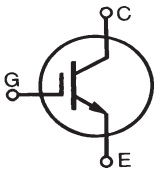
IXYS

Preliminary Technical Information

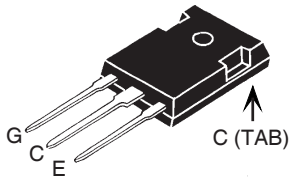
High Voltage IGBTs

IXGH24N170A
IXGT24N170A

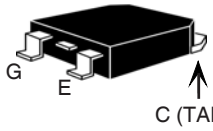
V_{CES} = 1700V
I_{C25} = 24A
$V_{CE(sat)}$ ≤ 6.0V
$t_{fi(typ)}$ = 40ns



TO-247 (IXGH)



TO-268 (IXGT)



G = Gate C = Collector
E = Emitter TAB = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_C = 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	24	A
I_{C90}	T_C = 90°C	16	A
I_{CM}	T_C = 25°C, 1ms	75	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 10Ω	I_{CM} = 50	A
	Clamped Inductive Load	0.8 • V_{CES}	V
t_{SC}	T_J = 125°C, V_{CE} = 1200V, V_{GE} = 15V, R_G = 22Ω	10	µs
P_C	T_C = 25°C	250	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
M_d	Mounting Torque (TO-247)	1.13/10	Nm/lb.in.
Weight	TO-247	6	g
	TO-268	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			50	µA
	T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V			±100	nA
$V_{CE(sat)}$	I_C = 16A, V_{GE} = 15V, Note 1		4.5	6.0	V
	T_J = 125°C		4.8		V

Features

- Optimized for Low Conduction and Switching Losses
- International Standard Packages

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

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

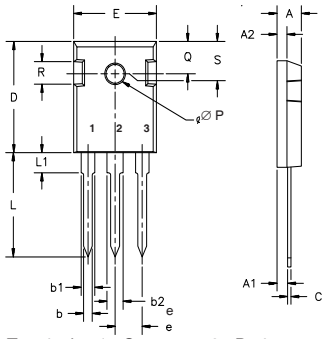
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 24A, V_{CE} = 10V, Note 2	13	22	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		2860	pF
C_{oes}			198	pF
C_{res}			58	pF
Q_g	I_C = 16A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		140	nC
Q_{ge}			18	nC
Q_{gc}			60	nC
$t_{d(on)}$	**Inductive Load, T_J = 25°C**		21	ns
t_{ri}	I_C = 24A, V_{GE} = 15V		36	ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 10Ω		2.97	mJ
$t_{d(off)}$	Note 1		336	ns
t_{fi}			40	80 ns
E_{off}			0.79	1.50 mJ
$t_{d(on)}$	**Inductive Load, T_J = 125°C**		23	ns
t_{ri}	I_C = 24A, V_{GE} = 15V		31	ns
E_{on}	V_{CE} = 0.5 • V_{CES}, R_G = 10Ω		3.60	mJ
$t_{d(off)}$	Note 1		360	ns
t_{fi}			96	ns
E_{off}			1.47	mJ
R_{thJC}				0.50 °C/W
R_{thCK}			0.25	°C/W

Notes:
1. Switching times may increase for V_{CE} (Clamp) > 0.5 • V_{CES}, higher T_J or increased R_G.
2. Pulse Test, t ≤ 300µs; Duty Cycle, d ≤ 2%.

PRELIMINARY TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from data gathered during objective characterizations of preliminary engineering lots; but also may yet contain some information supplied during a pre-production design evaluation. IXYS reserves the right to change limits, test conditions, and dimensions without notice.

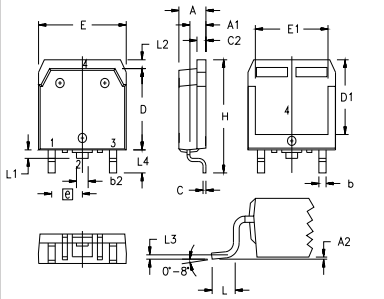
TO-247 (IXGH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

TO-268 (IXGT) Outline



SYM	INCHES MIN	MAX	MILLIMETERS MIN	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
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
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	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

