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Thick-film-on-steel resistors perform in battery cell balancing, bleeder circuits...

IRC'S PLANAR POWER RESISTORS PROVIDE EXTERNAL THERMAL DISSIPATION FOR BATTERY PACKS IN HYBRID ELECTRIC VEHICLES

BOONE, NC (February 22, 2010) — Giving alternative-energy automotive design engineers a rugged resistive device capable of dissipating significant amounts of heat generated during the battery charging cycle, TT electronics IRC has developed a series of planar power resistors for hybrid electric vehicles. Designated the WDBR Series, the planar thick-film resistors carry surge power ratings up to 7kW and feature a steel substrate that provides direct transfer of thermal energy to an external heat sink.

“In alternative energy vehicles with battery packs, charging of the individual battery cells within the module has to be balanced, since the overall cell bank can only be effectively charged to the level of the highest capacity cell and discharged to the lowest and most limiting capacity cell,” explained Wilson Hayworth, application engineer for TT electronics IRC. “The WDBR Series resistors are used to bypass higher state of charged cells so that the other cells can continue charging, resulting in the battery bank’s ability to hold a higher overall charge.”

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IRC'S PLANAR POWER RESISTORS EMPLOYED IN HYBRID ELECTRIC VEHICLES, PG. 2

The WDBR Series resistors can also be used in bleeder circuits to safely absorb excess energy that results when alternative energy systems such as fuel cells or onboard generators are switched off. "In both of these applications, the resistor's ability to transfer heat directly to a heat sink outside of the controls module is a tremendous advantage for the designer," Hayworth continued. The resistor's planar geometry also provides smaller size, less weight and lower cost than conventional resistor technology.

The WDBR Series planar power resistors are rated for 0.5, 1.0, 2, 3, 5 and 7kW (maximum pulse power rating). Standard resistance values include 12, 22, 47, 100 and 150 ohms, with tolerances to $\pm 10\%$ (custom resistance values and tolerances are also available). Minimum dielectric withstanding voltage is specified at 2500VDC. Inductance values range from less than $3\mu\text{H}$ to less than $6\mu\text{H}$.

The thick film resistive element is printed on an insulated stainless steel substrate, with a high temperature overglaze for protection. The closely matched thermal expansion coefficient between the steel substrate and the dielectric film enable the WDBR Series resistors to withstand severe temperature cycling (up to 400°C). Dimensions for the resistor range from 1.94 inches x 1.41 inches to 4 inches x 6 inches, with substrate thickness of either 0.035 or 0.059 inches.

Please consult IRC for pricing and lead times for the WDBR thick film power resistors.

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IRC'S PLANAR POWER RESISTORS EMPLOYED IN HYBRID ELECTRIC VEHICLES, PG. 3

For more information on IRC's WDBR planar power resistors, please access the Web site at <http://www.irctt.com/products.aspx?frmCategory=23>. For additional information, please contact TT electronics' North American sales office at 4222 S. Staples St., Corpus Christi, TX 78411; call 361-985-3166; or email sales@ttelectronics-na.com.

IRC Inc. is a leading international manufacturer of advanced film, metal glaze and wirewound resistive products with facilities in Corpus Christi, Texas, Boone, N.C., Smithfield, N.C., and Barbados. IRC is part of TT electronics plc, a global electronics company manufacturing a broad range of advanced electronic components, assemblies and sensor modules for the automotive, telecommunications, computer and aerospace markets. TT electronics' Web site can be found at: www.ttelectronics.com.

– 30 –

To request the electronic image, call 919-872-8172, or e-mail: beth.gaddy@btbmarketing.com

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