IXYS

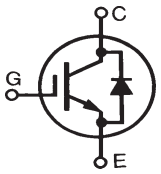
High Voltage IGBT with Diode

IXGR 32N170H1

V_{CES} = 1700 V
I_{C25} = 38 A
$V_{CE(sat)}$ = 3.5 V
$t_{fi(typ)}$ = 250 ns

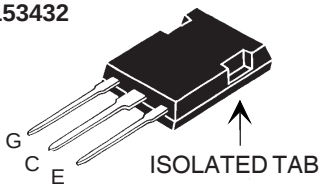
Electrically Isolated Tab

Preliminary Data Sheet



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	38	A
I_{C90}	T_C = 90°C	20	A
I_{F90}		14	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} = 70 @ 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	200	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°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	°C
Weight		5	g

ISOPLUS247 (IXGR)
E153432



G = Gate, C = Collector,
E = Emitter

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

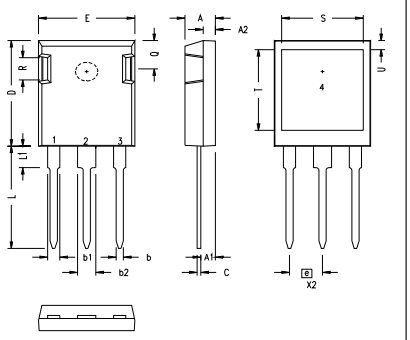
Applications
- Capacitor discharge & pulser circuits
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies

Symbol	Test Conditions	Characteristic Values (T_J = 25°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}			100	µA
	V_{GE} = 0 V, Note 1 T_J = 125°C			3	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V			±100	nA
$V_{CE(sat)}$	I_C = I_T, V_{GE} = 15 V		2.6	3.5	V
	Notes 2, 3 T_J = 125°C		3.1		V

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Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) min.	typ.	max.	
g_{fs}	$I_C = I_T$ V_{CE} = 10 V, Note 2	22	30		S
C_{ies}			3670		pF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		210		pF
C_{res}			41		pF
Q_g			155		nC
Q_{ge}	$I_C = I_T$ V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		28		nC
Q_{gc}			52		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		45		ns
t_{ri}	$I_C = I_T$, 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 4		250	500	ns
E_{off}			10.6	20	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		48		ns
t_{ri}	$I_C = I_T$, 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 4		360		ns
t_{fi}			560		ns
E_{off}			13.6		mJ
R_{thJC}				0.65	K/W
R_{thCK}			0.15		K/W

ISOPLUS247 Outline



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.

Reverse Diode (FRED)

Symbol	Test Conditions	Characteristic Values (T_J = 25°C unless otherwise specified) min.	typ.	max.	
V_F	I_F = 20A, V_{GE} = 0 V, Note 2			2.85	V
	T_J = 150°C			2.9	V
V_{TO}	For conduction power losses only			2.1	V
r_{FO}	T_J = 150°C			40	mΩ
I_{RM}	I_F = 20A, V_{GE} = 0 V, V_R = 1200 V		23		A
	$-di_F/dt$ = 450 A/μs T_J = 125°C		27		A
t_{rr}			230		ns
	T_J = 125°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 ≤ 300 μs, duty cycle ≤ 2 %
3. Test current I_T = 21 A.
4. Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G.
5. See IXGH32N170 datasheets for additional IGBT characteristics.

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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