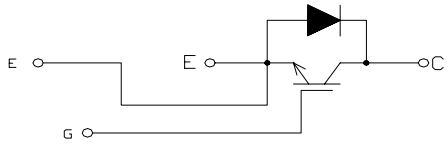
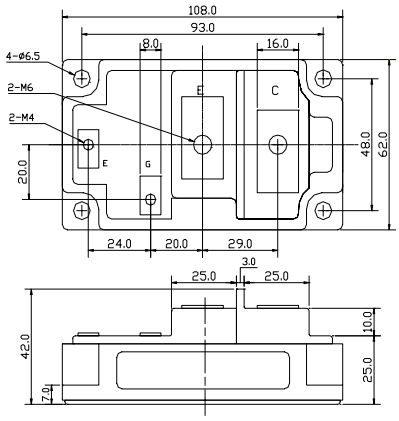
Nihon Inter Electronics Corporation

IGBT MODULE Single 300A 1200V PHMB300B12

CIRCUIT



OUTLINE DRAWING



Dimension(mm)

Approximate Weight : 650g

MAXMUM RATINGS (Tc=25°C)

Item		Symbol	PHMB300B12		Unit
Collector-Emitter Voltage		V_{CES}	1200		V
Gate - Emitter Voltage		V_{GES}	+/- 20		V
Collector Current	DC	I_C	300		A
	1 ms	I_{CP}	600		
Collector Power Dissipation		P_C	1600		W
Junction Temperature Range		T_j	-40 to +150		°C
Storage Temperature Range		T_{stg}	-40 to +125		°C
Isolation Voltage Terminal to Base AC, 1 min.)		V_{ISO}	2500		V
Mounting Torque	Module Base to Heatsink	F_{TOR}	3		N•m
	Bus Bar to Main Terminals		M4	1.4	
			M6	3	

ELECTRICAL CHARACTERISTICS (Tc=25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Emitter Cut-Off Current		I_{CES}	V_{CE}=1200V,V_{GE}=0V	-	-	6.0	mA
Gate-Emitter Leakage Current		I_{GES}	V_{GE}=+/- 20V,V_{CE}=0V	-	-	1.0	µA
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C=300A,V_{GE}=15V	-	1.9	2.4	V
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	V_{CE}=5V,I_C=300mA	4.0	-	8.0	V
Input Capacitance		Cies	V_{CE}=10V,V_{GE}=0V,f=1MHz	-	25000	-	pF
Switching Time	Rise Time	t_r	V_{CC}= 600V R_L= 2 ohm R_G= 1.3 ohm V_{GE}= +/- 15V	-	0.25	0.45	µs
	Turn-on Time	t_{on}		-	0.40	0.70	
	Fall Time	t_f		-	0.25	0.35	
	Turn-off Time	t_{off}		-	0.80	1.10	

FREE WHEELING DIODES RATINGS & CHARACTERISTICS (Tc=25°C)

Item		Symbol	Rated Value	Unit
Forward Current	DC	I_F	300	A
	1 ms	I_{FM}	600	

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Peak Forward Voltage	V_F	I_F=300A,V_{GE}=0V	-	1.9	2.4	V
Reverse Recovery Time	t_{rr}	I_F=300A,V_{GE}=-10V,di/dt=600A/µs	-	0.20	0.30	µs

THERMAL CHARACTERISTICS

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Thermal Impedance	IGBT	$R_{th(j-c)}$	Junction to Case	-	-	0.086	°C/W
	DIODE			-	-	0.16	

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Fig.1- Output Characteristics (Typical)

