

## IGBT Module-Dual

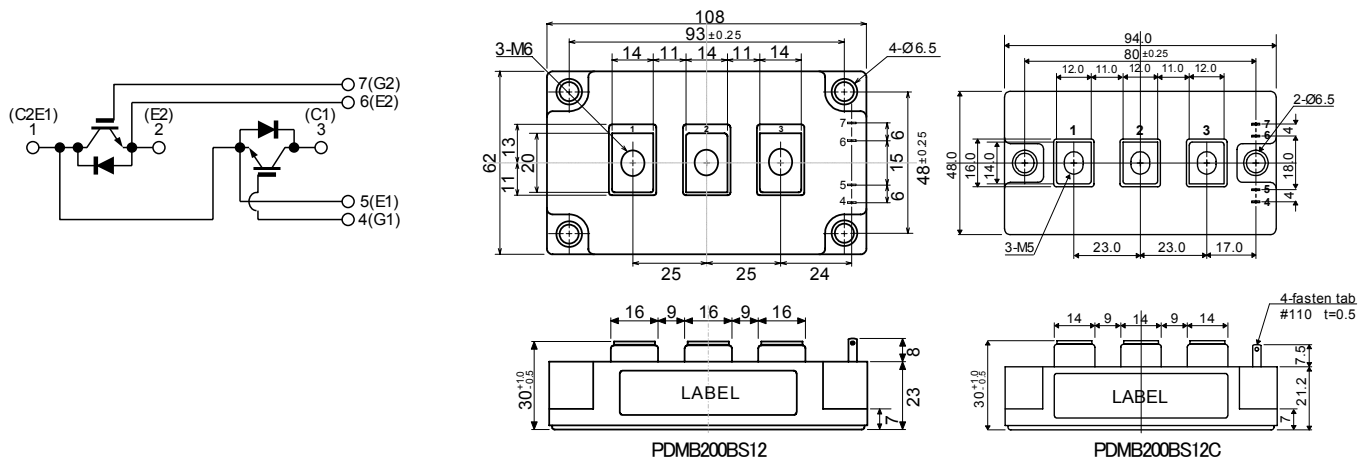
200 A, 1200V

PDMB200BS12

PDMB200BS12C

□ 回路図 : CIRCUIT

□ 外形寸法図 : OUTLINE DRAWING



Dimension: [mm]

□ 最大定格 : MAXIMUM RATINGS ( $T_c = 25^\circ\text{C}$ )

| Item                                                     | Symbol                  | Rated Value                       | Unit             |
|----------------------------------------------------------|-------------------------|-----------------------------------|------------------|
| コレクタ・エミッタ間電圧<br>Collector-Emitter Voltage                | $V_{CES}$               | 1,200                             | V                |
| ゲート・エミッタ間電圧<br>Gate-Emitter Voltage                      | $V_{GES}$               | $\pm 20$                          | V                |
| コレクタ電流<br>Collector Current                              | DC                      | $I_C$                             | A                |
|                                                          | 1ms                     | $I_{CP}$                          |                  |
| コレクタ損失<br>Collector Power Dissipation                    | $P_C$                   | 1,200                             | W                |
| 接合温度<br>Junction Temperature Range                       | $T_j$                   | $-40 \sim +150$                   | $^\circ\text{C}$ |
| 保存温度<br>Storage Temperature Range                        | $T_{stg}$               | $-40 \sim +125$                   | $^\circ\text{C}$ |
| 絶縁耐圧(Terminal to Base AC, 1 minute)<br>Isolation Voltage | $V_{ISO}$               | 2,500                             | V (RMS)          |
| 締め付けトルク<br>Mounting Torque                               | Module Base to Heatsink | PDMB200BS12 3 (30.6)              | N·m<br>(kgf·cm)  |
|                                                          | Busbar to Main Terminal | PDMB200BS12C 3 (30.6)<br>2 (20.4) |                  |

