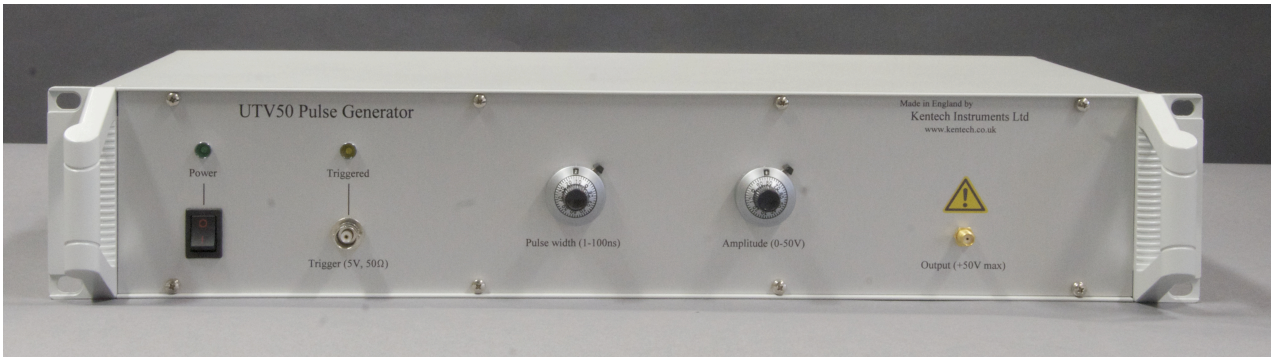
Kentech Instruments Ltd.

UTV50 Pulse Generator

Serial No: Jxxxxxxx

PLEASE READ THIS MANUAL CAREFULLY
BEFORE USING THE GENERATOR



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CAUTION

With an appropriate load, this unit is safe for use by an educated user in a laboratory environment. The generator is able to provide high frequency RF output and if connected to an unsuitable load may result in RF radiation. This equipment is supplied on the understanding that the user will analyse these emissions, accept responsibility for them and take appropriate precautions in the use of this instrument.

Kentech Instruments Ltd accepts no responsibility for any damage or liabilities incurred in the operation of this equipment.

Please read the manual before applying power.

There are hazardous voltages present in this pulse generator when the unit is operating. Do not remove the covers. Return to Kentech Instruments Ltd or its appointed agent for servicing.

The accessible terminals of this instrument are protected from hazardous voltages by basic insulation and protective grounding via the IEC power input connector. It is essential that the ground terminal of this connector is earthed via the power lead to maintain this protection.

If cleaning is necessary this should be performed with a soft dry cloth only.

1. Description

The UTV50 is designed to generate rectangular pulses into a 50 ohm load. On receipt of a trigger pulse the UTV50 will generate a single output pulse. The duration and amplitude of the output is set using the front panel mounted 'digi-dials'.

The unit is housed in a 2U 84HP rack-mount enclosure and requires a 110/240V, 50/60Hz ac supply to operate.

Ideally the trigger level should be 5V into 50 ohm. The trigger rise-time should be faster than 2ns for best jitter performance. The unit will, however, trigger reliably from slower and lower amplitude triggers, with some variation in jitter performance and trigger delay.

The front and rear panel layouts are shown in Figure 1.

As the specification calls up a 2U rack-mount enclosure, the feet are supplied but not fitted. If the feet were fitted, the covers would have to be removed to take them off prior to rack-mounting. The feet can be fitted without removing the covers if required.

2. Specification

The UTV50 was designed to meet the following specification:

		Performance achieved
Amplitude:	0-50V, front panel adjustable	0-53V
Polarity:	Positive	Positive
Load:	50 ohms	50 ohms
Pulse width:	1-100ns, front panel adjustable	0.8ns - 111ns
Trigger rate:	20kHz maximum	24kHz
Trigger input:	5V, 50 ohm	5V, 50 ohm
Trigger duration:	2ns minimum	1.1ns minimum
	1000ns maximum	1000ns maximum
Output risetime:	<200ps 20-80%	160ps 20-80%
Output falltime:	<500ps 20-80%	237ps 20-80%
Jitter:	<15ps, trigger to output leading edge (assumes trigger rise-time <=2ns)	4.5ps rms
Trigger delay:	Not specified	22.25ns

3. Controls

The UTV50 is controlled via two front panel mounted 10 turn digi-dials. One controls the output pulse width and the other controls the output amplitude. The controls are approximately linear and the characteristics are shown in Figures 2 and 3.

