

## R&D Electronics Newsletter (2014 Issue 9)

Welcome to our 9th issue of newsletter!

As the **exclusive Sales-Channel of TECHSEM**, which is a well-known Chinese developer and manufacturer of **diode / thyristor modules and capsules** with more than 48 years experience, **R&D Electronics** always strives to offer the best quality and price for our customers.

### Up to 20% price reduction:

Together with our supplier partner TECHSEM, we have succeeded to substantially reduce the process costs. As the result you can benefit from the **price reduction of up to 20%**. From now on the new prices in our online-shop [www.rd-ebusiness.com](http://www.rd-ebusiness.com) apply.

Please take the opportunity to use high quality power semiconductors at an excellent price-benefit ratio for your applications. Give us a try! We will provide **free samples** for the common product types.

#### FAQs about the TECHSEM products:

We regularly receive queries from the customers about TECHSEM product characteristics and manufacturing technology at TECHSEM. In this issue you will find answers to the 10 most frequently asked questions.

All of our newsletters are archived in the webshop. More information is available under: [www.rd-ebusiness.com](http://www.rd-ebusiness.com)

Yours faithfully  
R&D Electronics Team

#### FAQ 1: Why TECHSEM modules weigh partially more than the modules from other vendors?

All TECHSEM power modules, including modules below 200A, are based on pressure contact technology (refer to Fig.1). This is an essential difference to the modules of other providers, in which solder contact has been used for the low current modules. By using the pressure contact, all the components in the module are elastically connected. The heat-induced mechanical stress can be compensated by expansion of the elements in the module. Therefore, the modules with pressure contact have higher reliability and longer lifetime. To fix the components, a module with contact pressure requires additional elements inside, e.g. pressure element (Element 13 in Fig.1). This explains the higher weight of pressure contact modules in comparison to solder contact modules.

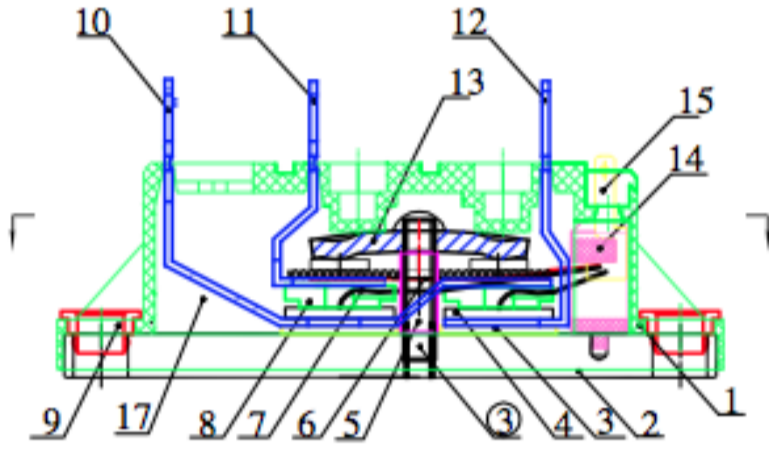


Fig. 1: Sectional view of a TECHSEM pressure contact module

#### FAQ 2: At what power cycles have the TECHSEM modules been tested?

Thanks to the pressure contact technology, TECHSEM modules can withstand much higher power cycles. In the Qualification Approval Testing, all the products have been tested up to 20,000 cycles under the test conditions in accordance with IEC 60749-34 (condition 3). Solder contact modules of other providers are usually tested up to 10,000 cycles only.

#### FAQ 3: Are the pressure contact modules more expensive than the modules with solder contact?

Compared to the solder contact, the molybdenum discs for semiconductor chips and the pressure elements are required as additional components for pressure contact. On the other side you can save the DCB in the pressure contact module. In addition, TECHSEM has its own chip-manufacturing. The additional costs of the components for high-quality pressure contact technology can be fully compensated through cost-effective manufacturing processes at TECHSEM.

Our aim is to offer the customers the pressure contact products, which not only have higher reliability and longer lifetime, but also are more cost-efficient than conventional solder contact products. The pricing information is available in our webshop: [www.rd-ebusiness.com](http://www.rd-ebusiness.com).

#### FAQ 4: How to assembly TECHSEM chip?

The chip is composed of the upper molybdenum, the silicon wafer and the lower molybdenum disk. The peculiarity of the TECHSEM chip is using of the sintering technology. The chips thus obtain, compared to pressed chips, a much higher compressive strength. This results in the assembly only to very low scrap rate, and thus to a considerable cost savings.

#### FAQ 5: What is the situation with the traceability of TECHSEM products? Are the TECHSEM chips also traceable as well?

In the material-incoming test at TECHSEM, the test reports are digitally archived. The materials are clearly identified and recorded to the respective end product. Also the test results of the semi-finished and finished products are digitally marked and archived as well. For the chips with a diameter of bigger than 30 mm, the identification numbers are engraved directly on the chips. For the smaller chips up to 30 mm, the traceability can be ensured at wafer level.

#### FAQ 6: What potting material is used for TECHSEM modules?

All TECHSEM modules below 200A are filled first with soft mold, and then shed with epoxy material under vacuum conditions. Modules from 200A up are potted with soft mold compound material. Through this an excellent moisture protection, in addition to a very good stability of the components, can be guaranteed.

#### FAQ 7: What moisture tests have been performed for TECHSEM products?

In the product qualification tests, the modules have been tested each time 12 hours at a relative humidity of 93% and at 40°C at ambient temperature. Only after 10 cycles, the products can be released.

