

**Test Report
For PMP9397
04/04/2014**



Overview

The reference design provides a power solution in automotive applications. It is a conducted EMI optimized 3.3W power supply design. This design uses the non-synchronous buck regulator, LM26001, to generate 3.3V, 1A output. The input voltage range is 4.5V to 38V suitable for automotive battery supply. The board comes with an input EMI filter stage to suppress the switching noise in the input supply line, and the board is tested to be compliant with the CISPR 25 Class 5 conducted emissions standard.

Power Specification

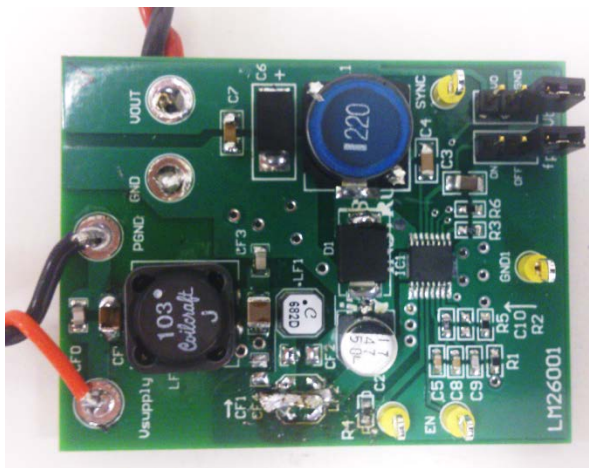
Vin range: 4.5V~38V

Nominal Vin: 13V

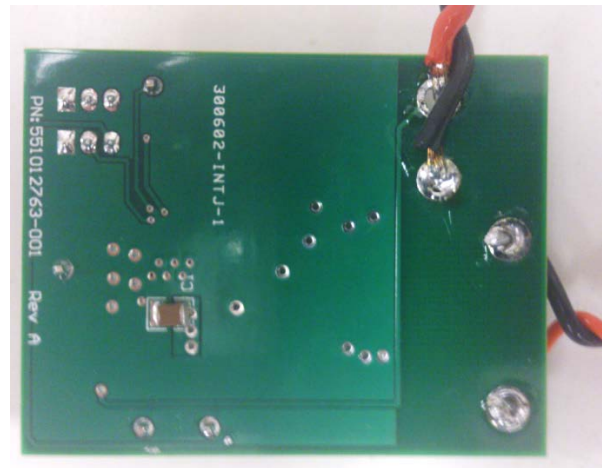
Output: 3.3V@1A

Fsw: 300kHz

Board Photos



Power Board Front



Power Board Back

Figure 1

Size: 60x45mm

Efficiency

The efficiency is measured separately at V_{in} = 4.5V, 13V, 38V.

