IXYS

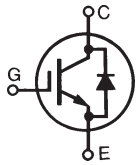
Advance Technical Information

GenX3™ 1200V IGBT w/ Diode

IXGR55N120A3H1

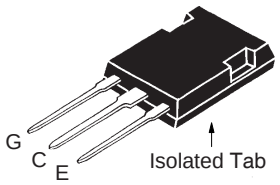
V_{CES} = 1200V
I_{C110} = 30A
$V_{CE(sat)}$ ≤ 2.35V

(Electrically Isolated Tab)



Ultra-Low-Vsat PT IGBTs for up to 3kHz Switching

ISOPLUS 247™



G = Gate C = Collector
E = Emitter

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} = 1MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (Chip Capability)	70	A
I_{C110}	T_C = 110°C	30	A
I_{F110}	T_C = 110°C	44	A
I_{CM}	T_C = 25°C, 1ms	330	A
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 125°C, R_G = 3Ω Clamped Inductive Load	I_{CM} = 110 @ 0.8 • V_{CES}	A
P_C	T_C = 25°C	200	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10	260	°C
V_{ISOL}	50/60 Hz, 1 minute	2500	V~
F_C	Mounting Force	20..120/4.5..27	N/lb.
Weight		5	g

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
$V_{GE(th)}$	I_C = 1mA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			25	μA
	Note 1, T_J = 125°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = 55A, V_{GE} = 15V, Note 2			2.35	V
	T_J = 125°C		2.20		

Features

- Silicon Chip on Direct-Copper Bond (DCB) Substrate
- Isolated Mounting Surface
- 2500V~ Electrical Isolation
- Anti-Parallel Ultra Fast Diode
- Optimized for Low Conduction Losses

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

- Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts
- Inrush Current Protection Circuits

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 55A, V_{CE} = 10V, Note 2	30	45		S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1 MHz		4340		pF
C_{oes}			300		pF
C_{res}			115		pF
$Q_{g(on)}$	I_C = 55A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		185		nC
Q_{ge}			25		nC
Q_{gc}			75		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		23		ns
t_{ri}	I_C = 55A, V_{GE} = 15V		42		ns
E_{on}	V_{CE} = 0.8 • V_{CES}, R_G = 3Ω		5.1		mJ
$t_{d(off)}$	Note 3		365		ns
t_{fi}			282		ns
E_{off}			13.3		mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		24		ns
t_{ri}	I_C = 55A, V_{GE} = 15V		46		ns
E_{on}	V_{CE} = 0.8 • V_{CES}, R_G = 3Ω		9.5		mJ
$t_{d(off)}$	Note 3		618		ns
t_{fi}			635		ns
E_{off}			29.0		mJ
R_{thJC}				0.62	°C/W
R_{thCK}			0.15		°C/W

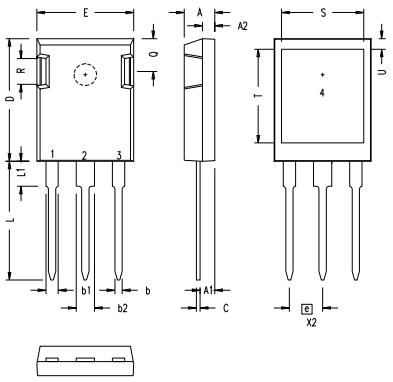
Reverse Diode (FRED)

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.	
V_F	I_F = 60A, V_{GE} = 0V, Note 2		1.85	2.5	V
	T_J = 150°C		1.90		V
t_{rr}	I_F = 60A, V_{GE} = 0V,		200		ns
I_{RM}	$-di_F/dt$ = 350A/μs, V_R = 600V, T_J = 100°C		24.6		A
R_{thJC}				0.42	°C/W

Notes:

1. Part must be heatsunk for high-temp Ices measurement.
2. Pulse test, t ≤ 300μs, duty cycle, d ≤ 2%.
3. Switching times & energy losses may increase for higher V_{CE}(Clamp), T_J or R_G.

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.

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.