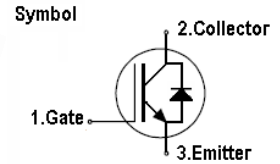
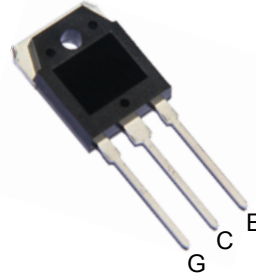


## IGBT in TO-3P

### Features

- 650V 40A,  $V_{CE(sat)}(typ.) = 2.10 V@40A$
- Field Stop IGBT Technology
- 10 $\mu$ s Short Circuit Capability
- Square RBSOA
- Positive  $V_{CE (on)}$  Temperature Coefficient



### 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	650	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	260	A
$P_D$	Maximum Power Dissipation ( $T_C=25^\circ C$ )	367	W
$P_D$	Maximum Power Dissipation ( $T_C=100^\circ C$ )	147	W
$T_J$	Operating Junction Temperature Range	-55 to +150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 to +150	$^\circ C$

### Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{th j-c}$	Thermal Resistance, Junction to case for IGBT	0.34	$^\circ C/W$
$R_{th j-c}$	Thermal Resistance, Junction to case for Diode	0.96	$^\circ C/W$
$R_{th j-a}$	Thermal Resistance, Junction to Ambient	40	$^\circ C/W$

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$BV_{CES}$	Collector-Emitter Breakdown Voltage	$V_{GE} = 0V, I_C = 250\mu A$	650		-	V
$I_{CES}$	Collector-Emitter Leakage Current	$V_{CE} = 650V, V_{GE} = 0V$	-	-	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	$V_{GE} = V_{CE}, I_C = 250\mu A$	4.0		5.5	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE} = 15V, I_C = 40A$	-	2.10		V
$Q_g$	Total Gate Charge	$V_{CC} = 480V$ $V_{GE} = 15V$ $I_C = 40A$	-	165		nC
$Q_{ge}$	Gate-Emitter Charge		-	22		nC
$Q_{gc}$	Gate-Collector Charge		-	85		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC} = 400V$ $V_{GE} = 15V$ $I_C = 40A$ $R_G = 10\Omega$ Inductive Load $T_C = 25^\circ C$	-	27	-	ns
$t_r$	Turn-on Rise Time		-	60	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	153	-	ns
$t_f$	Turn-off Fall Time		-	35	-	ns
$E_{on}$	Turn-on Switching Loss		-	1.68	-	mJ
$E_{off}$	Turn-off Switching Loss		-	0.83	-	mJ
$C_{ies}$	Input Capacitance	$V_{CE} = 25V$ $V_{GE} = 0V$ $f = 1MHz$	-	1750	-	pF
$C_{oes}$	Output Capacitance		-	204	-	pF
$C_{res}$	Reverse Transfer Capacitance		-	70	-	pF
$R_{Gint}$	Integrated gate resistor	$f = 1M; V_{pp} = 1V$		1.60		$\Omega$

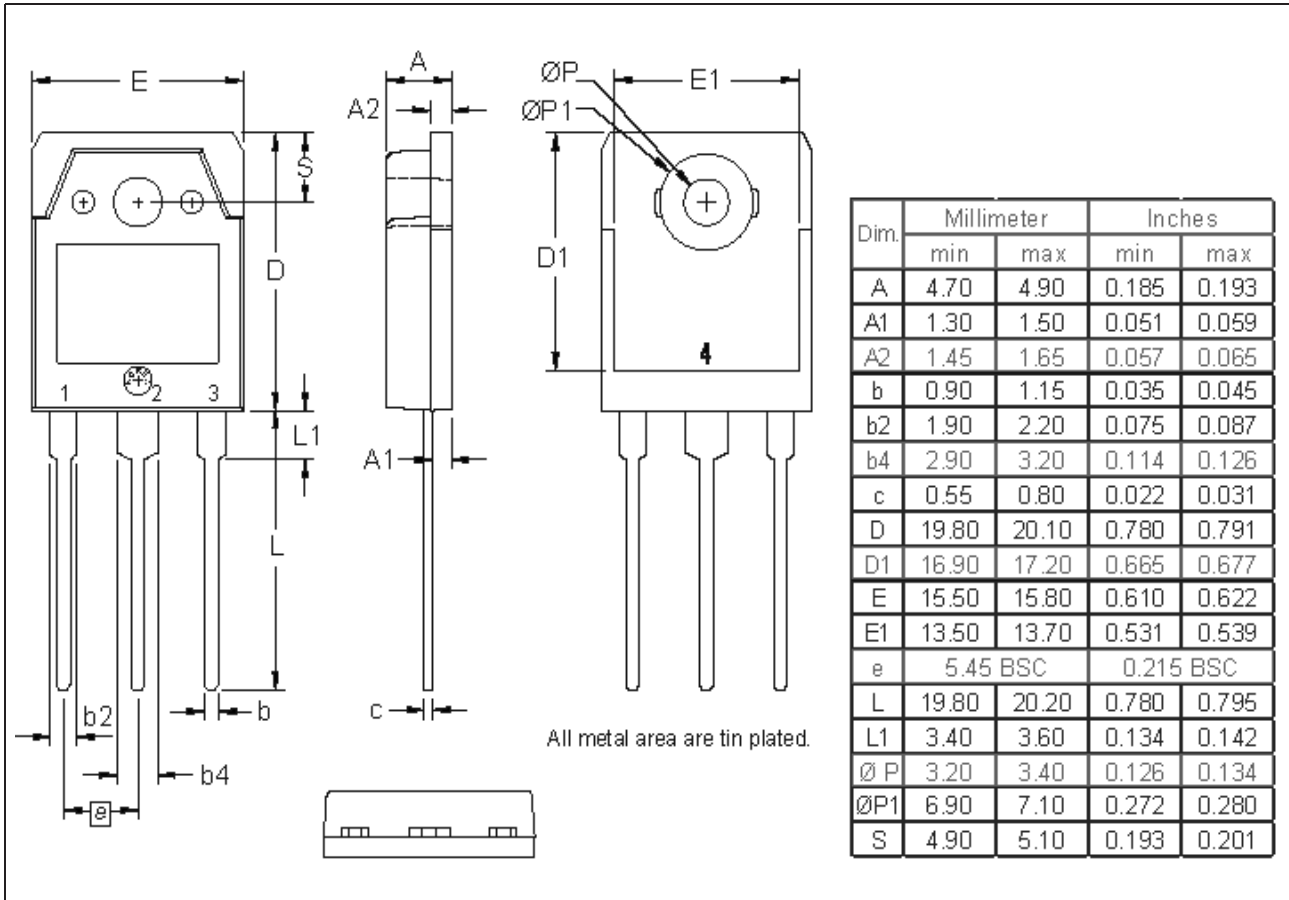
**Electrical Characteristics of Diode** (TC=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_F$	Diode Forward Voltage	$I_F = 20A$	-	1.6		V
$t_{rr}$	Diode Reverse Recovery Time	$V_{CE} = 400V$ $I_F = 20A$ $di_F/dt = 500A/\mu s$	-	73		ns
$I_{rrm}$	Diode peak Reverse Recovery Current		-	10.5		A
$Q_{rr}$	Diode Reverse Recovery Charge		-	420		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
CXG40N65AS	TO-3P	Tube/BOX	2000pcs / BOX	

## Revision history

Date	Revision	Changes
23-May-2012	1.0	Initial release

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