4. Test waveforms

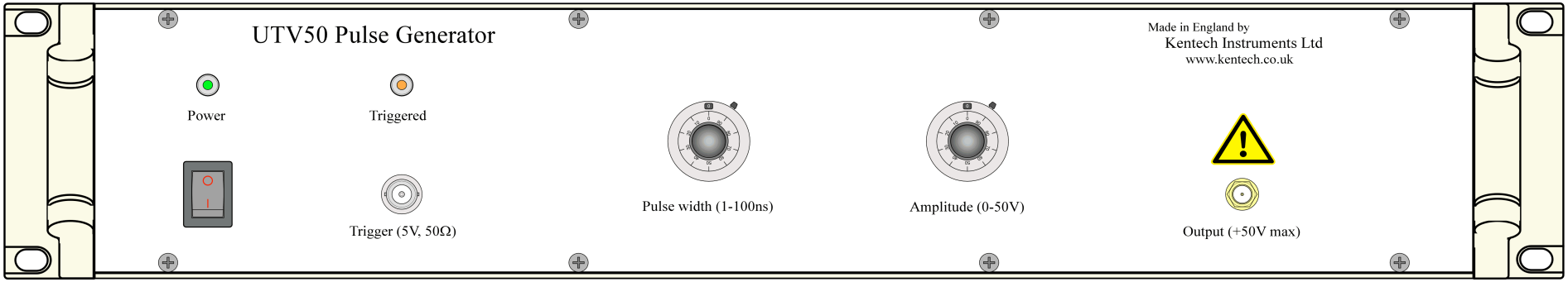
The test waveforms were obtained using a 5V 50ns trigger pulse duration, except where minimum trigger pulse widths were tested. No averaging was used to display the waveforms. The trigger rate was 20kHz. (See figures 4 to 9).

5. Test equipment

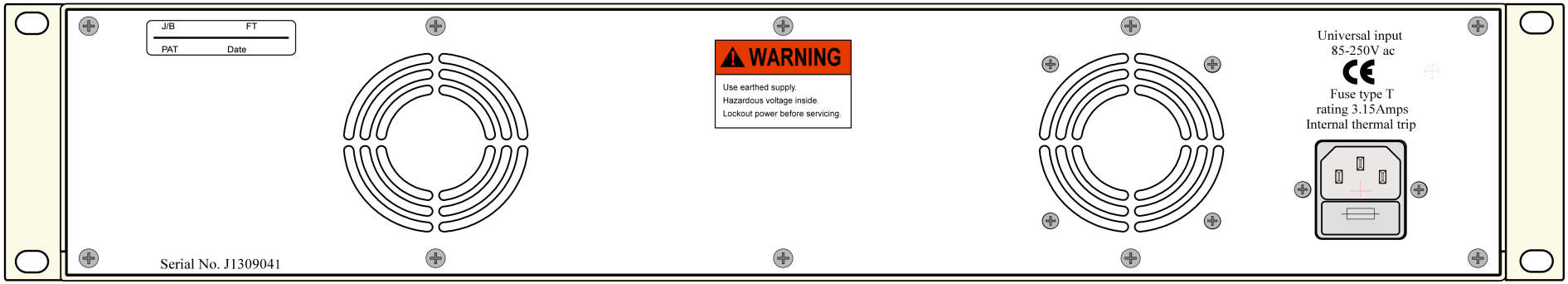
The measurements above were obtained using the following test equipment:

Agilent DSO 80604B Oscilloscope 6GHz 40GSa/s	Sn MY46000902
Highland P400 Digital Delay Generator	Sn 0157
Barth Attenuators, Type 142-NMFP-20B	Sn 455 and 561
Kentech RTV30 Sub-Nanosecond Pulser	Sn B1209271

To verify that the UTV50 would trigger at the minimum trigger pulse widths of <2ns a Kentech RTV30 Sub-Nanosecond Pulser was used as the trigger source. This source is capable of generating short, well defined pulses. This was necessary due to the finite rise-time of the Highland P400, which was the trigger source used in the other tests.



