

# Test Report for Spartan 7

## MPM54304-0001

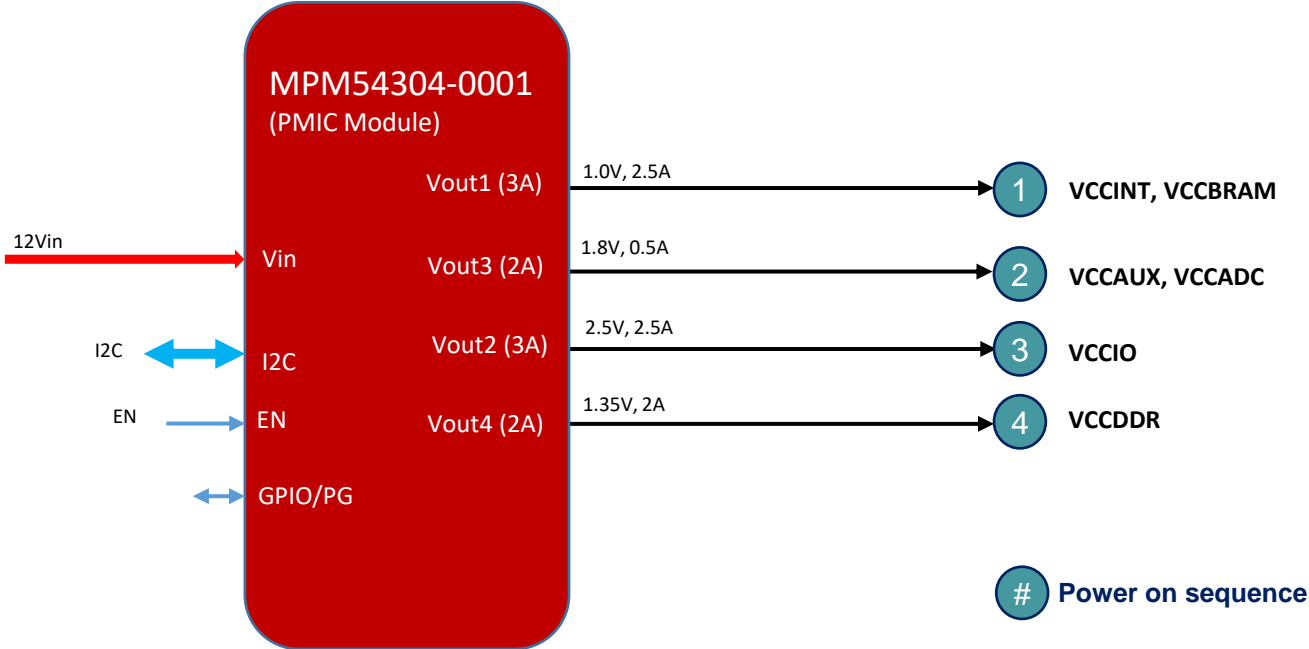
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# Table of Contents

1. Spartan 7 Power Tree
2. Spartan 7 Test Specifications
3. Spartan 7 DC Voltage Accuracy
4. Buck 1:
  - Steady State Ripple
  - Transient Response
5. Buck 2:
  - Steady State Ripple
  - Transient Response
6. Buck 3:
  - Steady State Ripple
  - Transient Response
7. Buck 4:
  - Steady State Ripple
  - Transient Response
8. Power Sequence On/Off
9. Test Setup

# Spartan 7 Power Tree



# Test Specifications

Rail Name	MPS Part#	Vin	Vout	Seq	Max Current	Max Ripple %	Step load	Slew Rate
VCCINT, VCCBRAM	MPM54034-0001 (Buck 1)	12V	1.0V	1	2.5A	+/-3%	1.25A→1.88A→1.25A	10A/us
VCCIO	MPM54034-0001 (Buck 2)	12V	2.5V	3	2.5A	+/-3%	1.25A→1.88A→1.25A	10A/us
VCCAUX, VCCADC	MPM54034-0001 (Buck 3)	12V	1.8V	2	0.5A	+/-3%	0.25A→0.375A→0.25A	10A/us
VCCDDR	MPM54034-0001 (Buck 4)	12V	1.35V	4	2.0A	+/-3%	1.0A→1.50A→1.0A	10A/us

# MPM54304-0001 DC Voltage Accuracy

Power Rail	Rail Name	Input Voltage	Design Target	Vout (No Load)	Vout (Half Load)	Vout (Full Load)	Max Error %
Buck 1	VCCINT, VCCBRAM	12V	1.0V	0.998	0.997	0.994	0.60%
Buck 2	VCCIO	12V	2.5V	2.518	2.517	2.514	0.72%
Buck 3	VCCAUX, VCCADC	12V	1.8V	1.792	1.792	1.791	0.50%
Buck 4	VCCDDR	12V	1.35V	1.354	1.354	1.356	0.44%

