

NWDDS101000-0

10MHz – 1GHz

Direct Digital Synthesizer

v 1.2

GENERAL DESCRIPTION

The Nanowave DDS is a fast frequency switching direct digital synthesizer operating from 10MHz to 1GHz. The unit provides RF frequency switching times of below 200ns and frequency step size down to 1uHz. The unit contains an internal processor which can be programmed to control the frequency amplitude and phase of the DDS output to enable chirp frequency generation. The unit contains an internal low g-sensitivity, < 0.5ppb/g, crystal reference which ensures frequency stability over the operating temperature range of less than 200ppb.

The Nanowave DDS is designed for environmentally harsh ground or airborne RADAR application requiring fast frequency or phase switching



Figure 1 100MHz to 1GHz DDS

FEATURES

- Low phase noise <-130dBc/Hz at 10KHz
- Fast RF frequency switching <200ns
- Wide operation bandwidth 10MHz to 1GHz
- Wide operational temperature range -40C to +85C (Packaged)

APPLICATIONS

- EW
- SIGINT
- High performance Air/Ground RADAR
- Frequency agile source requirements

ELECTRICAL PARAMETERS

Parameter	Unit	Min	Typ	Max	Remarks
Frequency Range	MHz	10		1000	Extension to 1.2GHz on request.
Frequency resolution	Hz	1e-6		1e6	Unit test at 1MHz step.
Frequency switching speed	ns			200	
Nominal Output power	dBm	-2	0	2	Higher power on request.
Output power range		-60		0	14 BIT power control resolution

NANOWAVE Technologies Inc.

425 Horner Avenue
Etobicoke, ON M8W 4W3
Canada

Phone: +1 416 252-5602
Fax: +1 416 252-7077

Copyright © 2024 NANOWAVE Technologies Inc. All rights reserved.
The information in this document is subject to change without notice. NANOWAVE and the NANOWAVE logo are trademarks of NANOWAVE Technologies Inc. Other trademarks, product and company names are the property of their respective owners and do not imply specific product and/or vendor endorsement or association.

NWDDS101000-0

10MHz – 1GHz

Direct Digital Synthesizer

v 1.2



Parameter	Unit	Min	Typ	Max	Remarks
Broad band Spurious Level	dBc	-90	-70	-50	Spurious dependent on frequency setting
Phase Noise @ 1 GHz	Offset			PN/[dBc/Hz]	Phase noise under static vibration
	10Hz			-80	
	100Hz			-105	
	1KHz			-125	
	10KHz			-130	
	100KHz			-135	
	1MHz			-140	
	10MHz			-145	
	100MHz			-145	
Residual Phase Noise Floor	dBm/Hz			-145	
Internal reference frequency	MHz		2500		Increase to 3GHz for extended operational range
Warm up time	Min			5	To +/-100ppb of frequency at 25C after 2 hours operation.
Stability over temperature	ppb	-200		+200	-40C to +85C
Ageing / 1 year	ppb	-100		+100	After 30 days of operation
Ageing / 10 year	ppm	-1.5		1.5	After 30 days of operation
DC power consumption	W			15	DC rails: -2.0, 1.5V, 2.5V, 4.0V and 15V: Can be rationalized to single 15V on request.
Monitor and Control			RS232/USB		GUI: for frequency and power setting

MECHANICAL AND ENVIRONMENTAL PARAMETERS

Parameter	Unit	Min	Typ.	Max	Remarks
Operating Temperature Range	°C	-40		+85	
Storage Temperature Range	°C	-40		+85	
Size (length, width, height)	Inches		5.4" x 6" x 2"		
Weight	g		900		
RF Output Connector			SMA-F		
Monitor and Control			DB9-M/ USB		
DC power			DB9-M		
Marking	Manufacturer name, model, serial number, date code				

Notes: Specifications subject to change without notice.

