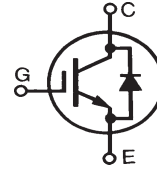


High Voltage IGBT with Diode

Electrically Isolated Tab

Preliminary Data Sheet

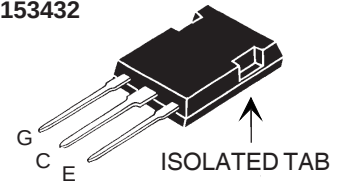
IXGR 32N170H1



$$\begin{aligned} V_{CES} &= 1700 \text{ V} \\ I_{C25} &= 38 \text{ A} \\ V_{CE(sat)} &= 3.5 \text{ V} \\ t_{fi(typ)} &= 250 \text{ ns} \end{aligned}$$

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1700	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}; R_{GE} = 1 \text{ M}\Omega$	1700	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	38	A
I_{C90}	$T_C = 90^\circ\text{C}$	20	A
I_{F90}		14	A
I_{CM}	$T_C = 25^\circ\text{C}, 1 \text{ ms}$	200	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}, T_{VJ} = 125^\circ\text{C}, R_G = 5\Omega$ Clamped inductive load	$I_{CM} = 70$ @ $0.8 V_{CES}$	A
t_{SC}	$T_J = 125^\circ\text{C}, V_{CE} = 1200 \text{ V}; V_{GE} = 15 \text{ V}, R_G = 10\Omega$	10	μs
P_C	$T_C = 25^\circ\text{C}$	200	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{stg}		-55 ... +150	$^\circ\text{C}$
F_C	Mounting force with clamp	22...130/5...30	N/lb
V_{ISOL}	50/60 Hz, 1 minute	2500	~V
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^\circ\text{C}$
Weight		5	g

ISOPLUS247 (IXGR)
E153432



G = Gate,
E = Emitter

C = Collector,

Features

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

Applications

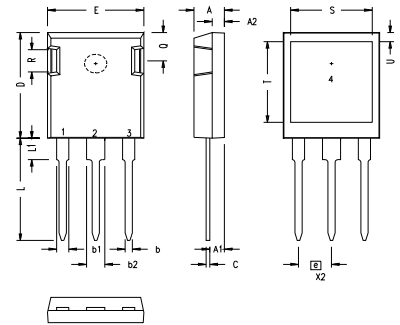
- Capacitor discharge & pulser circuits
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 1 \text{ mA}, V_{GE} = 0 \text{ V}$	1700		V
$V_{GE(th)}$	$I_C = 250 \mu\text{A}, V_{CE} = V_{GE}$	3.0		5.0 V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 \text{ V}, \text{ Note 1}$ $T_J = 125^\circ\text{C}$			100 μA 3 mA
I_{GES}	$V_{CE} = 0 \text{ V}, V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_T, V_{GE} = 15 \text{ V}$ Notes 2, 3 $T_J = 125^\circ\text{C}$	2.6 3.1		3.5 V V

Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_T$, $V_{CE} = 10\text{ V}$, Note 2	22	30	S
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		3670	pF
C_{oes}			210	pF
C_{res}			41	pF
Q_g	$I_C = I_T$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		155	nC
Q_{ge}			28	nC
Q_{gc}			52	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$		45	ns
t_{ri}	$I_C = I_T$, $V_{GE} = 15\text{ V}$		38	ns
$t_{d(off)}$	$R_G = 2.7\ \Omega$, $V_{CE} = 0.8 V_{CES}$		270	ns
t_{fi}	Note 4		250	ns
E_{off}		10.6	20	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$		48	ns
t_{ri}	$I_C = I_T$, $V_{GE} = 15\text{ V}$		42	ns
E_{on}	$R_G = 2.7\ \Omega$, $V_{CE} = 0.8 V_{CES}$		6.0	mJ
$t_{d(off)}$	Note 4		360	ns
t_{fi}			560	ns
E_{off}			13.6	mJ
R_{thJC}				0.65 K/W
R_{thCK}			0.15	K/W

Reverse Diode (FRED)		Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
Symbol	Test Conditions	min.	typ.	max.
V_F	$I_F = 20\text{ A}$, $V_{GE} = 0\text{ V}$, Note 2			2.85 V
	$T_J = 150^\circ\text{C}$			2.9 V
V_{TO}	For conduction power losses only			2.1 V
r_{FO}	$T_J = 150^\circ\text{C}$			40 m Ω
I_{RM}	$I_F = 20\text{ A}$, $V_{GE} = 0\text{ V}$, $V_R = 1200\text{ V}$		23	A
	$-di_F/dt = 450\text{ A}/\mu\text{s}$		27	A
t_{rr}	$T_J = 125^\circ\text{C}$		230	ns
	$T_J = 125^\circ\text{C}$		400	ns
R_{thJC}				1.5 K/W

- Notes: 1. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.
2. Pulse test, $t \leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$
3. Test current $I_T = 21\text{ A}$.
4. Switching times may increase for V_{CE} (Clamp) $> 0.8 \cdot V_{CES}$, higher T_J or increased R_G .
5. See IXGH32N170 datasheets for additional IGBT characteristics.

ISOPLUS247 Outline


SYM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	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	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585
	4,850,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	



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