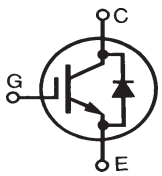
High Voltage IGBT with Diode

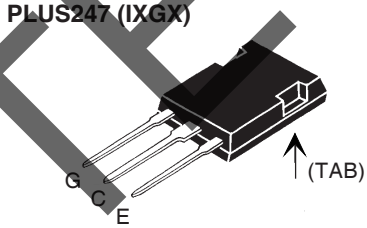
IXGX 32N170H1

V_{CES} = 1700 V
I_{C25} = 75 A
$V_{CE(sat)}$ = 3.3 V
$t_{fi(typ)}$ = 290 ns



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} = 1 MΩ	1700	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	75	A
I_{C90}	T_C = 90°C	32	A
I_{CM}	T_C = 25°C, 1 ms	200	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 5Ω Clamped inductive load	I_{CM} = 90 @ 0.8 V_{CES}	A
t_{SC}	T_J = 125°C, V_{CE} = 1200 V; V_{GE} = 15 V, R_G = 10Ω	10	µs
P_C	T_C = 25°C	350	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
F_C	Mounting force with chip	22...130/5...30	N/lb
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Weight		6	g

PLUS247 (IXGX)



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

Features

- High current handling capability
- MOS Gate turn-on
  - drive simplicity
- Rugged NPT structure
- Molding epoxies meet UL 94 V-0 flammability classification

Applications

- Capacitor discharge & pulser circuits
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 1mA, V_{GE} = 0 V		1700			V
$V_{GE(th)}$	I_C = 250 µA, V_{CE} = V_{GE}		3.0		5.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}	T_J = 25°C			500	µA
	V_{GE} = 0 V	Note 1 T_J = 125°C			8	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V	T_J = 25°C		2.5	3.3	V
		T_J = 125°C		3.0		V

Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
g_{fs}	$I_C = I_{C25}$; V_{CE} = 10 V, Note 2	25	33		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		3500		pF
C_{oes}			250		pF
C_{res}			40		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		155		nC
Q_{ge}			30		nC
Q_{gc}			51		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		45		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		38		ns
$t_{d(off)}$	R_G = 2.7 Ω, V_{CE} = 0.8 V_{CES}		270	500	ns
t_{fi}	Note 3		250	500	ns
E_{off}			15	25	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		48		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V		42		ns
E_{on}	R_G = 2.7 Ω, V_{CE} = 0.8 V_{CES}		6.0		mJ
$t_{d(off)}$	Note 3		360		ns
t_{fi}			560		ns
E_{off}			22		mJ
R_{thJC}				0.35	K/W
R_{thCK}			0.15		K/W

Reverse Diode (FRED) (Note 4)

Symbol	Test Conditions (T$_J$ = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
V_F	I_F = 70A, V_{GE} = 0 V, Pulse test, t ≤ 300 µs, duty cycle d ≤ 2 %			2.7	V
I_{RM}	I_F = 50A, V_{GE} = 0 V, $-di_F/dt$ = 800 A/µs		50		A
t_{rr}	V_R = 600 V		150		ns
R_{thJC}				0.4	K/W

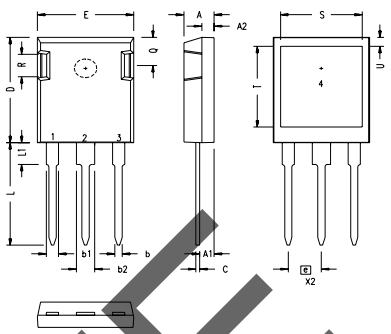
Notes: 1. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.

2. Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %

3. Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G.

4. See DH60-18A and IXGH32N170A datasheets for additional characteristics

PLUS247 Outline (IXGX)



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.190	.205	4.83	5.21
A1	.090	.100	2.29	2.54
A2	.075	.085	1.91	2.16
b	.045	.055	1.14	1.40
b1	.075	.084	1.91	2.13
b2	.115	.123	2.92	3.12
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
E	.620	.635	15.75	16.13
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83
S	.520	.540	13.21	13.72
T	.620	.640	15.75	16.26
U	.065	.080	1.65	2.03

1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – NO CONNECTION

NOTE: This drawing will meet all dimensions requirement of JEDEC outline TO-247AD except screw hole.

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 4,881,106 5,017,508 5,049,961 5,187,117 5,486,715 6,306,728B1 6,259,123B1 6,306,728B1 4,850,072 4,931,844 5,034,796 5,063,307 5,237,481 5,381,025 6,404,065B1 6,162,665 6,534,343