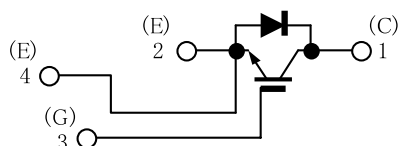


IGBT

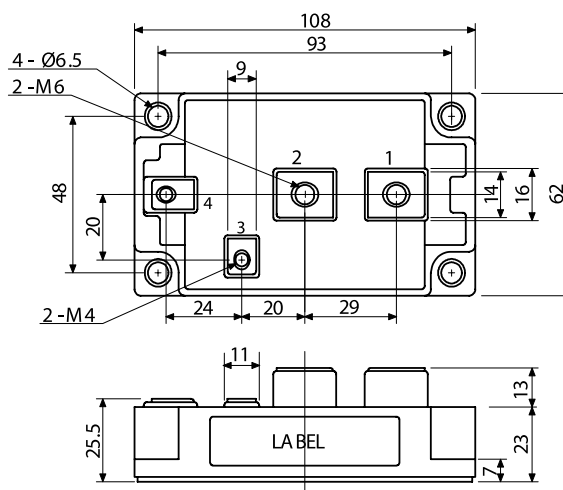
300 A 1200 V

PHMB300BS12

■回路図 CIRCUIT



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



■最大定格 Maximum Ratings ($T_c=25^\circ\text{C}$)

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	300	A
	1ms	I_{CP}	600	
コレクタ損失 Collector Power Dissipation		P_c	1800	W
接合温度 Junction Temperature Range		T_j	$-40 \sim +150$	$^\circ\text{C}$
保存温度 Storage Temperature Range		T_{stg}	$-40 \sim +125$	$^\circ\text{C}$
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)	$\text{N}\cdot\text{m}$ ($\text{kgf}\cdot\text{cm}$)
	端子部 Busbar to Terminal		M4 1.4 (14.3)	
			M6 3 (30.6)	

■電気的特性 Electrical Characteristics ($T_c=25^\circ\text{C}$)

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}	$V_{CE} = 1200\text{V}, V_{GE} = 0\text{V}$	—	—	3.0	mA
ゲート漏れ電流 Gate-Emitter Leakage Current	I_{GES}	$V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}$	—	—	1.0	μA
コレクタ・エミッタ間飽和電圧 Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_c = 300\text{A}, V_{GE} = 15\text{V}$	—	2.3	2.7	V
ゲートしきい値電圧 Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE} = 5\text{V}, I_c = 300\text{mA}$	4.0	—	8.0	V
入力容量 Input Capacitance	C_{ies}	$V_{CE} = 10\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$	—	18900	—	pF
スイッチング時間 Switching Time	上昇時間 Rise Time	$V_{CC} = 600\text{V}$ $R_L = 2.0\Omega$ $R_G = 5.1\Omega$ $V_{GE} = \pm 15\text{V}$	—	0.25	0.45	μs
	ターン・オン時間 Turn-On Time		—	0.40	0.70	
	下降時間 Fall Time		—	0.25	0.35	
	ターン・オフ時間 Turn-Off Time		—	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 ($T_C=25^\circ\text{C}$)

項目 Item		記号 Symbol	定格値 Rated Value	単位 Unit
順電流 Forward Current	DC	I_F	300	A
	1ms	I_{FM}	600	

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	$I_F = 300\text{A}$, $V_{GE} = 0\text{V}$	—	2.2	2.6	V
逆回復時間 Reverse Recovery Time	t_{rr}	$I_F = 300\text{A}$, $V_{GE} = -10\text{V}$ $di/dt = 600\text{A}/\mu\text{s}$	—	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	$R_{th(j-c)}$	T_C 測定点チップ直下 Junction to Case	—	—	0.069	$^\circ\text{C}/\text{W}$
	Diode			—	—	0.143	

■定格・特性曲線

Fig. 1 Output Characteristics (Typical)