□ 電気的特性 : ELECTRICAL CHARACTERISTICS ( $T_c = 25^\circ\text{C}$ )

| Characteristic                                         | Symbol                | Test Condition                                                                  | Min. | Typ.   | Max. | Unit          |
|--------------------------------------------------------|-----------------------|---------------------------------------------------------------------------------|------|--------|------|---------------|
| コレクタ遮断電流<br>Collector-Emitter Cut-Off Current          | $I_{CES}$             | $V_{CE} = 1200V, V_{GE} = 0V$                                                   | —    | —      | 2.0  | mA            |
| ゲート漏れ電流<br>Gate-Emitter Leakage Current                | $I_{GES}$             | $V_{GE} = \pm 20V, V_{CE} = 0V$                                                 | —    | —      | 1.0  | $\mu\text{A}$ |
| コレクタ・エミッタ間飽和電圧<br>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<br>Gate-Emitter Threshold Voltage            | $V_{GE(th)}$          | $V_{CE} = 5V, I_C = 200mA$                                                      | 4.0  | —      | 8.0  | V             |
| 入力容量<br>Input Capacitance                              | $C_{ies}$             | $V_{CE} = 10V, V_{GE} = 0V, f = 1MHz$                                           | —    | 12,600 | —    | pF            |
| スイッチング時間<br>Switching Time                             | 上昇時間 Rise Time        | $V_{CC} = 600V$<br>$R_L = 3.0\Omega$<br>$R_G = 7.5\Omega$<br>$V_{GE} = \pm 15V$ | —    | 0.25   | 0.45 | $\mu\text{s}$ |
|                                                        | 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 ( $T_c = 25^\circ\text{C}$ )

| I t e m                |       | S y m b o l | R a t e d   V a l u e |  | U n i t |  |
|------------------------|-------|-------------|-----------------------|--|---------|--|
| 順電流<br>Forward Current | DC    | $I_F$       | 200                   |  | A       |  |
|                        | 1 m s | $I_{FM}$    | 400                   |  |         |  |

| C h a r a c t e r i s t i c    |  | S y m b o l | T e s t   C o n d i t i o n                         | M i n . | T y p . | M a x . | U n i t |
|--------------------------------|--|-------------|-----------------------------------------------------|---------|---------|---------|---------|
| 順電圧<br>Peak Forward Voltage    |  | $V_F$       | $I_F = 200A, V_{GE} = 0V$                           | —       | 2.2     | 2.6     | V       |
| 逆回復時間<br>Reverse Recovery Time |  | $t_{rr}$    | $I_F = 200A, V_{GE} = -10V$<br>$di/dt = 400A/\mu s$ | —       | 0.2     | 0.3     | $\mu s$ |

□ 熱的特性 : THERMAL CHARACTERISTICS

| Characteristic           | Symbol | Test Condition                        | Min. | Typ. | Max.  | Unit                      |
|--------------------------|--------|---------------------------------------|------|------|-------|---------------------------|
| 熱抵抗<br>Thermal Impedance | IGBT   | Junction to Case<br>( $T_c$ 測定点チップ直下) | —    | —    | 0.104 | $^\circ\text{C}/\text{W}$ |
|                          | Diode  |                                       | —    | —    | 0.214 |                           |

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Fig.1- Output Characteristics (Typical)

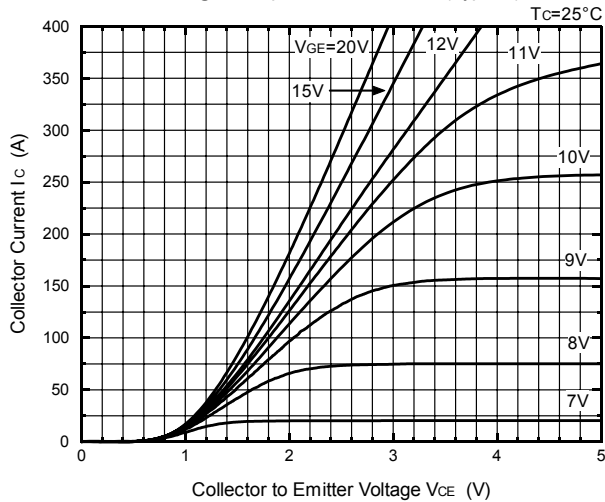


Fig.2- Output Characteristics (Typical)

