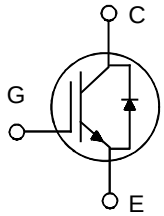
IXYS

IGBT with Diode

IXSH25N120AU1

"S" Series - Improved SCSOA Capability

I_{C25} = 50 A
V_{CES} = 1200 V
$V_{CE(sat)}$ = 4.0 V



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	50	A
I_{C90}	T_C = 90°C	25	A
I_{CM}	T_C = 25°C, 1 ms	80	A
SSOA (RBSOA)	V_{GE} = 15 V, T_J = 125°C, R_G = 33 Ω Clamped inductive load, L = 100 µH	I_{CM} = 50 @ 0.8 V_{CES}	A
t_{sc}	T_J = 125ºC, V_{CE} = 720 V; V_{GE} = 15V, R_G = 33Ω	10	µs
P_C	T_C = 25°C	200	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

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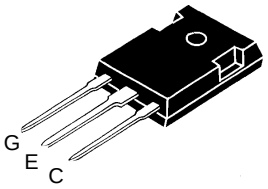


Features

- High frequency IGBT with guaranteed short circuit SOA capability.
- IGBT with anti-parallel diode in one package
- 2nd generation HDMOS™ process
  Low $V_{CE(sat)}$
  - 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
- Operates cooler
- Easier to assemble

Symbol	Test Conditions		Characteristic Values (T_J = 25°C unless otherwise specified) Min.	Typ.	Max.
BV_{CES}	I_C = 4 mA, V_{GE} = 0 V		1200		V
$V_{GE(th)}$	I_C = 2.5 mA, V_{CE} = V_{GE}		4		8 V
I_{CES}	V_{CE} = 0.8 V_{CES}, V_{GE} = 0 V	T_J = 25°C			500 µA
	Note 2	T_J = 125°C			8 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

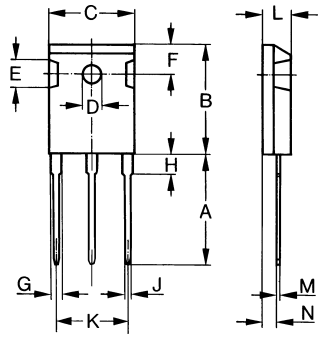
Symbol	Test Conditions (T_J = 25°C unless otherwise specified)	Characteristic Values Min.	Typ.	Max.	
g_{fs}	$I_C = I_{C90}$, V_{CE} = 10 V, Pulse test, t ≤ 300 µs, duty cycle ≤ 2 %	10	17		S
$I_{C(on)}$	V_{GE} = 15V, V_{CE} = 10 V		140		A
C_{ies}	V_{CE} = 25 V, V_{GE} = 0 V, f = 1 MHz		2850		pF
C_{oes}			210		pF
C_{res}			50		pF
Q_g	$I_C = I_{c90}$, V_{GE} = 15 V, V_{CE} = 0.5 V_{CES}		120		nC
Q_{ge}			30		nC
Q_{gc}			50		nC
$t_{d(on)}$	Inductive load, T_J = 25°C		100		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V, L = 100µH		200		ns
$t_{d(off)}$	R_G = 18 Ω, V_{CLAMP} = 0.8 V_{CES}		450		ns
t_{fi}	Note 1		650		ns
t_c			800		ns
E_{off}			9.6		mJ
$t_{d(on)}$	Inductive load, T_J = 125°C		100		ns
t_{ri}	$I_C = I_{C90}$, V_{GE} = 15 V, L = 100µH		200		ns
$E_{(on)}$	R_G = 18 Ω		1.8		mJ
$t_{d(off)}$	V_{CLAMP} = 0.8 V_{CES}		450		ns
t_{fi}	Note 1		900		ns
t_c			1200		ns
E_{off}			17		mJ
R_{thJC}				0.63	K/W
R_{thCK}			0.25		K/W

Reverse Diode (FRED)

			Characteristic Values Min.	Typ.	Max.	
	(TJ = 25ºC unless otherwise specified)					
V_F	$I_F = I_{C90}$, V_{GE} = 0V				2.5	V
	Pulse test, t< 300 µs, duty cycle < 2%	T_J = 125ºC			2.2	V
t_{rr}	I_F = 1A; di/dt = -100/µs; V_R = 30V;	T_J = 25ºC		40	60	ns
I_{RM}	$I_F = I_{C90}$, V_{GE} = 0V, $-di_F/dt$ = 240 A/µs			16		A
t_{rr}	T_J = 100ºC, V_R = 540V			300		ns
R_{thJC}					1.0	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 measurements to avoid thermal runaway.

TO-247 AD (IXSH) Outline



Dim.	Millimeter Min.	Max.	Inches 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