

Outline Drawing and Circuit Diagram

Dimensions	Inches	Millimeters
A	2.83	72.0
B	3.58	91.0
C	1.16 +0.04/-0.02	29.5 +1.0/-0.5
D	2.17±0.01	55.0±0.25
E	2.91±0.01	74.0±0.25
F	0.16	4.0
G	1.02	26.0
H	0.31	8.1
J	0.79	20.0
K	0.39	10.0
L	0.43	11.0

Dimensions	Inches	Millimeters
M	0.74	18.7
N	0.75	19.1
P	0.57	14.4
Q	1.55	39.3
R	0.05	1.25
S	M4	M4
T	0.22 Dia.	5.5 Dia.
U	1.61	41.0
V	0.69	17.5
W	0.02	0.5
X	0.110	2.79



Description:

Powerex IGBT H-Bridge Module is designed especially for customer applications. Each module consists of four IGBT Transistors in an H-Bridge configuration, with each transistor having a reverse-connected super-fast recovery free-wheel diode. All components and interconnects are isolated from the heat sinking baseplate, offering simplified system assembly and thermal management.

Features:

- Low Drive Power
- Low $V_{CE(sat)}$
- Discrete Super-Fast Recovery (100ns) Free-Wheel Diode
- Isolated Baseplate for Easy Heat Sinking

Applications:

- AC Motor Control
- Motion/Servo Control
- UPS
- Welding Power Supplies
- Laser Power Supplies

Maximum Ratings, T_j=25°C unless otherwise specified

Ratings	Symbol	QIB0607002	Units
Junction Temperature	T _j	-40 to 150	°C
Storage Temperature	T _{stg}	-55 to 125	°C
Collector Emitter Voltage	V _{CEs}	600	Volts
Gate Emitter Voltage	V _{GES}	±20	Volts
Collector Current	I _c	75	Amperes
Peak Collector Current	I _{CM}	150**	Amperes
Diode Forward Current	I _F	75	Amperes
Diode Forward Surge Current	I _{FM}	150**	Amperes
Maximum Collector dissipation (T _c =25°C, T _j ≤150 °C)	P _c	430	Watts
Mounting Torque, M4 Main Terminal	-	15	In-lb
Mounting Torque, M5 Mounting	-	31	In-lb
Module Weight (Typical)	-	390	Grams
V Isolation	V _{RMS}	2500	Volts

Static Electrical Characteristics, T_j=25°C unless otherwise specified

Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Collector Cutoff Current	I _{CEs}	V _{CE} =600V V _{GE} =0V	-	-	1.0	mA
Gate-Emitter Threshold Voltage	V _{GE(th)}	I _c =7.5mA, V _{CE} =10V	6	7	8.0	Volts
Gate Leakage Current	I _{GES}	V _{GE} =V _{GES} V _{CE} =0V	-	-	0.5	µA
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _c =75AV _{GE} =15V T _j =25°C	-	1.7	2.2	Volts
	V _{CE(sat)}	I _c =75AV _{GE} =15V T _j =125°C	-	1.7	-	Volts
Total Gate Charge	Q _G	V _{CC} =300V, I _c =75A, V _{GE} =15V	-	300	-	nC
Diode Forward Voltage	V _{FM}	I _E =75A, V _{GS} =0V	-	-	2.8	Volts

