

# GenX3™ 1200V IGBT w/ Diode

## IXGR55N120A3H1

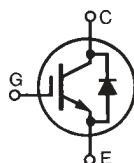
$$V_{CES} = 1200V$$

$$I_{C110} = 30A$$

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

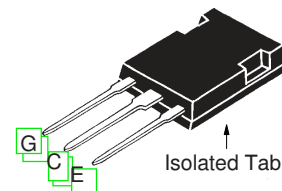
(Electrically Isolated Tab)

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



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

ISOPLUS 247™



G = Gate      C = Collector  
E = Emitter

### 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 ( $T_J = 25^\circ C$ , Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
$V_{GE(th)}$	$I_C = 1mA$ , $V_{CE} = V_{GE}$	3.0		5.0 V
$I_{CES}$	$V_{CE} = V_{CES}$ , $V_{GE} = 0V$ Note 1, $T_J = 125^\circ C$			25 $\mu A$ 1.5 mA
$I_{GES}$	$V_{CE} = 0V$ , $V_{GE} = \pm 20V$			$\pm 100$ nA
$V_{CE(sat)}$	$I_C = 55A$ , $V_{GE} = 15V$ , Note 2 $T_J = 125^\circ C$	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	$^\circ\text{C}/\text{W}$
$R_{thCK}$		0.15		$^\circ\text{C}/\text{W}$

### 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
$t_{rr}$	$I_F = 60\text{A}, V_{GE} = 0\text{V},$ $-di_F/dt = 350\text{A}/\mu\text{s}, V_R = 600\text{V}, T_J = 100^\circ\text{C}$		200	ns
$I_{RM}$			24.6	A
$R_{thJC}$			0.42	$^\circ\text{C}/\text{W}$

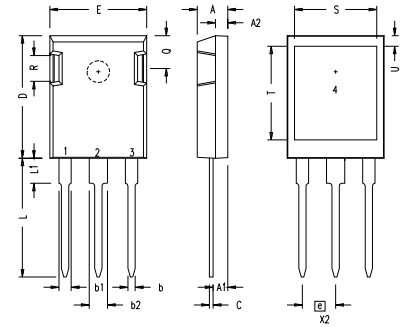
### Notes:

- Part must be heatsunk for high-temp  $I_{ces}$  measurement.
- Pulse test,  $t \leq 300\mu\text{s}$ , duty cycle,  $d \leq 2\%$ .
- 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.

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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	



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