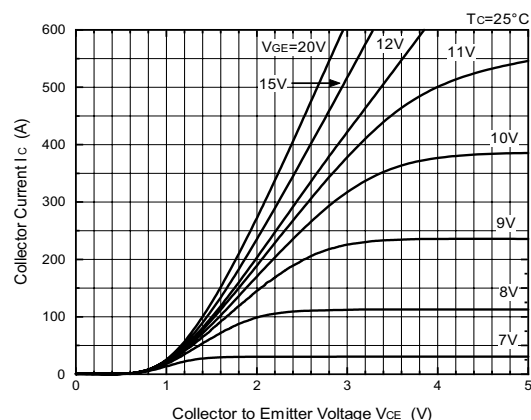


Fig. 2 Output Characteristics (Typical)

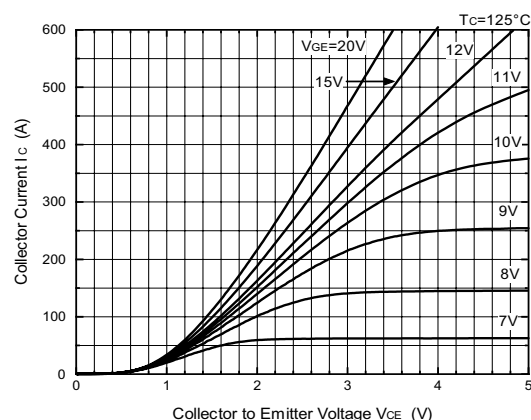


Fig. 3 Collector to Emitter on Voltage vs. Gate to Emitter Voltage (Typical)

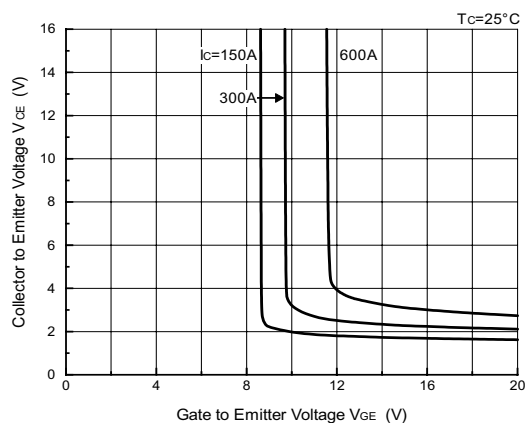


Fig. 4 Collector to Emitter on Voltage vs. Gate to Emitter Voltage (Typical)

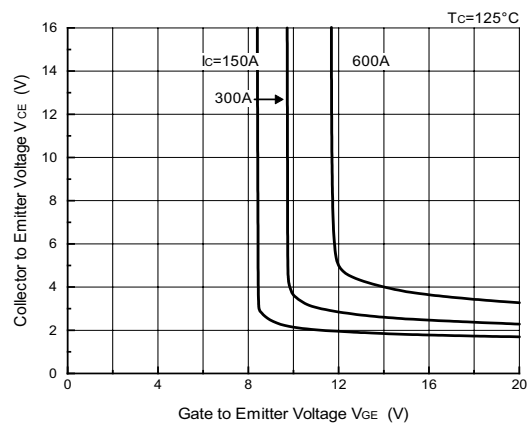


Fig. 5 Gate Charge vs. Collector to Emitter Voltage (Typical)

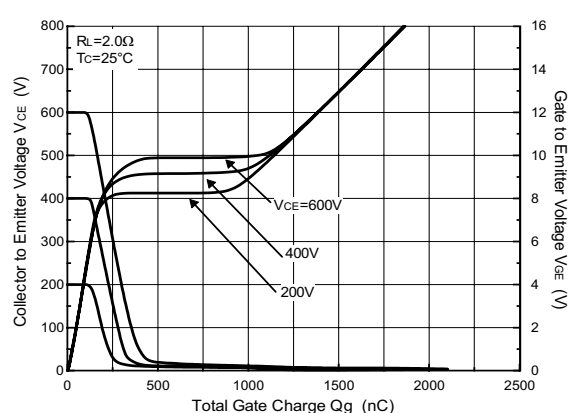


Fig. 6 Capacitance vs. Collector to Emitter Voltage (Typical)

