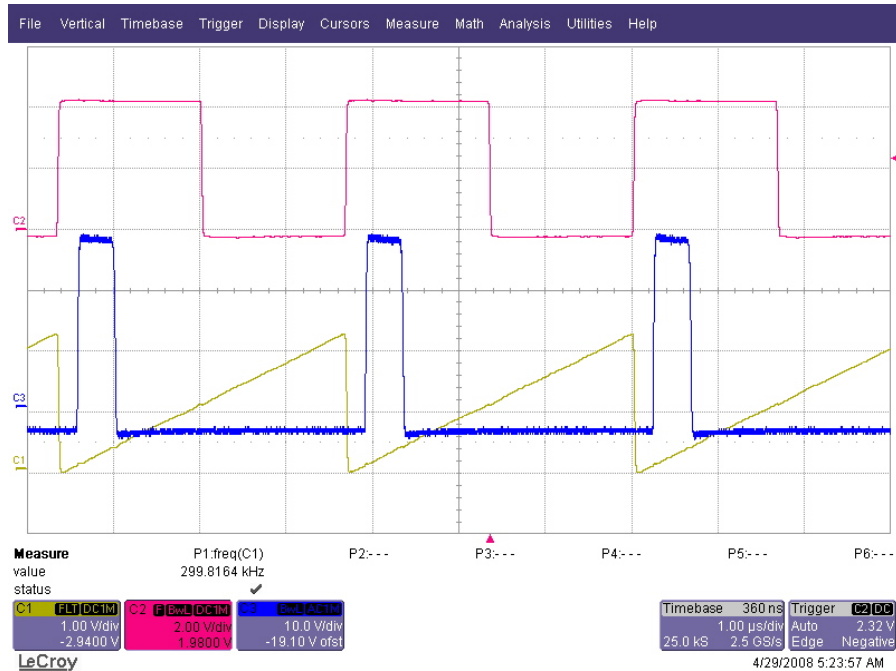


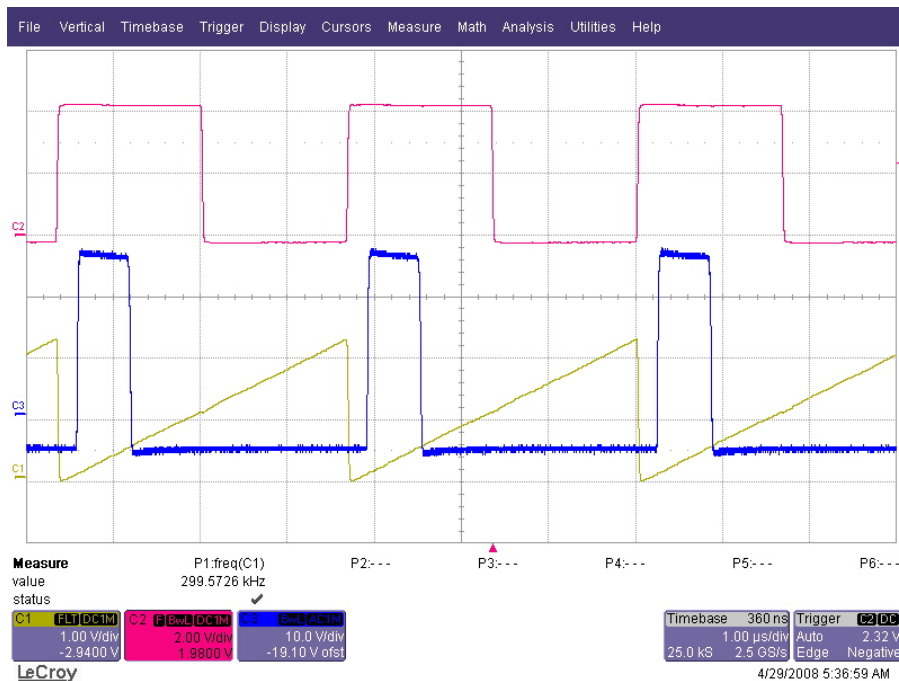
## 1 Synchronization and Switching Node Waveform

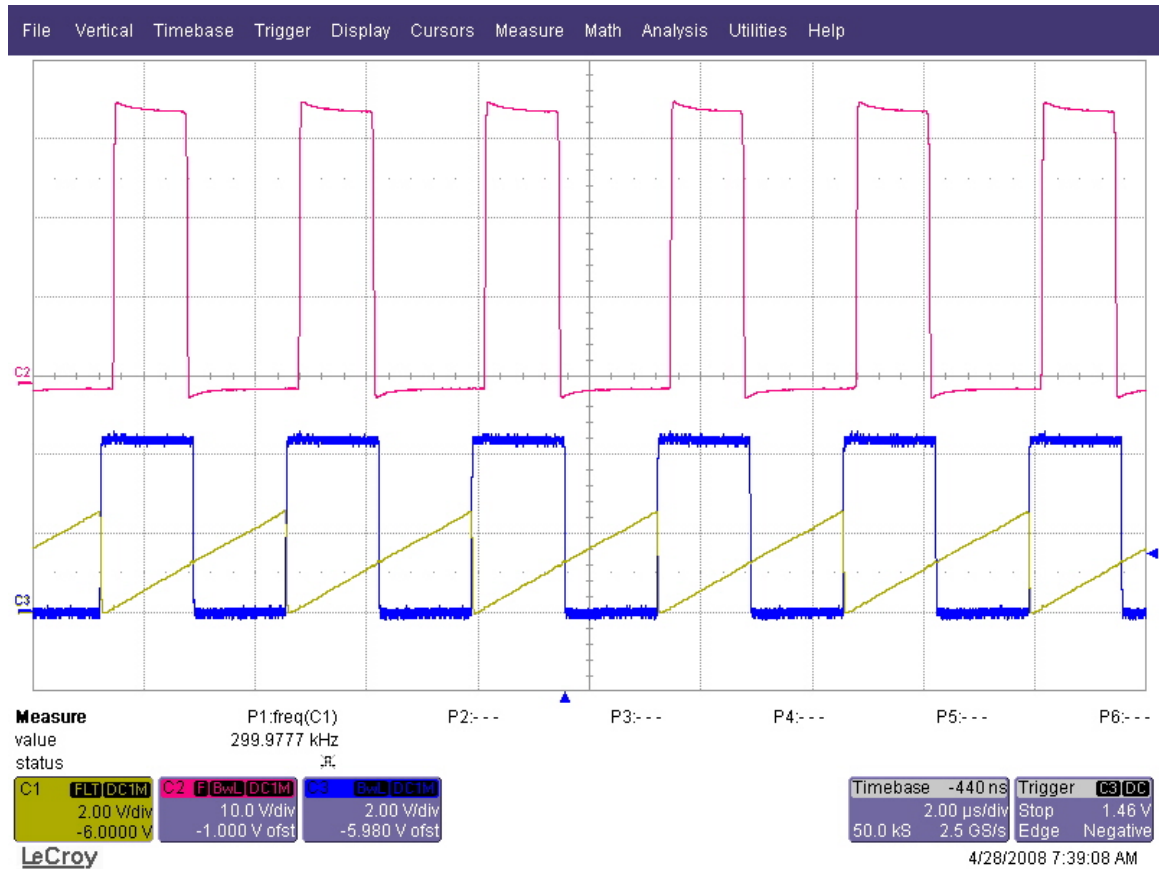
The figures below show the synchronization operations for the three converters. Waveforms are the synch-signal square wave, the rectifying Diode Voltage, Voltage on Pin1 of TPS40200D, all waveforms switching at  $f_s=300\text{kHz}$ .