Dynamic Electrical Characteristics, T_j=25°C unless otherwise specified

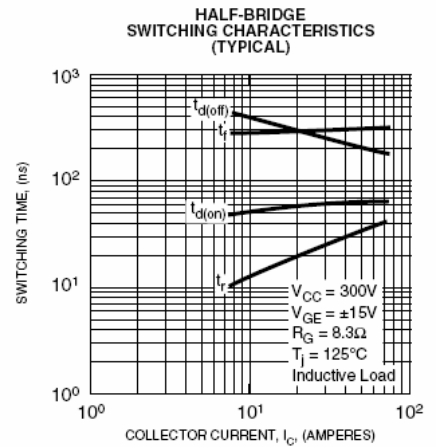
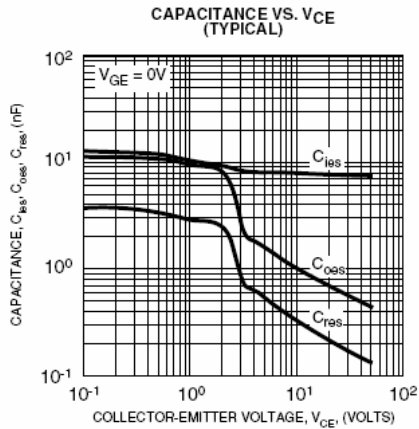
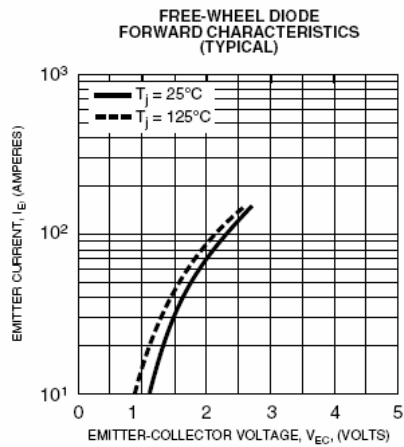
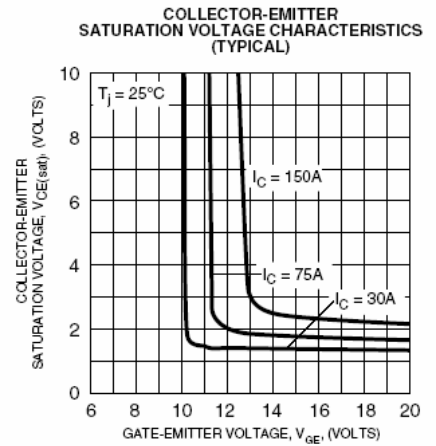
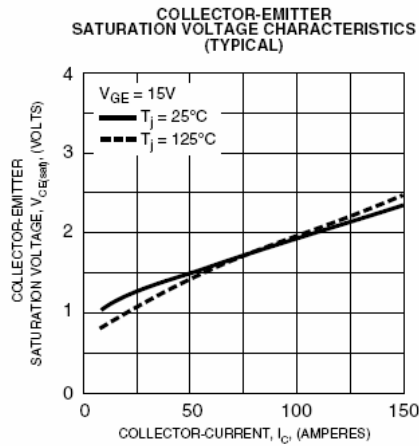
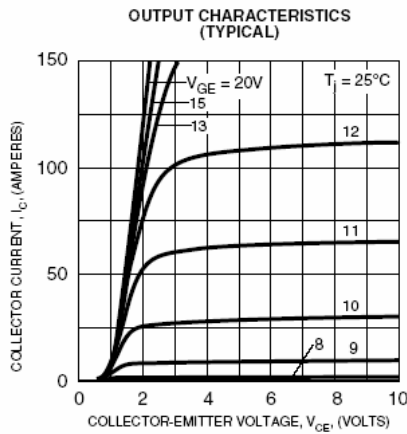
Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C _{ies}		-	-	11.3	nf
Output Capacitance	C _{oes}	V _{CE} = 10V, V _{GE} =0V	-	-	1.4	nf
Reverse Transfer Capacitance	C _{res}		-	-	.45	nf
Turn on Delay time	t _{d(on)}	V _{CC} =300V I _c =75A	-	-	120	ns
Rise Time	t _r	V _{GE1} =V _{GE2} =15V	-	-	100	ns
Turn- off Delay Time	t _{d(off)}	R _G =8.3Ω	-	-	300	ns
Fall Time	t _f	Resistive Load	-	-	300	ns
Diode Reverse Recovery Time	t _{rr}	I _E = 75A, di _E /dt=- 150A/µs	-	-	100	ns
Diode Reverse Recovery Charge	Q _{rr}		-	1.2	-	µC

