IXYS

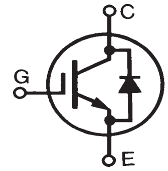
Advance Technical Information

High Voltage IGBT with Diode

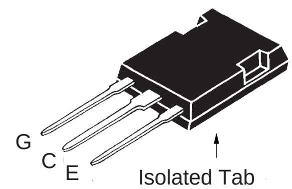
IXGR50N160H1

V_{CES} = 1600V
I_{C110} = 36A
$V_{CE(sat)}$ ≤ 2.30V

(Electrically Isolated Tab)



ISOPLUS247™



G = Gate C = Collector
E = Emitter

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1600	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C, Lead RMS limit	75	A
I_{C110}	T_C = 110°C	36	A
I_{CM}	T_C = 25°C, 1ms	330	A
SSOA (RBSOA)	V_{GE}= 15V, T_{VJ} = 125°C, R_G = 5Ω Clamped Inductive Load	I_{CM} = 100 @ 0.8 • V_{CES}	A
P_C	T_C = 25°C	240	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
F_C	Mounting Force	20..120/4.5..27	N/lb.
T_L	1.6mm (0.062 in.) from Case for 10s	300	°C
T_{SOLD}	Plastic Body for 10s	260	°C
V_{ISOL}	50/60Hz, RMS, 1 minute	2500	V~
	I_{ISOL} ≤ 1mA t = 1s	3000	V~
Weight		6	g

Features

- International Standard Package
- Molding Epoxies Meet UL 94 V-0 Flammability Classification

Advantages

- Space Savings
- High Power Density

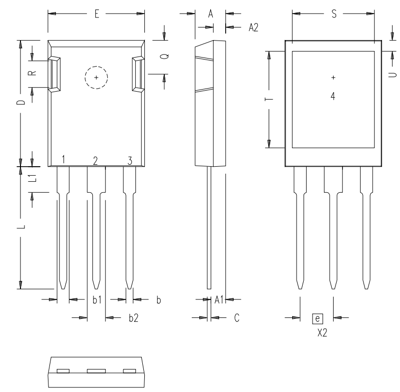
Applications

- Capacitor Discharge & Pulser Circuits
- AC Motor Speed Drives
- DC Servo and Robot Drives
- DC Choppers
- Uninterruptible Power Supplies (UPS)
- Switch-Mode and Resonant-Mode Power Supplies

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 1mA, V_{GE} = 0V	1600			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			85	μA
	Note 1, T_J = 125°C			6	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 50A, V_{GE} = 15V, Note 2		1.95	2.30	V
	T_J = 125°C		2.30		

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max.	
g_{fs}	I_C = 50A, V_{CE} = 10V, Note 2	18	30		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		3020		pF
C_{oes}			257		pF
C_{res}			50		pF
Q_g	I_C = 50A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		137		nC
Q_{ge}			24		nC
Q_{gc}			57		nC
$t_{d(on)}$	**Resistive Switching Times, T_J = 25°C**		53		ns
t_r	I_C = 50A, V_{GE} = 15V		111		ns
$t_{d(off)}$	R_G = 5Ω, V_{CE} = 0.8 • V_{CES}		235		ns
t_f			4400		ns
$t_{d(on)}$	**Resistive Switching Times, T_J = 125°C**		52		ns
t_r	I_C = 50A, V_{GE} = 15V		140		ns
$t_{d(off)}$	R_G = 5Ω, V_{CE} = 0.8 • V_{CES}		240		ns
t_f			4600		ns
R_{thJC}				0.52	°C/W
R_{thCS}			0.15		°C/W

ISOPLUS247™ (IXGR) 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 (T_J = 25°C Unless Otherwise Specified)	Min.	Typ.	Max.	
V_F	I_F = 20A, V_{GE} = 0V, Note 2			2.85	V
	T_J = 150°C			2.90	V
V_T	For conduction power losses only			2.10	V
r_{FO}	T_J = 150°C			40	mΩ
I_{RM}	I_F = 20A, V_{GE} = 0V, V_R = 1200V		23		A
	T_J = 125°C		27		A
t_{rr}	$-di_F/dt$ = 450A/µs		230		ns
	T_J = 125°C		400		ns
R_{thJC}				0.80°	C/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, d ≤ 2%.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.