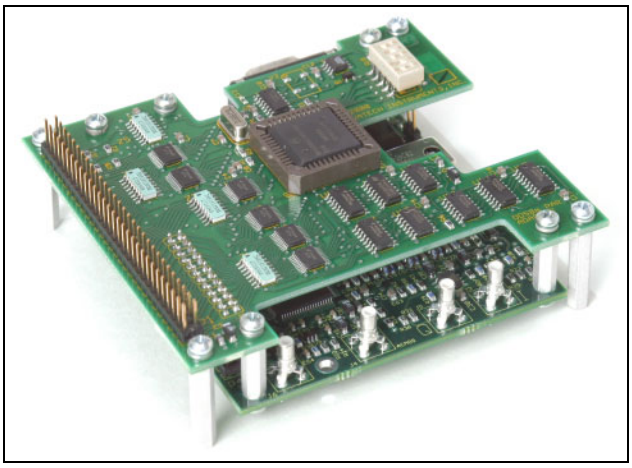
NOVATECH INSTRUMENTS, INC.

Frequency Agile 100MHz Signal Generator Module

Model DDS8par



The DDS8par is a 100MHz Frequency Agile Synthesized Signal Generator on a modular circuit board. The DDS8par generates Sine, Cosine and ACMOS/TTL output signals simultaneously up to 100MHz in 1μHz steps under parallel binary control. This allows 48-bits of frequency to be switched in approximately 100μs from a customer supplied controller. Multiple DDS8par can be synchronized and used to generate the fast-switching signals needed for radar, acoustic testing and similar applications. The DDS8par comes with a ±1.5ppm on-board TCXO clock or it can accept an external clock source up to 300MHz.

Specifications:

OUTPUTS

TYPES: Sine, Cosine and ACMOS/TTL simultaneously.
IMPEDANCE: 50Ω.
RANGE: 100Hz to 100MHz in 1μHz steps (int. clock).
SINE/COS AMPLITUDE: approximately +7dBm (0.5Vrms) into 50Ω load.
CLOCK OUTPUT: Approximately 1Vpp level clock at the oscillator or external clock frequency. (50Ω for daisy-chaining multiple units which are to remain phase synchronous.)

ACMOS/TTL AMPLITUDE

V_{OL}<0.5V, V_{OH}>2.5V into a series terminated 15pF load. $T_{r,f}$ <5ns. Duty Factor: 45-55%. 50Ω.

CONTROL

Output frequency is controlled by a 48-bit parallel binary port. Frequency switches in <100μs depending upon customer supplied hardware. See timing diagram and connector pin-out on next page.

ACCURACY AND STABILITY

Accuracy: < ±1.5ppm at 10-40°C. Stable to an additional ±2ppm per year, 18-28°C. (Internal Clock)

EXTERNAL CLOCK IN

LEVEL: 0.35-2.5Vrms Sine or Square Wave. 50Ω.
FREQUENCY: 5MHz to 75MHz. Multiplier of 4 to 20 selected via on-board switch. (Output may require additional filtering for optimum performance with external clock.) Multiplier can be bypassed for up to 300MHz input.

SPECTRAL PURITY (Typ. 50Ω load, internal clock)

Phase Noise: <-140dBc, 10kHz offset, 5MHz out.

Spurious:	<-70dBc below 10MHz (200MHz span)
	<-65dBc below 40MHz
	<-50dBc below 100MHz
Harmonic:	<-65dBc below 1MHz
	<-60dBc below 10MHz
	<-50dBc below 20MHz
	<-40dBc below 50MHz
	<-35dBc below 100MHz

POWER REQUIREMENTS

4.75 to 5.25V@ <0.9A and -5.25 to -4.75V@ <100mA.

SIZE

10.4cm by 9.1cm circuit board, excluding connectors. Maximum height 2.5cm.

