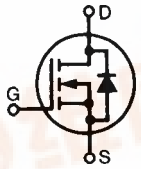
IXYS

Advanced Technical Information

HiPerFAST™ IGBT

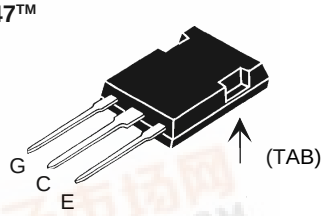
IXGK 120N60B
IXGX 120N60B

V_{CES} = 600 V
I_{C25} = 200 A
$V_{CE(sat)}$ = 2.1 V

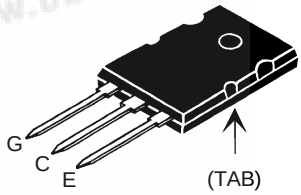


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25 °C to 150 °C	600	V
V_{CGR}	T_J = 25 °C to 150 °C; R_{GS} = 1 MΩ	600	V
V_{CES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25 °C	200	A
I_{C90}	T_C = 90 °C	120	A
$I_{L(RMS)}$	External lead limit	76	A
I_{CM}	T_C = 25°C, 1 ms	300	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 2.4 Ω Clamped inductive load	I_{CM} = 200 @ 0.8 V_{CES}	A
P_C	T_C = 25°C	560	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.063 in.) from case for 10 s	300	°C
M_d	Mounting torque TO-264	0.4/6	Nm/lb.in.
Weight	PLUS 247	6	g
	TO-264	10	g

PLUS 247™ (IXGX)



TO-264 AA (IXGK)



G = Gate E = Emitter
C = Collector TAB = Collector

Features

- International standard packages
- Very high current, fast switching IGBT
- Low $V_{CE(sat)}$
  - for minimum on-state conduction losses
- MOS Gate turn-on
  - drive simplicity

Applications

- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies

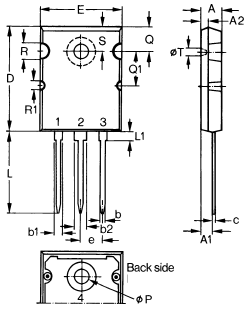
Advantages

- PLUS 247™ package for clip or spring mounting
- Space savings
- High power density

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 1 mA, V_{GE} = 0 V		600			V
$V_{GE(th)}$	I_C = 1 mA, V_{CE} = V_{GE}		2.5		5.5	V
I_{CES}	V_{CE} = V_{CES} V_{GE} = 0 V	T_J = 25°C T_J = 125°C			200 2	µA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±400	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V				2.1	V

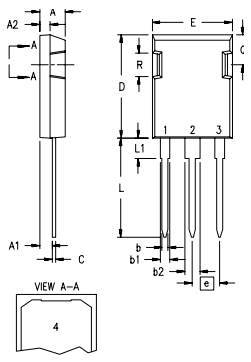
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
g_{fs}	I_C = 60 A; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	50	75		S
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		11000		pF
C_{oes}			680		pF
C_{res}			190		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		350		nC
Q_{ge}			72		nC
Q_{gc}			131		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		60		ns
t_{ri}	I_C = 100A, V_{GE} = 15 V		45		ns
E_{on}	V_{CE} = 0.8 V_{CES}, $R_G = R_{off}$ = 2.4 Ω		2.4		mJ
$t_{d(off)}$	Remarks: Switching times		200	360	ns
t_{fi}	may increase for		160	280	ns
E_{off}	V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		5.5	9.6	mJ
$t_{d(on)}$	**Inductive load, T_J =125°C**		60		ns
t_{ri}	I_C = 100A, V_{GE} = 15 V		60		ns
E_{on}	V_{CE} = 0.8 V_{CES}, $R_G = R_{off}$ = 2.4 Ω		4.8		mJ
$t_{d(off)}$	Remarks: Switching times		290		ns
t_{fi}	may increase for		250		ns
E_{off}	V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G		8.7		mJ
R_{thJC}				0.21	K/W
R_{thCK}			0.15		K/W

TO-264 AA 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

PLUS247™ (IXGX)



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	.244
R	4.32	4.83	.170	.190