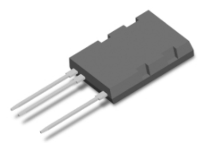
IXYL60N450 - High Voltage Series

Series: High Voltage

Questions? Contact Littelfuse Support



Roll Over to Zoom

Part Datasheet

Symbols & Models

Disclaimer Notice

Designed using the proprietary thin-wafer XPT™ technology and state-of-the-art IGBT process, these devices display qualities such as reduced thermal resistance, low tail current, low energy loss, and high-speed switching capability. Thanks to the positive temperature coefficient of their on-state voltage, these high-voltage IGBTs can be used in parallel, which provides cost-effective solutions compared to series-connected, lower-voltage devices. Consequently, this results in reduction in the associated gate drive circuitry, simplicity in design, and improvement in the reliability of the overall system.

The optional co-packed fast recovery diodes have low reverse recovery time and are optimized to produce smooth switching waveforms and significantly lower electromagnetic interference (EMI).

Features:

- Thin wafer XPT™ technology
- Low on-state voltages $V_{CE(sat)}$
- Co-packed fast recovery diodes
- Positive temperature coefficient of $V_{CE(sat)}$
- International standard size high-voltage packages

Applications:

- Pulser circuits
- Laser and X-ray generators
- High-voltage power supplies
- High-voltage test equipment
- Capacitor discharge circuits
- AC switches

Advantages:

- Higher efficiency
- Elimination of multiple series-connected devices
- Increased reliability of power systems

Contact Power Semiconductor Support

What type of support do you need?* Please Select

First Name*

Last Name*

Email*

Country* Please Select

Industry Please Select

How can we help?

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Feedback

Electrical Characteristics | Technical Resources | Environmental Info

Property (Mouseover for details)	Value
V_{CES} - Collector-Emitter Voltage (V)	4500
Collector Current @ 25 °C (A)	90
$V_{CE(sat)}$ - Collector-Emitter Saturation Voltage (V)	3.3
Configuration	Single
Package Type	TO-264I
Fall Time [Resistive Load] (ns)	1360
Thermal resistance [junction-case] [IGBT] (K/W)	0.3
Collector Current @ 110 °C (A)	38

Report Issue

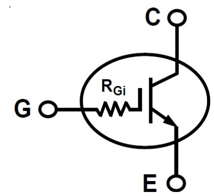
IXYS

High Voltage XPT™ IGBT

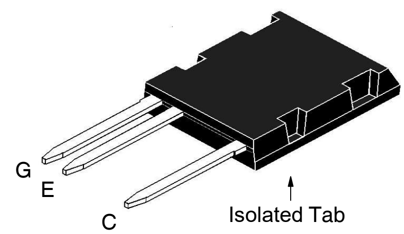
IXYL60N450

V_{CES} = 4500V
I_{C110} = 38A
$V_{CE(sat)} \leq$ 3.30V

(Electrically Isolated Tab)



ISOPLUS i5-Pak™



G = Gate E = Emitter
C = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	4500	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	4500	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	90	A
I_{C110}	T_C = 110°C	38	A
I_{CM}	T_C = 25°C, 1ms	680	A
SSOA	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 4.7Ω	I_{CM} = 120	A
(RBSOA)	Clamped Inductive Load	1500	V
P_C	T_C = 25°C	417	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	40..120 / 9..27	N/lb
V_{ISOL}	50/60 Hz, RM, t = 1min	4000	V~
Weight		8	g

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 4000V~ Electrical Isolation
- High Blocking Voltage
- High Peak Current Capability
- Low Saturation Voltage

Advantages

- Low Gate Drive Requirement
- High Power Density

Applications

- Switch-Mode and Resonant-Mode Power Supplies
- Uninterruptible Power Supplies (UPS)
- Laser Generators
- Capacitor Discharge Circuits
- AC Switches

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	4500			V
$V_{GE(th)}$	I_C = 250μA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 4000V, V_{GE} = 0V			25	μA
	Note 1, T_J = 90°C		75		μA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±300	nA
$V_{CE(sat)}$	I_C = 60A, V_{GE} = 15V, Note 1		2.64	3.30	V
	T_J = 125°C		3.46		V

