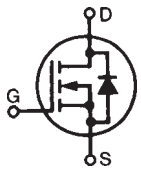
IXYS

Polar™ HiPerFET™ Power MOSFET

IXFL40N110P

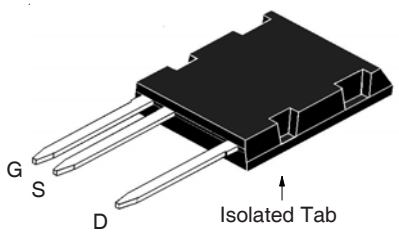
V_{DSS} = 1100V
I_{D25} = 21A
$R_{DS(on)}$ ≤ 280mΩ
t_{rr} ≤ 300ns

(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°C to 150°C	1100	V
V_{DGR}	T_J = 25°C to 150°C, R_{GS} = 1MΩ	1100	V
V_{GSS}	Continuous	±30	V
V_{GSM}	Transient	±40	V
I_{D25}	T_C = 25°C	21	A
I_{DM}	T_C = 25°C, Pulse Width Limited by T_{JM}	100	A
I_A	T_C = 25°C	20	A
E_{AS}	T_C = 25°C	2	J
dv/dt	$I_S \le I_{DM}$, $V_{DD} \le V_{DSS}$, $T_J \le 150°C$	15	V/ns
P_D	T_C = 25°C	357	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
F_C	Mounting Force	20..120 / 4.5..27	N/lb
V_{ISOL}	50/60 Hz, RMS t = 1 min	2500	V~
	$I_{ISOL} \le$ 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

AApplications

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

Symbol	Test Conditions (T_J = 25°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} = ±30V, V_{DS} = 0V			±300	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 = 20A, Note 1			280	mΩ

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Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	V_{DS} = 20V, I_D = 20A, Note 1	20	32		S
C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		19		nF
C_{oss}			1070		pF
C_{rss}			46		pF
R_{Gi}	Gate Input Resistance		1.65		Ω
$t_{d(on)}$	**Resistive Switching Times**		53		ns
t_r	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 20A		55		ns
$t_{d(off)}$	R_G = 1Ω (External)		110		ns
t_f			54		ns
$Q_{g(on)}$	V_{GS} = 10V, V_{DS} = 0.5 • V_{DSS}, I_D = 20A		310		nC
Q_{gs}			95		nC
Q_{gd}			142		nC
R_{thJC}				0.35	°C/W
R_{thCS}			0.15		°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			40	A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			160	A
V_{SD}	I_F = I_S, V_{GS} = 0V, Note 1			1.5	V
t_{rr}	I_F = 20A, -di/dt = 100A/μs			300	ns
Q_{RM}	V_R = 100V, V_{GS} = 0V		2.2		μC
I_{RM}			16.0		A

Note 1. Pulse test, t ≤ 300μs, duty cycle, d ≤ 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 4,860,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

