		Performance report for SiT9386, 125 MHz, HCSL		
<b>S</b> <sup>1</sup> Time	Type:	Performance report	Rev:	1.0
	Orig:		Date:	April 16, 2018

# Performance report for SiT9386 - 125 MHz, HCSL

# **Conditions:**

- Frequency 125 MHz
- VDD: 2.5 V, 3.3 V
- Room temperature
- Termination:
  - $\circ~$  30  $\Omega$  series and 50  $\Omega$  to GND.

## Equipment:

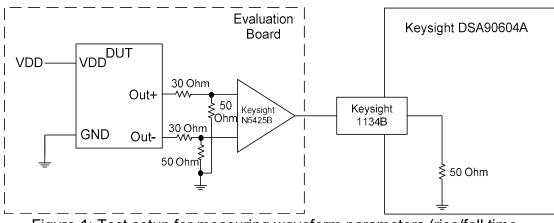
Model	Measurement / Purpose
Keysight DSA90604A (6 GHz,	Period jitter, differential voltage swing, rise/fall
20 Gsps)	time, duty cycle
Keysight 5052B Signal Source	Phase noise, integrated phase jitter
Analyzer	
Keysight 34980A	Power supply current
Keysight E3631A	Power supply
Keysight 53230A	Frequency

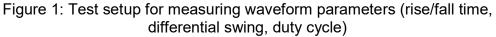
#### Test setup:

For waveform parameters measurement (rise/fall time, differential swing, duty cycle), both DUT outputs are terminated with 30  $\Omega$  series and 50  $\Omega$  to GND. Output signals are measured using Keysight 1134B active probe with Keysight N5425B probe head. All measurements are applied to the differential waveform. Figure 1 shows test setup diagram for waveform parameters measurement.

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For period jitter measurement output is terminated with 30  $\Omega$  series and 50  $\Omega$  to GND at the input of hi-speed comparator (ADCMP581). AC coupled comparator's output is connected to oscilloscope channel. Figure 2 shows test setup diagram for period jitter measurement.

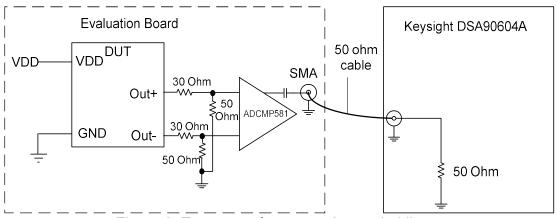


Figure 2: Test setup for measuring period jitter

For phase noise measurements, differential signal is converted to single-ended using impedance matching transformer. Transformer's output is connected to measurement instrument. Output is also terminated with 30  $\Omega$  series at the source side. Figure 3 shows test setup diagram for phase noise measurement.

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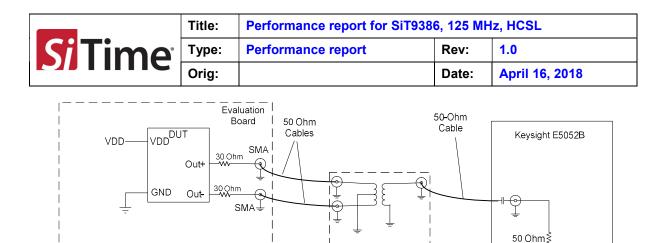


Figure 3: Test setup for measuring phase noise.

For IDD measurement device output is floating. For frequency measurement differential-to-single-ended converter is used.

#### Data:

- Phase noise
- Integrated phase jitter
- RMS period jitter
- Peak-to-peak period jitter
- Rise/fall time
- Duty cycle
- Differential output swing
- IDD
- Frequency stability over temperature

Parameter	Units	Voltage	
r arailletei		2.5 V	3.3 V
Integrated Phase jitter (1.875 MHz - 20 MHz)	fs, rms	105	104
Integrated Phase jitter (12 kHz - 20 MHz)	fs, rms	228	226
Period jitter	ps, rms	0.94	0.95
Period jitter (10,000 cycles)		7.33	7.53
Duty cycle		50.0	50.0
Rise time (20% - 80%)		374	370
Fall time (80% - 20%)	ps	381	378
Differential voltage swing	V	1.42	1.48
Current consumption (no load, output enabled)	mA	76.4	77.1
Current consumption (no load, output disabled)	mA	50.9	51.3

