

“HALF-BRIDGE” IGBT

Feature

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

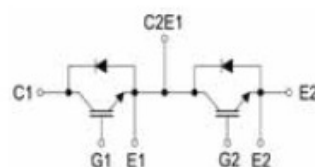
Application

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

$V_{CES} = 600V$
 $I_C = 400A$
 $V_{CE(sat)} \text{ typ.} = 1.5V$



Package : V3



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

Symbol	Parameter	Condition	Ratings	Unit
V_{CES}	Collector to emitter voltage	$V_{GE} = 0V, I_C = 4mA$	600	V
V_{GE}	Gate emitter voltage		± 20	V
I_C	Continuous collector current	$T_C = 75^\circ C (25^\circ C)$	400 (500)	A
I_{CP}	Pulsed collector current	$T_C = 25^\circ C$	800	A
I_F	Diode continuous forward current	$T_C = 75^\circ C (25^\circ C)$	400 (500)	A
I_{FM}	Diode maximum forward current	$T_C = 25^\circ C$	800	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		$-40 \sim 150$	$^\circ C$
T_{stg}	Storage temperature		$-40 \sim 125$	$^\circ C$
Weight	Weight of module		360	g
Md	Mounting torque with screw : M5		4.0	N.m
	Terminal connection torque : M5		4.0	N.m

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

Parameters		Min	Typ	Max	Unit	Test conditions
$V_{CE(sat)}$	Collector to emitter saturation voltage	1.0	1.5	2.0	V	$I_C = 400A, V_{GE} = 15V$
$V_{GE(th)}$	Gate threshold voltage	5.0	5.8	6.5		$V_{CE} = V_{GE}, I_C = 8mA$
I_{CES}	Zero gate voltage collector current	—	—	1.0	mA	$V_{GE} = 0V, V_{CE} = 600V$
I_{GES}	Gate to emitter leakage current	—	—	600	nA	$V_{CE} = 0V, V_{GE} = 20V$
V_F	Diode forward voltage drop	1.2	1.6	2.0	V	$I_F = 400A, V_{GE} = 0V$

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

Parameters		Min	Typ	Max	Unit	Test conditions
C _{iss}	Input capacitance	—	24670	—	pF	V _{CE} = 25V, V _{GE} = 0V f = 1 MHz
C _{oss}	Output capacitance	—	1540	—		
C _{rss}	Reverse transfer capacitance	—	732	—		
t _{d(on)}	Turn-on delay time	—	145	—	ns	Inductive Switching (T _J =125°C) V _{CC} = 300V I _C = 400A, V _{GE} = ±15V R _G = 2.2Ω
t _r	Rise time	—	60	—		
t _{d(off)}	Turn-off delay time	—	320	—		
t _f	Fall time	—	80	—		
V _{BR}	Maximum peak repetitive reverse voltage	600	—	—	V	I _R = 0.25mA
I _{RM}	Maximum reverse leakage current	—	—	250	μA	V _R = 600V
t _{rr}	Reverse recovery time	—	125	—	ns	I _F = 400A, V _R = 300V
Q _{rr}	Reverse recovery charge	—	20.3	—	μC	di / dt = 4000A / μs

Thermal Characteristics

Symbol	Parameter	Min	Typ	Max	Unit
R _{θJC}	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.12	°C/W
R _{θJC}	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.22	
R _{θCS}	Case-to-Heat Sink (Conductive grease applied)	-	0.03	-	

