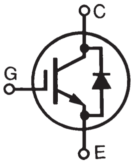
GenX3™ 1200V IGBTs w/ Diode

IXGK55N120A3D1
IXGX55N120A3D1

V_{CES} = 1200V
I_{C110} = 55A
$V_{CE(sat)} \leq$ 2.2V

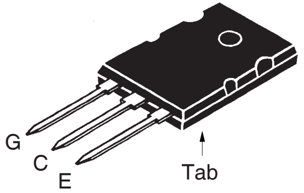
Ultra-Low-Vsat PT IGBTs for up to 3kHz Switching



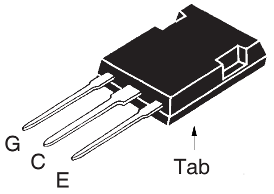
Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C, R_{GE} = 1MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (Chip Capability)	125	A
I_{C110}	T_C = 110°C	55	A
I_{LRMS}	T_C = 25°C (Lead RMS Limit)	120	A
I_{CM}	T_C = 25°C, 1ms	400	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	460	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
M_d	Mounting Torque (IXGK)	1.13/10	Nm/lb.in.
F_C	Mounting Force (IXGX)	20..120/4.5..27	N/lb.
Weight	TO-264	10	g
	PLUS247	6	g

Symbol	Test Conditions	Characteristic Values			
	(T_J = 25°C, Unless Otherwise Specified)	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			100	µA
	Note 1, T_J = 125°C			2.0	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±100	nA
$V_{CE(sat)}$	I_C = I_{C110}, V_{GE} = 15V, Note 2		1.85	2.2	V
	T_J = 125°C		1.90		

TO-264 (IXGK)



PLUS247™ (IXGX)



G = Gate
C = Collector
E = Emitter
Tab = Collector

Features

- Optimized for Low Conduction Losses
- International Standard Packages

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

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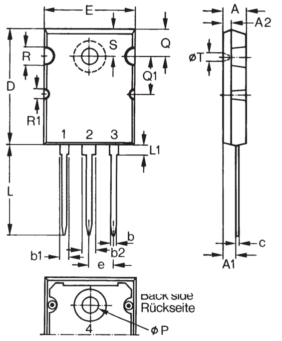
Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max.
g_{fs}	I_C = I_{C110}, V_{CE} = 10V, Note 2	30	45	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1 MHz		4340	pF
C_{oes}			300	pF
C_{res}			115	pF
$Q_{g(on)}$	I_C = I_{C110}, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}		185	nC
Q_{ge}			25	nC
Q_{gc}			75	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C** I_C = I_{C110}, V_{GE} = 15V V_{CE} = 0.8 • V_{CES}, R_G = 3Ω 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°C** I_C = I_{C110}, V_{GE} = 15V V_{CE} = 0.8 • V_{CES}, R_G = 3Ω 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}				0.27 °C/W
R_{thCK}			0.15	°C/W

TO-264 AA (IXGK) Outline



Dim.	Millimeter Min.	 Max.	Inches Min.	 Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

Reverse Diode (FRED)

Symbol	Test Conditions (T_J = 25°C, Unless Otherwise Specified)	Characteristic Values Min.	 Typ.	 Max.	
V_F	I_F = 30A, V_{GE} = 0V, Note 2			2.8	V
I_{RM}	I_F = 30A, V_{GE} = 0V,		32	36	A
t_{rr}	-di$_F$/dt = 480A/µs, V_R = 540V, T_J = 100°C		225		ns
t_{rr}	I_F = 1A, V_{GE} = 0V, -di$_F$/dt = 200A/µs, V_R = 30V		25	60	ns
R_{thJC}				0.65 °C/W	

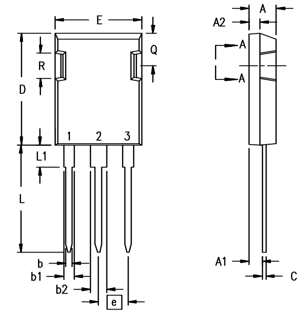
Notes:

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.

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.

PLUS247™ (IXGX) Outline



Terminals: 1 - Gate
2 - Drain (Collector)
3 - Source (Emitter)

Dim.	Millimeter Min.	 Max.	Inches Min.	 Max.
A	4.83	5.21	.190	.205
A_1	2.29	2.54	.090	.100
A_2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b_1	1.91	2.13	.075	.084
b_2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

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