IXYS

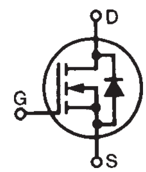
PolarHV™ HiPerFET Power MOSFET

IXFR 44N80P

Electrically Isolated Tab

V_{DSS}	=	800	V
I_{D25}	=	25	A
$R_{DS(on)}$	≤	200	mΩ
t_{rr}	≤	250	ns

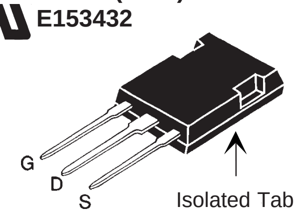
N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode



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	25	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	100	A
I_{AR}	T_C = 25°C	25	A
E_{AR}	T_C = 25°C	80	mJ
E_{AS}	T_C = 25°C	3.4	J
dv/dt	I_S ≤ I_{DM}, di/dt ≤ 100 A/µs, V_{DD} ≤ V_{DSS}, T_J ≤ 150°C, R_G = 10 Ω	10	V/ns
P_D	T_C = 25°C	300	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 seconds	260	°C
V_{ISOL}	50/60 Hz, RMS, 1 minute	2500	V~
F_C	Mounting force	20..120 /4.5..25	N/lb
Weight		5	g

Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 800 µA	800			V
$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 8 mA	3.0		5.0	V
I_{GSS}	V_{GS} = ± 30 V, V_{DS} = 0 V			± 200	nA
I_{DSS}	V_{DS} = V_{DSS} V_{GS} = 0 V T_J = 125°C			50 1.5	µA mA
$R_{DS(on)}$	V_{GS} = 10 V, I_D = I_T, Note 1			200	mΩ

ISOPLUS247 (IXFR)
E153432



G = Gate D = Drain
S = Source

Features

- Silicon chip on Direct-Copper-Bond substrate
  - High power dissipation
  - Isolated mounting surface
  - 2500V electrical isolation
- Low drain to tab capacitance(<30pF)
- Low $R_{DS (on)}$ HDMOS™ process
- Rugged polysilicon gate cell structure
- Unclamped Inductive Switching (UIS) rated
- 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

DS99504E(06/06)

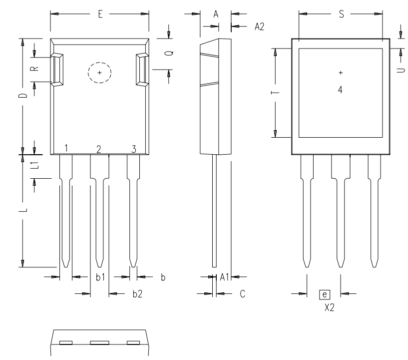
Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 20 V; $I_D = I_T$, Note 1	27	43		S
C_{iss}			12		nF
C_{oss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		910		pF
C_{rss}			30		pF
$t_{d(on)}$			28		ns
t_r	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 44 A		22		ns
$t_{d(off)}$	R_G = 1 Ω (External)		75		ns
t_f			27		ns
$Q_{g(on)}$			200		nC
Q_{gs}	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, $I_D = I_T$		67		nC
Q_{gd}			65		nC
R_{thJC}				0.42	°C/W
R_{thCS}			0.15		°C/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			44	A
I_{SM}	Repetitive			100	A
V_{SD}	$I_F = I_S$, V_{GS} = 0 V, Note 1			1.5	V
t_{rr}	I_F = 22 A, -di/dt = 100 A/µs			250	ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		0.8		µC
I_{RM}			8.0		A

Notes: 1. Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %;
2. Test current I_T = 22 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.