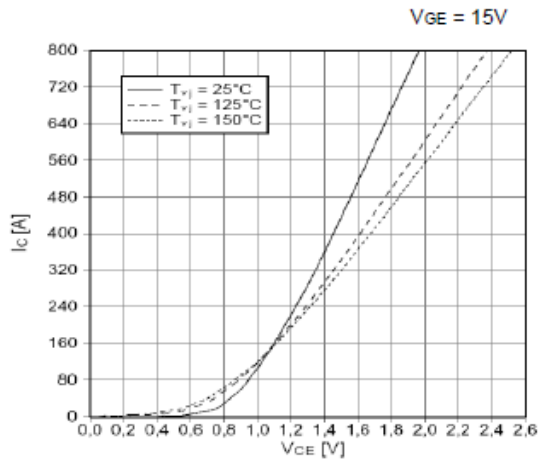


Fig 1. Typ. IGBT Output Characteristics

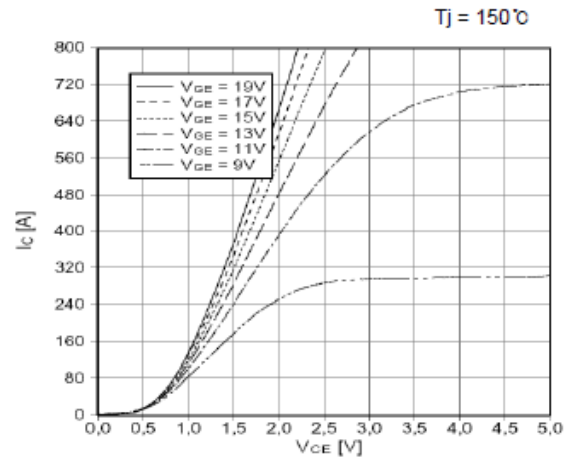


Fig 2. Typ. IGBT Output Characteristics

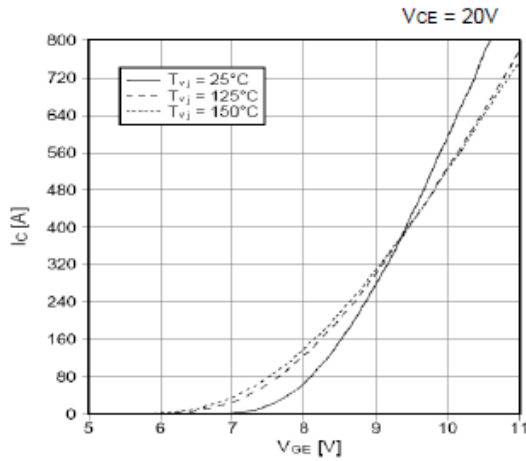


Fig 3. Typ. Transfer Characteristics

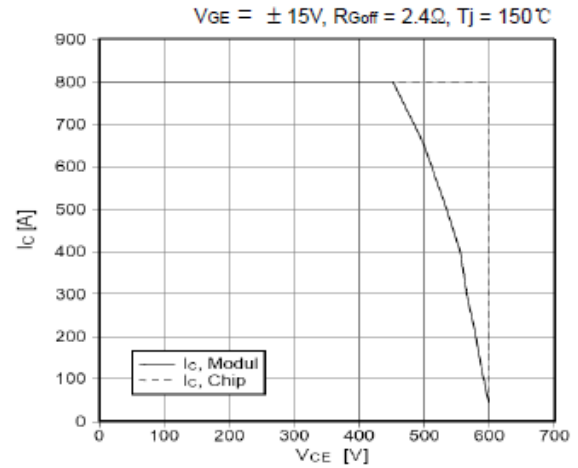


