Single/Dual BDC motor system for medium current applications

This document shares the tests results of the DRV8816 EVM with a Anaheim Automation BDC motor (BDD-38-63-12.0V-14200). The testing is performed with default firmware loaded into the MSP430G2131. This test data further enables the end user to familiarize the operations in medium current (0.3A-2.5A) applications.

The data is structured into 4 main categories.

1. Single Motor Bi Directional Control
2. Current Proportional output range.
3. Motor Voltage vs RPM
4. Thermal Image of device under operations.

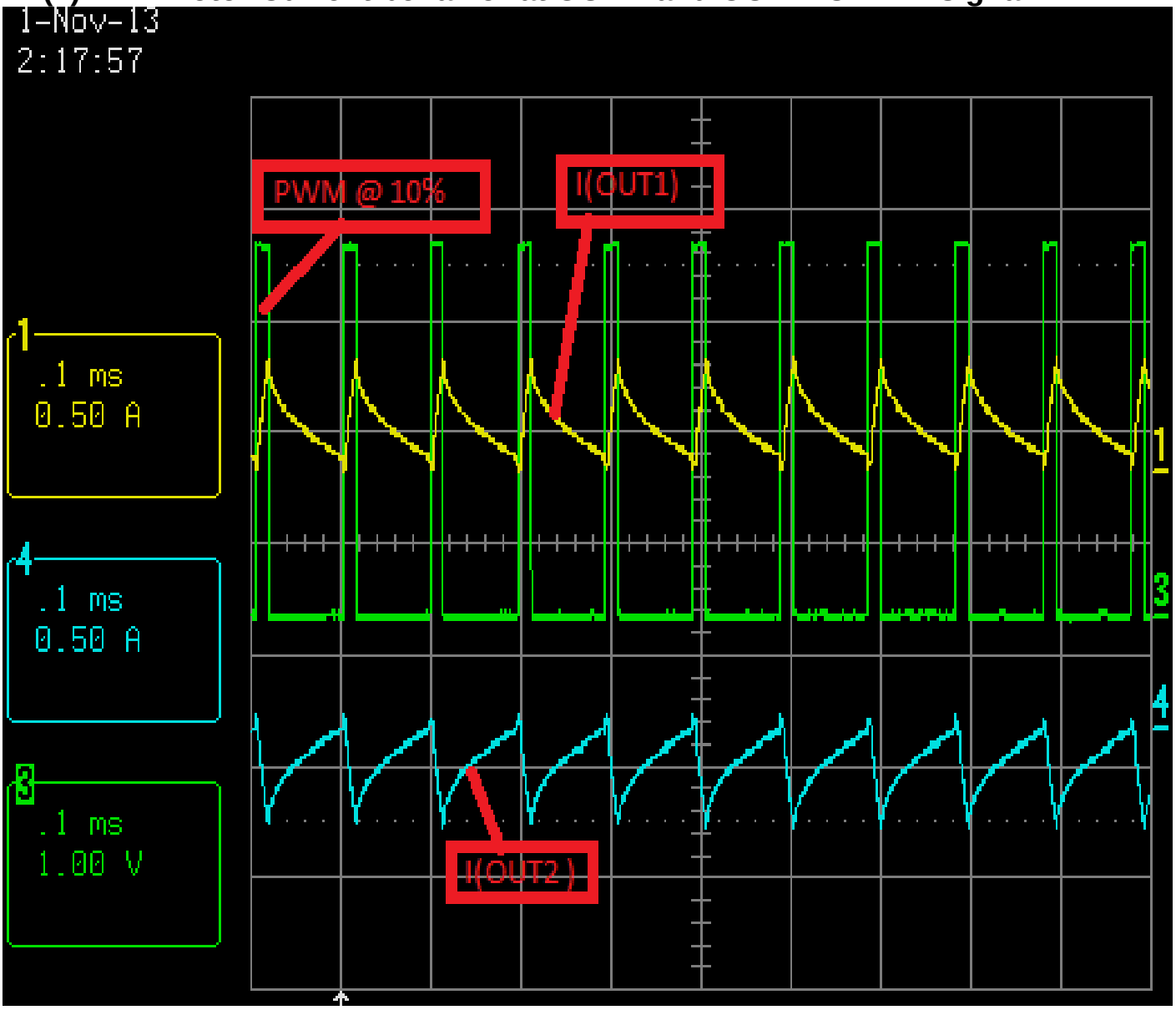
Section 1:
Single motor is connected between OUT1 and OUT2 **.**
The data demonstrates the motor current behavior at the OUT 1 and OUT 2 of the motor terminal when the motor is commanded FORWARD and REVERSE as per the following table. The duty cycle is varied by changing the potentiometer .