Fig. 1. Output Characteristics @ 25°C

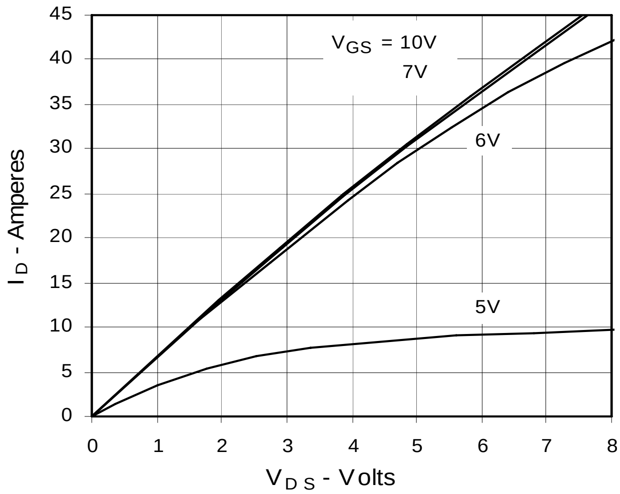


Fig. 2. Extended Output Characteristics @ 25°C

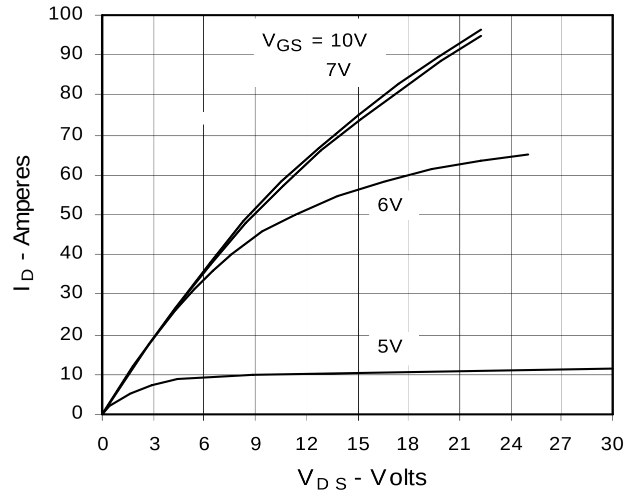


Fig. 3. Output Characteristics @ 125°C

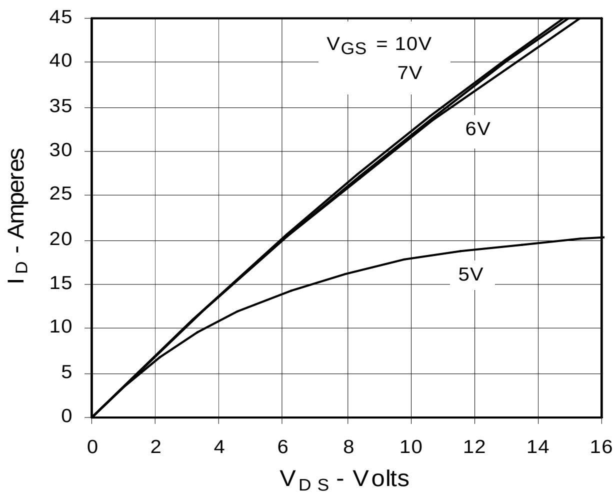


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 22A Value vs. Junction Temperature

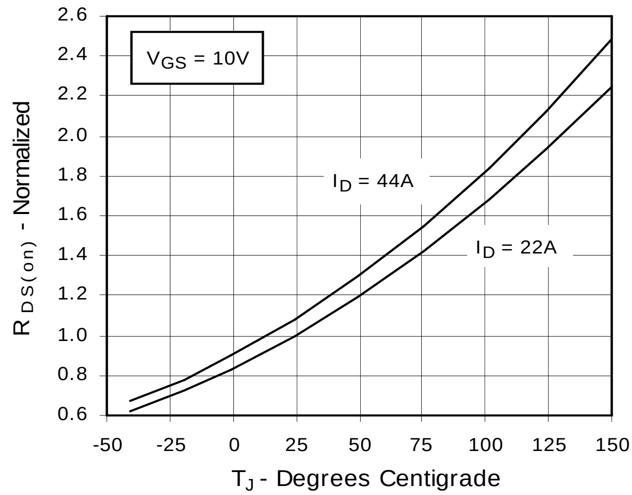


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 22A Value vs. Drain Current