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

Fig. 1. Output Characteristics @ 25ºC

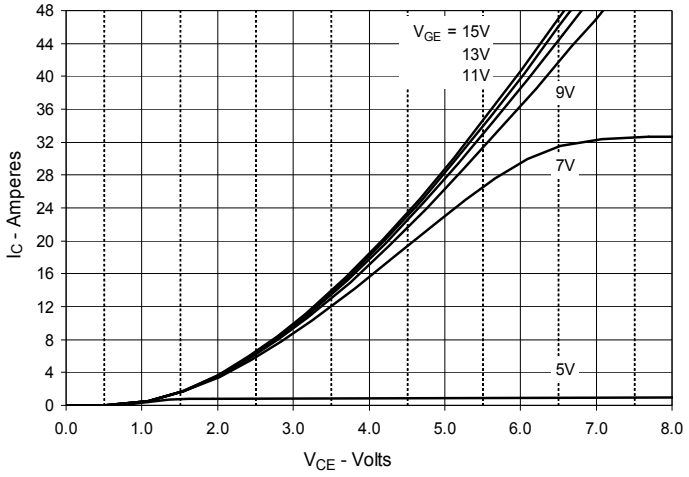


Fig. 2. Extended Output Characteristics @ 25ºC

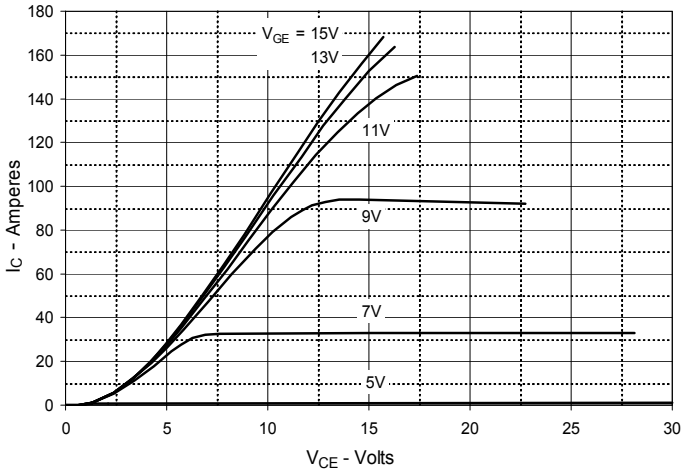


Fig. 3. Output Characteristics @ 125ºC

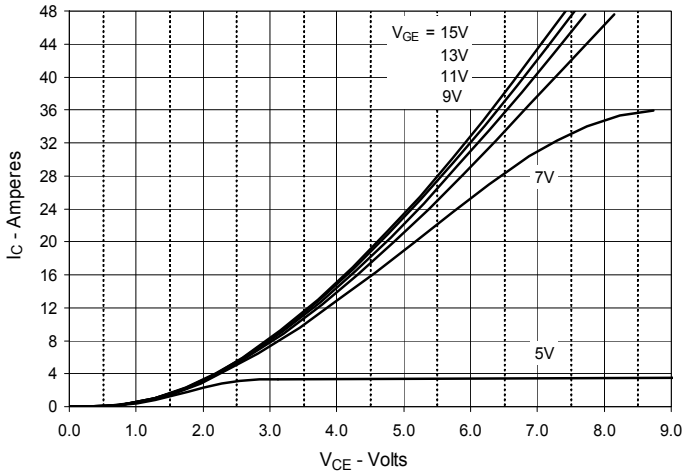