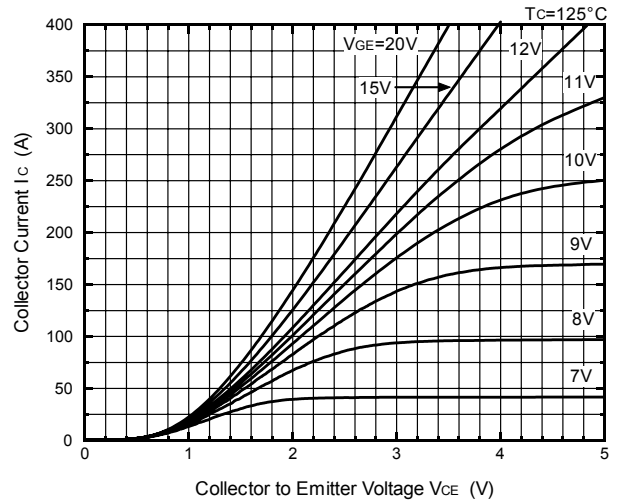


Fig.3- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

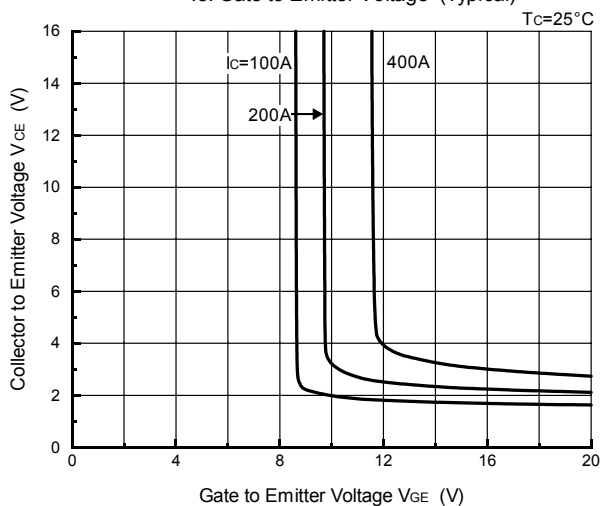


Fig.4- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

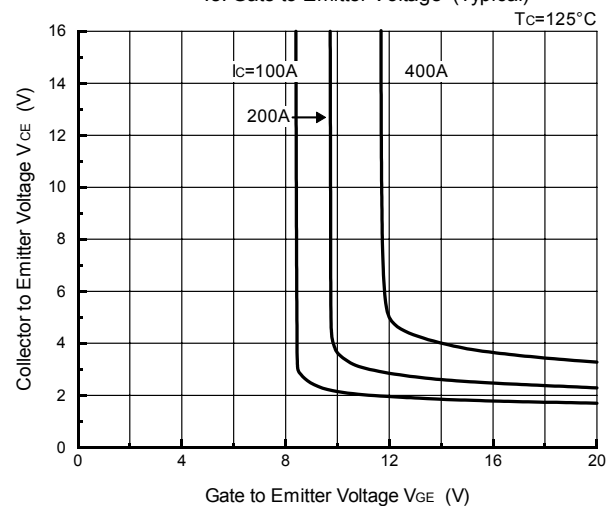


Fig.5- Gate Charge vs. Collector to Emitter Voltage (Typical)

