

# High Current IGBT

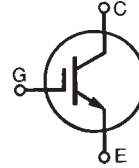
Short Circuit SOA Capability

## IXSK 80N60B IXSX 80N60B

$$V_{CES} = 600 \text{ V}$$

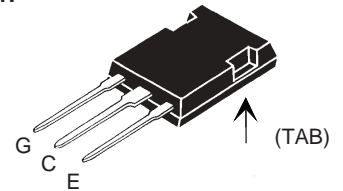
$$I_{C25} = 160 \text{ A}$$

$$V_{CE(sat)} = 2.5 \text{ V}$$

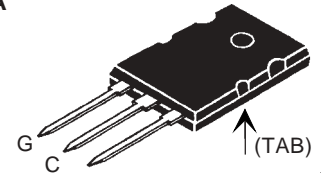


Symbol	Test Conditions	Maximum Ratings	
$V_{CES}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$	600	V
$V_{CGR}$	$T_J = 25^\circ\text{C}$ to $150^\circ\text{C}$ ; $R_{GS} = 1 \text{ M}\Omega$	600	V
$V_{CES}$	Continuous	$\pm 20$	V
$V_{GEM}$	Transient	$\pm 30$	V
$I_{C25}$	$T_C = 25^\circ\text{C}$ (silicon chip capability)	160	A
$I_{C90}$	$T_C = 90^\circ\text{C}$ (silicon chip capability)	80	A
$I_{L(RMS)}$	$T_C = 90^\circ\text{C}$ (silicon chip capability)	75	A
$I_{CM}$	$T_C = 25^\circ\text{C}$ , 1 ms	300	A
<b>SSOA</b> <b>(RBSOA)</b>	$V_{GE} = 15 \text{ V}$ , $T_{VJ} = 125^\circ\text{C}$ , $R_G = 5 \Omega$ Clamped inductive load	$I_{CM} = 160$ @ $0.8 V_{CES}$	A
<b>tsc</b> <b>SCSOA</b>	$V_{GE} = 15 \text{ V}$ , $V_{CE} = 0.6 V_{CES}$ , $T_J = 125^\circ\text{C}$ $R_G = 5 \Omega$ , non-repetitive	10	$\mu\text{s}$
$P_C$	$T_C = 25^\circ\text{C}$	500	W
$T_J$		-55 ... +150	$^\circ\text{C}$
$T_{JM}$		150	$^\circ\text{C}$
$T_{stg}$		-55 ... +150	$^\circ\text{C}$
$T_L$	1.6 mm (0.063 in.) from case for 10 s	300	$^\circ\text{C}$
$M_d$	Mounting torque	TO-264	0.4/6 Nm/lb.in.
<b>Weight</b>		PLUS 247	6 g
		TO-264	10 g

### PLUS 247™ (IXSX)



### TO-264 AA (IXSK)



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

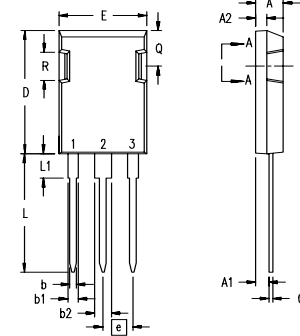
### Advantages

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

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)		
		min.	typ.	max.
$BV_{CES}$	$I_C = 500 \mu\text{A}$ , $V_{GE} = 0 \text{ V}$	600		V
$V_{GE(th)}$	$I_C = 8 \text{ mA}$ , $V_{CE} = V_{GE}$	4		V
$I_{CES}$	$V_{CE} = V_{CES}$ , $T_J = 25^\circ\text{C}$ $V_{GE} = 0 \text{ V}$ , $T_J = 125^\circ\text{C}$			200 $\mu\text{A}$ 2 mA
$I_{GES}$	$V_{CE} = 0 \text{ V}$ , $V_{GE} = \pm 20 \text{ V}$			$\pm 200 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$ , $V_{GE} = 15 \text{ V}$			2.5 V

Symbol	Test Conditions	Characteristic Values ( $T_J = 25^\circ\text{C}$ , unless otherwise specified)			
		min.	typ.	max.	
$g_{fs}$	$I_C = 60\text{ A}; V_{CE} = 10\text{ V}$ , Pulse test, $t \leq 300\ \mu\text{s}$ , duty cycle $\leq 2\%$	52		S	
$C_{ies}$	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		6600	pF	
$C_{oes}$			660	pF	
$C_{res}$			196	pF	
$Q_g$	$I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		240	nC	
$Q_{ge}$			85	nC	
$Q_{gc}$			90	nC	
$t_{d(on)}$	<b>Inductive load, <math>T_J = 25^\circ\text{C}</math></b> $I_C = I_{C90}, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 2.7\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$		60	ns	
$t_{ri}$			45	ns	
$t_{d(off)}$			140	280	ns
$t_{fi}$			180	280	ns
$E_{off}$			4.2	7.0	mJ
$t_{d(on)}$	<b>Inductive load, <math>T_J = 125^\circ\text{C}</math></b> $I_C = I_{C90}, V_{GE} = 15\text{ V}$ $V_{CE} = 0.8 V_{CES}, R_G = R_{off} = 2.7\ \Omega$ Remarks: Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 \cdot V_{CES}$ , higher $T_J$ or increased $R_G$		60	ns	
$t_{ri}$			60	ns	
$E_{on}$			4.8		mJ
$t_{d(off)}$			190		ns
$E_{off}$			260		ns
$R_{thJC}$				0.26	KW
$R_{thCK}$			0.15		KW

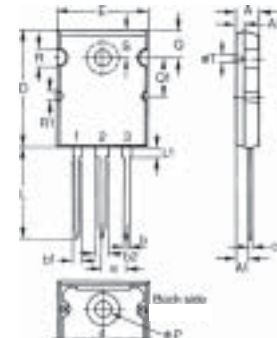
**PLUS 247™ Outline**



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

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A <sub>1</sub>	2.29	2.54	.090	.100
A <sub>2</sub>	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b <sub>1</sub>	1.91	2.13	.075	.084
b <sub>2</sub>	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

**TO-264 AA Outline**



Dim.	Millimeter		Inches	
	Min.	Max.	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

IXYS reserves the right to change limits, test conditions, and dimensions.