

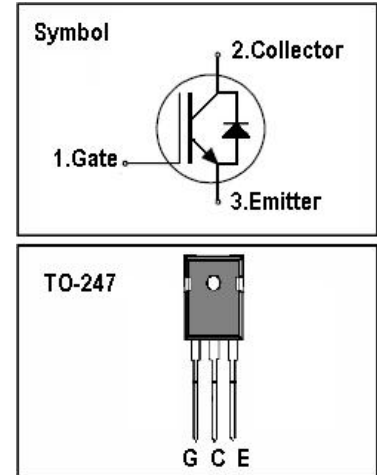
## IGBT

### Features

- 650V 40A,  $V_{CE(sat)(typ.)} = 2.3\text{ V}@40\text{A}$
- Field Stop IGBT Technology.
- 10 $\mu\text{s}$  Short Circuit Capability.
- Square RBSOA.
- Positive VCE (on) Temperature Coefficient.

### Benefits

- High Efficiency for Welding, Inductive heating, UPS and other high frequency application
- Rugged Performance
- Excellent Current Sharing in Parallel Operation



### Ordering Information

Part Number	Package	Marking
CXG40N65HSWU	TO-247	DXG40N65HSWU

### 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 ( $T_C=25\text{ }^\circ\text{C}$ )	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	$\mu\text{s}$
$I_{sc}$	Short Circuit Current	220	A
$P_D$	Maximum Power Dissipation ( $T_C=25\text{ }^\circ\text{C}$ )	312	W
$P_D$	Maximum Power Dissipation ( $T_C=100\text{ }^\circ\text{C}$ )	125	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
$R_{th\text{-}j\text{-}c}$	Thermal Resistance, Junction to case for IGBT	0.40	$^\circ\text{C}/\text{W}$
$R_{th\text{-}j\text{-}c}$	Thermal Resistance, Junction to case for Diode	0.81	$^\circ\text{C}/\text{W}$
$R_{th\text{-}j\text{-}a}$	Thermal Resistance, Junction to Ambient	80	$^\circ\text{C}/\text{W}$

## Electrical Characteristics ( $T_C=25^\circ\text{C}$ 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	$V_{GE}=15V, I_C=40A$	-	2.3		V
$Q_g$	Total Gate Charge	$V_{CC}=480V$ $V_{GE}=15V$ $I_C=40A$	-	99		nC
$Q_{ge}$	Gate-Emitter Charge		-	13		nC
$Q_{gc}$	Gate-Collector Charge		-	49		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=400V$ $V_{GE}=15V$ $I_C=40A$ $R_G=10\Omega$ Inductive Load $T_C=25^\circ\text{C}$	-	22	-	ns
$t_r$	Turn-on Rise Time		-	65	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	123	-	ns
$t_f$	Turn-off Fall Time		-	56	-	ns
$E_{on}$	Turn-on Switching Loss		-	1.95	-	mJ
$E_{off}$	Turn-off Switching Loss		-	1.20	-	mJ
$C_{ies}$	Input Capacitance	$V_{CE}=25V$	-	1000	-	pF
$C_{oes}$	Output Capacitance	$V_{GE}=0V$	-	157	-	pF
$C_{res}$	Reverse Transfer Capacitance	$f=1\text{MHz}$	-	73	-	pF
$R_{Gint}$	Integrated gate resistor	$f=1\text{MHz}; V_{pp}=1V$		1.5		$\Omega$

## Electrical Characteristics of Diode ( $T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_F$	Diode Forward Voltage	$I_F=40A$	-	1.35		V
$t_{rr}$	Diode Reverse Recovery Time	$V_{CE}=400V$ $I_F=40A$	-	100		ns
$I_{rrm}$	Diode peak Reverse Recovery Current		-	16.5		A
$Q_{rr}$	Diode Reverse Recovery Charge	$dI_F/dt=500A/\mu s$	-	980		nC

### Notes:

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

### Revision history

Date	Revision	Changes
28-May-2020	1.0	Initial release

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