IXYS

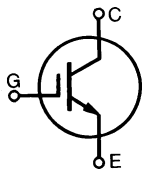
Preliminary Data Sheet

Low $V_{CE(sat)}$ IGBT

Short Circuit SOA Capability

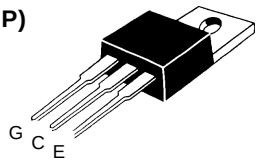
IXSA 16N60
IXSP 16N60

V_{CES} = 600V
I_{C25} = 16A
$V_{CE(sat)typ}$ = 1.8V

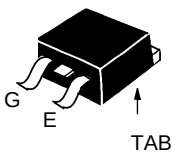


Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	600	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	600	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	T_C = 25°C	32	A
I_{C90}	T_C = 90°C	16	A
I_{CM}	T_C = 25°C, 1 ms	52	A
SSOA (RBSOA)	V_{GE}= 15 V, T_J = 125°C, R_G = 150 Ω Clamped inductive load, L = 300 µH	I_{CM} = 32 @ 0.8 V_{CES}	A
t_{SC} **(SCSOA)**	V_{GE}= 15 V, V_{CE} = 360 V, T_J = 125°C R_G = 82 Ω, non repetitive	5	µs
P_C	T_C = 25°C	100	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
Weight		2	g
Maximum lead temperature for soldering 1.6 mm (0.062 in.) from case for 10 s		300	°C
Maximum tab temperature for soldering for 10s		260	°C

TO-220AB(IXSP)



TO-263AA



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

Symbol	Test Conditions		Characteristic Values (T_J = 25°C, unless otherwise specified) min.	typ.	max.	
BV_{CES}	I_C = 250 µA, V_{GE} = 0 V		600			V
$V_{GE(th)}$	I_C = 750 µA, V_{CE} = V_{GE}		3.5		6.5	V
I_{CES}	V_{CE} = 0.8 • V_{CES}	T_J = 25°C			200	µA
	V_{GE} = 0 V	T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ± 20 V				± 100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V			1.8	2.3	V

Features

- International standard package
- 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 20 kHz

Applications

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

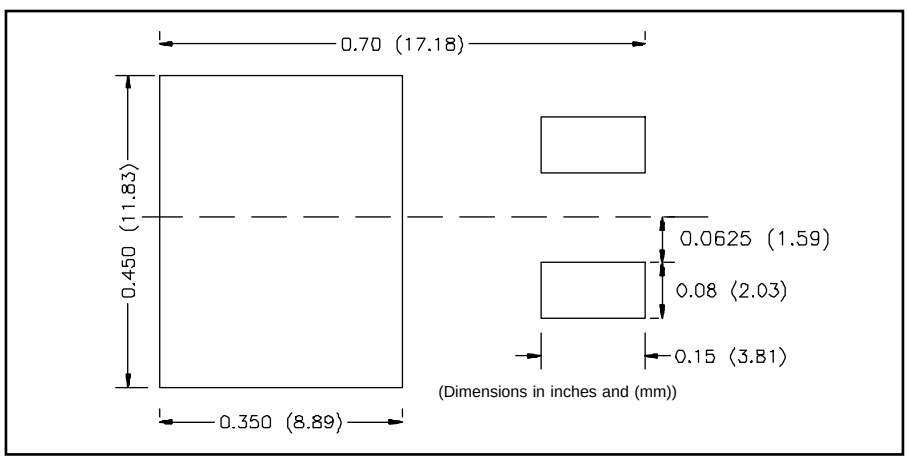
Advantages

- High power density

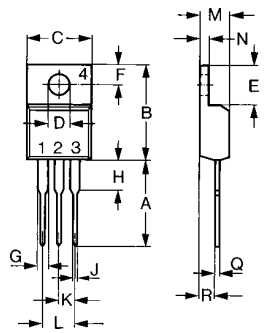
Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)	Characteristic Values min.	typ.	max.	
g_{fs}	$I_C = I_{C90}$; V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	3.3	5.0		S
$I_{C(on)}$	V_{GE} = 15 V, V_{CE} = 10 V		50		A
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		920		pF
C_{oes}			65		pF
C_{res}			14		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		40		nC
Q_{ge}			13		nC
Q_{gc}			18		nC
$t_{d(on)}$	**Inductive load, T_J = 25°C**		30		ns
t_{ri}	I_C = 16A, V_{GE} = 15 V, L = 300 µH		30		ns
$t_{d(off)}$	V_{CE} = 0.8 V_{CES}, R_G = 22 Ω		100	420	ns
t_{fi}			310	470	ns
E_{off}			1.9	2.9	mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C**		30		ns
t_{ri}	I_C = 16A, V_{GE} = 15 V, L = 300 µH		30		ns
E_{on}	V_{CE} = 0.8 V_{CES}, R_G = 22 Ω		0.12		mJ
$t_{d(off)}$			150		ns
t_{fi}			510		ns
E_{off}			3.0		mJ
R_{thJC}				1.25	K/W

Note 1: Switching times may increase for V_{CE} (Clamp) > 0.8 • V_{CES}, higher T_J or increased R_G

Min. Recommended Footprint

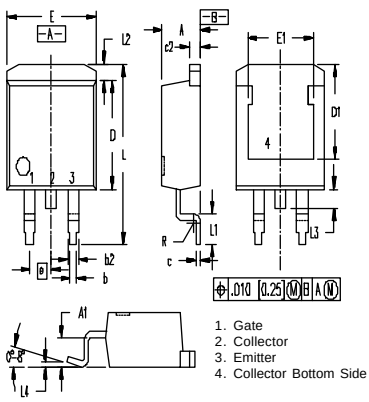


TO-220 AB Outline



Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	12.70	14.93	0.500	0.580
B	14.23	16.50	0.560	0.650
C	9.66	10.66	0.380	0.420
D	3.54	4.08	0.139	0.161
E	5.85	6.85	0.230	0.270
F	2.29	2.79	0.090	0.110
G	1.15	1.77	0.045	0.070
H	2.79	6.35	0.110	0.250
J	0.64	0.89	0.025	0.035
K	2.54	BSC	0.100	BSC
M	4.32	4.82	0.170	0.190
N	0.64	1.39	0.025	0.055
Q	0.51	0.76	0.020	0.030
R	2.04	2.49	0.080	0.115

TO-263 AA Outline



1. Gate
2. Collector
3. Emitter
4. Collector Bottom Side

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.06	4.83	.160	.190
A1	2.03	2.79	.080	.110
b	0.51	0.99	.020	.039
b2	1.14	1.40	.045	.055
c	0.46	0.74	.018	.029
c2	1.14	1.40	.045	.055
D	8.64	9.65	.340	.380
D1	7.11	8.13	.280	.320
E	9.65	10.29	.380	.405
E1	6.86	8.13	.270	.320
e	2.54	BSC	.100	BSC
L	14.61	15.88	.575	.625
L1	2.29	2.79	.090	.110
L2	1.02	1.40	.040	.055
L3	1.27	1.78	.050	.070
L4	0	0.38	0	.015
R	0.46	0.74	.018	.029

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