### 3.3V, 0.5A Output



### 5V, 1.5A Output



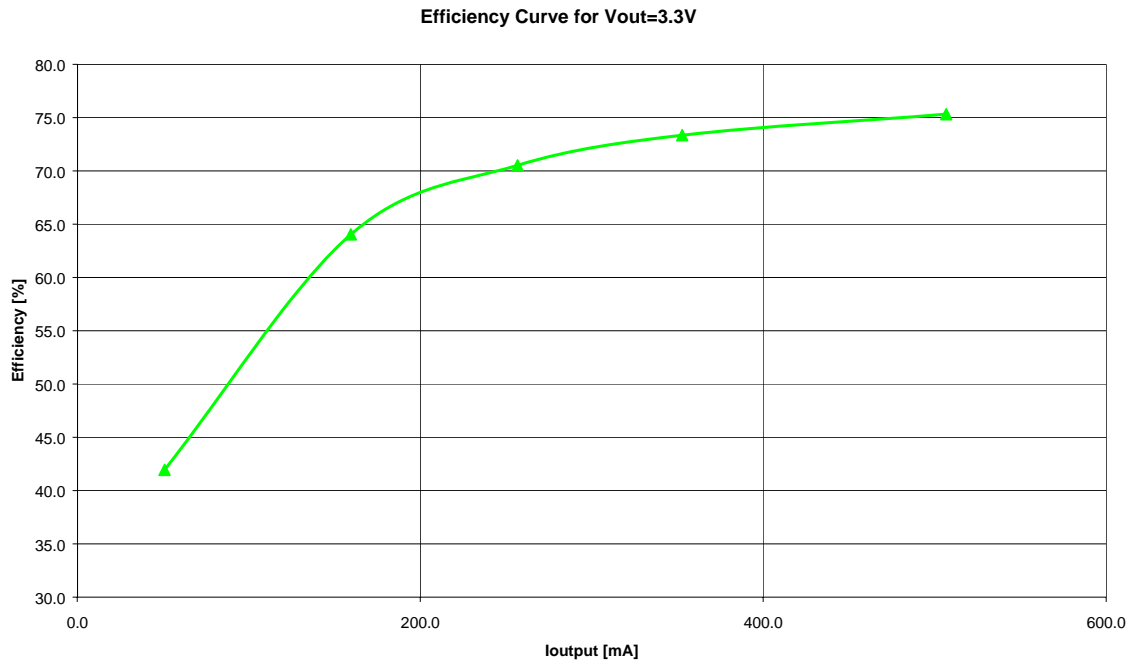
**3.3V, 2.5A Output**

The synchronization signal amplitude has to be larger than 4.5V to operate and it has to be connected between (according to the schematic and to the assembly of the boards:

- (3.3V Output) TP6 and the free round terminal of capacitor C901.
- (5V Output) TP26 and the free round terminal of capacitor C2901.
- (12V Output) TP36 and the free round terminal of capacitor C3901.

