



Coaxial

Low Phase Noise Frequency Synthesizer 1 to 18GHz

Low Phase Noise Frequency Synthesizers														
P/N	Freq.		Step	Power	Flatness	Phase Noise				Harmonics ⁴	Spurious	Switching	Power Supply ⁵	Case
	Range	Size ²	Output			(dBc/Hz)				(dBc)	(dBc)	Speed	(V/mA)	
	(GHz)	(MHz)	(dBm)	(dB)	Freq.	@1	@10	@100	@1	(dBc)	(dBc)	(us)	max	
			min	Typ.	(GHz)	KHz	KHz	KHz	MHz	ma	max	Typ.		
MFS1020	1 - 2	10	+10	≤ ±1.5	1	-108	-110	-110	-125	-10	-60	≤ 150	+12/1200	MFS-1
					2	-102	-104	-104	-120				+5/1200	
MFS2040	2 - 4	10	+10	≤ ±1.5	2	-102	-104	-104	-120	-10	-60	≤ 150	+12/1200	MFS-1
					4	-96	-100	-100	-118				+5/1200	
MFS4080	4 - 8	10	+10	≤ ±1.5	4	-96	-100	-100	-118	-10	-60	≤ 150	+12/1400	MFS-1
					8	-90	-94	-94	-105				+24/50	
MFS80120	8 - 12	10	+10	≤ ±1.5	8	-90	-94	-94	-105	-10	-60	≤ 150	+12/1500	MFS-1
					12	-85	-90	-90	-103				+5/1500	
MFS80180	8 - 18	10	+10	≤ ±1.5	8	-90	-94	-94	-105	-10	-60	≤ 150	+12/1600	MFS-1
					12	-85	-90	-90	-103				+5/1600	
MFS20180	2 - 18	10	+10	≤ ±1.5	2	-102	-104	-104	-120	-10	-60	≤ 150	+12/1600	MFS-1
					4	-96	-100	-100	-118				+5/1800	
					8	-90	-94	-94	-105				+24/50	
					12	-85	-90	-90	-103					
					18	-82	-85	-85	-100					

Notes:

1. Narrowband low phase noise frequency synthesizer also available.
2. Step Size: When step size meets 1MHz, phase noise will deteriorate 2-8dB and switching speed will deteriorate 100us.
3. Frequency Stability: $\pm 1 \times 10^{-7}$ with built-in OCXO or with external reference.
4. Harmonics: □ -55dBc with additional switch filter option. (For outline drawing, Pls. refer to MFS-2).
5. Power supply: with switch filter option, additional -5V/200mA power supply will be needed.
6. For Commercial Application: Operating Temperature: -10~+50°C.
For Industrial Application: Operating Temperature: -20~+60°C.
For other Application: Operating Temperature: -40~+70°C, -55~+85°C.



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High Performance DDS Frequency Synthesizer 1 to 18GHz

High Performance DDS Frequency Synthesizers

P/N	Freq.	Step	Power	Flatness	Phase					Harmonics ³	Spurious	Switching	Power	Case
	Range	Size	Output		(dBc/Hz)							Speed	Supply ⁴	
	(GHz)	(Hz)	(dBm)	(dB)	Freq.	@1	@	@100	@1	(dBc)	(dBc)	(us)	(V/mA)	
			min	Typ.	(GHz)	KHz	K	KHz	MHz	max	max		max	
DFS1020	1 - 2	1	+13	□ ±1.5	1	-106	-108	-108	-125	-10	-60	□ 120	+5/1700	DFS-1
					2	-100	-102	-102	-120				+24/50	
DFS2040	2 - 4	1	+13	□ ±1.5	2	-100	-102	-102	-120	-10	-60	□ 120	+5/1700	DFS-1
					4	-92	-94	-94	-118				+24/50	
DFS4080	4 - 8	1	+13	□ ±1.5	4	-92	-94	-94	-118	-10	-60	□ 120	+5/1900	DFS-1
					8	-88	-90	-90	-105				+24/50	
DFS80180	8 - 18	1	+10	□ ±1.5	8	-88	-90	-90	-105	-10	-60	□ 120	+5/2000	DFS-1
					12	-82	-85	-85	-103				+24/50	
DFS20180	2 - 18	1	+10	□ ±1.5	2	-100	-102	-102	-120	-10	-60	□ 120	+5/2100	DFS-1
					4	-92	-94	-94	-118				+12/1600	
					8	-88	-90	-90	-105	-10	-60	□ 120	+5/2100	DFS-1
					12	-82	-85	-85	-103				+24/50	
					18	-80	-82	-82	-100					

