



# Type Designation and Abbreviations

Short Form Catalog 2012



# Type designation

| Presspacks |    |    |   |   |         |  |
|------------|----|----|---|---|---------|--|
| T640       | N  | 18 | T | O | F       |  |
| T          |    |    |   |   |         | thyristor  |
| D          |    |    |   |   |         | diode  |
| 930        |    |    |   |   |         | average on state current (A)   |
| 0          |    |    |   |   |         | standard ceramic disc  |
| 1          |    |    |   |   |         | high power ceramic disc  |
| 3          |    |    |   |   |         | light triggered thyristor, ceramic disc  |
|            | N  |    |   |   |         | phase control device   |
|            | K  |    |   |   |         | phase control diode with cathode on case (only flatbase or stud)                         |
|            | S  |    |   |   |         | fast diode   |
|            | U  |    |   |   |         | fast diode with cathode on case (only flatbase or metric)                                |
|            | A  |    |   |   |         | avalanche diode with anode on case   |
|            | B  |    |   |   |         | avalanche diode with cathode on case (only flatbase or metric)                           |
|            | NH |    |   |   |         | Diode: soft recovery for high current pulses<br>Thyristor: high turn-on di/dt capability |
|            | SH |    |   |   |         | softrecovery diode   |
|            |    | 18 |   |   |         | repetitive peak off-state and reverse voltage in 100 V                                   |
|            |    |    | B |   |         | metric thread with cable   |
|            |    |    | C |   |         | metric thread with solder pin  |
|            |    |    | E |   |         | flat base  |
|            |    |    | T |   |         | disc   |
|            |    |    |   | O |         | no guaranteed turn off time  |
|            |    |    |   |   |         | critical rate of off-state voltage   |
|            |    |    |   |   | C       | 500 V/ $\mu$ s   |
|            |    |    |   |   | F       | 1000 V/ $\mu$ s  |
|            |    |    |   |   | G       | 1500 V/ $\mu$ s  |
|            |    |    |   |   | H       | 2000 V/ $\mu$ s  |
|            |    |    |   |   | B01...n | contruction variation  |
|            |    |    |   |   | S01...n | electrical selection   |

| PowerBLOCK Modules |   |     |   |   |         |   |
|--------------------|---|-----|---|---|---------|---|
| TT 162             | N | 16  | K | O | F -K    |   |
| TT                 |   |     |   |   |         | with 2 thyristors   |
| DD                 |   |     |   |   |         | with 2 diodes   |
| ND, DZ, TZ         |   |     |   |   |         | with 1 thyristor or 1 diode                                   |
| TD, DT             |   |     |   |   |         | with 1 thyristor and 1 diode                                  |
|                    |   | 162 |   |   |         | average on state current (A)                                  |
|                    | N |     |   |   |         | phase control device  |
|                    | S |     |   |   |         | fast diode  |
|                    |   | 16  |   |   |         | repetitive peak off-state and reverse voltage in 100 V        |
|                    |   |     | K |   |         | mechanical construction: module                               |
|                    |   |     | A |   |         | mechanical construction: module                               |
|                    |   |     |   | O |         | no guaranteed turn off time                                   |
|                    |   |     |   |   | F       | critical rate of rise of off-state voltage (see disc devices) |
|                    |   |     |   |   | -K      | design with common cathode                                    |
|                    |   |     |   |   | -A      | design with common anode                                      |
|                    |   |     |   |   | B01...n | construction variation  |
|                    |   |     |   |   | S01...n | electrical selection  |