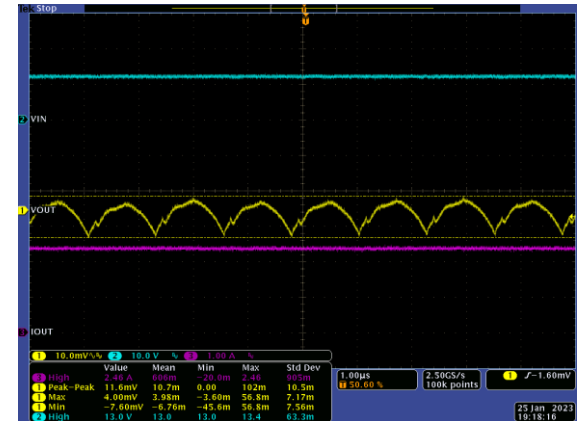
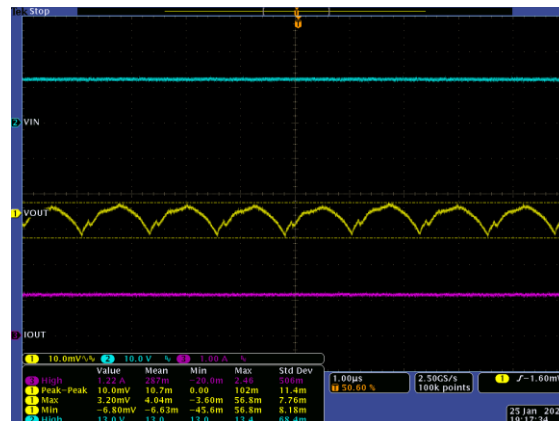
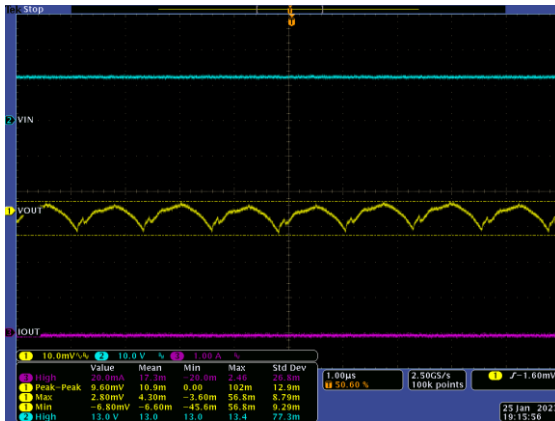
# Buck 1 – 1.0Vout - Steady State Ripple

No load

Half Load (1.25A)

Max Load (2.50A)

VIN  
VOUT  
IOUT

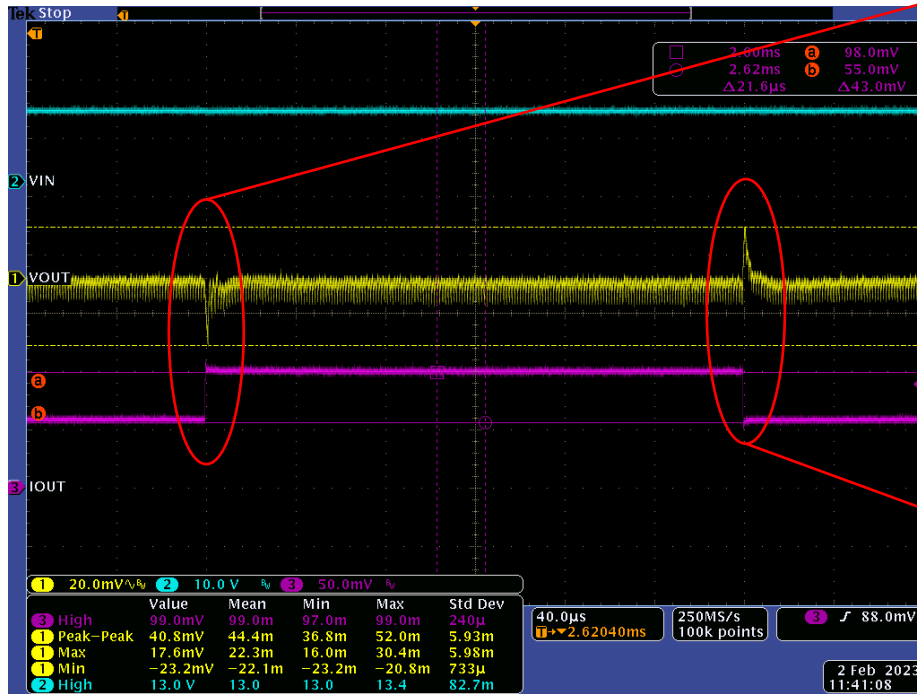


- 9.60 mV peak-peak ripple at No load
- 10.0 mV peak-peak ripple at Half load
- 11.6 mV peak-peak ripple at Max load