NWDDS101000-0

10MHz – 1GHz

Direct Digital Synthesizer

v 1.2

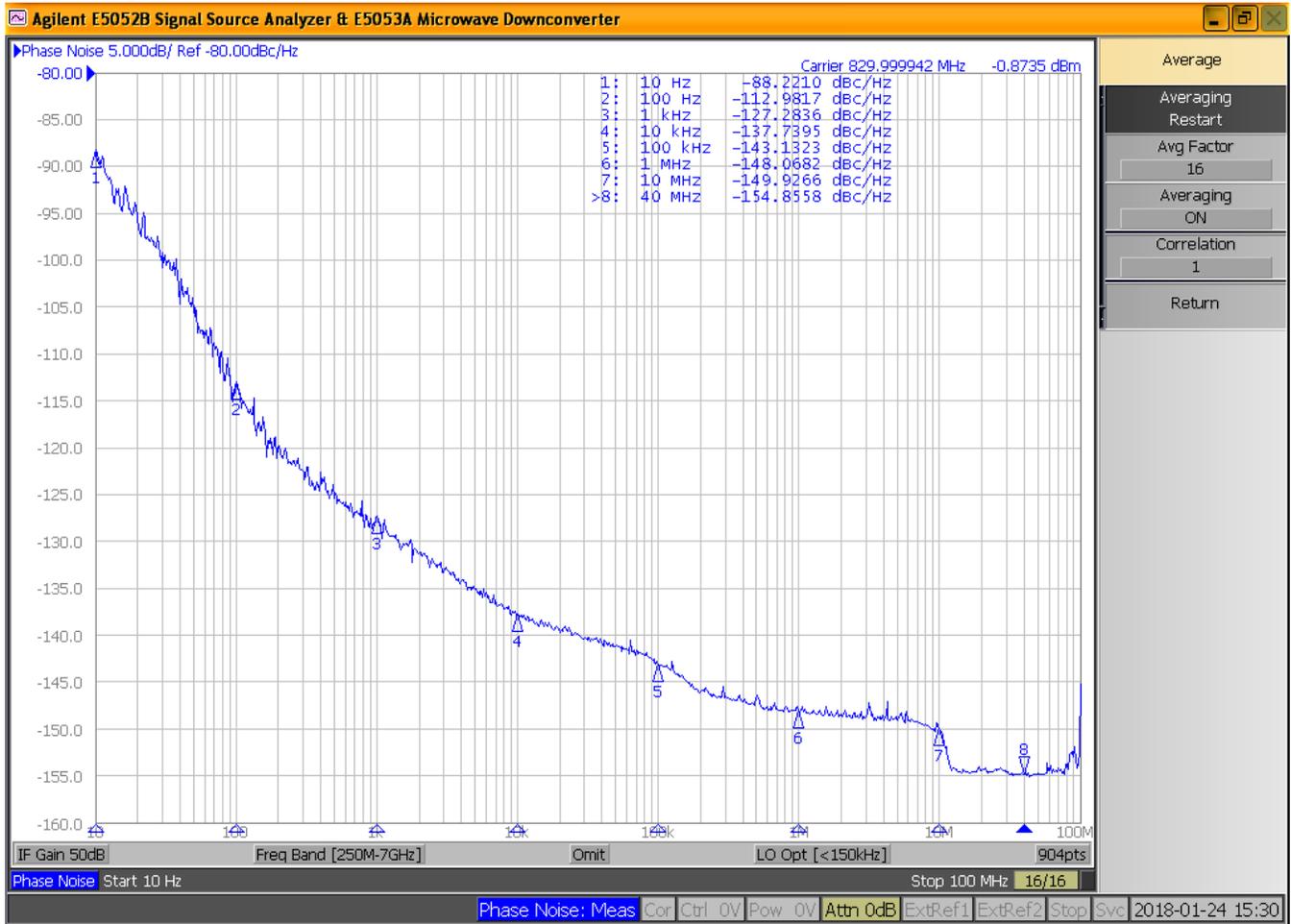


Fig 2: Typical Phase noise Performance at 830MHz, 85°C

NWDDS101000-0

10MHz – 1GHz

Direct Digital Synthesizer

v 1.2

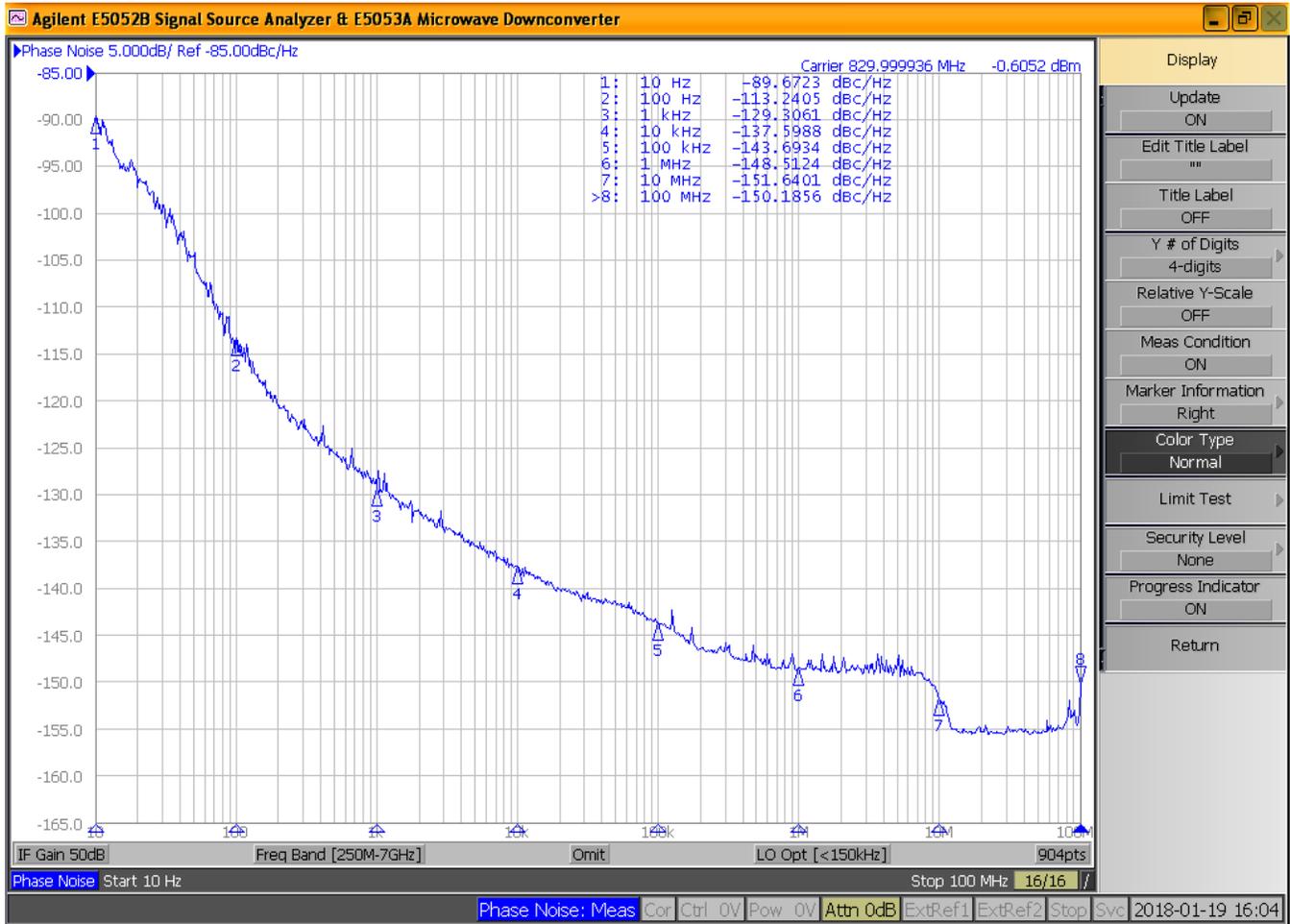


Fig 3: Typical Phase noise Performance at 830MHz, 25°C

COMMUNICATION AND CONTROL INTERFACE

The DDS can be monitored and controlled via a Graphical User Interface (GUI). The communication is conducted using an RS-232 interface allowing frequency to be set from a host computer. Control and monitor signals can be provided either through a USB port or a DB9 connector.

