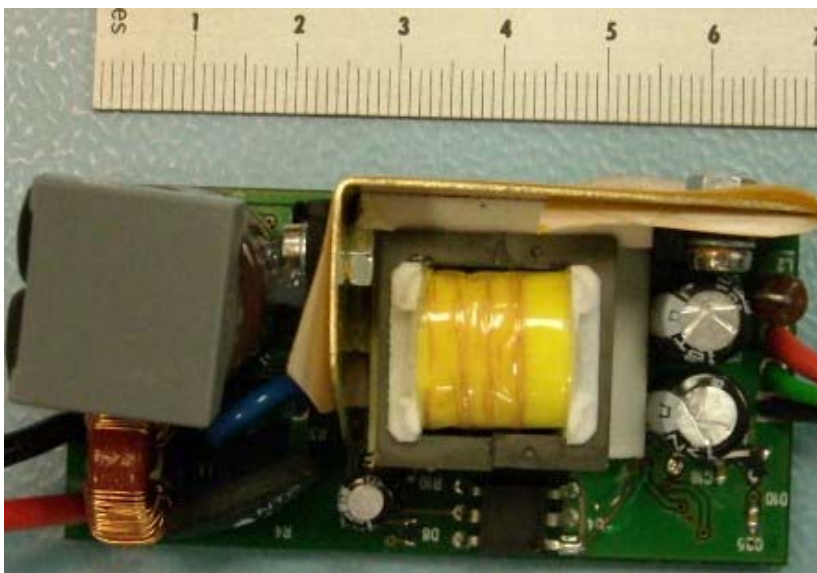


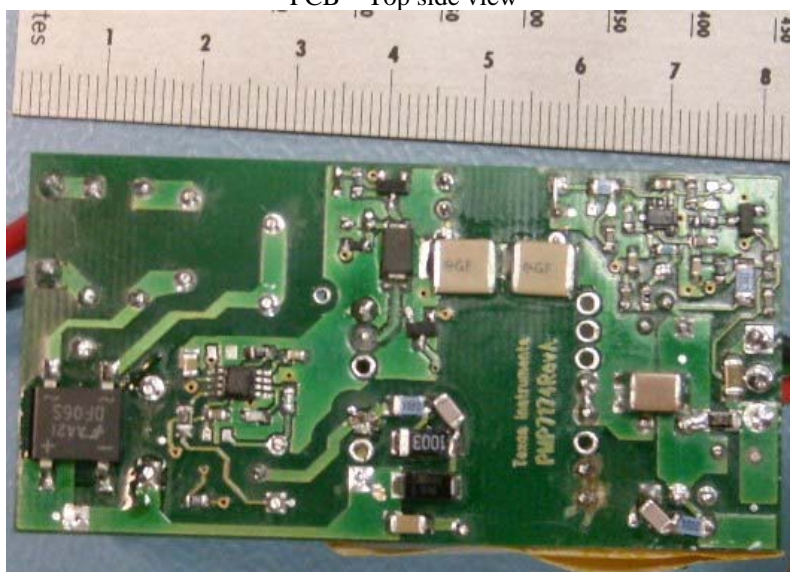
The PMP7174 is a fixed switching frequency, DCM flyback (LM5021) and has the following requirements:

- Input voltage range: 85Vac – 130Vac
- Output voltage: 24V (1.45A - 35W)
- Galvanic isolation: YES, 4kV
- Surface area: 68mm x 34mm

If not other described, all tests are done at 115Vac input voltage and 2200uF capacitive load.



