TIDA-00503, Test Report

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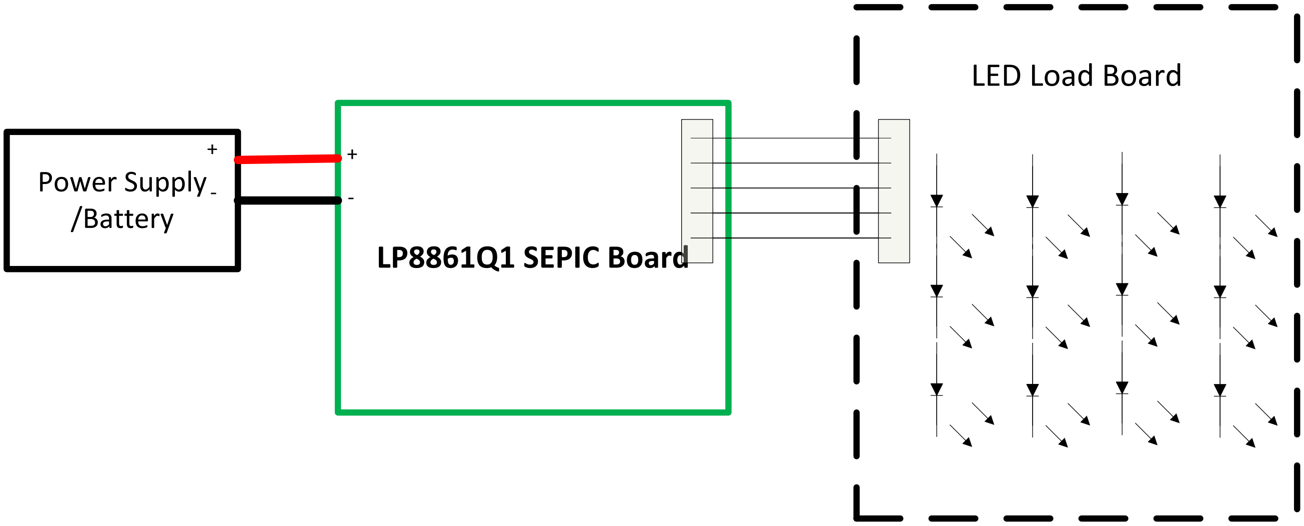
1. Test Setup



Three different LED configurations tested:

- 4 strings, 3 LEDs in series per string (4P3S), 100mA/string
- 2 strings, 3 LEDs in series per string (2P3S), 200mA/string
    - Two outputs of LP8861Q1 shorted externally per string, to increase current up to 200 mA per string
- 4 strings, 2 LEDs in series per string (4P2S), 100mA/string

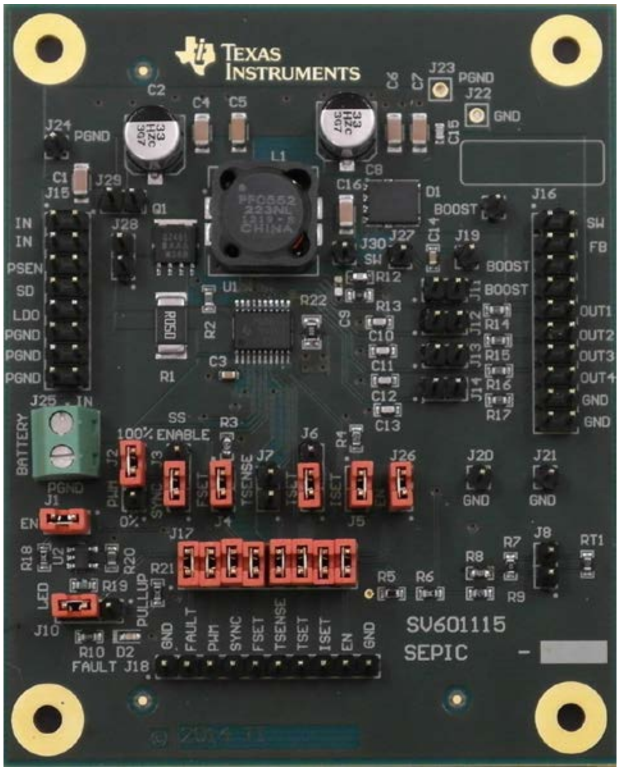


Figure 1 Original LP8861Q1 SEPIC board with coupled coil, 33uH (for Fsw = 300 kHz)

