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Switching Speed Tests on DTA-0R5G18G-60-CD-1

Prepared by
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December 15, 2017

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Cage Code: 05XQ0 DUNS Number: 829998517

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Product Feature

DESCRIPTION:

PMI MODEL NUMBER DTA-0R5G18G-60-CD-1 IS A NON-REFLECTIVE 10 BIT PROGRAMMABLE 60 dB PIN DIODE ATTENUATOR WITH STEP RESOLUTION AS LOW AS 0,06 dB OVER THE FREQUENCY RANGE OF 0,5 TO 18,0 GHz, THIS MODEL IS OFFERED IN A SLIM LINE HOUSING MEASURING ONLY 0,5" HEIGHT.

SPECIFICATIONS:

- FREQUENCY: 0.5 GHz TO 18.0 GHz
- MEAN ATTENUATION RANGE: 60 dB
- INSERTION LOSS: 4.8 dB MAX
- VSWR: 2.0 :1 MAX
- FLATNESS UP TO:
  - 20 dB ±1.0 dB TYP
  - 40 dB ±1.25 dB TYP
  - 60 dB ±3.0 dB TYP
- ACCURACY OF ATTENUATION:
  - 0 dB TO 20 dB ±1.0 dB TYP
  - 20 dB TO 40 dB ±1,5 dB TYP
  - 40 dB TO 60 dB ±2.0 dB TYP
- MINIMUM ATTENUATION STEP: 0.06 dB
- OPERATING POWER: 15dBm TYP
- SURVIVAL POWER: 1W Average from -65°C to +25°C
- SWITCHING TIME:
  - ON TIME 1.0 us MAX
  - OFF TIME 0.5 us MAX
- DC POWER SUPPLY: +15V @ 150 mA MAX
- CONNECTORS: 2 SMA & 15 PIN Micro-D-Female Shipped with Mating Micro-D Male
- WEIGHT: 3.0 oz (85 gm) Approximate
- FINISH: PAINTED BLUE
- LOGIC INPUT:
  - LOGIC "0" (BIT OFF) -0.3 to +0.8V
  - LOGIC "1" (BIT ON) +2,0 to +5,0V

ENVIRONMENTAL RATINGS:

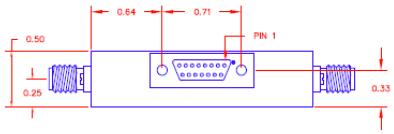
- TEMPERATURE: -40°C TO +85°C (OPERATING) -65°C TO +125°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B COND, B
- SHOCK: MIL-STD-202F, METHOD 213B COND, B
- VIBRATION: MIL-STD-202F, METHOD 204D COND. B
- ALTITUDE: MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107

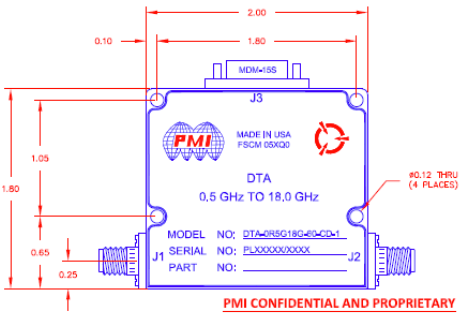
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

PIN NO:	J3 PIN FUNCTIONS
1	2dB
2	1dB
3	0.5dB
4	0.25dB
5	GND
6	0.13 dB
7	0,06 dB (LSB)
8	GND
9	Not Used
10	Not Used
11	+12VDC
12	32dB (MSB)
13	16dB
14	8dB
15	4dB

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	10/15/12	
	A2	ECN # 13-0080	07/09/13	
	A3	ECN # 17-0071	04/13/17	
	A4	ECN # 17-0252	11/16/17	





