

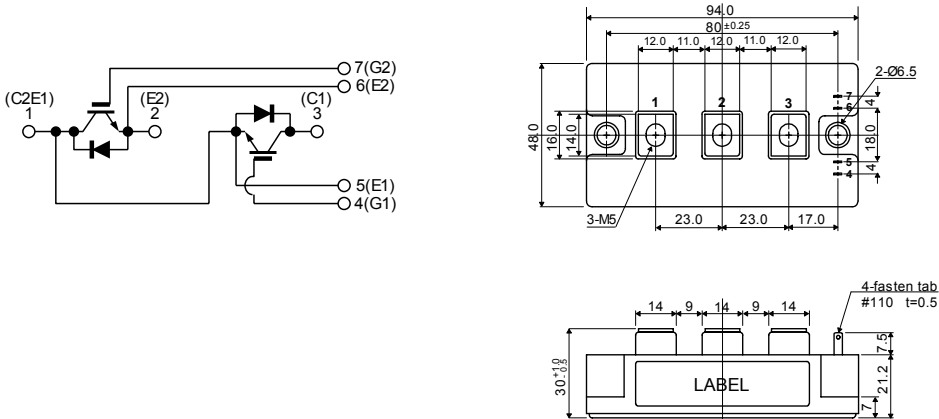
IGBT Module-Dual

150 A, 1200V

PDMB150BS12

□ 回路図 : CIRCUIT

□ 外形寸法図 : OUTLINE DRAWING



Dimension: [mm]

□ 最大定格 : MAXIMUM RATINGS (T<sub>c</sub> = 25℃)

| Item                                                     |                         | Symbol           | Rated Value | Unit               |
|----------------------------------------------------------|-------------------------|------------------|-------------|--------------------|
| コレクタ・エミッタ間電圧<br>Collector-Emitter Voltage                |                         | V <sub>CES</sub> | 1,200       | V                  |
| ゲート・エミッタ間電圧<br>Gate-Emitter Voltage                      |                         | V <sub>GES</sub> | ±20         | V                  |
| コレクタ電流<br>Collector Current                              | DC                      | I <sub>C</sub>   | 150         | A                  |
|                                                          | 1ms                     | I <sub>CP</sub>  | 300         |                    |
| コレクタ損失<br>Collector Power Dissipation                    |                         | P <sub>C</sub>   | 765         | W                  |
| 接合温度<br>Junction Temperature Range                       |                         | T <sub>j</sub>   | -40~+150    | ℃                  |
| 保存温度<br>Storage Temperature Range                        |                         | T <sub>stg</sub> | -40~+125    | ℃                  |
| 絶縁耐圧(Terminal to Base AC, 1 minute)<br>Isolation Voltage |                         | V <sub>ISO</sub> | 2,500       | V <sub>(RMS)</sub> |
| 締め付けトルク<br>Mounting Torque                               | Module Base to Heatsink | F <sub>tor</sub> | 3 (30.6)    | N・m<br>(kgf・cm)    |
|                                                          | Busbar to Main Terminal |                  | 2 (20.4)    |                    |

□ 電気的特性 : ELECTRICAL CHARACTERISTICS (T<sub>c</sub> = 25℃)

