

**Polar™ HiPerFET™
Power MOSFET**

IXFL40N110P

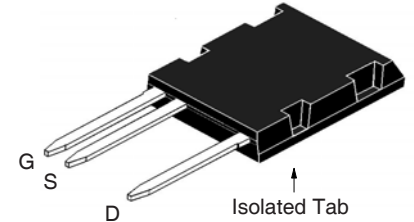
$V_{DSS} = 1100V$
 $I_{D25} = 21A$
 $R_{DS(on)} \leq 280m\Omega$
 $t_{rr} \leq 300ns$

(Electrically Isolated Tab)



N-Channel Enhancement Mode
 Avalanche Rated
 Fast Intrinsic Rectifier

ISOPLUS i5-Pak™ (HV)



G = Gate S = Source
 D = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	$T_J = 25^\circ C$ to $150^\circ C$	1100	V
V_{DGR}	$T_J = 25^\circ C$ to $150^\circ C$, $R_{GS} = 1M\Omega$	1100	V
V_{GSS}	Continuous	± 30	V
V_{GSM}	Transient	± 40	V
I_{D25}	$T_C = 25^\circ C$	21	A
I_{DM}	$T_C = 25^\circ C$, Pulse Width Limited by T_{JM}	100	A
I_A	$T_C = 25^\circ C$	20	A
E_{AS}	$T_C = 25^\circ C$	2	J
dv/dt	$I_S \leq I_{DM}$, $V_{DD} \leq V_{DSS}$, $T_J \leq 150^\circ C$	15	V/ns
P_D	$T_C = 25^\circ C$	357	W
T_J		-55 ... +150	$^\circ C$
T_{JM}		150	$^\circ C$
T_{stg}		-55 ... +150	$^\circ C$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ C$
T_{SOLD}	Plastic Body for 10s	260	$^\circ C$
F_C	Mounting Force	20..120 / 4.5..27	N/lb
V_{ISOL}	50/60 Hz, RMS $t = 1$ min	2500	V~
	$I_{ISOL} \leq 1$ mA $t = 1$ s	3000	V~
Weight		8	g

Features

- Silicon Chip on Direct-Copper-Bond Substrate
 - High Power Dissipation
 - Isolated Mounting Surface
 - 2500V~ Electrical Isolation
- Avalanche Rated
- Low Package Inductance
- Fast Intrinsic Rectifier
- Low $R_{DS(on)}$ and Q_G

Advantages

- Easy to Mount
- Space Savings

Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- AC Motor Control
- High Speed Power Switching Application

Symbol	Test Conditions ($T_J = 25^\circ C$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{DSS}	$V_{GS} = 0V$, $I_D = 3mA$	1100		V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 1mA$	3.5		6.5 V
I_{GSS}	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			± 300 nA
I_{DSS}	$V_{DS} = V_{DSS}$, $V_{GS} = 0V$ $T_J = 125^\circ C$			50 μA 3 mA
$R_{DS(on)}$	$V_{GS} = 10V$, $I_D = 20A$, Note 1			280 m Ω

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 20\text{V}, I_D = 20\text{A}$, Note 1	20	32	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		19	nF
C_{oss}			1070	pF
C_{rss}			46	pF
R_{Gi}	Gate Input Resistance		1.65	Ω
$t_{d(on)}$	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)		53	ns
t_r			55	ns
$t_{d(off)}$			110	ns
t_f			54	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 20\text{A}$		310	nC
Q_{gs}			95	nC
Q_{gd}			142	nC
R_{thJC}				0.35 $^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ Unless Otherwise Specified)	Characteristic Values		
		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}	$I_F = 20\text{A}, -di/dt = 100\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$			300 ns
Q_{RM}			2.2	μC
I_{RM}			16.0	A

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
4,860,072	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 @ $T_J = 25^\circ\text{C}$