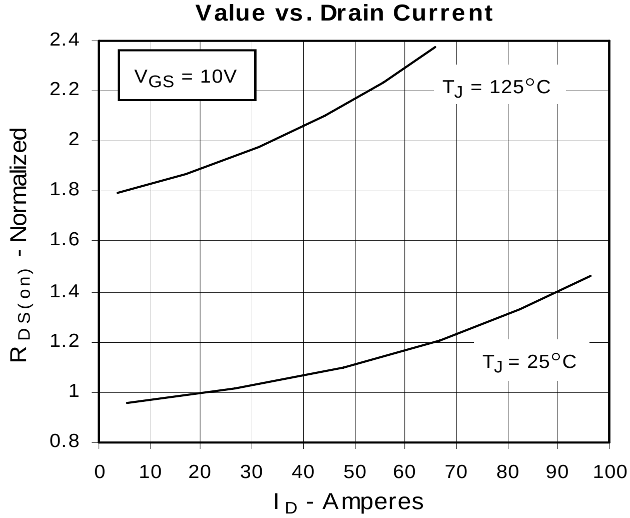


Fig. 6. Drain Current vs. Case Temperature

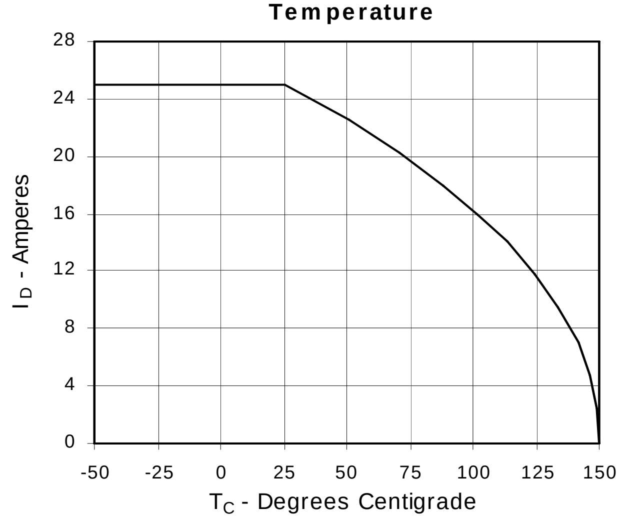


Fig. 7. Input Admittance

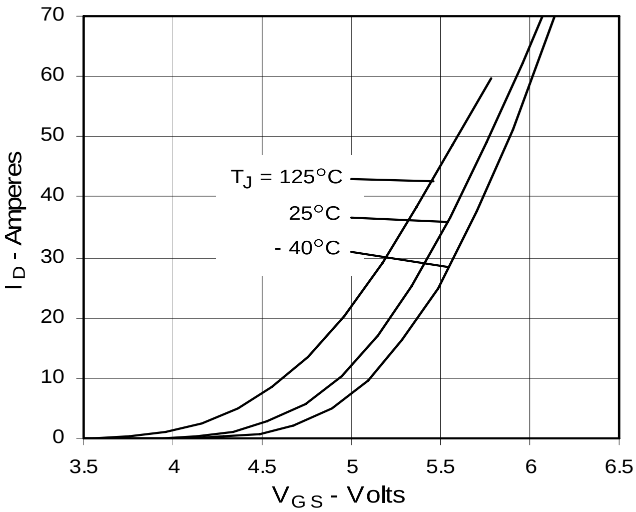


Fig. 8. Transconductance

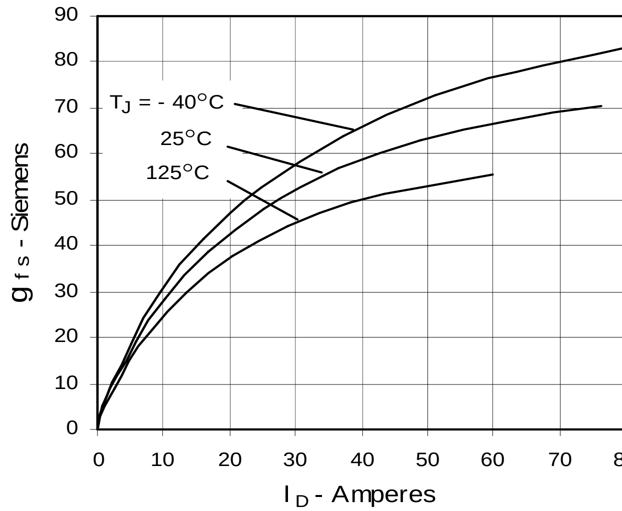


