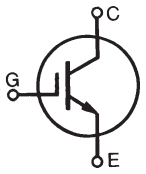
IXYS

Advance Technical Information

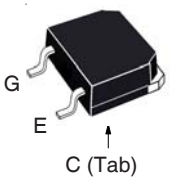
High Voltage IGBT

IXGT6N170AHV

V_{CES} = 1700V
I_{C25} = 6A
$V_{CE(sat)}$ ≤ 7.0V
$t_{fi(typ)}$ = 32ns



TO-268



G = Gate C = Collector
E = Emiiter Tab = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1700	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1700	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	6	A
I_{C110}	T_C = 110°C	3	A
I_{CM}	T_C = 25°C, 1ms	14	A
SSOA	V_{GE}= 15V, T_{VJ} = 125°C, R_G = 33Ω	I_{CM} = 12	A
(RBSOA)	Clamped Inductive Load	0.8 • V_{CES}	
t_{sc}	V_{GE}= 15V, V_{CE} = 1200V, T_J = 125°C	10	µs
(SCSOA)	R_G = 33Ω, Non Repetitive		
P_C	T_C = 25°C	75	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10 seconds	260	°C
Weight		4	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{GE} = 0V	1700			V
$V_{GE(th)}$	I_C = 250µA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}, V_{GE} = 0V			10	µA
	T_J = 125°C			500	µA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 3A, V_{GE} = 15V, Note 1			7.0	V
	T_J = 125°C		5.4		V

Features

- High Blocking Voltage
- High Voltage Package

Advantages

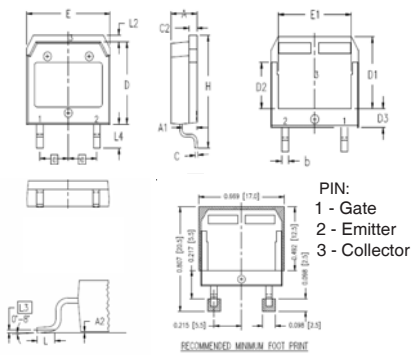
- High Power Density
- Easy to Mount

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Welding Machines

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 6A, V_{CE} = 20V, Note 1	2.0	3.5		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		390		pF
C_{oes}			20		pF
C_{res}			7		pF
$Q_{g(on)}$	I_C = 6A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		18.5		nC
Q_{ge}			2.8		nC
Q_{gc}			8.2		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		46		ns
t_{ri}	I_C = 6A, V_{GE} = 15V		40		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 33Ω		0.59		mJ
$t_{d(off)}$	Note 2		220	400	ns
t_{fi}			32		ns
E_{off}			0.18	0.36	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		48		ns
t_{ri}	I_C = 6A, V_{GE} = 15V		43		ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 33Ω		0.62		mJ
$t_{d(off)}$	Note 2		230		ns
t_{fi}			41		ns
E_{off}			0.25		mJ
R_{thJC}				1.65	°C/W

TO-268 (VHV) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETER MIN	MILLIMETER MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.465	.476	11.80	12.10
D2	.295	.307	7.50	7.80
D3	.114	.126	2.90	3.20
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.067	.079	1.70	2.00
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

Notes:

1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V_{CE}(clamp), T_J or R_G.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