ALL DIMENSIONS ARE IN INCHES
TOLERANCES:
X.XX ±0,020
X.XXX ±0,010

PMI CONFIDENTIAL AND PROPRIETARY

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ISO 9001 CERTIFIED

APPROVALS	DATE
DRAWN	10/15/12
CHECKED	
ISSUED	

TITLE: PRODUCT FEATURE
DTA-0R5G18G-60-CD-1

SIZE	FSCM NO.	DWG NO.	REV.
A	05XQ0	27017781	A4

SCALE N:S SHEET 1 OF 1

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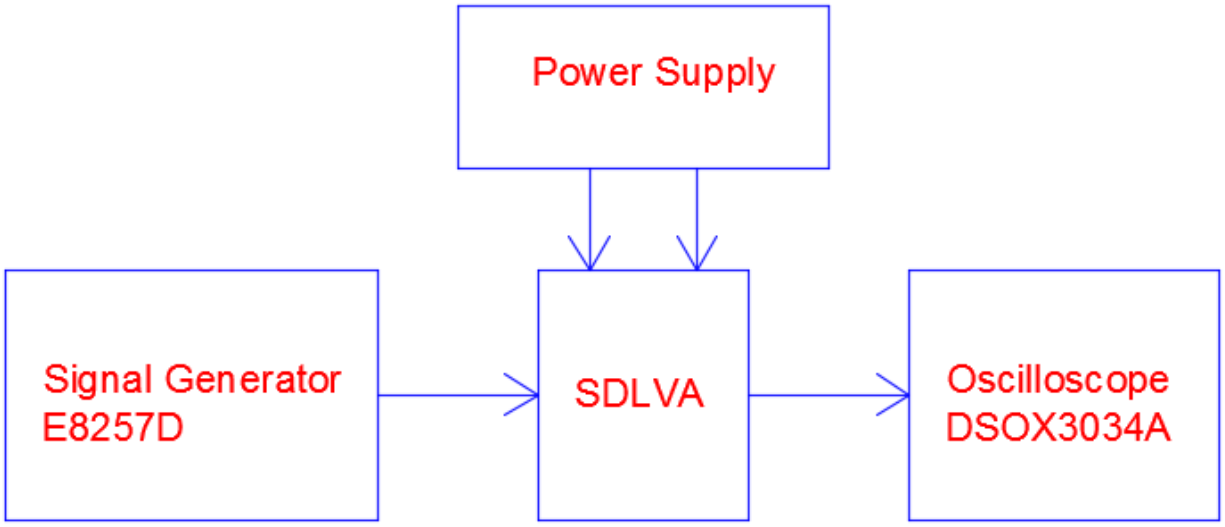
Test for SDLVA through cable into 50 ohm load oscilloscope alone:



Results:
Input 9 GHz @ -10 dBm : 2.96 V
Input 9 GHz @ -42 dBm : 1.79 V

Slope = 1.17 V / 32 dB = 36.6 mV / dB

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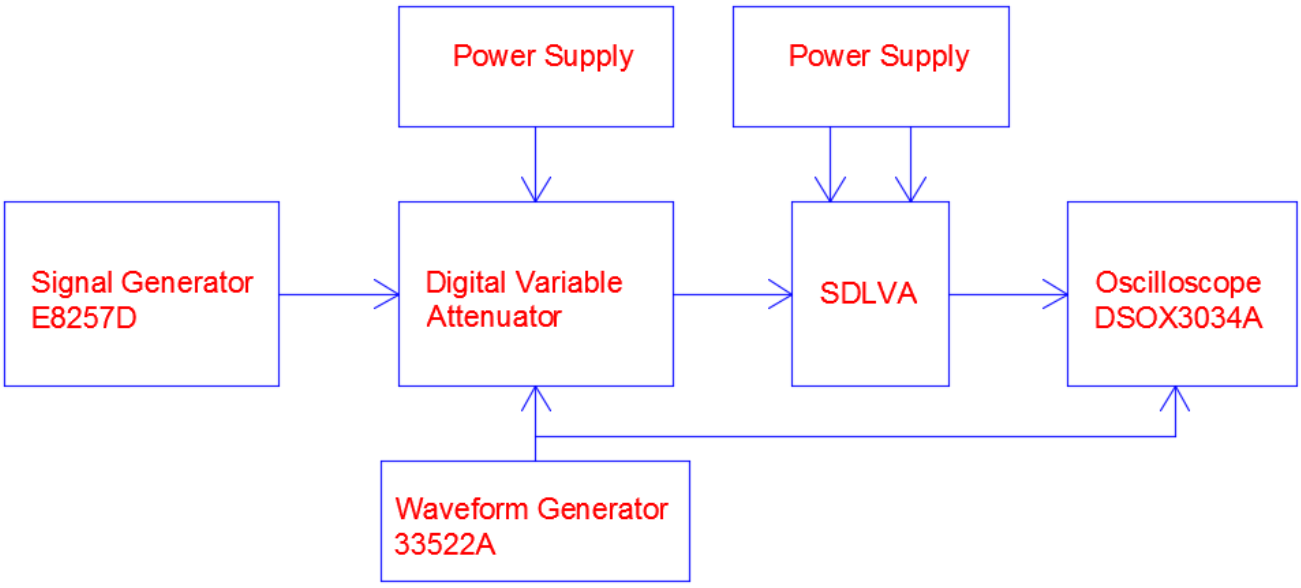
Test for DTA switching speed into 50 ohm load oscilloscope:

Signal Generator:
9 GHz
0 dBm Input

Waveform Generator:
Square Wave
4 V peak-peak (0 to +4 V)
Frequency: 2 Hz
Connected to 32 dB bit (MSB) of the Digital Variable Attenuator



Results:

First the full scale pulse is shown in Figure 1. Channel 1 is the TTL signal from the Waveform Generator (Yellow). Channel 2 is the SDLVA output (Green).

The voltage difference from the SDLVA is 1.17 V / 32 dB = 36.6 mV / dB (same as SDLVA alone with 32 dB difference in input power level from the signal generator).

The TTL signal has been inverted to show rising and falling edges matching the rising and falling edges of the SDLVA output. The SDLVA output high corresponds to 0 dB attenuation and the SDLVA output low corresponds to 32 dB attenuation.

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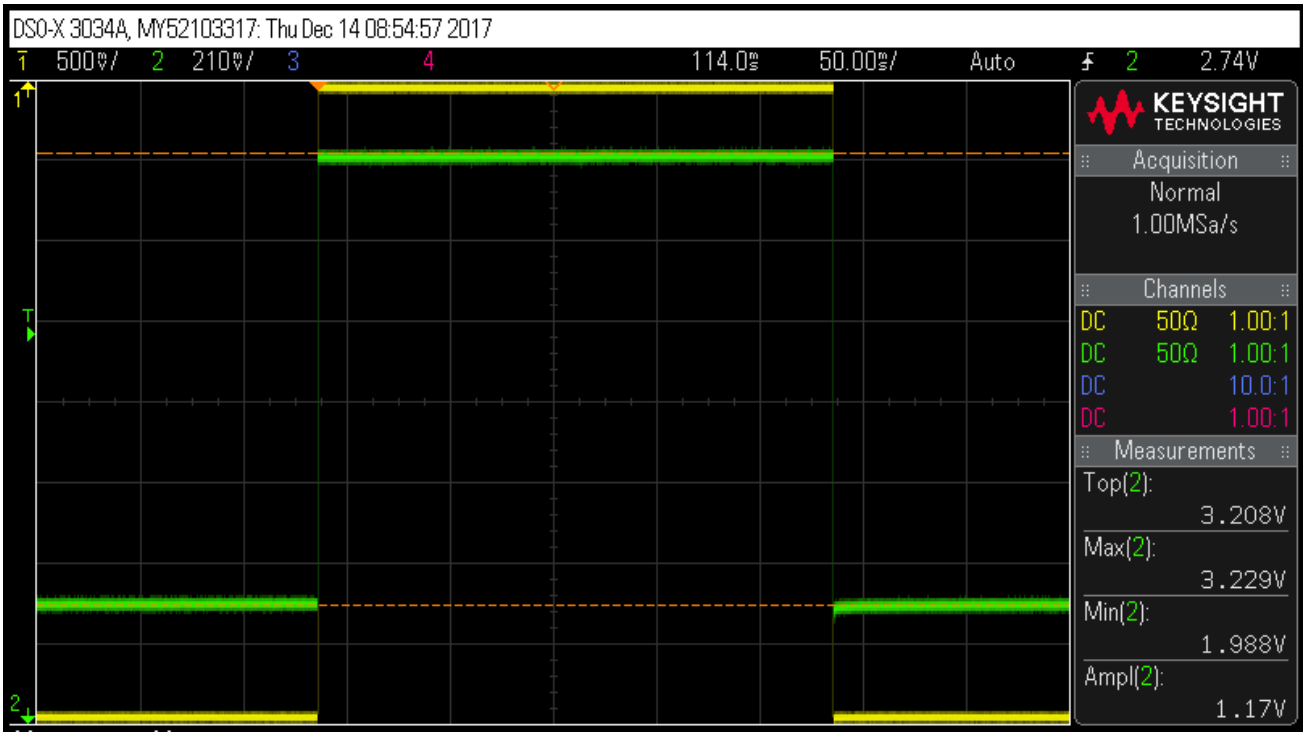

Figure 1: Full Scale Pulse centered on 0 dB attenuation (Yellow Trace: TTL, Green Trace: RF)

Next, the full scale pulse is shown in Figure 2 with the scope centered on 32 dB attenuation.