EN1	EN2	IN1	IN2	OUT1	OUT2	Operation
1	1	1	0	H	L	Forward
1	1	0	1	L	H	Reverse

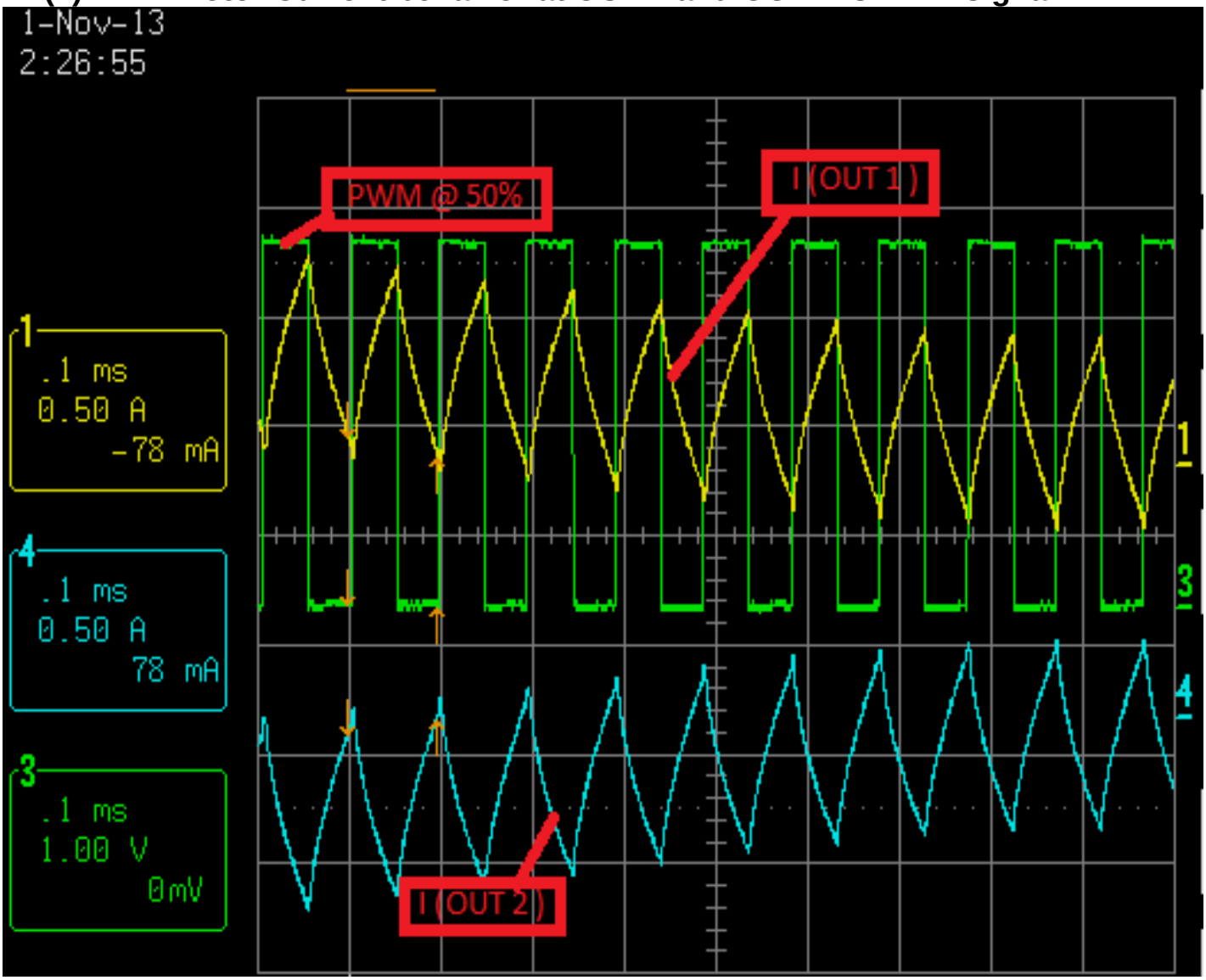
Note: The device is not commanded into BRAKE mode for this experiment**.**

Forward Motor Motion (FWD)