Fig 4. Reverse Bias Safe Operation Area

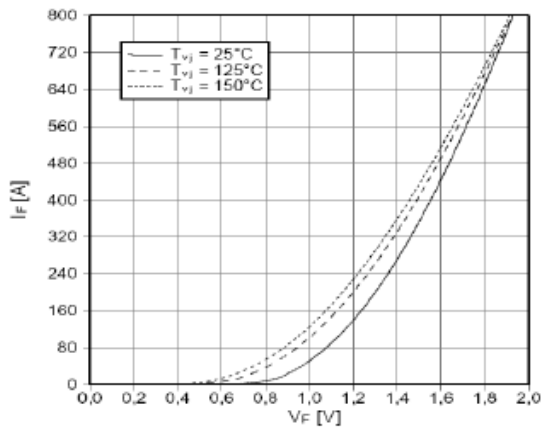
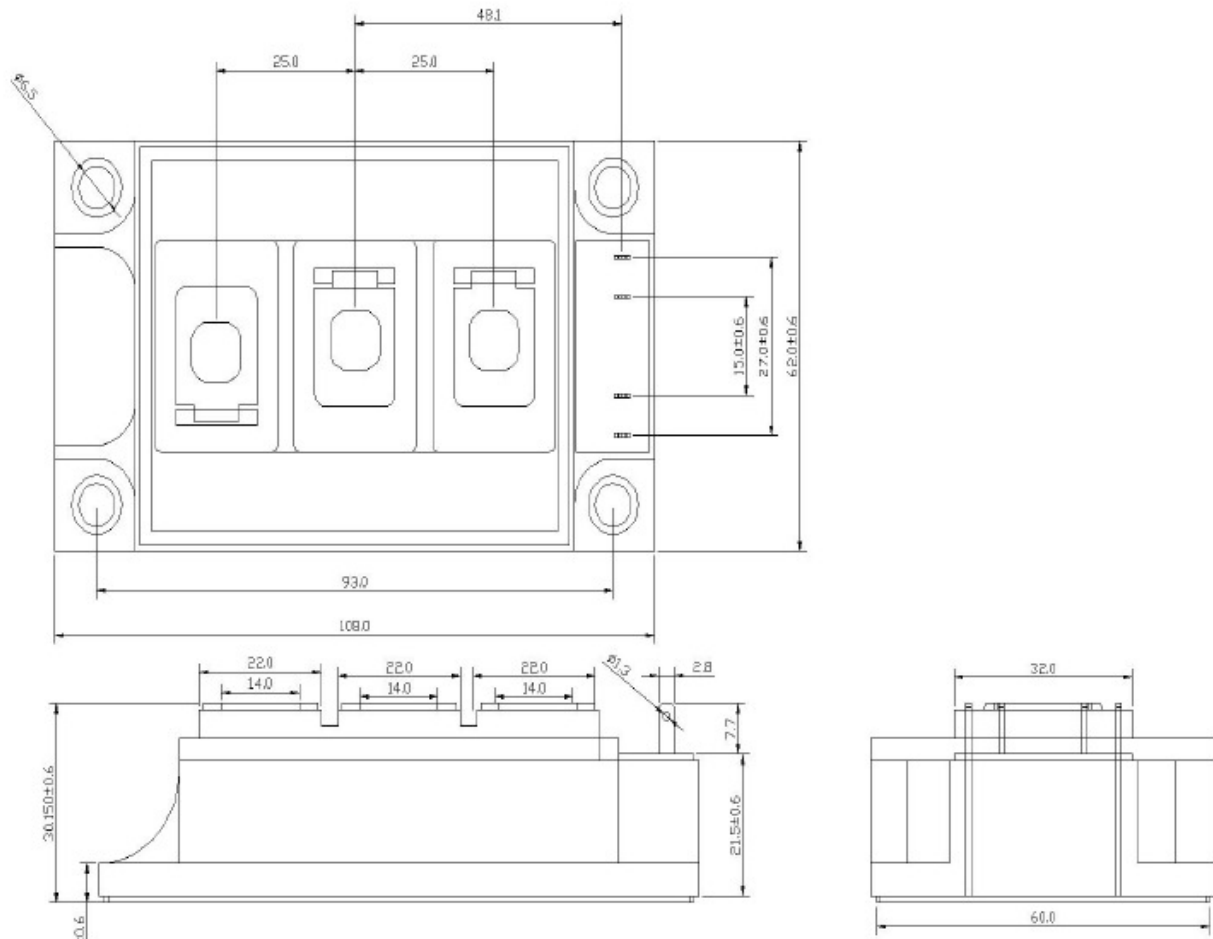


Fig 5. Forward Characteristics of Diode

Package Outline (dimensions in mm)



* Data and specifications subject to change without notice.