Fig. 1. Output Characteristics @ T_J = 25°C

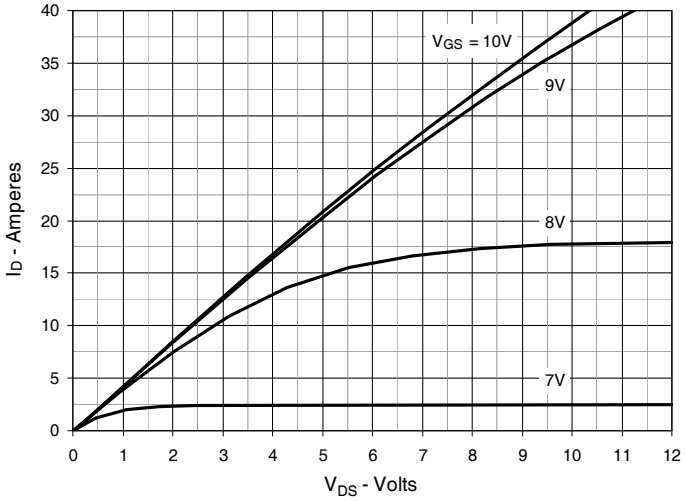


Fig. 2. Extended Output Characteristics @ T_J = 25°C

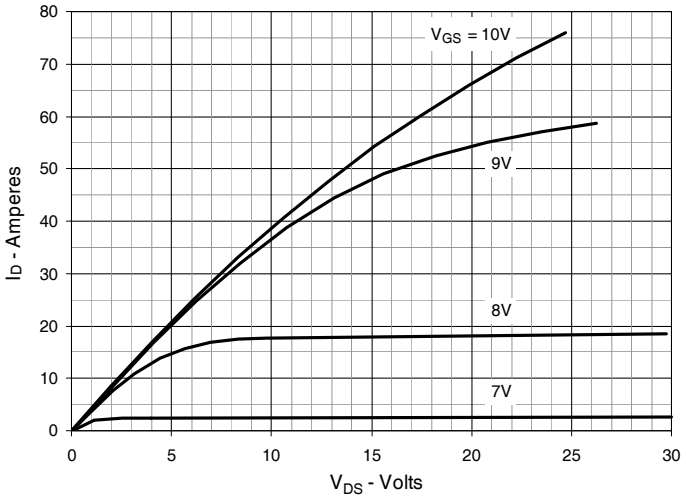


Fig. 3. Output Characteristics @ T_J = 125°C

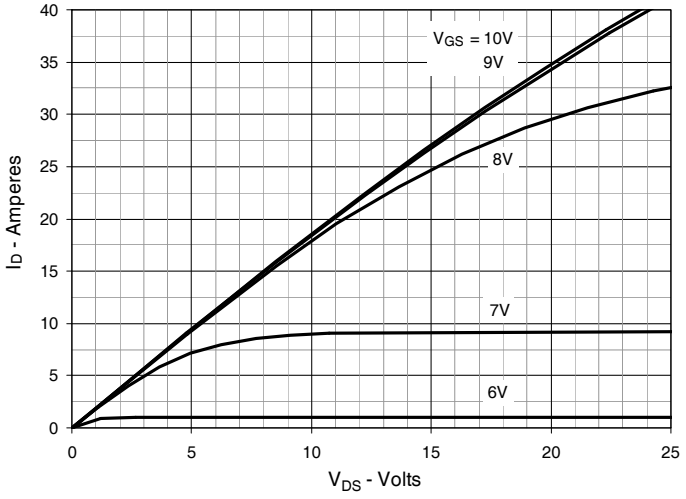