PCB – Top side view



PCB – Bottom side view

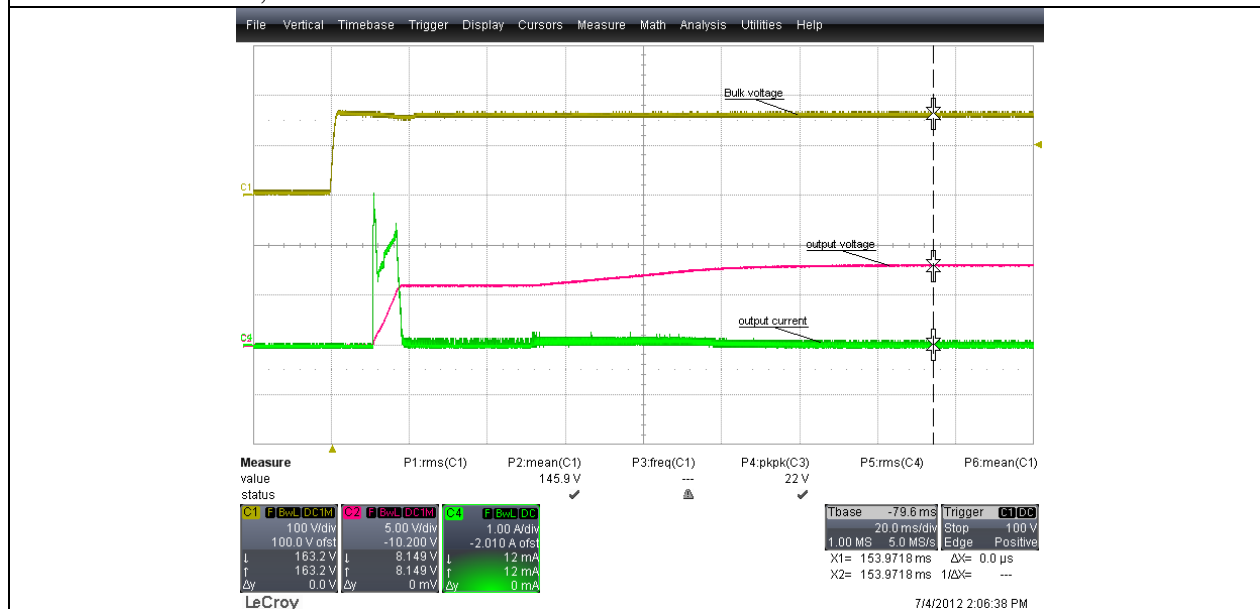
1 Startup

The AC input inrush current, output voltage and current at startup are shown in the images below, respectively.



