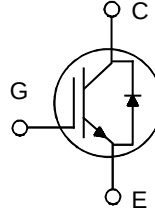


IGBT with Diode IXSH25N120AU1

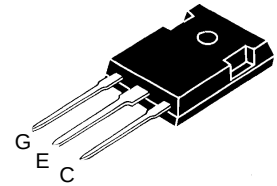
"S" Series - Improved SCSOA Capability

$$\begin{aligned} I_{C25} &= 50 \text{ A} \\ V_{CES} &= 1200 \text{ V} \\ V_{CE(sat)} &= 4.0 \text{ V} \end{aligned}$$



Symbol	Test Conditions	Maximum Ratings	
V_{CES}	$T_J = 25^\circ\text{C}$ to 150°C	1200	V
V_{CGR}	$T_J = 25^\circ\text{C}$ to 150°C ; $R_{GE} = 1 \text{ M}\Omega$	1200	V
V_{GES}	Continuous	± 20	V
V_{GEM}	Transient	± 30	V
I_{C25}	$T_C = 25^\circ\text{C}$	50	A
I_{C90}	$T_C = 90^\circ\text{C}$	25	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	80	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_J = 125^\circ\text{C}$, $R_G = 33 \Omega$ Clamped inductive load, $L = 100 \mu\text{H}$	$I_{CM} = 50$ @ $0.8 V_{CES}$	A
t_{sc}	$T_J = 125^\circ\text{C}$, $V_{CE} = 720 \text{ V}$; $V_{GE} = 15 \text{ V}$, $R_G = 33 \Omega$	10	μs
P_C	$T_C = 25^\circ\text{C}$	200	W
T_J		-55 ... +150	$^\circ\text{C}$
T_{JM}		150	$^\circ\text{C}$
T_{STG}		-55 ... +150	$^\circ\text{C}$
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	$^\circ\text{C}$

TO-247 AD



Features

- High frequency IGBT with guaranteed short circuit SOA capability.
- IGBT with anti-parallel diode in one package
- 2nd generation HDMOSTM 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

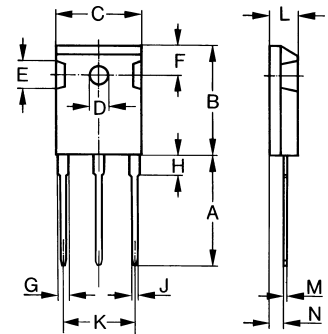
Advantages

- 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 ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 4 \text{ mA}$, $V_{GE} = 0 \text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 2.5 \text{ mA}$, $V_{CE} = V_{GE}$	4		8 V
I_{CES}	$V_{CE} = 0.8 V_{CES}$, $V_{GE} = 0 \text{ V}$ Note 2			500 μA 8 mA
I_{GES}	$V_{CE} = 0 \text{ V}$, $V_{GE} = \pm 20 \text{ V}$			$\pm 100 \text{ nA}$
$V_{CE(sat)}$	$I_C = I_{C90}$, $V_{GE} = 15 \text{ V}$			4.0 V

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$I_C = I_{C90}, V_{CE} = 10\text{ V}$, Pulse test, $t \leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$	10	17	S
$I_{C(on)}$	$V_{GE} = 15\text{ V}$, $V_{CE} = 10\text{ V}$		140	A
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		2850	pF
C_{oes}			210	pF
C_{res}			50	pF
Q_g	$I_C = I_{C90}, V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		120	nC
Q_{ge}			30	nC
Q_{gc}			50	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$		100	ns
t_{ri}	$I_C = I_{C90}, V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$		200	ns
$t_{d(off)}$	$R_G = 18\text{ }\Omega$, $V_{CLAMP} = 0.8 V_{CES}$		450	ns
t_{fi}	Note 1		650	ns
t_c			800	ns
E_{off}			9.6	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$		100	ns
t_{ri}	$I_C = I_{C90}, V_{GE} = 15\text{ V}$, $L = 100\text{ }\mu\text{H}$		200	ns
$E_{(on)}$	$R_G = 18\text{ }\Omega$		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

TO-247 AD (IXSH) Outline



Dim.	Millimeter		Inches	
	Min.	Max.	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

Reverse Diode (FRED)

Characteristic Values
($T_J = 25^\circ\text{C}$ unless otherwise specified)

		Min.	Typ.	Max.
V_F	$I_F = I_{C90}, V_{GE} = 0\text{ V}$ Pulse test, $t < 300\text{ }\mu\text{s}$, duty cycle $< 2\%$			2.5 V
	$T_J = 125^\circ\text{C}$			2.2 V
t_{rr}	$I_F = 1\text{ A}$; $di/dt = -100\text{ }\mu\text{s}$; $V_R = 30\text{ V}$; $T_J = 25^\circ\text{C}$	40	60	ns
I_{RM}	$I_F = I_{C90}, V_{GE} = 0\text{ V}$, $-di_F/dt = 240\text{ A}/\mu\text{s}$	16		A
t_{rr}	$T_J = 100^\circ\text{C}$, $V_R = 540\text{ V}$	300		ns
R_{thJC}				1.0 K/W

Notes:

- 1) Switching times may increase for $V_{CE}(\text{Clamp}) > 0.8 V_{CES}$, higher T_J or R_G values.
- 2) Device must be heatsunk for high temperature measurements to avoid thermal runaway.