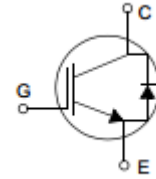


IGBT

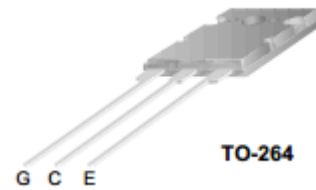
Features

- 1200V 40A, $V_{CE(sat)(typ.)} = 2.80\text{ V}@40\text{A}$
- 10 μs Short Circuit Capability.w
- Square RBSOA.
- Positive VCE (on) Temperature Coefficient.



Benefits

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



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 ($T_C=25\text{ }^\circ\text{C}$)	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
I_{sc}	Short Circuit Current	450	A
P_D	Maximum Power Dissipation ($T_C=25\text{ }^\circ\text{C}$)	520	W
	Maximum Power Dissipation ($T_C=100\text{ }^\circ\text{C}$)	208	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	0.24	$^\circ\text{C}/\text{W}$
$R_{th\ j-c}$	Thermal Resistance, Junction to case for Diode	0.74	$^\circ\text{C}/\text{W}$
$R_{th\ j-a}$	Thermal Resistance, Junction to Ambient	40	$^\circ\text{C}/\text{W}$

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	$V_{GE}=0V, I_C=250\mu A$	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	-	5.7	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=40A$	-	2.8	3.2	V
Q_g	Total Gate Charge	$V_{CC}=960V$ $V_{GE}=15V$ $I_C=40A$	-	340	-	nC
Q_{ge}	Gate-Emitter Charge		-	27	-	nC
Q_{gc}	Gate-Collector Charge		-	210	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=15V$ $I_C=40A$ $R_G=10\Omega$ Inductive Load $T_C=25^\circ\text{C}$	-	38	-	ns
t_r	Turn-on Rise Time		-	61	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	462	-	ns
t_f	Turn-off Fall Time		-	37	-	ns
E_{on}	Turn-on Switching Loss		-	2.44	-	mJ
E_{off}	Turn-off Switching Loss		-	1.51	-	mJ
E_{ts}	Total Switching Loss		-	3.95	-	mJ
C_{ies}	Input Capacitance	$V_{CE}=25V$	-	3050	-	pF
C_{oes}	Output Capacitance	$V_{GE}=0V$	-	400	-	pF
C_{res}	Reverse Transfer Capacitance	$f=1\text{MHz}$	-	250	-	pF
R_{Gint}	Integrated gate resistor	$f=1\text{M}; V_{pp}=1V$	-	2.3	-	Ω

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	$I_F=40A$	-	1.9	-	V
t_{rr}	Diode Reverse Recovery Time	$V_{CE}=600V$	-	126	-	ns
I_{rr}	Diode peak Reverse Recovery Current	$I_F=40A$	-	21.5	-	A
Q_{rr}	Diode Reverse Recovery Charge	$dI_F/dt=500A/\mu s$	-	1646	-	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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