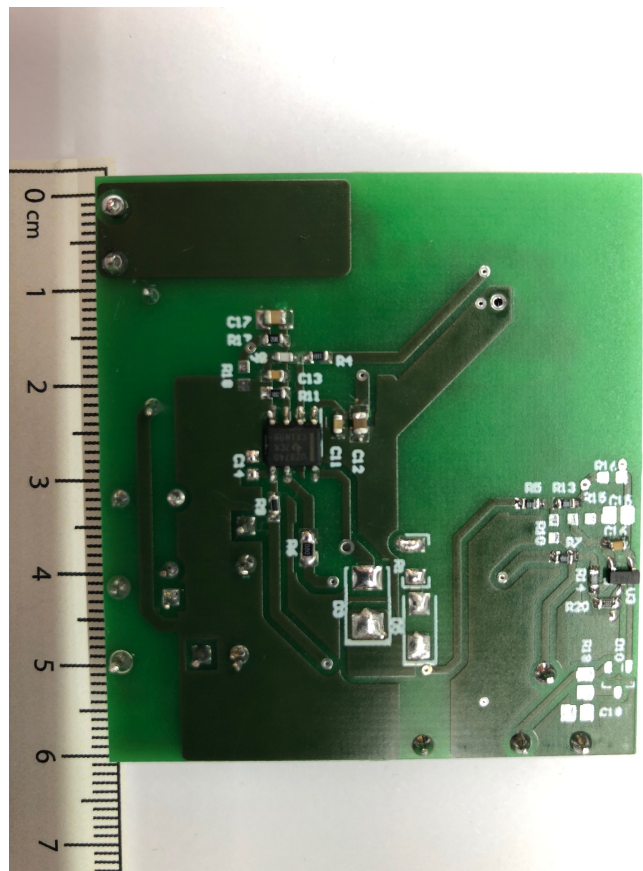
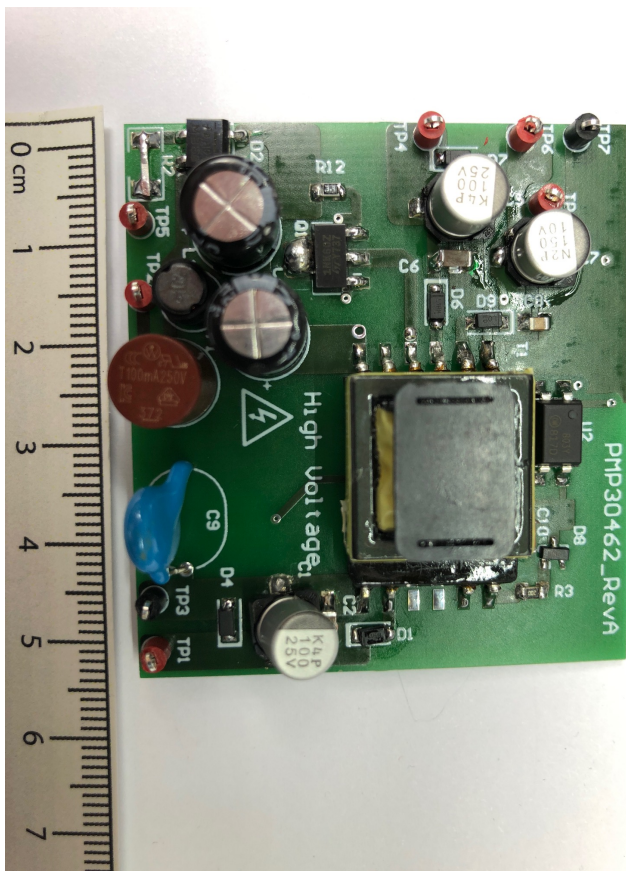


# Test Report: PMP30462 180VAC - 264VAC Input Multiple Output Flyback Reference Design



## Description

The PMP30462 reference design generates 3 isolated outputs (5V@30mA, 15V@20mA, 15V@20mA) from an AC input (180VAC -264VAC). The design can provide 750mW output power. The UCC28740 uses an optical coupler to regulate the 5V output and to improve transient response. The valley-switching technique reduces switching losses and keeps the efficiency high.



