

GenX3™ 1200V

IGBT w/ Diode

IXGR55N120A3H1

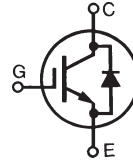
$$V_{CES} = 1200V$$

$$I_{C110} = 30A$$

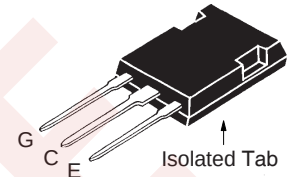
$$V_{CE(sat)} \leq 2.35V$$

(Electrically Isolated Tab)

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



ISOPLUS 247™



G = Gate
E = Emitter
C = Collector

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}$	1200	V
V_{CGR}	$T_J = 25^\circ\text{C to } 150^\circ\text{C}, R_{GE} = 1M\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$ (Chip Capability)	70	A
I_{C110}	$T_C = 110^\circ\text{C}$	30	A
I_{F110}	$T_C = 110^\circ\text{C}$	44	A
I_{CM}	$T_C = 25^\circ\text{C}, 1\text{ms}$	330	A
SSOA (RBSOA)	$V_{GE} = 15V, T_{VJ} = 125^\circ\text{C}, R_G = 3\Omega$ Clamped Inductive Load	$I_{CM} = 110$ @ $0.8 \cdot V_{CES}$	A
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	$^\circ\text{C}$
T_L	Maximum Lead Temperature for Soldering	300	$^\circ\text{C}$
T_{SOLD}	1.6 mm (0.062 in.) from Case for 10	260	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, 1 minute	2500	V~
F_C	Mounting Force	20..120/4.5..27	N/lb.
Weight		5	g

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

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

Reverse Diode (FRED)

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

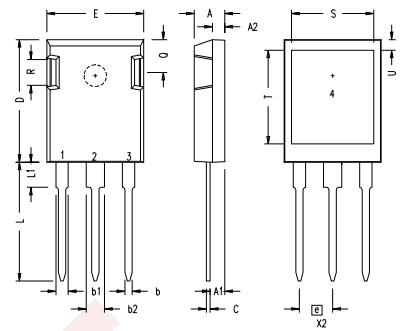
Notes:

1. Part must be heatsunk for high-temp I_{ces} measurement.
2. Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.
3. Switching times & energy losses may increase for higher V_{CE} (Clamp), T_J or R_G .

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.

ISOPLUS247 (IXGR) 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	7,005,734 B2	7,157,338B2
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	7,063,975 B2	
4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

OBSOLETE

OBSOLETE



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