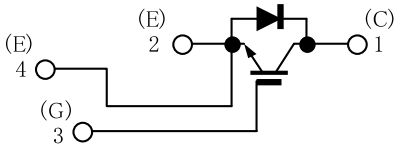
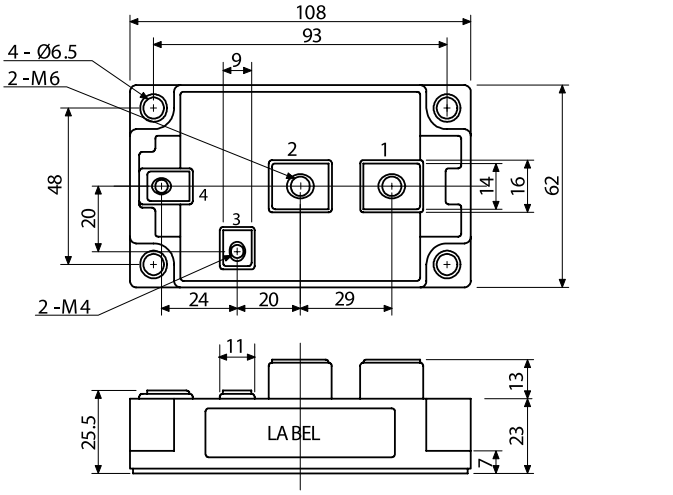
IGBT　200 A　1200 V　PHMB200BS12

■回路図　CIRCUIT



■外形寸法図　OUTLINE DRAWING　（単位　Dimension：mm）



■最大定格　Maximum Ratings（Tc＝25℃）

項　目 Item		記号 Symbol	定　格　値 Rated Value		単位 Unit
コレクタ・エミッタ間電圧 Collector-Emitter Voltage		V_{CES}	1200		V
ゲート・エミッタ間電圧 Gate-Emitter Voltage		V_{GES}	±20		V
コレクタ電流 Collector Current	DC	I_C	200		A
	1ms	I_{CP}	400		
コレクタ損失 Collector Power Dissipation		P_C	1200		W
接合温度 Junction Temperature Range		T_j	−40～＋150		℃
保存温度 Storage Temperature Range		T_{stg}	−40～＋125		℃
絶縁耐圧(端子－ベース間，AC 1 分間) Isolation Voltage(Terminal to Base, AC 1 min.)		V_{iso}	2500		$V_{(RMS)}$
締付トルク Mounting Torque	ベース取付部 Module Base to Heatsink	F_{tor}	3（30.6）		N・m (kgf・cm)
	端子部 Busbar to Terminal		M4	1.4（14.3）	
			M6	3（30.6）	

■電気的特性　Electrical Characteristics（Tc＝25℃）

項　目 Characteristic		記号 Symbol	条　件 Test Conditions	最小 Min.	標準 Typ.	最大 Max.	単位 Unit
コレクタ遮断電流 Collector-Emitter Cut-Off Current		I_{CES}	V_{CE}＝1200V, V_{GE}＝0V	—	—	2.0	mA
ゲート漏れ電流 Gate-Emitter Leakage Current		I_{GES}	V_{GE}＝±20V, V_{CE}＝0V	—	—	1.0	μA
コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	I_C＝200A, V_{GE}＝15V	—	2.3	2.7	V
ゲートしきい値電圧 Gate-Emitter Threshold Voltage		$V_{GE(th)}$	V_{CE}＝5V, I_C＝200mA	4.0	—	8.0	V
入力容量 Input Capacitance		C_{ies}	V_{CE}＝10V, V_{GE}＝0V, f＝1MHz	—	12600	—	pF
スイッチング時間 Switching Time	上昇時間 Rise Time	t_r	V_{CC}＝600V R_L＝2.0Ω R_G＝7.5Ω V_{GE}＝±15V	—	0.25	0.45	μs
	ターン・オン時間 Turn-On Time	t_{on}		—	0.40	0.70	
	下降時間 Fall Time	t_f		—	0.25	0.35	
	ターン・オフ時間 Turn-Off Time	t_{off}		—	0.80	1.10	

■フリーホイーリングダイオードの特性　Free Wheeling Diode Ratings & Characteristics（Tc＝25℃）

項　　目 Item		記号 Symbol	定　格　値 Rated Value	単位 Unit
順電流 Forward Current	DC	I_F	200	A
	1ms	I_{FM}	400	

