IXYS

IXSH10N120AU1

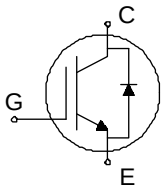
PRELIMINARY DATA SHEET

I_{C25} = 20 A
V_{CES} = 1200 V
$V_{CE(sat)}$ = 4.0 V

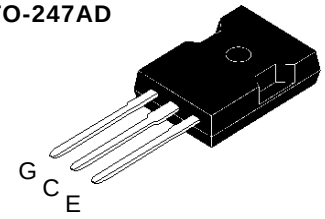
IGBT with Diode

"S" Series - Improved SCSOA Capability

Symbol	Test Conditions	Maximum Ratings	
V_{CES}	T_J = 25°C to 150°C	1200	V
V_{CGR}	T_J = 25°C to 150°C; R_{GE} = 1 MΩ	1200	V
V_{GES}	Continuous	±20	V
V_{GEM}	Transient	±30	V
I_{C25}	T_C = 25°C	20	A
I_{C90}	T_C = 90°C	10	A
I_{CM}	T_C = 25°C, 1 ms	40	A
SSOA (RBSOA)	V_{GE} = 15 V, T_J = 125°C, R_G = 150 Ω Clamped inductive load, L = 300 µH	I_{CM} = 20 @ 0.8 V_{CES}	A
t_{sc}	T_J = 125ºC, V_{CE} = 720 V; V_{GE} = 15V, R_G = 150Ω	5	µs
P_C	T_C = 25°C	100	W
T_J		-55 ... +150	°C
T_{JM}		150	°C
T_{STG}		-55 ... +150	°C
M_d	Mounting torque	1.15/10	Nm/lb-in.
Weight		6	g
Max. Lead Temperature for Soldering (1.6mm from case for 10s)		300	°C



TO-247AD



Features

- High voltage IGBT with guaranteed short circuit SOA capability.
- IGBT with anti-parallel diode in one package
- 2nd generation HDMOS™ process Low VCE(sat)
  - for minimum on-state conduction losses
- MOS Gate turn-on
  - drive simplicity

Applications

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

Advantages

- Saves space (two devices in one package
- Easy to mount(isolated mounting hole)
- Reduces assembly time and cost
- Runs cooler than equivalent 6-pack IGBTs
- Easier to package to meet UL requirements

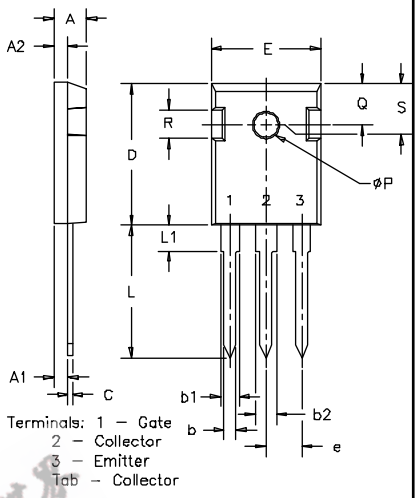
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)		Characteristic Values Min.	Typ.	Max.	
BV_{CES}	I_C = 3.25 mA, V_{GE} = 0 V		1200			V
$V_{GE(th)}$	I_C = 750 µA, V_{CE} = V_{GE}		4		8	V
I_{CES}	V_{CE} = 0.8 V_{CES}, V_{GE} = 0 V	T_J = 25°C			400	µA
	Note 2	T_J = 125°C			5	mA
I_{GES}	V_{CE} = 0 V, V_{GE} = ±20 V				± 100	nA
$V_{CE(sat)}$	I_C = I_{C90}, V_{GE} = 15 V				4.0	V

IXYS Corporation
3540 Bassett Street; Santa Clara, CA 95054
Tel: 408-982-0700; Fax: 408-496-0670

IXYS Semiconductor GmbH
Edisonstr.15, D-68623 Lampertheim, Germany
Phone: +49-6206-5030 Fax: +49-6206-503627

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 %	4			S
$I_{C(on)}$	V_{GE} = 15V, V_{CE} = 10 V		37		A
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		800		pF
C_{oes}			53		pF
C_{res}			15		pF
Q_g	$I_C = I_{C90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		40		nC
Q_{ge}			12		nC
Q_{gc}			20		nC
$t_{d(on)}$	Inductive load, T_J = 25°C		100		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V, L = 300µH		200		ns
$t_{d(off)}$	R_G = 120 Ω, V_{CLAMP} = 0.8 V_{CES}		250		ns
t_{fi}	Note 1		620		ns
t_c			750		ns
E_{off}			2.5		mJ
$t_{d(on)}$	Inductive load, T_J = 125°C		100		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V, L = 300µH		200		ns
$E_{(on)}$	R_G = 120 Ω		TBD		mJ
$t_{d(off)}$	V_{CLAMP} = 0.8 V_{CES}		300		ns
t_{fi}	Note 1		1100		ns
t_c			1200		ns
E_{off}			4.0		mJ
R_{thJC}				1.25	K/W
R_{thCK}			0.25		K/W

TO-247AD (IXSH)



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.209	4.7	5.3
A_1	.087	.102	2.2	2.54
A_2	.059	.098	2.2	2.6
b	.040	.055	1.0	1.4
b_1	.065	.084	1.65	2.13
b_2	.113	.123	2.87	3.12
C	.016	.031	.4	.8
D	.819	.845	20.80	21.46
E	.610	.640	15.75	16.26
e	.215 BSC		5.45 BSC	
L	.780	.800	19.81	20.32
L1		.177		4.50
øP	.140	.144	3.55	3.65
Q	.212	.244	5.4	6.2
R	.170	.216	4.32	5.49
S	.242 BSC		6.15 BSC	

Reverse Diode (FRED)

	Characteristic Values (TJ = 25ºC unless otherwise specified) Min.	Typ.	Max.	
V_F	$I_F = I_{C90}$, V_{GE} = 0V		2.6	V
	Pulse test, t< 300 µs, duty cycle < 2% T_J = 125ºC		2.3	
t_{rr}	I_F = 1A; di/dt = -50A/µs; V_R = 30V; T_J = 25ºC	50	70	ns
I_{RM}	$I_F = I_{C90}$, V_{GE} = 0V, $-di_F/dt$ = 100 A/µs	6.5	7.2	A
t_{rr}	T_J = 100ºC, V_R = 540V	300		ns
R_{thJC}			2.0	K/W

Notes:
1. Switching times may increase for V_{CE} (Clamp) > 0.8 V_{CES}, higher T_J or Rg values.
2. Device must be heatsunk for high temperature leakage current measurements to avoid thermal runaway.

IXYS Corporation
3540 Bassett Street; Santa Clara, CA 95054
Tel: 408-982-0700; Fax: 408-496-0670

IXYS Semiconductor GmbH
Edisonstr. 15, D-68623 Lampertheim, Germany
Phone: +49-6206-5030 Fax: +49-6206-503627