Fig. 4. $R_{DS(on)}$ Normalized to I_D = 20A Value vs. Junction Temperature

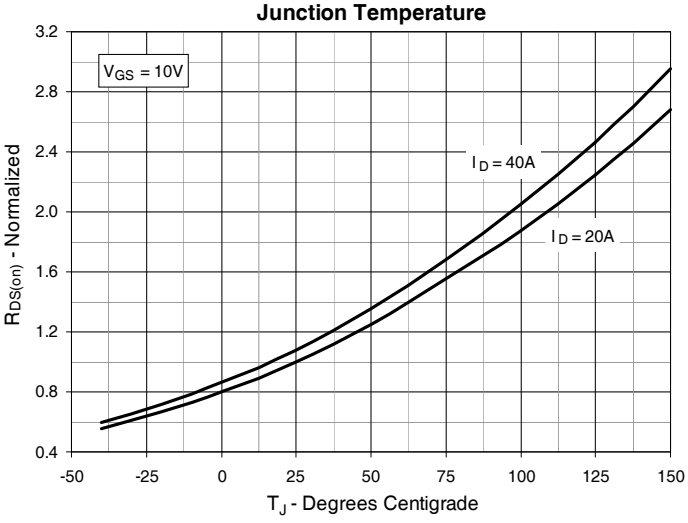


Fig. 5. $R_{DS(on)}$ Normalized to I_D = 20A Value vs. Drain Current

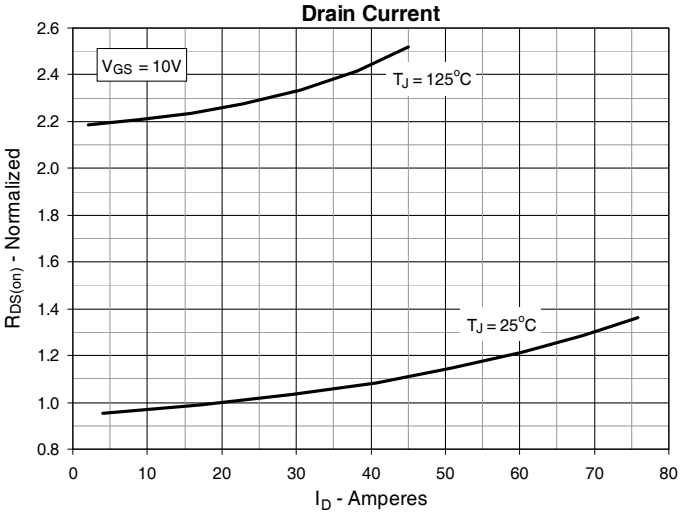
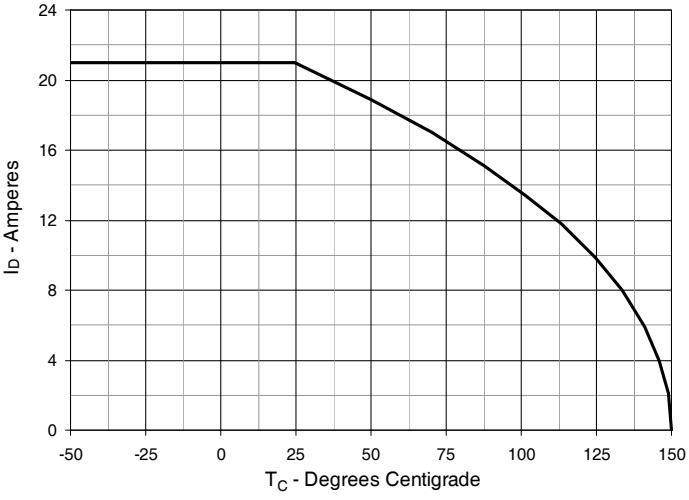