項　　目 Characteristic	記号 Symbol	条　　件 Test Conditions	最小 Min.	標準 Typ.	最大 Max.	単位 Unit
順電圧 Peak Forward Voltage	V_F	I_F＝200A, V_{GE}＝0V	—	2.2	2.6	V
逆回復時間 Reverse Recovery Time	t_{rr}	I_F＝200A, V_{GE}＝－10V di/dt＝400A/μs	—	0.2	0.3	μs

■熱的特性　Thermal Characteristics

項　　目 Characteristic		記号 Symbol	条　　件 Test Conditions	最小 Min.	標準 Typ.	最大 Max.	単位 Unit
熱抵抗 Thermal Impedance	IGBT	$R_{th(j-c)}$	Tc測定点チップ直下 Junction to Case	—	—	0.104	℃/W
	Diode			—	—	0.214	

■定格・特性曲線

Fig. 1 Output Characteristics (Typical)

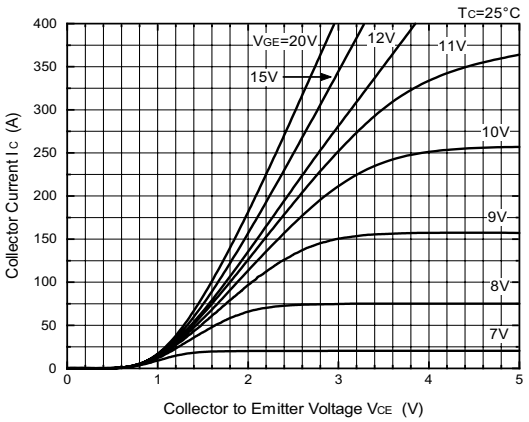


Fig. 2 Output Characteristics (Typical)

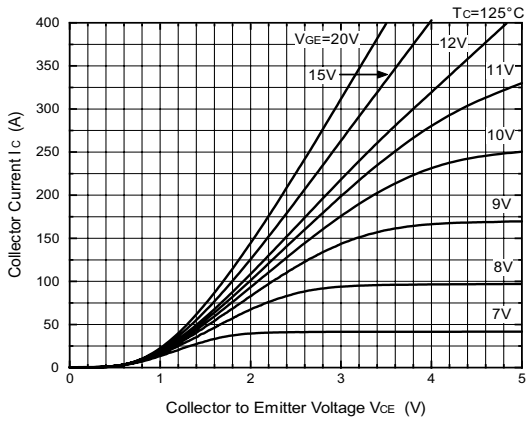


Fig. 3 Collector to Emitter on Voltage vs. Gate to Emitter Voltage (Typical)

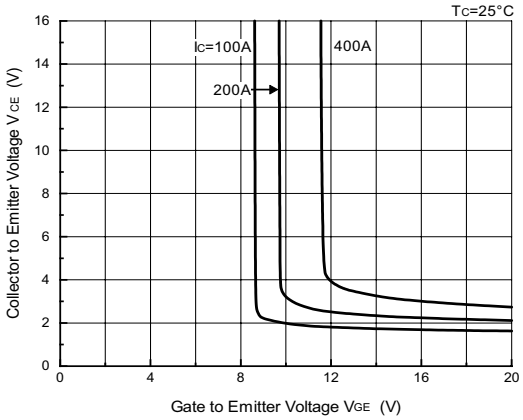


Fig. 4 Collector to Emitter on Voltage vs. Gate to Emitter Voltage (Typical)

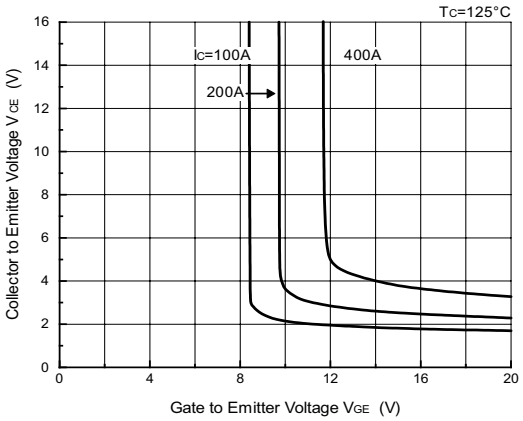


Fig. 5 Gate Charge vs. Collector to Emitter Voltage (Typical)