NWDDS101000-0

10MHz – 1GHz
Direct Digital Synthesizer
v 1.2

OUTLINE DRAWING

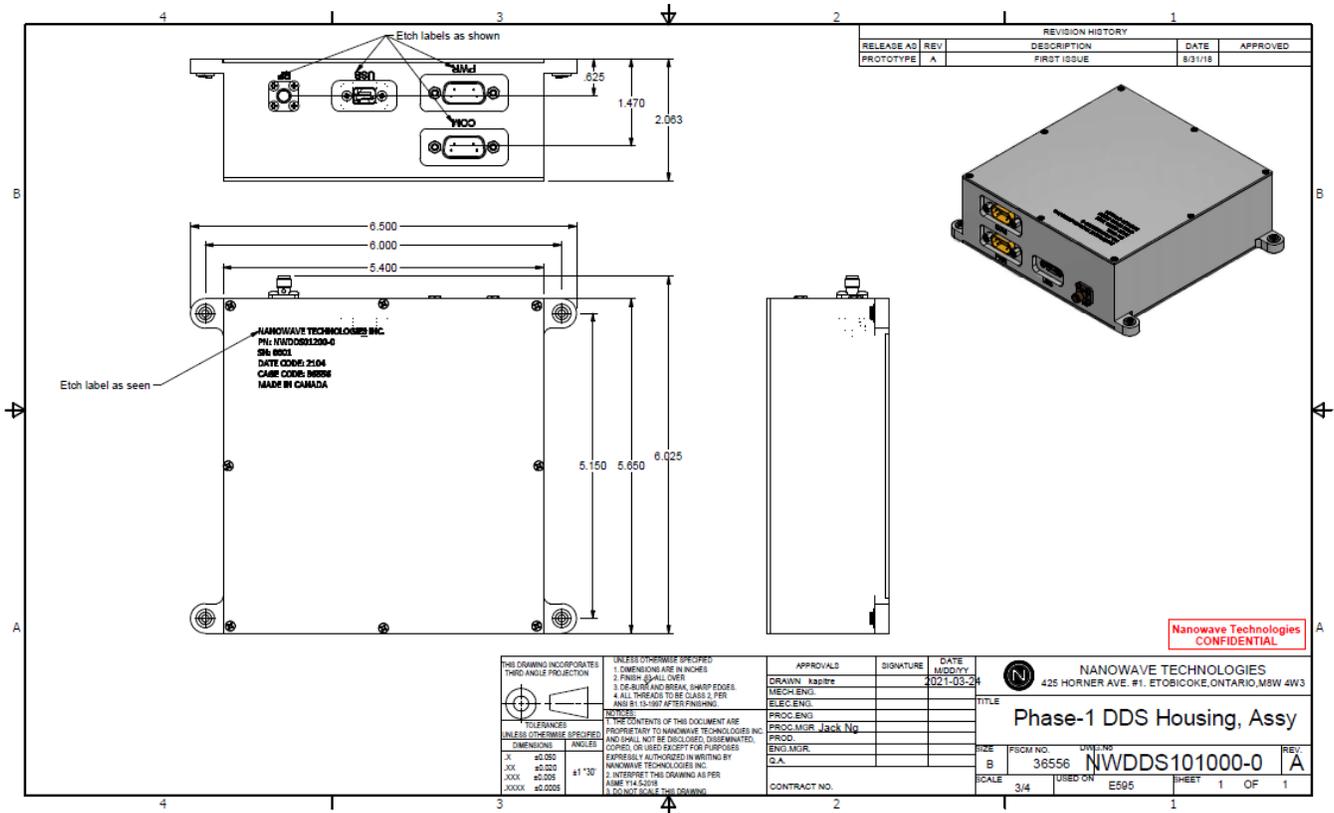


Fig 4: Outline Drawing NWDDS101000-0 Direct Digital Synthesizer Outline Drawing

Table 1: List of Connectors

RF	RF O/P SMA
USB	Digital Control USB
COM	Digital Control DB9
PWR	DC POWER DB9

Notes:

The outline of this source unit is customizable. Arbitrary shapes are possible to accommodate form-fit functionality.

Additional features:

- Marking: The unit is marked with manufacturer part no., date code, and Serial Number.
- All plating and painting is RoHS compliant

For further information please contact NANOWAVE Technologies Inc. at sales@nanowavetech.com, or call at (+1) 416-252-5602