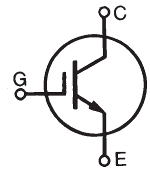
IXYS

High Voltage IGBT

Preliminary Data Sheet

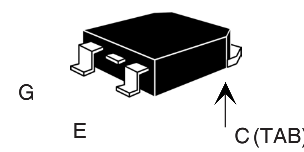
IXGH 20N120B
IXGT 20N120B

V_{CES} = 1200 V
I_{C25} = 40 A
$V_{CE(sat)}$ = 3.4 V
$t_{fi(typ)}$ = 160 ns

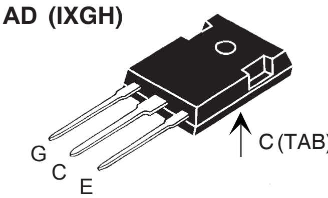


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	40	A
I_{C110}	T_C = 110°C	20	A
I_{CM}	T_C = 25°C, 1 ms	80	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 10 Ω Clamped inductive load	I_{CM} = 80 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	190	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
Maximum Lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Maximum Tab temperature for soldering SMD devices for 10 s		260	°C
M_d	Mounting torque (M3) (TO-247)	1.13/10Nm/lb.in.	
Weight	TO-247 AD	6	g
	TO-268	4	g

TO-268 (IXGT)



TO-247 AD (IXGH)



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

Features

- High Voltage IGBT for resonant power supplies
  - Induction heating
  - Rice cookers
- International standard packages JEDEC TO-268 surface and JEDEC TO-247 AD
- Low switching losses, low $V_{(sat)}$
- MOS Gate turn-on
  - drive simplicity

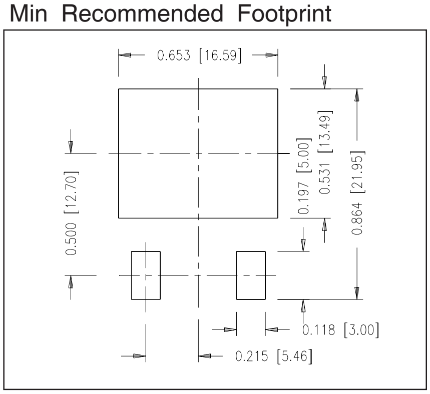
Advantages

- High power density
- Suitable for surface mounting
- Easy to mount with 1 screw, (isolated mounting screw hole)

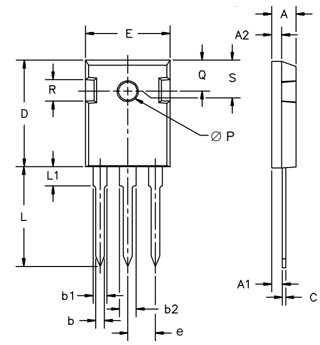
Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 250 µA, V_{GE} = 0 V		1200			V
$V_{GE(th)}$	I_C = 250 µA, V_{CE} = V_{GE}		2.5		5	V
I_{CES}	V_{CE} = V_{CES}	T_J = 25°C			50	µA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = 20A, V_{GE} = 15 V			2.9	3.4	V
		T_J = 125°C		2.8	3.8	V

Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
g_{fs}	I_C = 20A; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	12	18		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		1700		pF
C_{oes}			95		pF
C_{res}			35		pF
Q_g	I_C = 20A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		72		nC
Q_{ge}			12		nC
Q_{gc}			27		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		25		ns
t_{ri}	I_C = 20 A, V_{GE} = 15 V		15		ns
$t_{d(off)}$	V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 10 Ω		150	280	ns
t_{fi}			160	320	ns
E_{off}			2.1	3.5	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		25		ns
t_{ri}	I_C = 20A, V_{GE} = 15 V		18		ns
E_{on}	V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 10 Ω		0.9		mJ
$t_{d(off)}$			270		ns
t_{fi}			360		ns
E_{off}			3.5		mJ
R_{thJC}				0.65	K/W
R_{thCK}	(TO-247)		0.25		K/W