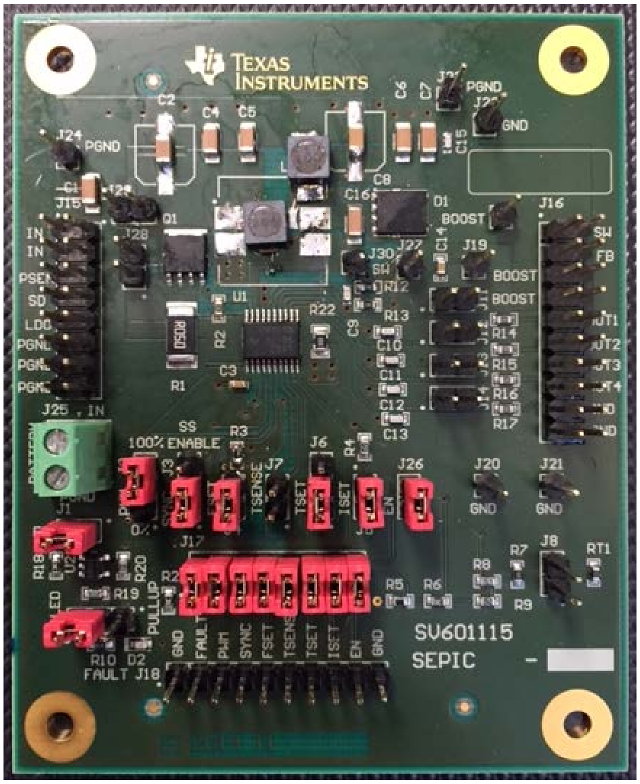


Figure 2 Modified LP8861Q1 SEPIC board with two separate 10 uH coils for Fsw =2.2 MHz

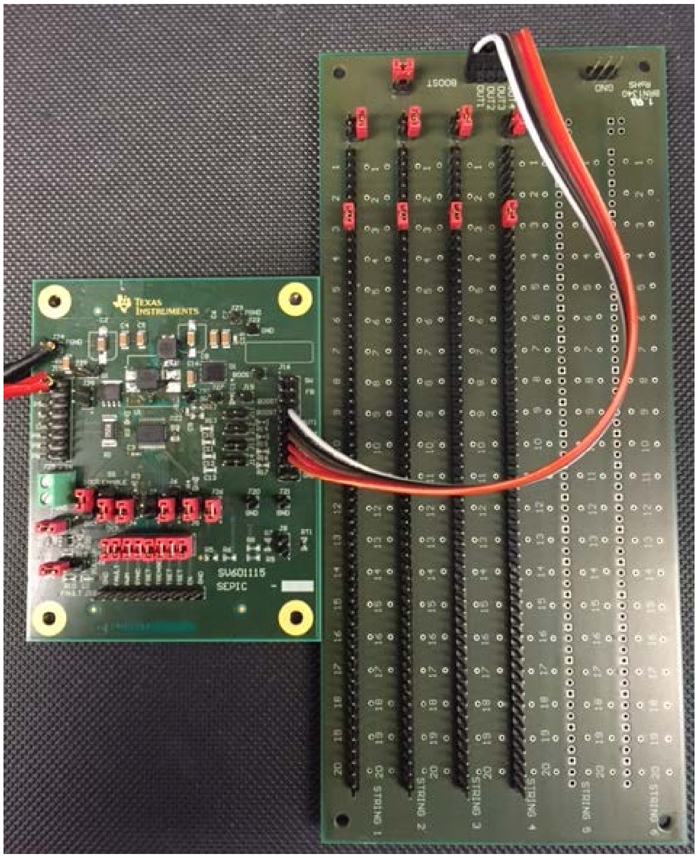


Figure 3 Test setup with LED load board

2. 4P3S and 2P3S Test Results, Fsw = 2.2 MHz

Two separate 10uH coils (Wurth Elektronik 744043100).
Note: coil current rating should be checked separately according to application conditions.

Efficiency

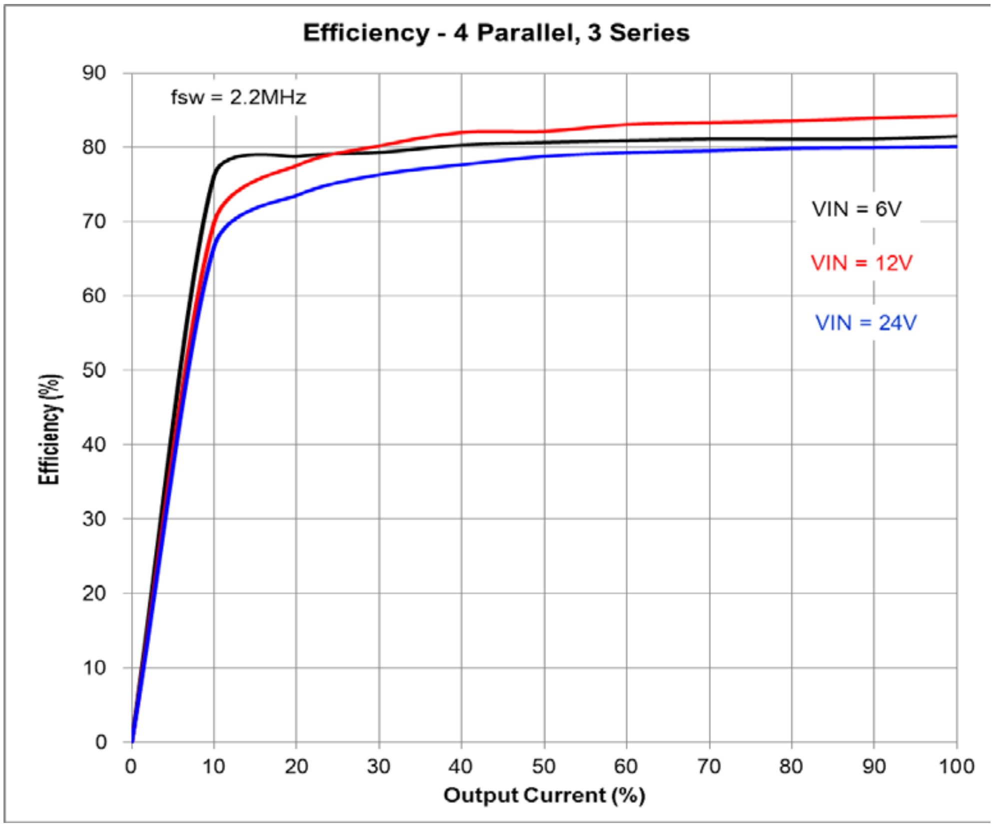


Figure 4 **Efficiency for 4P3S LED Configuration, 100mA/ch**

Switch Node Waveforms

The images below show the measured switching node waveforms under different input and output configurations.