Notes:

1. Narrowband high performance DDS frequency synthesizer also available.
2. Frequency Stability: $\pm 1 \times 10^{-7}$ with built-in OCXO or with external reference.
3. Harmonics: □ -55dBc with additional switch filter option. (For outline drawing, Pls. refer to DFS-2).
4. Power supply: with switch filter option, additional -5V/200mA power supply will be needed.
5. For Commercial Application: Operating Temperature: -10~+50°C.
 For Industrial Application: Operating Temperature: -20~+60°C.
 For other Application: Operating Temperature: -40~+70°C, -55~+85°C.



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Miniature Frequency Synthesizer 1 to 8GHz

Miniature Frequency Synthesizers														
P/N	Freq. Range (GHz)	Step Size (MHz)	Power Output ² (dBm) min	Flatness (dB) Typ.	Phase Noise (10 MHz Step Size) (dBc/Hz)				Harmonics ⁴ (dBc) max	Spurious (dBc) max	Switching Speed ⁵ (us)	Power Supply (V/mA) Typ.	Case	
					Freq. (GHz)	@1 KHz	@10 KHz	@100 KHz						@1 MHz
UFS1020	1 - 2	0.1 to 10	+13	□ ±1.5	1	-104	-106	-106	-125	-10	-65	□ 40	+18/150	UFS-1
					2	-98	-100	-100	-120					
UFS2040	2 - 4	0.1 to 10	+13	□ ±1.5	2	-98	-100	-100	-120	-10	-65	□ 40	+18/200	UFS-1
					4	-92	-94	-94	-105					
UFS4080	4 - 8	0.1 to 10	+13	□ ±1.5	4	-92	-94	-94	-105	-10	-65	□ 40	+18/250	UFS-1
					8	-86	-88	-88	-100					

- Notes:**
1. Narrowband Miniature frequency synthesizer also available.
 2. Power Output: □ +13dBm can be extended to dual outputs.
 3. Frequency Stability: $\pm 3 \times 10^{-6}$ with built-in TCXO or with external reference.
 4. Harmonics: □ -30~-50dBc with frequency range <80% octave.
 5. Switching Speed: □ 40us (10MHz Step Size)
 6. For Commercial Application: Operating Temperature: -10~+50°C.
For Industrial Application: Operating Temperature: -20~+60°C.
For other Application: Operating Temperature: -40~+70°C, -55~+85°C.

Fractional Frequency Synthesizer 0.5 to 4GHz

Fractional Frequency Synthesizers													
P/N	Freq. Range (GHz)	Step Size (KHz)	Power Output ² (dBm) min	Flatness (dB)	Phase Noise(Narrowband) (dBc/Hz)				Harmonics (dBc) max	Spurious (dBc) max	Switching Speed (us)	Power Supply (V/mA) Typ.	Case
					Freq. (GHz)	@10 KHz	@100 KHz	@1 MHz					
KFS0540	0.5 -4	1-100	+13	□ ±0.5	0.5	-100	-117	-135	-45	-60	□ 200	+12/100	KFS-1
					1	-95	-115	-130					
					2	-87	-100	-120					
					4	-80	-90	-110					

- Notes:**
1. Fractional Frequency Synthesizer has better spurious when it operates in narrowband.
 2. Power Output: □ +13dBm can be extended to dual outputs.
 3. Frequency Stability: $\pm 3 \times 10^{-6}$ with built-in TCXO or with external reference.
 4. For Commercial Application: Operating Temperature: -10~+50°C.
For Industrial Application: Operating Temperature: -20~+60°C.
For other Application: Operating Temperature: -40~+70°C, -55~+85°C.