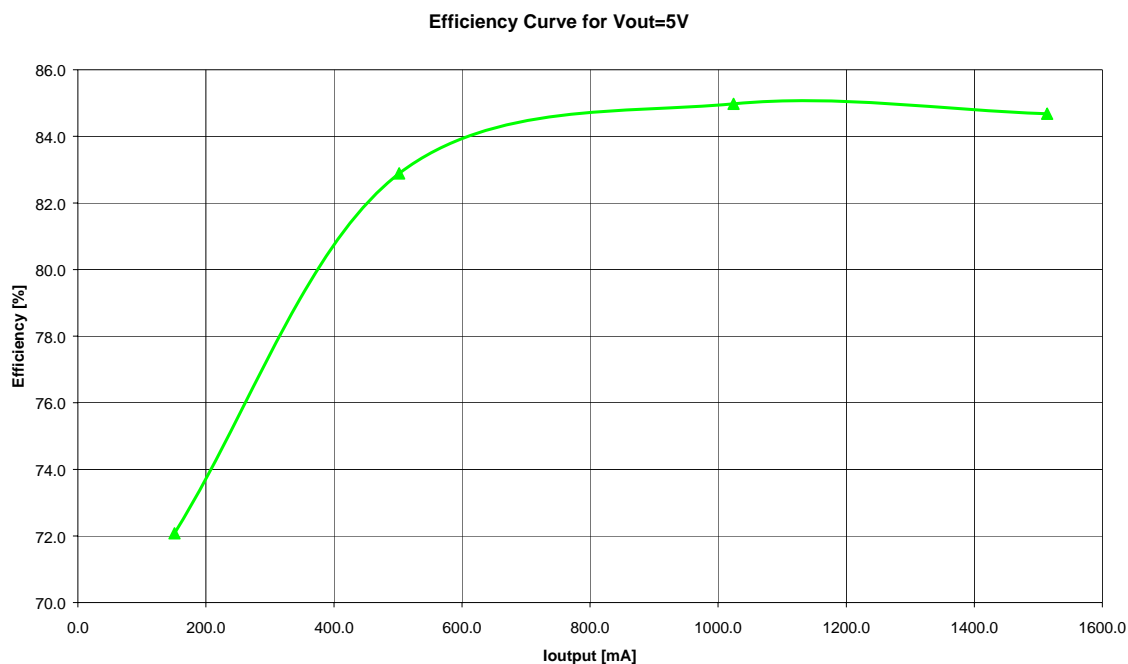
## 2 Efficiency

The efficiency diagrams are shown in the figures below for the three different converters.



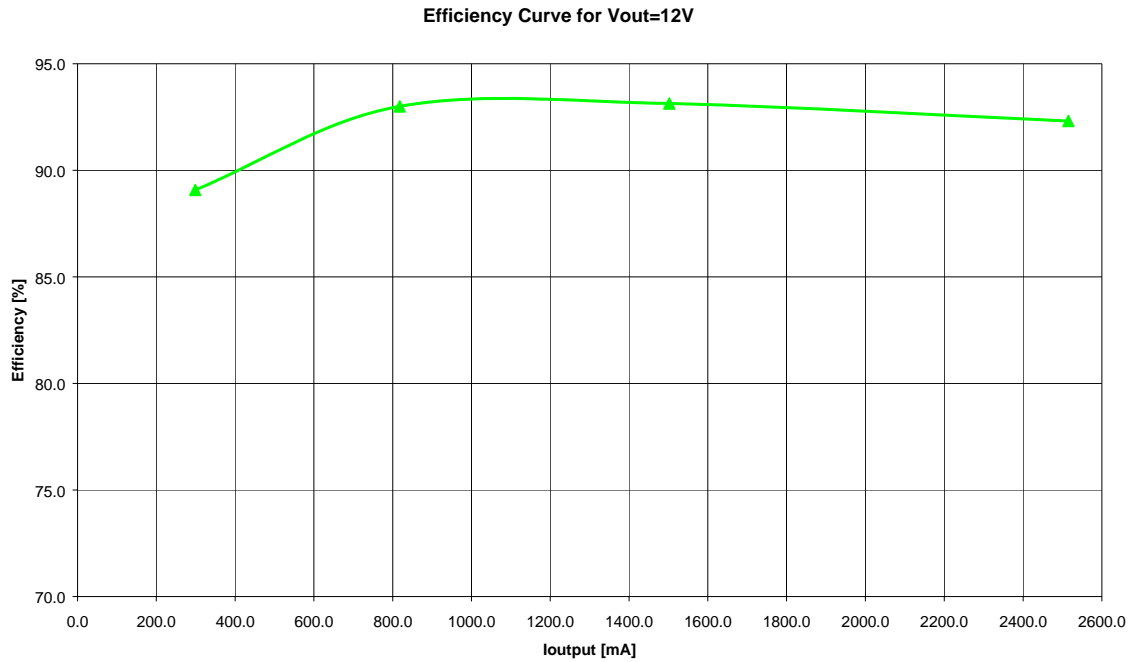
The following table shows the measured values for **3.3V Output**:

Vin[V]	Iin[mA]	Vout[V]	Iout[mA]	Pin[W]	Pout[W]	$\eta$ %
30.12	74.3	<b>3.326</b>	<b>506.8</b>	2.238	1.686	<b>75.3</b>
30.12	53.1	<b>3.326</b>	<b>352.7</b>	1.599	1.173	<b>73.3</b>
30.12	40.2	<b>3.326</b>	<b>256.7</b>	1.211	0.854	<b>70.5</b>
30.12	27.5	<b>3.326</b>	<b>159.5</b>	0.828	0.530	<b>64.0</b>
30.12	13.4	<b>3.326</b>	<b>50.9</b>	0.404	0.169	<b>41.9</b>



The following table shows the measured values for **5V Output**:

Vin[V]	Iin[mA]	Vout[V]	Iout[mA]	Pin[W]	Pout[W]	$\eta$ %
30.09	297.1	<b>5.000</b>	<b>1514.0</b>	8.940	7.570	<b>84.7</b>
30.10	200.2	<b>5.000</b>	<b>1024.1</b>	6.026	5.121	<b>85.0</b>
30.12	100.5	<b>5.000</b>	<b>501.8</b>	3.027	2.509	<b>82.9</b>
30.12	34.8	<b>5.000</b>	<b>151.1</b>	1.048	0.756	<b>72.1</b>



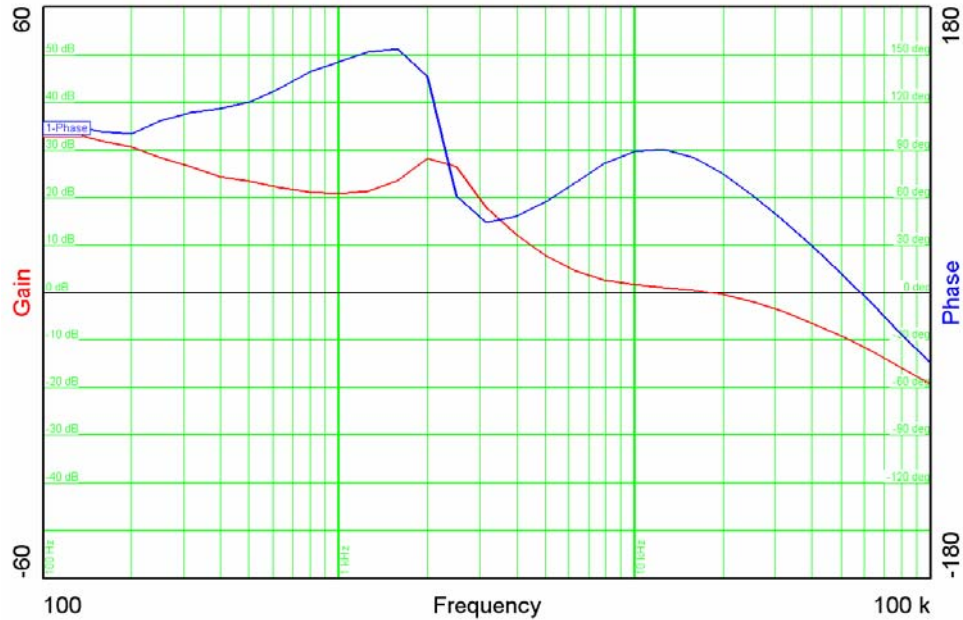
The following table shows the measured values for **12V Output**:

Vin[V]	Iin[mA]	Vout[V]	Iout[mA]	Pin[W]	Pout[W]	$\eta$ %
29.80	1092.5	<b>11.950</b>	<b>2515.0</b>	32.557	30.054	<b>92.3</b>
29.84	646.4	<b>11.960</b>	<b>1502.0</b>	19.289	17.964	<b>93.1</b>
29.88	352.1	<b>11.960</b>	<b>818.1</b>	10.521	9.784	<b>93.0</b>
29.96	134.0	<b>11.960</b>	<b>299.0</b>	4.015	3.576	<b>89.1</b>

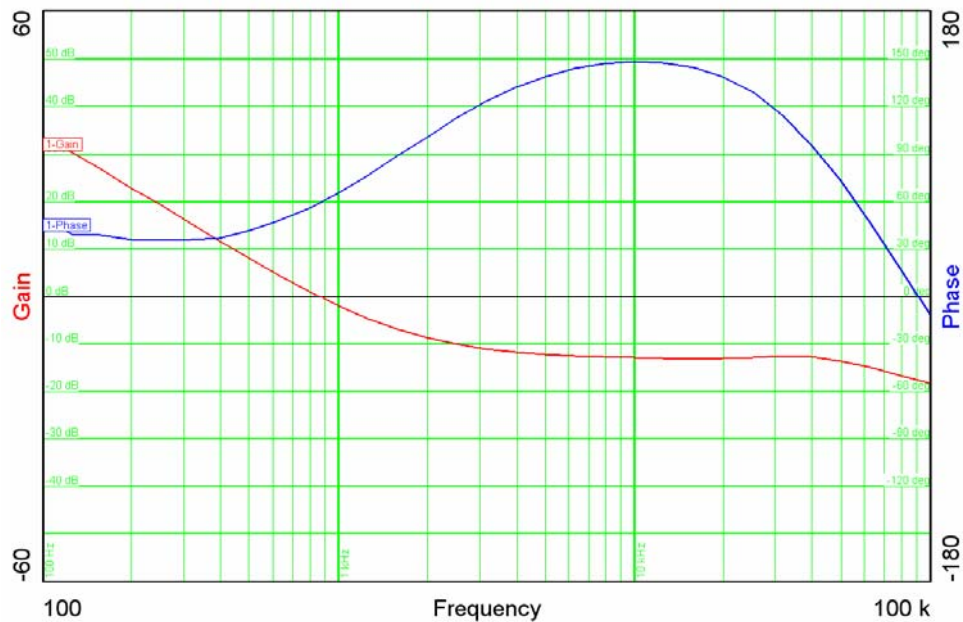
### 3 Control Loop Frequency Response

The figures below show the open loop response at full load 0.8A and after entering in the discontinuous mode, for the two different nominal input voltages.