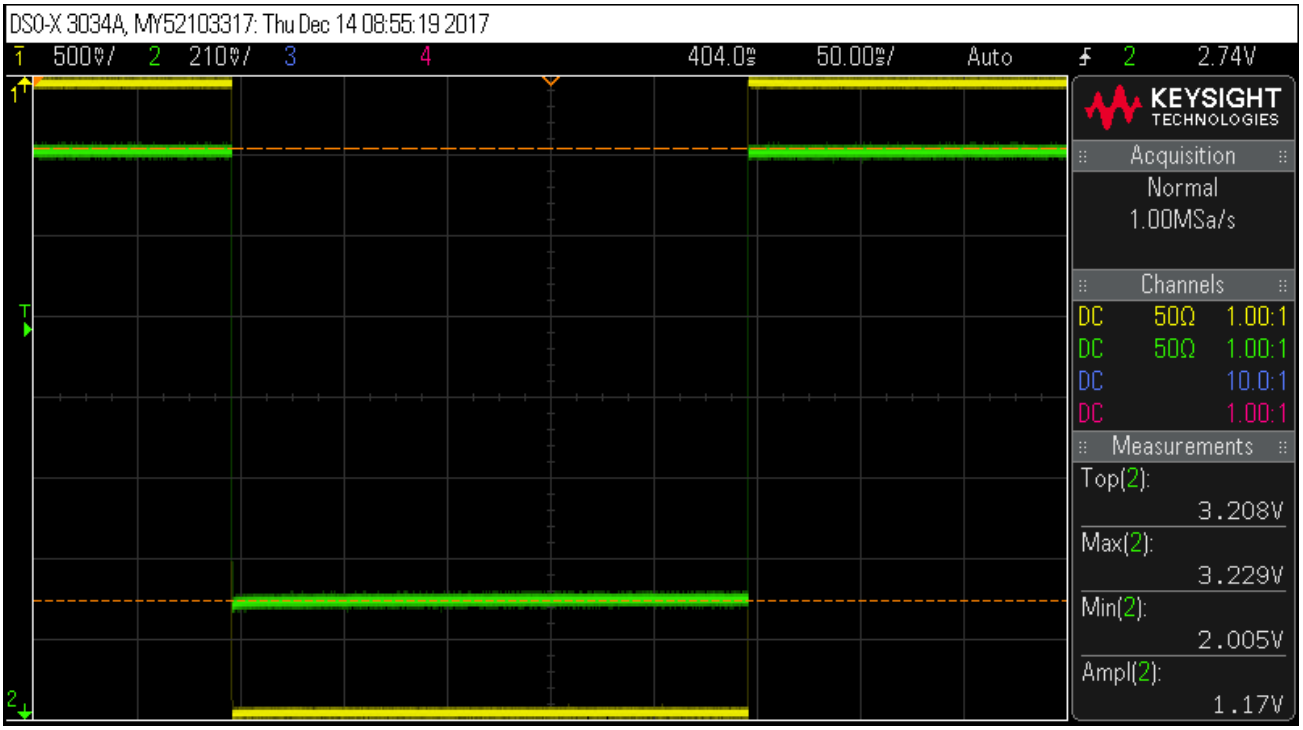

Figure 2: Full Scale Pulse centered on 32 dB attenuation (Yellow Trace: TTL, Green Trace: RF)

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Next, for clarity, multiple pulses are shown in Figure 3.