Thermal and Mechanical Characteristics, T_j=25°C unless otherwise specified

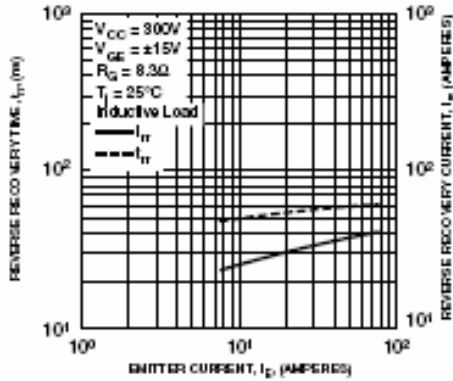
Characteristic	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Thermal Resistance, Junction to Case*	R _{θJC}	Per IGBT ¼ Module	-	-	0.29	°C/W
Thermal Resistance, Junction to Case*	R _{θJC}	Per Diode ¼ Module	-	-	0.51	°C/W
Contact Thermal Resistance	R _{θ(c-f)}	Per Module, Thermal Grease	-	0.025	-	°C/W

**Pulse width and repetition rate should be such that device junction temperature does not exceed device rating.

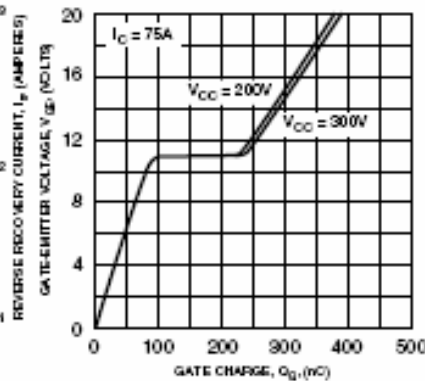
*T_c, T_f measured point is just under the chips.



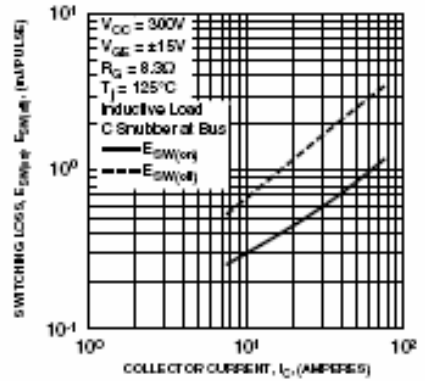
REVERSE RECOVERY CHARACTERISTICS (TYPICAL)



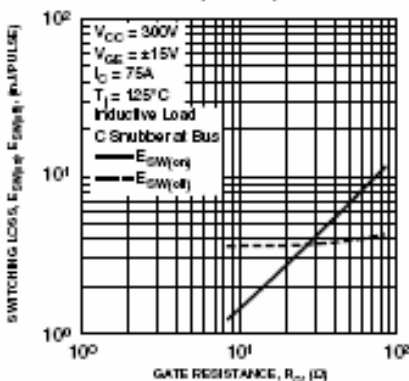
GATE CHARGE VS. V_{GE}



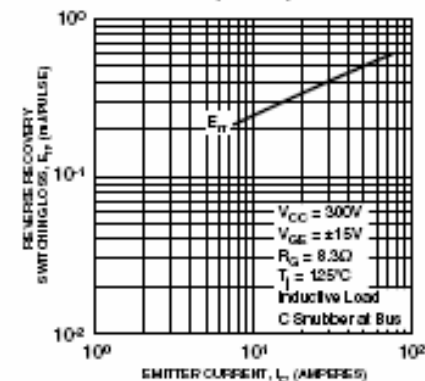
SWITCHING LOSS VS. COLLECTOR CURRENT (TYPICAL)



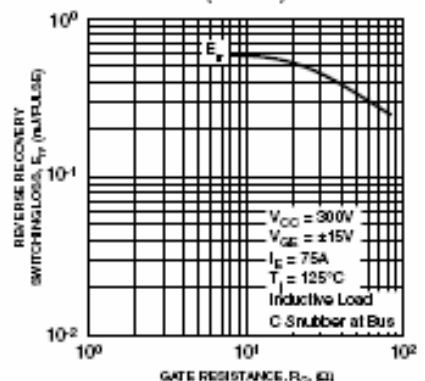
SWITCHING LOSS VS. GATE RESISTANCE (TYPICAL)



REVERSE RECOVERY SWITCHING LOSS VS. EMITTER CURRENT (TYPICAL)



REVERSE RECOVERY SWITCHING LOSS VS. GATE RESISTANCE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS (IGBT & FWD)