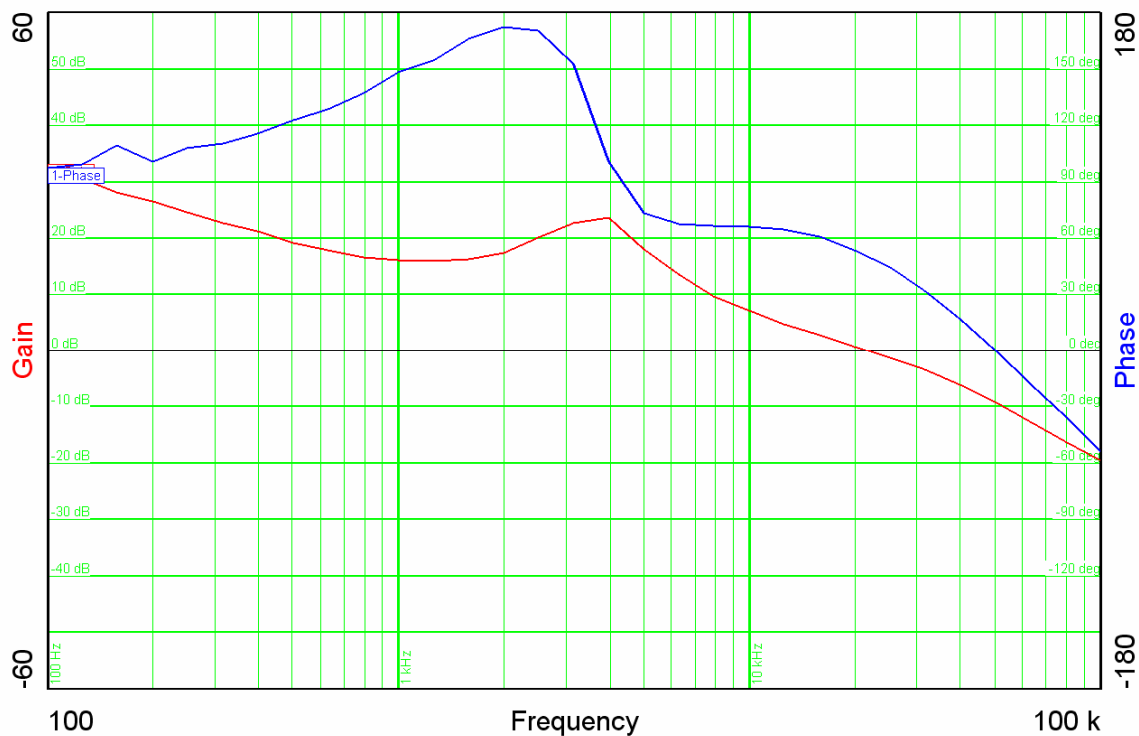
**3.3V , 0.5A Output**



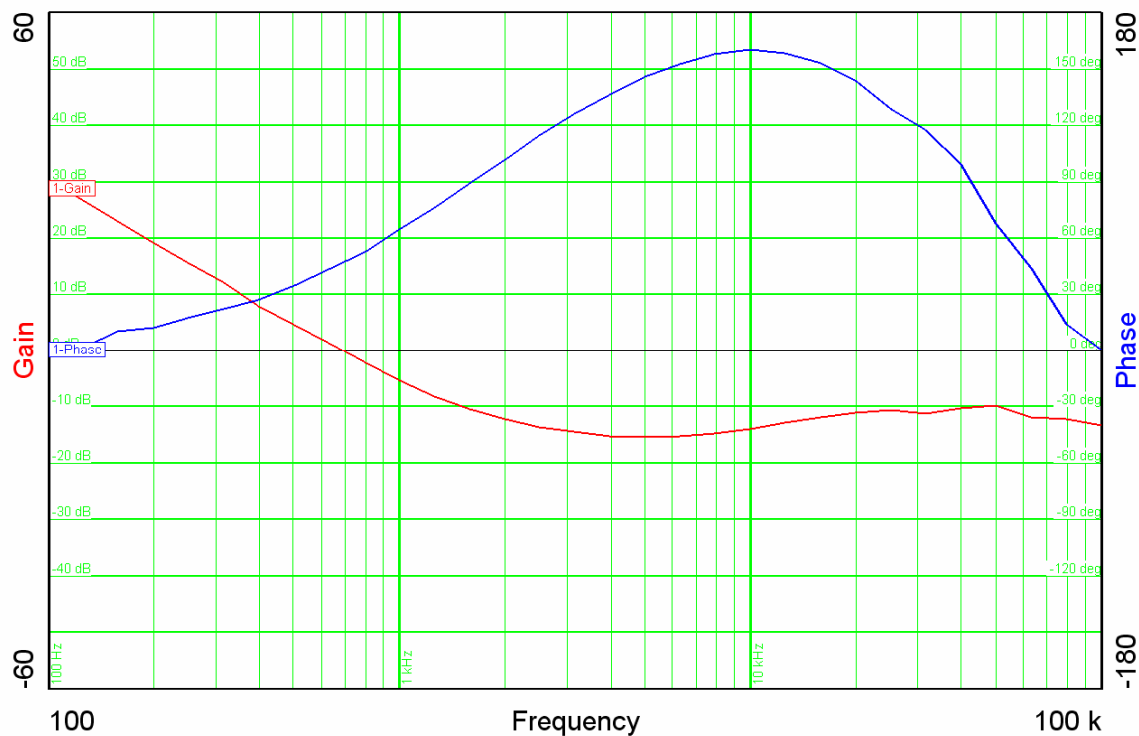
**3.3V, discontinuous Output (discontinuous mode starts for output current less than 80mA)**



