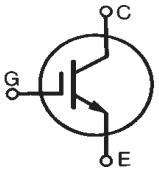
IXYS

Advance Technical Information

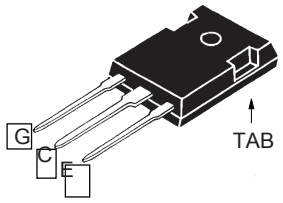
HiPerFAST™ IGBT

Short Circuit SOA Capability

	V_{CES}	I_{C90}	$V_{CE(sat)}$
IXSH24N60	**600V**	**24A**	**2.2V**
IXSH24N60A	**600V**	**24A**	**2.7V**



TO-247 (IXSH)



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

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} = 1MΩ	600	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	48	A
I_{C90}	T_C = 90°C	24	A
I_{CM}	T_C = 25°C, 1ms	96	A
SSOA	V_{GE} = 15V, T_J = 125°C, R_G = 10Ω	I_{CM} = 48	A
(RBSOA)	Clamped inductive load	@0.8 • V_{CES}	V
t_{SC} **(SCSOA)**	V_{GE} = 15V, V_{CE} = 360V, T_J = 125°C R_G = 82Ω, non repetitive	10	µs
P_C	T_C = 25°C	150	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{stg}		-55 ... +150	°C
M_d	Mounting torque	1.13 / 10	Nm/lb.in.
T_L	Maximum lead temperature for soldering	300	°C
T_{SOLD}	1.6mm (0.062 in.) from case for 10s	260	°C
Weight		6	g

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 250µA, V_{CE} = V_{GE}		600			V
$V_{GE(th)}$	I_C = 1.5mA, V_{CE} = V_{GE}		4.0		7.0	V
I_{CES}	V_{CE} = 0.8 • V_{CES}				200	µA
	V_{GE} = 0V	T_J = 125°C			1	mA
I_{GES}	V_{CE} = 0V, V_{GE} = ±20V				±100	nA
$V_{CE(sat)}$	I_C = 24A, V_{GE} = 15V, Note 1	IXSH24N60			2.2	V
		IXSH24N60A			2.7	V

Features

- International standard package JEDEC TO-247AD
- High frequency IGBT with guaranteed Short Circuit SOA Capability
- 2nd generation HDMOS™ process
- Low $V_{CE(SAT)}$ - for low on-state conduction losses
- MOS Gate turn-on - drive simplicity

Applications

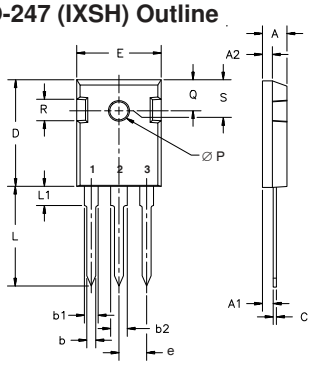
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies
- Welding

Advantages

- Easy to mount with 1 screw (isolated mounting screw hole)
- Switching speed for high frequency applications
- High power density

Symbol	Test Conditions (T_J = 25°C, unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
g_{fs}	I_C = 24A, V_{CE} = 10V, Note 1		9	23		S
$I_{C(ON)}$	V_{GE} = 15V, V_{CE} = 10V			65		A
C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz			1800		pF
C_{oes}				160		pF
C_{res}				45		pF
Q_g	I_C = 24A, V_{GE} = 15V, V_{CE} = 0.5 • V_{CES}			75	90	nC
Q_{ge}				20	30	nC
Q_{gc}				35	50	nC
$t_{d(on)}$	**Inductive load, T_J = 25°C** I_C = 24A, V_{GE} = 15V V_{CE} = 480V, R_G = 10Ω			100		ns
t_{ri}				200		ns
$t_{d(off)}$				450		ns
t_{fi}		IXSH24N60		500		ns
		IXSH24N60A		275		ns
E_{off}		IXSH24N60A		2.0		mJ
$t_{d(on)}$	**Inductive load, T_J = 125°C** I_C = 24A, V_{GE} = 15V V_{CE} = 480V, R_G = 10Ω			100		ns
t_{ri}				200		ns
E_{on}				1.2		mJ
$t_{d(off)}$				475		ns
		IXSH24N60		600		ns
t_{fi}		IXSH24N60A		450		ns
E_{off}		IXSH24N60		4.0		mJ
		IXSH24N60A		3.0		mJ
R_{thJC}					0.83	°C/W
R_{thCK}				0.21		°C/W

TO-247 (IXSH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Max.	Inches Min.	Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
∅P	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

Notes: 1. Pulse test, t ≤ 300μs; duty cycle, d ≤ 2%.

ADVANCE TECHNICAL INFORMATION

The product presented herein is under development. The Technical Specifications offered are derived from a subjective evaluation of the design, based upon prior knowledge and experience, and constitute a "considered reflection" of the anticipated result. IXYS reserves the right to change limits, test conditions, and dimensions without notice.