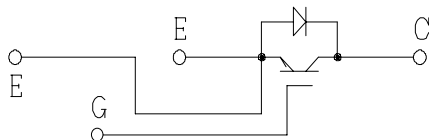
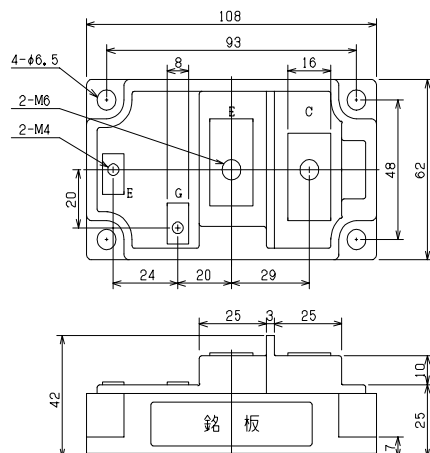


CIRCUIT



OUTLINE DRAWING



Dimension(mm)

Approximate Weight : 500g

MAXIMUM RATINGS (Tc=25°C)

Item		Symbol	PHMB400A6		Unit
Collector-Emitter Voltage		V_{CES}	600		V
Gate - Emitter Voltage		V_{GES}	+/- 20		V
Collector Current	DC	I_C	400		A
	1 ms	I_{CP}	800		
Collector Power Dissipation		P_C	1470		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 (T_c=25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Collector-Emitter Cut-Off Current		I_{CES}	$V_{CE}=600V, V_{GE}=0V$	-	-	4.0	mA
Gate-Emitter Leakage Current		I_{GES}	$V_{GE}=+/- 20V, V_{CE}=0V$	-	-	1.0	μA
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	$I_C=400A, V_{GE}=15V$	-	2.1	2.6	V
Gate-Emitter Threshold Voltage		$V_{GE(th)}$	$V_{CE}=5V, I_C=400mA$	4.0	-	8.0	V
Input Capacitance		C_{ies}	$V_{CE}=10V, V_{GE}=0V, f=1MHz$	-	40,000	-	pF
Switching Time	Rise Time	t_r	$V_{CC}= 300V$	-	0.25	0.45	μs
	Turn-on Time	t_{on}	$R_L= 0.75 \text{ ohm}$	-	0.45	0.85	
	Fall Time	t_f	$R_G= 1.6 \text{ ohm}$	-	0.2	0.35	
	Turn-off Time	t_{off}	$V_{GE}= +/- 15V$	-	0.6	0.8	

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

Item		Symbol	Rated Value	Unit
Forward Current	DC	I_F	400	A
	1 ms	I_{FM}	800	

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Peak Forward Voltage	V_F	$I_F=400A, V_{GE}=0V$	-	1.9	2.4	V
Reverse Recovery Time	t_{rr}	$I_F=400A, V_{GE}=-10V, di/dt=400A/\mu s$	-	0.15	0.25	μs

THERMAL CHARACTERISTICS

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Thermal Impedance	IGBT	$R_{th(j-c)}$	Junction to Case	-	-	0.085	°C/W
	DIODE			-	-	0.20	

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Fig.1- Output Characteristics (Typical)