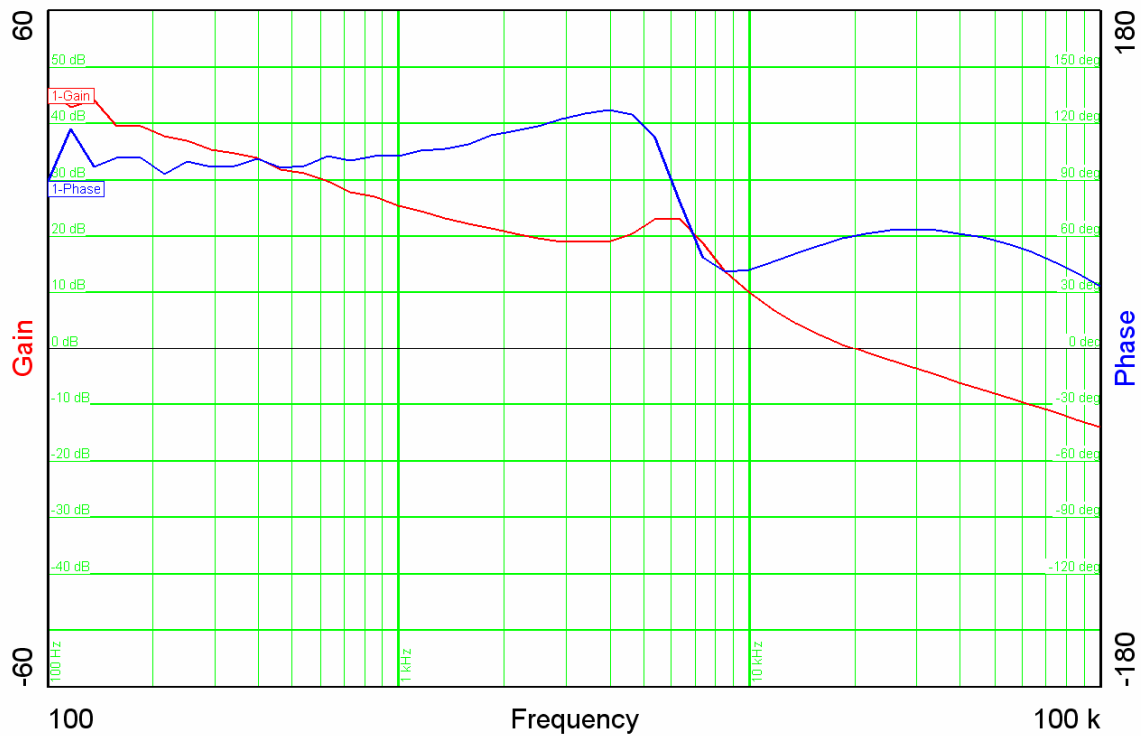
## 5V , 1.5A Output



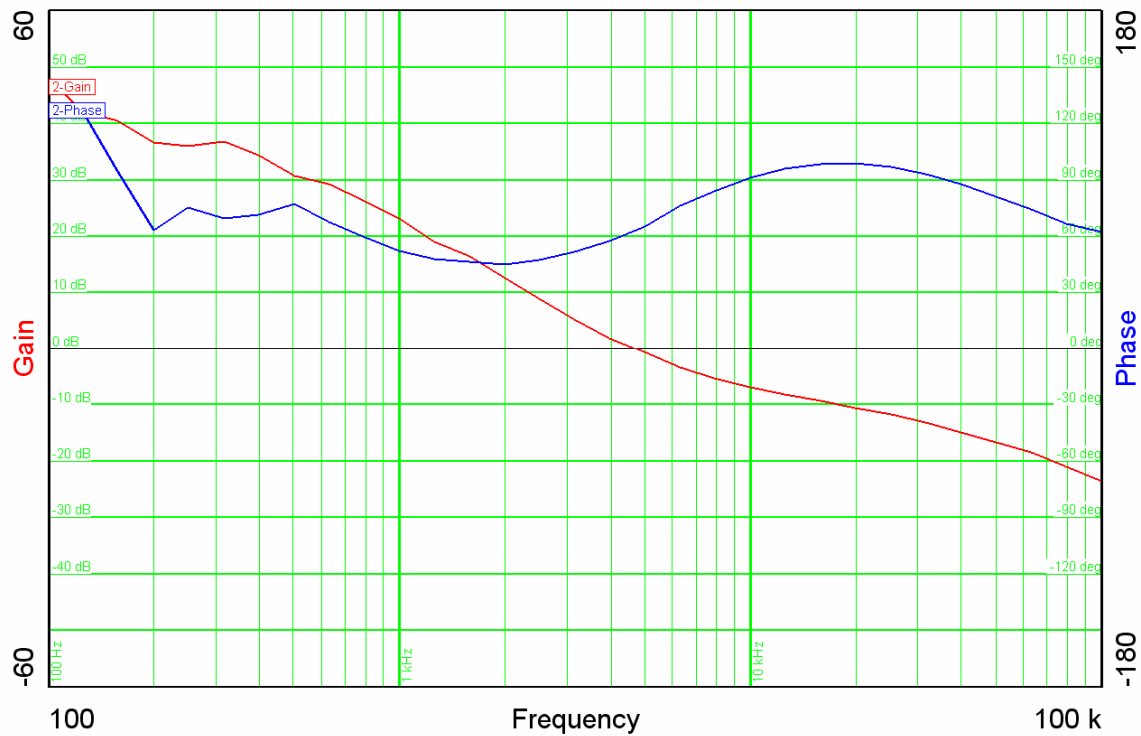
## 5V, discontinuous Output (discontinuous mode starts for output current less than 180mA)



