

T-39-31

## 2.6 IGBT Module Range with Soft and Fast (SFD) Free-Wheeling Diodes

In order to maintain switching losses to minimal, improving Free Wheeling Diodes, (FWD), is essential and Hitachi's version of this is the Soft and Fast Recovery (SFD) Free Wheeling Diode. Basically, improvements have been achieved in the following key requirements.

- High speed ... small recovery time, tr
- Low loss ... small reverse-peak current, Irp
- Low noise ... small rate of charge of recovery current, di/dt

Ultimately reducing your energy losses, Qrr.

## 2.7 IGBT Modules Electrical Characteristics

| Voltage Series | Type Number | Absolute Maximum Ratings |                      |                      |                        |                    | Typical Electrical Characteristics |                       |                     |                      |                     |                       |                      |     |      |     |      |      |
|----------------|-------------|--------------------------|----------------------|----------------------|------------------------|--------------------|------------------------------------|-----------------------|---------------------|----------------------|---------------------|-----------------------|----------------------|-----|------|-----|------|------|
|                |             | Package                  | V <sub>CES</sub> (V) | V <sub>GES</sub> (V) | I <sub>C</sub> (A)     | P <sub>C</sub> (W) | V <sub>CE(sat)</sub> (V)           | C <sub>ies</sub> (pF) | t <sub>r</sub> (μs) | t <sub>on</sub> (μs) | t <sub>f</sub> (μs) | t <sub>off</sub> (μs) | t <sub>rr</sub> (μs) |     |      |     |      |      |
| 600V           | MBN200A6    | Single Arm               | 600                  | ± 20                 | 300                    | 1200               | 2.5                                | 18000                 | 0.35                | 0.45                 | 0.3                 | 0.85                  | 0.3                  |     |      |     |      |      |
|                | MBN400A6    |                          |                      |                      | 400                    | 1300               |                                    |                       |                     |                      | 0.35                |                       |                      |     |      |     |      |      |
|                | MBM50A6     | Single Phase (Dual Pack) | 600                  | ± 20                 | 50                     | 250                | 3                                  | 2400                  | 0.3                 | 0.35                 | 0.3                 | 0.55                  | 0.15                 |     |      |     |      |      |
|                | MBM75A6     |                          |                      |                      | 75                     | 325                |                                    | 3700                  |                     |                      |                     |                       |                      |     |      |     |      |      |
|                | MBM100A6    |                          |                      |                      | 100                    | 400                |                                    | 4500                  |                     |                      |                     |                       |                      |     |      |     |      |      |
|                | MBM150A6    |                          |                      |                      | 150                    | 600                |                                    | 7400                  |                     |                      |                     |                       |                      |     |      |     |      |      |
|                | MBM200A6    |                          |                      |                      | 200                    | 730                |                                    | 9000                  | 0.4                 | 0.45                 |                     | 0.7                   |                      |     |      |     |      |      |
|                | MBM300A6    |                          |                      |                      | 300                    | 1000               |                                    | 17000                 | 0.35                |                      |                     | 0.85                  |                      |     |      |     |      |      |
|                | MBB50A6     |                          |                      |                      | Three Phase (Six Pack) | 600                |                                    | ± 20                  | 50                  | 250                  |                     | 3                     | 2700                 | 0.3 | 0.35 | 0.3 | 0.55 | 0.1  |
|                | MBB75A6     |                          |                      |                      |                        |                    |                                    |                       | 75                  | 300                  |                     |                       | 3700                 |     |      |     |      | 0.15 |
|                | MBB100A6    | 100                      | 400                  | 4500                 |                        |                    |                                    |                       |                     |                      |                     |                       |                      |     |      |     |      |      |
|                | 1200V       | MBN200F12                | Single Arm           | 1200                 | ± 20                   | 200                | 1200                               | 3                     | 19000               | 0.4                  | 0.5                 | 0.4                   | 1                    | 0.3 |      |     |      |      |
| MBN300F12      |             | 300                      |                      |                      |                        | 1700               | 33000                              |                       |                     |                      |                     |                       |                      |     |      |     |      |      |
| MBM50F12       |             | Single Phase (Dual Pack) | 1200                 | ± 20                 | 50                     | 400                | 3                                  | 4800                  | 0.4                 | 0.5                  | 0.4                 | 0.75                  | 0.25                 |     |      |     |      |      |
| MBM75F12       |             |                          |                      |                      | 75                     | 700                |                                    | 8900                  |                     |                      |                     | 1                     | 0.3                  |     |      |     |      |      |
| MBM100F12      |             |                          |                      |                      | 100                    | 800                |                                    | 9300                  |                     |                      |                     |                       |                      |     |      |     |      |      |
| MBM150F12      |             |                          |                      |                      | 150                    | -                  |                                    | 18000                 |                     |                      |                     |                       |                      |     |      |     |      |      |
| MBB50F12       |             |                          |                      |                      | Three Phase (Six Pack) | 1200               |                                    | ± 20                  |                     |                      |                     |                       |                      | 50  | -    | -   | -    | -    |