Fig. 4. Dependence of $V_{CE(sat)}$ on Junction Temperature

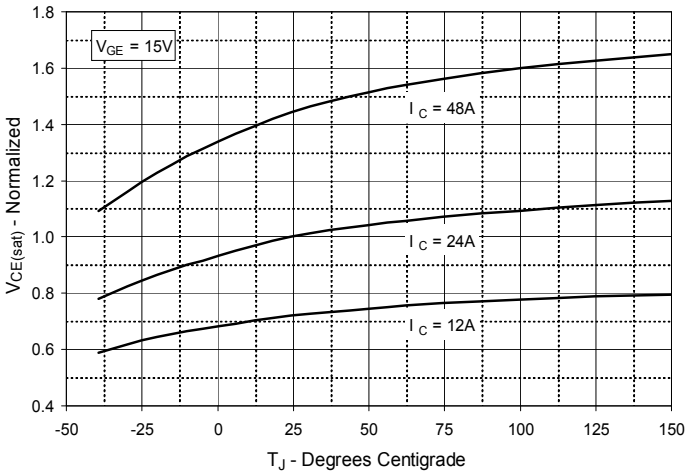


Fig. 5. Collector-to-Emitter Voltage vs. Gate-to-Emitter Voltage

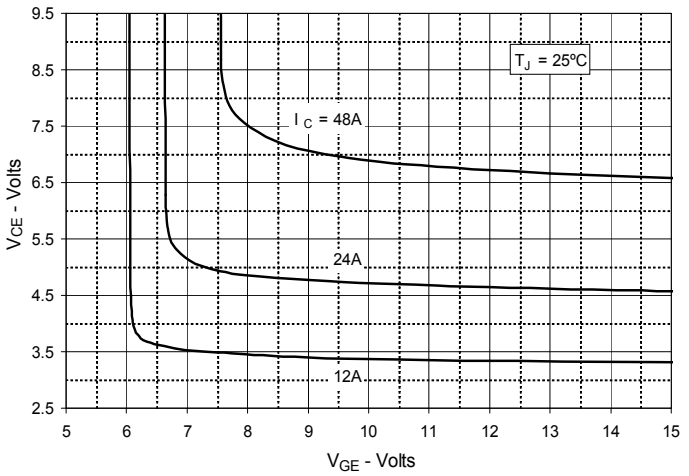


Fig. 6. Input Admittance

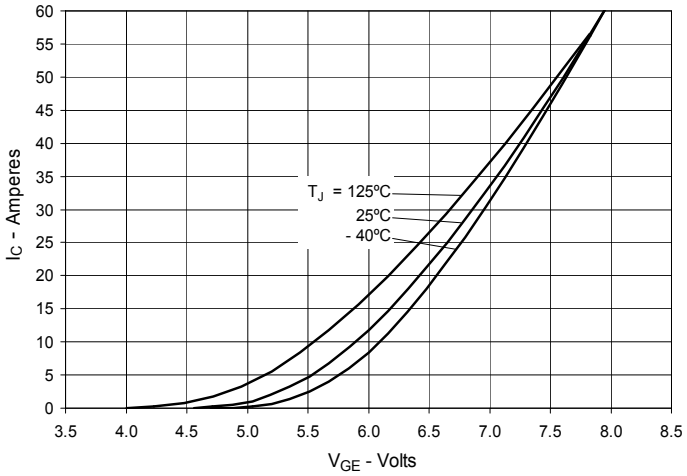


Fig. 7. Transconductance

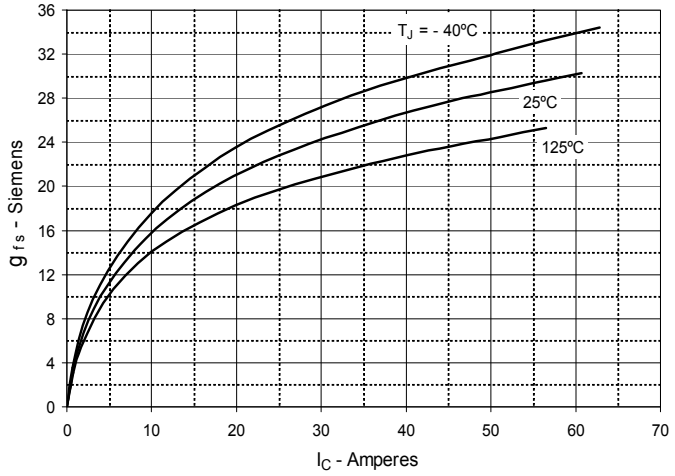


Fig. 8. Gate Charge