#### FAQ 8: Why are there several different housing types for a TECHSEM product with certain voltage and current?

The housing types for power semiconductors are not standardized worldwide. For a module with the same current and voltage, different housing types are offered by different vendors. To ensure the best compatibility and substitutability, TECHSEM provides the modules with the most common housing types.

#### FAQ 9: What are the differences between "B" type housing (e.g. 216F3B / 223F3B) and housing type without "B" in the product name (e.g. 216F3 / 223F3)?

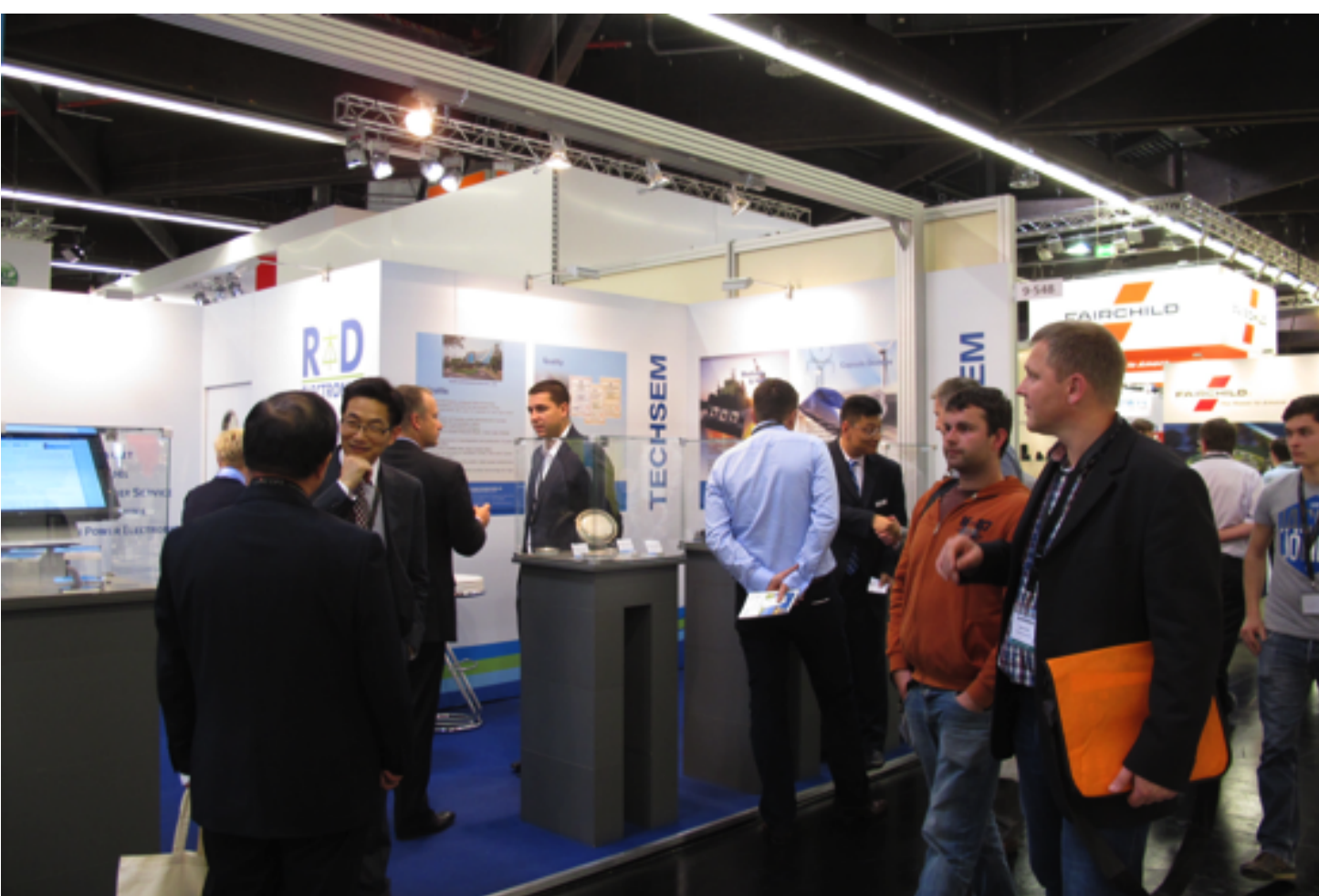
For different customer habits, the different sequences of connection for the control connectors Gate (G) and Auxiliary Cathode (K) are offered: G1/K1, G2/K2 (e.g. 216F3 / 223F3) and G1/K1, K2/G2 (216F3B / 223F3B).

#### FAQ 10: What does the code "H" and "Y" mean in the TECHSEM disc cells (capsule) products?

In case of H-type disc cells, the chips and the molybdenum disks, and all other electrical components are pressed together by the metallized ceramic cases. With this packaging technology, it is possible to use 6-inch chips inside. Thus, the voltage up to 8.5 kV and the current up to 5.2 kA can be reached. In Y-type, the chips, however, are sintered. The used chip-size here is limited to 4-inch. The upper limit for current and voltage amounts to 3 kA and 4 kV.

### Thank you very much for your visits at the PCIM

We would like to thank you for the numerous visits during the PCIM in Nuremberg Germany and for your interest and trust.



You can find more impressions of the PCIM: [www.rd-ebusiness.com](http://www.rd-ebusiness.com).

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