Inrush current, no load

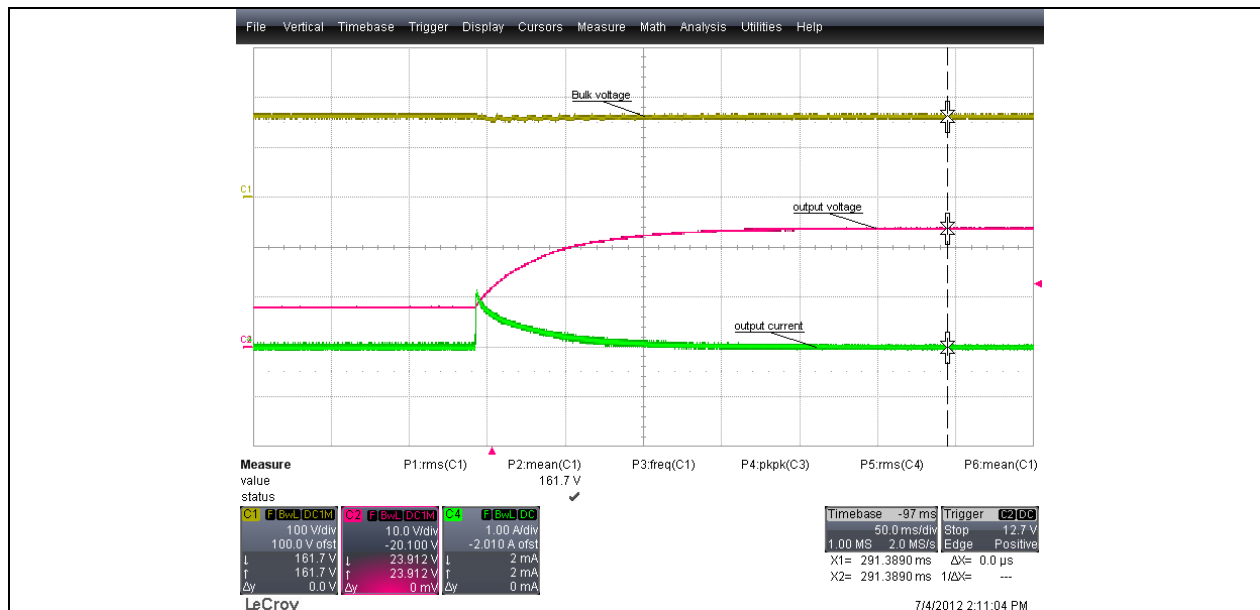
Channel 4 5A/div, time base 10ms/div



Channel 1 Bulk Voltage – 100V/div

Channel 2 Output voltage – 5V/div, rump up, program pin open, 15mA current drain

Channel 4 Output current - 1A/div, time base 20ms/div



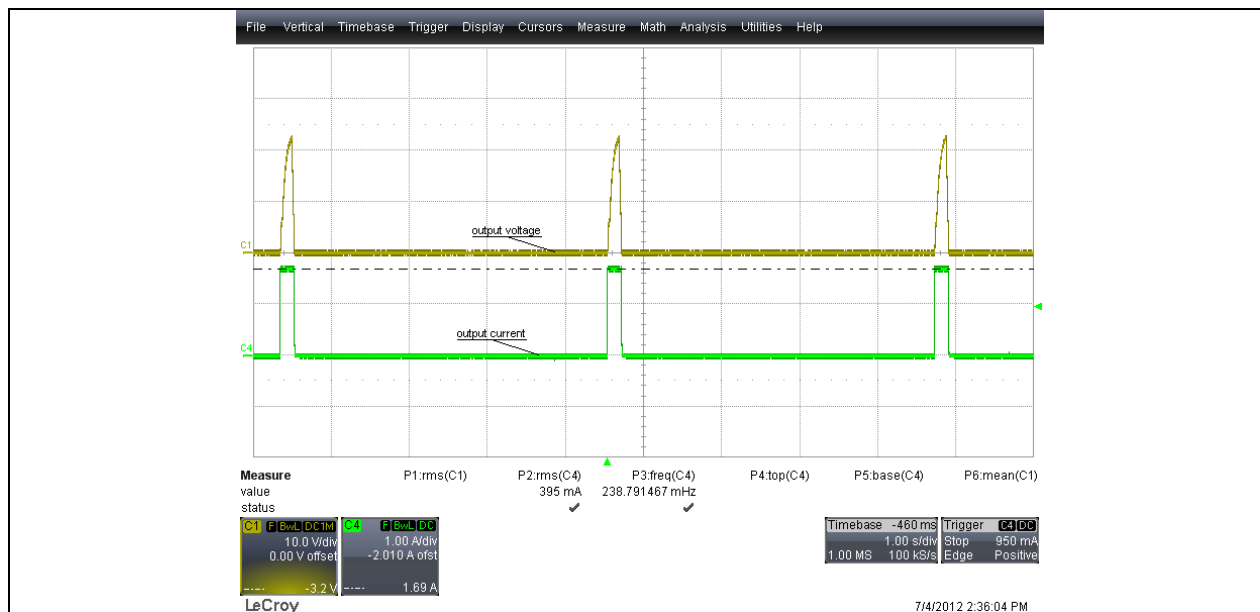
Channel 1 Bulk Voltage – 100V/div

Channel 2 Output voltage – 10V/div, rump up 8V->24V, program pin closed, 15mA current drain

Channel 4 Output current - 1A/div, time base 50ms/div

2 Output over load protection

If the load current hits the threshold point of 1600mA, the converter will go in hiccup mode.



Channel 1 Output voltage – 10V/div

Channel 4 Output current - 1A/div, time base 1s/div

3 Efficiency

The efficiency data are shown in the tables and graph below.

The load: constant current load.

