## **BOID'S POUR Systems**® 4in1 400A/1200V Module with T-type Topology for 3-Level Applications

A growing demand for 3-level inverter technology combining reduced power loss and increased power capacity is originating from power conversion applications like wind and PV inverter as well as from industrial equipment such as uninterruptible power supplies (UPS) and recently active frontends of 4-quadrant drives.

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Much attention has focused on the further development of power semiconductor modules being the key devices in inverters, that offer low power consumption, reduced package size and especially low inductance to help maximizing the 3-level inverter's performance.



Figure 1: Photo of CM400ST-24S1



Mitsubishi Electric launched the CM400ST-24S1 IGBT, e.g. a 4in1 400A/1200V IGBT module as part of a new family of power semiconductor modules optimized for 3-level inverters to meet these demands by adopting new packages that help reducing inductance, thereby contributing to reduced power consumption and downsizing in largecapacity industrial equipment.

## Module ratings

This new 400A/1200V module represents the biggest current rating of a planned lineup of 4in1 3-level IGBT modules planned in the same package. Based on electrical and thermal evaluations the CM400ST-24S1 is supposed to operate in 125kW-class inverters.

The photo of the CM400ST-24S1 reveals the outline of the package and figure 2 indicates the drawing of this new package. With baseplate dimensions of 115mm x 82mm and the innovative step terminal design this new outline provides new degrees of freedom in designing a power stage including the mechanical design of a gate driver Printed Circuit Board and an efficient utilization of the heatsink in case of parallel connection of modules. The next paragraph will introduce the design features that have led to such an innovative IGBT module packaging concept.



Figure 3: Design considerations for 3-level modules

Outline drawing F

February 2015