Fig. 1. Output Characteristics @ T_J = 25ºC

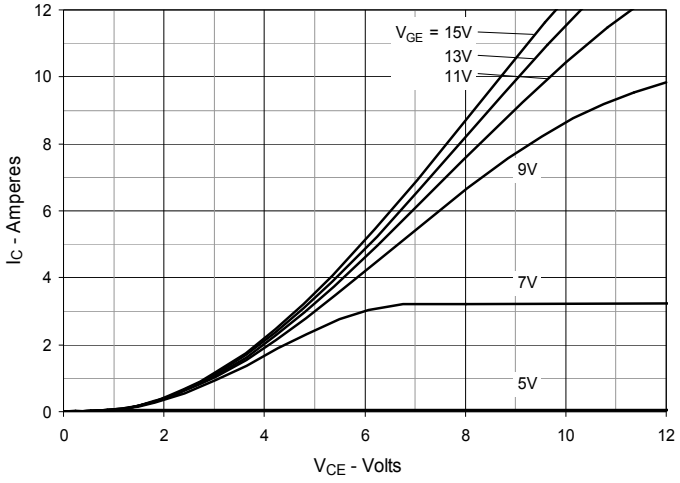


Fig. 2. Extended Output Characteristics @ T_J = 25ºC

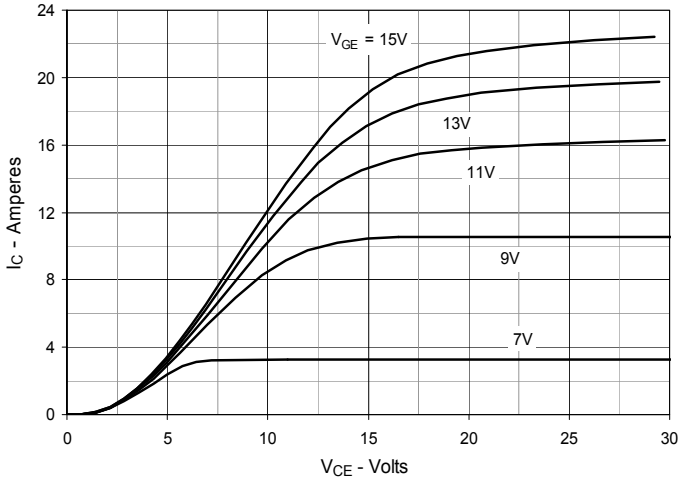


Fig. 3. Output Characteristics @ T_J = 125ºC

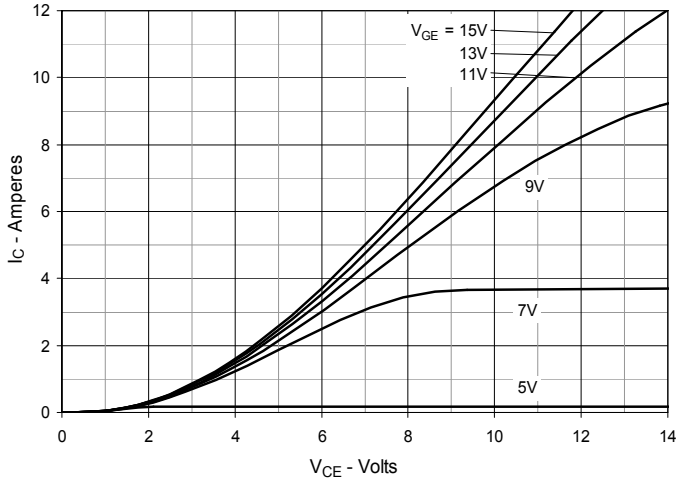


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

