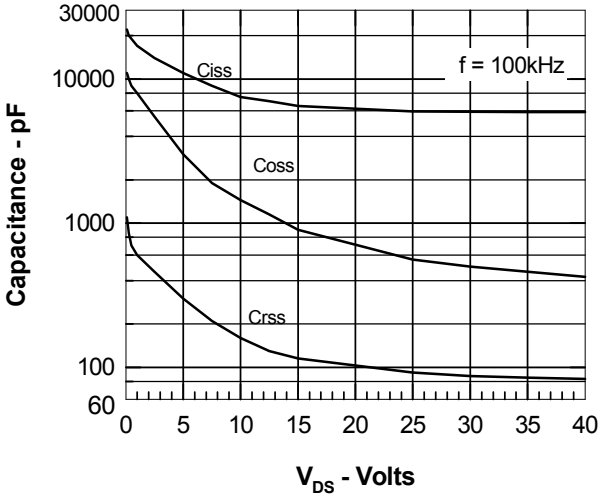


Fig. 8 Capacitance Curves

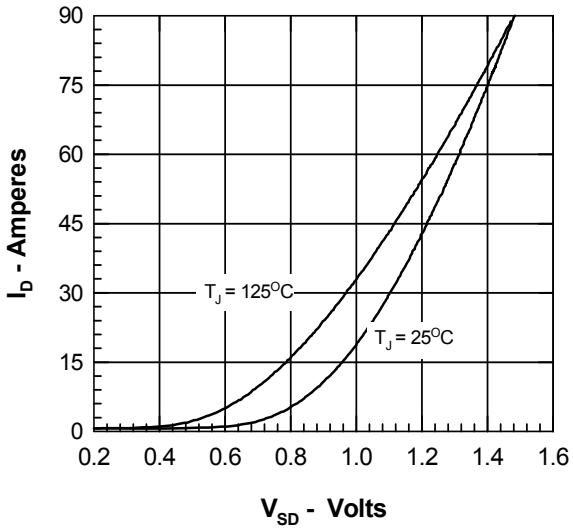


Fig. 9 Drain Current vs Drain Source Voltage

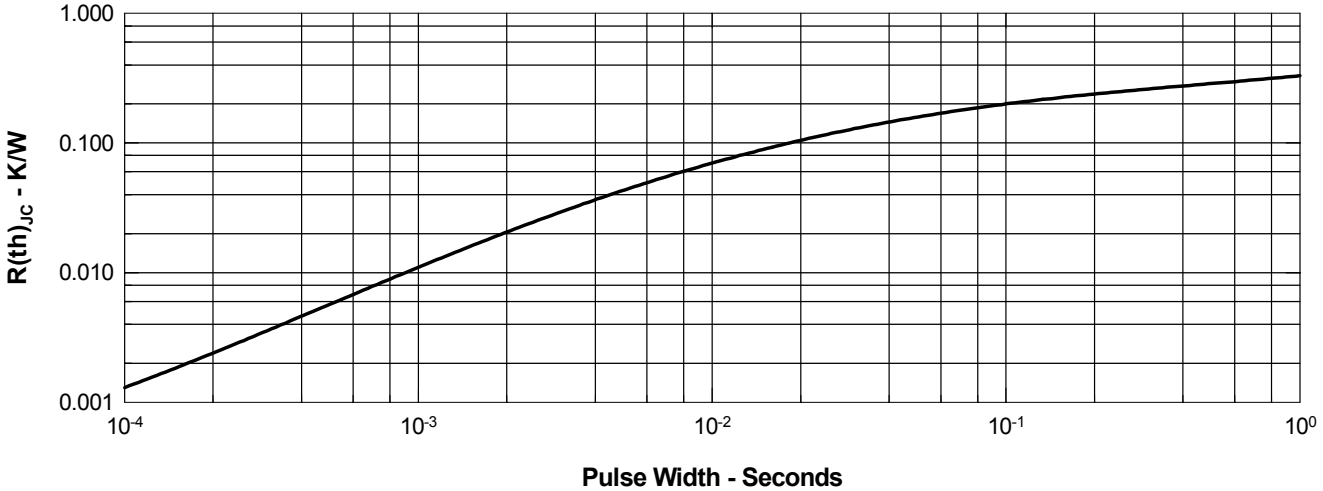


Fig. 10 Transient Thermal Impedance

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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025



Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.