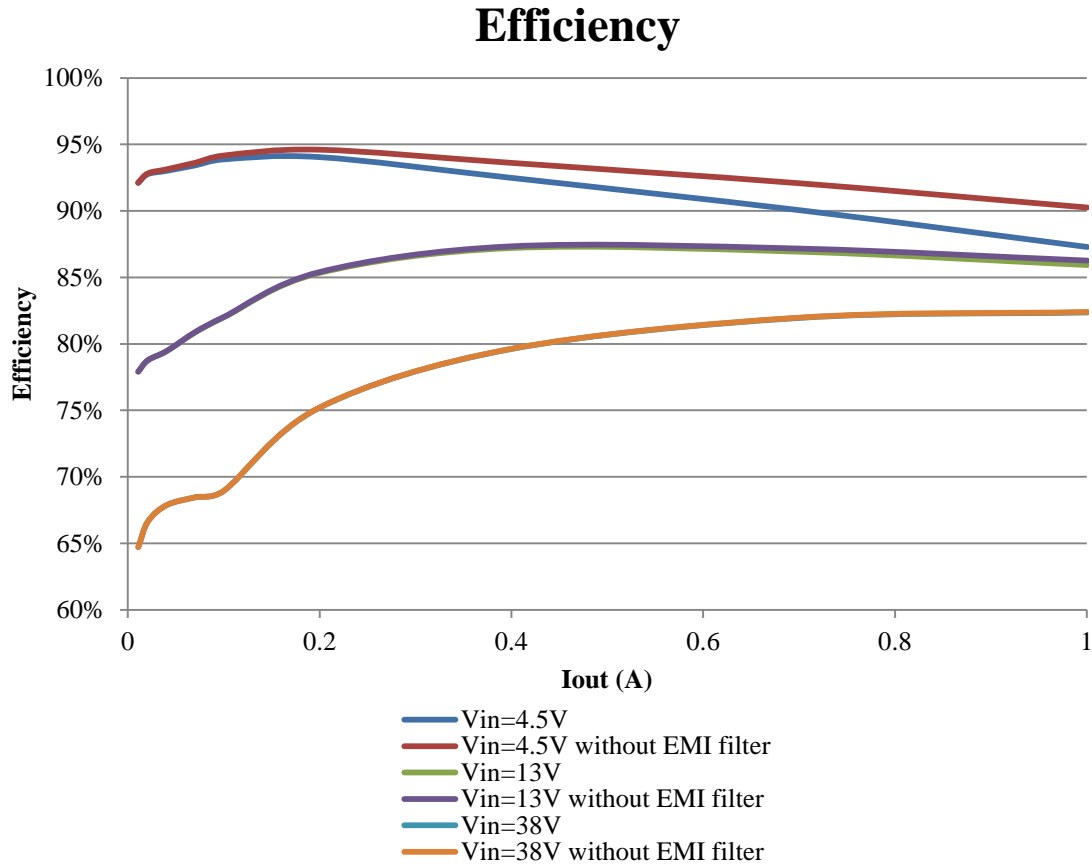


Figure 2

Start Up

Test condition: the input voltage was set at 13V, and the output is set at full load.
Ch1 - Vout, Ch2 - Vin

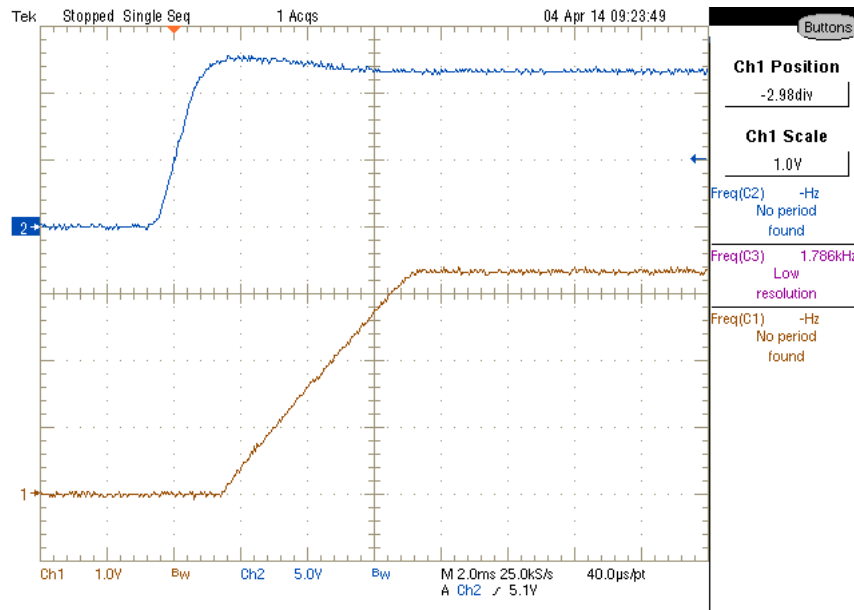


Figure 3

Switch Node Waveform

Test condition: The input voltage was set at 13V, and the output is set at full load

Ch1 – Vsw (switch node voltage).