# Buck 1 – 1.0Vout Transient Response

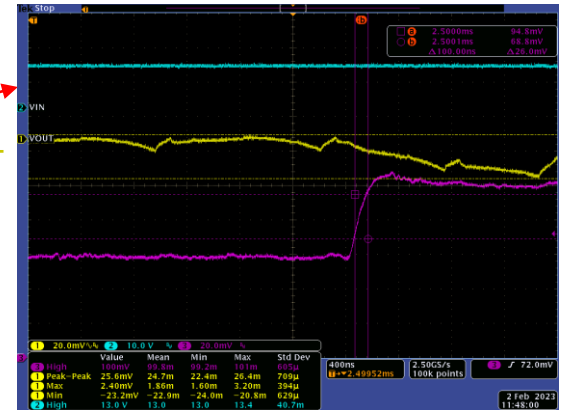
Step Load 1.25A → 1.88A → 1.25A, 10A/us

VIN  
VOUT  
IOUT



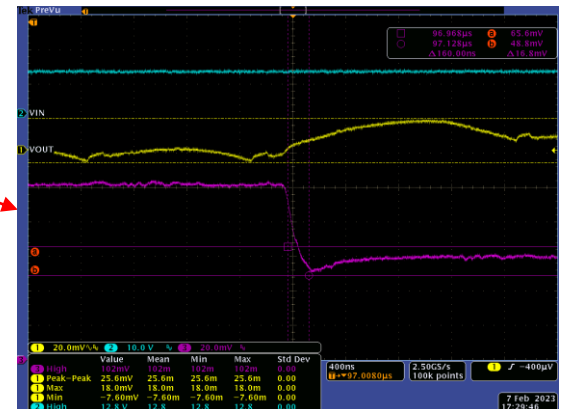
Rising Edge

VIN  
VOUT  
IOUT



Falling Edge

VIN  
VOUT  
IOUT



➤ Vout ripple -2.32% (-23.2mV) to +1.76% (17.6mV) with load transient

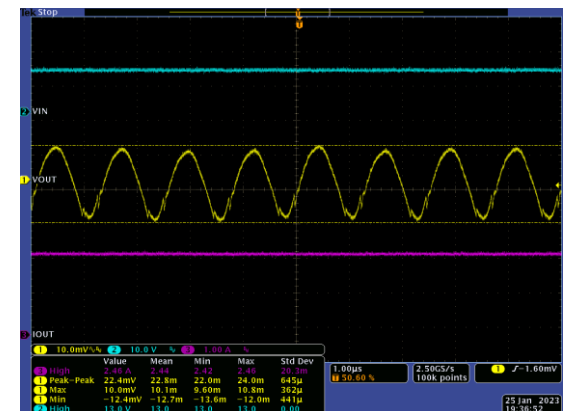
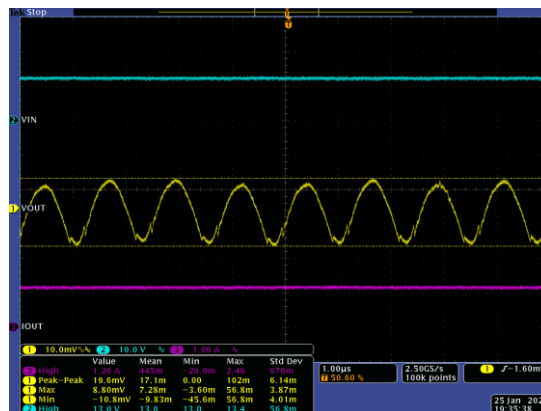
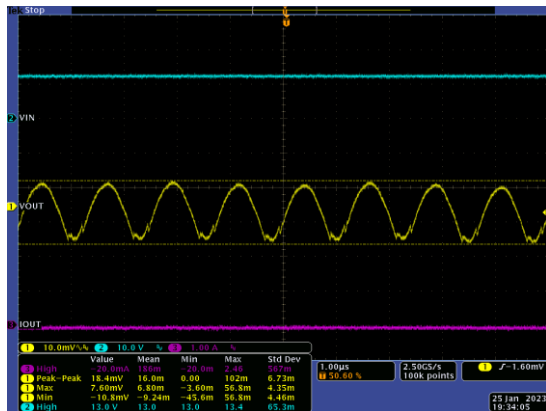
# Buck 2 – 2.5Vout - Steady State Ripple

No load

Half Load (1.25A)

Max Load (2.50A)