Min Recommended Footprint

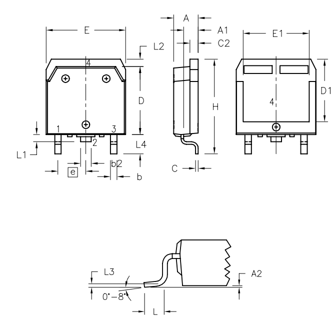


TO-247 AD Outline



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
∅P	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 Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.9	5.1	.193	.201
A_1	2.7	2.9	.106	.114
A_2	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b_2	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E_1	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L1	1.20	1.40	.047	.055
L2	1.00	1.15	.039	.045
L3	0.25 BSC		.010 BSC	
L4	3.80	4.10	.150	.161

IXYS reserves the right to change limits, test conditions, and dimensions.

Fig. 1. Output Characteristics
@ 25 Deg. C

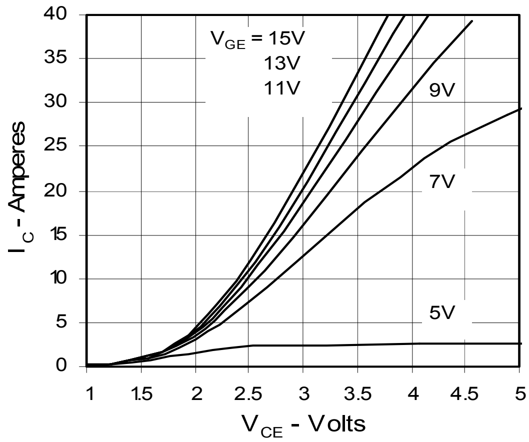


Fig. 2. Extended Output Characteristics
@ 25 deg. C

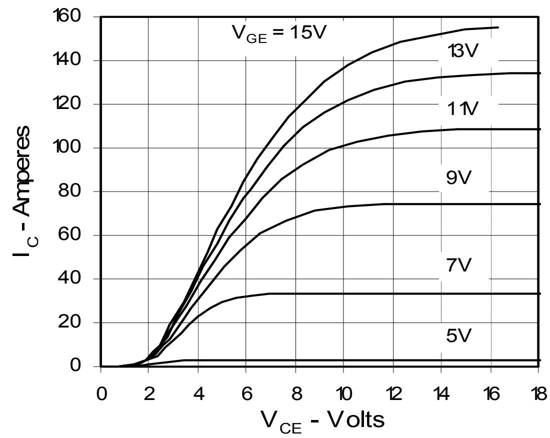


Fig. 3. Output Characteristics
@ 125 Deg. C

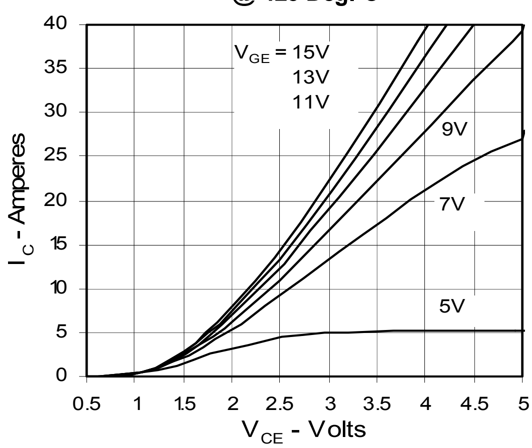


Fig. 4. Temperature Dependence of $V_{CE(sat)}$

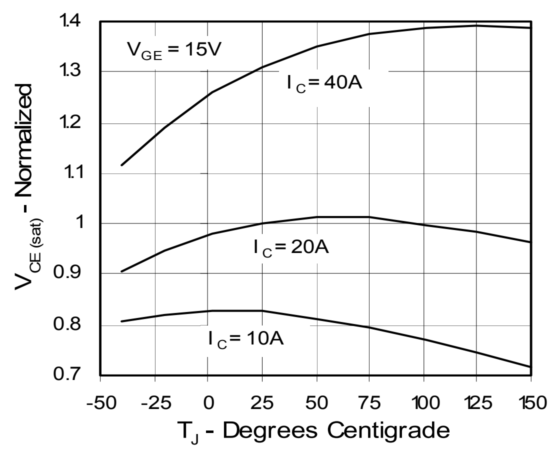


Fig. 5. Input Admittance

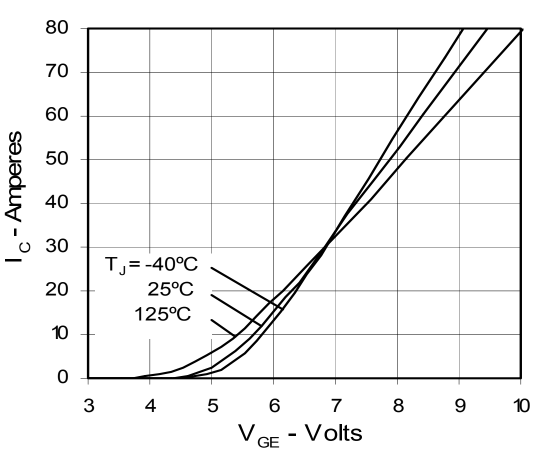


Fig. 6. Transconductance