## 12V , 2.5A Output



## 12V, discontinuous Output (discontinuous mode starts for output current less than 260mA)

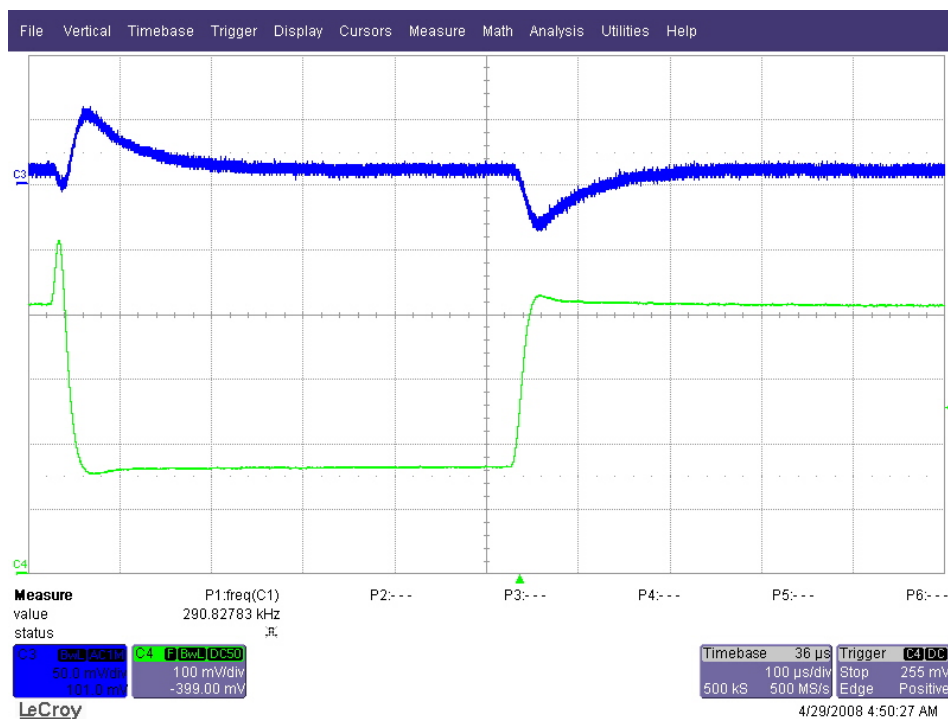




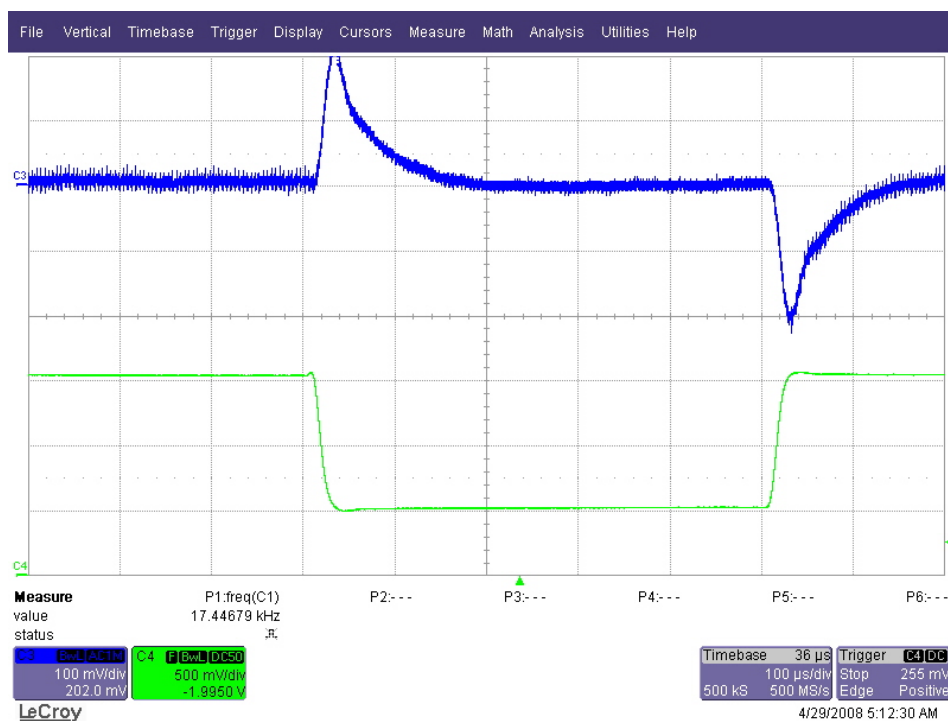
## 4 Load Transients

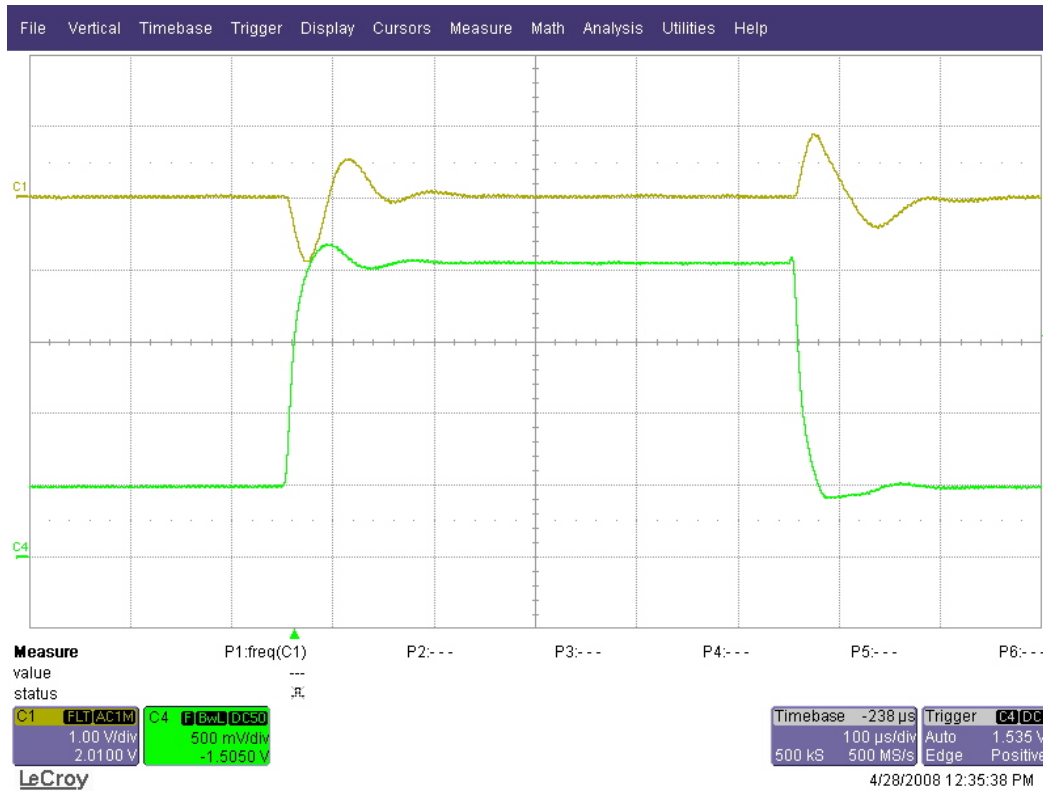
The figures below show the response to load transients, for the three converters. The current is stepping from 25% to 75% Full Load. Channel 1: Vout (AC coupled), channel 2: Iout (0.2A/div)