# Letter Symbols/Kurzzeichen

|  |   |  |
|--|---|--|
| B  | DC current gain                               | Kollektor-Basis-Gleichstromverhalten                 |
| FBSOA                                    | forward biased safe operating area            | Sicherer Vorwärts-Arbeitsbereich                     |
| f  | frequency                                     | Frequenz   |
| f <sub>o</sub>                           | repetition frequency                          | Wiederholfrequenz                                    |
| F  | clamping force                                | Anpresskraft   |
| G  | weight  | Gewicht  |
| I <sub>C</sub>                           | maximum permissible DC collector current      | höchstzulässiger Dauergleichstrom                    |
| I <sub>CAVM</sub>                        | maximum permiss. average collector current    | Kollektor-Dauergrenzstrom                            |
| I <sub>CES</sub>                         | collector-emitter cut-off current             | Kollektor-Emitter-Reststrom                          |
| I <sub>GES</sub>                         | gate-leakage current                          | Gate-Emitter Reststrom                               |
| I <sub>CRM</sub>                         | permissible repetitive peak collector current | höchstzulässiger periodischer Kollektor-Spitzenstrom |
| i <sub>D</sub>                           | forward off-state current                     | Vorwärts-Sperrstrom                                  |
| i <sub>G</sub>                           | gate current                                  | Steuerstrom  |
| I <sub>GD</sub>                          | gate non trigger current                      | nicht zündender Steuerstrom                          |
| i <sub>GM</sub>                          | peak gate current                             | Spitzensteuerstrom                                   |
| I <sub>GT</sub>                          | gate trigger current                          | Zündstrom  |
| I <sub>H</sub>                           | holding current                               | Haltestrom   |
| I <sub>L</sub>                           | latching current                              | Einraststrom   |
| i <sub>R</sub>                           | reverse current                               | Rückwärts-Sperrstrom                                 |
| I <sub>RMS</sub>                         | RMS current                                   | Strom-Effektivwert                                   |
| I <sub>RM</sub>                          | peak reverse recovery current                 | Rückstromspitze                                      |
| i <sub>T</sub> /I <sub>F</sub>           | on-state current                              | Durchlassstrom                                       |
| I <sub>TAV</sub> /I <sub>FAV</sub>       | on-state current (average value)              | Durchlassstrom (Mittelwert)                          |
| I <sub>TAVM</sub> /I <sub>FAVM</sub>     | maximum average on-state current              | Dauergrenzstrom                                      |
| I <sub>TINT</sub> /I <sub>FINT</sub>     | on-state current at intermittent duty         | Durchlassstrom bei Aussetzbetrieb                    |
| I <sub>TM</sub> /I <sub>FM</sub>         | on-state current (peak value)                 | Durchlassstrom (Spitzenwert)                         |
| I <sub>T(OV)</sub> /I <sub>F(OV)</sub>   | on-state current at shorttime duty            | Überstrom bei Kurzzeitbetrieb                        |
| I <sub>T(OV)M</sub> /I <sub>F(OV)M</sub> | maximum overload on-state current             | Grenzstrom   |
| I <sub>T(RC)M</sub>                      | repetitive turn-on current (from snubber)     | periodischer Einschaltstrom (aus RC)                 |
| I <sub>TRMSM</sub> /I <sub>FRMSM</sub>   | maximum RMS on-state current                  | Durchlassstrom-Grenzeffektivwert                     |
| I <sub>TSM</sub> /I <sub>FSM</sub>       | surge non repetitive on-state current         | Stoßstrom-Grenzwert                                  |