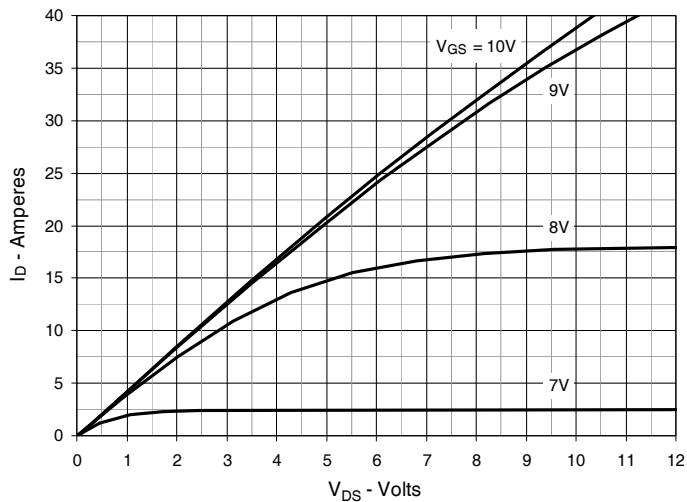


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

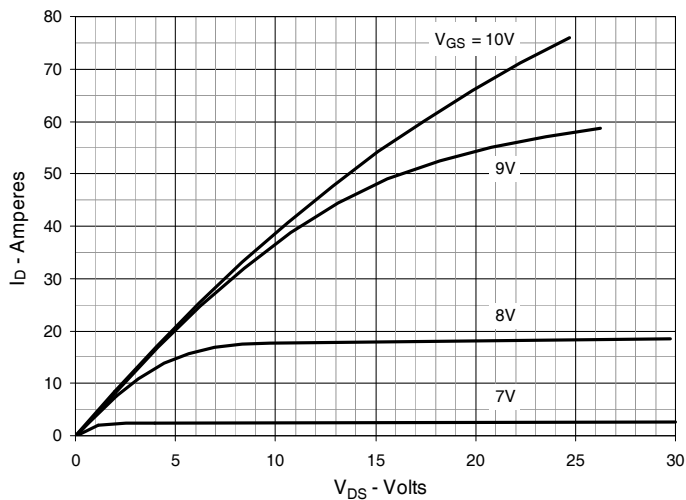


Fig. 3. Output Characteristics @ $T_J = 125^\circ\text{C}$

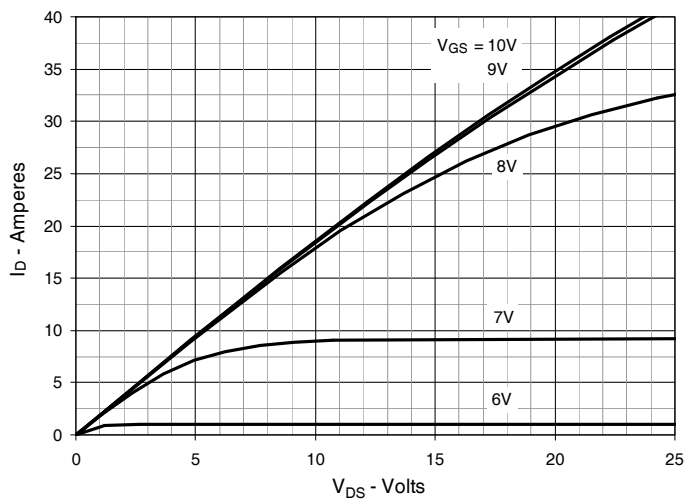


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 20A$ Value vs. Junction Temperature

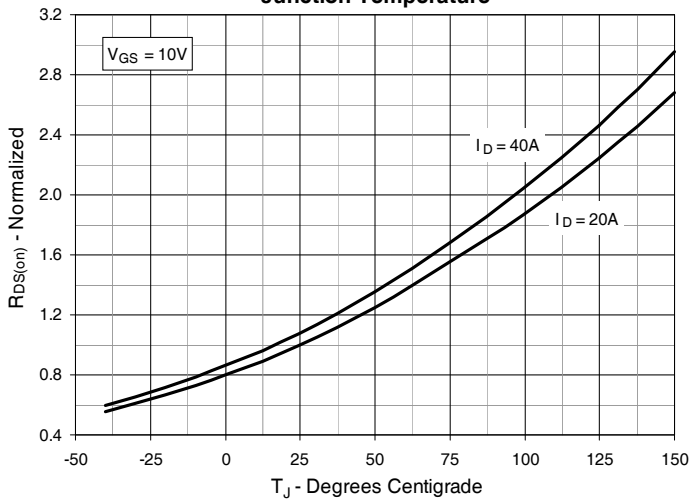


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 20A$ Value vs. Drain Current