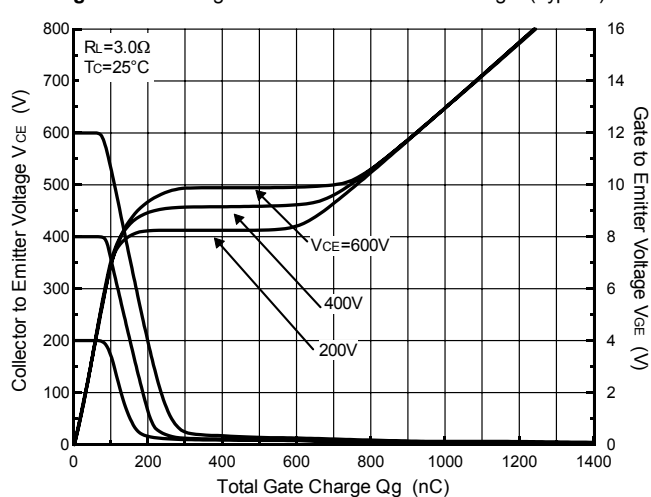
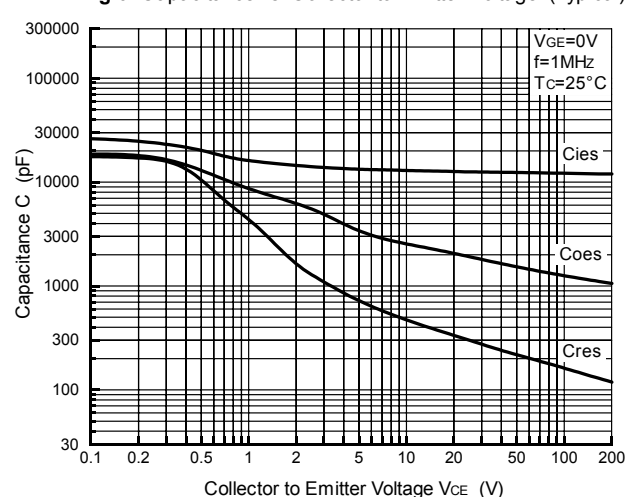


Fig.6- Capacitance vs. Collector to Emitter Voltage (Typical)



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

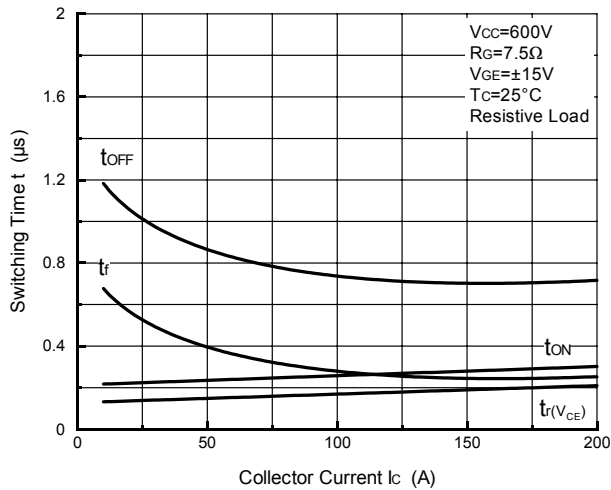


Fig.8- Series Gate Impedance vs. Switching Time (Typical)