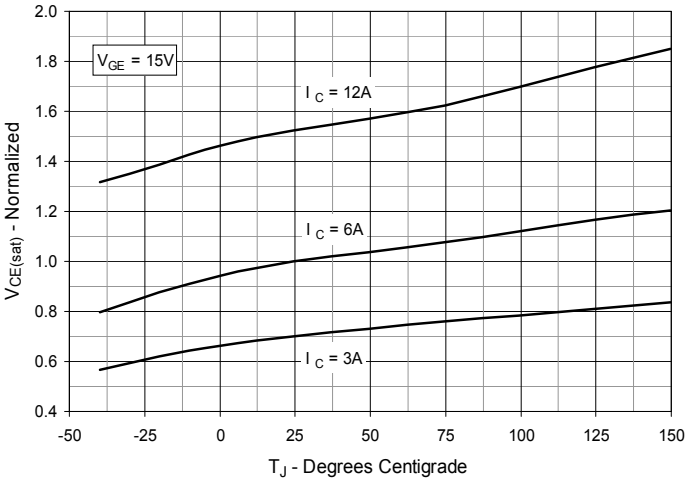


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

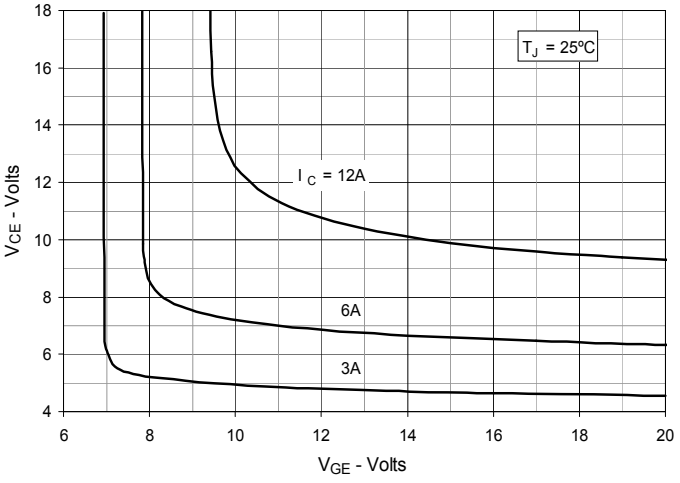


Fig. 6. Input Admittance

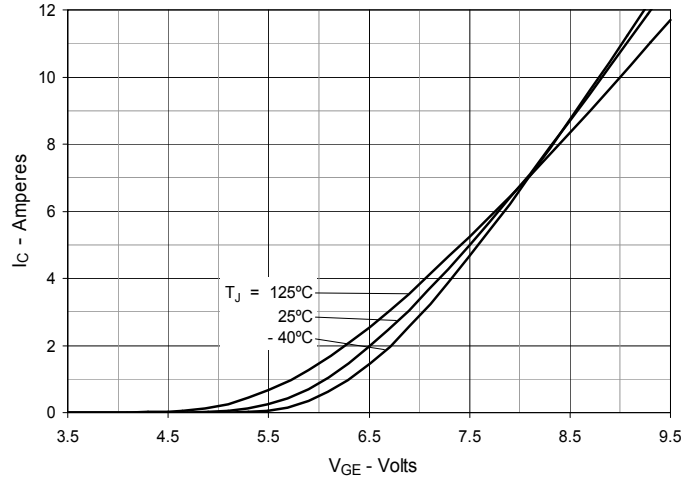


Fig. 7. Transconductance

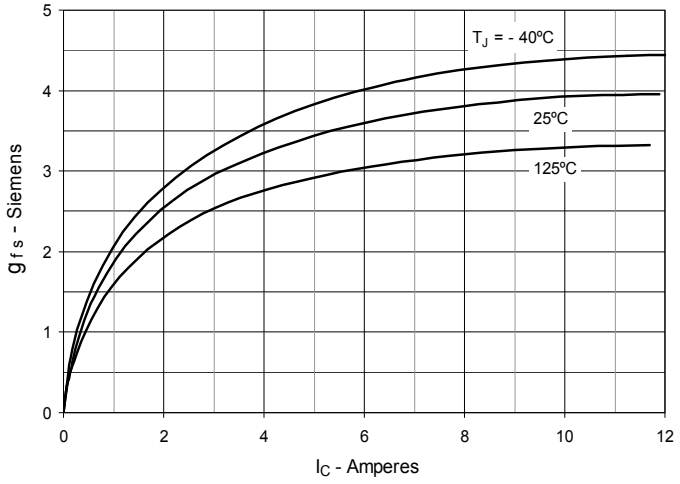


Fig. 8. Gate Charge

