

IGBT with Diode

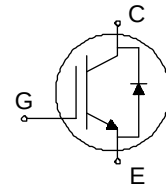
"S" Series - Improved SCSOA Capability

$$I_{C25} = 20 \text{ A}$$

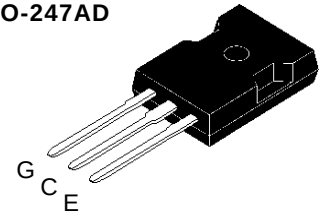
$$V_{CES} = 1200 \text{ V}$$

$$V_{CE(sat)} = 4.0 \text{ V}$$

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}	$T_C = 25^\circ\text{C}$	20	A
I_{C90}	$T_C = 90^\circ\text{C}$	10	A
I_{CM}	$T_C = 25^\circ\text{C}$, 1 ms	40	A
SSOA (RBSOA)	$V_{GE} = 15 \text{ V}$, $T_J = 125^\circ\text{C}$, $R_G = 150 \Omega$ Clamped inductive load, $L = 300 \mu\text{H}$	$I_{CM} = 20$ @ $0.8 V_{CES}$	A
t_{sc}	$T_J = 125^\circ\text{C}$, $V_{CE} = 720 \text{ V}$; $V_{GE} = 15 \text{ V}$, $R_G = 150 \Omega$	5	μs
P_C	$T_C = 25^\circ\text{C}$	100	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-247AD



Features

- High voltage 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

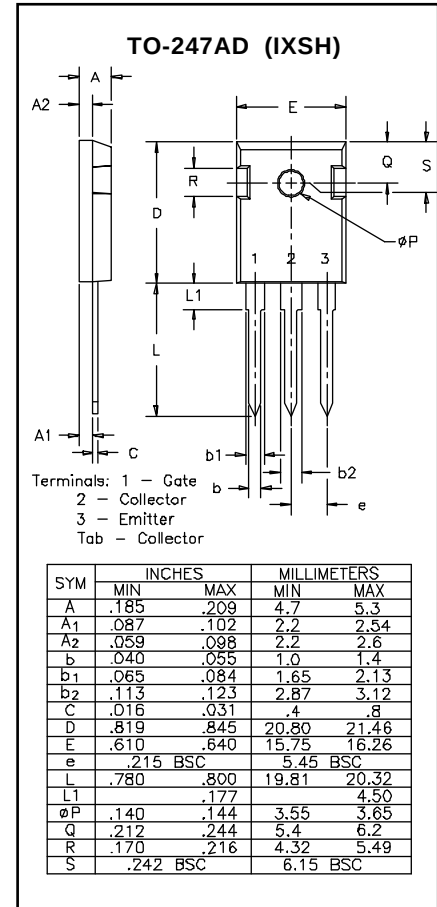
- AC motor speed control
- DC servo and robot drives
- Uninterruptible power supplies (UPS)
- Switched-mode and resonant-mode power supplies
- DC choppers

Advantages

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

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$ unless otherwise specified)	Characteristic Values		
		Min.	Typ.	Max.
BV_{CES}	$I_C = 3.25 \text{ mA}$, $V_{GE} = 0 \text{ V}$	1200		V
$V_{GE(th)}$	$I_C = 750 \mu\text{A}$, $V_{CE} = V_{GE}$	4		8 V
I_{CES}	$V_{CE} = 0.8 V_{CES}$, $V_{GE} = 0 \text{ V}$ Note 2			400 μA 5 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	Characteristic Values ($T_J = 25^\circ\text{C}$ unless otherwise specified)		
		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 $\leq 2\%$	4		S
$I_{C(on)}$	$V_{GE} = 15\text{ V}$, $V_{CE} = 10\text{ V}$		37	A
C_{ies}	$V_{CE} = 25\text{ V}$, $V_{GE} = 0\text{ V}$, $f = 1\text{ MHz}$		800	pF
C_{oes}			53	pF
C_{res}			15	pF
Q_g	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $V_{CE} = 0.5 V_{CES}$		40	nC
Q_{ge}			12	nC
Q_{gc}			20	nC
$t_{d(on)}$	Inductive load, $T_J = 25^\circ\text{C}$		100	ns
t_{ri}	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 300\mu\text{H}$		200	ns
$t_{d(off)}$	$R_G = 120\text{ }\Omega$, $V_{CLAMP} = 0.8 V_{CES}$		250	ns
t_{fi}	Note 1		620	ns
t_c			750	ns
E_{off}			2.5	mJ
$t_{d(on)}$	Inductive load, $T_J = 125^\circ\text{C}$		100	ns
t_{ri}	$I_C = I_{C90}$, $V_{GE} = 15\text{ V}$, $L = 300\mu\text{H}$		200	ns
$E_{(on)}$	$R_G = 120\text{ }\Omega$		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



Symbol	Test Conditions	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 $< 2\%$ $T_J = 125^\circ\text{C}$			2.6 V 2.3
t_{rr}	$I_F = 1\text{ A}$; $di/dt = -50\text{ A}/\mu\text{s}$; $V_R = 30\text{ V}$; $T_J = 25^\circ\text{C}$		50	70 ns
I_{RM}	$I_F = I_{C90}$, $V_{GE} = 0\text{ V}$, $-di_F/dt = 100\text{ A}/\mu\text{s}$		6.5	7.2 A
t_{rr}	$T_J = 100^\circ\text{C}$, $V_R = 540\text{ V}$		300	ns
R_{thJC}				2.0 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 leakage current measurements to avoid thermal runaway.

IXYS reserves the right to change limits, test conditions, and dimensions.