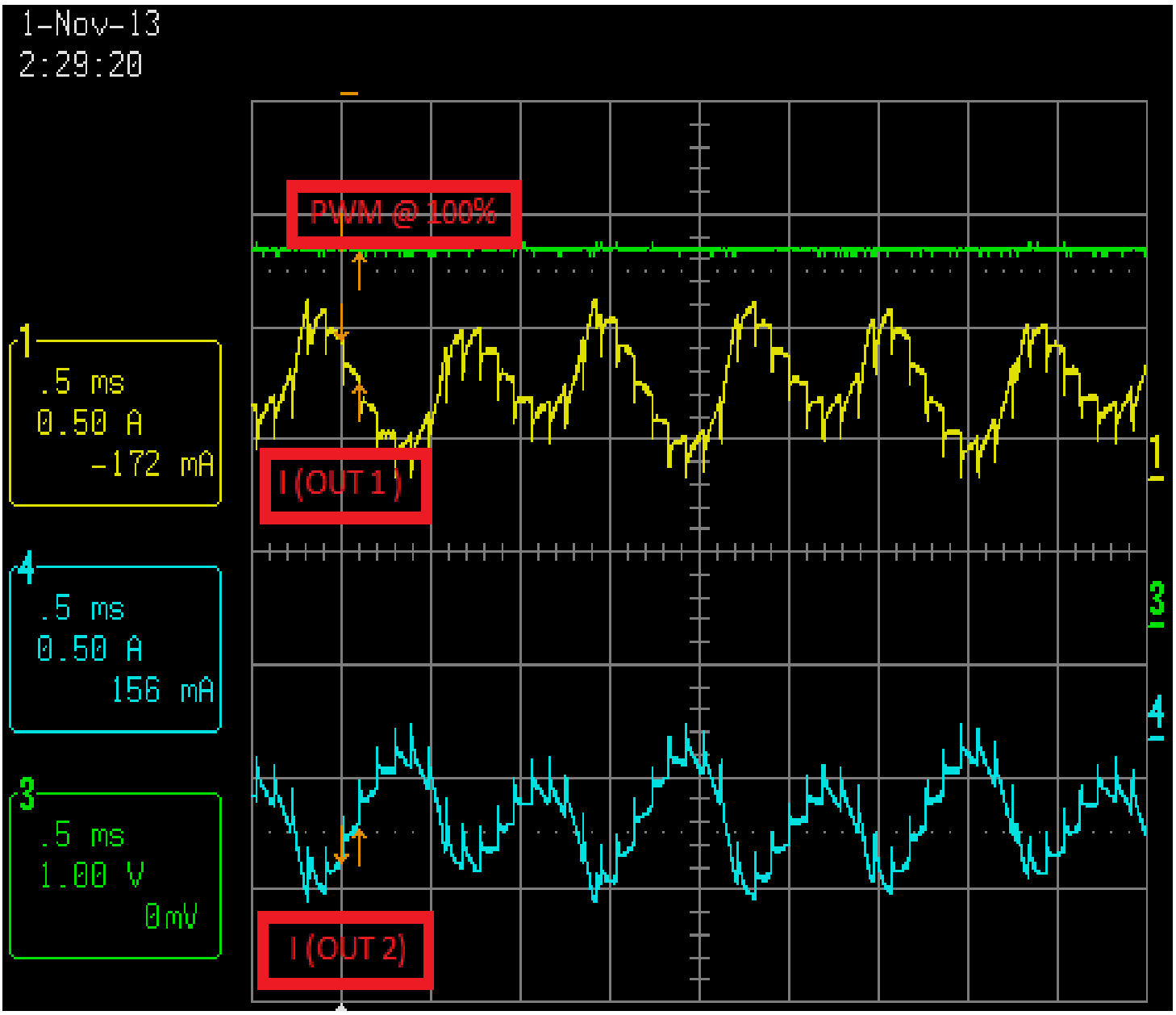
(1)FWD-Motor Current behavior at OUT 1 and OUT2 vs PWM signal