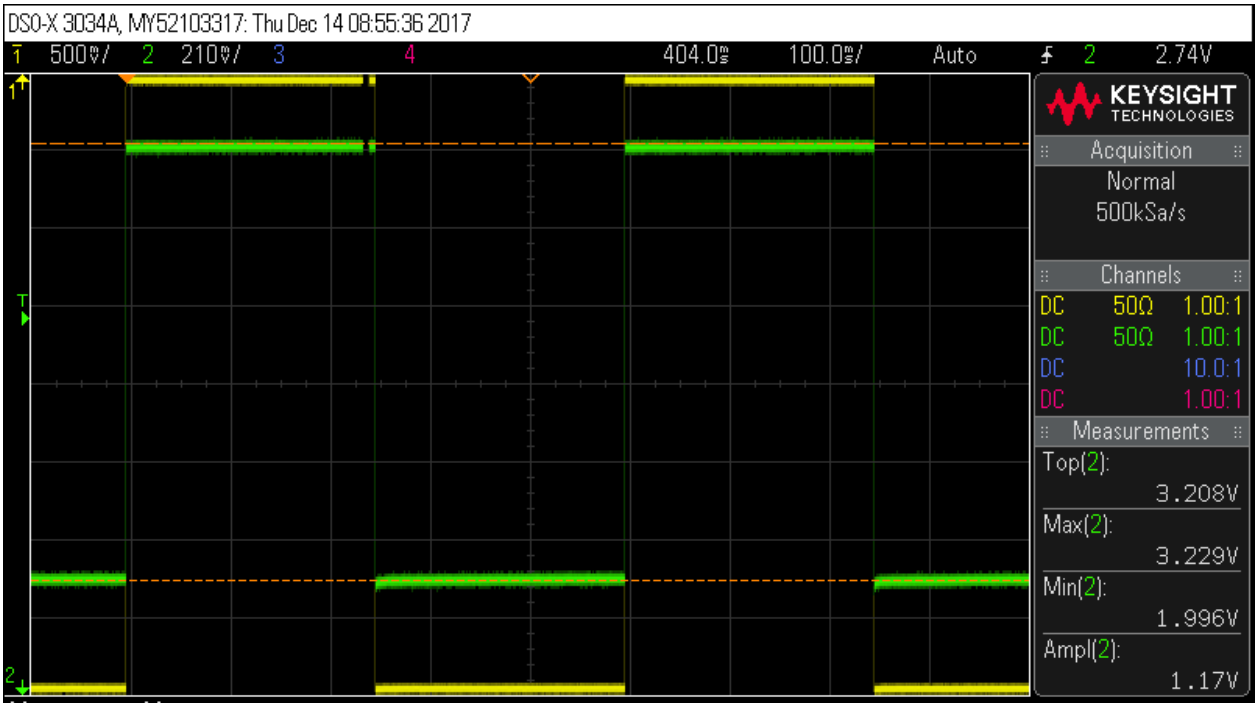

Figure 3: Multiple Pulses (Yellow Trace: TTL, Green Trace: RF)

Figure 4 shows the switching speed off (from 32 dB attenuation to 0 dB attenuation. The result is an off switching speed of 308.5 ns (50% TTL to 90% RF).