VIN  
VOUT  
IOUT

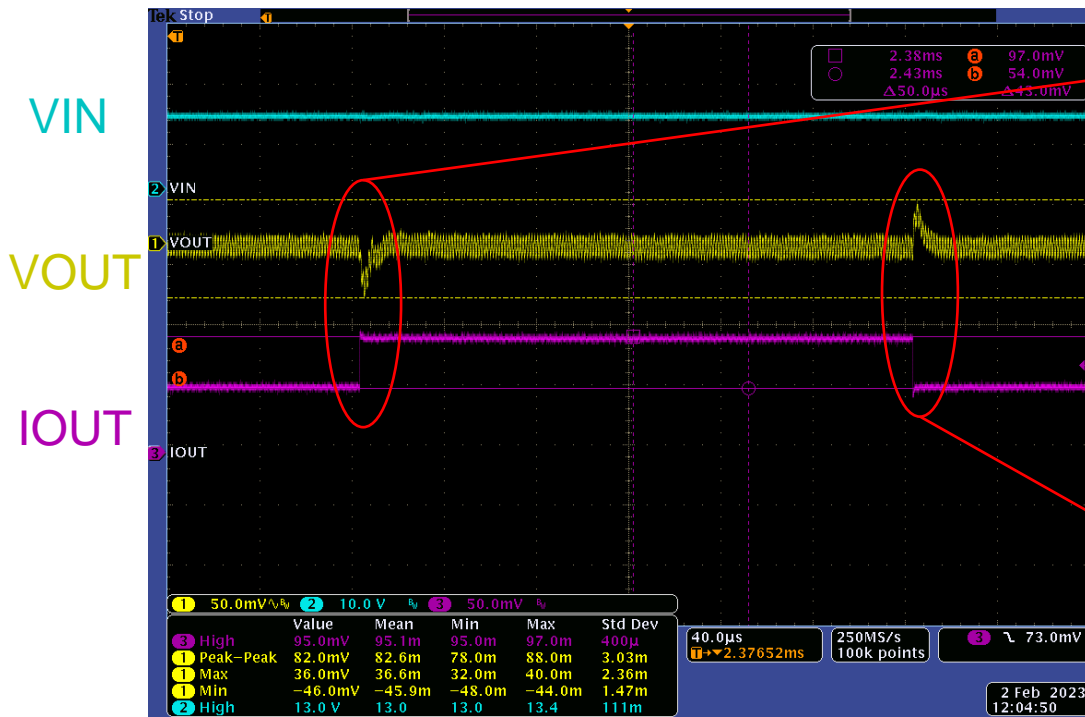


- 18.4 mV peak-peak ripple at No load
- 19.6 mV peak-peak ripple at Half load
- 22.4 mV peak-peak ripple at Max load

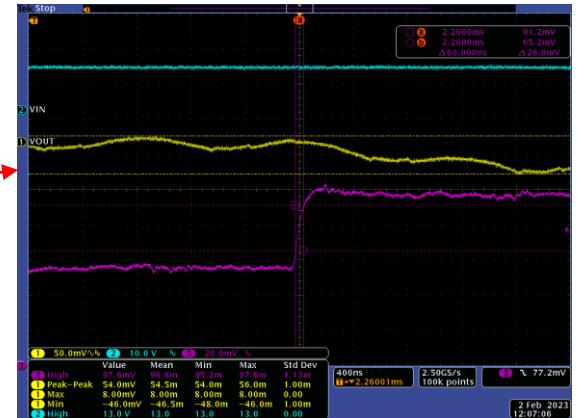


# Buck 2 – 2.5Vout Transient Response

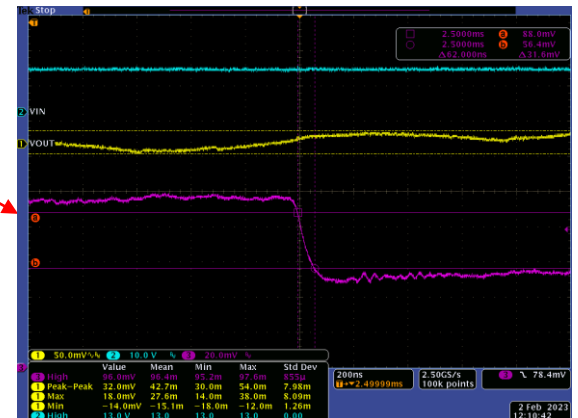
Step Load 1.25A → 1.88A → 1.25A, 10A/us



Rising Edge



Falling Edge



➤ Vout ripple -1.84% (-46.0mV) to +1.44% (36.0mV) with load transient

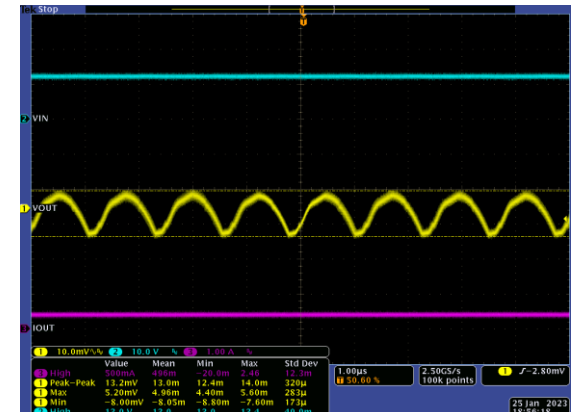
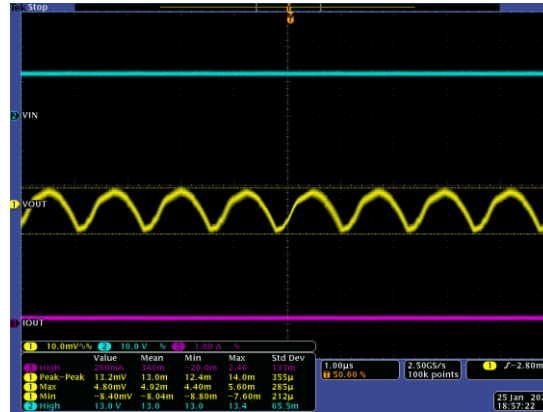
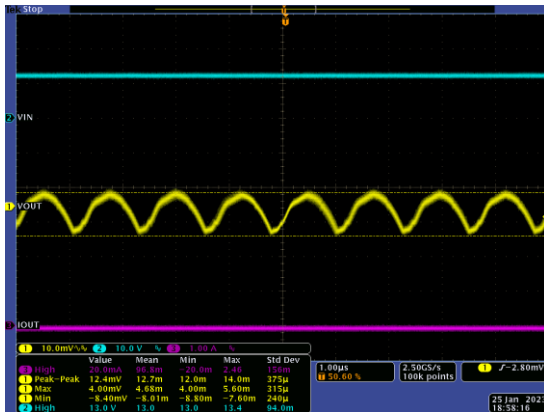
# Buck 3 – 1.8Vout - Steady State Ripple