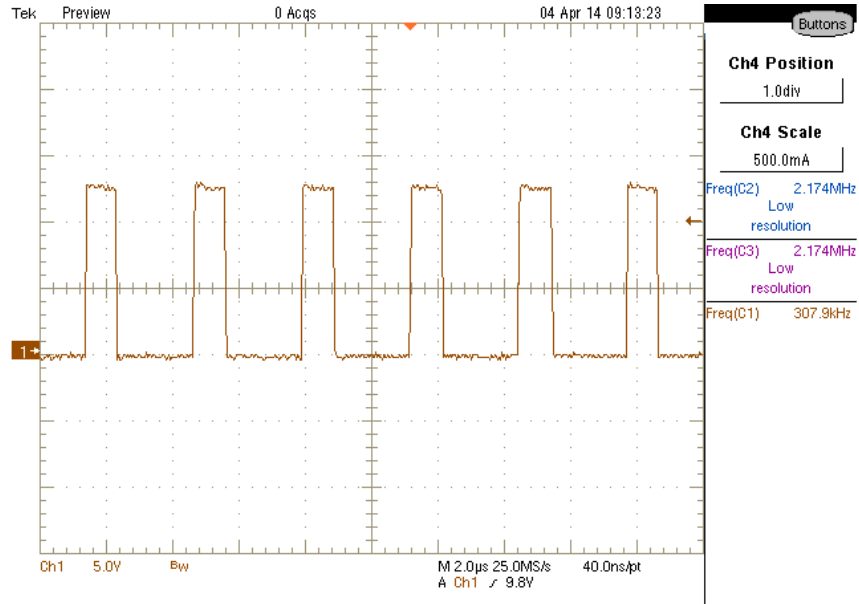


Figure 4

Load transients

Test condition: $V_{in} = 13V$, I_{o1} from 0.0A to 1A

Ch1- V_{out} (AC coupled) Ch4- I_{out}

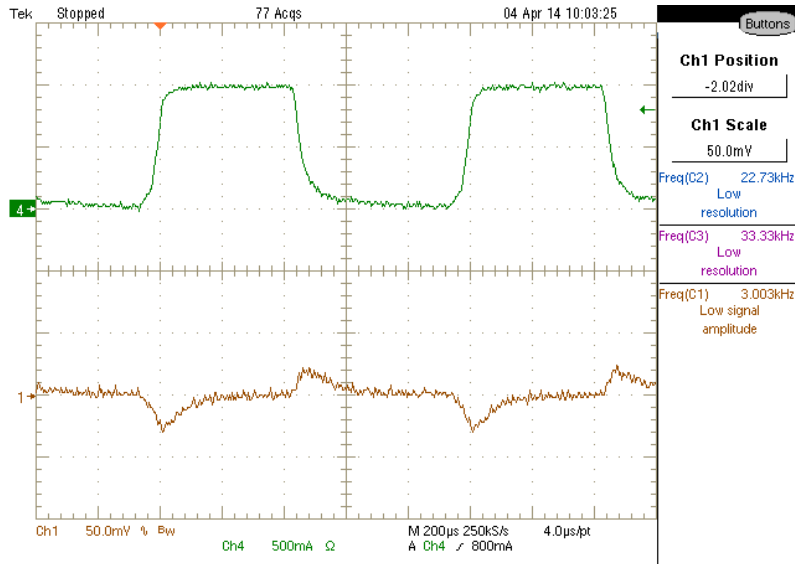


Figure 5

Output Voltage Ripples

Test condition: The input voltage is set at 13V, and the output is set at full load.

