

IGBT in TO-247

Features

- 1200V 40A, $V_{CE(sat)}(typ.) = 1.9 V @ V_{GE}=15V$
- SPT (Soft Punch Through) technology
- Lower losses
- Higher system efficiency
- Excellent short-circuit capability
- Square RBSOA

Benefits

- High Efficiency for Motor Control
- Rugged Performance
- Excellent Current Sharing in Parallel Operation

Mechanical Data

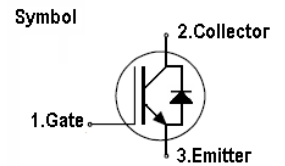
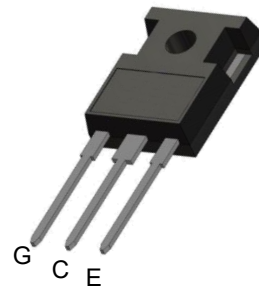
- **Case:** TO-247 (plastic package).
Lead free; RoHS compliant
- **Molding Compound Flammability Rating:**
UL 94 V-0
- **Terminals:** High temperature soldering guaranteed:
260 °C/10 sec. at terminals

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 30	V
I_C	Continuous Collector Current ($T_C=25^\circ C$)	80	A
	Continuous Collector Current ($T_C=100^\circ C$)	40	A
I_{CM}	Pulsed Collector Current (Note 1)	160	A
I_F	Diode Continuous Forward Current ($T_C=100^\circ C$)	40	A
I_{FM}	Diode Maximum Forward Current (Note 1)	160	A
t_{sc}	Short Circuit Withstand Time	10	us
I_{sc}	Short Circuit Current	160	A
P_D	Maximum Power Dissipation ($T_C=25^\circ C$)	378	W
	Maximum Power Dissipation ($T_C=100^\circ C$)	151	W
T_J	Operating Junction Temperature Range	-55 to +150	°C
T_{STG}	Storage Temperature Range	-55 to +150	°C

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case for IGBT	0.33	°C/ W
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.65	°C/ W
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	40	°C/ W



Ordering Information

Part Number	Package	Marking
CXG40S120H	TO-247	DXG40S120H

Applications

RDSEMI's IGBTs offer lower losses and higher energy for application such as motor drive ,UPS, inverter and other soft switching applications.

Electrical Characteristics (TC=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{CES}	Collector-Emitter Breakdown Voltage	$V_{GE}=0V, I_C=250\mu A$	1200	-	-	V
I_{CES}	Collector-Emitter Leakage Current	$V_{CE}=1200V, V_{GE}=0V$	-	-	250	μA
I_{GES}	Gate Leakage Current, Forward	$V_{GE}=30V, V_{CE}=0V$	-	-	100	nA
	Gate Leakage Current, Reverse	$V_{GE}=-30V, V_{CE}=0V$	-	-	-100	nA
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=250\mu A$	4.5	5.0	5.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=40A$	-	1.9	2.2	V
Q_g	Total Gate Charge	$V_{CC}=960V$ $V_{GE}=15V$ $I_C=40A$	-	230		nC
Q_{ge}	Gate-Emitter Charge		-	25		nC
Q_{gc}	Gate-Collector Charge		-	150		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=15V$ $I_C=40A$ $R_G=10\Omega$ Inductive Load $T_C=25^\circ C$	-	29	-	ns
t_r	Turn-on Rise Time		-	76	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	304	-	ns
t_f	Turn-off Fall Time		-	163	-	ns
E_{on}	Turn-on Switching Loss		-	3.95	-	mJ
E_{off}	Turn-off Switching Loss		-	2.7	-	mJ
E_{ts}	Total Switching Loss		-	6.65	-	mJ
C_{ies}	Input Capacitance	$V_{CE}=25V$ $V_{GE}=0V$ $f=1MHz$	-	1600	-	pF
C_{oes}	Output Capacitance		-	270	-	pF
C_{res}	Reverse Transfer Capacitance		-	165	-	pF
R_{Gint}	Integrated gate resistor	$f=1M; V_{pp}=1V$		4.5		Ω

