Amplifier module delivers 100W of output power

Empower model BBM5K8CKT (SKU 1191) is a 2500 to 6000 MHz amplifier which is guaranteed to deliver 100W output power and related RF performance under all specified temperature and environmental conditions. The amplifier module is 8.0” x 6.5” x 1.0”. This amplifier is suitable for broadband jamming and high power linear applications in the S / C bands. This module utilizes high power GaN on SiC transistors and also features built in control and monitoring, with protection functions. The control system core has a built–in non-volatile memory for event recording and factory setup recovery features.

What’s so special about this module?
RF performance which is guaranteed over full bandwidth, temperature, and environmental conditions is not “typical” of products presently available in the market.
In addition to this, the user interface capabilities of this module and embedded controls that are standard with Empower next generation designs allow the user to communicate with the PA building block with a PC or systems controller via RS485. Analog control capabilities still exist, if applicable.

About an event log and non-volatile memory
This allows for internal diagnostics and troubleshooting in a systems failure scenario – basically, we have a flight recorder in the module which is continuously sampling and logging PA “health”. The memory features also enable us to record product and configuration information at time of manufacture.

Internal monitoring and protection features
The module is designed to be actively (continuously) monitoring critical performance parameters – ie, temperature, current consumption, voltage levels, alarms, etc – and taking action via the microcontroller to initiate protection and/or shutdown to avoid PA damage.

Thermal management and reliability advantages
This is a “minimal touch” design which eliminates a number of manual process steps - design margin evaluation (DME) analysis and a full battery of qualification tests are integral to this product introduction. Detailed thermal simulations, heat spreading techniques, and device management all contribute to high reliability. Temperature compensation is actively running in this module, including control of device level quiescent current.
User interface capabilities - the customer can actually adjust some of the amplifier parameters through the RS485 connection

The user can adjust the gain of the module, enable / disable the PA, and set the communication address. The user can also monitor current consumption, internal temperature, supply voltage, and warning and error status related to system health. Also, this product has legacy, analog control capabilities (voltage) for gain and enable / disable and analog reporting for current and temperature.

Protection features

The PA has multiple defense mechanisms which are active at the same time:
- Current monitoring for the overall PA, the driver stages, and the output devices. The over current protection (limiting) feature lowers output power.
- Temperature monitoring provides internal readings and lowers output power in an over temp condition, enables with low gain for “warm up” in under temp condition.
- Voltage monitoring on the DC supply - PA shutdown or muting will result if triggered.
- Reverse polarity and ESD protection on the I/O lines – hardwired with 17 pin connector.

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[1] http://www.EmpowerRF.com