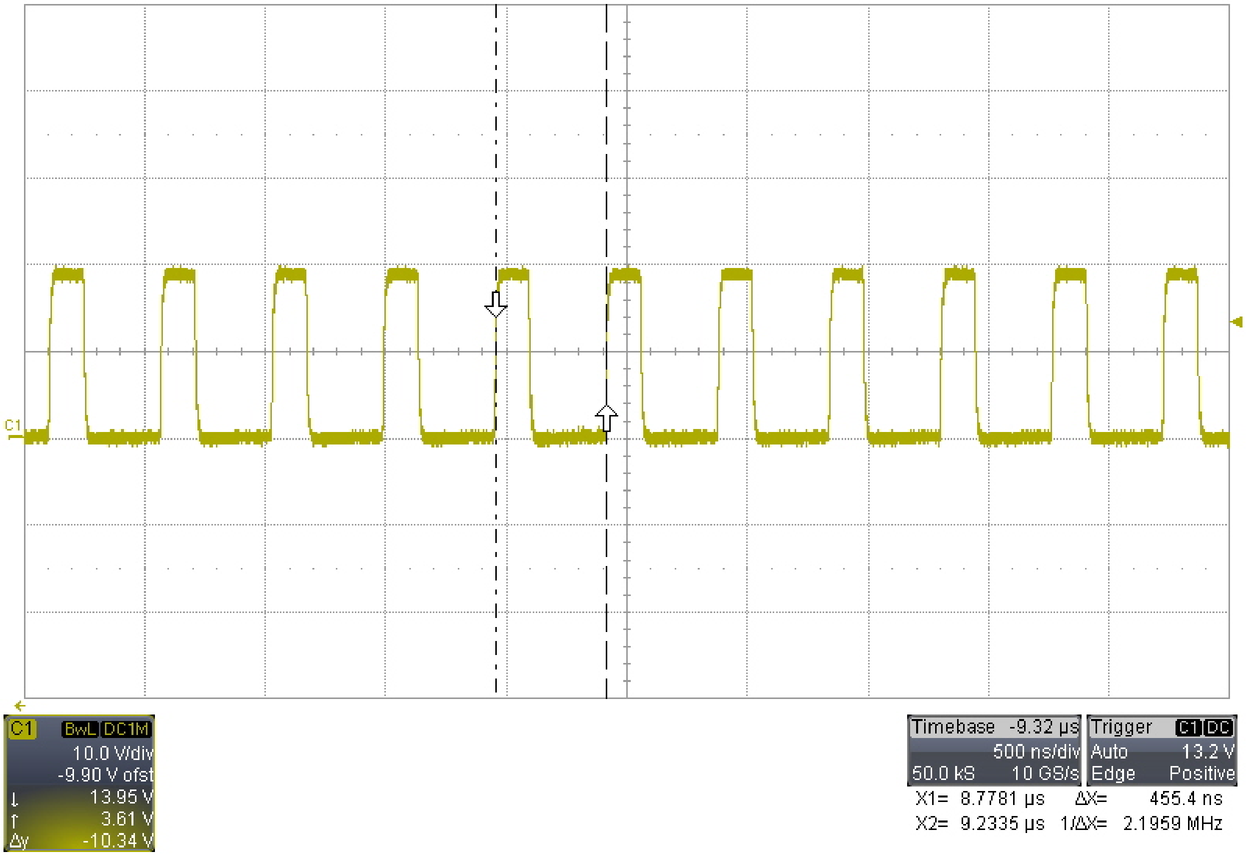


Figure 5 LED Configuration 4P3S, VIN = 6V Switching Node Waveform