CONNECTORS

SMBs for Cosine(I), Sine(Q), ACMOS/TTL, CLK OUT and EXT CLK IN. 3-pin header for Power. 60pin header for frequency and control.

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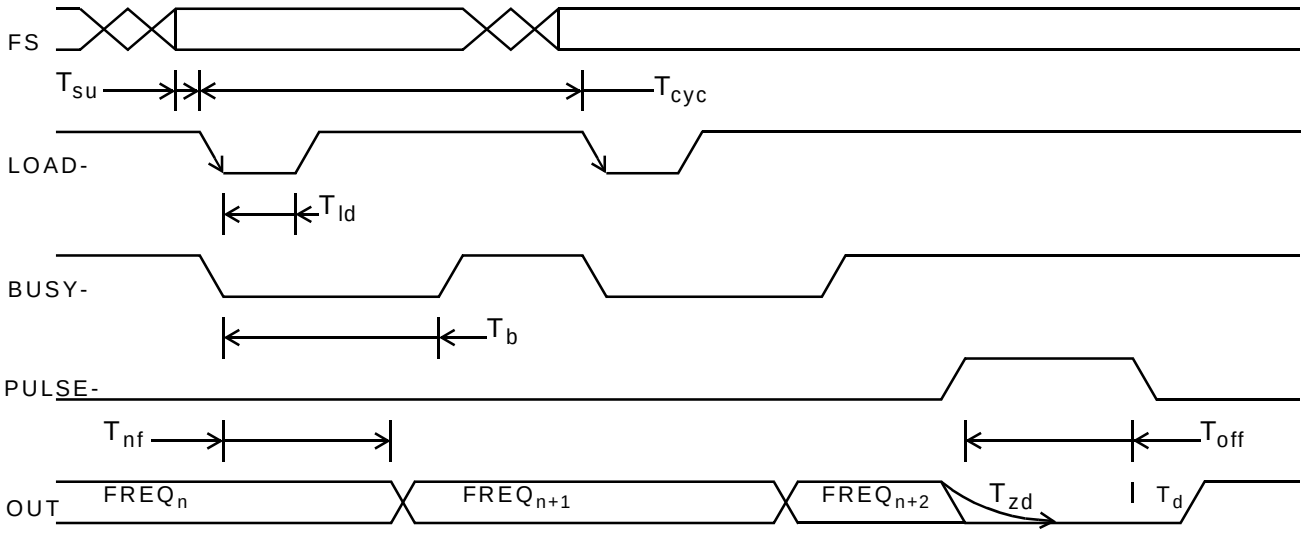
Parallel Input Timing Diagram (Not to Scale)



Parameter	Name	Min	Max	Notes
T_{su}	Binary Data Setup	10ns		Binary Data Stable before LOAD-.
T_{ld}	Load Pulse Width Low	25ns		Minimum Load pulse width.
T_b	Busy Time		100µs	Busy- is low for internal data transfer.
T_{nf}	New Frequency Time		90µs	New frequency on output.
T_{off}	Pulse Off Time	1µs		PULSE- must be low for output.
T_{zd}	Zero Decay Time		10µs TYP	Time for Output to decay to ±100mV.
T_d	Pulse low to output		170ns	Time for output to start after PULSE- goes true (LOW).
T_{cyc}	Load cycle time	125µs TYP		Cycle time before next LOAD- time.

P1 Pin Number	Function	P1 Pin Number	Function
1	Frequency Select 1 (FS1)	2	Frequency Select 0 (FS0) (LSB)
3	FS3	4	FS2
[...]	[...]	[...]	[...]
47	FS47 (MSB)	48	FS46
49	Factory Only (Tie LOW)	50	BUSY- **(OUTPUT)**
51	LOAD-	52	PULSE- (LOW for Frequency Out)
53	nc	54	nc
55	nc	56	nc
57	RES-	58	nc
59	Circuit Common (GROUND)	60	Circuit Common (GROUND)