| Characteristic                                         |                          | Symbol               | Test Condition                                                                                      | Min. | Typ.  | Max. | Unit |
|--------------------------------------------------------|--------------------------|----------------------|-----------------------------------------------------------------------------------------------------|------|-------|------|------|
| コレクタ遮断電流<br>Collector-Emitter Cut-Off Current          |                          | I <sub>CES</sub>     | V <sub>CE</sub> = 1200V, V <sub>GE</sub> = 0V                                                       | —    | —     | 1.5  | mA   |
| ゲート漏れ電流<br>Gate-Emitter Leakage Current                |                          | I <sub>GES</sub>     | V <sub>GE</sub> = ±20V, V <sub>CE</sub> = 0V                                                        | —    | —     | 1.0  | μA   |
| コレクタ・エミッタ間飽和電圧<br>Collector-Emitter Saturation Voltage |                          | V <sub>CE(sat)</sub> | I <sub>C</sub> = 150A, V <sub>GE</sub> = 15V                                                        | —    | 2.3   | 2.7  | V    |
| ゲートしきい値電圧<br>Gate-Emitter Threshold Voltage            |                          | V <sub>GE(th)</sub>  | V <sub>CE</sub> = 5V, I <sub>C</sub> = 150mA                                                        | 4.0  | —     | 8.0  | V    |
| 入力容量<br>Input Capacitance                              |                          | C <sub>ies</sub>     | V <sub>CE</sub> = 10V, V <sub>GE</sub> = 0V, f = 1MHz                                               | —    | 8,300 | —    | pF   |
| スイッチング時間<br>Switching Time                             | 上昇時間<br>Rise Time        | t <sub>r</sub>       | V <sub>CC</sub> = 600V<br>R <sub>L</sub> = 4.0Ω<br>R <sub>g</sub> = 10.0Ω<br>V <sub>GE</sub> = ±15V | —    | 0.25  | 0.45 | μs   |
|                                                        | ターンオン時間<br>Turn-on Time  | t <sub>on</sub>      |                                                                                                     | —    | 0.40  | 0.70 |      |
|                                                        | 下降時間<br>Fall Time        | t <sub>f</sub>       |                                                                                                     | —    | 0.25  | 0.35 |      |
|                                                        | ターンオフ時間<br>Turn-off Time | t <sub>off</sub>     |                                                                                                     | —    | 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<sub>c</sub> = 25℃)

| Item                   |     | Symbol          | Rated Value | Unit |
|------------------------|-----|-----------------|-------------|------|
| 順電流<br>Forward Current | DC  | I <sub>F</sub>  | 150         | A    |
|                        | 1ms | I <sub>FM</sub> | 300         |      |

| Characteristic                 |  | Symbol          | Test Condition                                                   | Min. | Typ. | Max. | Unit |
|--------------------------------|--|-----------------|------------------------------------------------------------------|------|------|------|------|
| 順電圧<br>Peak Forward Voltage    |  | V <sub>F</sub>  | I <sub>F</sub> = 150A, V <sub>GE</sub> = 0V                      | —    | 2.2  | 2.6  | V    |
| 逆回復時間<br>Reverse Recovery Time |  | t <sub>rr</sub> | I <sub>F</sub> = 150A, V <sub>GE</sub> = -10V<br>di/dt = 300A/μs | —    | 0.2  | 0.3  | μs   |

□ 熱的特性 : THERMAL CHARACTERISTICS

| Characteristic           |       | Symbol               | Test Condition                                | Min. | Typ. | Max.  | Unit |
|--------------------------|-------|----------------------|-----------------------------------------------|------|------|-------|------|
| 熱抵抗<br>Thermal Impedance | IGBT  | R <sub>th(j-c)</sub> | Junction to Case<br>(T <sub>c</sub> 測定点チップ直下) | —    | —    | 0.163 | ℃/W  |
|                          | Diode |                      |                                               | —    | —    | 0.327 |      |

P D M B 1 5 0 B S 1 2

Fig.1- Output Characteristics (Typical)

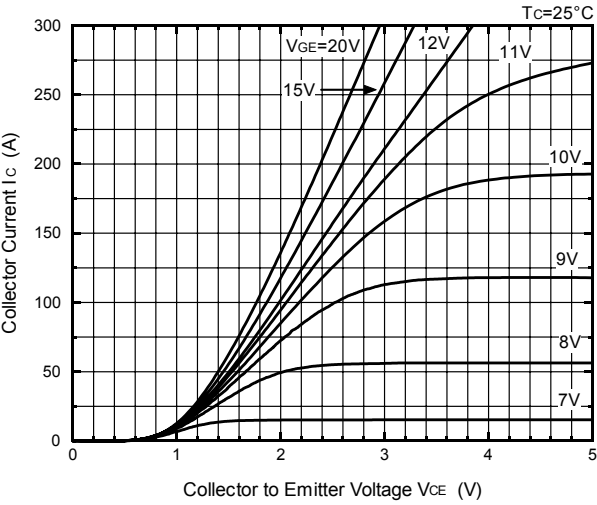


Fig.2- Output Characteristics (Typical)