(2)FWD- Motor Current behavior at OUT 1 and OUT2 vs PWM signal

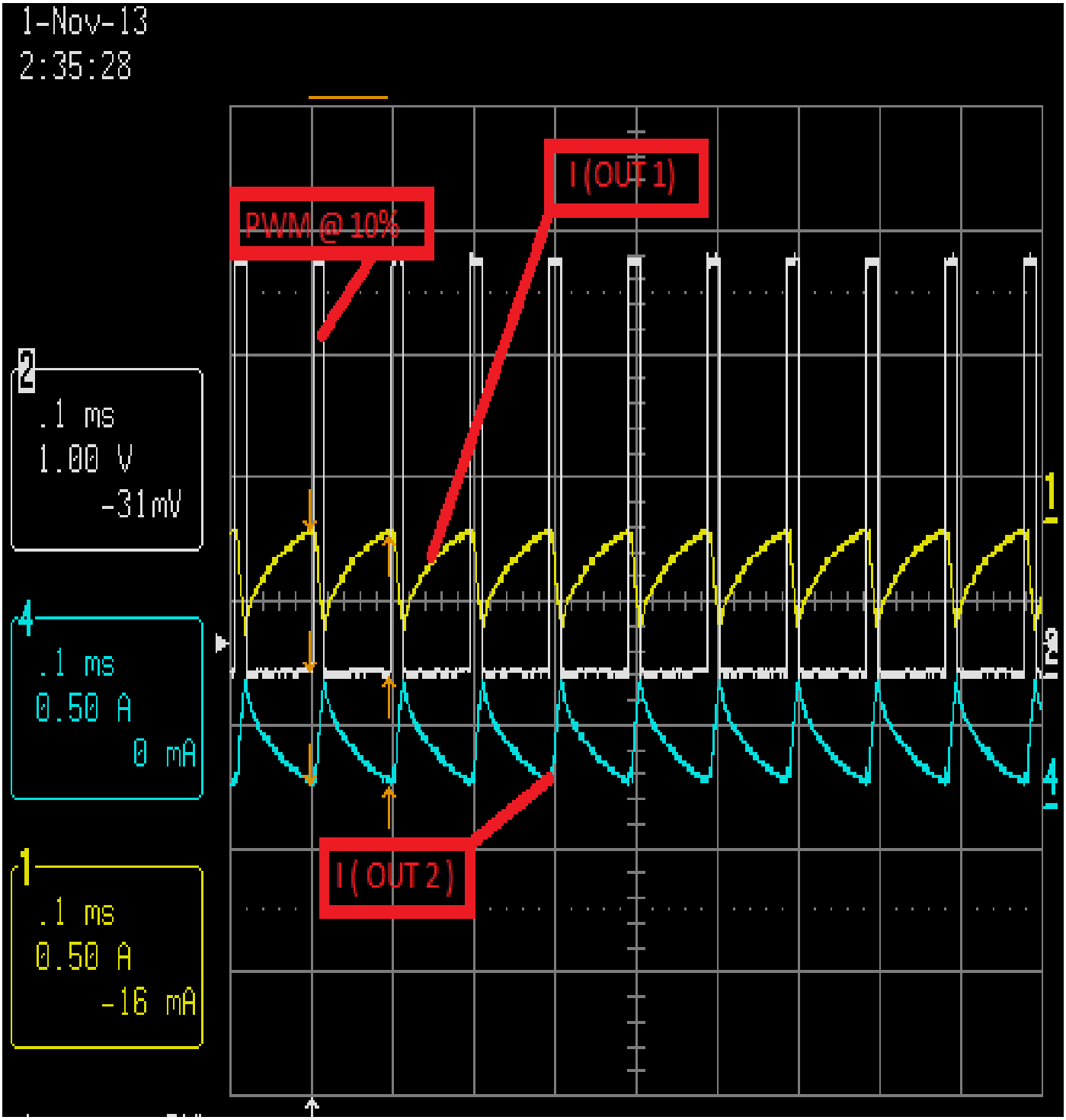


(3)FWD-Motor Current behavior at OUT 1 and OUT2 vs PWM