### Table 1: Summary performance data

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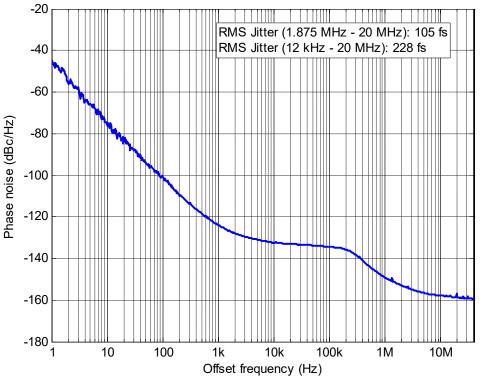


Figure 4: Phase noise, 2.5 V

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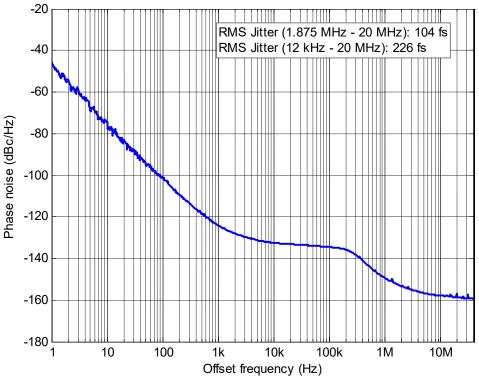


Figure 5: Phase noise, 3.3 V

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Results (Mea	sure All Edges)								
Measurement	Current 50.0 %	Mean 50.0 %	Min 49.7 %	Max 50.0 %	Range (Max-Mir		Count 1230		
Duty cycle(4) V amptd(4)	50.0 % 1.41638 V	50.0 % 1.41651 V	49.7 % 1.41638 V	50.0 % 1.43324 V	350 m% 16.86 mV	21.2 m% 1.314 mV	205		
V ampto(4) Fall time(4)	380.75 ps	380.5953 ps	373.54 ps	392.75 ps	19.22 ps	1.5257 ps	1230		
Rise time(4)	374.67 ps	373.8813 ps	368.86 ps	392.49 ps	23.64 ps	1.7445 ps	1435		

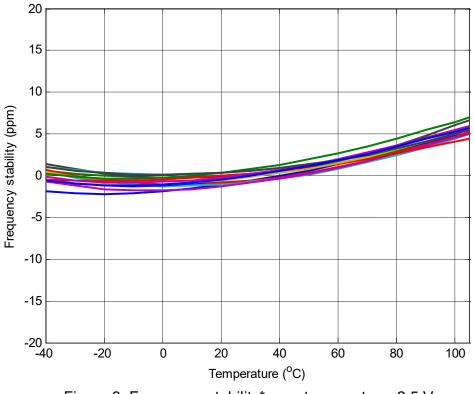
Figure 6: Output waveform, 2.5 V

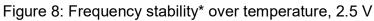
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Results (Mea	asure All Edges)									
Measurement	Current	Mean	Min	Max	Range (M		Std Dev	Count		
Duty cycle(4) V amptd(4)	50.0 % 1.48383 V	50.0 % 1.48395 V	49.9 % 1.48383 V	50.1 % 1.50069 V	210 m% 16.86 mV		17.1 m% 1.305 mV	1248 208		
V ampto(4) Fall time(4)	377.80 ps	377.5978 ps	370.19 ps	389.64 ps	10.00 mv 19.46 ps		1.5447 ps	1248		
Rise time(4)	369.03 ps	370.3482 ps	363.98 ps	383.17 ps	19.20 ps		1.5209 ps	1456		

Figure 7: Output waveform, 3.3 V

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\*SiT9386 frequency stability is independent of output frequency.

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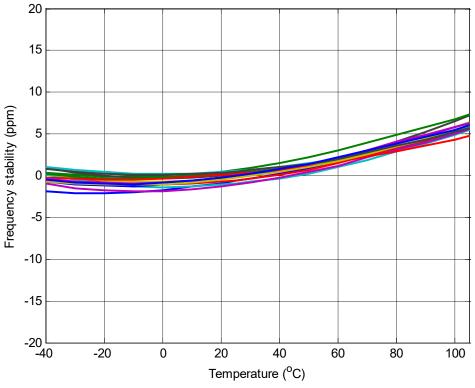


Figure 9: Frequency stability over temperature, 3.3 V