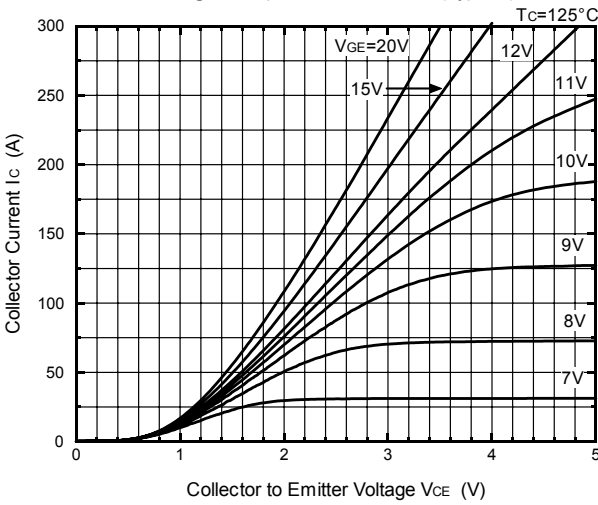


Fig.3- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

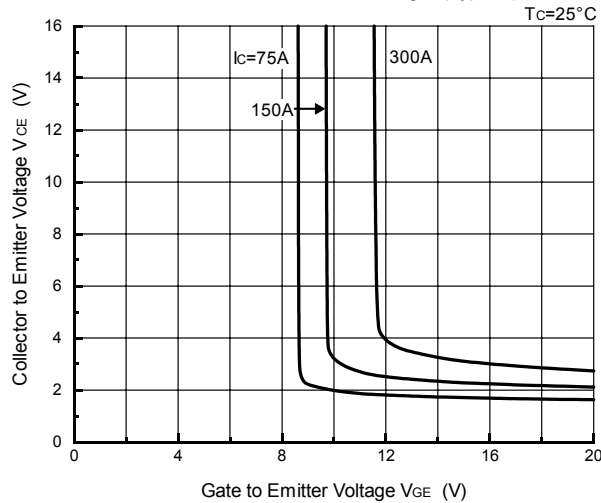


Fig.4- Collector to Emitter On Voltage vs. Gate to Emitter Voltage (Typical)

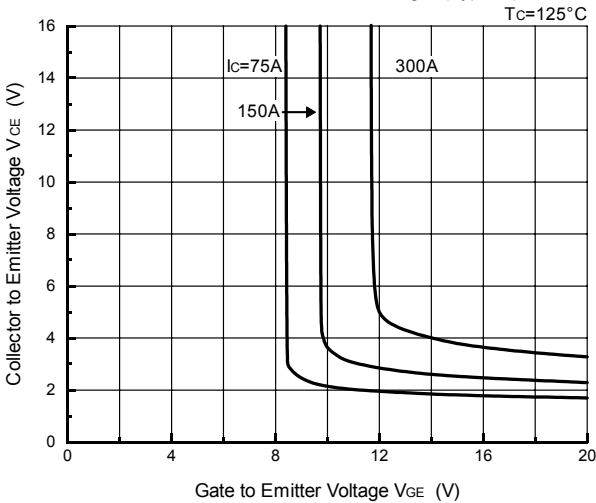


Fig.5- Gate Charge vs. Collector to Emitter Voltage (Typical)

