# A **de de** 750 V, 680 A S S D C **de 1** 6-P R 6 M 6

# VE-T <sup>™</sup> D My6. NVH680S75L4SPC

Product Description The NVH680S75L4SPC is a power module from the VE−Trac<sup>™</sup> Pin Description

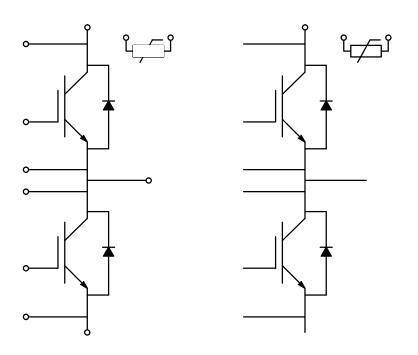


Figure 1. Pin Description

| Symbol             | Parameter   |  |     | Rating     |     |      |
|--------------------|---|--|-----|------------|-----|------|
| Τ <sub>vj</sub>    | Operating Junction Temperature                          |  |     | -40 to 175 |     |      |
| T <sub>STG</sub>   | Storage Temperature                                     |  |     | -40 to 125 |     |      |
| V <sub>ISO</sub>   | Isolation Voltage (DC, 0 Hz, 1 s)                       |  |     | 4200       |     |      |
| L <sub>sCE</sub>   | Stray Inductance  |  |     | 10         |     |      |
| RCC'+EE'           | Module Lead Resistance, Terminals – Chip                |  |     | 0.75       |     |      |
| G                  | Module Weight   |  |     | 700        |     |      |
| CTI                | Comparative Tracking Index                              |  |     | >200       |     |      |
| d <sub>creep</sub> | Creepage: Terminal to Heatsink<br>Terminal to Terminal  |  |     | 9.0<br>9.0 |     |      |
| d <sub>clear</sub> | Clearance: Terminal to Heatsink<br>Terminal to Terminal |  |     | 4.5<br>4.5 |     |      |
| Symbol             | Parameters  | Conditions   | Min | Тур        | Max | Unit |
| Δp                 | Pressure Drop in Cooling Circuit                        | 10 L/min, 65°C, 50/50 EGW                                      | -   | 95         | -   | mbar |
| P (Note 1)         | Maximum Pressure in Cooling<br>Loop (relative)          | T <sub>Baseplate</sub> < 40°C<br>T <sub>Baseplate</sub> > 40°C |     |            | 2.5 | -    |

## MODULE CHARACTERISTICS (T<sub>vj</sub> = 25°C, Unless Otherwise Specified)

| Symbol          | Parameters                          | Conditions  |  | Min         | Тур                  | Max            | Unit |
|-----------------|-------------------------------------|---|--|-------------|----------------------|----------------|------|
| V <sub>F</sub>  | Diode Forward Voltage<br>(Terminal) | I <sub>F</sub> = 500 A  | $T_{vj} = 25^{\circ}C$   | -           | 1.60                 | 1.85           | V    |
|                 | Diode Forward Voltage (Chip)        | I <sub>F</sub> = 500 A  | $\begin{array}{l} T_{vj} = 25^{\circ}C \\ T_{vj} = 150^{\circ}C \\ T_{vj} = 175^{\circ}C \end{array}$  | -<br>-<br>- | 1.53<br>1.45<br>1.40 | 1.78<br>-<br>- |      |
|                 |                                     | I <sub>F</sub> = 680 A  | $T_{vj} = 25^{\circ}C$<br>$T_{vj} = 150^{\circ}C$<br>$T_{vj} = 175^{\circ}C$   | _<br>_<br>_ | 1.65<br>1.61<br>1.57 |                |      |
| Err             | Reverse Recovery Energy             | $    I_{F} = 500 \text{ A}, \text{ V}_{R} = 400 \text{ V}, \\     V_{GE} = +15/-8 \text{ V}, \\     R_{g.on} = 4.7 \Omega $ | $\begin{array}{l} \text{di/dt} = 3.5 \text{ A/nS}, \\ \text{T}_{\text{vj}} = 25^{\circ}\text{C} \\ \text{di/dt} = 3.0 \text{ A/nS}, \\ \text{T}_{\text{vj}} = 150^{\circ}\text{C} \end{array}$ | -           | 3<br>8               | -              | mJ   |
|                 |                                     |   | di/dt = 2.8 A/nS,<br>T <sub>vj</sub> = 175°C   | -           | 10                   | -              |      |
| Q <sub>RR</sub> | Recovered Charge                    | $I_F = 500 \text{ A}, V_R = 400 \text{ V},$<br>$V_{GE} = -8 \text{ V},$   | $\begin{array}{l} \text{di/dt} = 3.5 \text{ A/nS}, \\ \text{T}_{\text{vj}} = 25^{\circ}\text{C} \end{array}$   | -           | 11                   | -              | μC   |
|                 |                                     | $R_{g.on} = 4.7 \Omega$   | di/dt = 3.0 A/nS,<br>T <sub>vj</sub> = 150°C   | -           | 32                   | -              |      |
|                 |                                     |   | di/dt = 2.8 A/nS,<br>T <sub>vj</sub> = 175°C   | -           | 38                   | -              |      |
| I <sub>rr</sub> | Peak Reverse Recovery<br>Current    | I <sub>F</sub> = 500 A, V <sub>R</sub> = 400 V,<br>V <sub>GE</sub> = -8 V,  | di/dt = 3.5 A/nS,<br>T <sub>vi</sub> = 25°C  | -           | 141                  | -              | A    |
|                 |                                     | $R_{g.on} = 4.7 \Omega$   | di/dt = 3.0 A/nS,<br>T <sub>vj</sub> = 150°C   | -           | 247                  | -              |      |
|                 |                                     |   | di/dt = 2.8 A/nS,<br>T <sub>vj</sub> = 175°C   | -           | 265                  | -              |      |