| I <sub>F</sub>                           | DC forward current                            | Dauergleichstrom                                     |
| I <sub>FRM</sub>                         | repetitive peak forward current               | Periodischer Spitzenstrom                            |
| ∫i <sup>2</sup> dt                       | I <sup>2</sup> t value                        | Grenzlastintegral                                    |
| di <sub>G</sub> /dt                      | rate of rise of gate current                  | Steilheit des Steuerstromes                          |
| di <sub>T</sub> /dt/di <sub>F</sub> /dt  | rate of rise of on-state current              | Steilheit des Durchlassstromes                       |
| (di/dt) <sub>cr</sub>                    | critical rate of rise of on-state current     | kritische Stromsteilheit                             |
| L  | inductance                                    | Induktivität   |
| M  | mounting torque                               | Anzugsdrehmoment                                     |
| P <sub>ON</sub>                          | turn-on dissipation                           | Einschaltverlustleistung                             |
| P <sub>OFF</sub>                         | turn-off dissipation                          | Ausschaltverlustleistung                             |
| P  | power dissipation                             | Verlustleistung                                      |
| P <sub>D</sub>                           | forward off-state dissipation                 | Vorwärts-Sperrverlustleistung                        |
| P <sub>G</sub>                           | gate dissipation                              | Steuerverlustleistung                                |
| P <sub>R</sub>                           | reverse power dissipation                     | Rückwärts-Sperrverlustleistung                       |
| P <sub>RQ</sub>                          | turn-off dissipation                          | Ausschaltverlustleistung                             |
| P <sub>TT</sub> + P <sub>RQ</sub>        | switching dissipation                         | Schaltverlustleistung                                |
| P <sub>T</sub> /P <sub>F</sub>           | on-state power dissipation                    | Durchlassverlustleistung                             |
| P <sub>TAV</sub> /P <sub>FAV</sub>       | on-state power dissipation (average value)    | Durchlassverlustleistung (arithmetischer Mittelwert) |
| P <sub>TT</sub>                          | turn-on dissipation                           | Einschaltverlustleistung                             |
| P <sub>tot</sub>                         | total power dissipation                       | Gesamtverlustleistung                                |
| Q <sub>r</sub>                           | recovered charge                              | Sperrverzugsladung                                   |
| Q <sub>s</sub>                           | lag charge                                    | Nachlaufladung                                       |
| R  | resistance                                    | Widerstand   |
| r <sub>T</sub>                           | slope resistance                              | Ersatzwiderstand                                     |
| R <sub>thCA</sub>                        | thermal resistance, case to coolant           | Wärmewiderstand Gehäuse-Kühlmittel                   |
| R <sub>thCK</sub>                        | thermal resistance, case to heatsink          | Übergangs-Wärmewiderstand                            |
| R <sub>thJA</sub>                        | thermal resistance, junction to coolant       | Gesamtwärmewiderstand                                |
| R <sub>thJC</sub>                        | thermal resistance, junction to case          | innerer Wärmewiderstand                              |
| RBSOA                                    | reverse biased safe operating area            | Sicherer Rückwärts-Arbeitsbereich                    |
| t  | time  | Zeit   |
| T  | period  | Periodendauer  |