Power consumption: 8V, 15mA @ the output (program pin open) - ~ 300mW

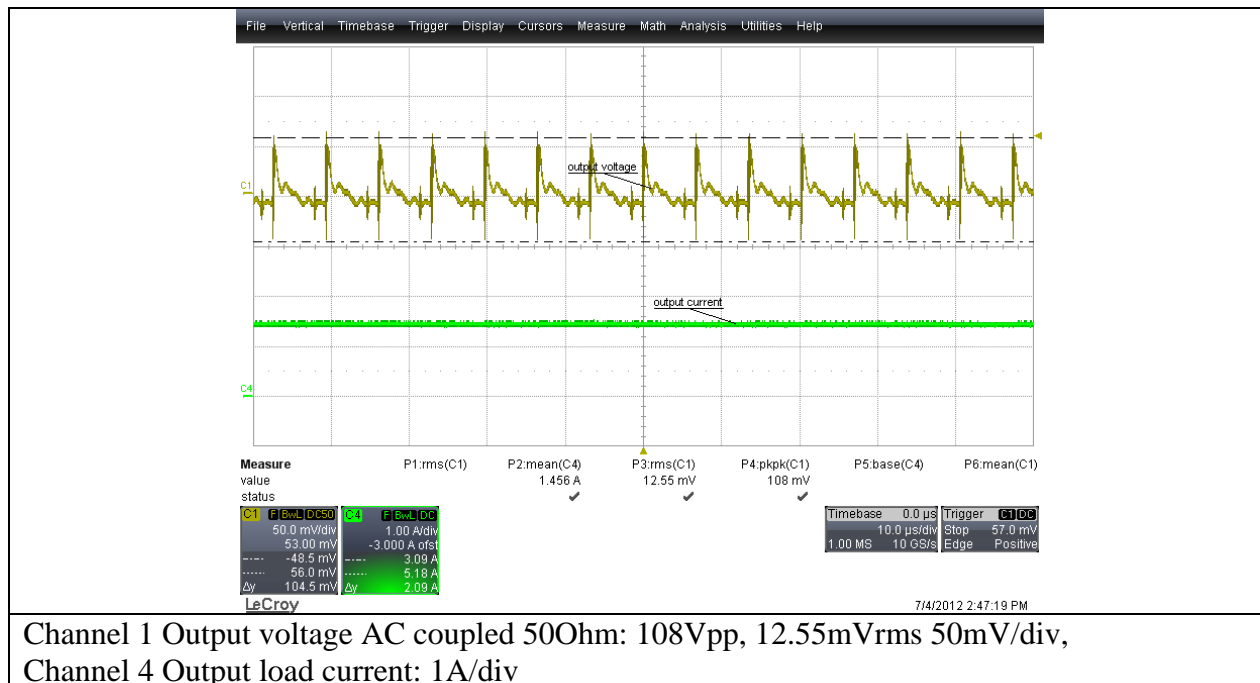
85Vac								
Uout 24V	23.990	23.990	23.980	23.970	23.950	23.940	23.920	23.910
Iout	0.000	0.100	0.250	0.500	0.750	1.000	1.250	1.450
Pout	0.000	2.399	5.995	11.985	17.963	23.940	29.900	34.670
Pin	0.260	3.160	7.290	14.080	21.010	27.840	34.900	40.660
Plosses	0.260	0.761	1.295	2.095	3.048	3.900	5.000	5.991
Pout/Pmax %	0.00	6.89	17.23	34.44	51.62	68.79	85.92	99.63
Eta	0.00	75.92	82.24	85.12	85.50	85.99	85.67	85.27

130Vac								
Uout 24V	23.990	23.990	23.980	23.970	23.950	23.940	23.920	23.910
Iout	0.000	0.100	0.250	0.500	0.750	1.000	1.250	1.450
Pout	0.000	2.399	5.995	11.985	17.963	23.940	29.900	34.670
Pin	0.310	3.160	7.210	13.960	20.760	27.540	34.260	40.010
Plosses	0.310	0.761	1.215	1.975	2.798	3.600	4.360	5.341
Pout/Pmax %	0.00	6.89	17.23	34.44	51.62	68.79	85.92	99.63
Eta	0.00	75.92	83.15	85.85	86.52	86.93	87.27	86.65



