Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

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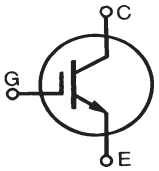
IXYS

Advance Technical Information

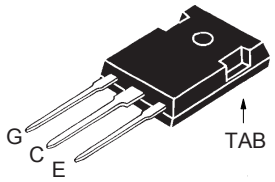
HiPerFAST™ IGBT

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

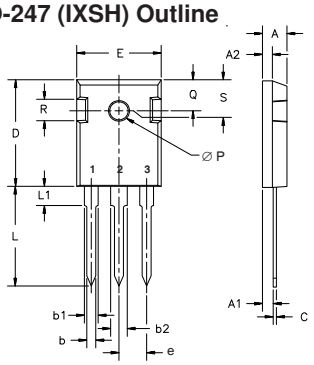
- AC motor speed control
- DC servo and robot drives
- DC choppers
- Uninterruptible power supplies (UPS)
- Switch-mode and resonant-mode power supplies
- Welding

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
ØP	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.