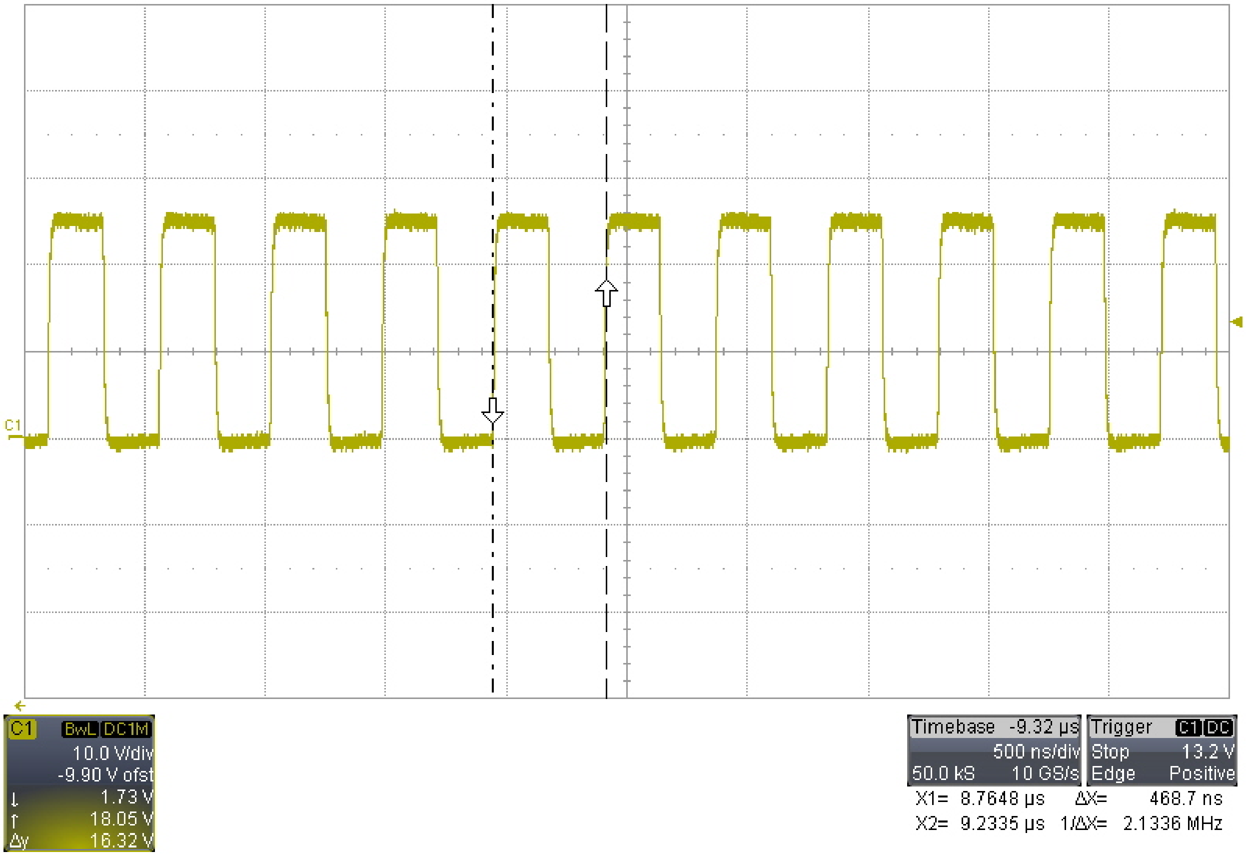


Figure 6 LED Configuration 4P3S, VIN = 12V Switching