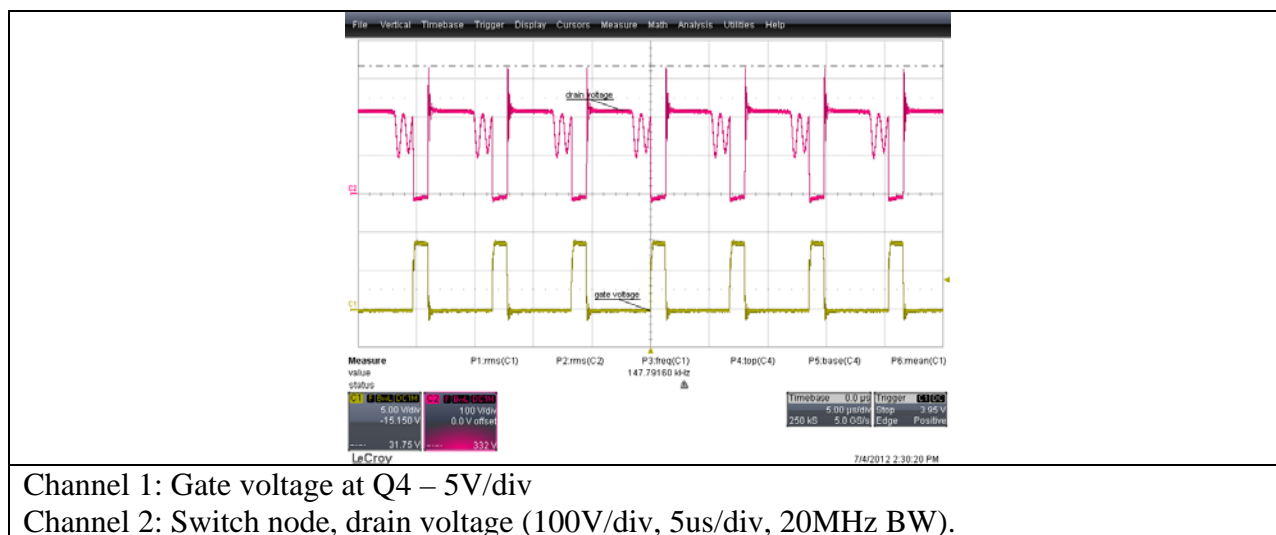
4 Output Ripple Voltage and current

The output ripple voltage and spikes is shown in the plot below. Load 1.45A



5 Switching Node Waveform

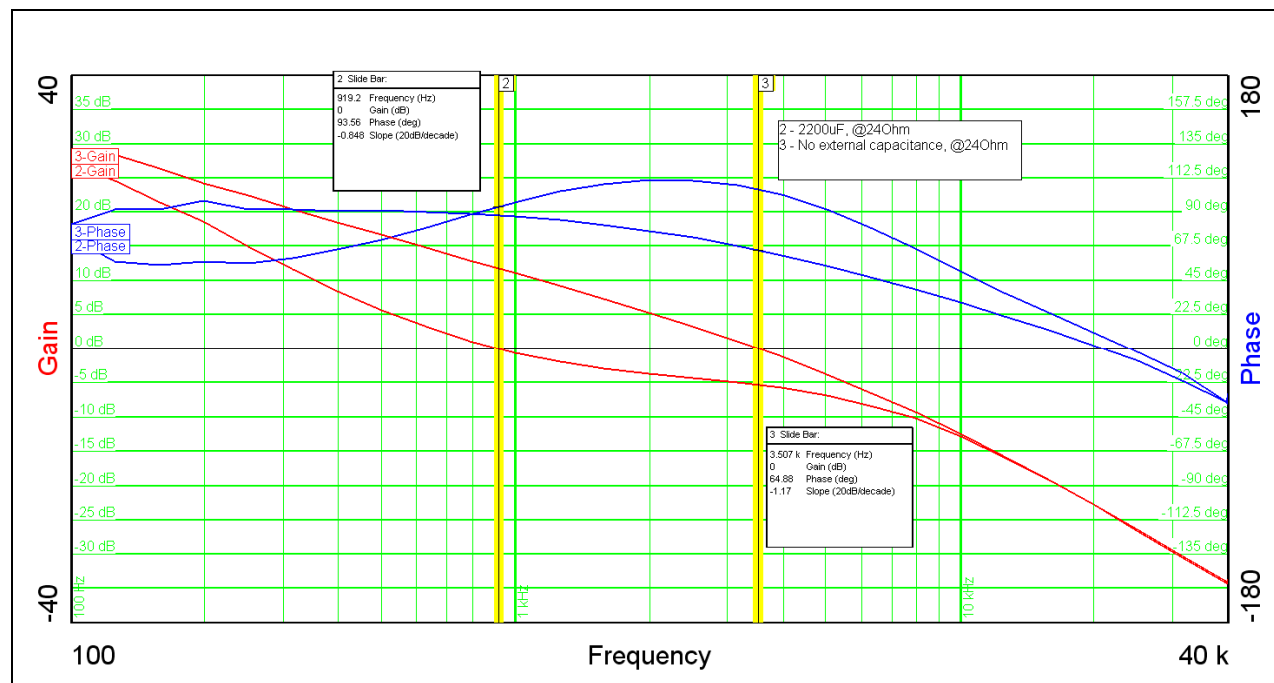
The image below shows the gate voltage and peak voltage at the drain of Q4 – power switch.