Fig. 6. Maximum Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

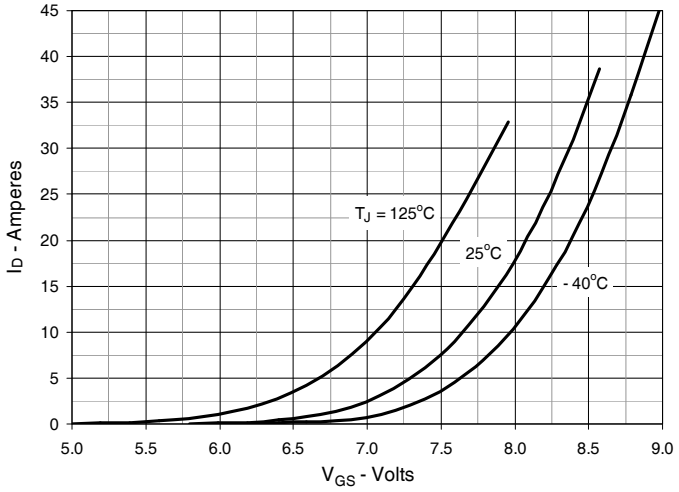


Fig. 8. Transconductance

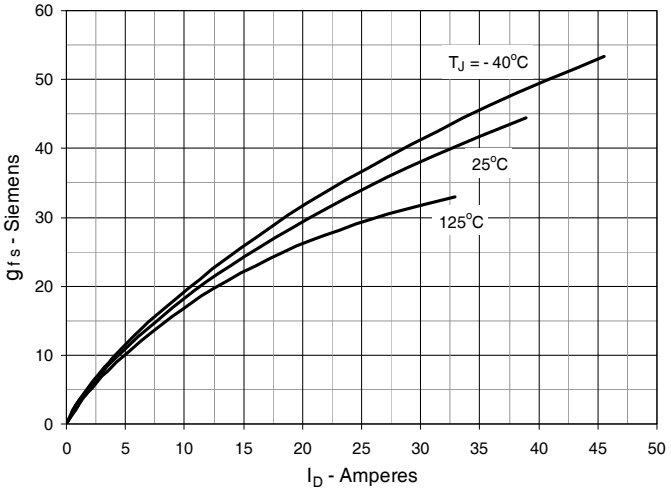


Fig. 9. Forward Voltage Drop of Intrinsic Diode

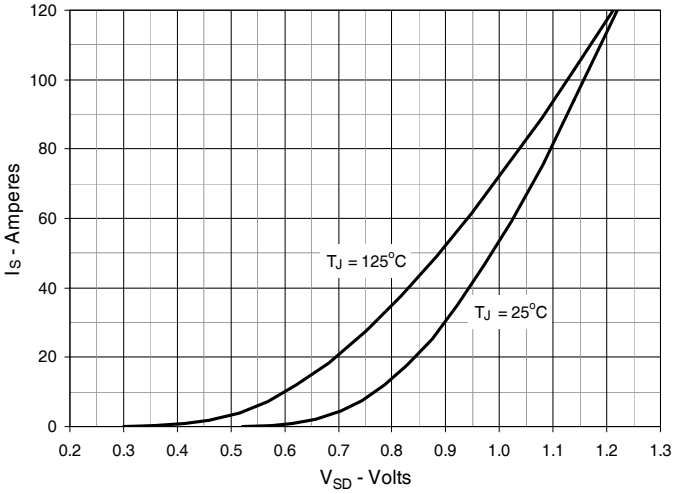


Fig. 10. Gate Charge

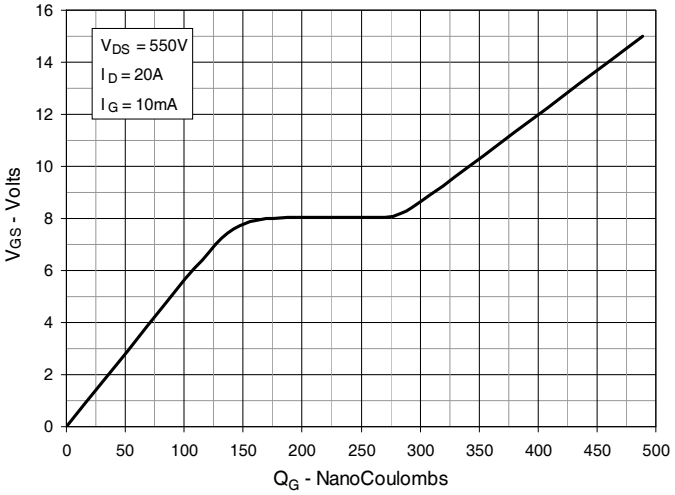