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## 1 Test Prerequisites

### 1.1 Voltage and Current Requirements

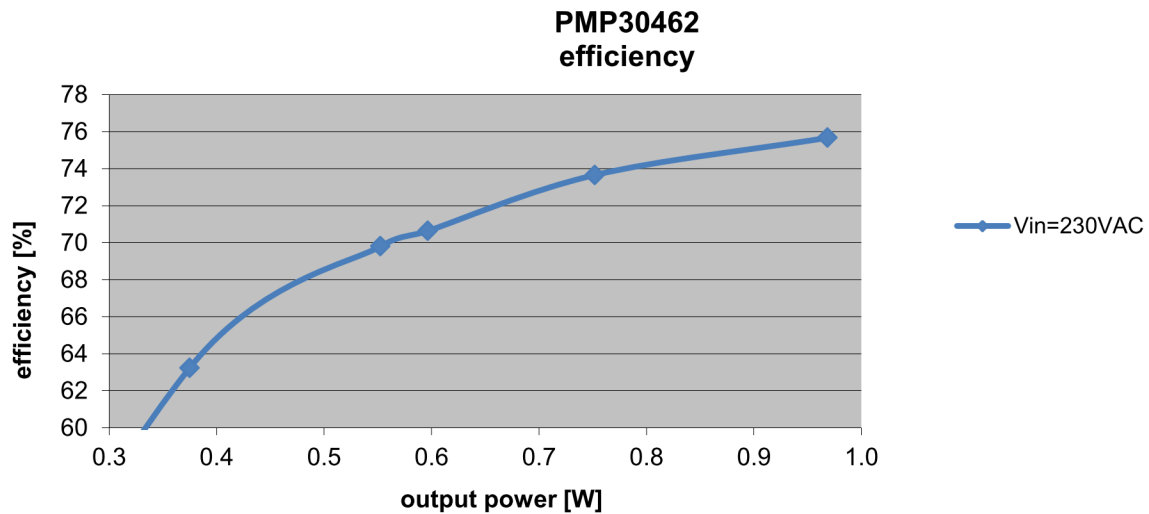
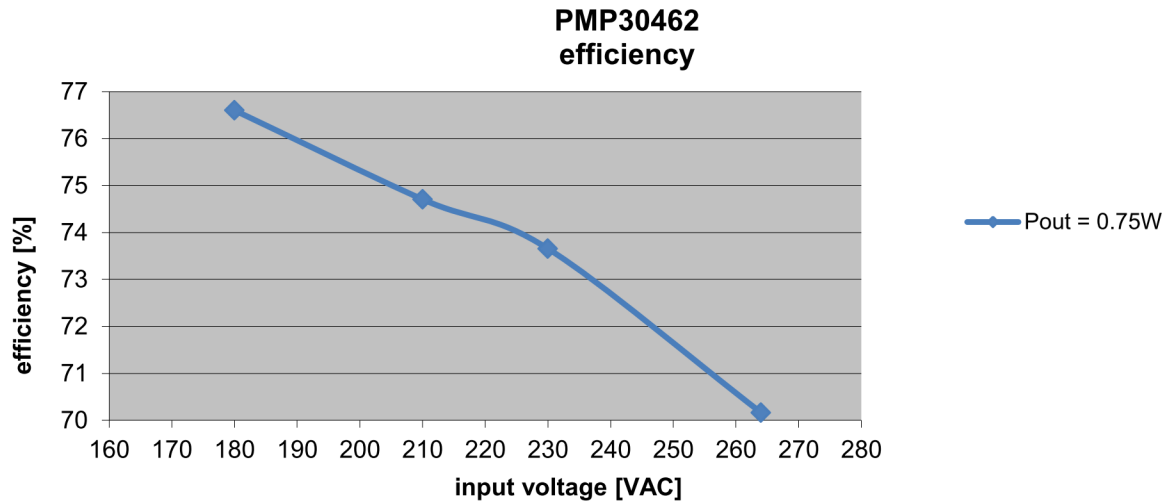
**Table 1. Voltage and Current Requirements**

PARAMETER	SPECIFICATIONS
$V_{IN}$	180VAC - 264VAC
$V_{OUT}$	5V@30mA, 15V@20mA, 15V@20mA
Nominal switching frequency	40kHz

## 2 Testing and Results

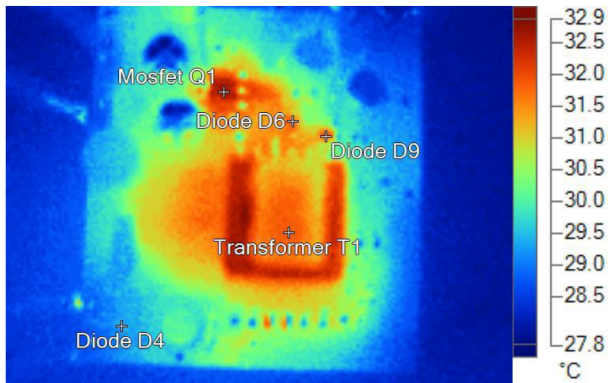
### 2.1 Efficiency Graphs

Figure 1. Efficiency

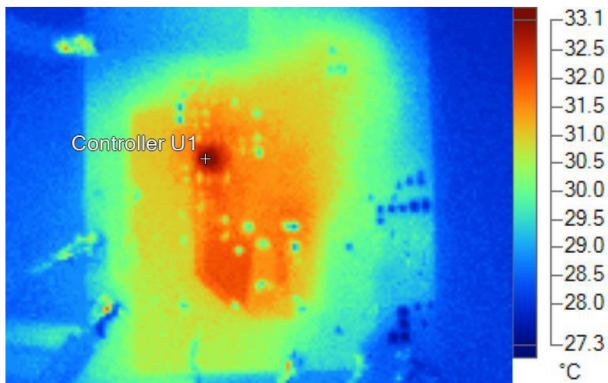


### 2.2 Thermal Images

The images below show the infrared images taken from the FlexCam after 15min at full load output power with 230VAC input.

**Figure 2. Top View**


Name	Temperature	
Mosfet Q1	32.9°C	
Transformer T1	32.0°C	
Diode D4	29.4°C	
Diode D9	31.9°C	
Diode D6	31.6°C	