6 Loop Response

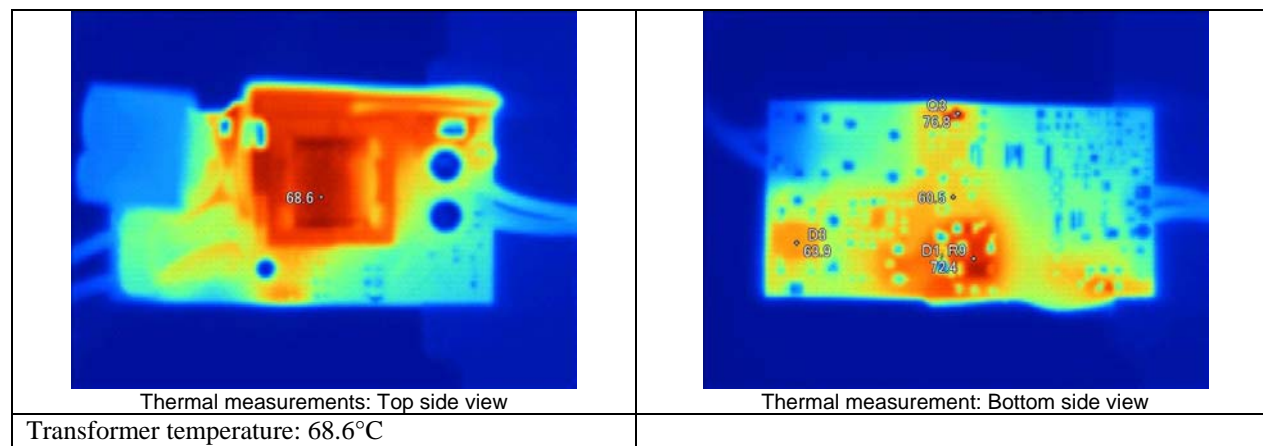
The image below shows the loop response of the converter measured at 1A output load with 2200 μ F capacitive load and without.

Crossover frequency is 919Hz, Phase margin is 93deg (with 2200uF and 24Ohm in parallel)
 Crossover frequency is 3500Hz, Phase margin is 64deg (only 24Ohm at the output)