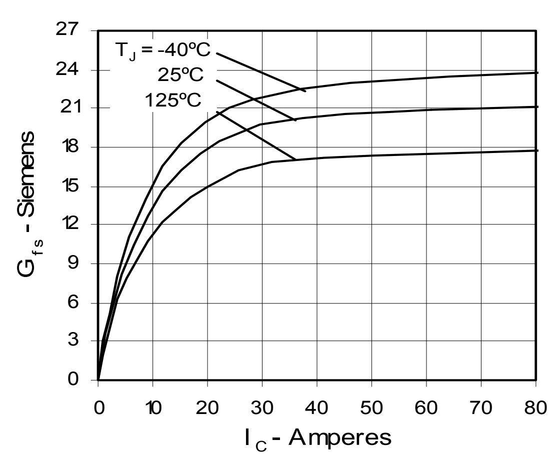


Fig. 7. Dependence of E_{off} on R_G

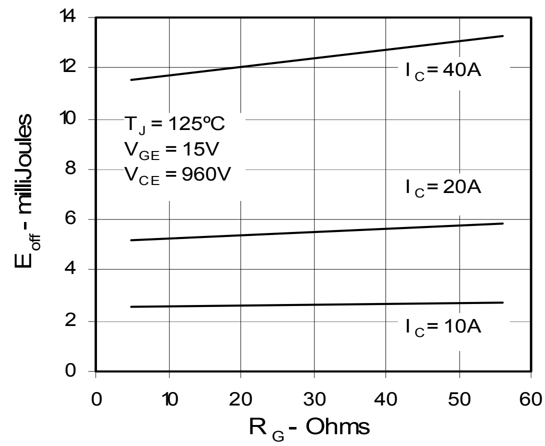


Fig. 8. Dependence of E_{off} on I_C

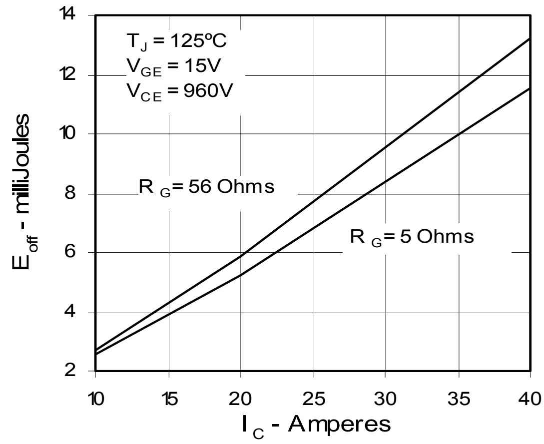


Fig. 9. Dependence of E_{off} on Temperature

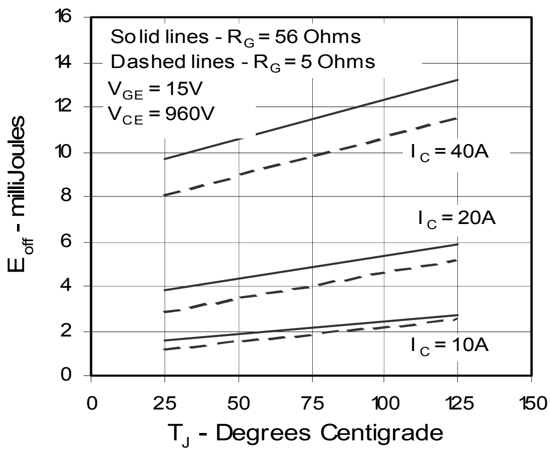


Fig. 10. Gate Charge

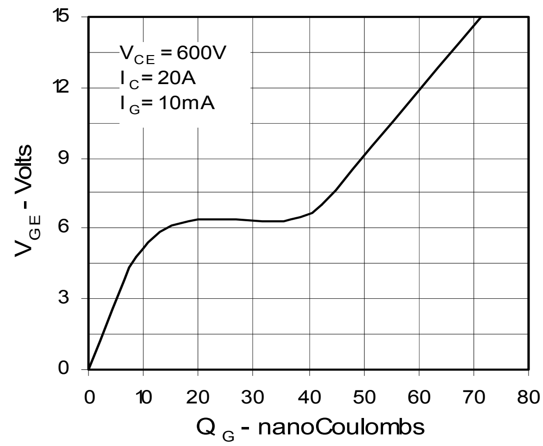


Fig. 11. Capacitance

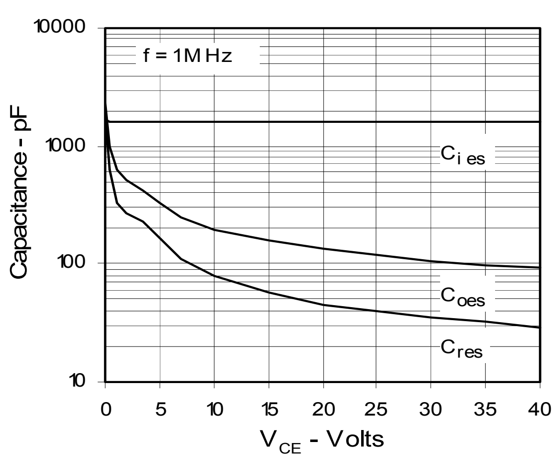


Fig. 12. Reverse-Bias Safe Operating Area

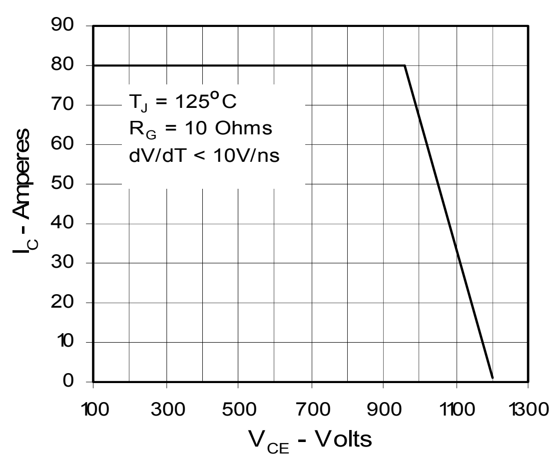


Fig. 13. Maximum Transient Thermal Resistance