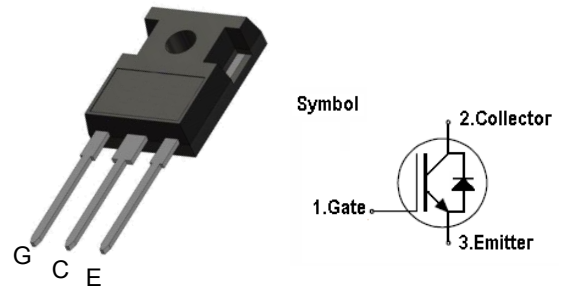


## IGBT in TO-247

### Features

- 1200V 40A,  $V_{CE(sat)(typ.)} = 2.3 V @ V_{GE}=15V$
- SPT (Soft Punch Through) technology
- Lower losses
- Higher system efficiency
- Excellent short-circuit capability
- Square RBSOA



### 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

### Benefits

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

### Applications

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

### Absolute Maximum Ratings

Symbol	Parameter	Value	Units
$V_{CES}$	Collector-Emitter Voltage	1200	V
$V_{GES}$	Gate-Emitter Voltage	$\pm 30$	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

**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	$\mu A$
$I_{GES}$	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	$V_{GE}=15V, I_C=40A$	-	2.3	2.6	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 $T_C=25^\circ C$	-	30	-	ns
$t_r$	Turn-on Rise Time		-	73	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	280	-	ns
$t_f$	Turn-off Fall Time		-	39	-	ns
Eon	Turn-on Switching Loss		-	4.3	-	mJ
Eoff	Turn-off Switching Loss		-	1.7	-	mJ
Ets	Total Switching Loss		-	6.0	-	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		$\Omega$

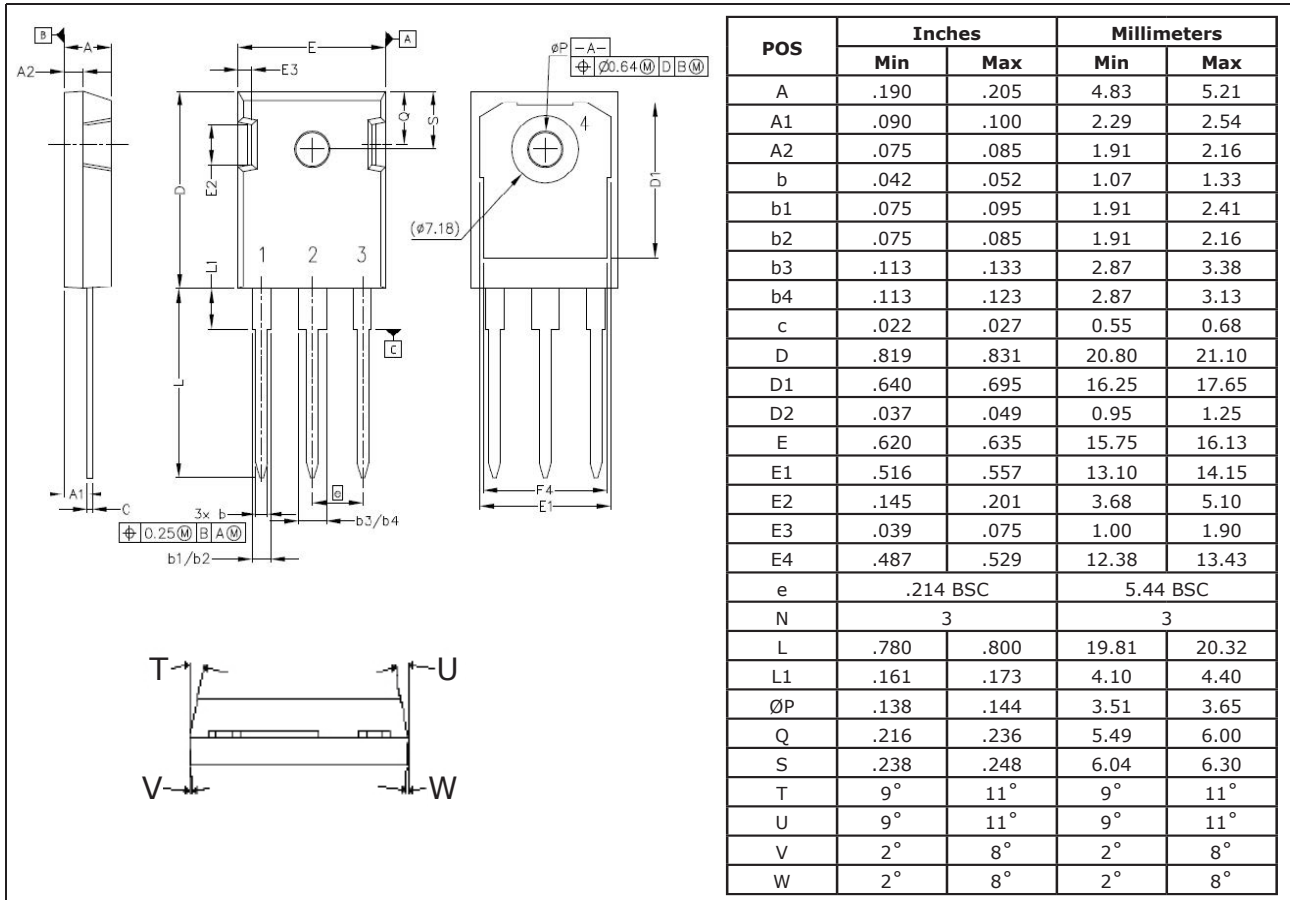
**Electrical Characteristics of Diode** (TC=25°C unless otherwise noted)

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
CXG40S120HU	TO-247	Tube/BOX	2000pcs / BOX	EIA STD RS-481

## Revision history

Date	Revision	Changes
23-May-2018	1.0	Initial release

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