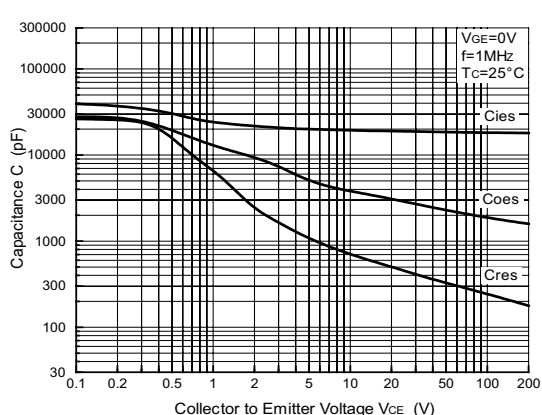


Fig. 7 Collector Current vs. Switching Time (Typical)

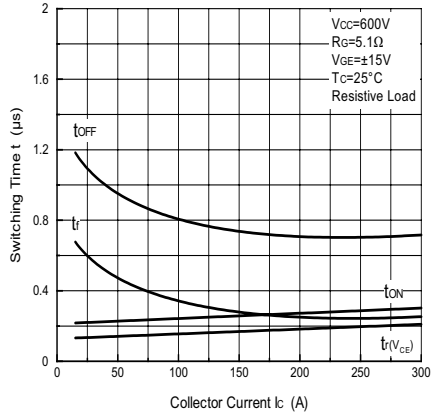


Fig. 10 Series Gate Impedance vs. Switching Time

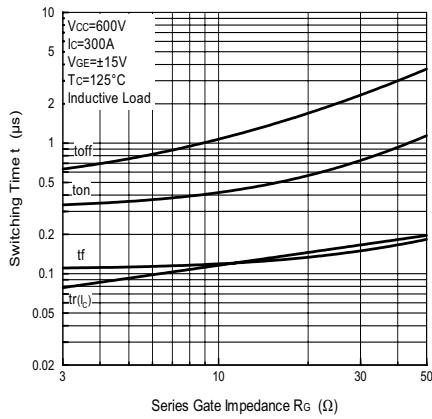


Fig. 13 Forward Characteristics of Free Wheeling Diode (Typical)

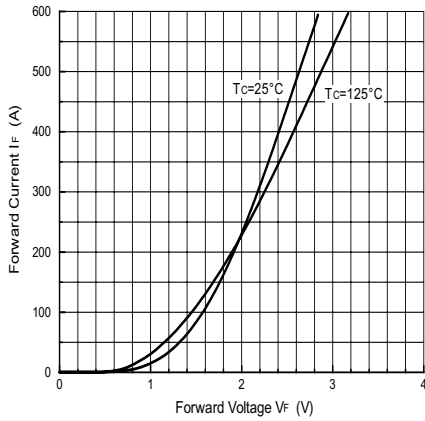


Fig. 16 Transient Thermal Impedance

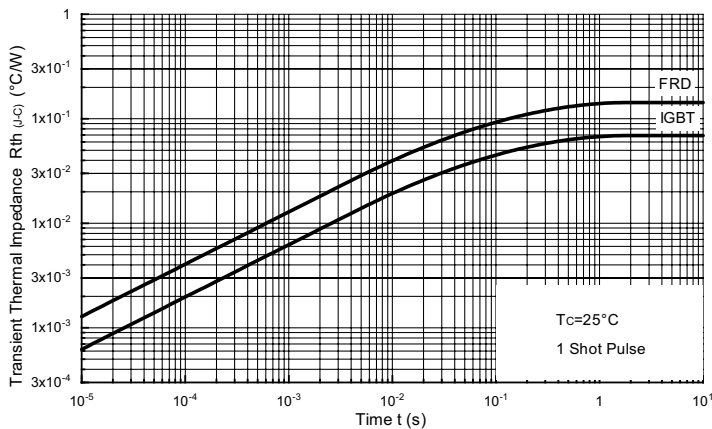


Fig. 8 Series Gate Impedance vs. Switching Time (Typical)

