

High Speed IGBT

IXSH 40N60B

IXST 40N60B

$V_{CES} = 600V$

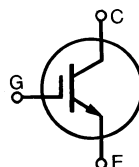
$I_{C25} = 75A$

$V_{CE(sat)} = 2.2V$

$t_{fi typ} = 100 ns$

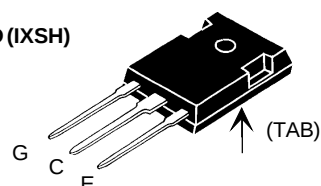
Short Circuit SOA Capability

Preliminary data

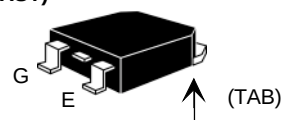


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^{\circ}C$ to $150^{\circ}C$	600	V
V_{CGR}	$T_J = 25^{\circ}C$ to $150^{\circ}C$; $R_{GE} = 1 M\Omega$	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^{\circ}C$	75	A
I_{C90}	$T_C = 90^{\circ}C$	40	A
I_{CM}	$T_C = 25^{\circ}C$, 1 ms	150	A
SSOA (RBSOA)	$V_{GE} = 15 V$, $T_J = 125^{\circ}C$, $R_G = 2.7 \Omega$ Clamped inductive load, $V_{CC} = 0.8 V_{CES}$	$I_{CM} = 80$ @ $0.8 V_{CES}$	A
t_{SC} (SCSOA)	$V_{GE} = 15 V$, $V_{CE} = 360 V$, $T_J = 125^{\circ}C$ $R_G = 22 \Omega$, non repetitive	10	μs
P_C	$T_C = 25^{\circ}C$	280	W
T_J		-55 ... +150	$^{\circ}C$
T_{JM}		150	$^{\circ}C$
T_{stg}		-55 ... +150	$^{\circ}C$
M_d	Mounting torque	1.13/10	Nm/lb.in.
Weight		6	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	$^{\circ}C$

TO-247 AD (IXSH)



TO-268 (D3) (IXST)



G = Gate
E = Emitter

TAB = Collector

Features

- International standard packages
- Guaranteed Short Circuit SOA capability
- Low $V_{CE(sat)}$
 - for low on-state conduction losses
- High current handling capability
- MOS Gate turn-on
 - drive simplicity
- Fast Fall Time for switching speeds up to 50 kHz

Applications

- AC and DC motor speed control
- Uninterruptible power supplies (UPS)
- Welding

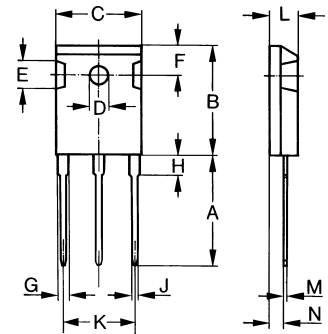
Advantages

- Easy to mount with 1 screw (TO-247) (isolated mounting screw hole)
- High power density

Symbol	Test Conditions	Characteristic Values ($T_J = 25^{\circ}C$, unless otherwise specified)		
		min.	typ.	max.
BV_{CES}	$I_C = 250 \mu A$, $V_{GE} = 0 V$	600		V
$V_{GE(th)}$	$I_C = 4 mA$, $V_{CE} = V_{GE}$	4		V
I_{CES}	$V_{CE} = 0.8 \cdot V_{CES}$ $V_{GE} = 0 V$			25 μA 1 mA
I_{GES}	$V_{CE} = 0 V$, $V_{GE} = \pm 20 V$			± 100 nA
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15 V$			2.2 V

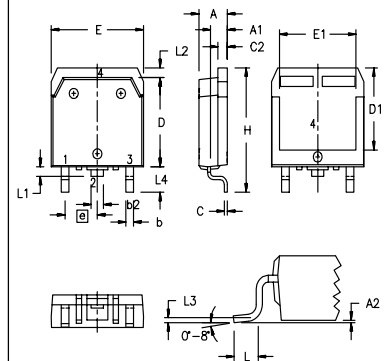
Symbol	Test Conditions	Characteristic Values ($T_J = 25^\circ\text{C}$, unless otherwise specified)		
		min.	typ.	max.
g_{fs}	$I_C = I_{C90}, V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	16	23	S
C_{ies}	$V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}, f = 1\text{ MHz}$		3700	pF
C_{oes}			280	pF
C_{res}			80	pF
Q_g	$I_C = I_{C90}, V_{GE} = 15\text{ V}, V_{CE} = 0.5 V_{CES}$		190	nC
Q_{ge}			45	nC
Q_{gc}			90	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}, L = 100\text{ }\mu\text{H}$ $V_{CE} = 0.8 V_{CES}, R_G = 2.7\text{ }\Omega$		50	ns
t_{ri}			50	ns
$t_{d(off)}$			110	200 ns
t_{fi}			120	200 ns
E_{off}			1.8	2.6 mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$ $I_C = I_{C90}, V_{GE} = 15\text{ V}$, $V_{CE} = 0.8 V_{CES}, R_G = 2.7\text{ }\Omega$		55	ns
t_{ri}			170	ns
E_{on}			1.7	mJ
$t_{d(off)}$			190	ns
t_{fi}			180	ns
E_{off}			2.0	mJ
R_{thJC}	(IXSH40N60B)		0.25	0.45 K/W
R_{thCK}				K/W

TO-247 AD (IXSH) Outline



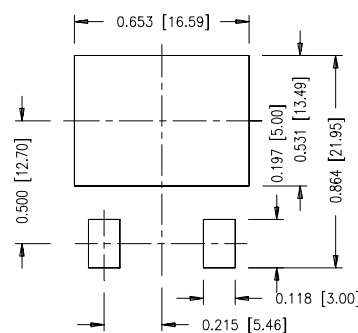
Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	19.81	20.32	0.780	0.800
B	20.80	21.46	0.819	0.845
C	15.75	16.26	0.610	0.640
D	3.55	3.65	0.140	0.144
E	4.32	5.49	0.170	0.216
F	5.4	6.2	0.212	0.244
G	1.65	2.13	0.065	0.084
H	-	4.5	-	0.177
J	1.0	1.4	0.040	0.055
K	10.8	11.0	0.426	0.433
L	4.7	5.3	0.185	0.209
M	0.4	0.8	0.016	0.031
N	1.5	2.49	0.087	0.102

TO-268AA (D³ PAK)



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.9	5.1	.193	.201
A ₁	2.7	2.9	.106	.114
A ₂	.02	.25	.001	.010
b	1.15	1.45	.045	.057
b ₂	1.9	2.1	.75	.83
C	.4	.65	.016	.026
D	13.80	14.00	.543	.551
E	15.85	16.05	.624	.632
E ₁	13.3	13.6	.524	.535
e	5.45 BSC		.215 BSC	
H	18.70	19.10	.736	.752
L	2.40	2.70	.094	.106
L ₁	1.20	1.40	.047	.055
L ₂	1.00	1.15	.039	.045
L ₃	0.25 BSC		.010 BSC	
L ₄	3.80	4.10	.150	.161

Min. Recommended Footprint



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