**vin=230VAC full load Top.is2**
**Figure 3. Bottom View**


Name	Temperature	
Controller U1	33.1°C	

**Vin=230VAC full load bottom.is2**

### 2.3 Dimensions

54mm x 55mm

### 3 Waveforms

#### 3.1 Switching\*

Figure 4. primary Switchnode: 264VAC input / full load

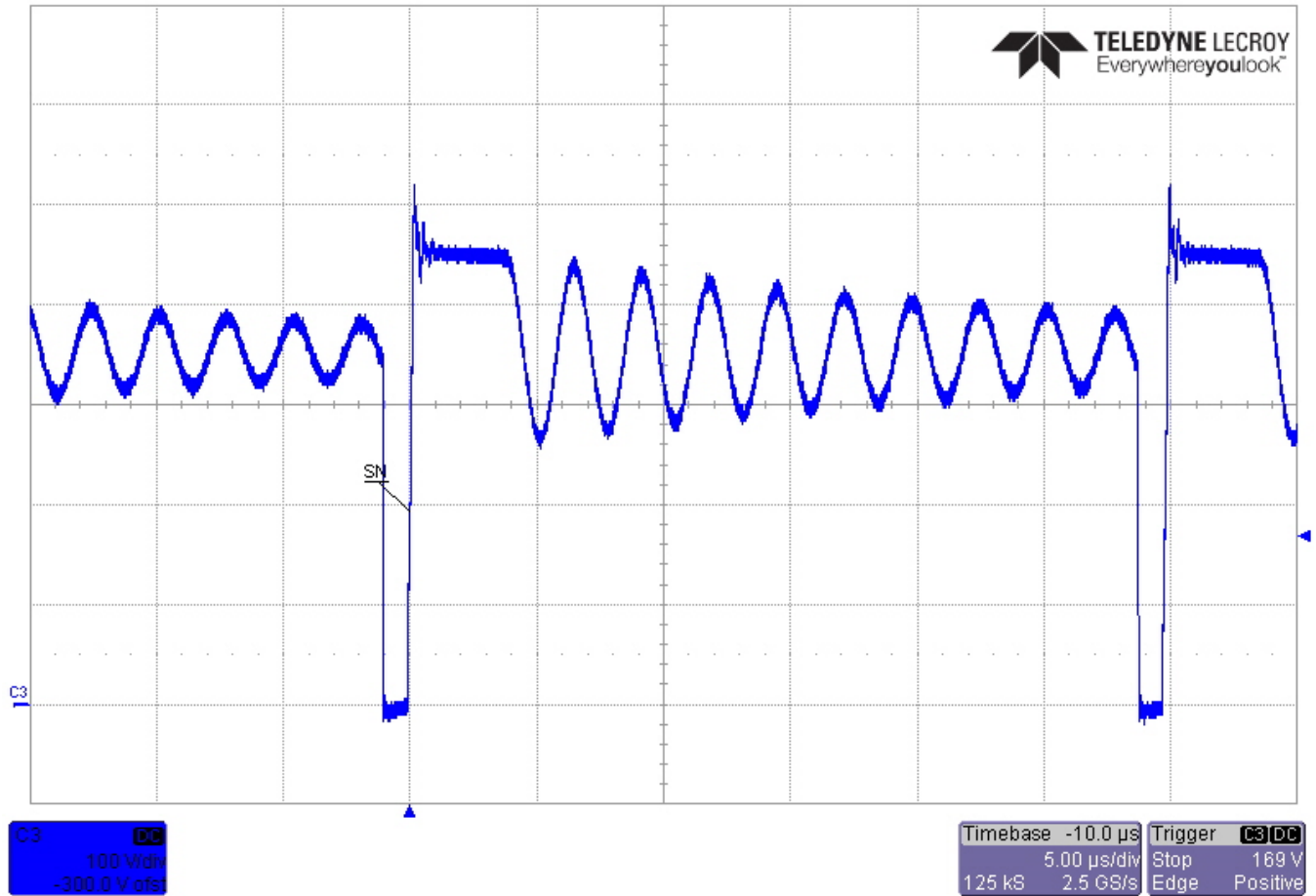


Figure 5. secondary 5Vout2 Switchnode: 264VAC input / full load