No load

Half Load (0.25A)

Max Load (0.50A)

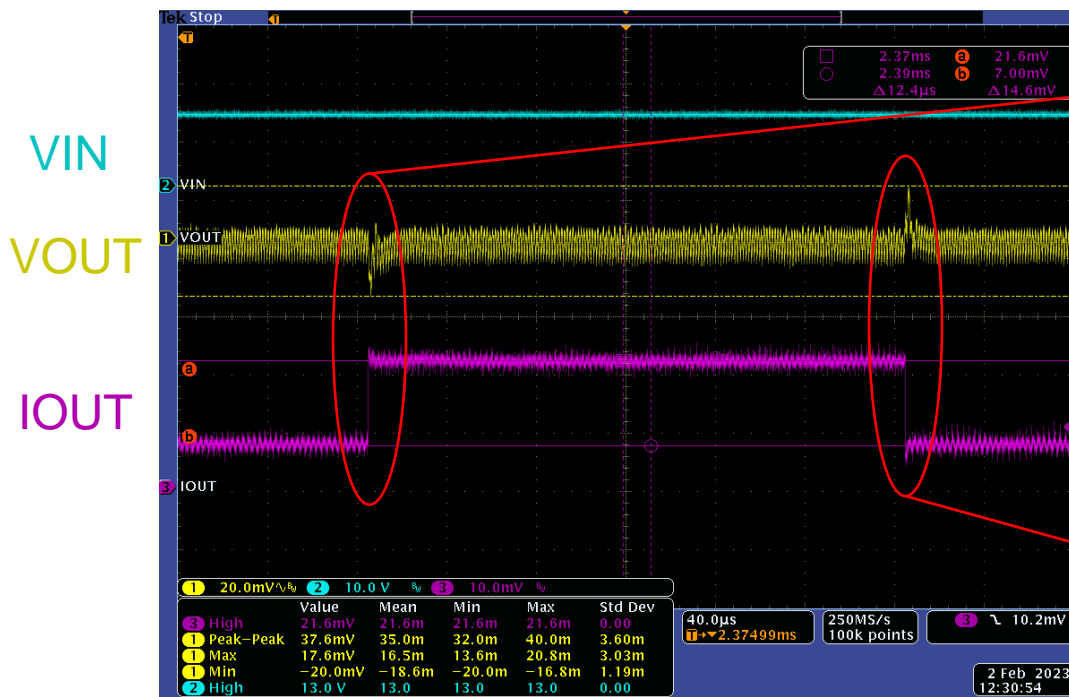
VIN  
VOUT  
IOUT



- 12.4 mV peak-peak ripple at No load
- 13.2 mV peak-peak ripple at Half load
- 13.2 mV peak-peak ripple at Max load