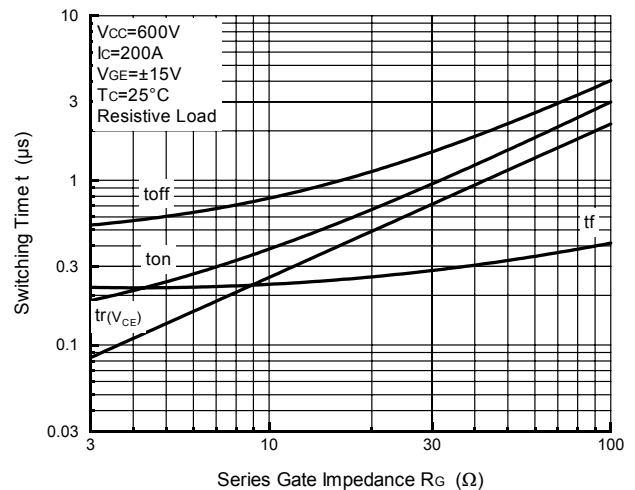


Fig.9- Collector Current vs. Switching Time

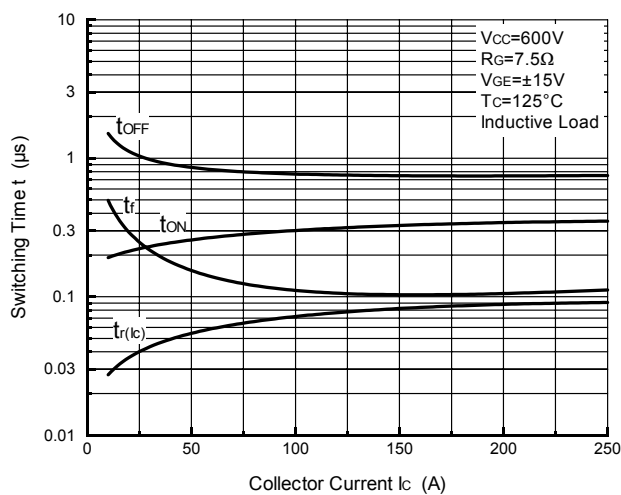


Fig.10- Series Gate Impedance vs. Switching Time

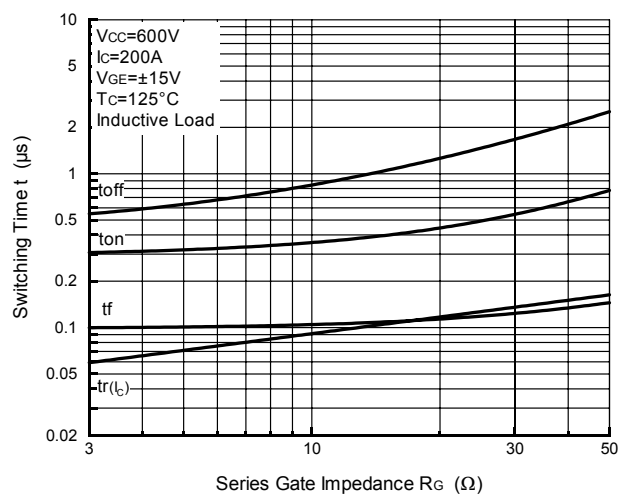


Fig.11- Collector Current vs. Switching Loss

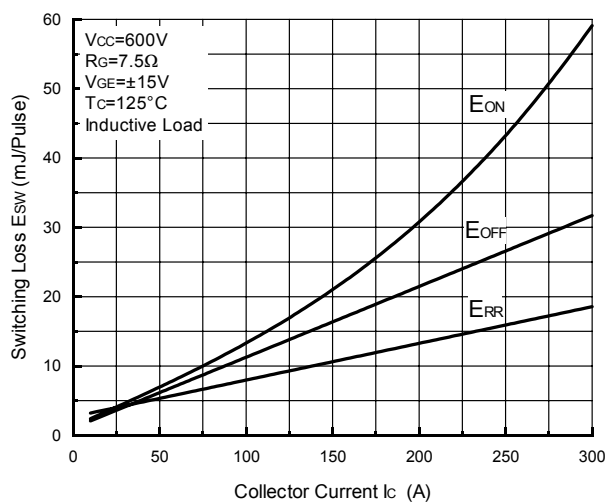