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fS}	I_C = 60A, V_{CE} = 10V, Note 1	32	54	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		7530	pF
C_{oes}			270	pF
C_{res}			115	pF
R_{Gi}	Integrated Gate Input Resistance		5.0	Ω
$Q_{g(on)}$	I_C = 60A, V_{GE} = 15V, V_{CE} = 1000V		366	nC
Q_{ge}			48	nC
Q_{gc}			138	nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		55	ns
t_r	I_C = 60A, V_{GE} = 15V		450	ns
$t_{d(off)}$	V_{CE} = 960V, R_G = 4.7Ω		450	ns
t_f			1360	ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		60	ns
t_r	I_C = 60A, V_{GE} = 15V		664	ns
$t_{d(off)}$	V_{CE} = 960V, R_G = 4.7Ω		510	ns
t_f			1070	ns
R_{thJC}				0.30 °C/W
R_{thCS}			0.15	°C/W

Notes:

1. Pulse test, t < 300μs, duty cycle, d < 2%.
2. Device must be heatsunk for high-temperature leakage current measurements to avoid thermal runaway.

Fig. 1. Output Characteristics @ T_J = 25ºC

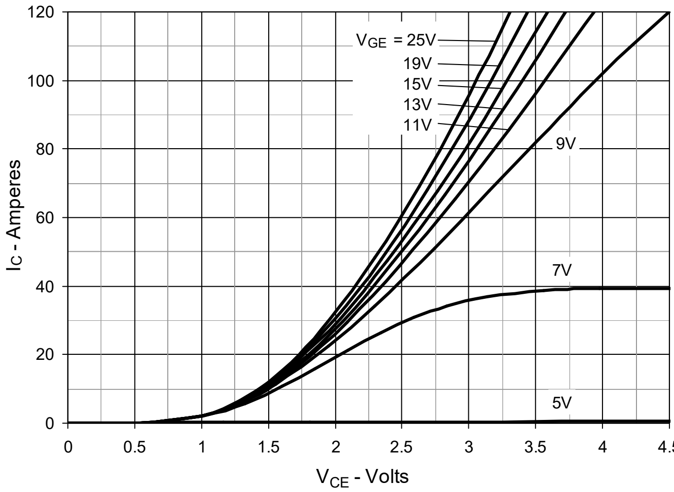


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

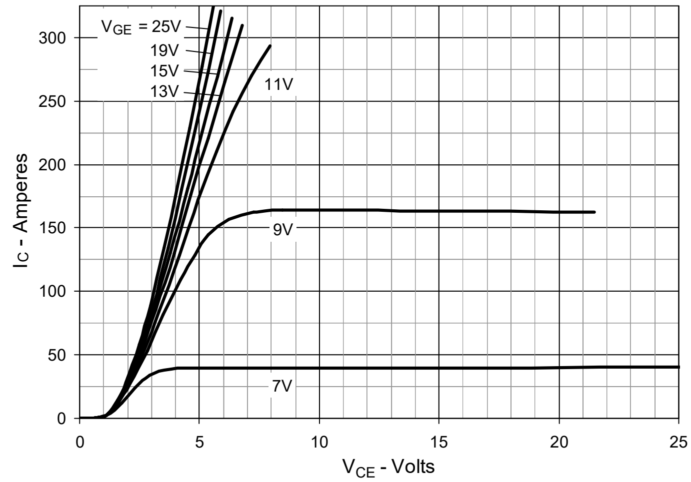


Fig. 3. Output Characteristics @ T_J = 125ºC

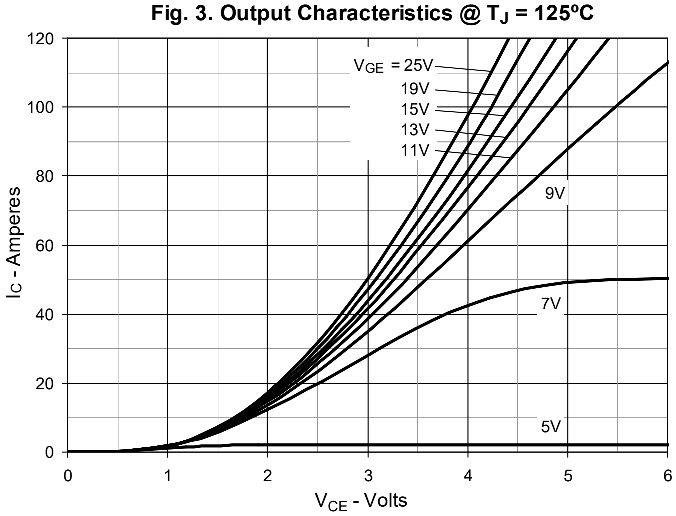


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

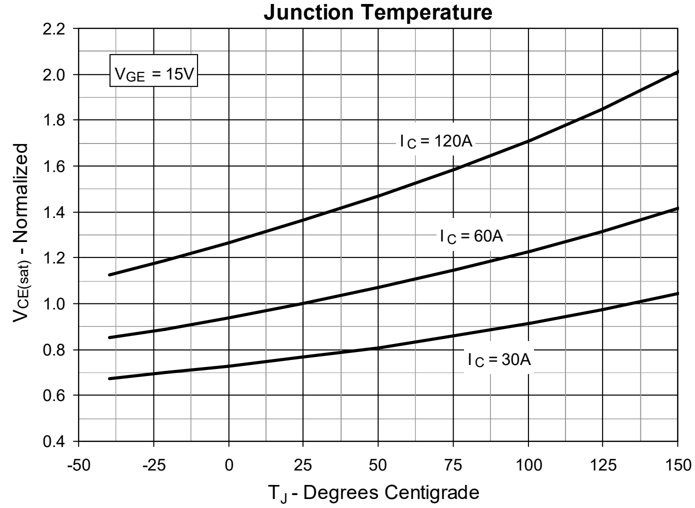


