

DSM202 – 2.0 GHz Linear Chirping Source

GENERAL DESCRIPTION

The DSM202 is a linear chirping waveform module that generates two types of chirping waveforms at 32 clocks per frequency update. The DSM202 can be controlled using a user-friendly GUI on a PC. The sole RF input source is the 2.0 GHz clock source DDSCK with a minimum input power of 0 dBm. The outputs of the module consist of a pair of differential analog outputs: DDSOP and DDSON.

FEATURES

- 11-bit amplitude and 13-bit phase resolution ROM
- Input clock frequency up to 2.0 GHz
- Frequency update rate of 32 clocks per update
- 2 running modes: Free run (Continuous) and Burst Run (Triggered)
- 2 kinds of chirping waveforms: Ramp and Triangle
- Programmable marker length
- USB 2.0 compliant interface (other interfaces available upon request)
- Powered by a 12V AC/DC Power Adapter
- 5.8 W power consumption (at 2.0 GHz clock)

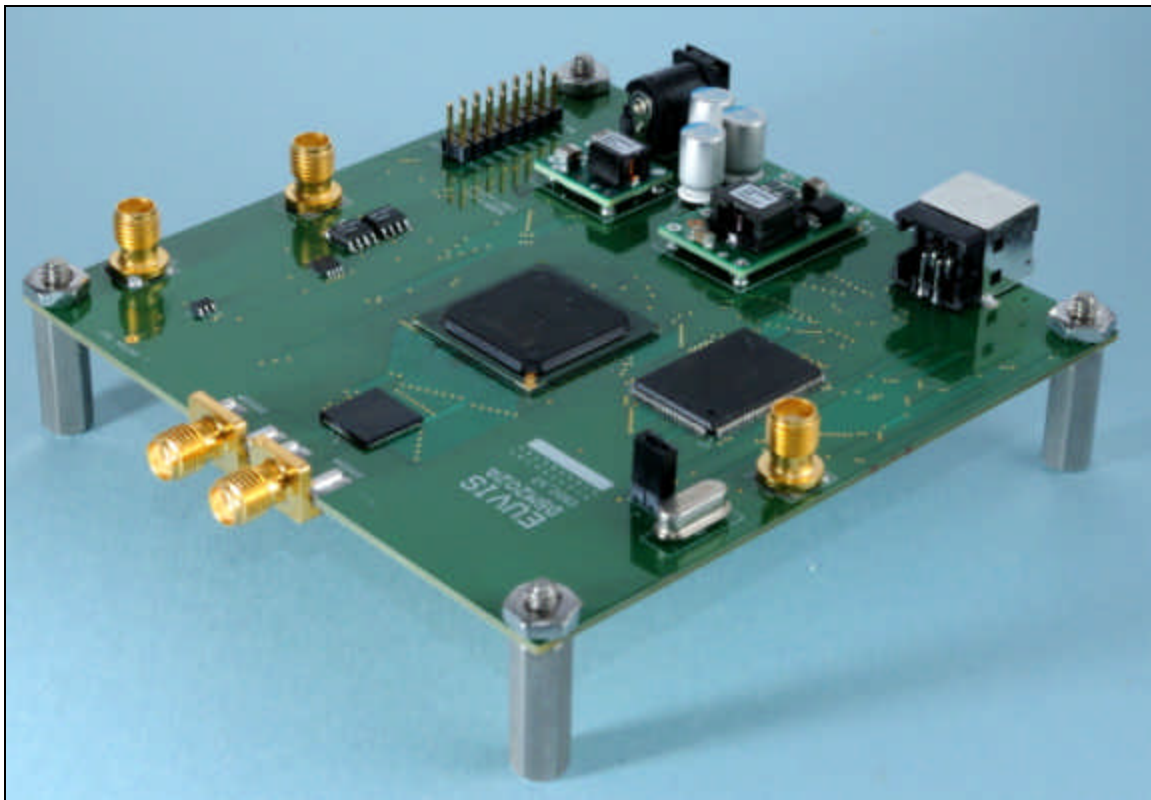


Figure 1 – DSM202 Module Snapshot

Electrical Specifications

Parameter	Min	Typical	Max	Units
Operating Temperature		25		C°
Output Level (V_{out})	-635		0	mV
Output Power (P_{out})	-4		0	dBm
Residual phase noise* (N_f)		-145		dBc/Hz
Output Port Return Loss (RL_{RF})		15		dB
Power Supply Voltage (V)		12V		V
Power Supply Current (I)		480		mA