FRONT VIEW



REAR VIEW

Figure 1 UTV50 Pulse generator instrument layout

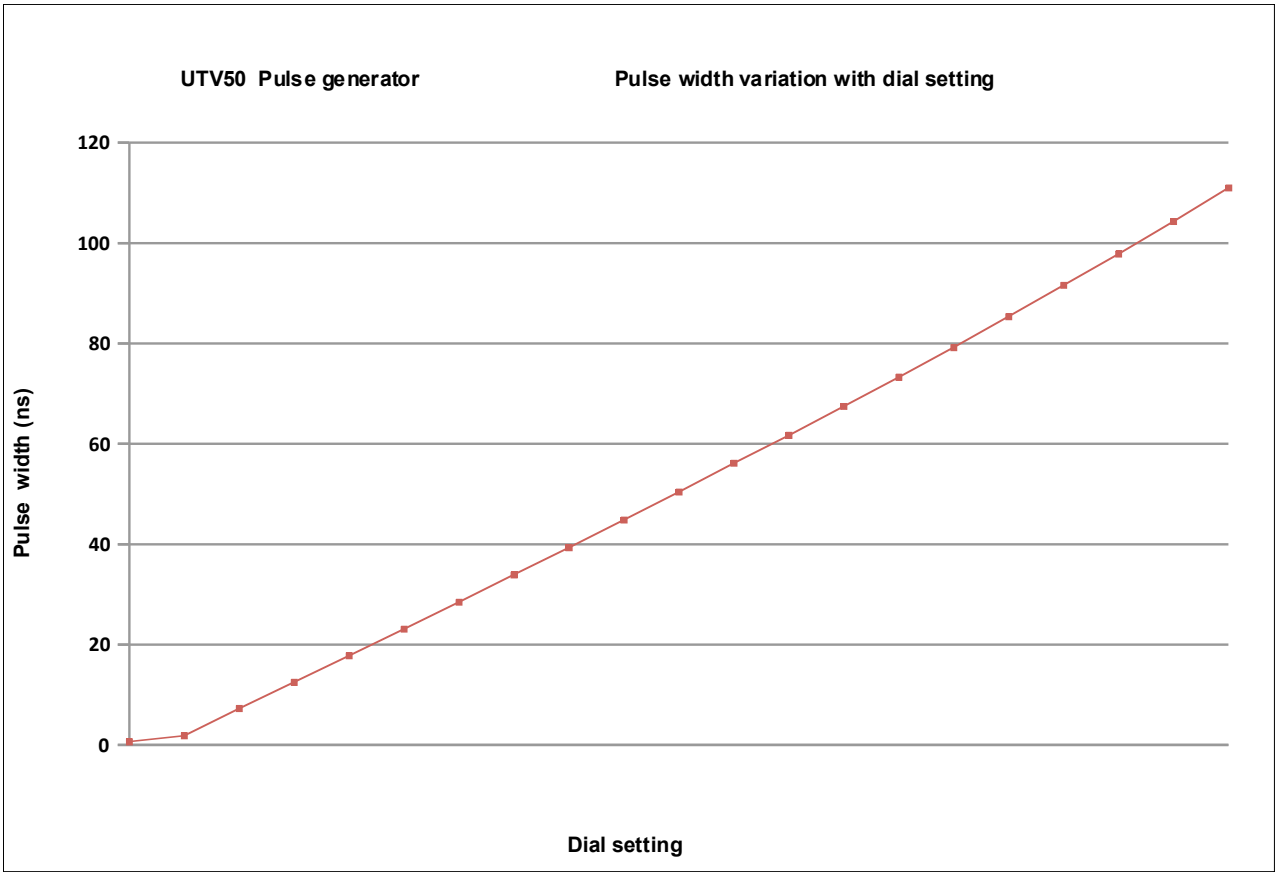


Figure 2 Pulse width variation with dial setting

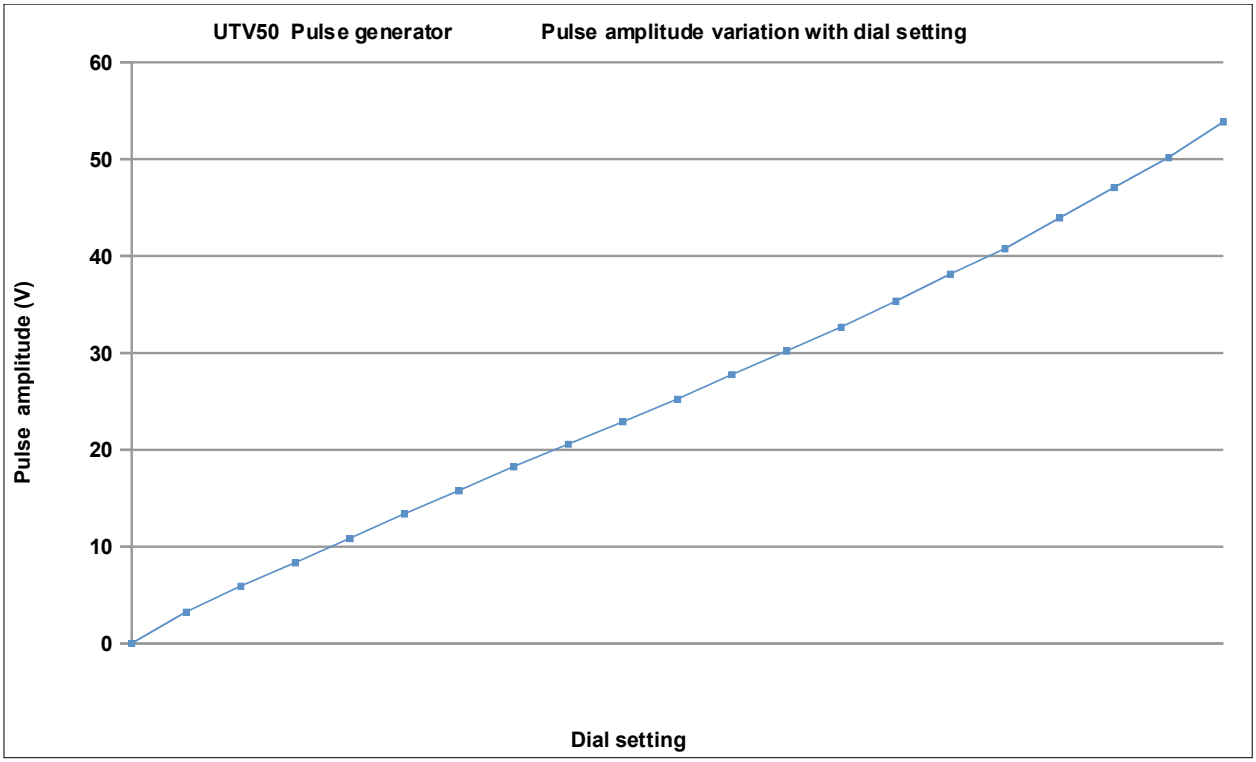


Figure 3 Pulse amplitude variation with dial setting