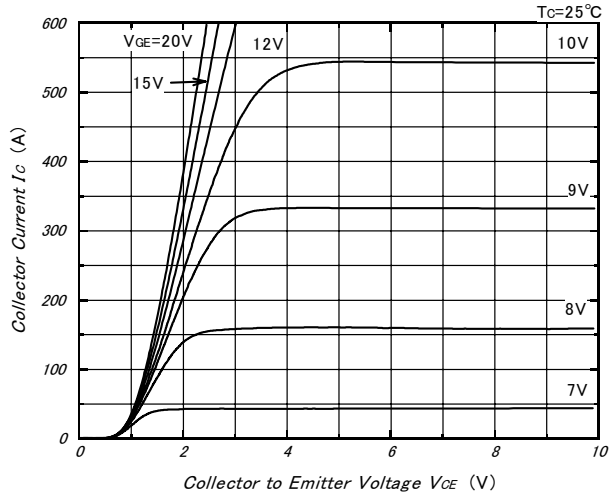

Fig.2- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

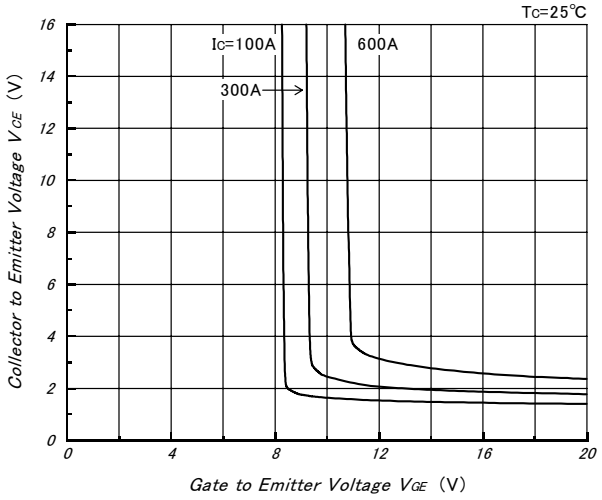

Fig.3- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

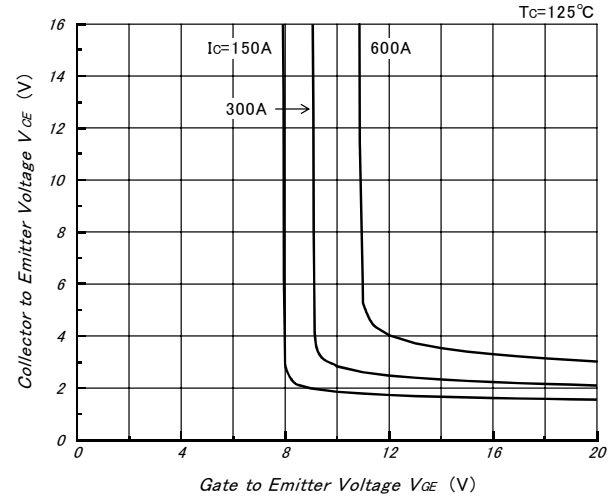

Fig.4- Gate Charge vs. Collector to Emitter Voltage (Typical)

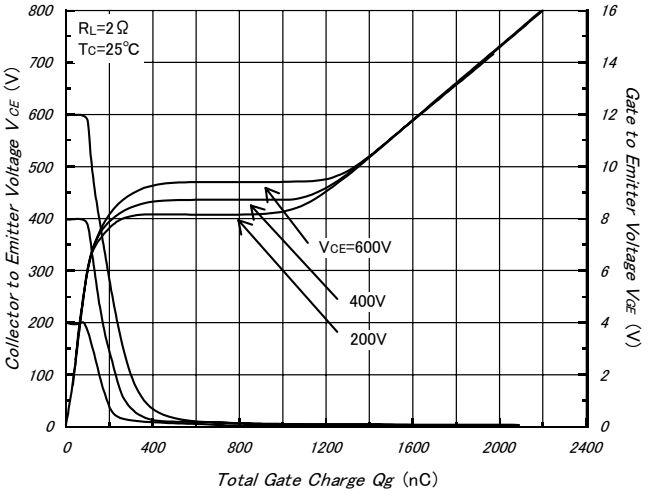

Fig.5- Capacitance vs. Collector to Emitter Voltage (Typical)

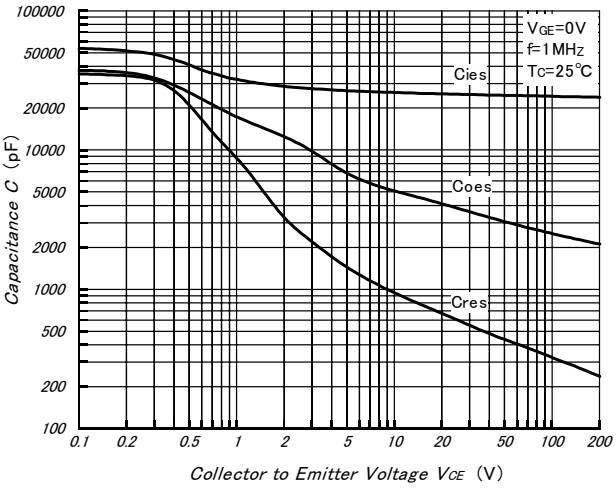

Fig.6- Collector Current vs. Switching Time (Typical)

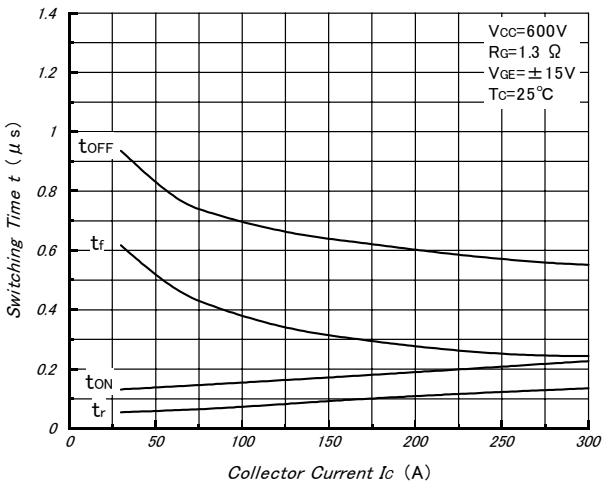

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Fig.7- Series Gate Impedance vs. Switching Time (Typical)