*1 KHz away from carrier

Detailed Specifications

General	
DDS Frequency Resolution	32 bits
Frequency Update Rate	32 clocks per update
Running Modes	Continuous Triggered Continuous Triggered Burst
User Interface	Windows Graphical User Interface, USB
Input Clock	
Type	Single Ended 50Ω terminated
Connector Type	SMA
Frequency Range	1.0 GHz to 2.0 GHz
Power Level	0 dBm to 10 dBm
Return Loss	10 dB
Output	
Type	Differential, 50Ω terminated
Connector Type	SMA
Output Sampling Rate Range	1 GSPS to 2 GSPS
Output Maximum Frequency	Half of sampling rate
Output Level	-635 mV to 0 V
Output Power	-4 dBm to 0 dBm
Residual Phase Noise	-145 dBc/Hz @ 1KHz
Output Return Loss	15 dB
Trigger	
Connector Type	SMA
Source	External or Software
Logic Level Standard	LVC MOS 3.3 V

Detailed Specifications Continued

Waveforms	
Max Waveform Length	Continuous
Minimum Waveform Length	16 data points
Waveform Types	Ramp and Triangle
Marker	
Number of Markers	1
Marker Level	LVC MOS 3.3 V
Marker Length	Programmable

Waveform Snapshots

The following snapshots feature the DSM202 module's startup waveform parameters running at different modes and waveform types. The startup waveform starts at 7.8125 MHz, stops at 125 MHz, and has step of 7.8125 MHz. The input clock frequency for all four outputs is 2.0 GHz.