Node Waveform

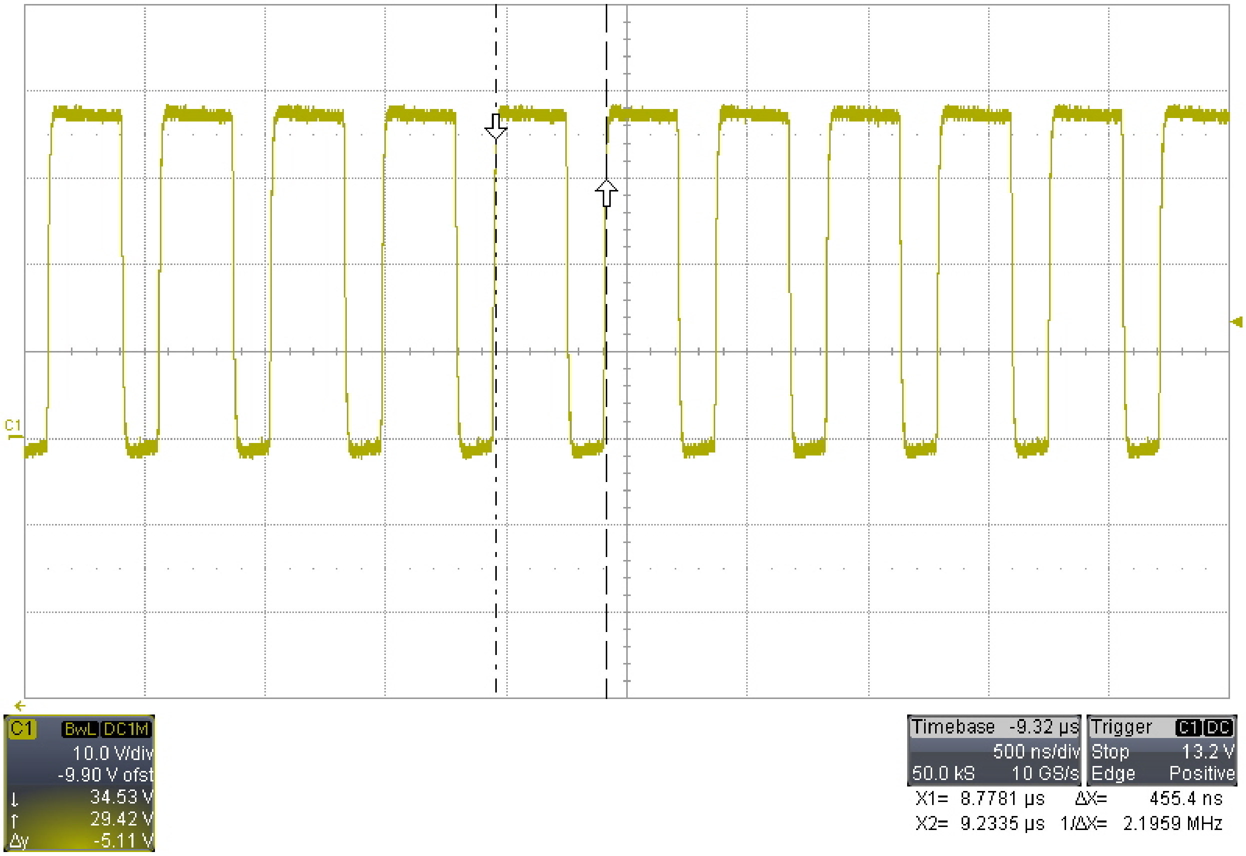
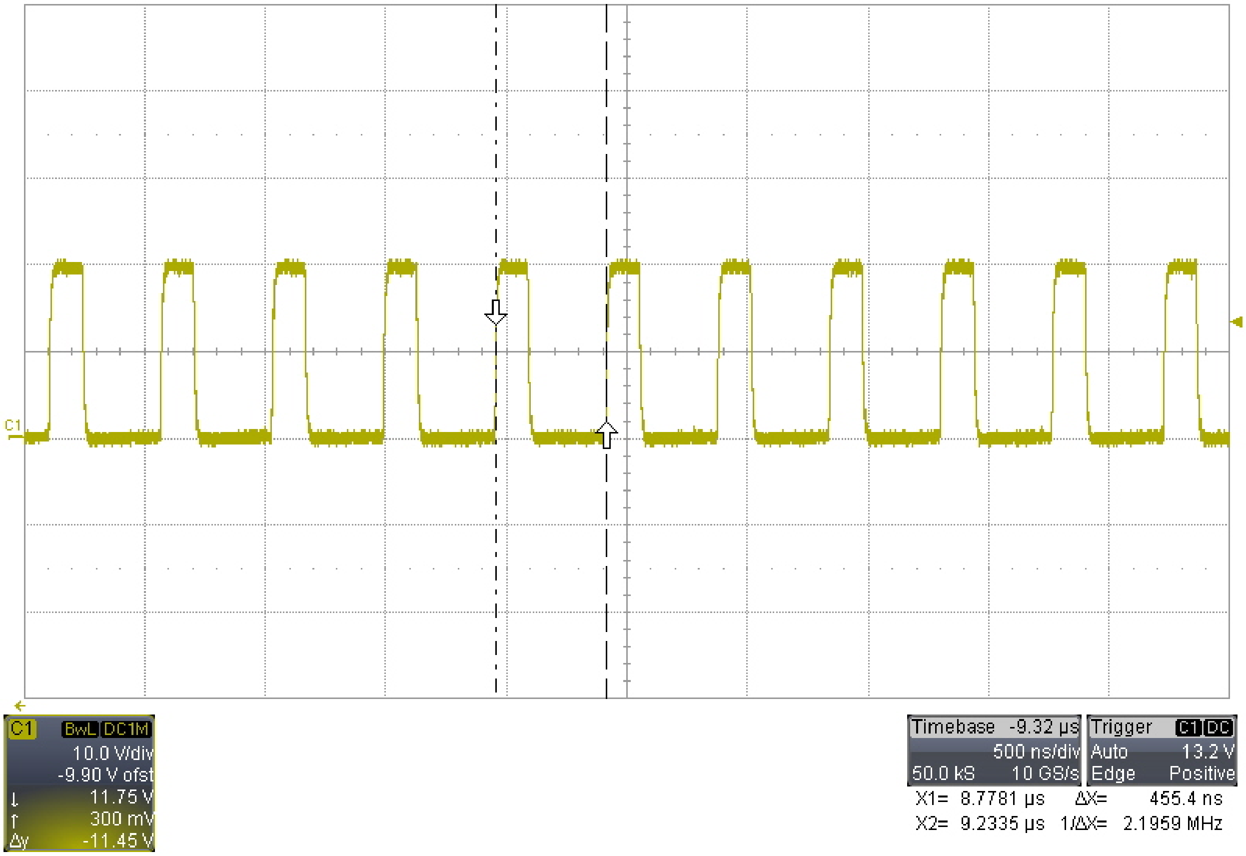