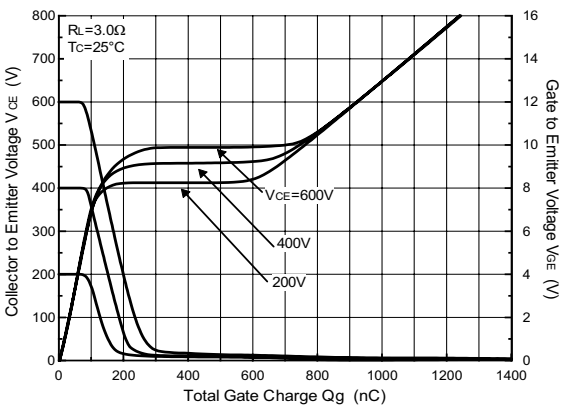


Fig. 6 Capacitance vs. Collector to Emitter Voltage (Typical)

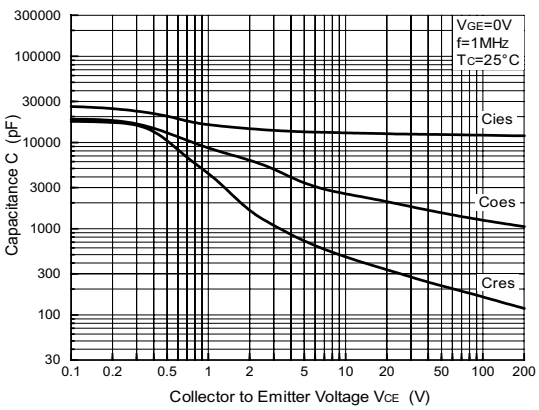


Fig. 7 Collector Current vs. Switching Time (Typical)

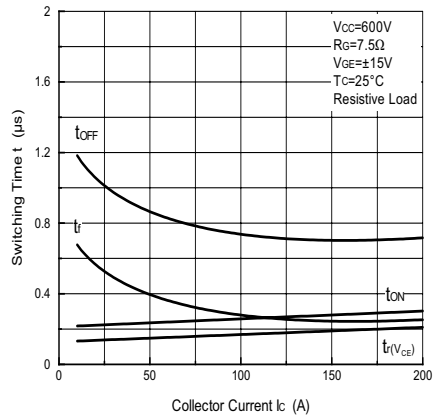


Fig. 8 Series Gate Impedance vs. Switching Time (Typical)

