

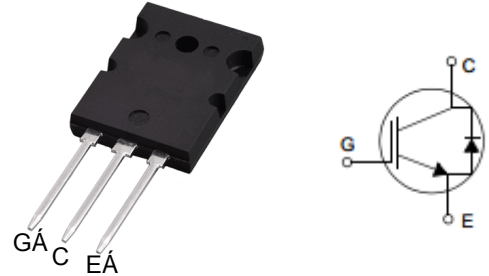
## IGBT in TO-264

### Features

- 1200V I 0A,  $V_{CE(sat)(typ.)} = 2.0 V@40A$
- Higher system efficiency
- Soft current turn-off waveforms

### Benefits

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



### Mechanical Data

- **Case:** TO-2 $\hat{I}$  I (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

### 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	<u>30</u>	V
$I_C$	Continuous Collector Current ( $T_C=25\text{ }^\circ\text{C}$ )	80	A
	Continuous Collector Current ( $T_C=100\text{ }^\circ\text{C}$ )	40	A
$I_{CM}$	Pulsed Collector Current (Note 1)	160	A
$I_F$	Diode Continuous Forward Current ( $T_C=100\text{ }^\circ\text{C}$ )	40	A
$I_{FM}$	Diode Maximum Forward Current (Note 1)	160	A
$t_{sc}$	Short Circuit Withstand Time	10	us
$t_{sc(Max)}$	Maximum Short Circuit Withstand Time	>23	us
$I_{sc}$	Short Circuit Current	360	A
$P_D$	Maximum Power Dissipation ( $T_C=25\text{ }^\circ\text{C}$ )	500	W
	Maximum Power Dissipation ( $T_C=100\text{ }^\circ\text{C}$ )	200	W
$T_J$	Operating Junction Temperature Range	-55 to +150	$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150	$^\circ\text{C}$

### Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th\ j-c}$	Thermal Resistance, Junction to case for IGBT	0.6	$^\circ\text{C/W}$
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.1	$^\circ\text{C/W}$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	6	$^\circ\text{C/W}$

**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	-	5.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE} = 15V, I_C = 40A$	-	2.0	2.4	V
$Q_g$	Total Gate Charge	$V_{CC} = 960V$ $V_{GE} = 15V$ $I_C = 40A$	-	195		nC
$Q_{ge}$	Gate-Emitter Charge		-	90		nC
$Q_{gc}$	Gate-Collector Charge		-	105		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 600V$ $V_{GE} = 15V$ $I_C = 40A$ $R_G = 10\Omega$ Inductive Load $T_C = 25^\circ C$	-	38	-	ns
$t_r$	Turn-on Rise Time		-	58	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	480	-	ns
$t_f$	Turn-off Fall Time		-	52	-	ns
$E_{on}$	Turn-on Switching Loss		-	2.34	-	mJ
$E_{off}$	Turn-off Switching Loss		-	2.48	-	mJ
$E_{ts}$	Total Switching Loss		-	4.82	-	mJ
$C_{ies}$	Input Capacitance	$V_{CE} = 25V$	-	3000	-	pF
$C_{oes}$	Output Capacitance	$V_{GE} = 0V$	-	405	-	pF
$C_{res}$	Reverse Transfer Capacitance	$f = 1MHz$	-	245	-	pF
$R_{Gint}$	Integrated gate resistor	$f = 1M; V_{pp} = 1V$		2.5		$\Omega$

