

“HALF-BRIDGE” IGBT

Feature

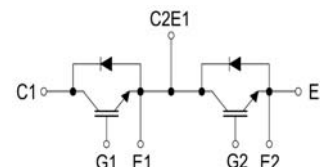
- IGBT New Technology
- Low $V_{CE(sat)}$
- Low Turn-off losses
- Short tail current
- Positive temperature coefficient

Application

- AC & DC Motor controls
- General purpose inverters
- Optimized for high current inverter
- Servo Controls
- UPS, Robotics



Package : V1



$V_{CES} = 600V$

$I_C = 75A$

$V_{CE(ON)} \text{ typ.} = 1.5V$

@ $I_C = 75A$

Absolute Maximum Ratings @ $T_j = 25^\circ C$ (Per Leg)

Symbol	Parameter	Condition	Ratings	Unit
V_{CES}	Collector-to-Emitter Voltage	$T_c = 25^\circ C$	600	V
V_{GES}	Gate emitter voltage		± 20	V
I_C	Continuous Collector Current	$T_c = 80^\circ C (25^\circ C)$	75 (100)	A
I_{CP}	Pulsed collector current	$T_c = 25^\circ C$	140	A
I_F	Diode Continuous Forward Current	$T_c = 80^\circ C (25^\circ C)$	75 (100)	A
I_{FM}	Diode Maximum Forward Current	$T_c = 25^\circ C$	140	A
t_p	Short circuit test, $V_{GE} = 15V$, $V_{CC} = 360V$	$T_c = 150^\circ C (25^\circ C)$	6 (8)	μs
V_{iso}	Isolation Voltage test	AC @ 1 minute	2500	V
T_j	Junction Temperature		-40 ~ 150	$^\circ C$
T_{stg}	Storage Temperature		-40 ~ 125	$^\circ C$
Weight	Weight of Module		190	g
Md	Mounting torque with screw : M5		2.0	N.m
	Terminal connection torque : M5		2.0	N.m

Static Characteristics @ $T_j = 25^\circ C$ (unless otherwise specified)

Parameters		Min	Typ	Max	Unit	Test conditions
$V_{CE(ON)}$	Collector-to-Emitter Saturation Voltage	1.05	1.50	1.95	V	$I_C = 75A$, $V_{GE} = 15V$
$V_{GE(th)}$	Gate Threshold Voltage	5.0	5.8	6.5		$V_{CE} = V_{GE}$, $I_C = 4mA$
I_{CES}	Zero Gate Voltage Collector Current	—	—	5.0	mA	$V_{GE} = 0V$, $V_{CE} = 600V$
I_{GES}	Gate-to-Emitter Leakage Current	—	—	400	nA	$V_{CE} = 0V$, $V_{GE} = 20V$
V_F	Diode Forward Voltage Drop	—	1.6	2.0	V	$I_F = 75A$, $V_{GE} = 0V$
R_{GINT}	Integrated gate resistor	—	4	—	Ω	