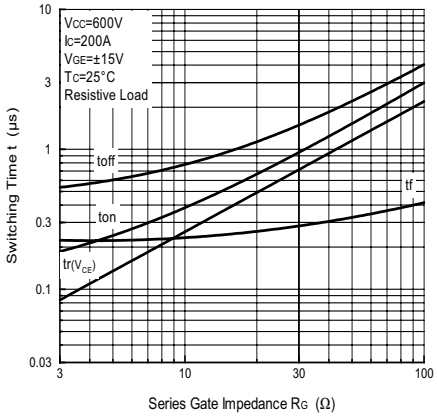


Fig. 9 Collector Current vs. Switching Time

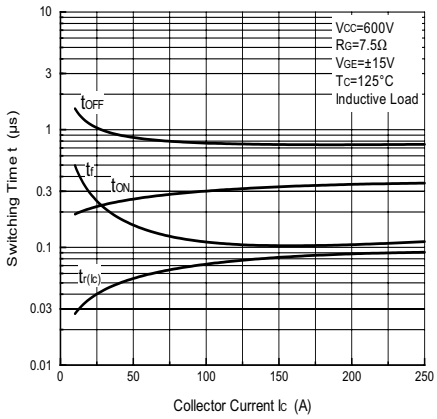


Fig. 10 Series Gate Impedance vs. Switching Time

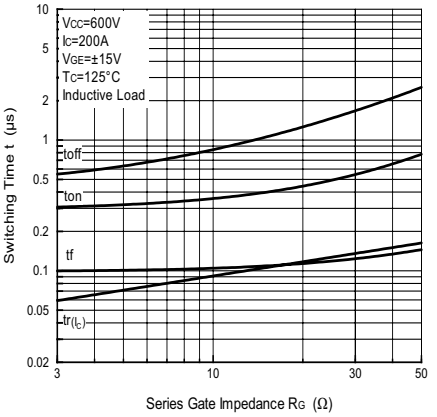


Fig. 11 Collector Current vs. Switching Loss

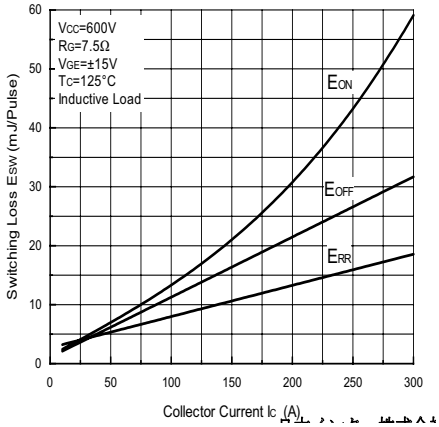


Fig. 12 Series Gate Impedance vs. Switching Loss

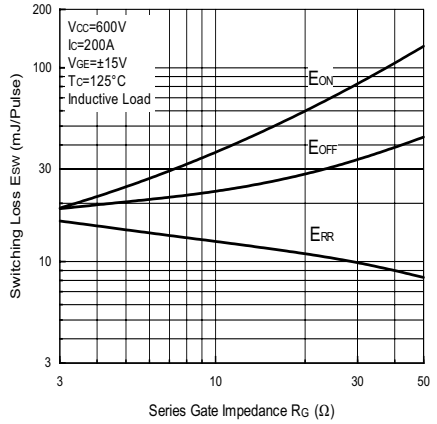


Fig. 13 Forward Characteristics of Free Wheeling Diode (Typical)

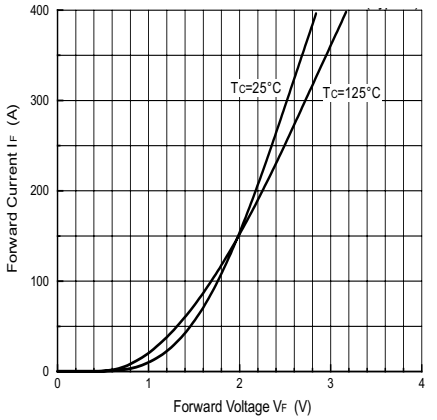


Fig. 14 Reverse Recovery Characteristics (Typical)

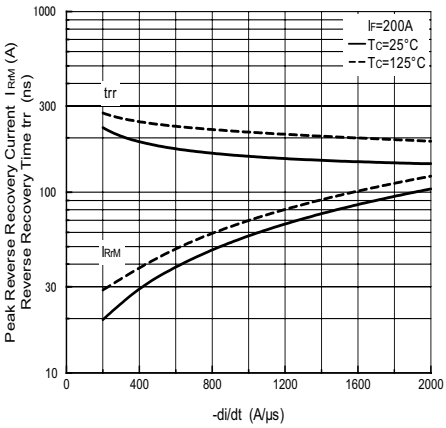


Fig. 15 Reverse Bias Safe Operating Area

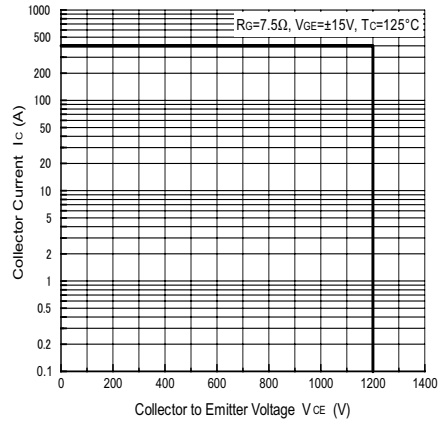
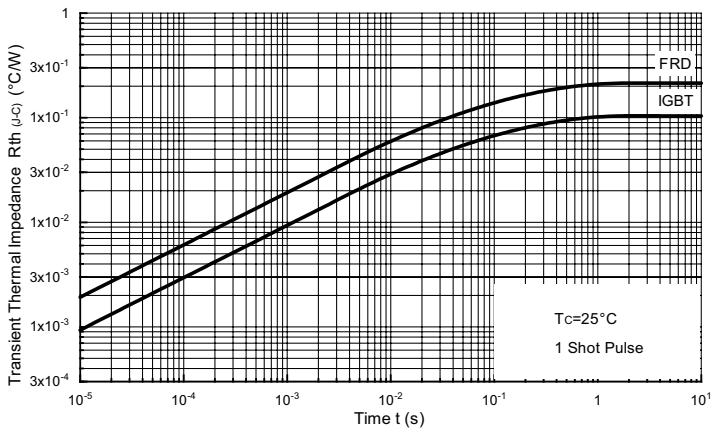


Fig. 16 Transient Thermal Impedance



IGBTモジュール