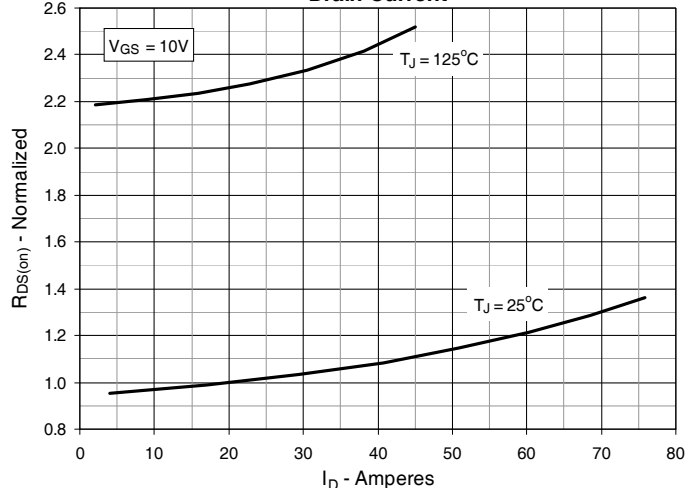


Fig. 6. Maximum Drain Current vs. Case Temperature

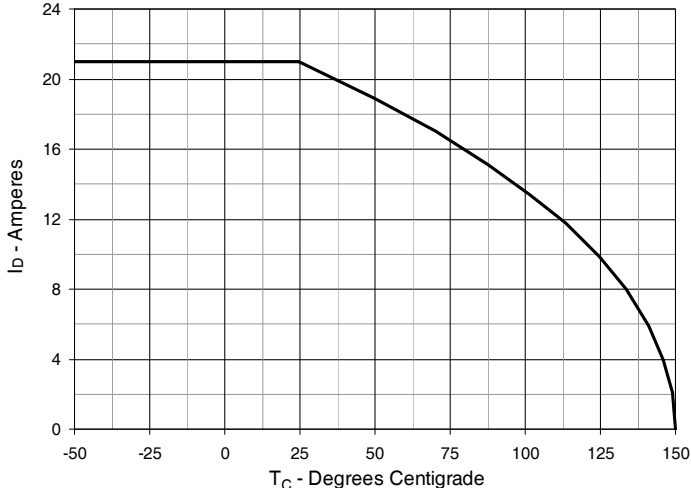
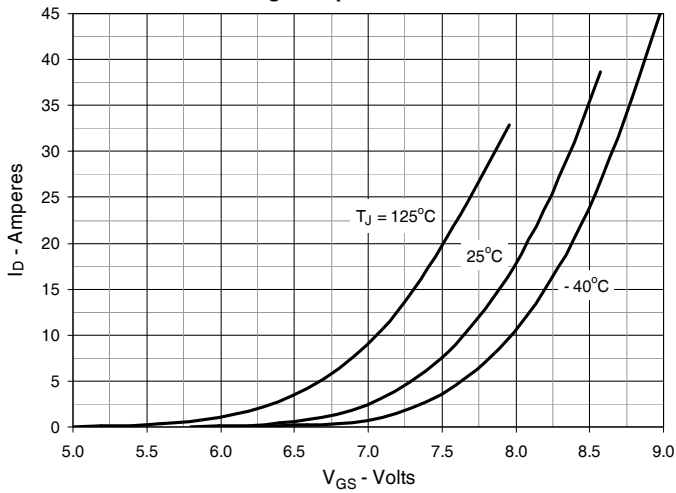
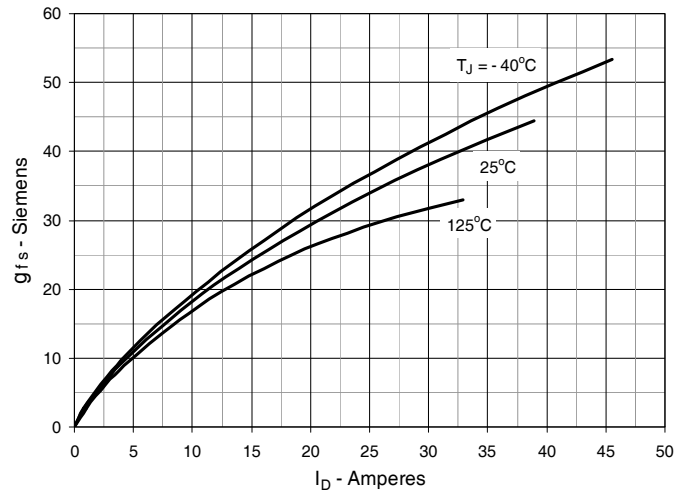
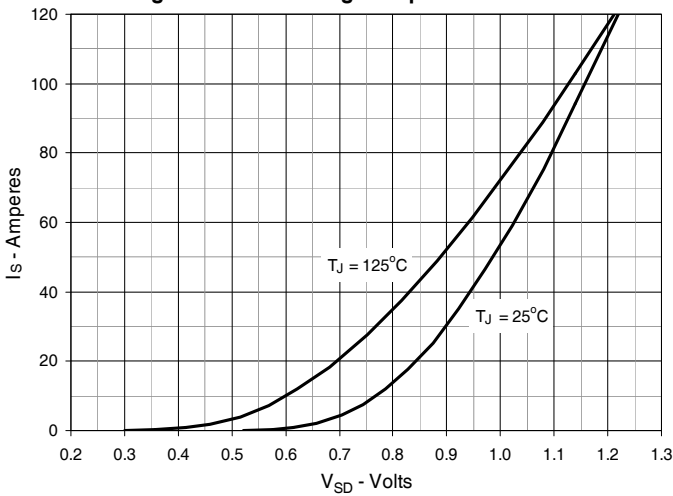
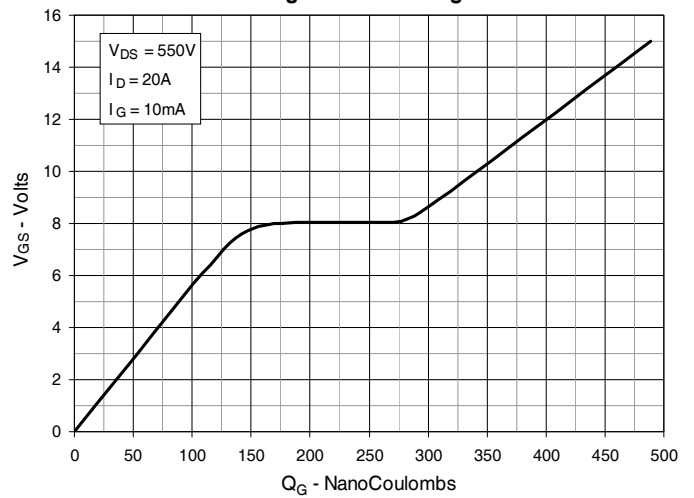
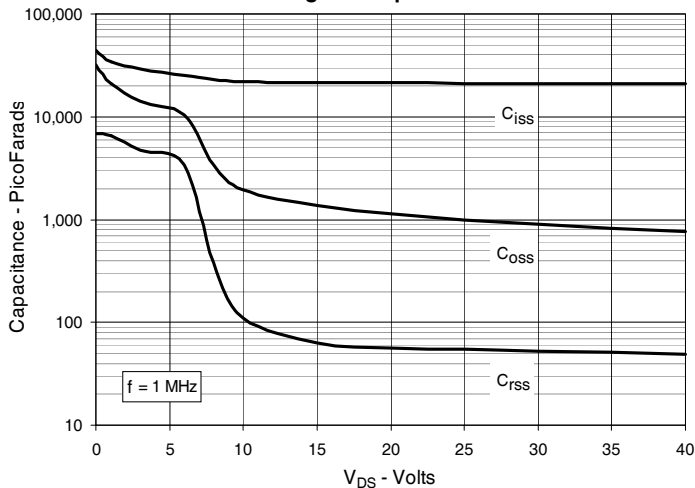