### 3.3V Output



### 5V Output

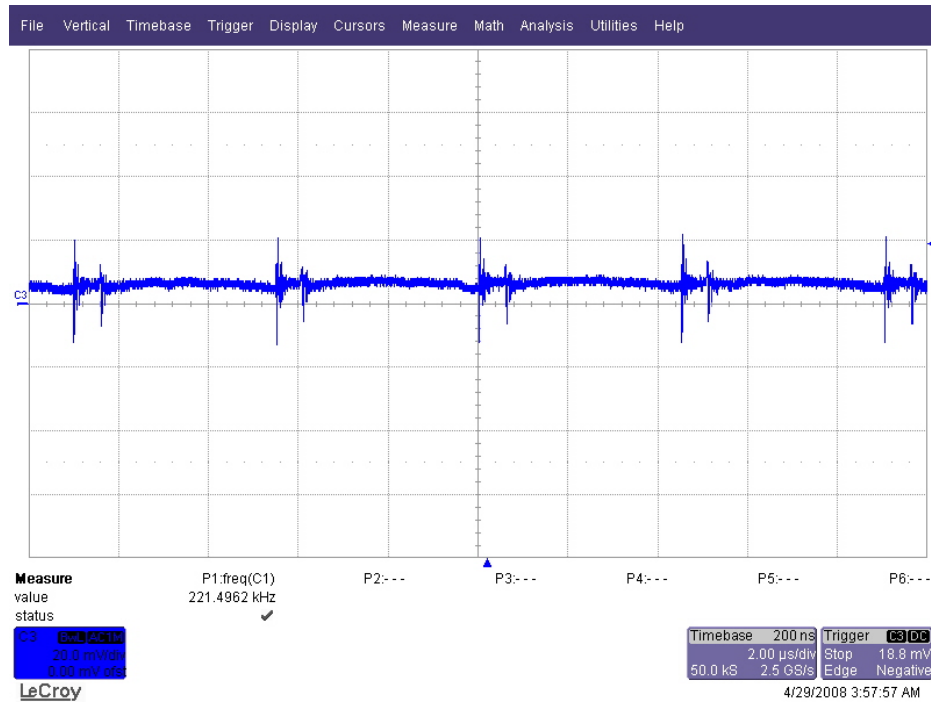


**12V Input**

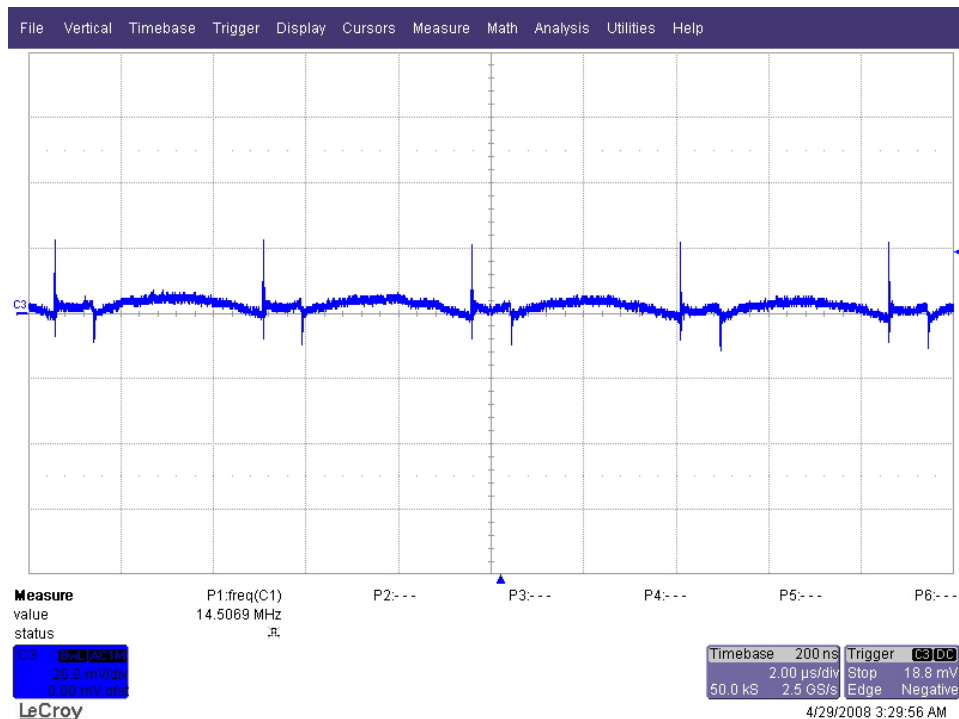
## 5 Output Ripple Voltage

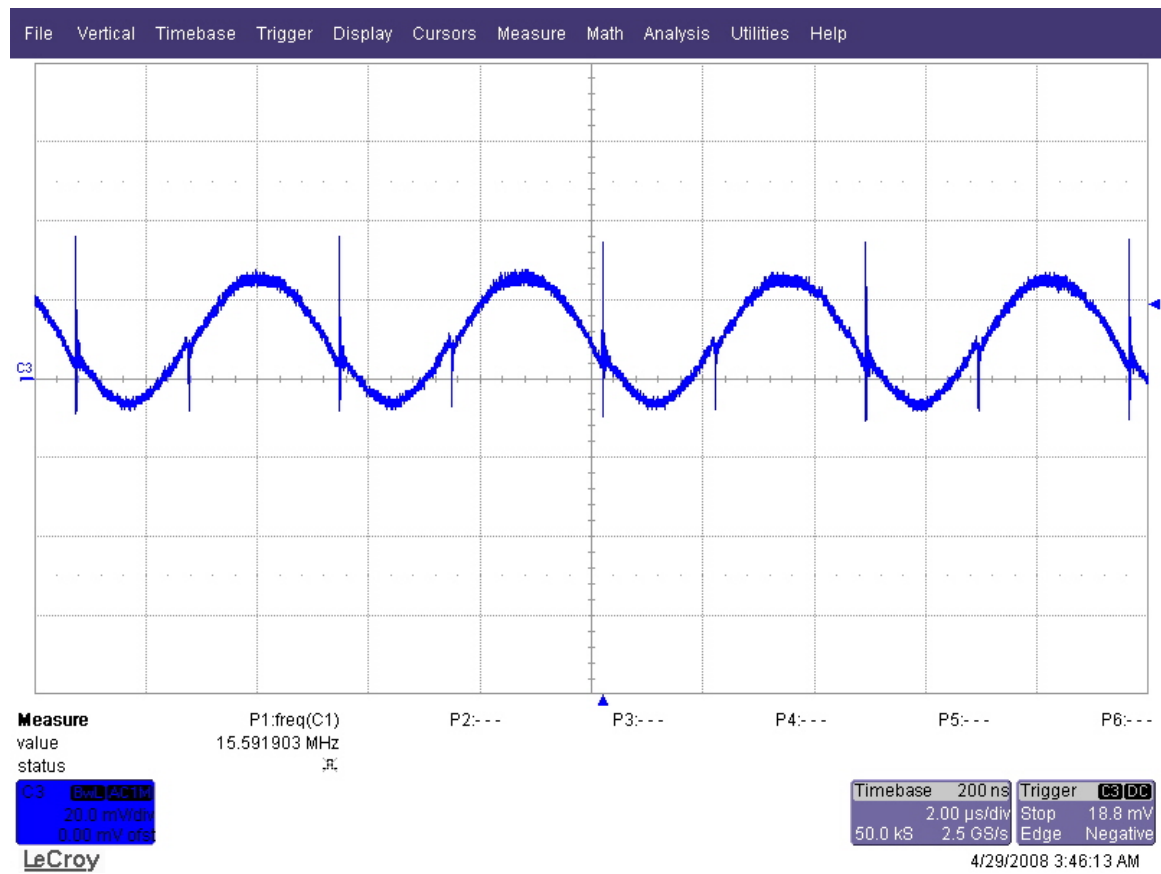
The output ripple voltages are shown in the figures below, for the three converters.

### 3.3V, 0.5A Output



### 5V, 1.5A Output



**12V, 2.5A Output**

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