# Buck 3 – 1.8Vout Transient Response

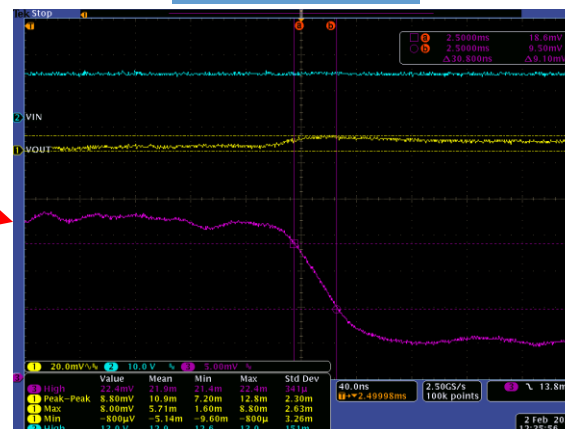
Step Load 0.25A→0.375A→0.25A, 10A/us



Rising Edge



Falling Edge



➤ Vout ripple -0.80% (-20.0mV) to +0.70% (17.6mV) with load transient

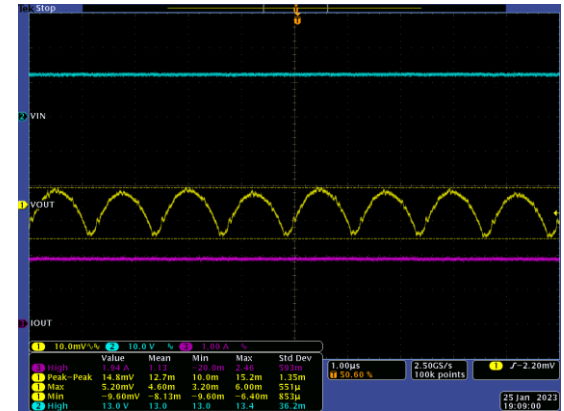
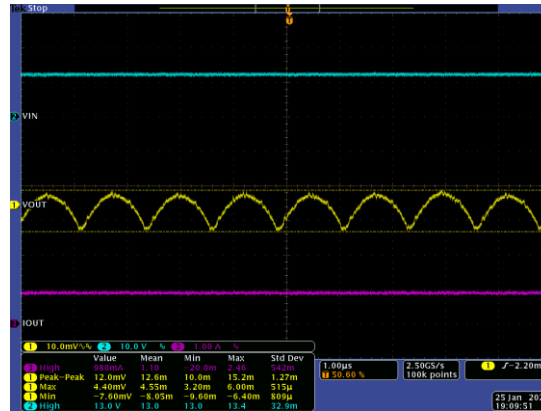
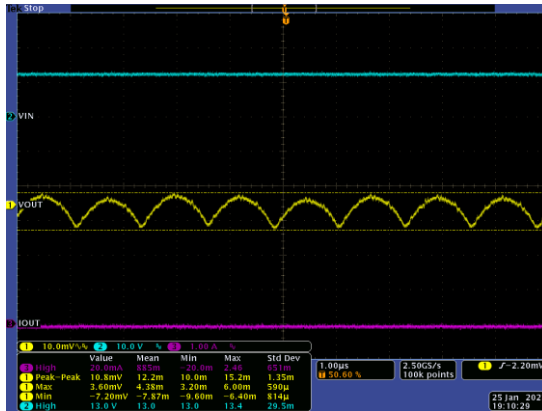
# Buck 4 – 1.35Vout - Steady State Ripple

No load

Half Load (1.00A)

Max Load (2.00A)

VIN  
VOUT  
IOUT

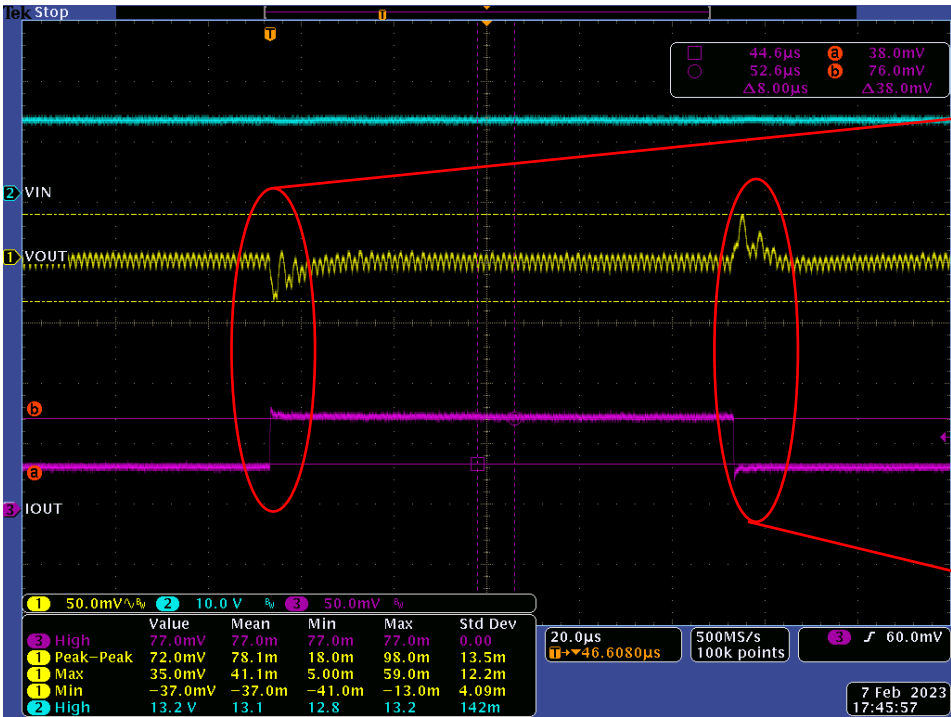


- 10.8 mV peak-peak ripple at No load
- 12.0 mV peak-peak ripple at Half load
- 14.8 mV peak-peak ripple at Max load