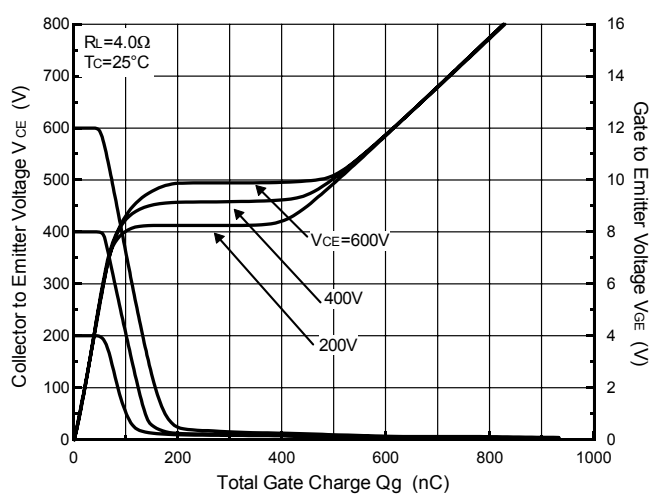
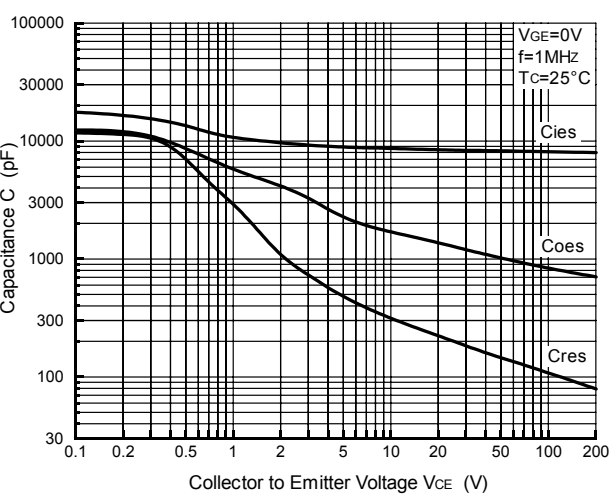


Fig.6- Capacitance vs. Collector to Emitter Voltage (Typical)



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

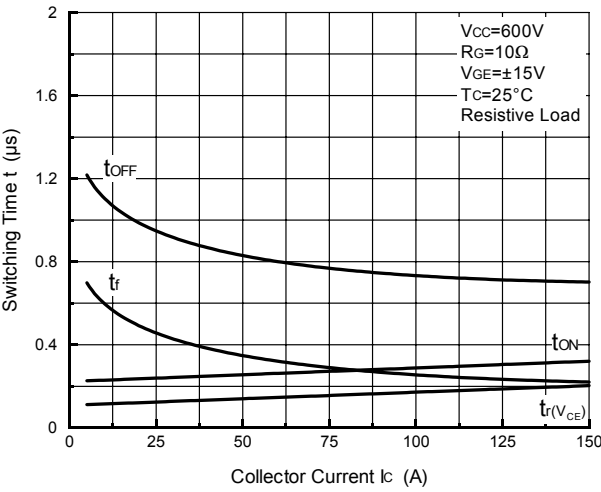


Fig.8- Series Gate Impedance vs. Switching Time (Typical)