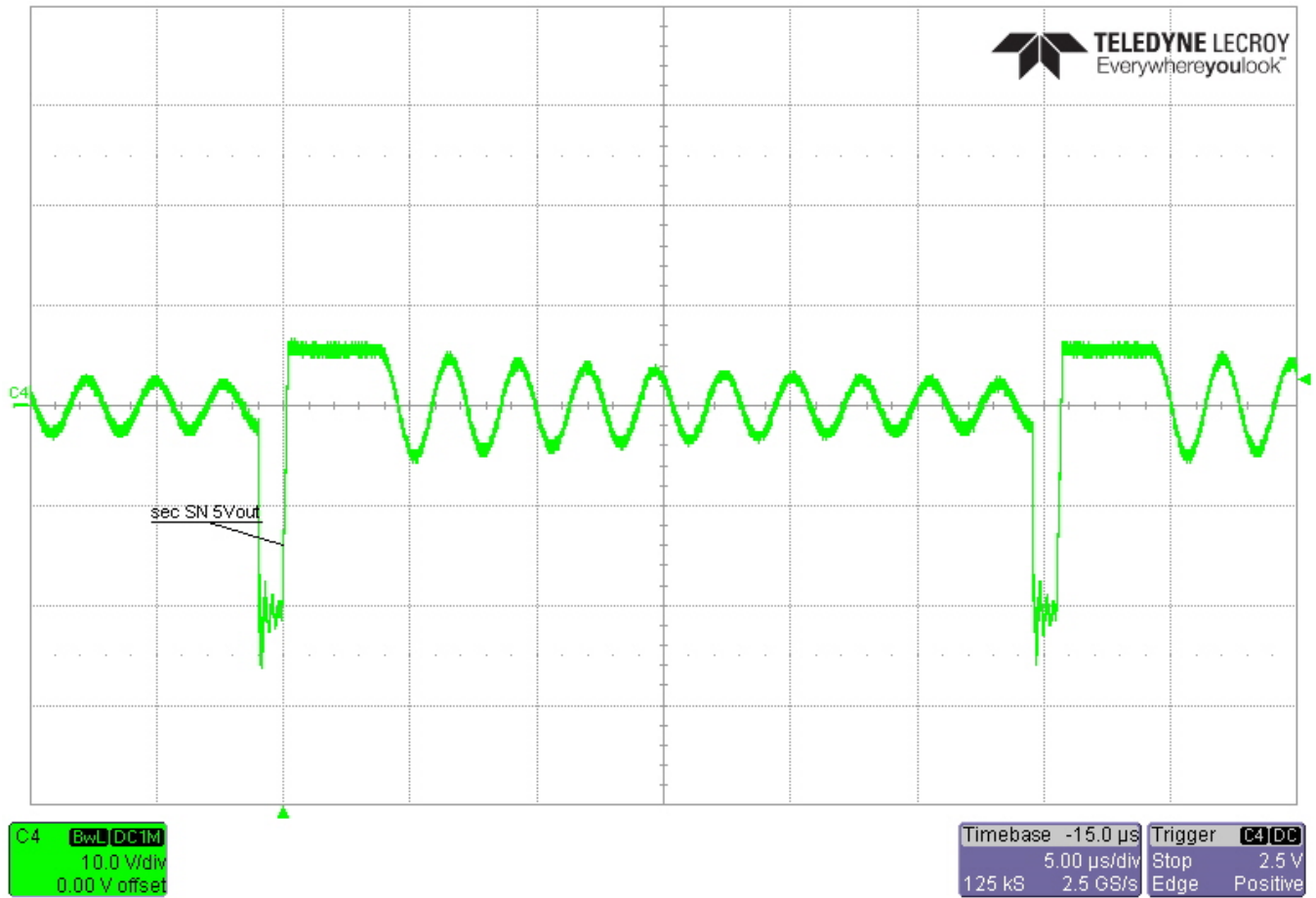


Figure 6. secondary 15Vout2 Switchnode: 264VAC input / full load

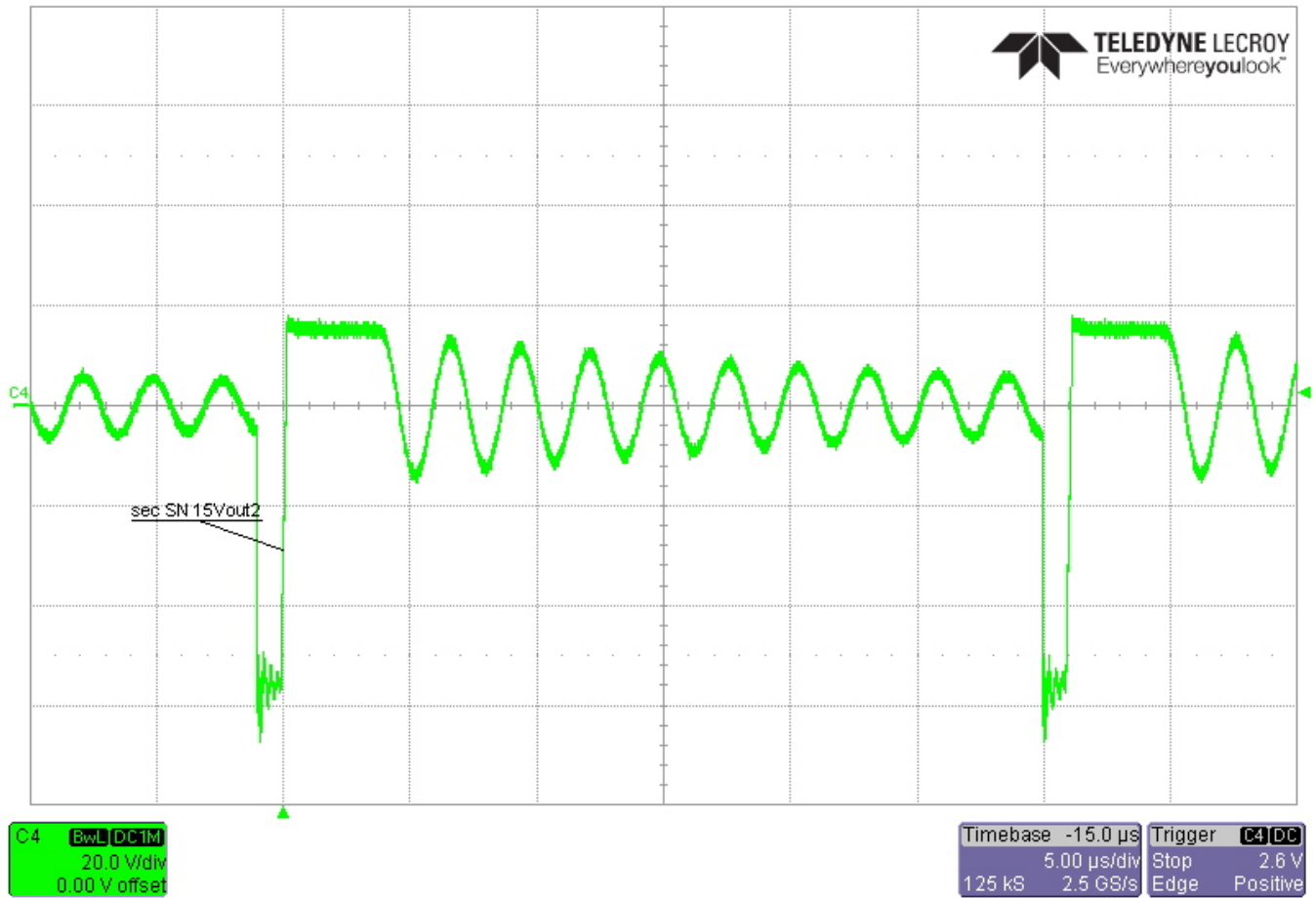
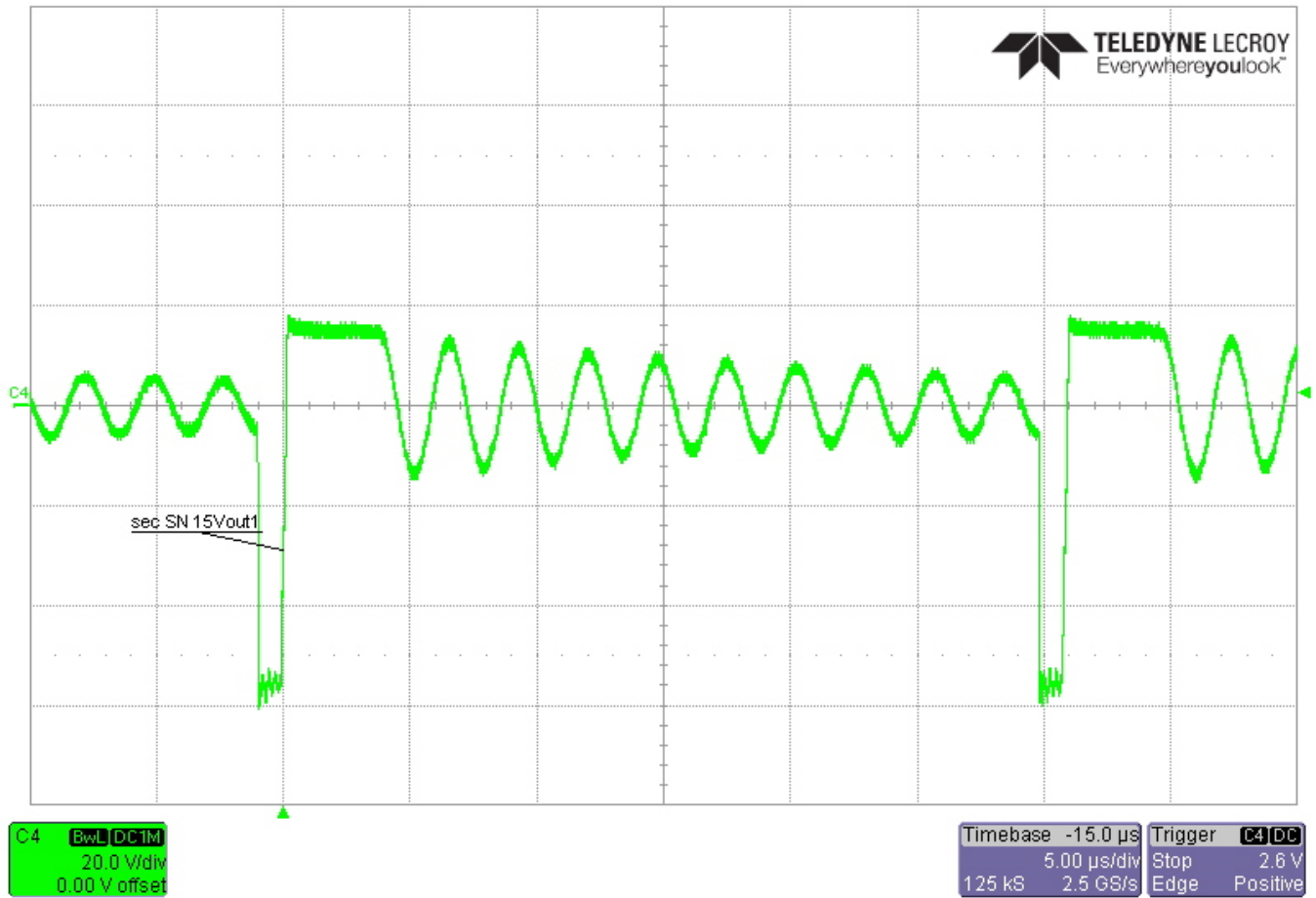