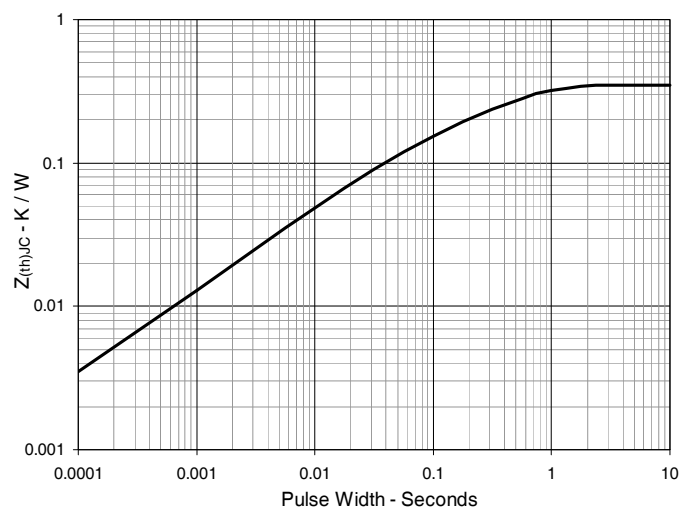
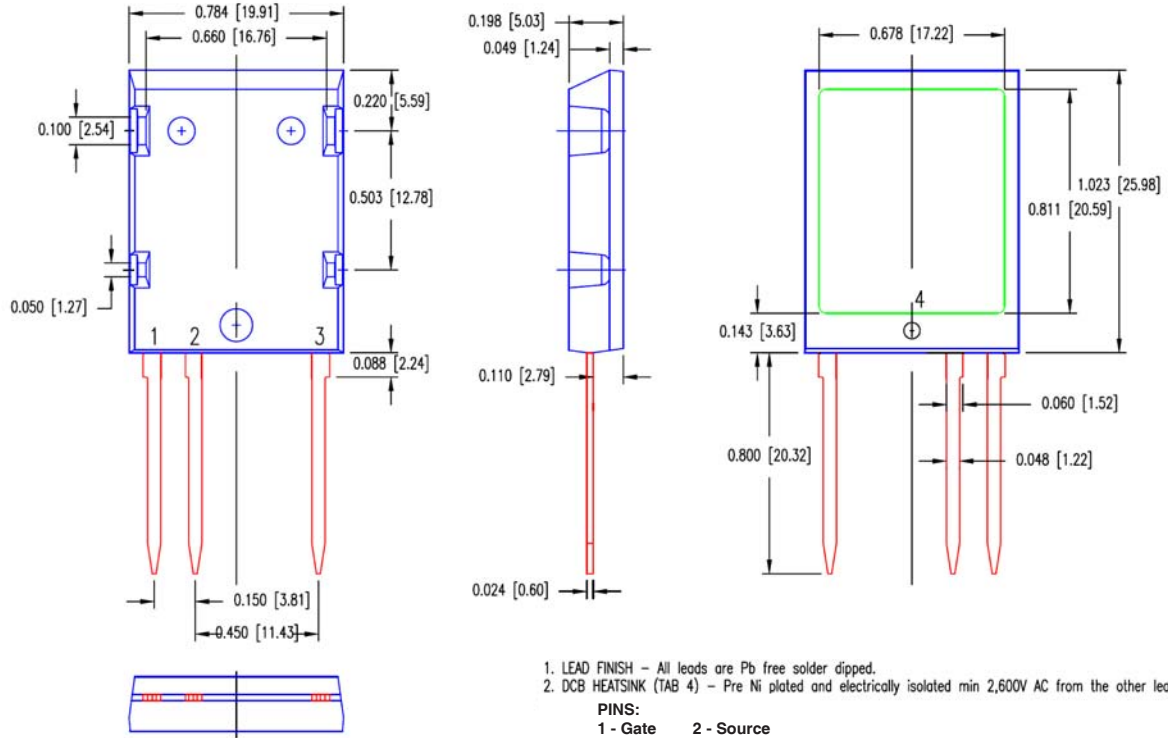


Fig. 7. Input Admittance

Fig. 8. Transconductance

Fig. 9. Forward Voltage Drop of Intrinsic Diode

Fig. 10. Gate Charge

Fig. 11. Capacitance

Fig. 12. Maximum Transient Thermal Impedance


ISOPLUS i5-Pak™ (IXFL) Outline


1. LEAD FINISH - All leads are Pb free solder dipped.
 2. DCB HEATSINK (TAB 4) - Pre Ni plated and electrically isolated min 2,600V AC from the other leads.
- PINS:**
- | | |
|-----------|--------------|
| 1 - Gate | 2 - Source |
| 3 - Drain | 4 - Isolated |



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