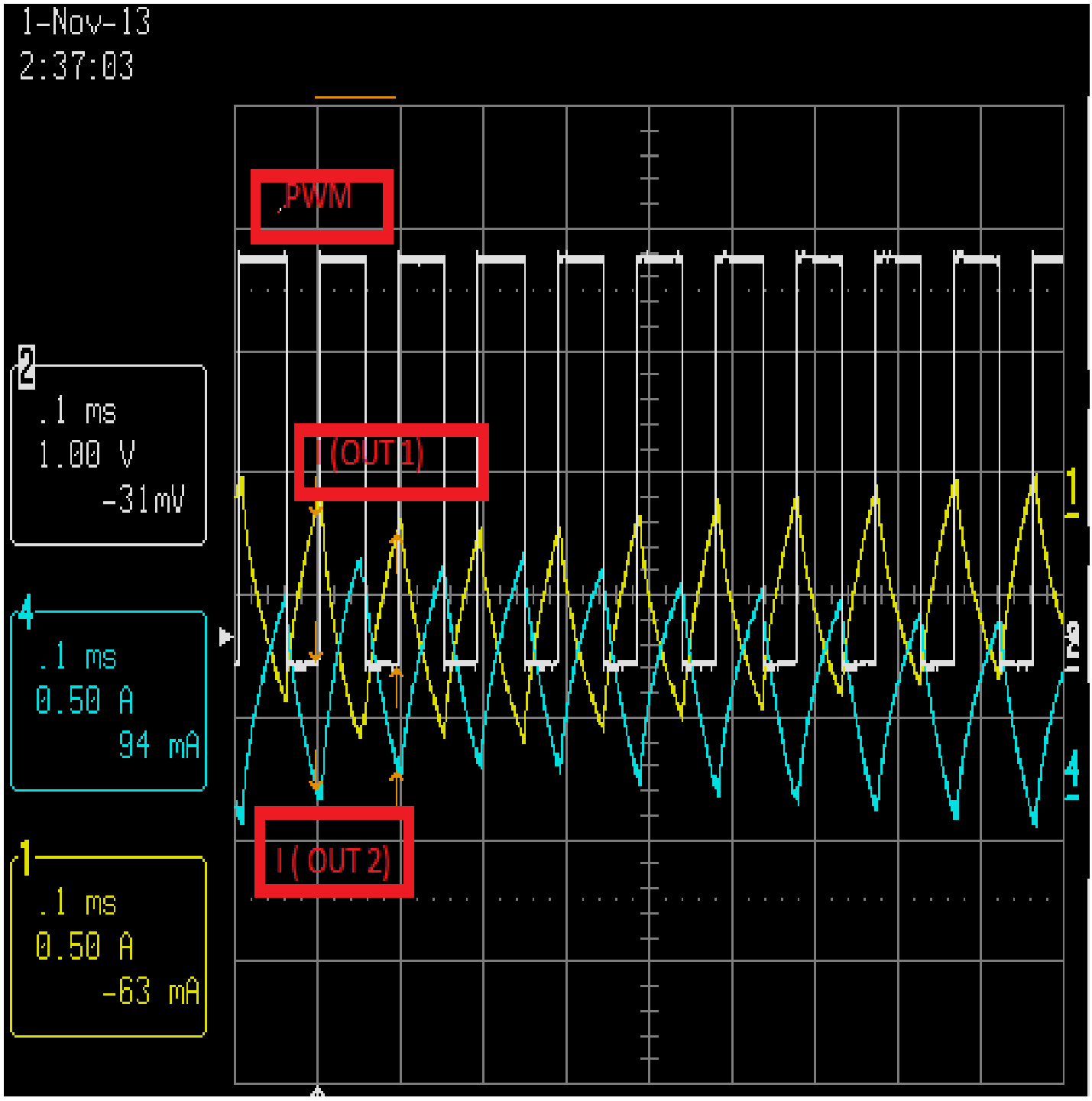


Reverse Motor Motion (REV)

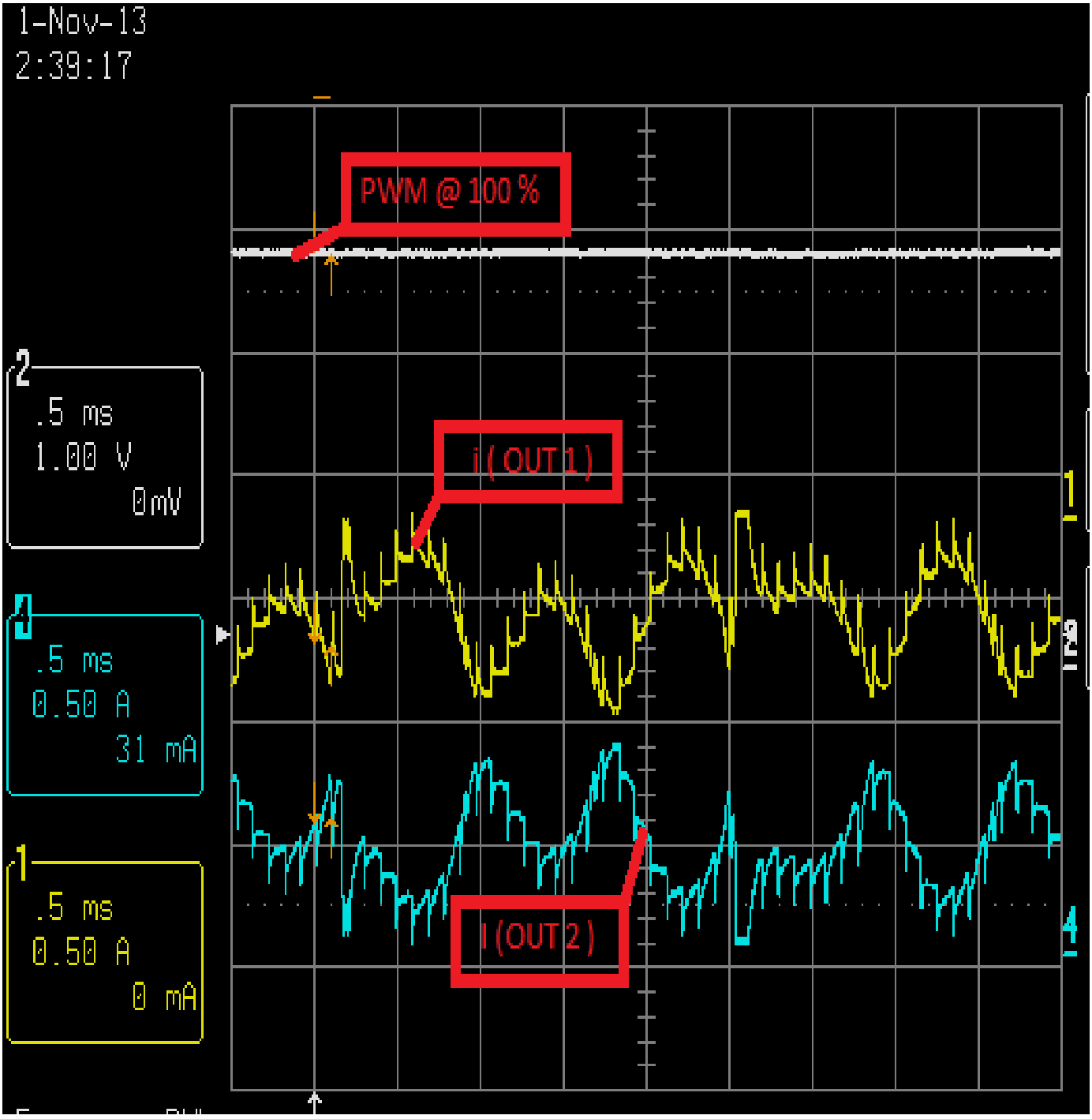
(1)REV-Motor Current behavior at OUT 1 and OUT2 vs PWM signal