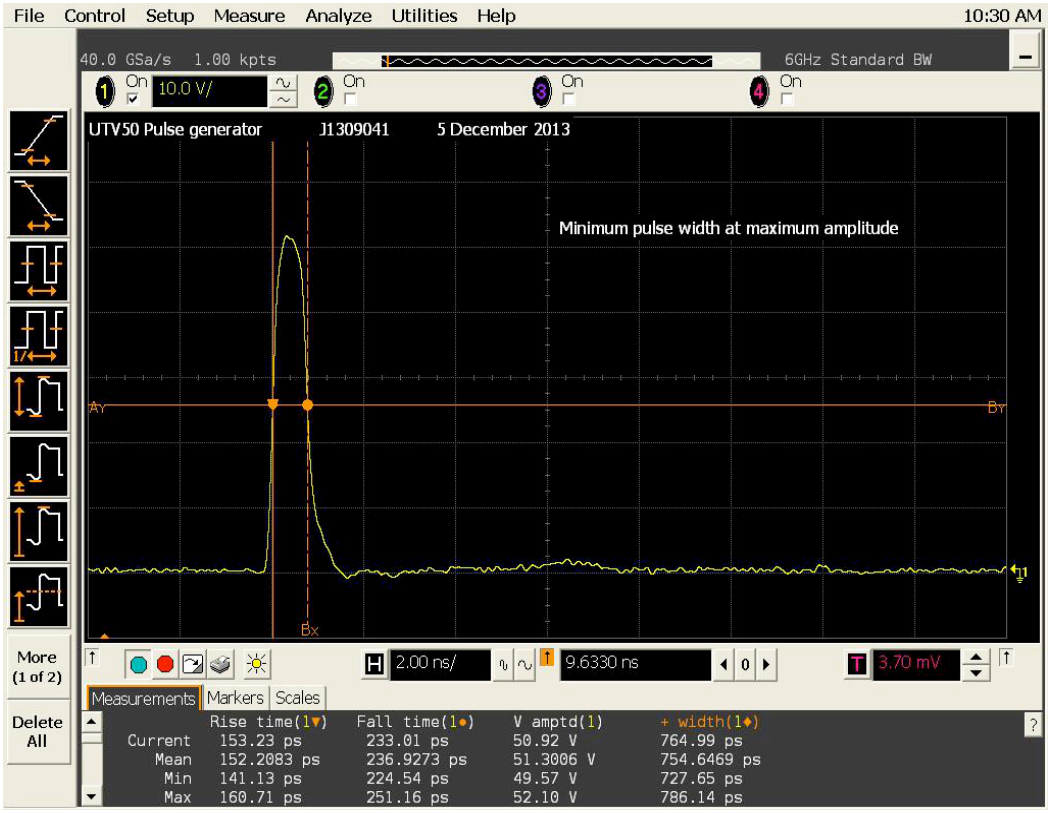


Figure 4 Minimum width at maximum amplitude

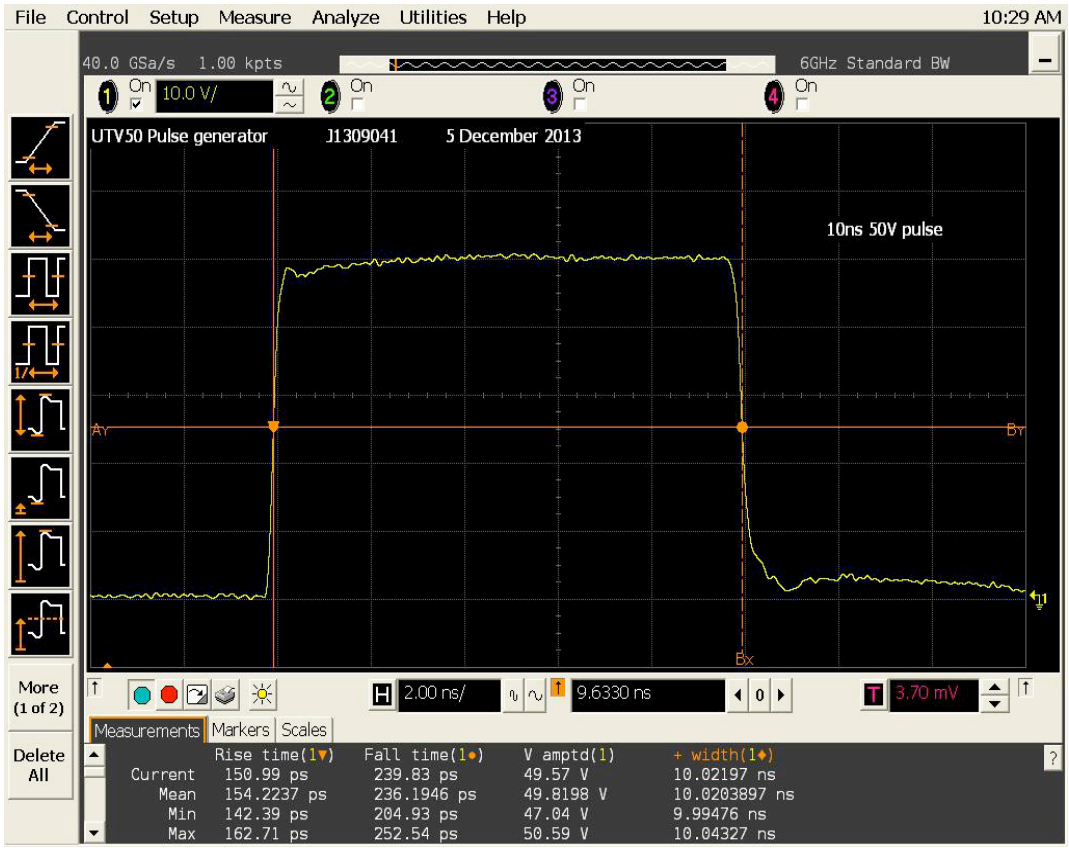


Figure 5 10ns 50V pulse parameters

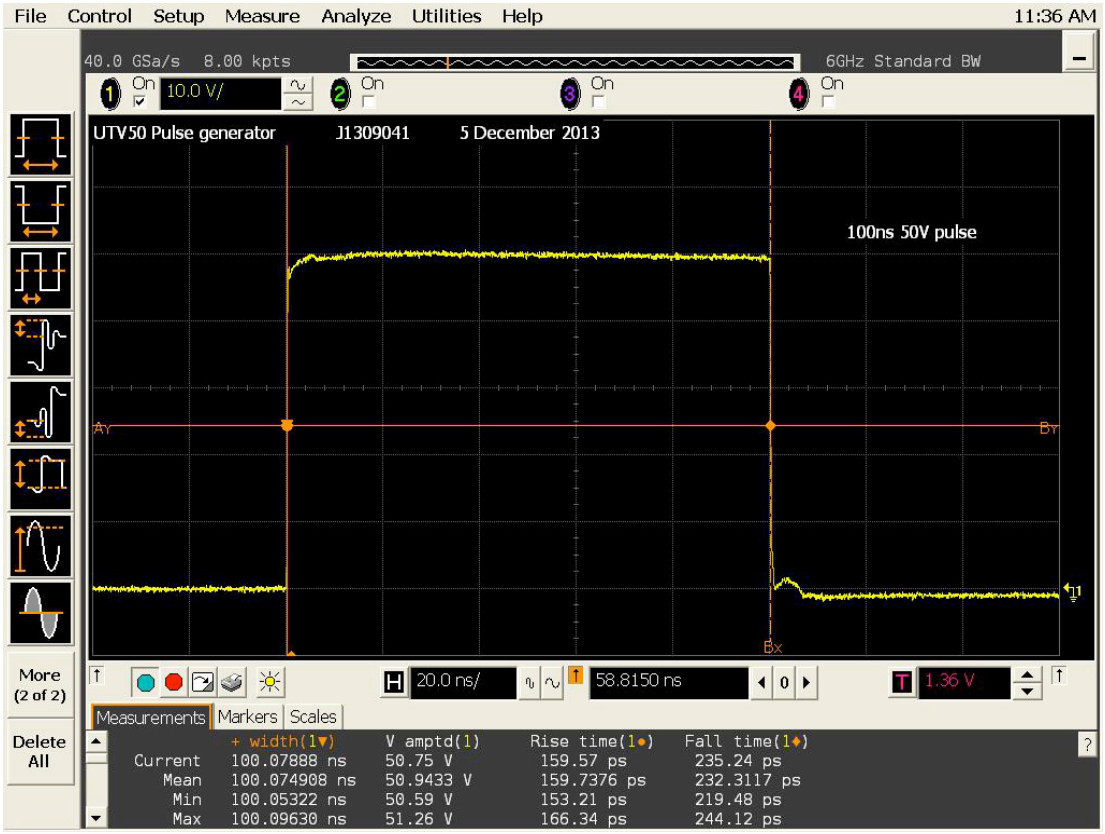


Figure 6 100ns 50V pulse parameters

Figure 7 Pulse jitter with minimum pulse width

