IXYS

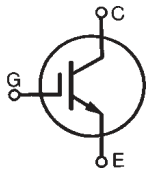
Advance Technical Information

1200V XPT™ IGBT GenX3™

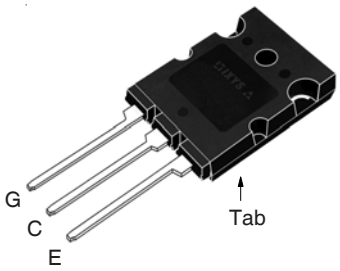
IXYK120N120B3
IXYX120N120B3

V_{CES} = 1200V
I_{C110} = 120A
$V_{CE(sat)}$ ≤ 2.2V
$t_{fi(typ)}$ = 260ns

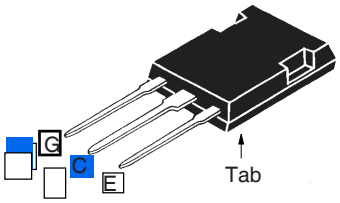
High-Speed IGBT
for 10-30 kHz Switching



TO-264P (IXYK)



PLUS247 (IXYX)



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

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 175°C	1200	V
V_{CGR}	T_J = 25°C to 175°C, R_{GE} = 1MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (Chip Capability)	320	A
I_{LRMS}	Terminal Current Limit	160	A
I_{C110}	T_C = 110°C	120	A
I_{CM}	T_C = 25°C, 1ms	800	A
I_A	T_C = 25°C	60	A
E_{AS}	T_C = 25°C	2	J
SSOA (RBSOA)	V_{GE} = 15V, T_{VJ} = 150°C, R_G = 1Ω Clamped Inductive Load	I_{CM} = 240 $V_{CE} \leq V_{CES}$	A
P_C	T_C = 25°C	1500	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +175	°C
T_L	Maximum Lead Temperature for Soldering	300	°C
T_{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M_d	Mounting Torque (TO-264)	1.13/10	Nm/lb.in
F_C	Mounting Force (PLUS247)	20..120 /4.5..27	N/lb
Weight	TO-264P	10	g
	PLUS247	6	g

Symbol (T_J = 25°C, Unless Otherwise Specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250μA, V_{GE} = 0V	1200			V
$V_{GE(th)}$	I_C = 1mA, V_{CE} = V_{GE}	3.0		5.0	V
I_{CES}	V_{CE} = V_{CES}, V_{GE} = 0V			25	μA
	T_J = 150°C			1.5	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V			±200	nA
$V_{CE(sat)}$	I_C = 100A, V_{GE} = 15V, Note 1		1.8	2.2	V
	T_J = 150°C		2.4		V

Features

- Square RBSOA
- International Standard Packages
- Positive Thermal Coefficient of Vce(sat)
- Avalanche Rated
- High Current Handling Capability

Advantages

- High Power Density
- Low Gate Drive Requirement

Applications

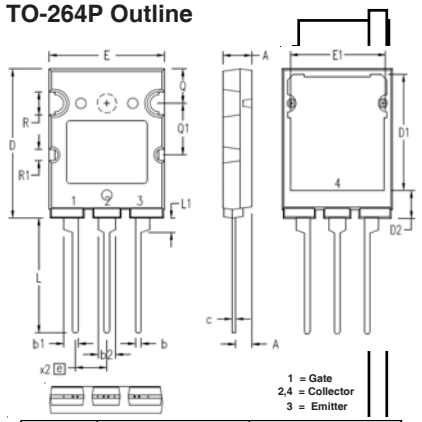
- High Frequency Power Inverters
- UPS
- Motor Drives
- SMPS
- PFC Circuits
- Battery Chargers
- Welding Machines
- Lamp Ballasts

Symbol	Test Conditions (T_J = 25°C Unless Otherwise Specified)	Characteristic Values Min.	Typ.	Max.
g_{fs}	I_C = 60A, V_{CE} = 10V, Note 1	40	70	S
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz		9800	pF
C_{oes}			567	pF
C_{res}			215	pF
$Q_{g(on)}$	$I_C = I_{C110}$, V_{GE} = 15V, $V_{CE} = 0.5 \bullet V_{CES}$		400	nC
Q_{ge}			70	nC
Q_{gc}			190	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		30	ns
t_{ri}	I_C = 100A, V_{GE} = 15V		54	ns
E_{on}	$V_{CE} = 0.8 \bullet V_{CES}$, $R_G = 1\Omega$		9.7	mJ
$t_{d(off)}$	Note 2		340	ns
t_{fi}			260	ns
E_{off}			21.5	mJ
$t_{d(on)}$	**Inductive load, T_J = 150°C**		29	ns
t_{ri}	I_C = 100A, V_{GE} = 15V		55	ns
E_{on}	$V_{CE} = 0.8 \bullet V_{CES}$, $R_G = 1\Omega$		14.7	mJ
$t_{d(off)}$	Note 2		420	ns
t_{fi}			406	ns
E_{off}			27.9	mJ
R_{thJC}				0.10 °C/W
R_{thCS}			0.15	°C/W

Notes:

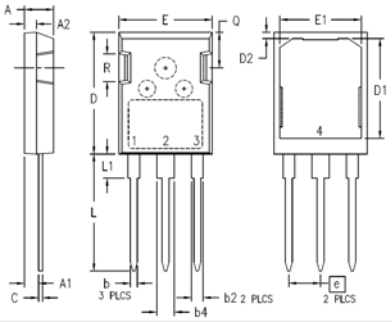
1. Pulse test, t ≤ 300µs, duty cycle, d ≤ 2%.
2. Switching times & energy losses may increase for higher V_{CE}(clamp), T_J or R_G.

TO-264P Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.70	5.30
A1	.102	.118	2.60	3.00
b	.035	.049	0.90	1.25
b1	.091	.106	2.30	2.70
b2	.110	.126	2.80	3.20
c	.020	.033	0.50	0.85
D	1.012	1.035	25.70	26.30
D1	.783	.799	19.90	20.30
D2	.185	.205	4.70	5.20
E	.776	.799	19.70	20.30
E1	.661	.677	16.80	17.20
e	.215 BSC		5.46 BSC	
L	.768	.807	19.50	20.50
L1	.091	.106	2.30	2.70
Q	.228	.244	5.80	6.20
Q1	.346	.362	8.80	9.20
øR	.150	.165	3.80	4.20
øR1	.071	.087	1.80	2.20

PLUS247™ Outline



Terminals: 1 - Gate
2,4 - Collector
3 - Emitter

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
b2	.075	.087	1.91	2.20
b4	.115	.126	2.92	3.20
C	.024	.031	0.61	0.80
D	.819	.840	20.80	21.34
D1	.650	.690	16.51	17.53
D2	.035	.050	0.89	1.27
E	.620	.635	15.75	16.13
E1	.520	.560	13.08	14.22
e	.215 BSC		5.45 BSC	
L	.780	.810	19.81	20.57
L1	.150	.170	3.81	4.32
Q	.220	.244	5.59	6.20
R	.170	.190	4.32	4.83

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.