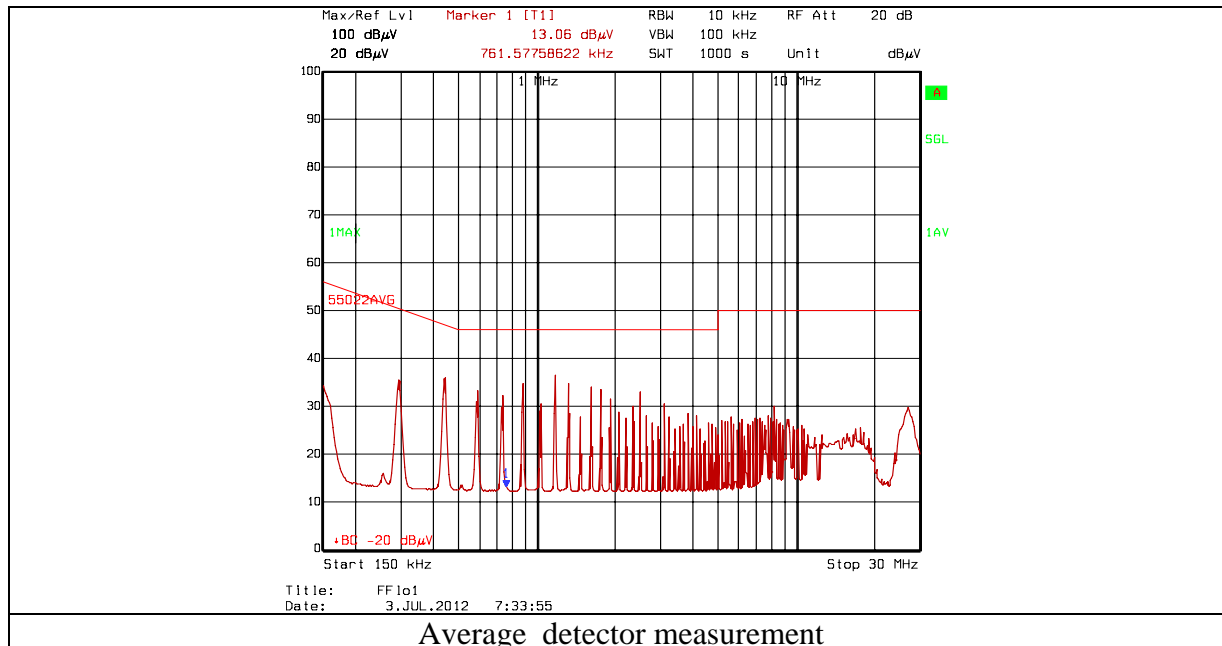
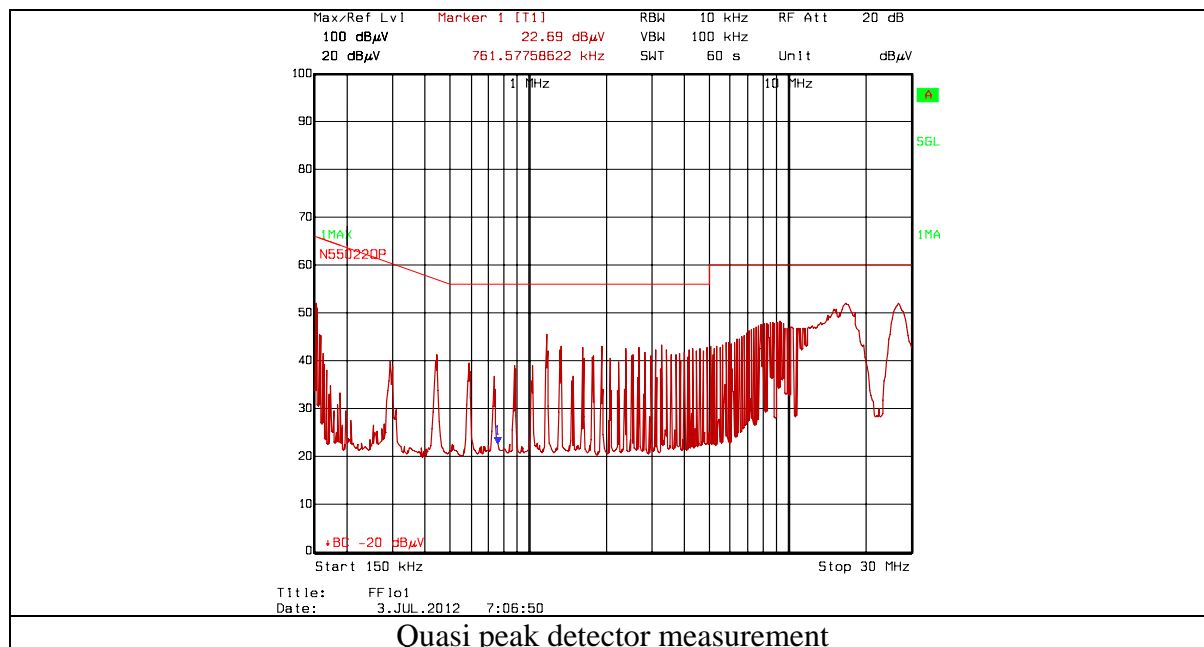
7 Thermal Image

The thermal measurements are shown in the picture below (ambient temperature ~25°C):



8 EMI Measurements

The conducted emission measurements are shown in pictures below (**the measurements are not done in certified lab**)



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