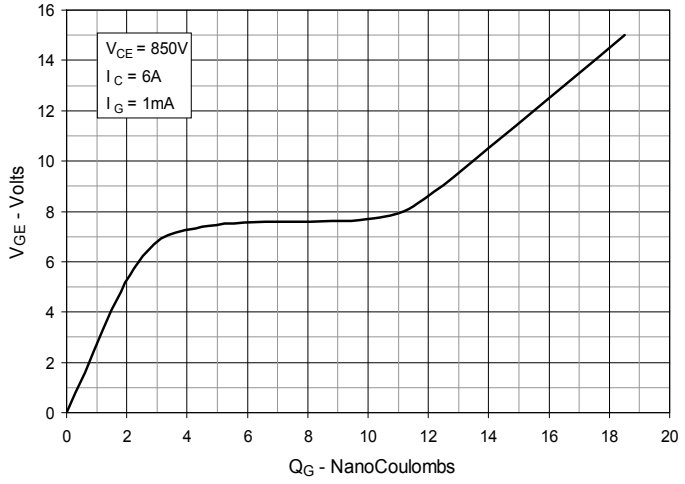


Fig. 9. Reverse-Bias Safe Operating Area

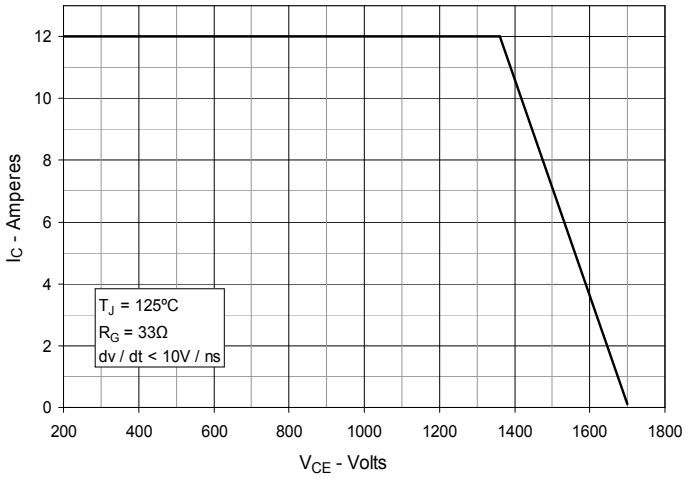


Fig. 10. Capacitance

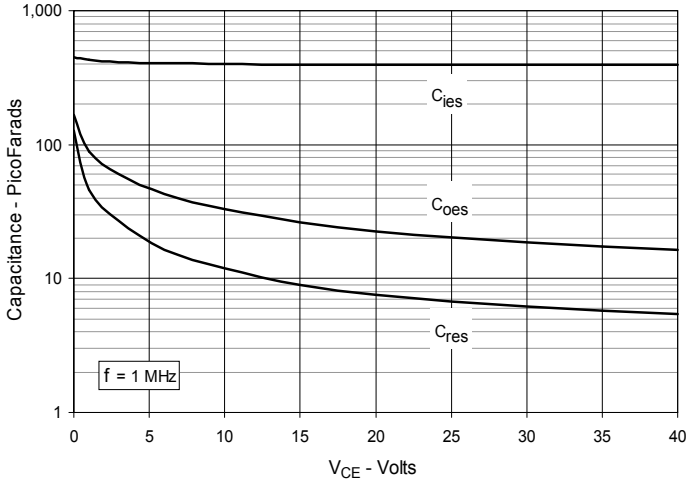


Fig. 11. Maximum Transient Thermal Impedance

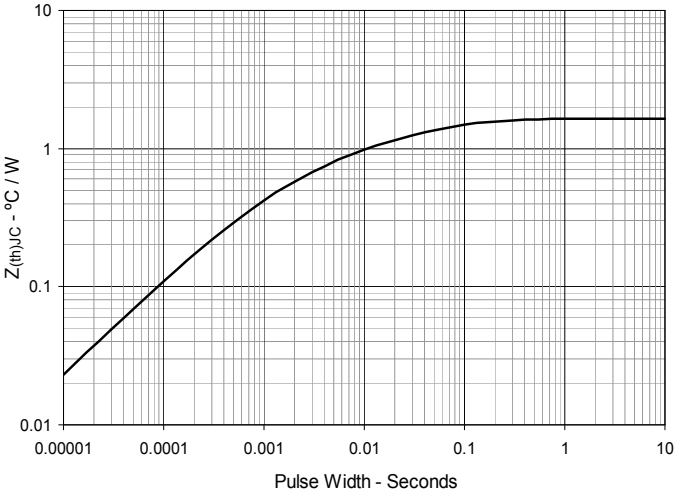


Fig. 12. Forward-Bias Safe Operating Area