Fig. 9. Source Current vs. Source-To-Drain Voltage

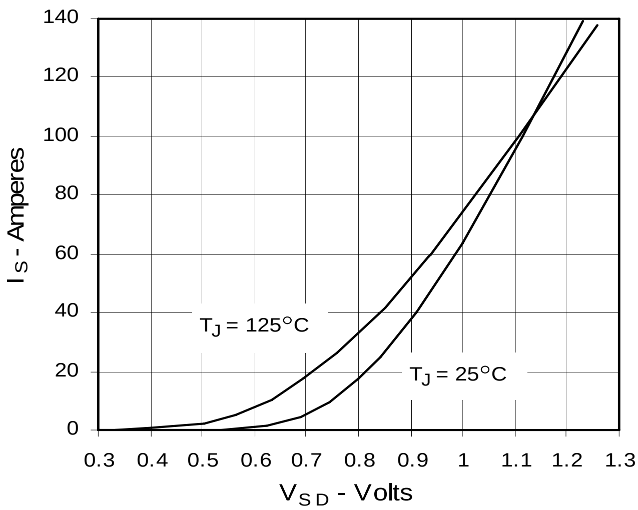


Fig. 10. Gate Charge

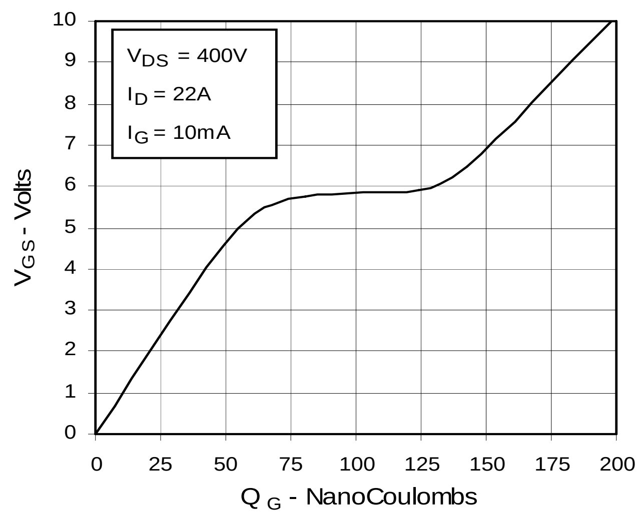


Fig. 11. Capacitance

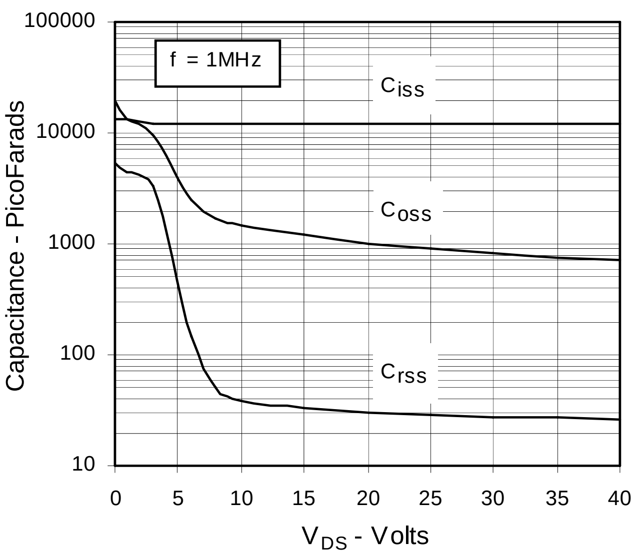


Fig. 12. Maximum Transient Thermal Resistance