Ch1 - Vout (AC coupled) Ch2-Iout

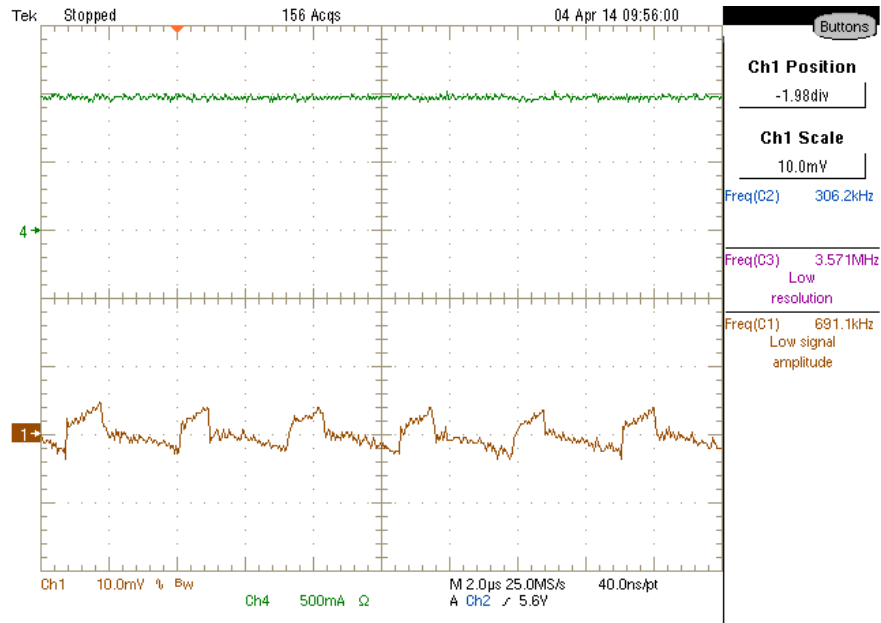


Figure 6

Conducted Emissions

The conducted emissions is tested followed the of CISPR 25 standards. The frequency band examined spans from 150 kHz to 108 MHz covering the AM, FM radio bands, VHF band, and TV band specified in the CISPR 25.

The test results are shown in Figure 7~10. The Figure 7 and Figure 8 show the test result using peak detector measurement, and the Figure 9 and Figure 10 show the test result using average detector measurement. The limit lines shown in red are the Class 5 limits for conducted disturbances specified in the CISPR 25; the yellow trace is the test result. It can be seen that the power supply operates quietly and the noise is below the Class 5 limits.