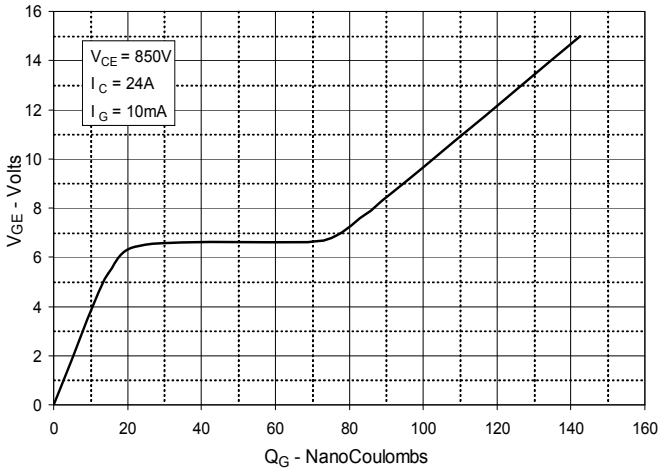


Fig. 9. Capacitance

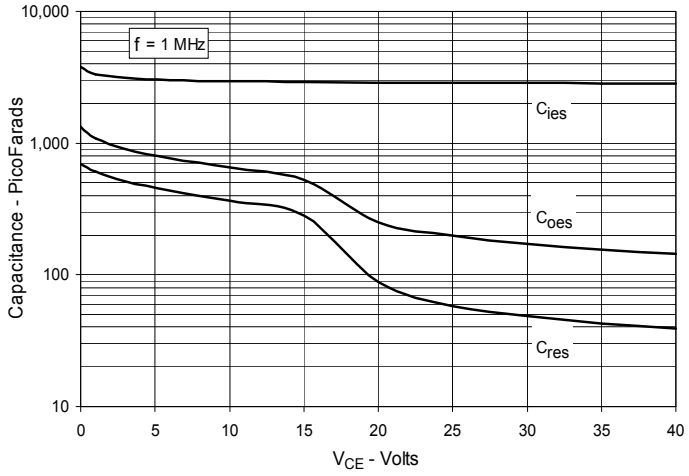


Fig. 10. Reverse-Bias Safe Operating Area

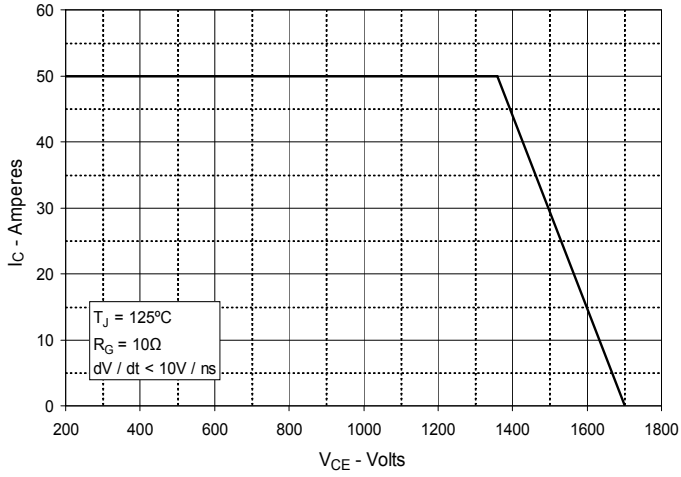
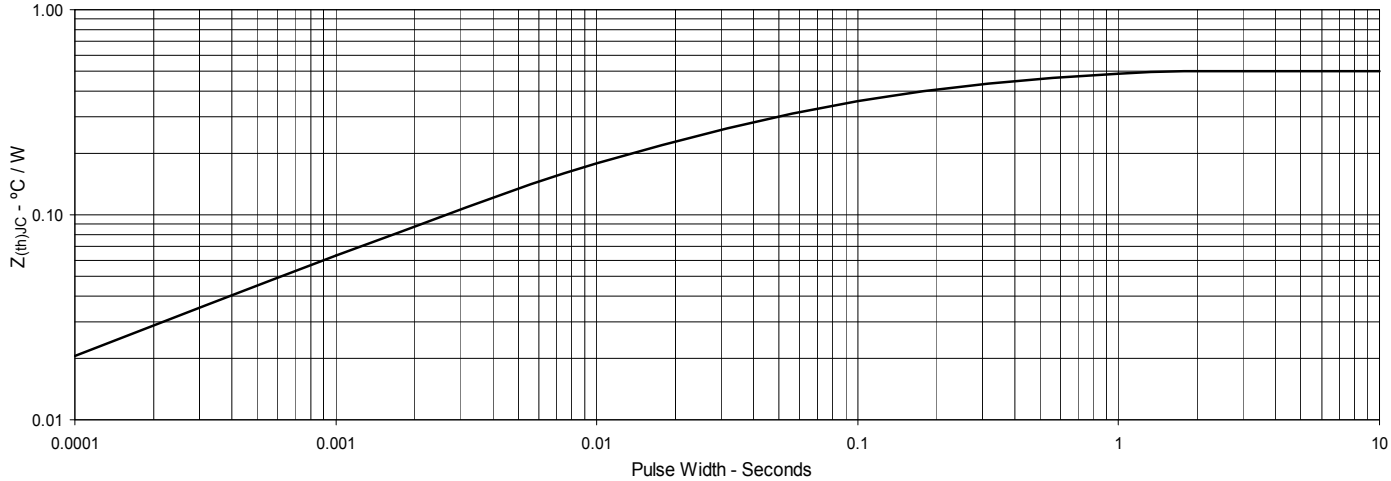


Fig. 11. Maximum Transient Thermal Impedance



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