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SMD Frequency Synthesizer 1 to 8GHz

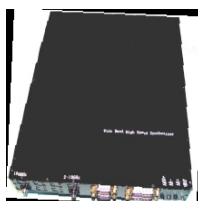
SMD Frequency Synthesizers														
P/N	Freq. Range (GHz)	Step Size (MHz)	Power Output (dBm) min	Flatness (dB) Typ.	Phase Noise (10MHz Step Size) (dBc/Hz)					Hamonics ³ (dBc) max	Spurious (dBc) max	Switching Speed ⁴ (us)	Power Supply (V/mA) Typ.	Case
					Freq. (GHz)	@1 KHz	@10 KHz	@100 KHz	@1 MHz					
					1	2	4	8						
SFS1020	1 - 2	0.1 to 10	+10	□ ±1.5	1	-104	-106	-106	-125	-10	-65	□ 40	+12/50	SFS-1
					2	-98	-100	-100	-120				+12/100	
SFS2040	2 - 4	0.1 to 10	+10	□ ±1.5	2	-98	-100	-100	-120	-10	-65	□ 40	+12/100	SFS-1
					4	-92	-94	-94	-105				+12/150	
SFS4080	4 - 8	0.1 to 10	+10	□ ±1.5	4	-92	-94	-94	-105	-10	-65	□ 40	+12/100	SFS-1
					8	-86	-88	-88	-100				+12/200	

- Notes:**
1. Narrowband SMD Frequency Synthesizer also available
 2. Frequency Stability: $\pm 3 \times 10^{-6}$ with built-in TCXO or with external reference
 3. Harmonics: □ -30~-50dBc with frequency range <80% octave
 4. Switching Speed: □ 40us (10MHz Step Size)
 5. For Commercial Application: Operating Temperature: -10~+50°C
 For Industrial Application: Operating Temperature: -20~+60°C
 For other Application: Operating Temperature: -40~+70°C、-55~+85°C

Miniature Fast Switching Synthesizer 0.4 to 2.8GHz

Miniature Fast Switching Synthesizers														
P/N	Freq. Range (MHz)	Step Size (MHz)	Power Output (dBm) min	Flatness (dB) Typ.	Phase Noise (dBc/Hz)					Harmonics ⁴ (dBc) max	Spurious (dBc) max	Switching Speed (ns)	Power Supply (V/mA) Typ.	Case
					Freq. (MHz)	@1 KHz	@10 KHz	@100 KHz	@1 MHz					
					400	550	900	2400	1300					
MFSS04055	400-550	10	+13	□ ±1.5	400	-106	-108	-125	-140	-10	-60	□ 50	+3.3/800	TBD
					550	-106	-108	-125	-140				+5/200	
MFSS0924	900-2400	100	+13	□ ±1.5	900	-100	-102	-110	-120	-10	-60	□ 50	+3.3/800	TBD
					2400	-96	-98	-110	-120				+5/200	
MFSS1328	1300-2800	100	+13	□ ±1.5	1300	-100	-102	-110	-120	-10	-60	□ 50	+3.3/800	TBD
					1800	-96	-98	-110	-120				+5/200	

- Notes:**
1. Narrowband Miniature Fast Switching Synthesizer also available
 2. Max Frequency Point is 16.
 3. Frequency Stability: $\pm 3 \times 10^{-6}$ with built-in TCXO or with external reference
 4. Harmonics: □ -30~-50dBc with frequency range <80% octave
 5. For Commercial Application: Operating Temperature: -10~+50°C
 For Industrial Application: Operating Temperature: -20~+60°C
 For other Application: Operating Temperature: -40~+70°C、-55~+85°C



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Wideband High Speed Synthesizer 0.01 to 18GHz

