Thermal Information for DVHF2805S/DVHF2800D/DVHF2800T

The DVHF DC/DC converters utilize hybrid technology. All the power semiconductor chips such as linear regulator, MOSFET, and Schottky diode are attached to an Alumina substrate and the substrate is then attached to the metal case which houses the DC/DC converter. The power transformer however is directly mounted to the metal case through a thermally conductive epoxy preform. Table 2.1 shows the maximum junction temperature rise (ΔT_{JC}) at full load operation of all the power components referenced to the outside of the base plate of the metal case. The case-ambient thermal resistance (θ_{CA})of the metal case between the base plate of the metal case and ambient is also listed in the table.

A simplified and conservative way to calculate the worse case junction temperature of all the power components is as follows:

1) Measure the worse case input power (Pi) and output power (Po) of the DC/DC converter according to the system requirement and calculate the total power dissipation (Pd) equal to Pi-Po.
2) If no additional heatsink is attached to the converter, the case temperature of the base plate of the metal case (T_C) is equal to $Pd*\theta_{CA} + T_A$ where T_A is the ambient temperature and the value of θ_{CA} comes from the table. If any additional heatsink is attached to the converter, the new effective θ_{CA} needs to be used.
3) The worse case junction temperature (T_J) of all the power components is then equal to $Tc + \Delta T_{JC}$ where the value of ΔT_{JC} is from Table 2.1.

The maximum junction temperature of all the power components are rated at 175 °C. Additional heatsink is always recommended in order to maintain a low junction temperature of the power components so that a higher reliability number can be achieved.

Table 2.1 Thermal Data for DVHF DC/DC Converters

ΔT_{JC} of Linear Regulator	12 °C
ΔT_{JC} of MOSFET	7 °C
ΔT_{JC} of Schottky Diode	9 °C
ΔT_{JC} of Power Transformer	12 °C
θ_{CA}, Case to Ambient Thermal Resistance	25 °C/W