Figure 7 LED Configuration 4P3S, VIN = 24V Switching Node Waveform



C1 BwL DC1M
10.0 V/div
-9.90 V ofst
↓ 11.75 V
↑ 300 mV
Δy -11.45 V

Timebase -9.32 µs
500 ns/div
50.0 kS 10 GS/s

Trigger C1 DC
Auto 13.2 V
Edge Positive

X1= 8.7781 µs ΔX= 455.4 ns
X2= 9.2335 µs 1/ΔX= 2.1959 MHz

Figure 8 LED Configuration 2P3S, VIN = 6V Switching Node Waveform

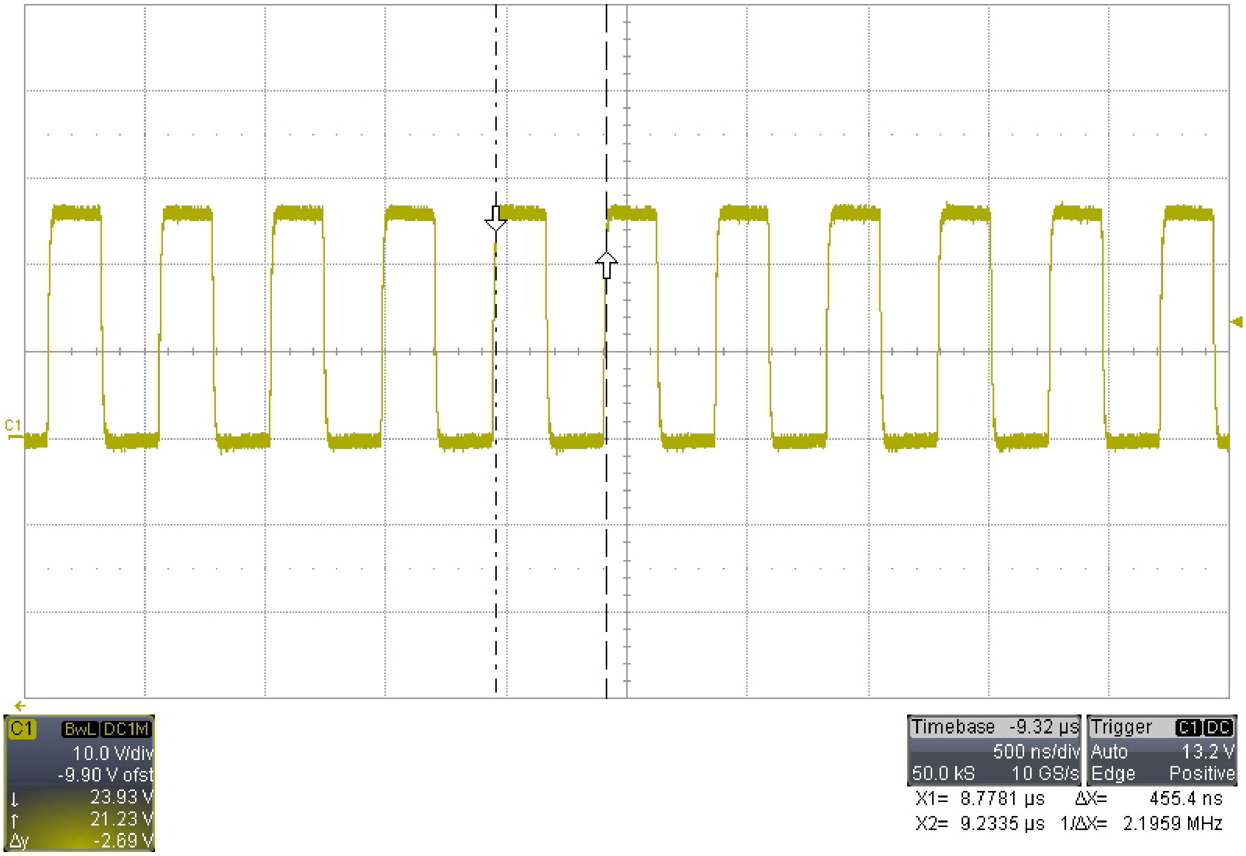


Figure 9 LED Configuration 2P3S, VIN = 12V Switching Node Waveform

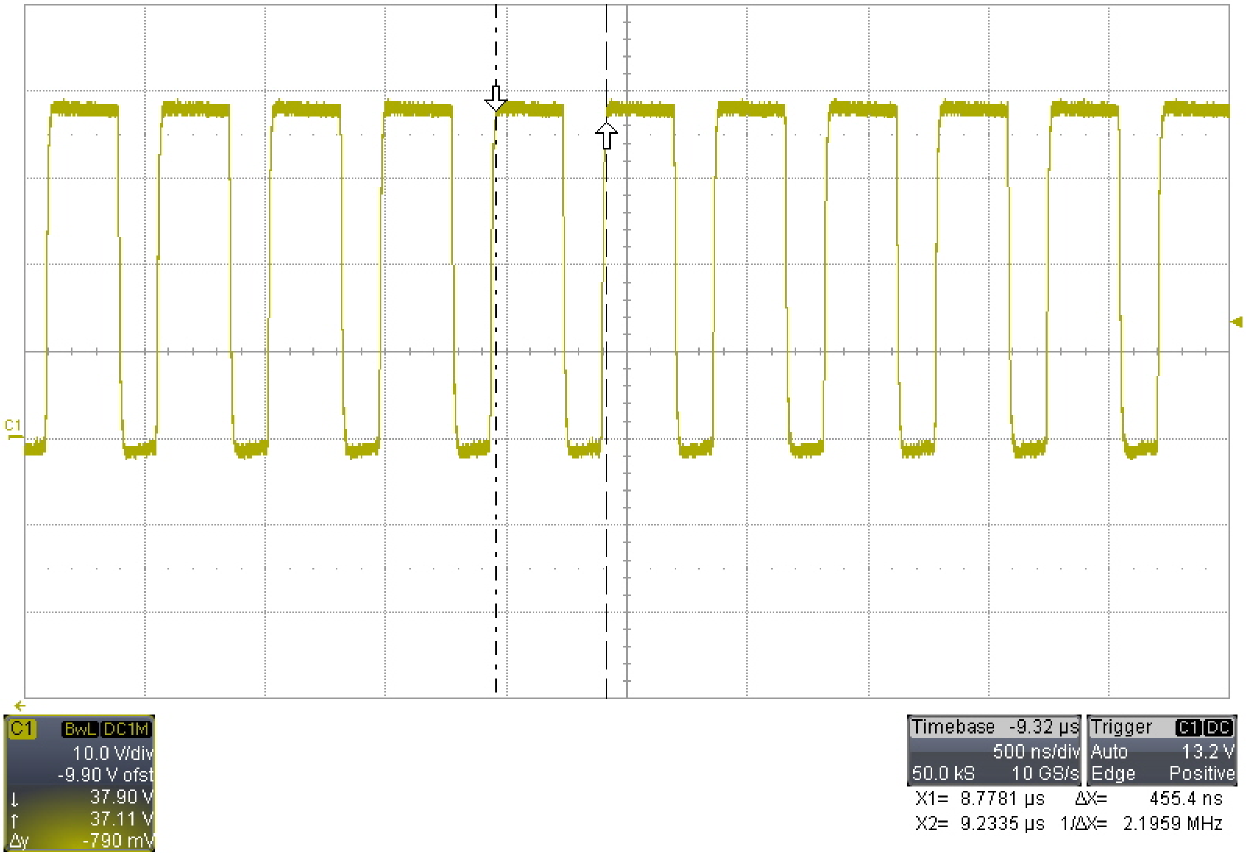


Figure 10 LED Configuration 2P3S, VIN = 24V Switching Node Waveform

Output Current Matching

The tables below show the measured output current matching between channels.

	Output Current (mA)	% Difference from Average
Average Current	100.3	-
CH1	99.5	0.8%
CH2	99.1	1.1%
CH3	101.4	1.1%
CH4	101.1	0.8%

Table 1. 4 Parallel, 3 Series 100mA/ch

	Output Current (mA)	% Difference from Average
Average Current	202	-
CH1	201	0.5%
CH2	203	0.5%

Table 3. 2 Parallel, 3 Series 200mA/ch

3. 4P2S Test Results, Fsw = 2.2 MHz

Two separate 10uH coils (IHLP2525BDER100M).