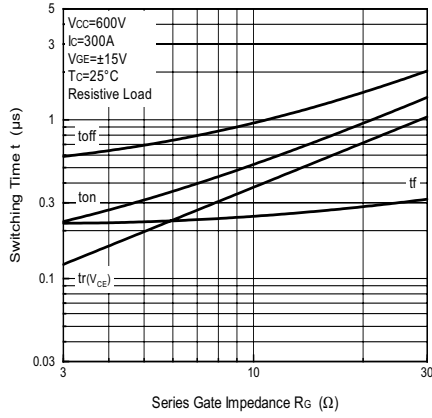


Fig. 11 Collector Current vs. Switching Loss

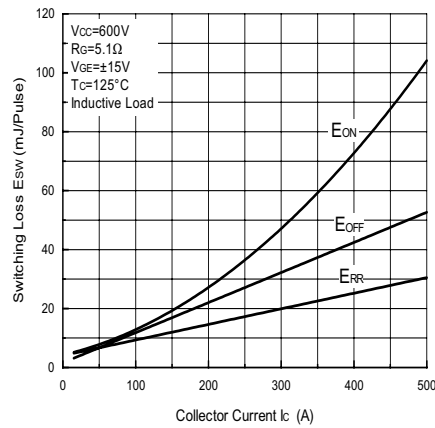


Fig. 14 Reverse Recovery Characteristics (Typical)

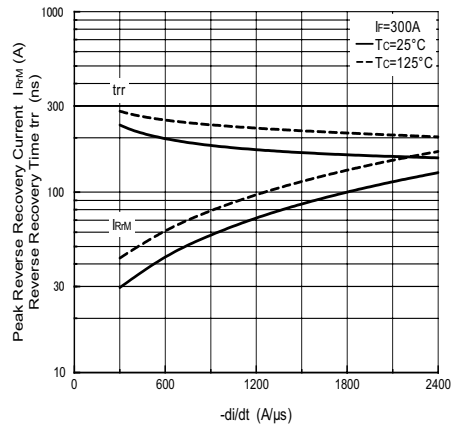


Fig. 9 Collector Current vs. Switching Time

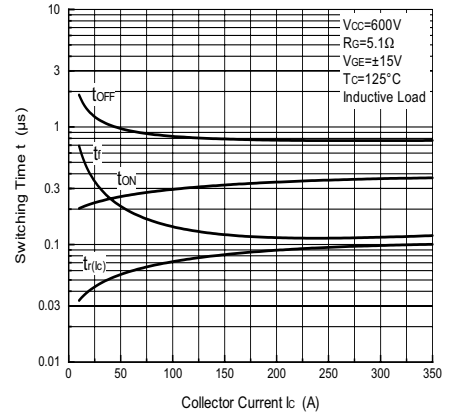


Fig. 12 Series Gate Impedance vs. Switching Loss

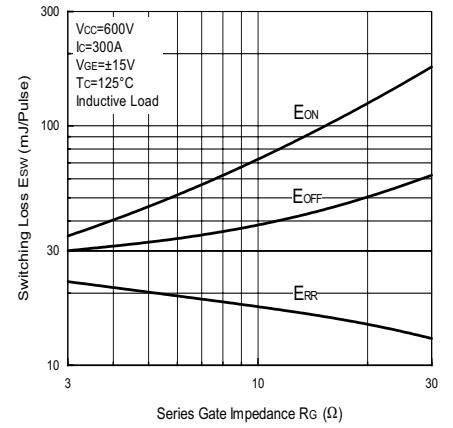


Fig. 15 Reverse Bias Safe Operating Area