Figure 7. secondary 15Vout1 Switchnode: 264VAC input / full load





### 3.2 Output Voltage Ripple\*

Figure 8. output ripple 5Vout2: 230VAC input / full load

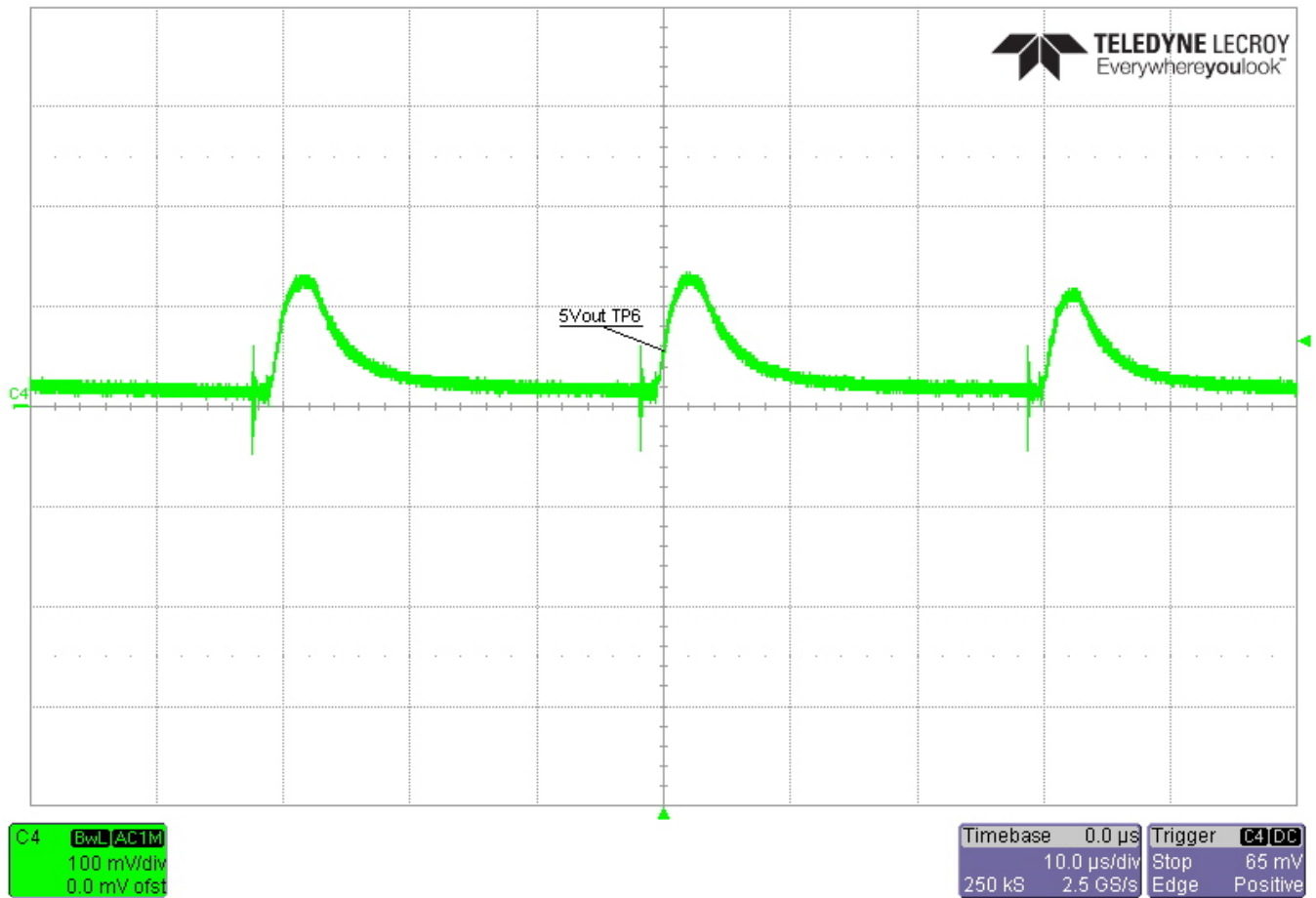