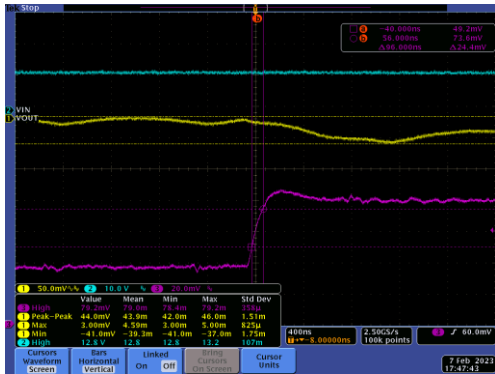
# Buck 4 – 1.35Vout Transient Response

Step Load 1.00A → 1.50A → 1.00A, 10A/us

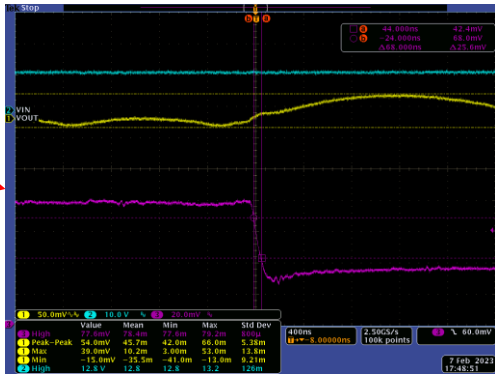
VIN  
VOUT  
IOUT



Rising Edge

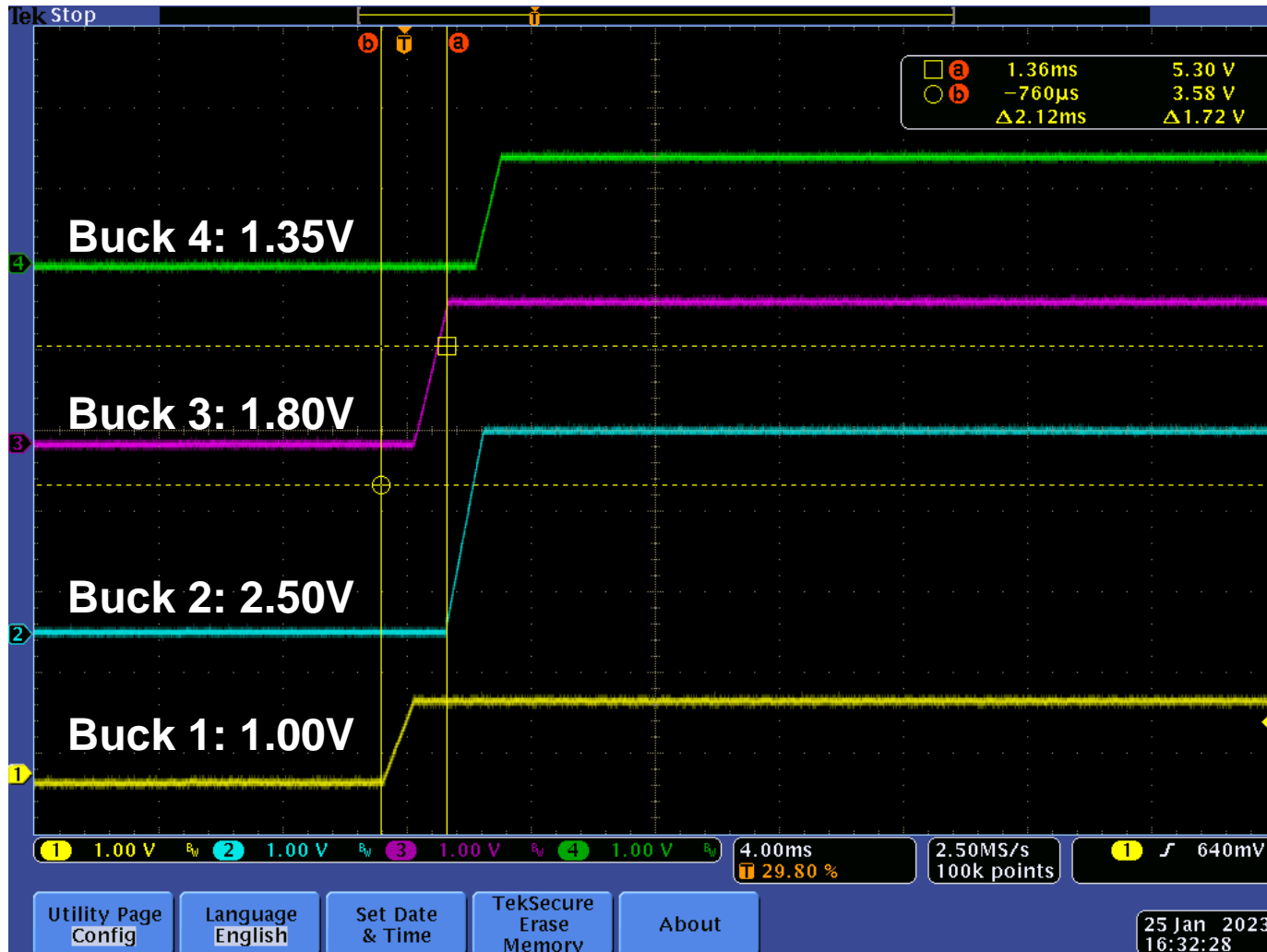


Falling Edge

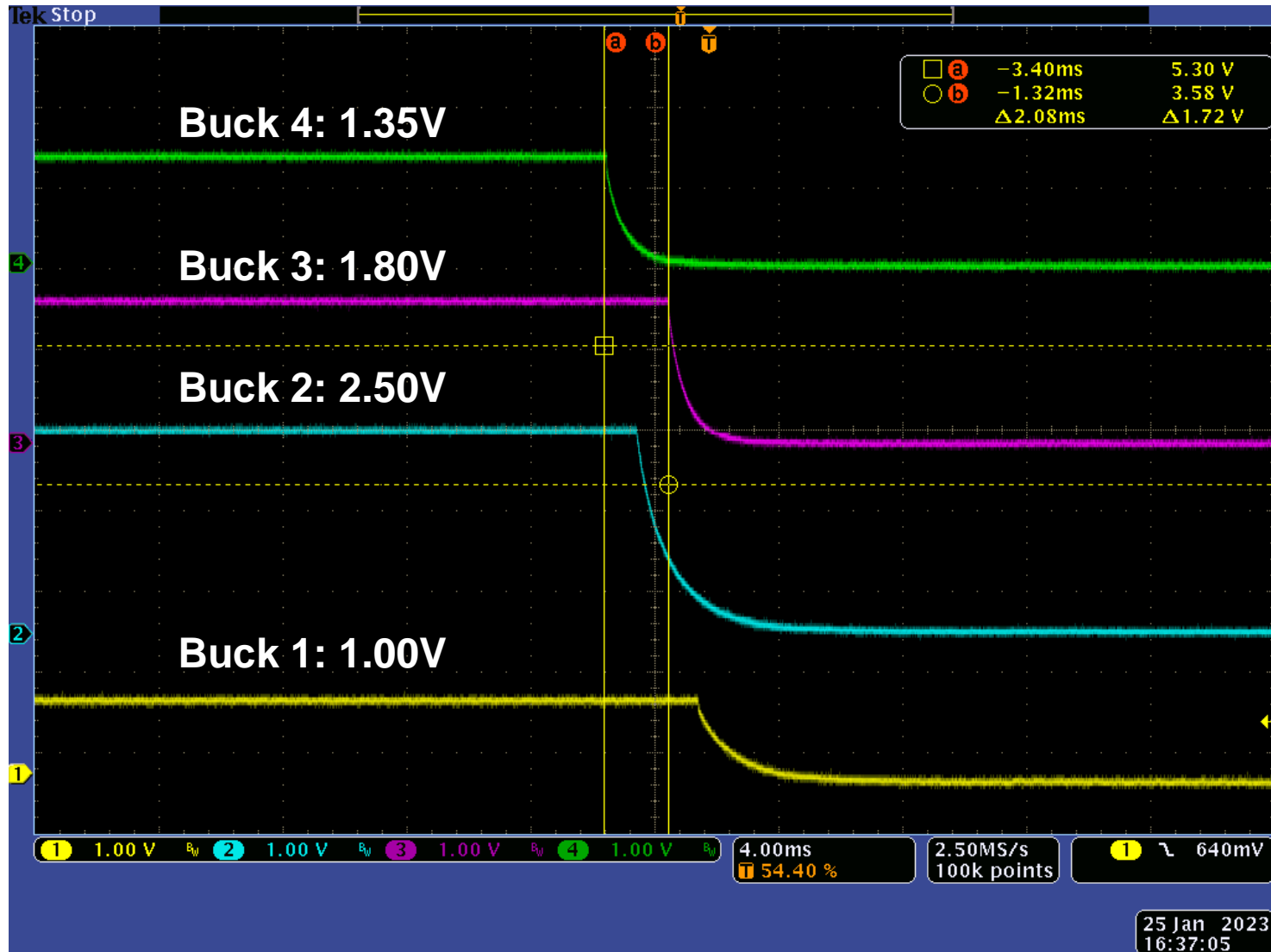


➤ Vout ripple -2.74% (-37.0mV) to +2.59% (35.0mV) with load transient

# Power-Up Sequence



# Power-Down Sequence



## Measurement procedures:

- All steady state measurements (No Load/Typical/Max) were taken directly at output capacitors using a digital multimeter
- All current waveforms were captured with a current probe coming directly off the output capacitor into the E-load
- Steady state ripple and transient response waveforms were measured directly across the output capacitors using a shielded cable

## Equipment:

- Tektronix DPO 4034 Digital Phosphor Oscilloscope
- Agilent E3633A DC Power Supply
- Chroma 63103A DC Electronic Load
- Tektronix AFG3022C Function Generator
- Intel Series 1 25A Mini Slammer ver. B2