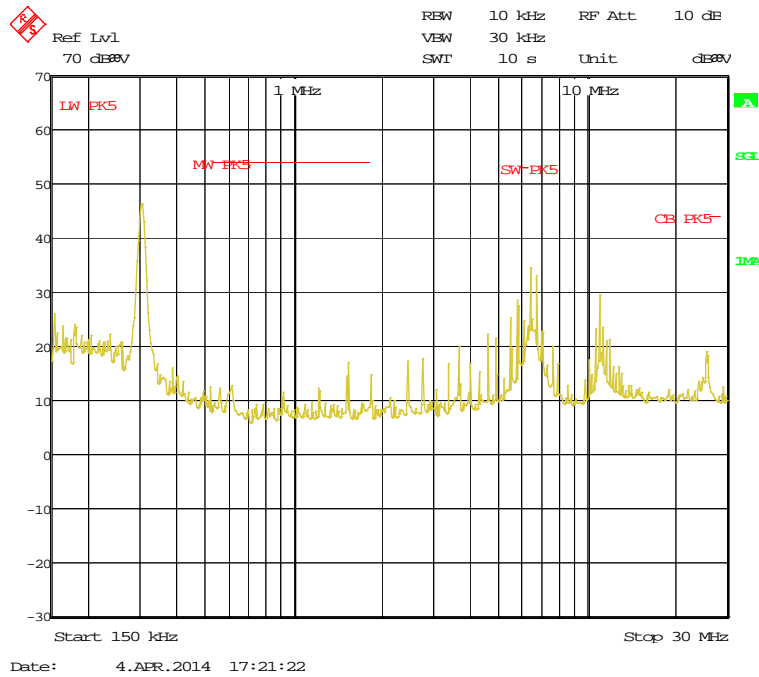


Figure 7 Peak detect, 150kHz – 30MHz

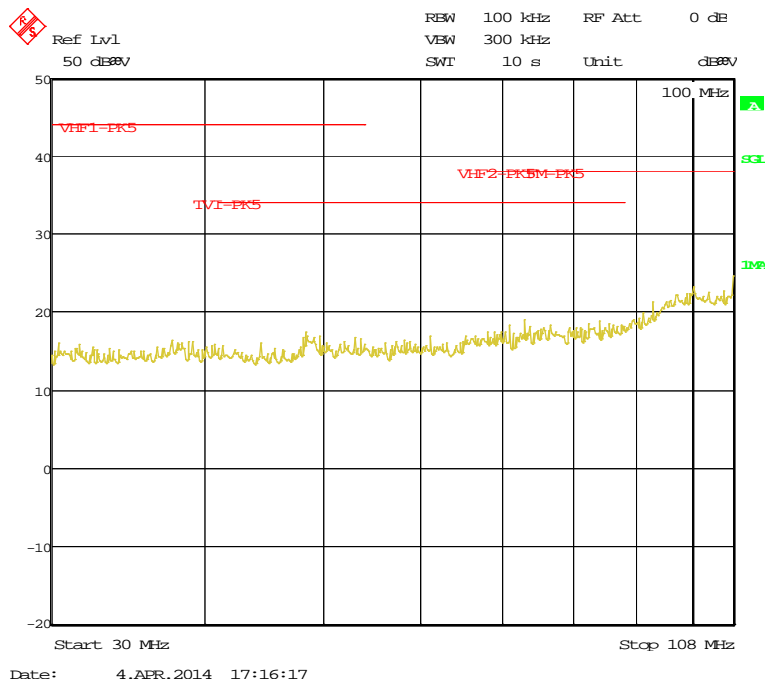


Figure 8 Peak detect, 30MHz – 108MHz

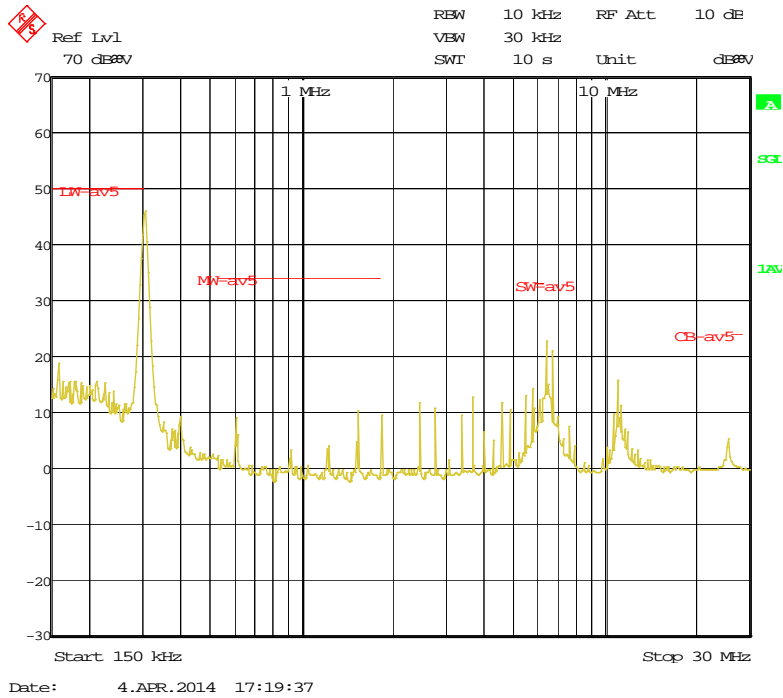


Figure 9 Average detect, 150kHz – 30MHz

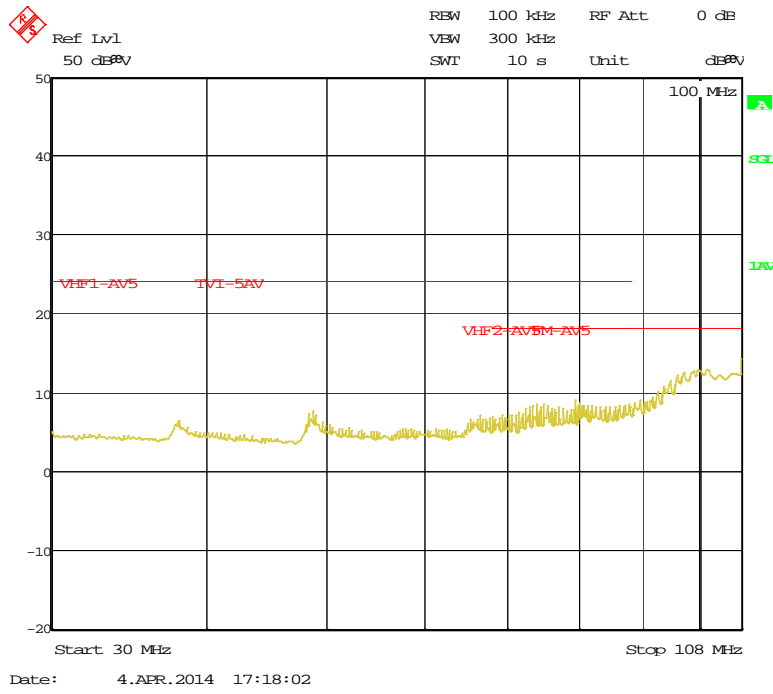


Figure 10 Average detect, 30MHz - 108MHz

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