(2)REV-Motor Current behavior at OUT 1 and OUT2 vs PWM signal

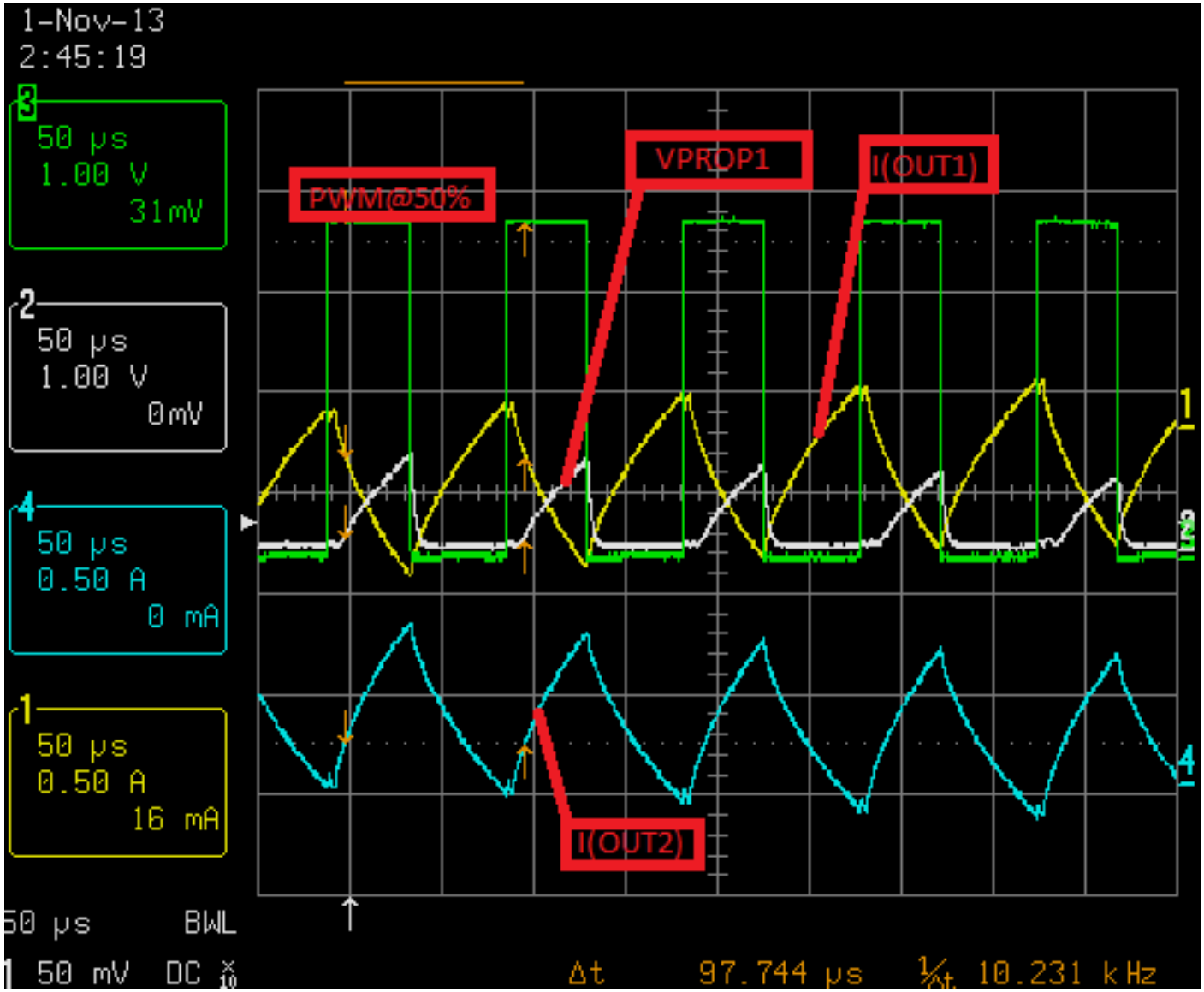


(3)REV-Motor Current behavior at OUT 1 and OUT2 vs PWM signal



Section 2. Current proportional output range

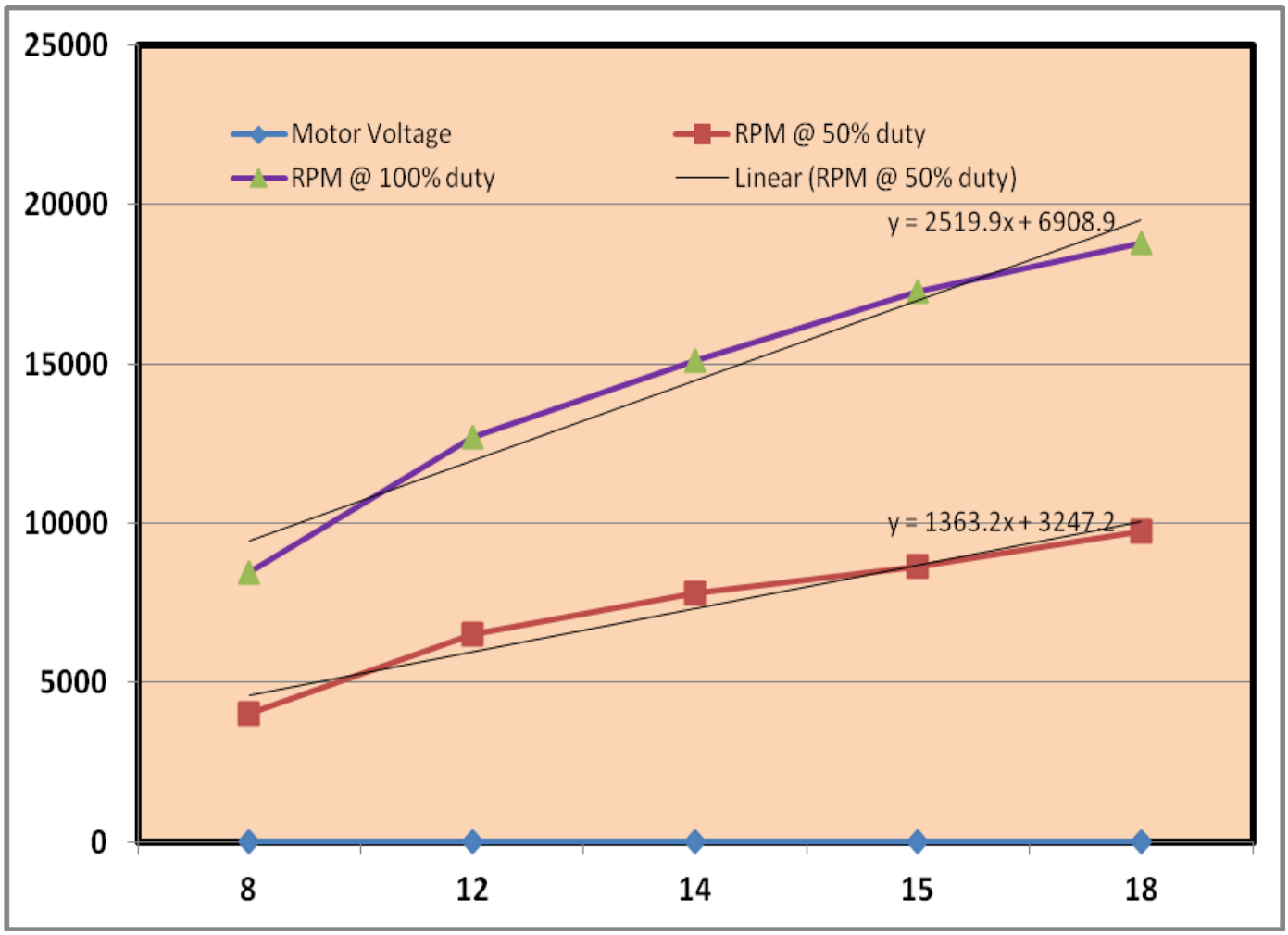
A sense resistor of 0.2 ohm is connected to ground for current sensing purposes. The voltage at the VPROP1 is approximately 800mV per captured Waveform. The voltage at the sense pin 800mV/5 = 160mV. Thus the current Is calculated to be 160mV/0.2ohm = 800mA.
Referring to I(OUT2) and I(OUT1), the motor currents are very similar to the calculated values.