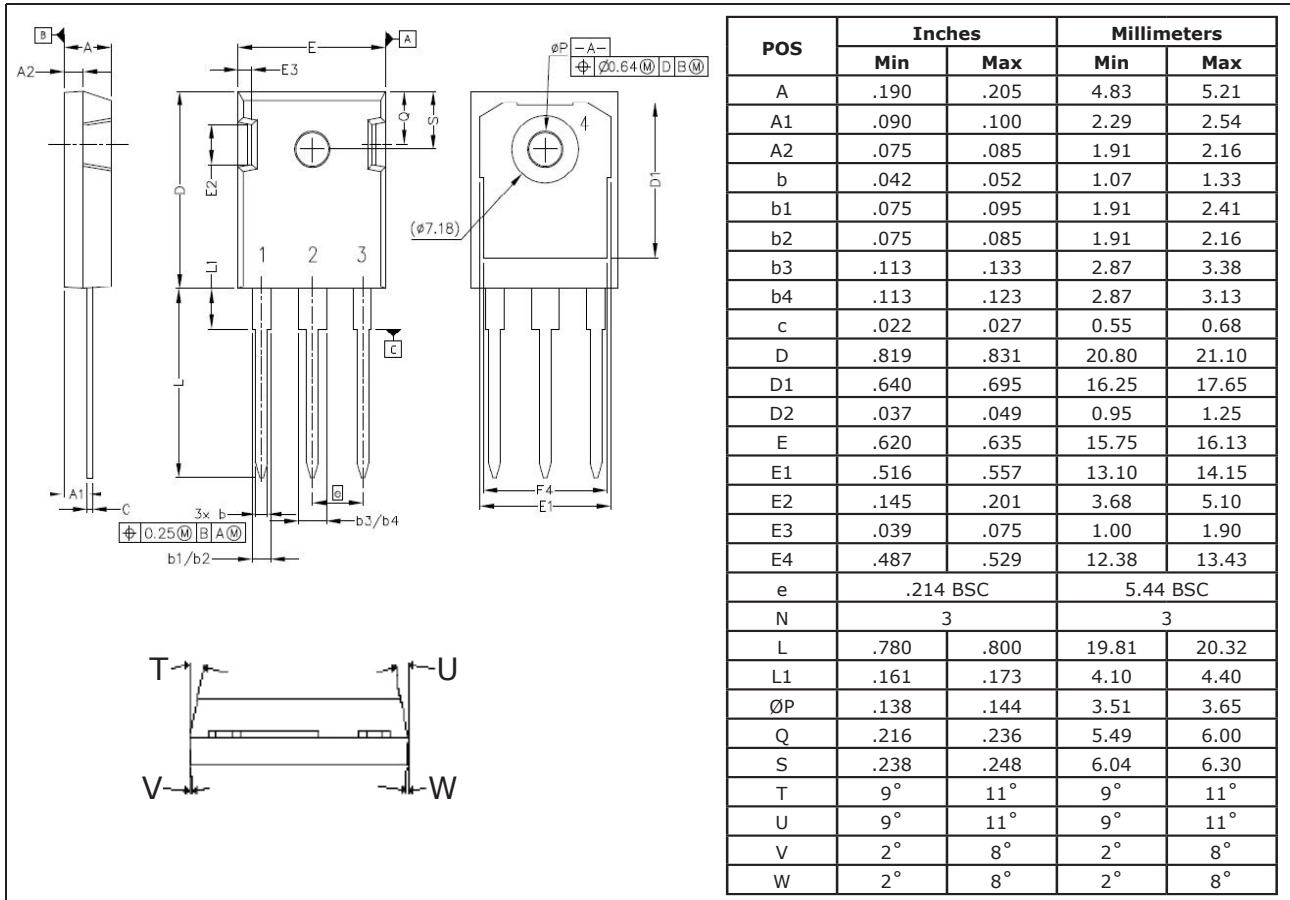
Electrical Characteristics of Diode (TC=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_F	Diode Forward Voltage	$I_F=40A$	-	1.9	2.2	V
t_{rr}	Diode Reverse Recovery Time	$V_{CE}=600V$ $I_F=40A$	-	130		ns
I_{rr}	Diode peak Reverse Recovery Current		-	25		A
Q_{rr}	Diode Reverse Recovery Charge	$dI_F/dt=500A/\mu s$	-	2100		nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature

Package Dimensions



Ordering information

Order code	Package	Packaging option	Base quantity	Packaging specification
CXG40S120H	TO-247	Tube/BOX	2000pcs / BOX	EIA STD RS-481

Revision history

Date	Revision	Changes
28-May-2020	1.0	Initial release

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