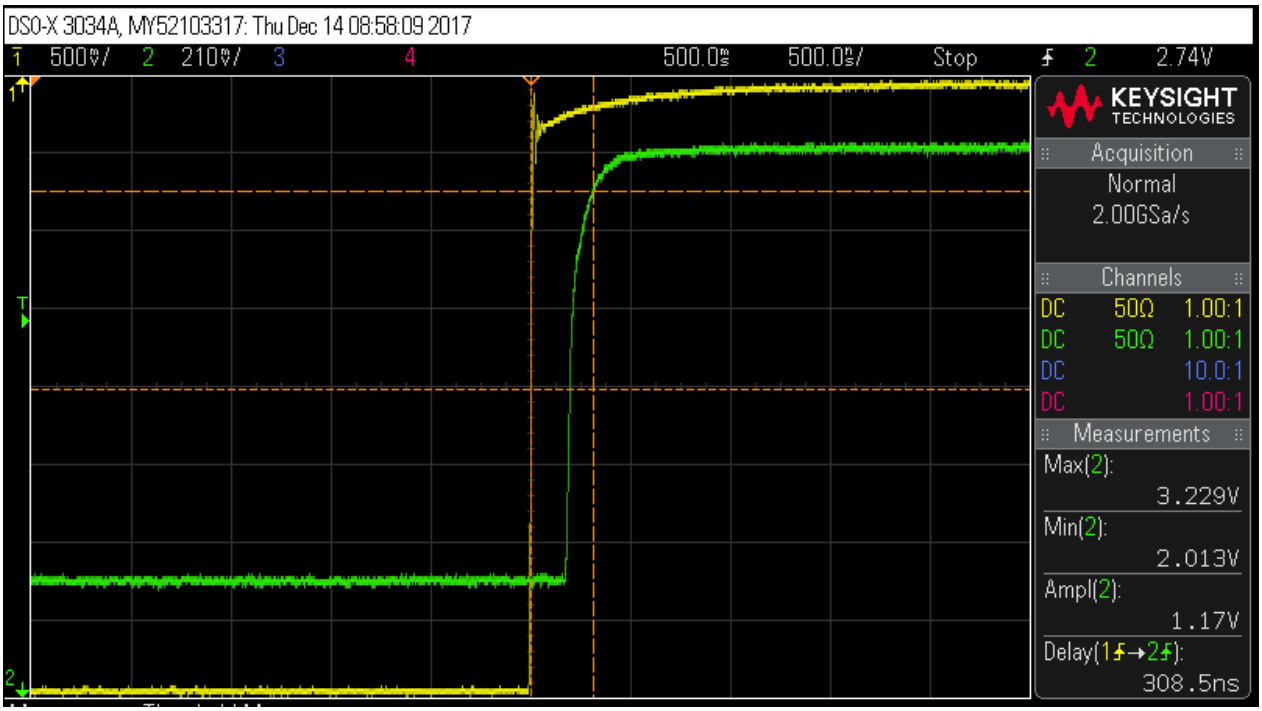

Figure 4: Off Switching Speed (308.5 ns) (Yellow Trace: TTL, Green Trace: RF)

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Figure 5 shows the On Switching Speed (from 0 dB attenuation to 32 dB attenuation). The result is an On Switching Speed of 452 ns (50% TTL to 10% RF)

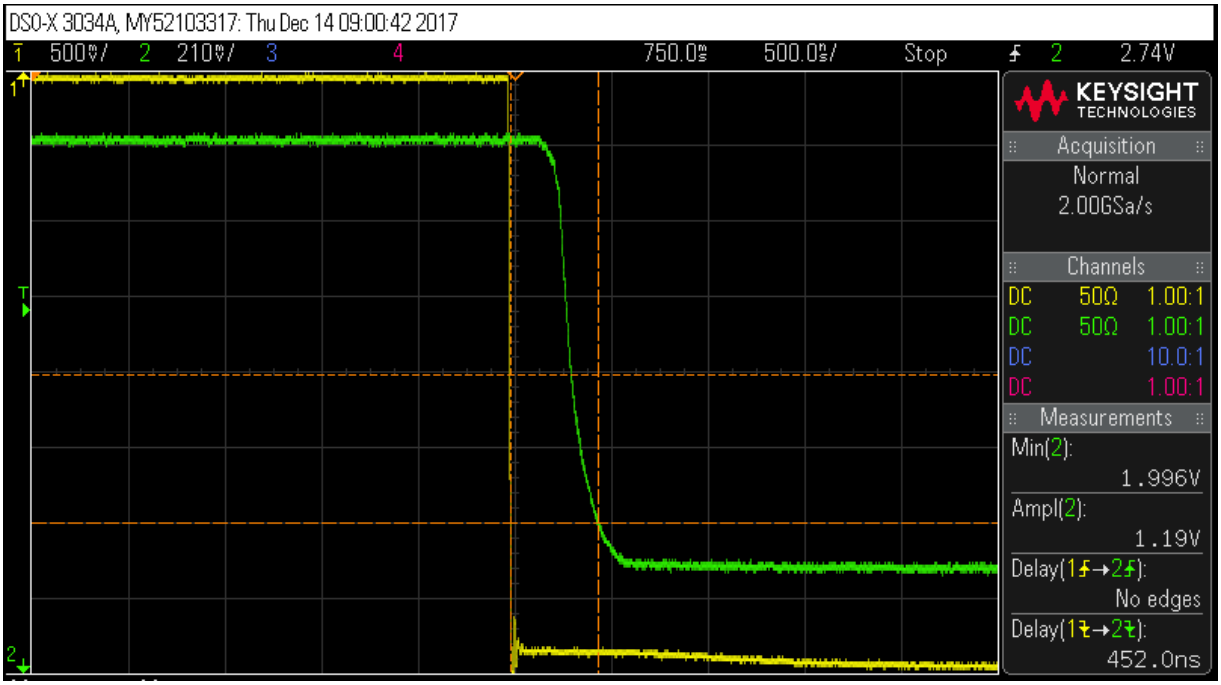

Figure 5: On Switching Speed (452 ns) (Yellow Trace: TTL, Green Trace: RF)

The results show that the units are meeting the switching speed requirements.