Section 3. Motor Voltage versus RPM

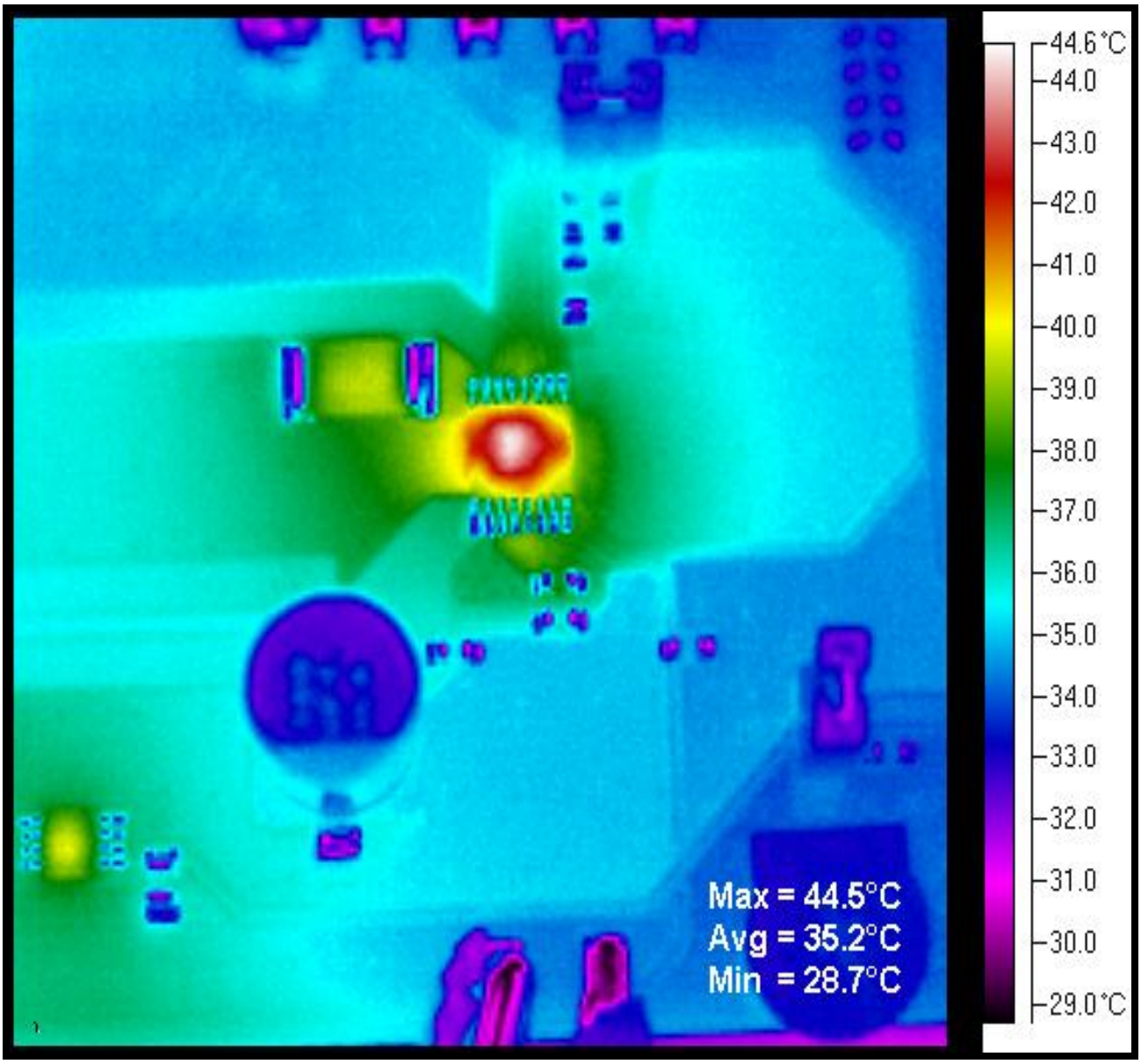
This data reflects the non-loaded performance of Anaheim (BDD-38-63) motor configured across OUT1 and OUT2.
The motor's shaft RPM was captured using NEIKO-Laser Photo Tachnometer while varying the motor voltage at VBB terminal and varying the duty cycle by adjusting the potentiometer (RP1). When the speed reference potentiometer is turned up all the way, 100% duty is attained.

PWM = 10.1KHz	12V @ VBB	20V @ VBB
Min motor current (10% dutycycle)	140mA	170mA
Max motor current (100% dutycycle)	630mA	1.1A



Section 2. Thermal Image of the device

This data set was collected with the VBB = 20V and I_{motor} = 1.1A.



Section 2. Thermal Image of the device (continued)

The IR image was produced in the lab with Fluke –T32 –IR Fusion camera during device operation

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