Figure 9. output ripple 15Vout2: 230VAC input / full load

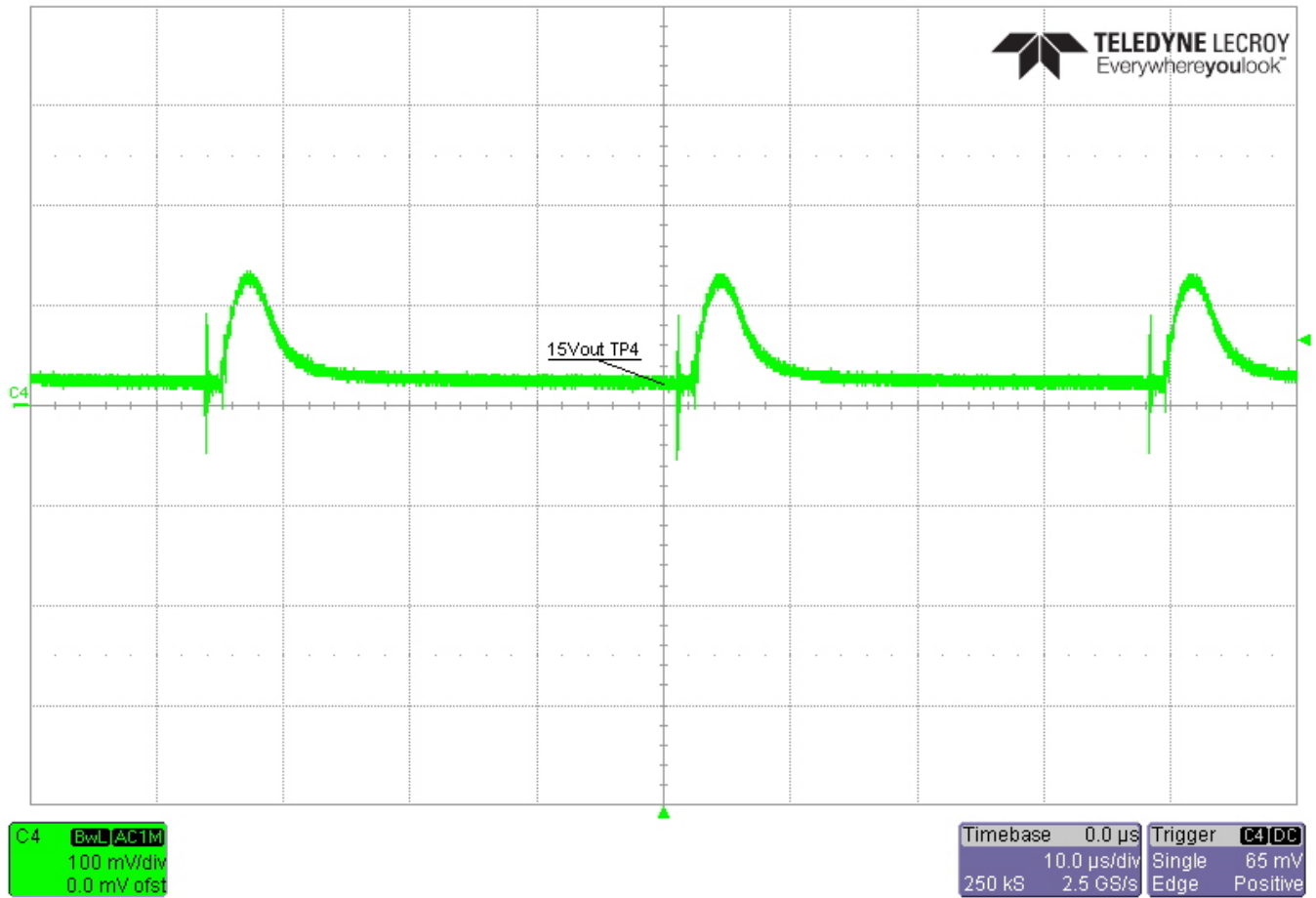
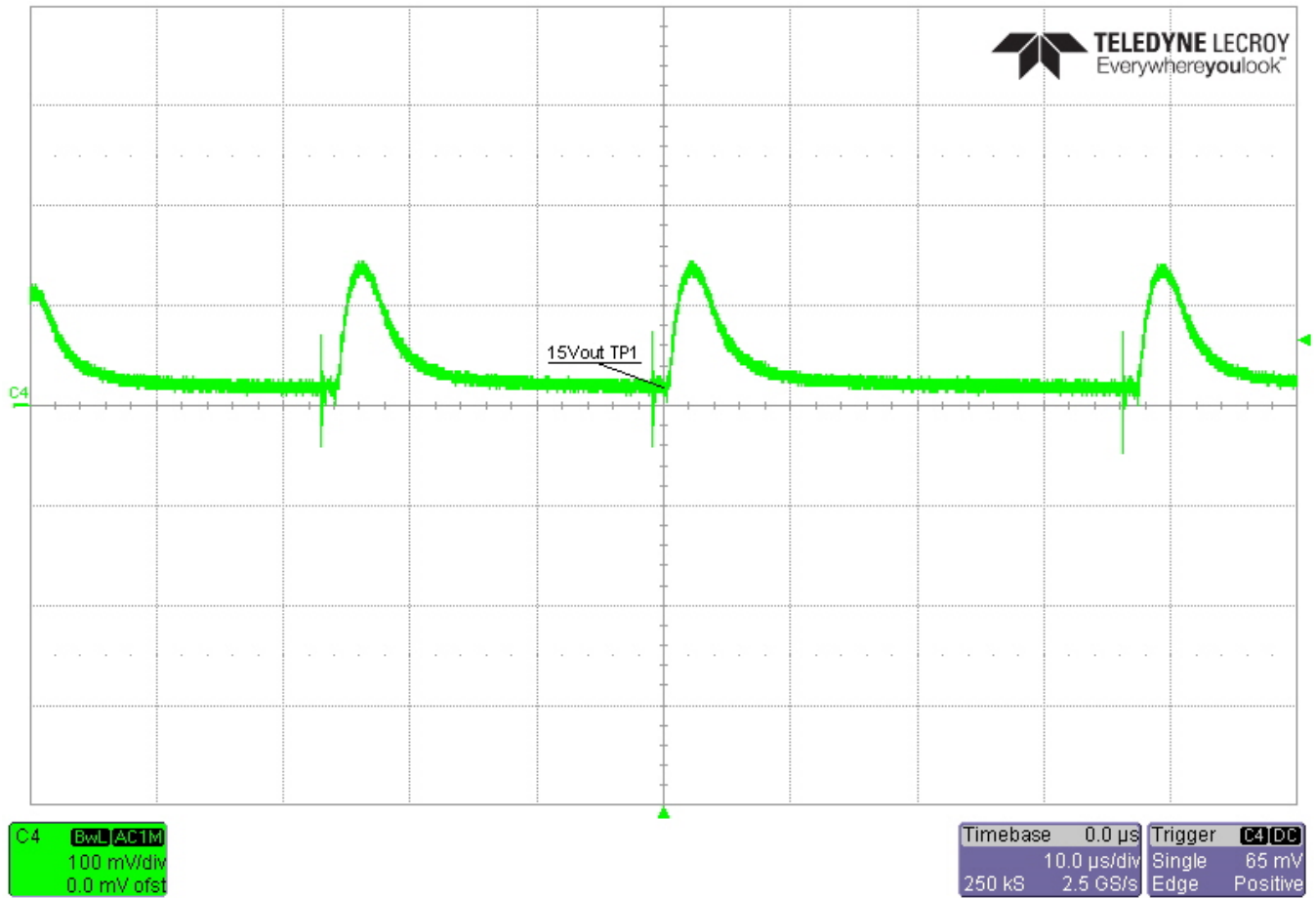
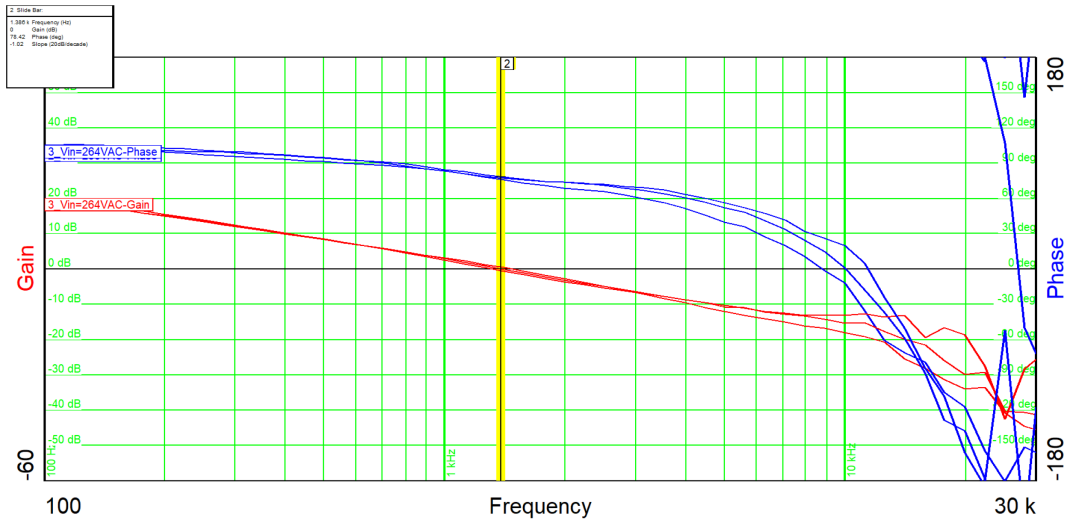