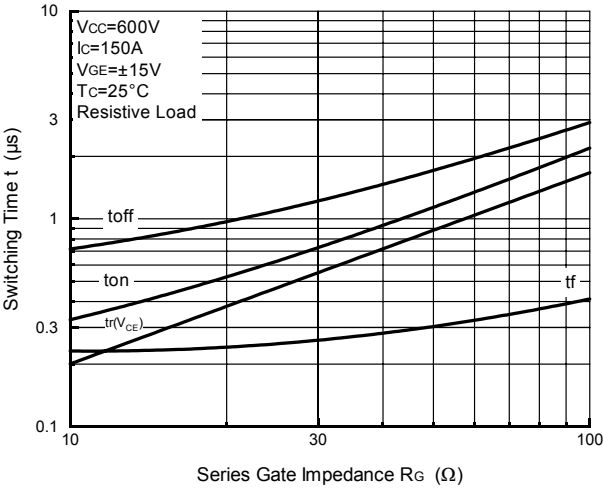


Fig.9- Collector Current vs. Switching Time

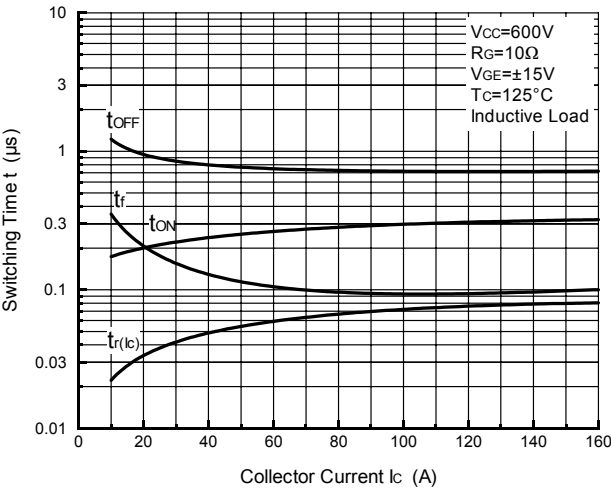


Fig.10- Series Gate Impedance vs. Switching Time

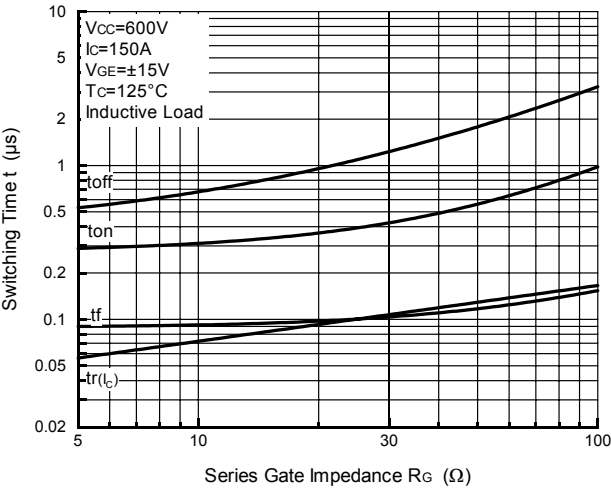


Fig.11- Collector Current vs. Switching Loss

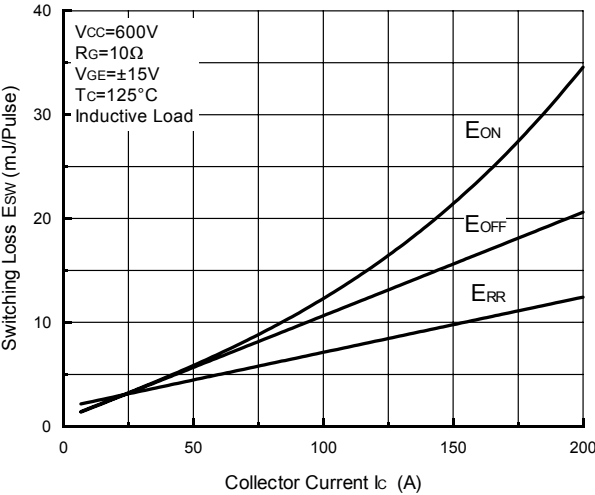
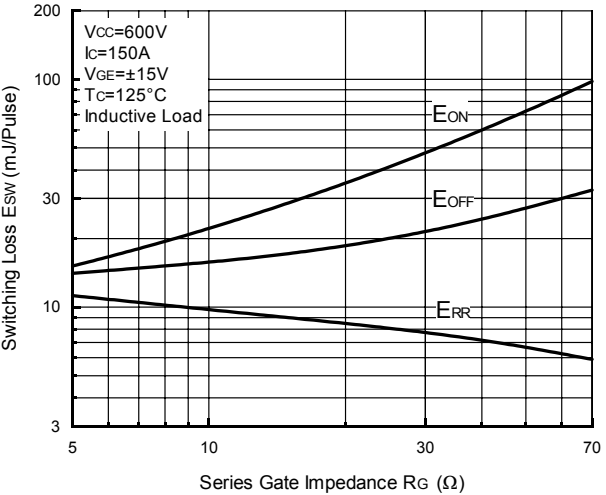