### CHARACTERISTICS OF INVERSE DIODE ( $T_{vj}$ = 25°C, Unless Otherwise Specified)

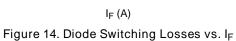
### NTC SENSOR CHARACTERISTICS (Tvj = 25°C, Unless Otherwise Specified)

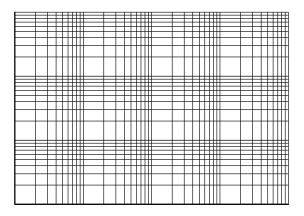
| Symbol                   | Parameters                    | Conditions                                     | Min        | Тур  | Max | Unit |
|--------------------------|-------------------------------|--|------------|------|-----|------|
| R <sub>25</sub> (Note 3) | Rated Resistance              | $T_{C} = 25^{\circ}C$                          | -          | 5147 | -   | Ω    |
| ΔR/R                     | Deviation of R <sub>105</sub> | $T_{C} = 105^{\circ}C, R_{105} = 472 \ \Omega$ | 5          | -    | 5   | %    |
| P <sub>25</sub>          | Power Dissipation             | $T_{C} = 25^{\circ}C$                          | -          | -    | 32  | mW   |
| B <sub>25/55</sub>       | B-Value                       | $R = R_{25} \exp [B_{25/55} 25/46]$            | <b>6</b> e | -    |     | -    |

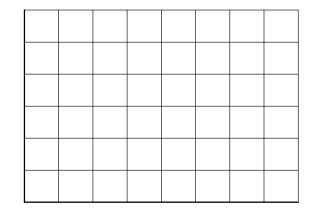
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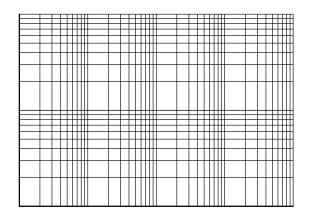
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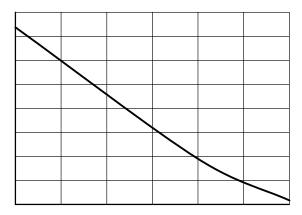




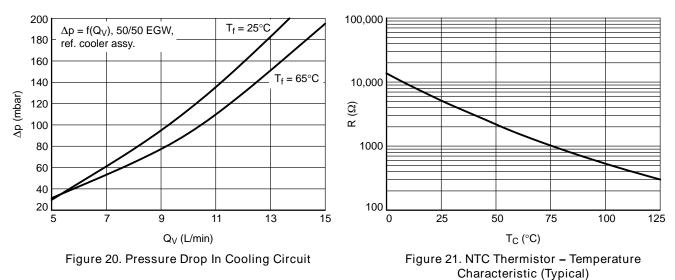


 $\mathsf{R}_{\mathsf{G}}\left(\Omega\right)$  Figure 15. Diode Switching Losses vs.  $\mathsf{R}_{\mathsf{G}}$ 









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