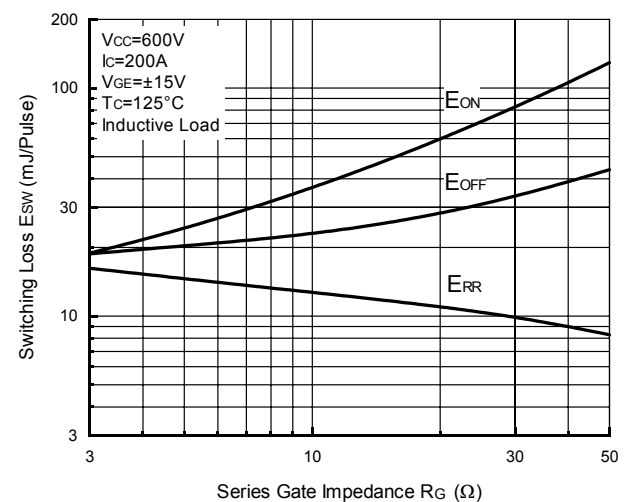
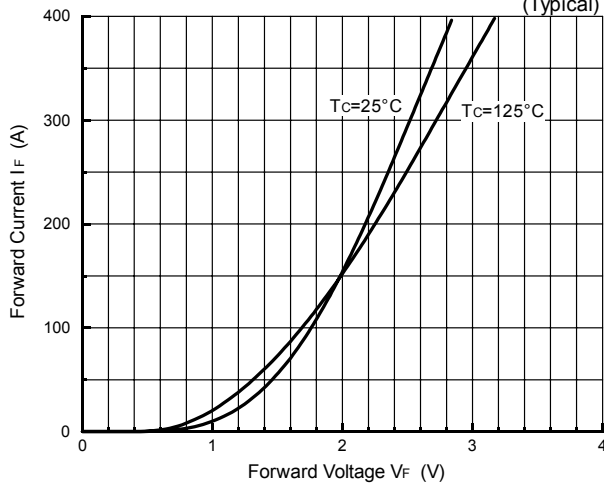
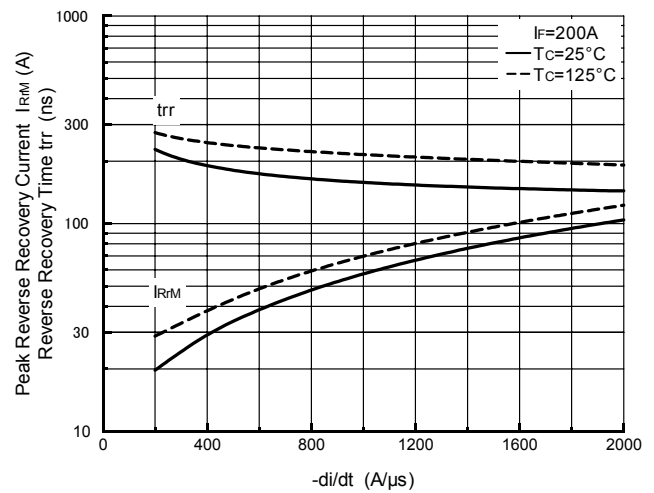
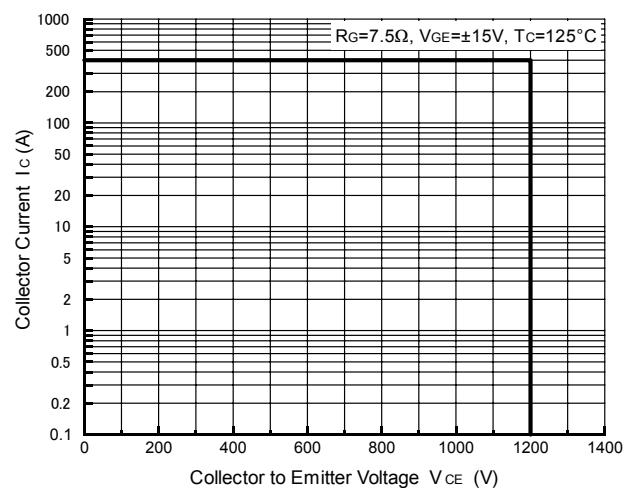


Fig.12- Series Gate Impedance vs. Switching Loss



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**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**