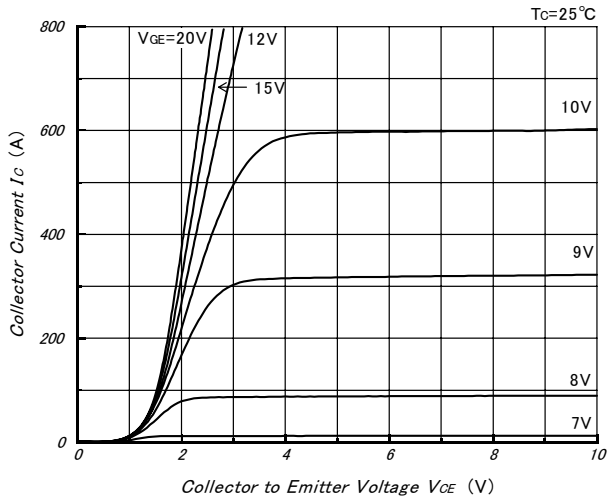


Fig.2- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

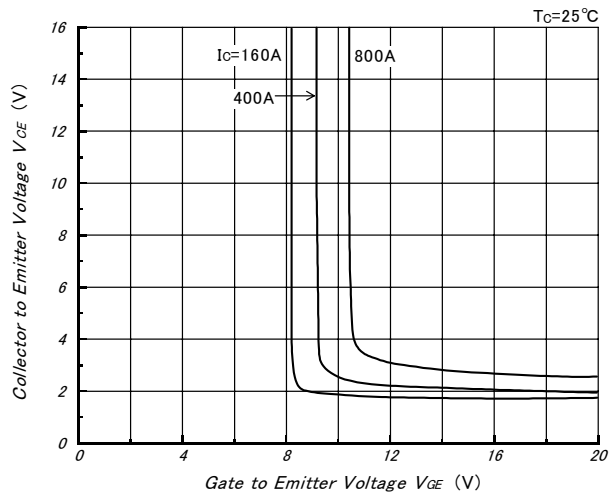


Fig.3- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

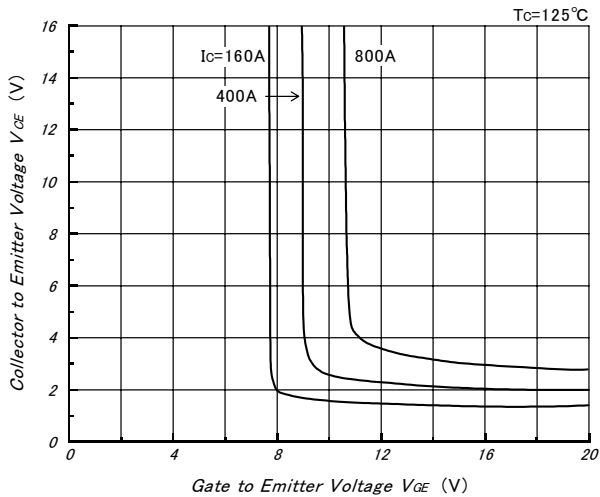


Fig.4- Gate Charge vs. Collector to Emitter Voltage (Typical)

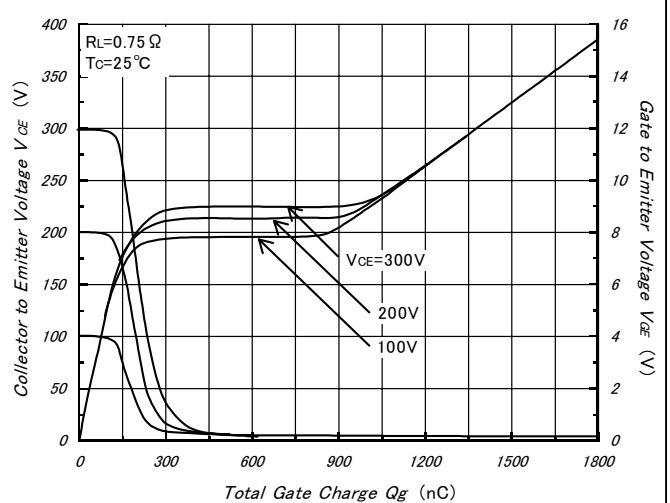


Fig.5- Capacitance vs. Collector to Emitter Voltage (Typical)

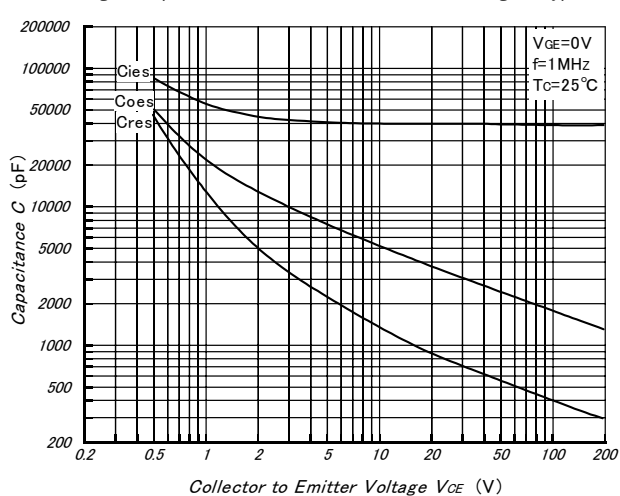
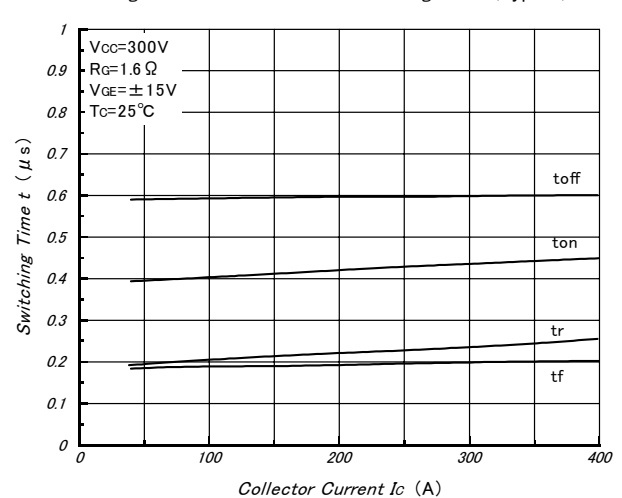