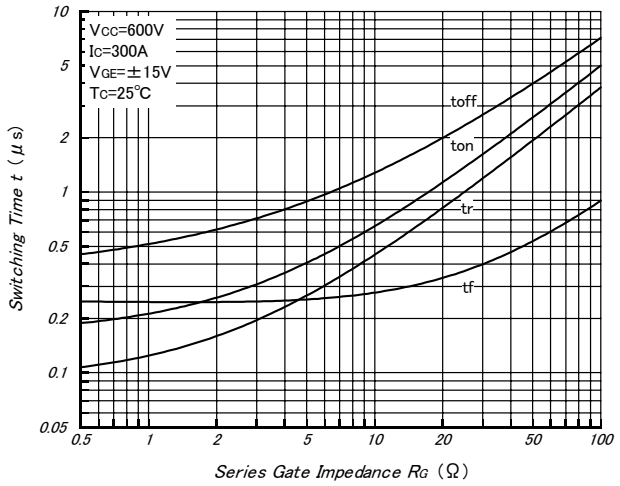

Fig.8- Forward Characteristics of Free Wheeling Diode (Typical)

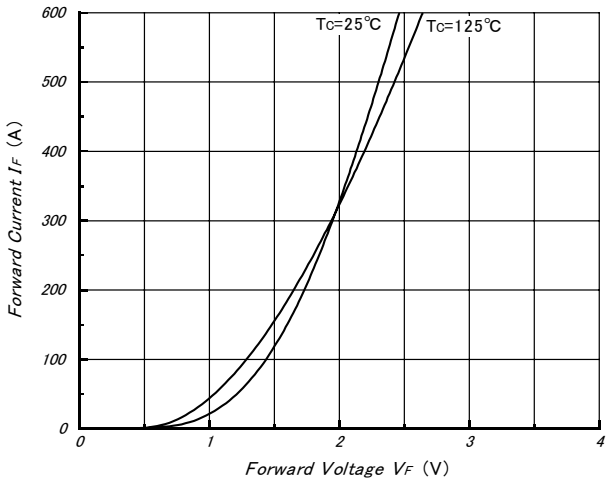

Fig.9- Reverse Recovery Characteristics (Typical)

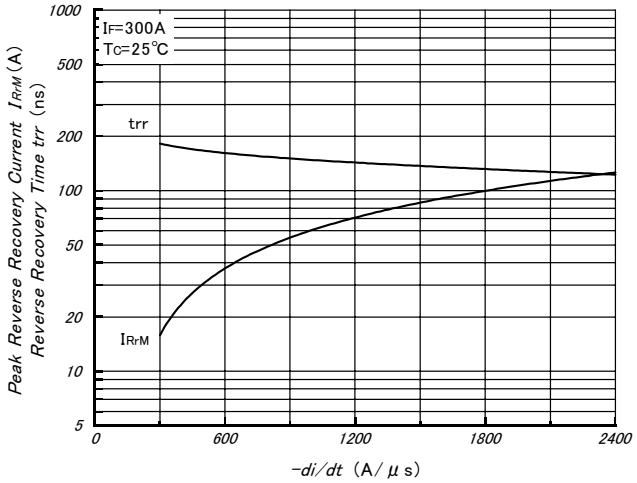

Fig.10- Reverse Bias Safe Operating Area (Typical)

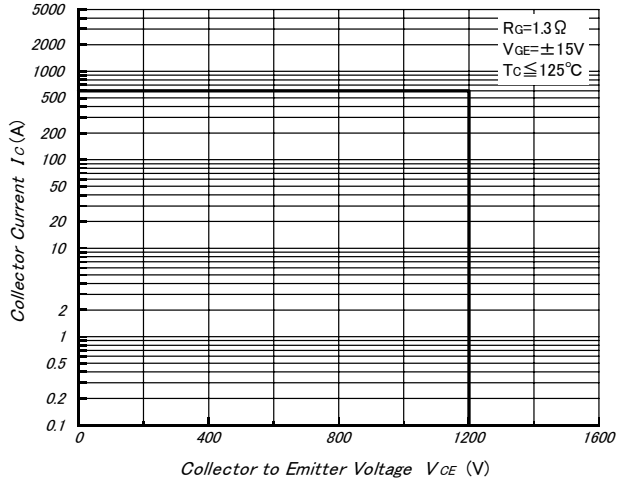

Fig.11- Transient Thermal Impedance