# Letter Symbols/Kurzzeichen

|                   |   |  |
|-------------------|---|--|
| $T_A$             | coolant temperature                               | Kühlmitteltemperatur                                   |
| $T_C$             | case temperature                                  | Gehäusetemperatur                                      |
| $T_{op}$          | operating temperature                             | Betriebstemperatur                                     |
| $t_g$             | trigger pulse duration                            | Steuerimpulsdauer                                      |
| $t_{gd}$          | gate controlled delay time                        | Zündverzug   |
| $T_h$             | heatsink temperature                              | Kühlkörpertemperatur                                   |
| $t_p$             | current pulse duration (sinusoidal)               | Strompulsdauer (Sinusform)                             |
| $t_q$             | circuit commutated turn-off time                  | Freiwerdezeit  |
| $t_{rr}$          | reverse recovery time                             | Sperrverzugszeit                                       |
| $T_{vj}$          | junction temperature                              | Sperrschichttemperatur                                 |
| $T_{vj\ max}$     | maximum permissible junction temperature          | höchstzul. Sperrschichttemperatur                      |
| $t_w$             | current pulse duration (trapezoidal)              | Stromflusszeit (Trapezform)                            |
| $t_f$             | fall time   | Fallzeit   |
| $t_{off}$         | turn-off time                                     | Abschaltzeit   |
| $t_{on}$          | turn-on time                                      | Einschaltzeit  |
| $t_s$             | storage time                                      | Speicherzeit   |
| $T_{vj\ op}$      | operating temperature                             | Betriebstemperatur                                     |
| $T_{stg}$         | storage temperature                               | Lagertemperatur  |
| $V_D$             | forward off-state voltage                         | Vorwärts-Sperrspannung                                 |
| $V_{DM}$          | forward off-state voltage (peak value)            | Vorwärts-Sperrspannung (Spitzenwert)                   |
| $V_{DRM}$         | repetitive peak forward off-state voltage         | periodische Vorwärtsspitzenspannung                    |
| $V_{DSM}$         | non-repetitive peak forward off-state voltage     | Vorwärts-Stoßspitzenspannung                           |
| $V_G$             | gate voltage                                      | Steuerspannung   |
| $V_{GD}$          | gate non trigger voltage                          | nicht zündende Steuerspannung                          |
| $V_{GE(th)}$      | gate threshold voltage                            | Gate-Schwellenspannung                                 |
| $V_{GT}$          | gate trigger voltage                              | Zündspannung   |
| $V_{ISOL}$        | insulation test voltage                           | Isolat.-Prüfspannung                                   |
| $V_L$             | no-load voltage of trigger pulse generator        | Leerlaufspannung des Steuergenerators                  |
| $V_R$             | reverse voltage                                   | Rückwärts-Sperrspannung                                |
| $V_R$             | direct reverse voltage                            | Rückwärts-Gleichsperrspannung                          |
| $V_{R(D)}$        | continuous diode reverse voltage                  | Gleichsperrspannung                                    |
| $V_{RG}$          | reverse gate voltage                              | Rückwärts-Steuerspannung                               |
| $V_{RGM}$         | peak reverse gate voltage                         | Rückwärts-Spitzensteuerspannung                        |
| $V_{RM}$          | reverse voltage (peak value)                      | Rückwärts-Sperrspannung (Spitzenw.)                    |
| $V_{RMS} V_{DC}$  | RMS or DC voltage value                           | Bemessungsspannung Effektivwert/Gleichspannung         |
| $V_{RRM}$         | repetitive reverse voltage                        | periodische Rückwärts-Spitzensperrspannung             |
| $V_{RRM(C)}$      | repetitive peak reverse voltage after commutation | periodische Spitzensperrspannung nach der Kommutierung |
| $V_{RSM}$         | non-repetitive peak reverse voltage               | Rückwärts-Stoßspitzenspannung                          |
| $V_T/V_F$         | on-state voltage                                  | Durchlassspannung                                      |
| $V_{(TO)}$        | threshold voltage                                 | Schleusenspannung                                      |
| $V_M$             | repetitive peak voltage                           | periodische Spitzensperrspannung                       |
| $V_{CE\ sat}$     | collector-emitter saturation emitter voltage      | Kollektor-Emitter-Sättigungsspannung                   |
| $V_{CES}, V_{CE}$ | maximum permissible collector-voltage             | höchstzulässige Kollektor-Emitter-Sperrspannung        |
| $dv_D/dt$         | rate of rise of forward off-state voltage         | Steilheit der Vorwärts-Spannung                        |
| $dv_R/dt$         | rate of rise of reverse voltage                   | Steilheit der Rückwärts-Spannung                       |
| $(dv/dt)_{cr}$    | critical rate of rise of off-state voltage        | kritische Spannungssteilheit                           |
| $V_L$             | air quantity                                      | Luftmenge  |
| $V_W$             | water quantity                                    | Wassermenge  |
| $W$               | energy  | Verlustenergie   |
| $W_{tot}$         | total energy                                      | Gesamtverlustenergie                                   |
| $Z_{thCA}$        | transient thermal impedance, case to coolant      | transienter äußerer Wärmewiderstand                    |
| $Z_{thJA}$        | transient thermal impedance, junction to coolant  | transienter Gesamtwärmewiderstand                      |
| $Z_{thJC}$        | transient thermal impedance, junction to case     | transienter innerer Wärmewiderstand                    |
| $Q$               | current conduct. angle                            | Stromflusswinkel                                       |

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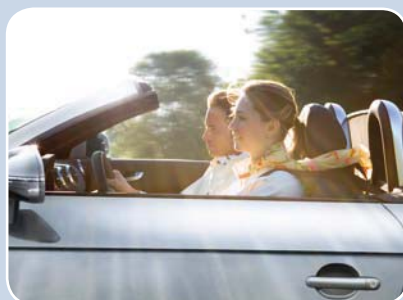
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