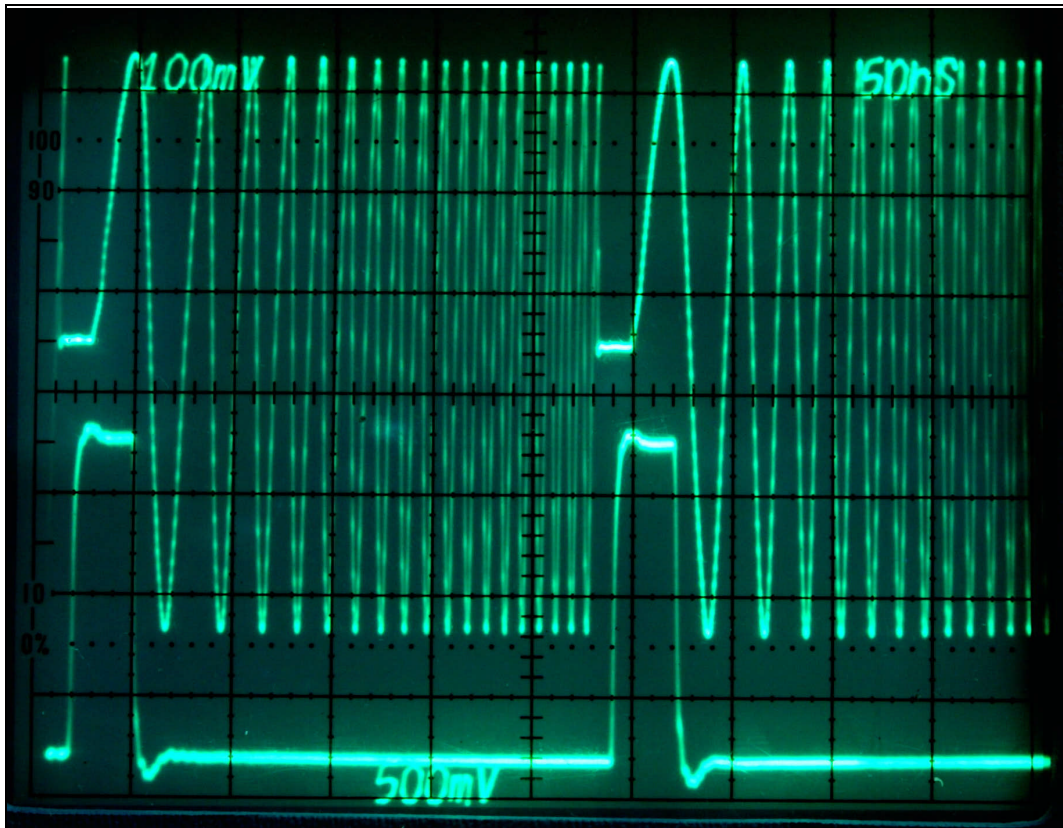


Figure 2- Ramped Chirping Waveform in Free Run Mode

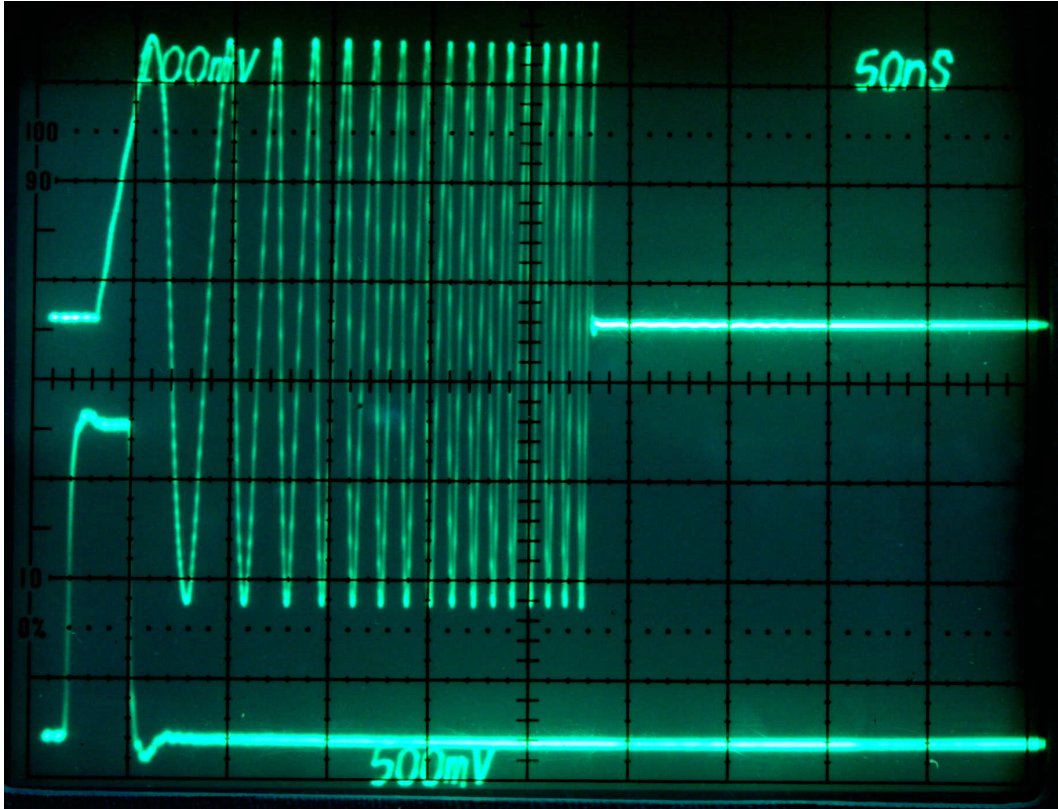


Figure 3- Ramped Chirping Waveform in Burst Run Mode

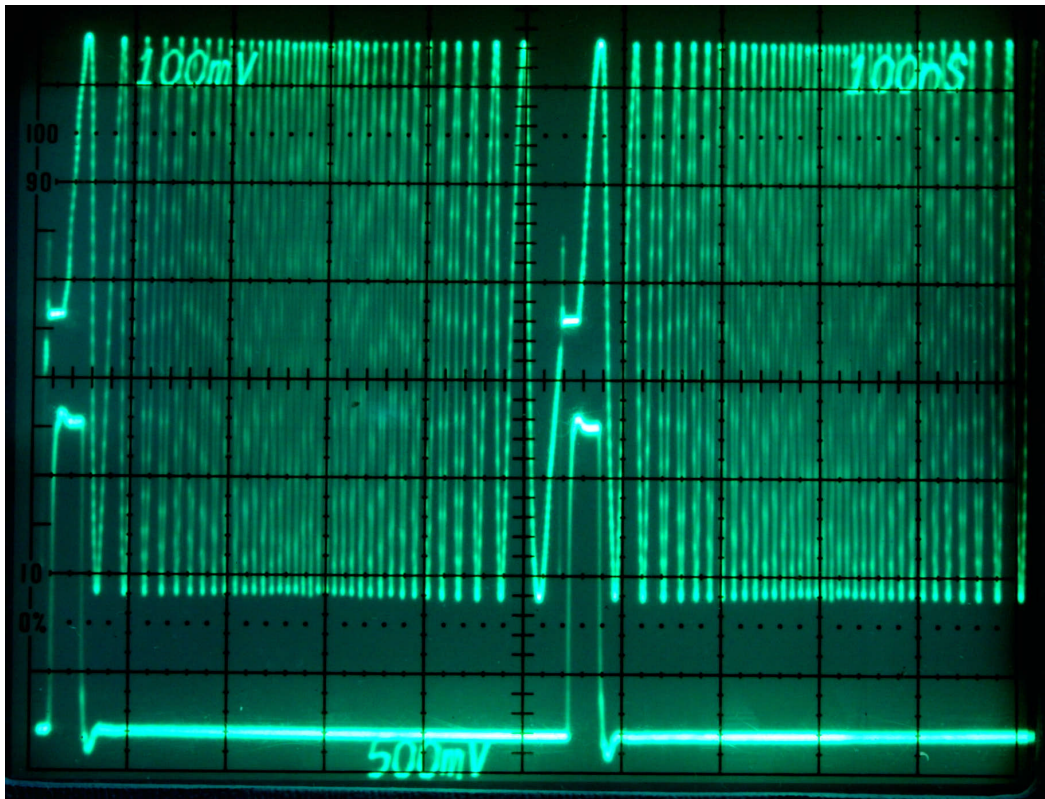


Figure 4- Triangular Chirping Waveform in Free Run Mode