Figure 10. output ripple 5Vout1: 230VAC input / full load



3.3 Bode Plot\*

Figure 11. Bode Plot @ full load



Vin = 180VAC -> phasemargin = 75°

Vin = 230VAC -> phasemargin = 78°

Vin = 264VAC -> phasemargin = 78°

### 3.4 Start-up Sequence

Figure 12. startup: 180VAC input / full load

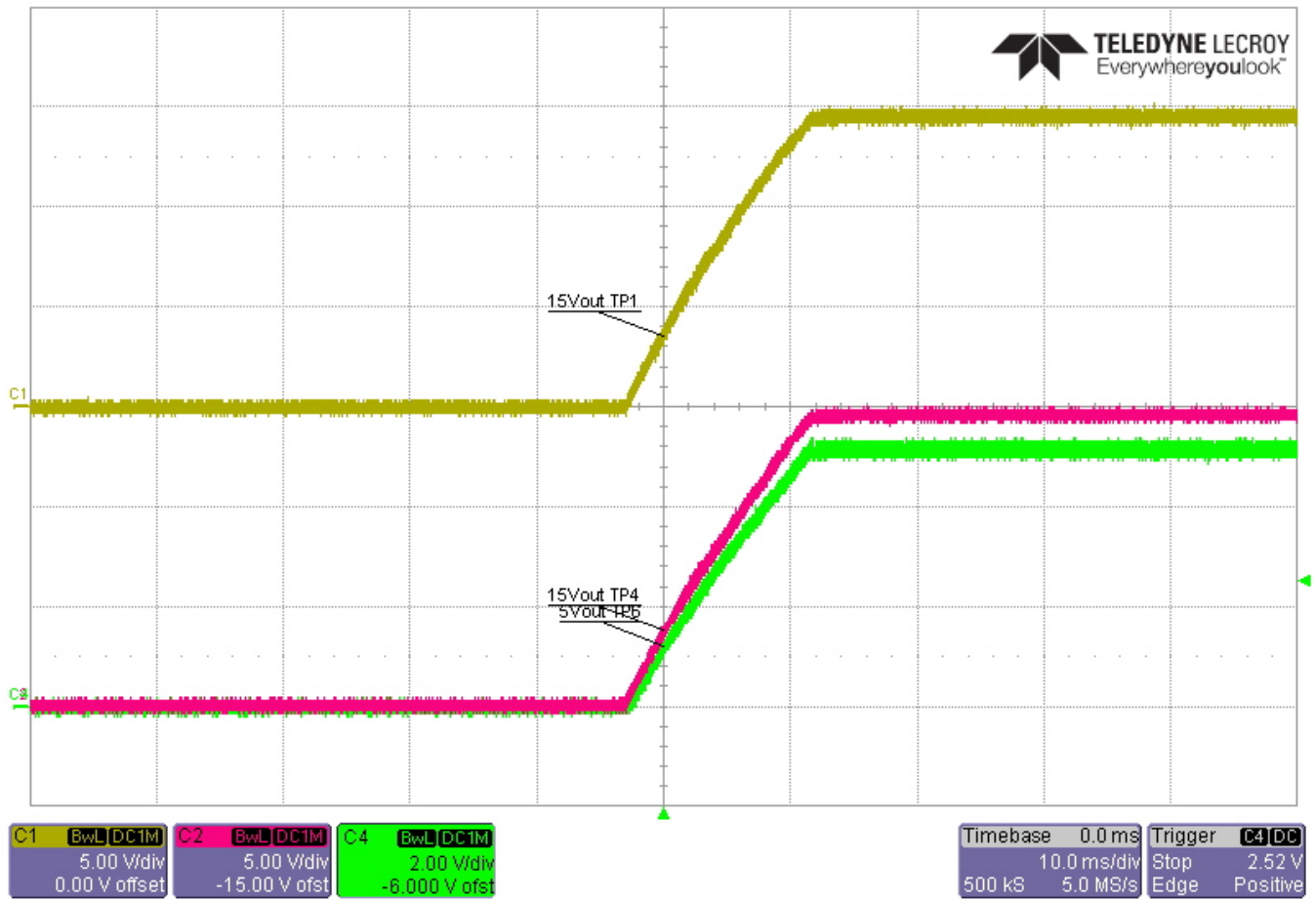
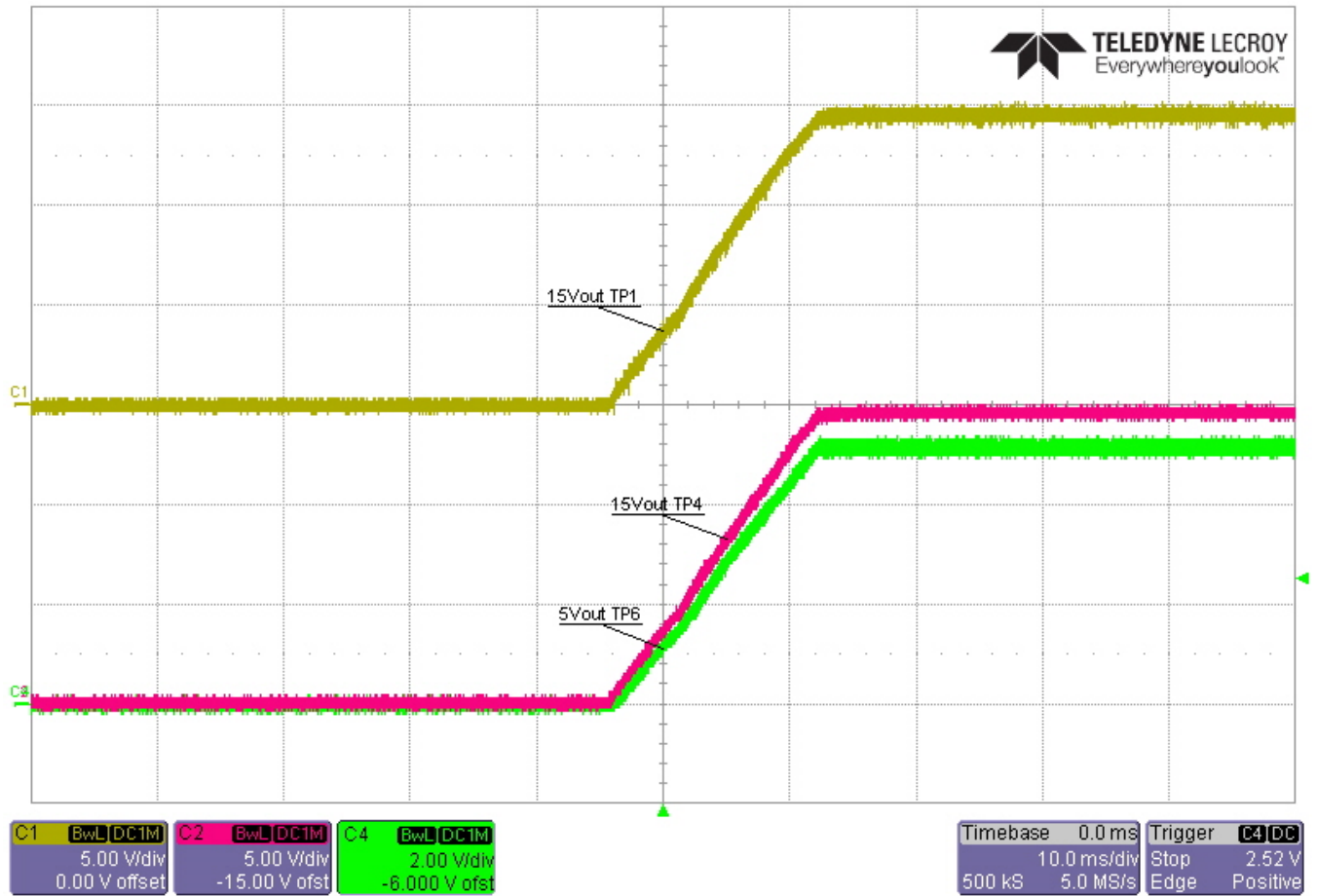


Figure 13. startup: 264VAC input / full load



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