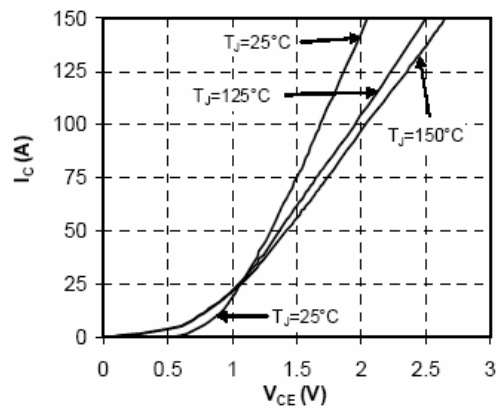
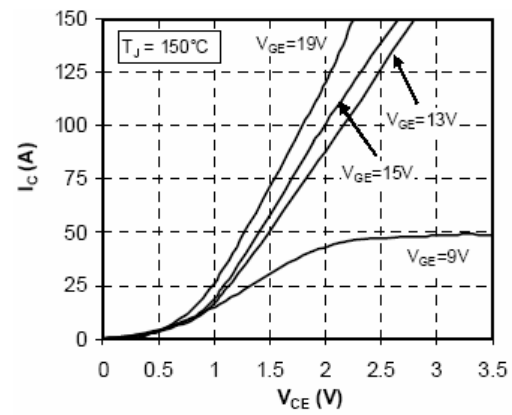
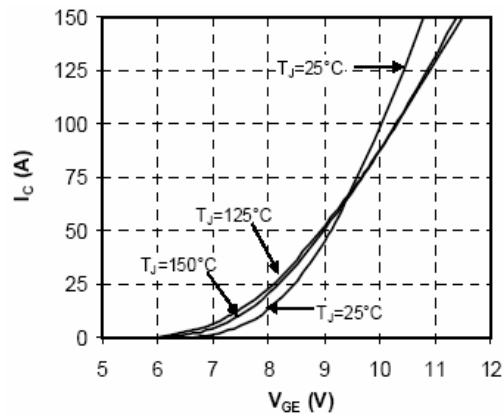
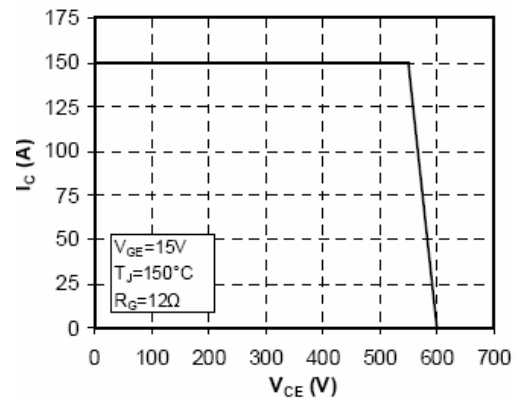
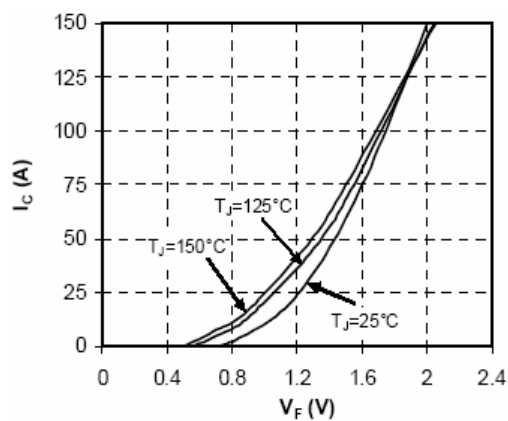
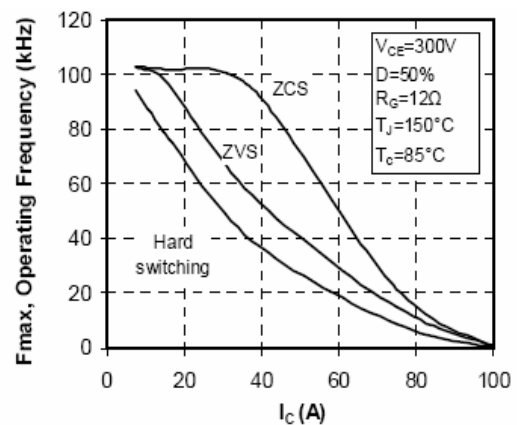
Electrical Characteristic Values (IGBT / DIODE) @ $T_j = 25^\circ\text{C}$ (unless otherwise specified)

Parameters		Min	Typ	Max	Unit	Test conditions
C_{iss}	Input capacitance	—	4700	—	pF	$V_{CE} = 25\text{V}$, $V_{GE} = 0\text{V}$ $f = 1\text{ MHz}$
C_{oss}	Output capacitance	—	300	—		
C_{rss}	Reverse transfer capacitance	—	145	—		
$t_{d(on)}$	Turn-on delay time	—	25	—	ns	Inductive Switching (125°C) $V_{CC} = 300\text{V}$ $I_C = 75\text{A}$, $V_{GE} = \pm 15\text{V}$ $R_G = 1.2\Omega$
t_r	Rise time	—	18	—		
$t_{d(off)}$	Turn-off delay time	—	210	—		
t_f	Fall time	—	60	—		
V_{RRM}	Maximum Peak Repetitive Reverse Voltage	600	—	—	V	
I_{RM}	Maximum Reverse leakage current	—	—	250	μA	$V_R = 600\text{V}$
t_{rr}	Reverse Recovery Time	—	125	—	ns	$I_F = 75\text{A}$, $V_R = 300\text{V}$ $di / dt = 2000\text{A} / \mu\text{s}$
Q_{rr}	Reverse Recovery Charge	—	7.6	—	μC	

※ Data and specifications subject to change without notice.

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.60	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.98	
$R_{\theta CS}$	Case-to-Heat Sink (Conductive grease applied)	-	0.05	-	


Fig 1. Typ. IGBT Output Characteristics

Fig 2. Typ. IGBT Out Characteristics

Fig 3. Typ. Transfer Characteristics

Fig 4. Reverse Bias Operating Area

Fig 5. Forward Characteristics of Diode

Fig 6. Operating Frequency vs Collector Current