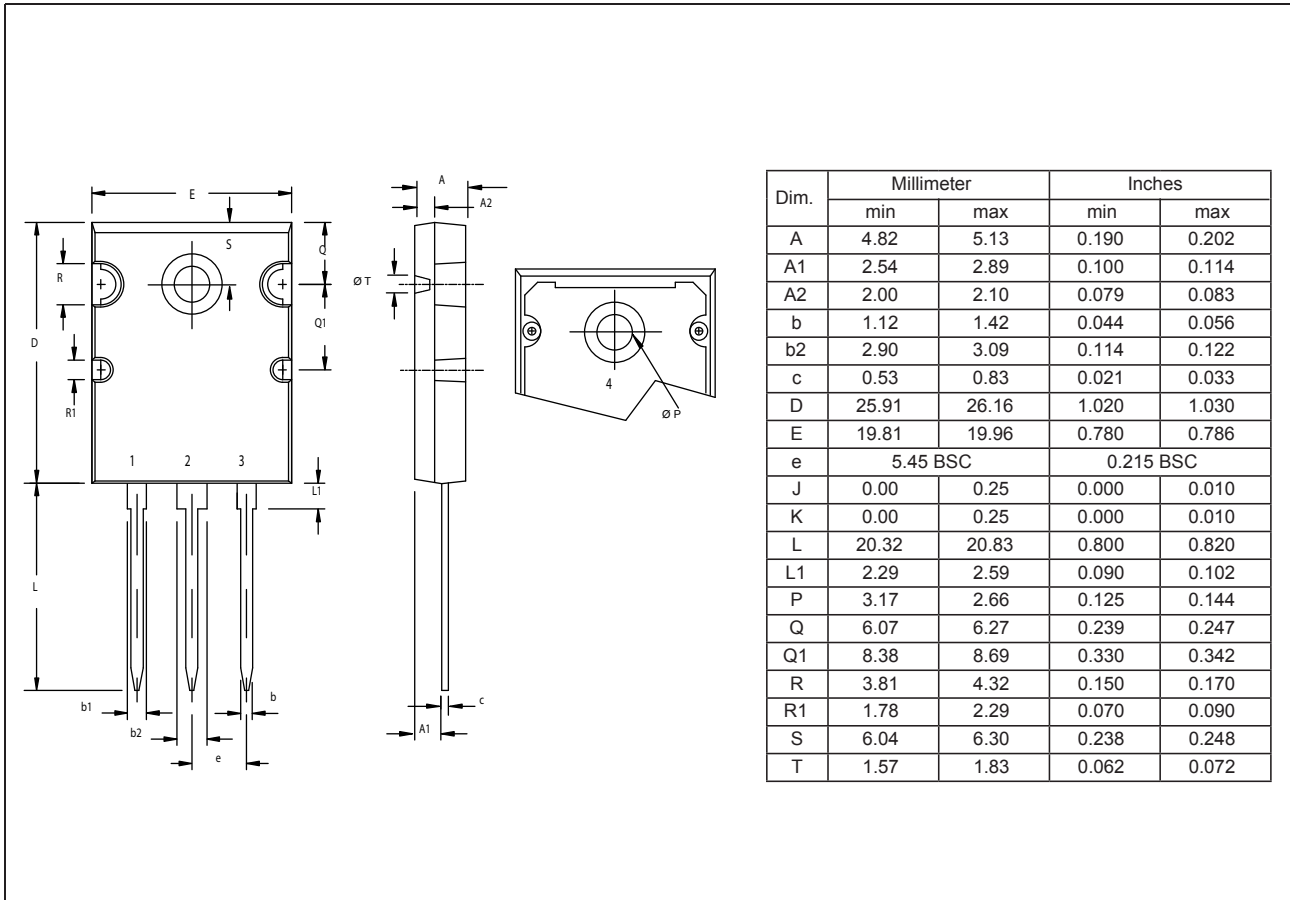
**Electrical Characteristics of Diode** (TC=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_F$	Diode Forward Voltage	$I_F = 40A$	-	2.8	3.2	V
$t_{rr}$	Diode Reverse Recovery Time	$V_{CE} = 600V$ $I_F = 40A$ $di_F/dt = 500A/\mu s$	-	106		ns
$I_{rr}$	Diode peak Reverse Recovery Current		-	19.3		A
$Q_{rr}$	Diode Reverse Recovery Charge		-	1093		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
CXG40N120J	TO-264	Tube/BOX	20pcs / Tube	

## Revision history

Date	Revision	Changes
23-May-2012	1.0	Initial release

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