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

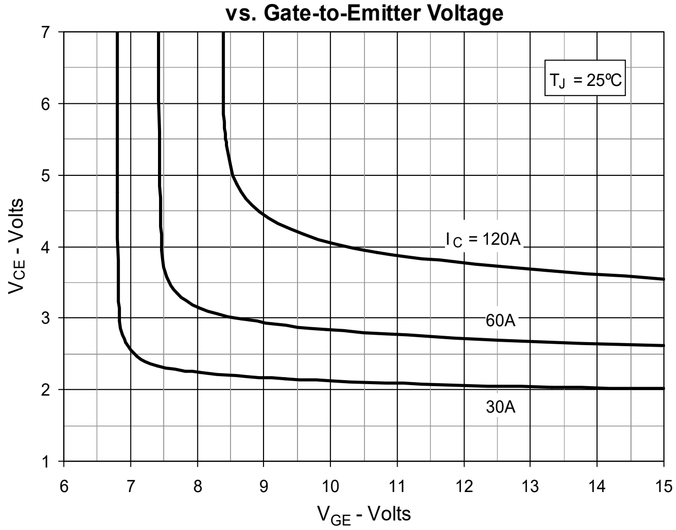


Fig. 6. Input Admittance

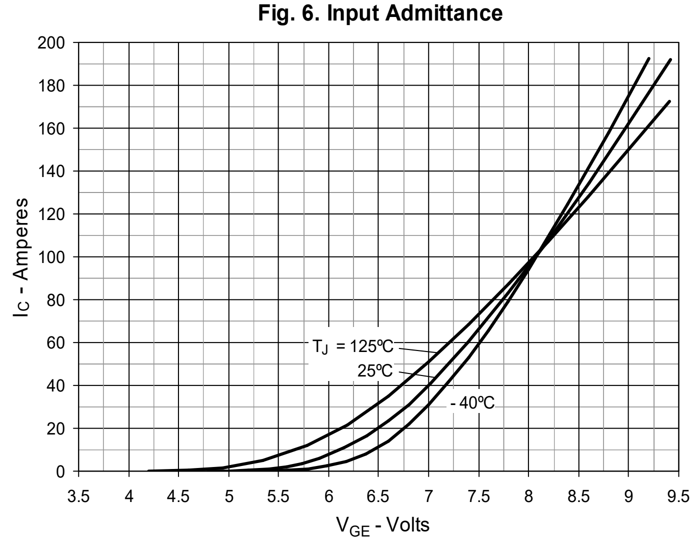


Fig. 7. Transconductance

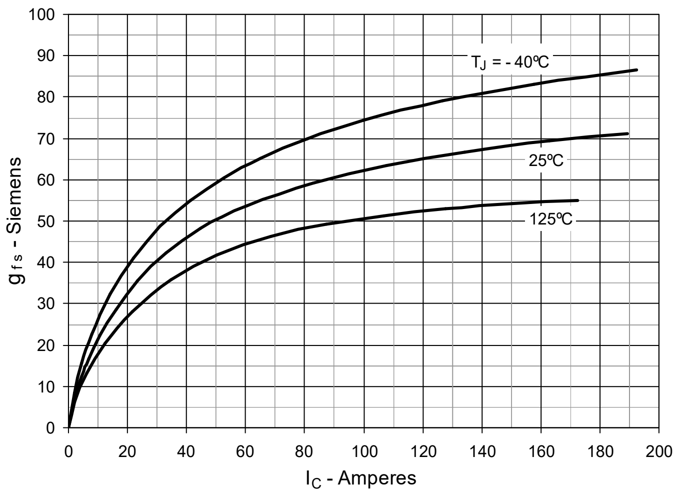


Fig. 8. Gate Charge

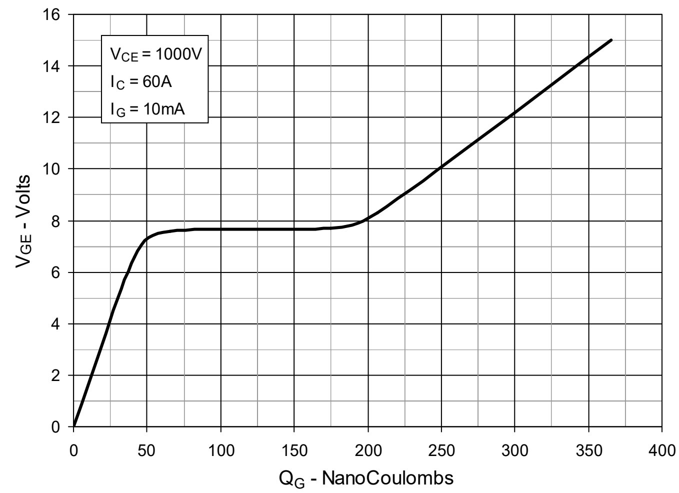


Fig. 9. Capacitance

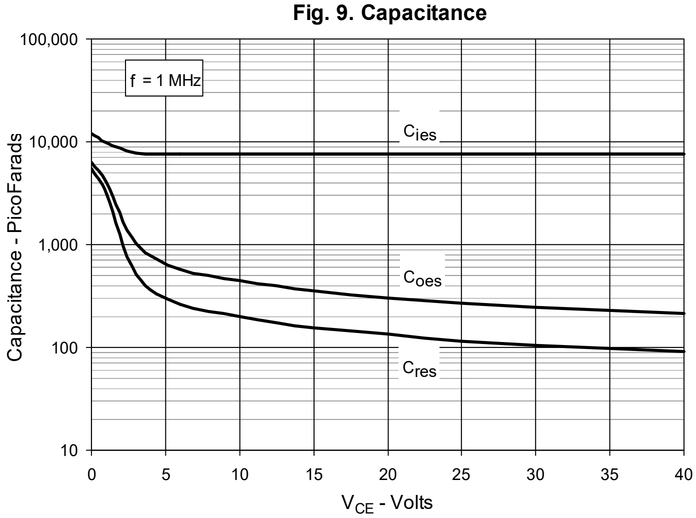


Fig. 10. Reverse-Bias Safe Operating Area

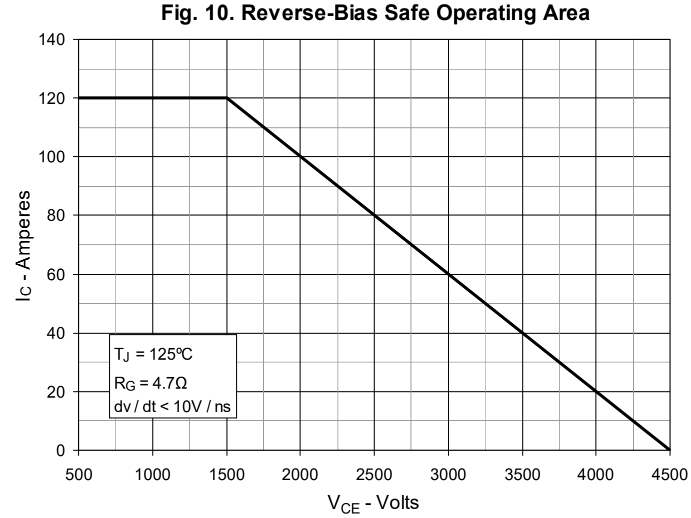
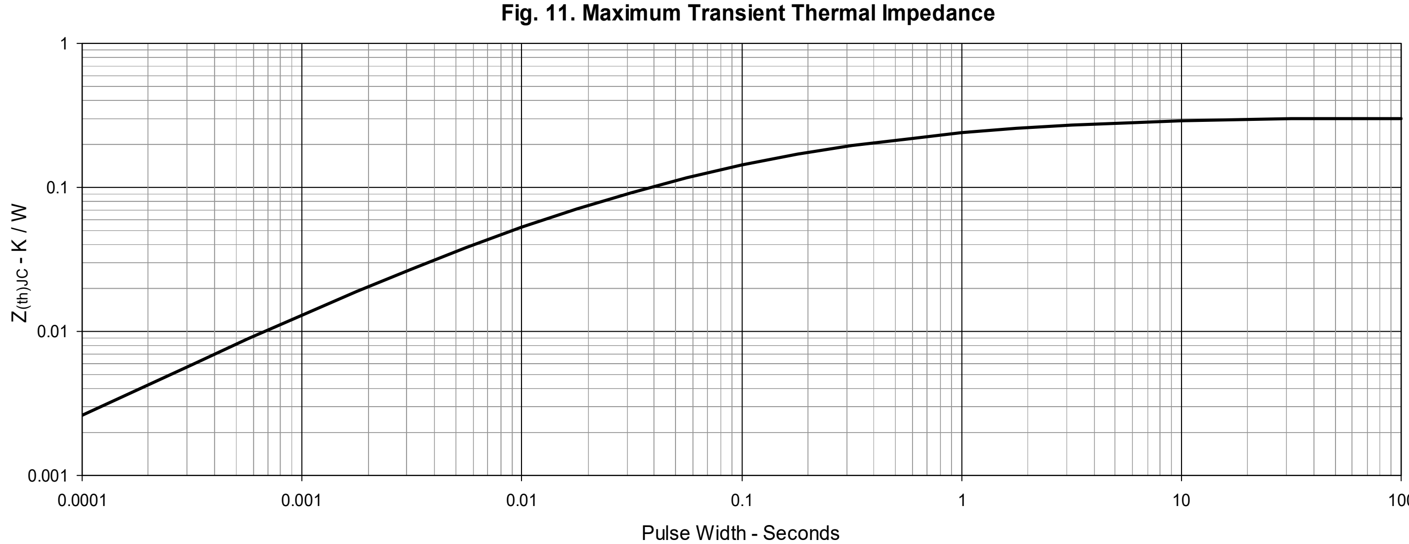
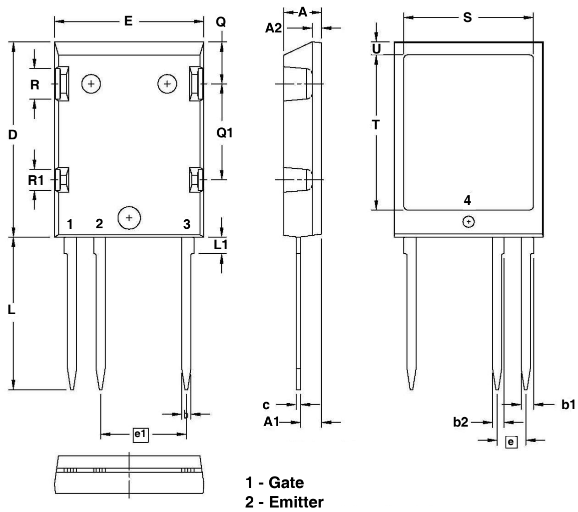


Fig. 11. Maximum Transient Thermal Impedance



IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

ISOPLUS i5-Pak™ (IXYL) Outline



1 - Gate
2 - Emitter
3 - Collector
4 - Electrically Isolated 3,600V to pins

SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	.190	.205	4.83	5.21
A1	.102	.118	2.59	3.00
A2	.046	.055	1.17	1.40
b	.045	.055	1.14	1.40
b1	.063	.072	1.60	1.83
b2	.058	.068	1.47	1.73
c	.020	.029	0.51	0.74
D	1.020	1.040	25.91	26.42
E	.770	.799	19.56	20.29
e	.150 BSC		3.81 BSC	
e1	.450 BSC		11.43 BSC	
L	.780	.820	19.81	20.83
L1	.080	.102	2.03	2.59
Q	.210	.235	5.33	5.97
Q1	.490	.513	12.45	13.03
R	.150	.180	3.81	4.57
R1	.100	.130	2.54	3.30
S	.668	.690	16.97	17.53
T	.801	.821	20.34	20.85
U	.065	.080	1.65	2.03