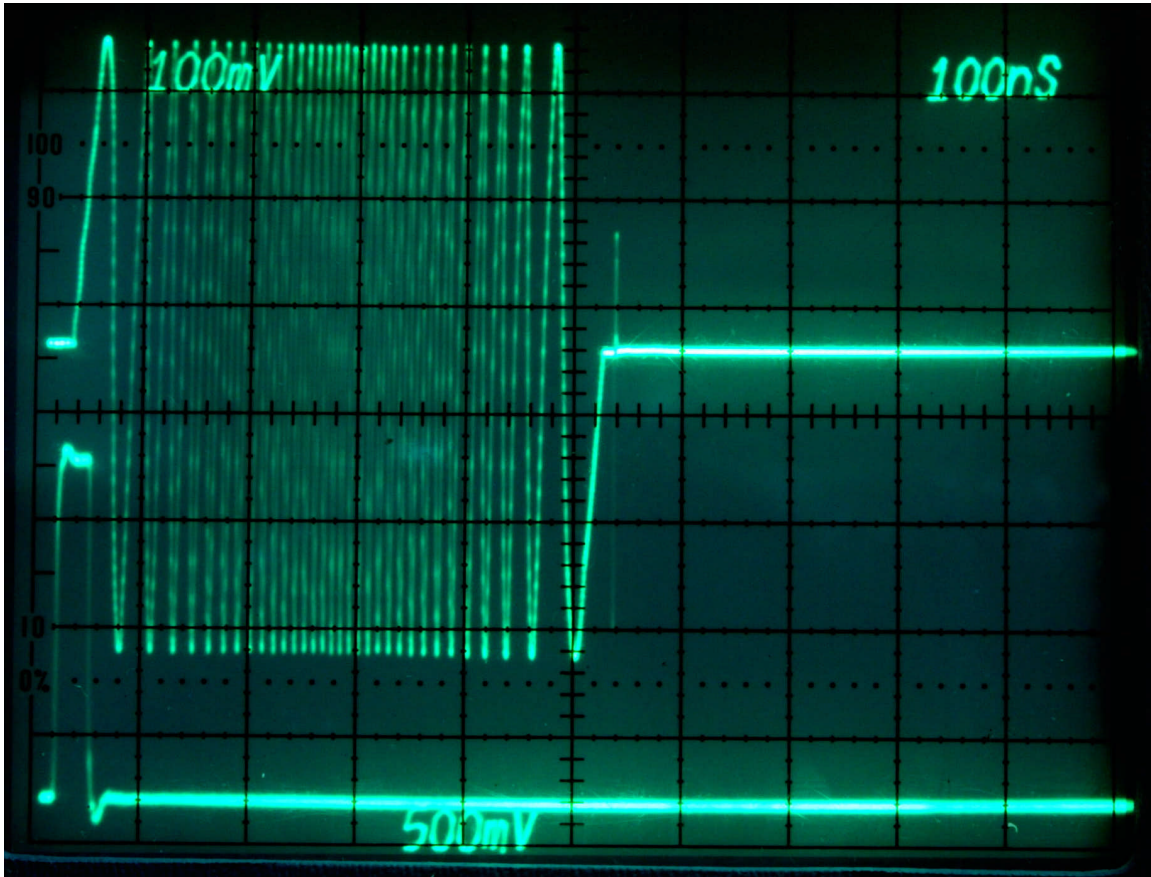


Figure 5- Triangular Chirping Waveform in Free Run Mode

The DSM202 module has a minor flaw to the triangular chirping waveform due to difficult synchronization issues. A spike occurs at the end of the triangular chirping waveform. Besides this imperfection, the waveform output is correct.