Fig. 11. Capacitance

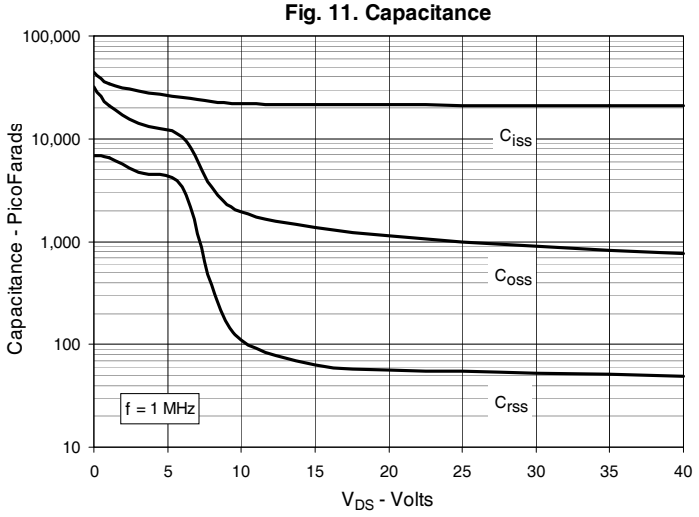
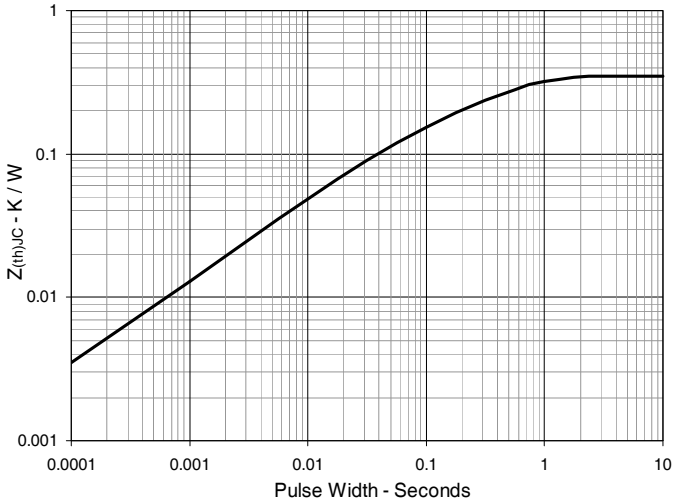
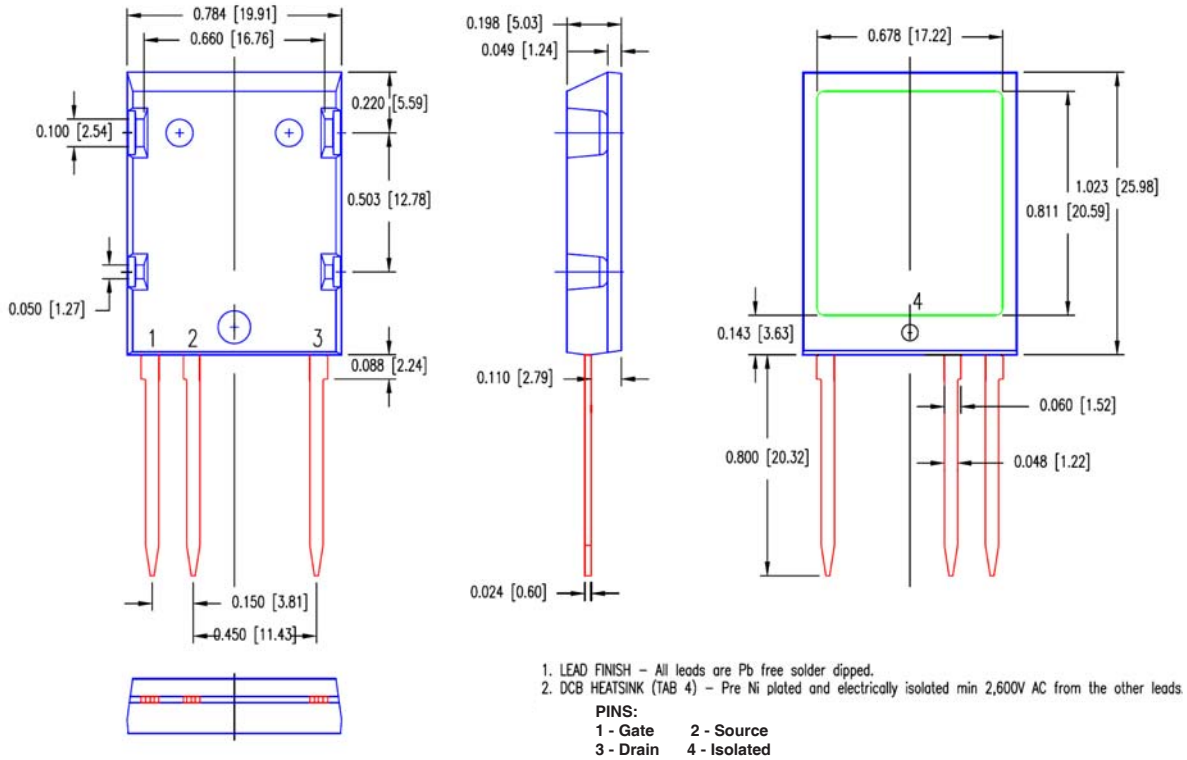


Fig. 12. Maximum Transient Thermal Impedance



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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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