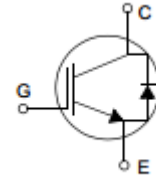


## IGBT

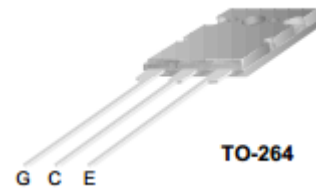
### Features

- 1200V 50A,  $V_{CE(sat)(typ.)} = 2.30\text{ V}@50\text{A}$
- 10 $\mu\text{s}$  Short Circuit Capability.
- 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	$\pm 30$	V
$I_C$	Continuous Collector Current ( $T_C=25\text{ }^\circ\text{C}$ )	100	A
	Continuous Collector Current ( $T_C=100\text{ }^\circ\text{C}$ )	50	A
$I_{CM}$	Pulsed Collector Current (Note 1)	200	A
$I_F$	Diode Continuous Forward Current ( $T_C=100\text{ }^\circ\text{C}$ )	50	A
$I_{FM}$	Diode Maximum Forward Current (Note 1)	200	A
$t_{sc}$	Short Circuit Withstand Time	10	$\mu\text{s}$
$I_{sc}$	Short Circuit Current	300	A
$P_D$	Maximum Power Dissipation ( $T_C=25\text{ }^\circ\text{C}$ )	657	W
	Maximum Power Dissipation ( $T_C=100\text{ }^\circ\text{C}$ )	263	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	0.19	$^\circ\text{C}/\text{W}$
$R_{th\ j-c}$	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	$\mu A$
$I_{GES}$	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	-	5.7	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=50A$	-	2.3	2.5	V
$Q_g$	Total Gate Charge	$V_{CC}=960V$ $V_{GE}=15V$ $I_C=50A$	-	400		nC
$Q_{ge}$	Gate-Emitter Charge		-	31		nC
$Q_{gc}$	Gate-Collector Charge		-	230		nC
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=15V$ $I_C=50A$ $R_G=10\Omega$ Inductive Load $T_C=25^\circ\text{C}$	-	43	-	ns
$t_r$	Turn-on Rise Time		-	100	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	432	-	ns
$t_f$	Turn-off Fall Time		-	36	-	ns
$E_{on}$	Turn-on Switching Loss		-	5.20	-	mJ
$E_{off}$	Turn-off Switching Loss		-	2.00	-	mJ
$E_{ts}$	Total Switching Loss		-	7.20	-	mJ
$C_{ies}$	Input Capacitance	$V_{CE}=25V$ $V_{GE}=0V$ $f=1\text{MHz}$	-	2870	-	pF
$C_{oes}$	Output Capacitance		-	370	-	pF
$C_{res}$	Reverse Transfer Capacitance		-	230	-	pF
$R_{Gint}$	Integrated gate resistor	$f=1\text{M}; V_{pp}=1V$		2.9		$\Omega$

**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	$I_F=50A$	-	1.9	-	V
$t_{rr}$	Diode Reverse Recovery Time	$V_{CE}=600V$ $I_F=50A$ $dI_F/dt=500A/\mu s$	-	190		ns
$I_{rr}$	Diode peak Reverse Recovery Current		-	23.5	-	A
$Q_{rr}$	Diode Reverse Recovery Charge		-	1916	-	nC

**Notes:**

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