IXYS

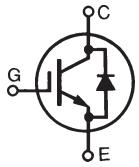
Advance Technical Information

GenX3™ 1200V IGBTs w/ Diode

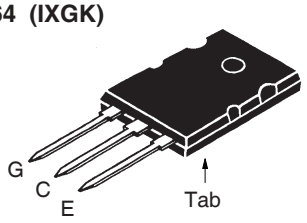
IXGK55N120A3H1
IXGX55N120A3H1

V_{CES} = 1200V
I_{C110} = 55A
$V_{CE(sat)} \leq$ 2.3V

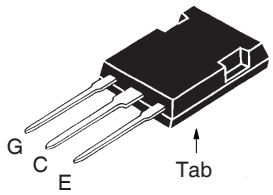
Ultra-Low-Vsat PT IGBTs for up to 3kHz Switching



TO-264 (IXGK)



PLUS247™ (IXGX)



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

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 (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			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	2.3	V
	T_J = 125°C		1.90		

Features

- Optimized for Low Conduction Losses
- Anti-Parallel Ultra Fast Diode

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}	$I_C = I_{C110}$, 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**		23		ns
t_{ri}	$I_C = I_{C110}$, 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}	$I_C = I_{C110}$, 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}				0.27	°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.

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.

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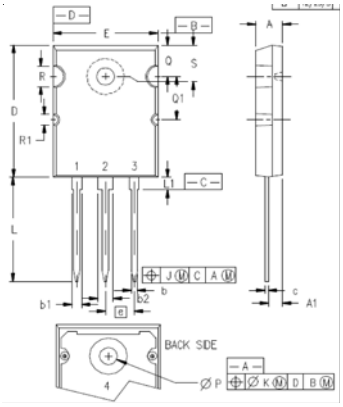
IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405 B2 6,710,463 6,727,585 6,759,692 6,771,478 B2 7,005,734 B2 7,063,975 B2 7,071,537 7,157,338B2

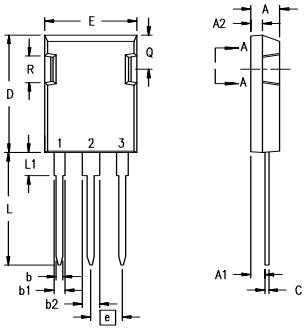
TO-264 (IXGK) Outline



Terminals: 1 = Gate
2 = Collector
3 = Emitter

SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.70	5.31
A1	.102	.118	2.59	3.00
b	.037	.055	0.94	1.40
b1	.087	.102	2.21	2.59
b2	.110	.126	2.79	3.20
c	.017	.029	0.43	0.74
D	1.007	1.047	25.58	26.59
E	.760	.799	19.30	20.29
e	.215BSC		5.46 BSC	
J	.000	.010	0.00	0.25
K	.000	.010	0.00	0.25
L	.779	.842	19.79	21.39
L1	.087	.102	2.21	2.59
ØP	.122	.138	3.10	3.51
Q	.240	.256	6.10	6.50
Q1	.330	.346	8.38	8.79
ØR	.155	.187	3.94	4.75
ØR1	.085	.093	2.16	2.36
S	.243	.253	6.17	6.43

PLUS 247™ (IXGX) Outline



Terminals: 1 = Gate
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3 = Emitter

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches 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