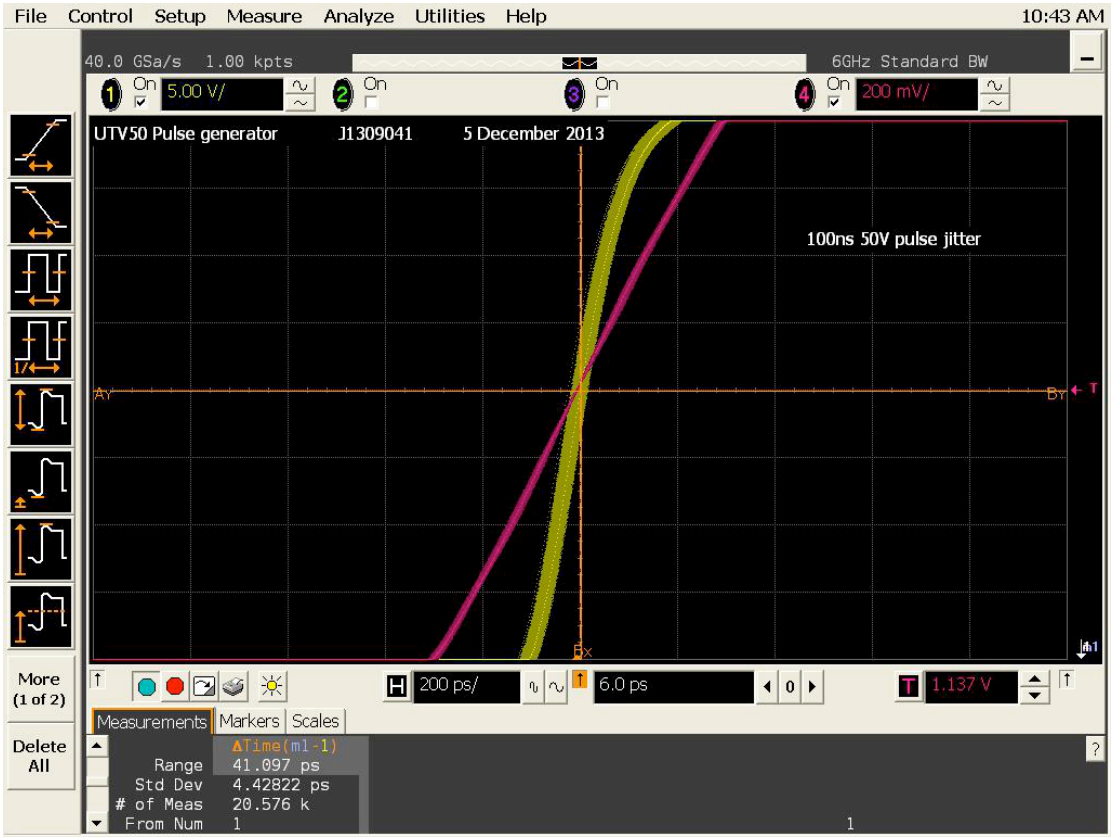


Figure 8 Pulse jitter with 100ns pulse width

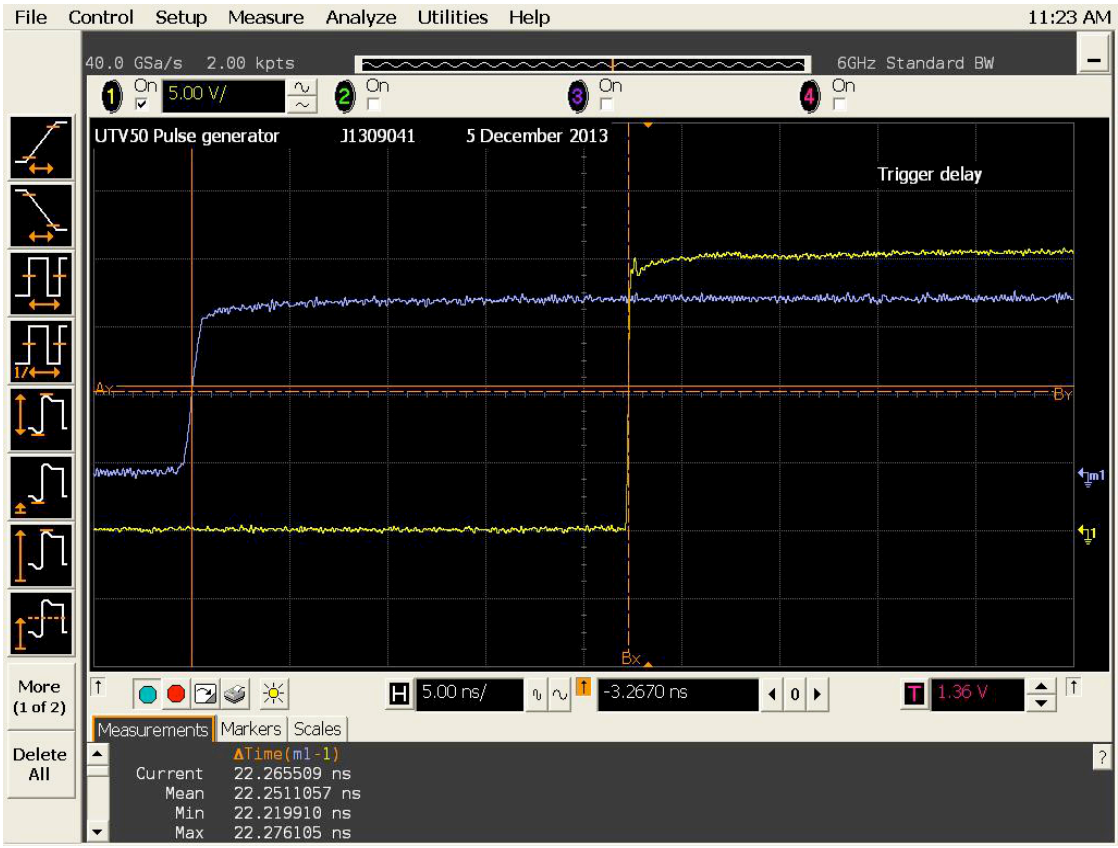


Figure 9 Trigger delay 22.25ns

Declaration of Conformity

We:- **Kentech Instruments Ltd**
The Isis Building
Howbery Park
Wallingford
Oxfordshire OX10 8BA, UK

Certify that this apparatus:

Kentech Instruments UTV50 Pulse Generator
Serial no: Jxxxxxxx

Conforms with the protection requirements of European Community Directives:

73/23/EEC	**Low Voltage Directive**
89/336/EEC	**Electromagnetic Compatibility Directive**
93/68/EEC	**CE Marking Directive**

The following harmonized standards have been applied:

BS EN55011 Emissions Specification (Group 2 Class A)
Industrial, Scientific and Medical equipment

BS EN50082-2 Generic Immunity Standard
Part 2 Industrial

BS EN 61010-1 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use

The following documents contain additional relevant information:-

Kentech file reference Jxxxxxxx

Name: **Signature:**

On behalf of Kentech Instruments Ltd

Position: Engineer **Issued:** Date