



POWER CONVERSION AND INSTRUMENTATION SOLUTIONS FOR OVER 50 YEARS

WDE Temperature De-rating Guidelines

[Preliminary data based on Efficiency and Thermal Impedance measurements]

Scope

This document describes the recommended temperature de-ratings for the WDE series based on product efficiency, case to ambient thermal impedance and airflow, including natural convection.

Test conditions

The temperature de-rating is established with the product inserted in the 'demo-board' mounted vertically and facing another printed circuit board ½ inch away. The case to ambient thermal impedance is approximately 9°C/W, natural convection. The temperature de-rating is intended as a guideline and actual operating case (worst case) should always be verified in the end application. The maximum case temperature (operating) is 100°C.

Nominal Efficiencies & Power Dissipation

The table below lists the typical efficiencies for the WDE series for the different output voltage models:

WDE Nominal Efficiencies, V_{in} = Nominal

Output Voltage	25% Load	50% Load	75% Load	100% Load
5.0	88%	90%	91%	91%
12.0	87%	90%	91%	92%
24.0	85%	88%	88%	87%
28.0	84%	86%	87%	89%
48.0	81%	86%	88%	89%

The power dissipation under the same conditions is as follows:

Power Dissipation (W)

Output Voltage	25% Load	50% Load	75% Load	100% Load
5.0	2.6	4.2	5.6	7.4
12.0	2.7	4.0	5.3	6.7
24.0	3.2	4.9	7.4	10.8
28.0	3.3	5.7	7.8	8.7
48.0	4.2	5.9	7.4	8.9

The thermal Impedance Case to Ambient depends primarily on airflow and is approximated as follows:

Airflow LFM	Factor	Case to Ambient Thermal Impedance °C/W
0	1	9.00
100	0.757	6.81
200	0.536	4.82
300	0.439	3.95
400	0.378	3.40



De-rating Curves according to LFM (Linear feet / minute), air-flow.

The curves below indicate the maximum ambient operating temperature at Vin nominal Vs % Load and airflow. It should be noted that efficiency reduces at input voltage extremes and different output trim settings.