Fig.12- Series Gate Impedance vs. Switching Loss



P D M B 1 5 0 B S 1 2

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

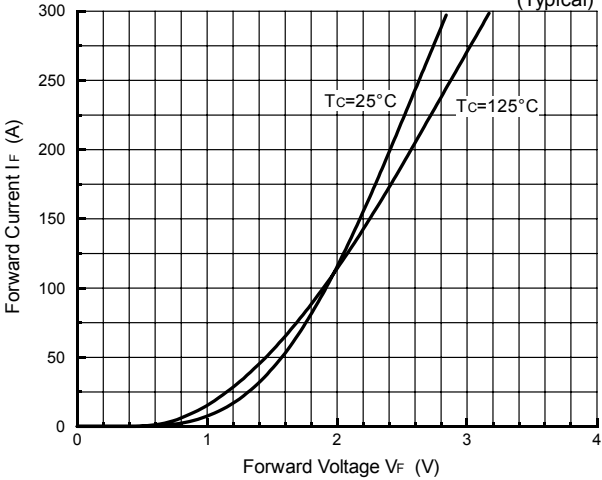


Fig.14- Reverse Recovery Characteristics (Typical)

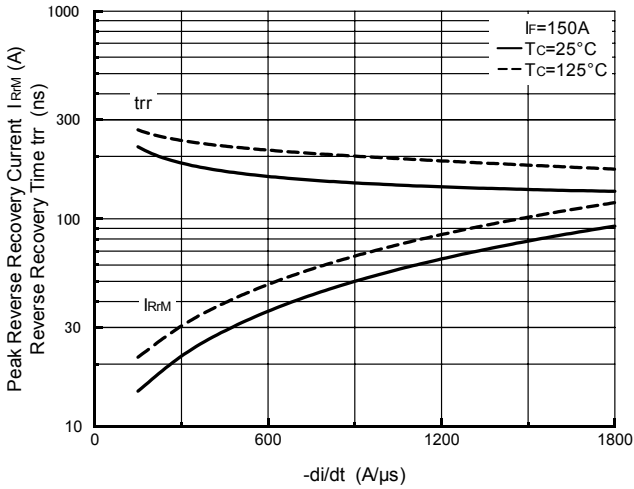


Fig.15- Reverse Bias Safe Operating Area

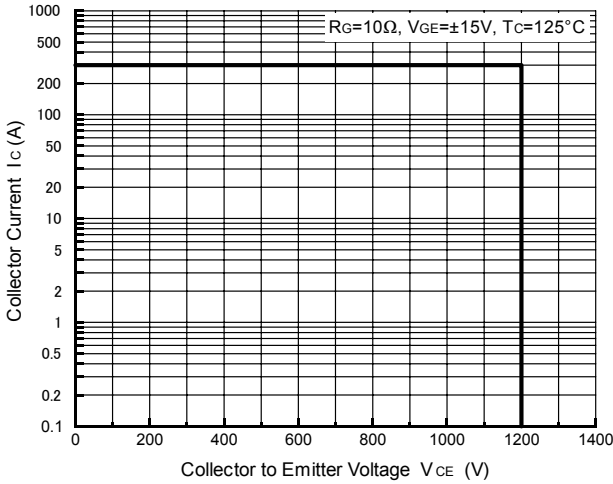


Fig.16- Transient Thermal Impedance

