IXYS

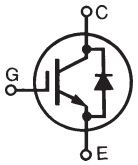
Advance Technical Data

IGBT with Diode

IXGK 50N60A2D1
IXGX 50N60A2D1

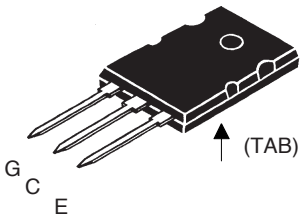
V_{CES} = 600 V
I_{C25} = 75 A
$V_{CE(sat)}$ = 1.4 V

Low Saturation Voltage

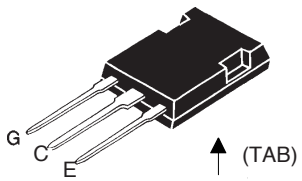


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C (limited by leads)	75	A
I_{C110}	T_C = 110°C	50	A
I_{F110}	T_C = 110°C (50N60B2D1 Diode)	38	A
I_{CM}	T_C = 25°C, 1 ms	200	A
SSOA (RBSOA)	V_{GE} = 15 V, T_{VJ} = 125°C, R_G = 10 Ω Clamped inductive load @ $V_{CE} \le 600$ V	I_{CM} = 80	A
P_C	T_C = 25°C	400	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque, TO-264	1.13/10	Nm/lb.in.
Weight	TO-264	10	g
	PLUS247	6	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C

TO-264 (IXGK)



PLUS247 (IXGX)



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

Features

- Low on-state voltage IGBT and anti-parallel diode in one package
- High current handling capability
- MOS Gate turn-on for drive simplicity

Applications

- Lighting controls
- Heating controls
- AC/DC relays

Advantages

- Space savings (two devices in one package)
- Easy to mount with 1 screw or spring clip

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
$V_{GE(th)}$	I_C = 250 μA, $V_{CE} = V_{GE}$		3.0		5.0	V
I_{CES}	$V_{CE} = V_{CES}$ V_{GE} = 0 V	T_J = 25°C T_J = 125°C			600 5	μA mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				±100	nA
$V_{CE(sat)}$	I_C = 50 A, V_{GE} = 15 V Note 1	 T_J = 125°C		1.1	1.4	V V

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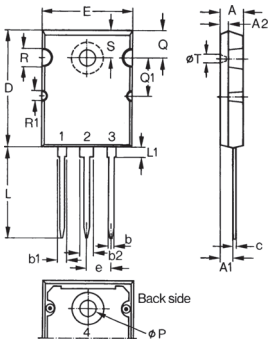
Symbol	Test Conditions	Characteristic Values (T_J = 25°C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	I_C = 40 A; V_{CE} = 10 V, Note 1	40	55		S
C_{ies}			3500		pF
C_{oes}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		220		pF
C_{res}			50		pF
Q_g			140		nC
Q_{ge}	I_C = 40 A, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		23		nC
Q_{gc}			44		nC
$t_{d(on)}$			20		ns
t_{ri}	**Inductive load, T_J = 25°C**		25		ns
$t_{d(off)}$	I_C = 50 A, V_{GE} = 15 V		360		ns
t_{fi}	V_{CE} = 480 V, R_G = R_{off} = 5.0 Ω		250		ns
E_{off}			2.0		mJ
$t_{d(on)}$			20		ns
t_{ri}	**Inductive load, T_J = 125°C**		25		ns
E_{on}	I_C = 50 A, V_{GE} = 15 V		1.0		mJ
$t_{d(off)}$	V_{CE} = 480 V, R_G = R_{off} = 5.0 Ω		290		ns
t_{fi}			600		ns
E_{off}			4.1		mJ
R_{thJC}				0.31	K/W
R_{thCK}			0.15		K/W

Reverse Diode (FRED)

Symbol	Test Conditions	Characteristic Values (T_J = 25∞C, unless otherwise specified) min.	typ.	max.	
V_F	I_F = 50 A, V_{GE} = 0 V, Note 1			1.2	V
	T_J = 150°C			0.9	V
R_{thJC}				0.65	K/W

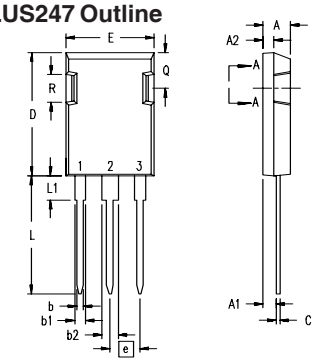
Note 1: Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %

TO-264 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 Outline



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

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

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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 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 4,881,106 5,034,796 5,187,117 5,486,715 6,306,728 B1 6,583,505 6,710,463 6771478 B2

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