Converter Efficiency

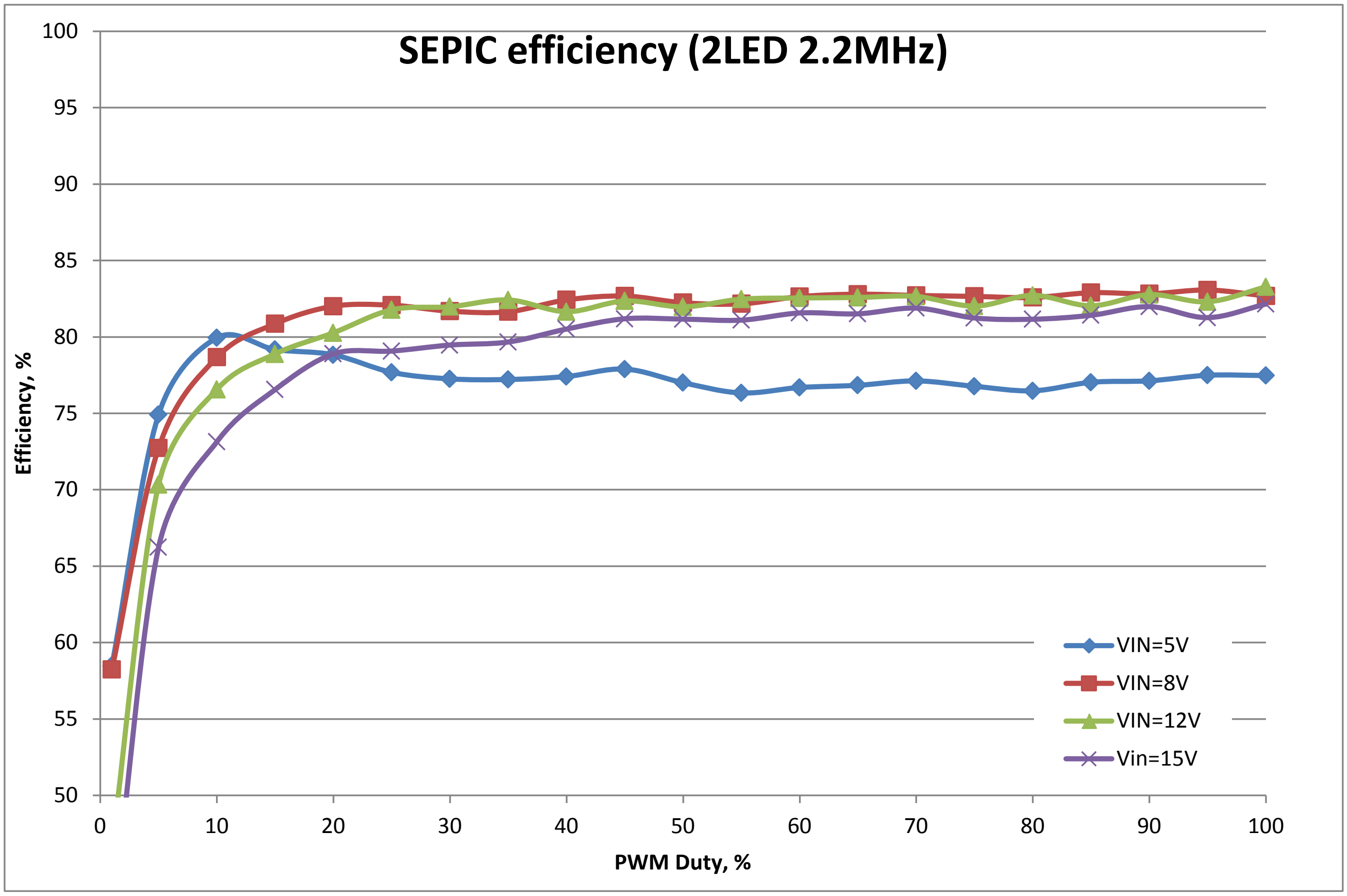


Figure 11 **Converter efficiency for 4P2S LED Configuration, 100mA/ch**

System Efficiency

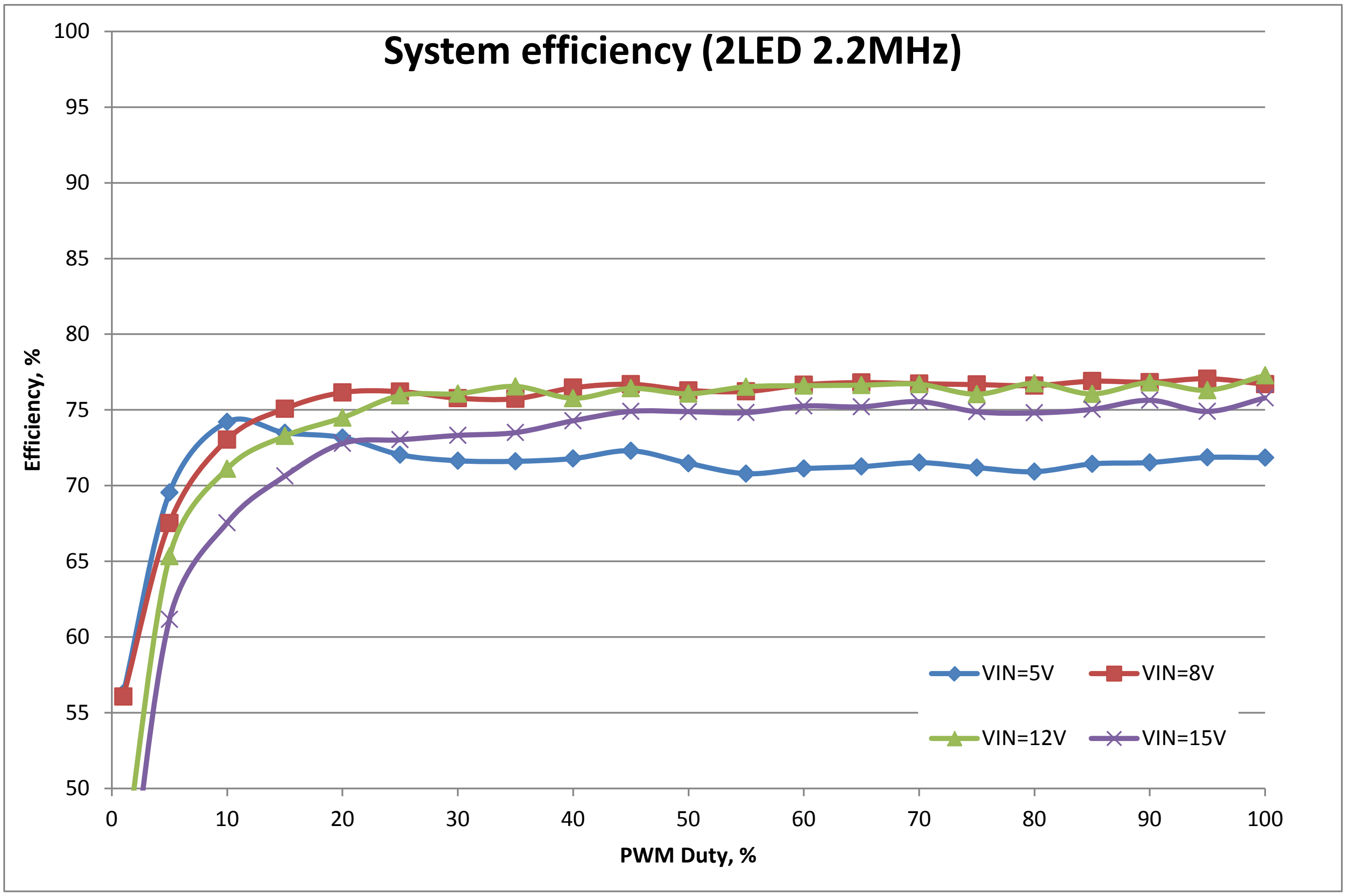


Figure 12 System efficiency for 4P2S LED Configuration, 100mA/ch

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