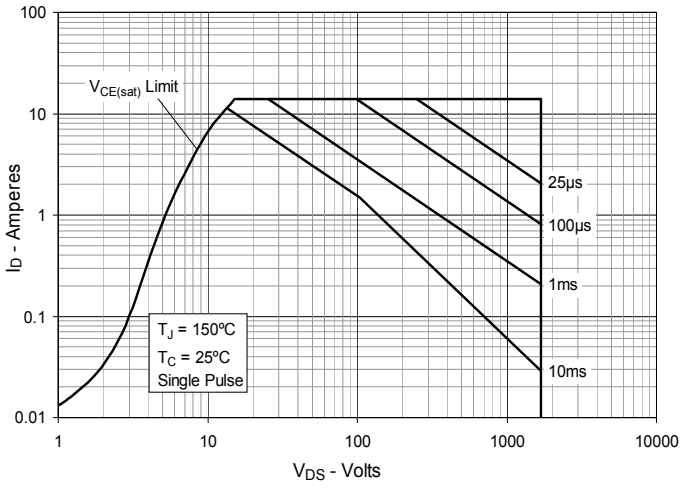


Fig. 13. Inductive Switching Energy Loss vs. Gate Resistance

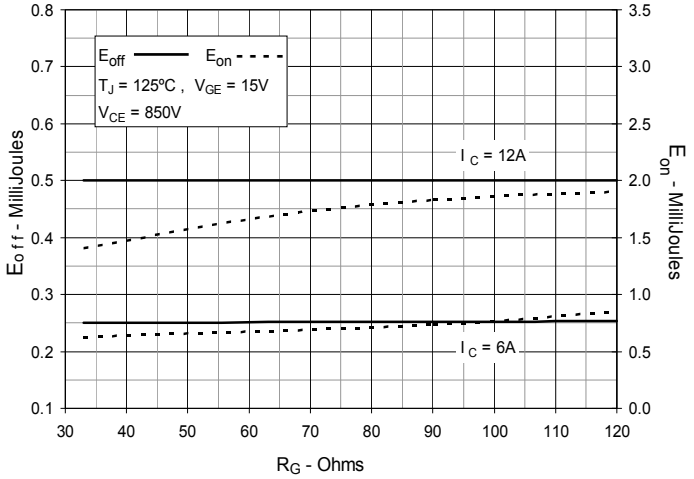


Fig. 14. Inductive Switching Energy Loss vs. Collector Current

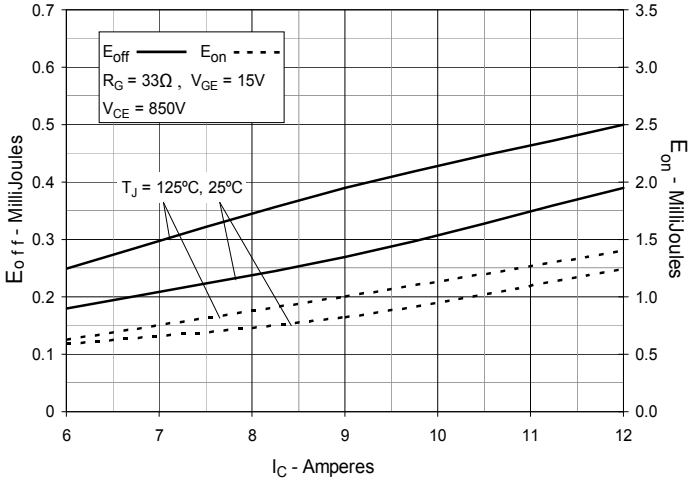


Fig. 15. Inductive Switching Energy Loss vs. Junction Temperature