Fig.6- Collector Current vs. Switching Time (Typical)



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

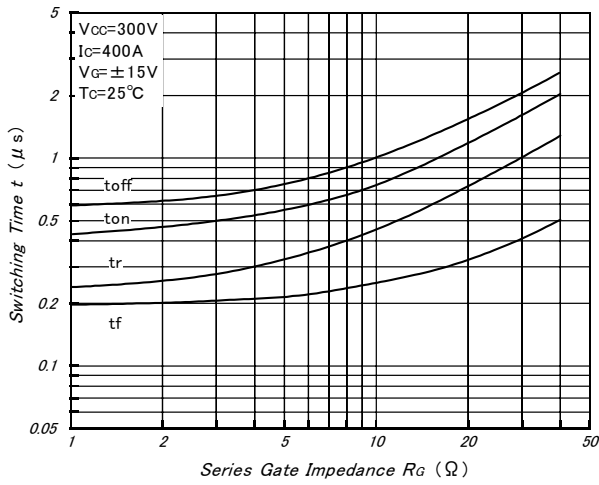


Fig.8- Forward Characteristics of Free Wheeling Diode (Typical)

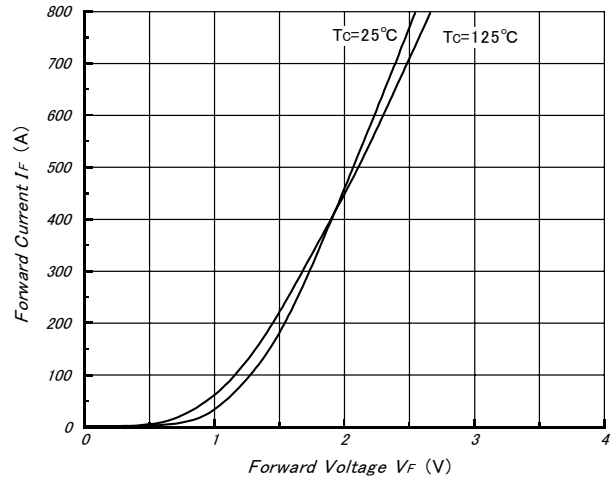


Fig.9- Reverse Recovery Characteristics (Typical)

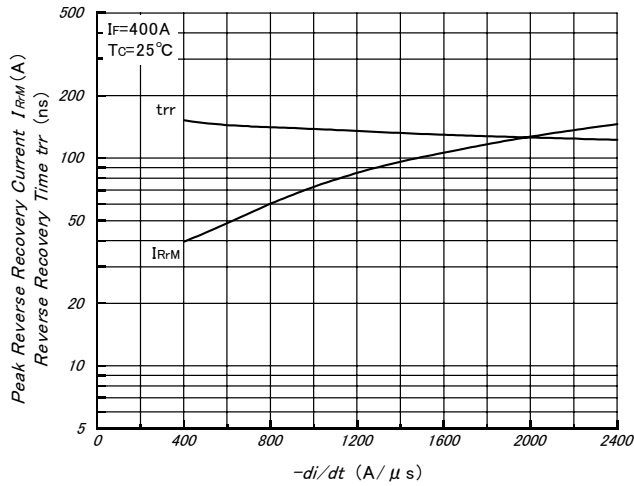


Fig.10- Reverse Bias Safe Operating Area (Typical)

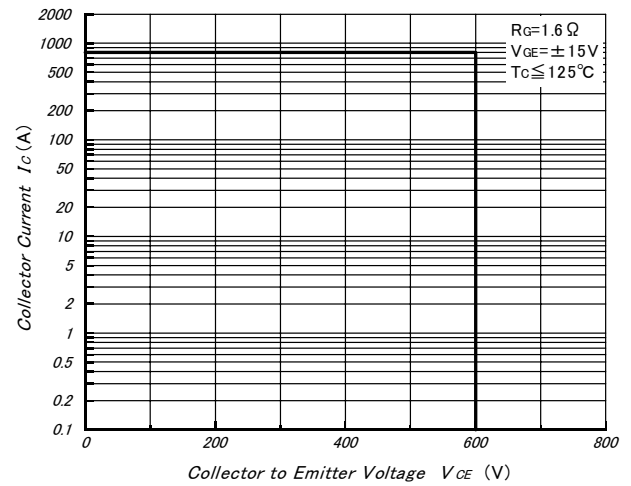


Fig.11- Transient Thermal Impedance