Board Diagram

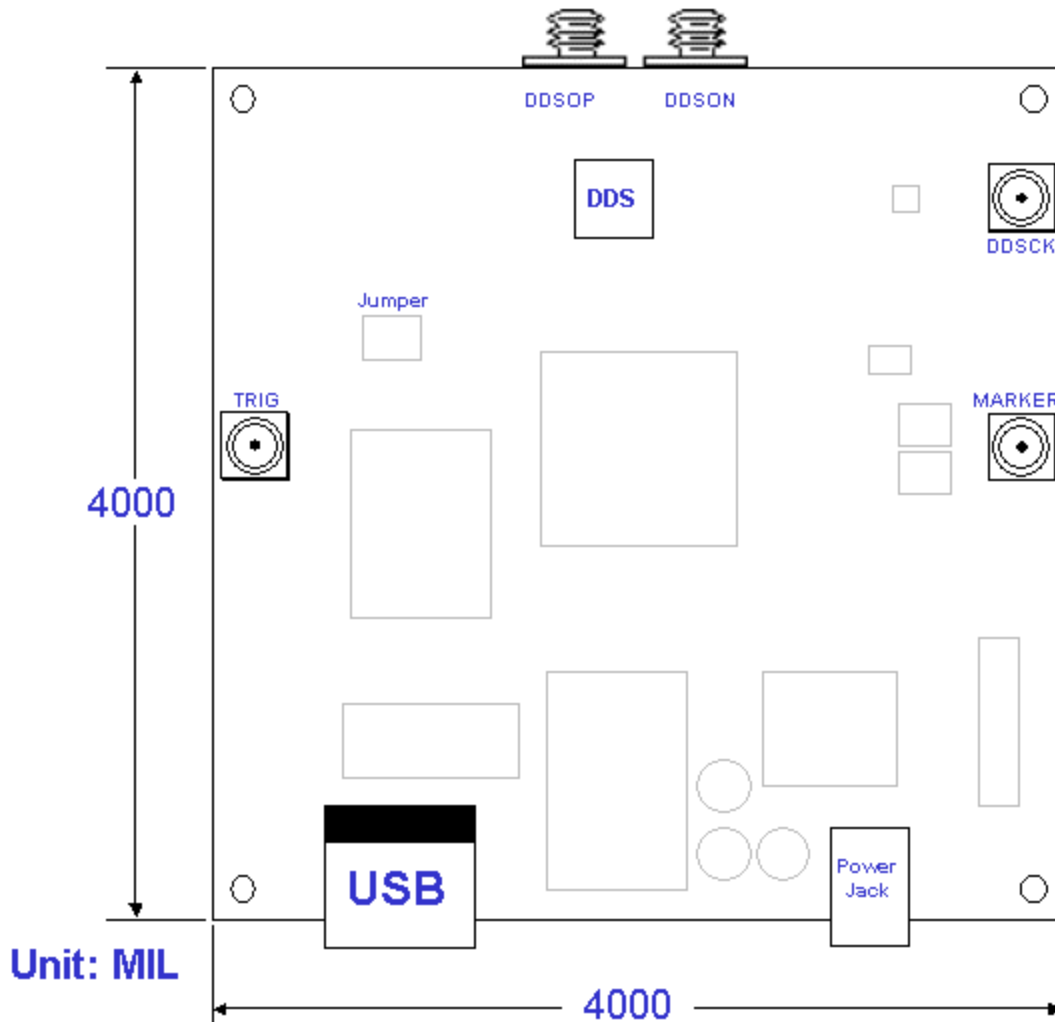


Figure 6- DSM202 Module Board Diagram

Physical Dimensions	
Length	4 inches (nominal)
Width	4 inches (nominal)
Height	0.6 inches (nominal)
Mounthole Locations: (in mils)	1. (125 , 3875) 2. (125 ,125) 3. (3875 , 125) 4. (3875 , 3875)

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