Wideband High Speed Synthesizers														
P/N	Freq. Range (GHz)	Step Size (MHz)	Power Output (dBm) min	Flatness (dB) Typ.	Phase Noise (dBc/Hz)					Harmonic s (dBc) max	Spurious (dBc) max	Switching Speed (ns)	Power Supply (V/mA) Typ.	Case
					Freq. (GHz)	@1 KHz	@10 KHz	@100 KHz	@1 MHz					
WHSS00120	0.01-2	0.1	+13	□ ±1.5	0.01	-140	-145	-148	-	-50	-65	□ 200	TBD	
					2	-110	-112	-120	-140					
WHSS20180	2-18	0.1 to 10	+13	□ ±1.5	2	-110	-112	-120	-140	-50	-65	□ 200	TBD	
					18	-90	-92	-100	-120					
WHSS001180	0.01-18	0.1 to 10	+13	□ ±1.5	0.01	-140	-145	-148	-	-50	-65	□ 200	TBD	
					18	-90	-92	-100	-120					

- Notes:**
1. Wideband High Speed Synthesizer also available.
 2. Frequency Stability: $\pm 1 \times 10^{-7}$ with built-in OCXO or with external reference.
 3. For Commercial Application: Operating Temperature: -10~+50°C.
For Industrial Application: Operating Temperature: -20~+60°C.
For other Application: Operating Temperature: -40~+70°C.

PXI RF Signal Generators 0.01 to 18GHz

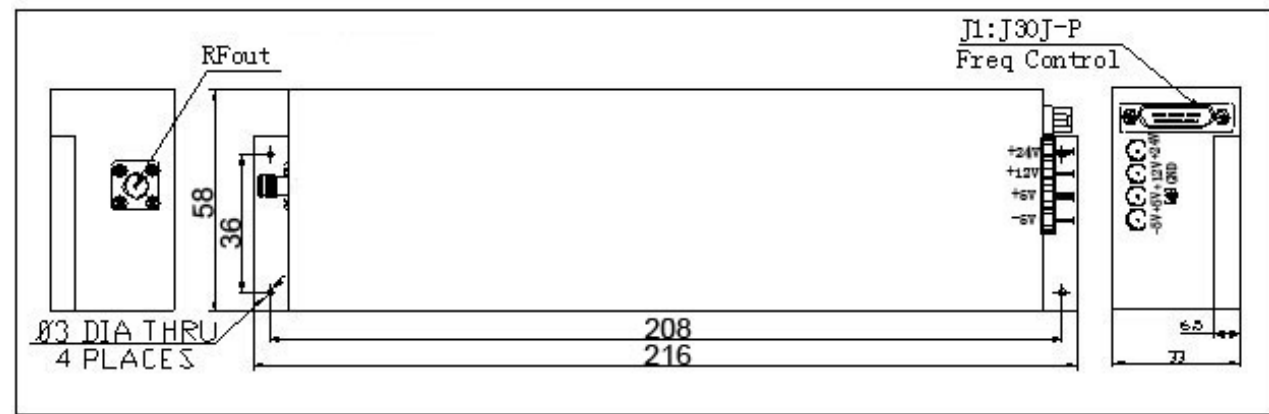
PXI RF Signal Generators														
P/N	Freq. Range (GHz)	Step Size (Hz)	Power Output (dBm) min	Flatness (dB) Typ.	Phase Noise (dBc/Hz)					Harmonic s (dBc) max	Spurious (dBc) max	Switching Speed (ms)	Power Supply (V/mA) Typ.	Case
					Freq. (GHz)	@1 KHz	@10 KHz	@100 KHz	@1 MHz					
PRSG00120	0.01-2	1	+13	□ ±1.5	0.01	-135	-140	-142	-	-40	-65	2	TBD	
					2	-105	-107	-120	-140					
PRSG20180	2-18	1	+13	□ ±1.5	2	-105	-107	-120	-140	-50	-65	2	TBD	
					18	-85	-87	-100	-120					
PRSG001180	0.01-18	1	+13	□ ±1.5	0.01	-135	-140	-142	-	-40	-65	2	TBD	
					18	-85	-87	-100	-120					

- Notes:**
1. Narrowband PXI RF Signal Generator also available.
 2. Frequency Stability: $\pm 1 \times 10^{-7}$ with built-in OCXO or with external reference.
 3. For Commercial Application: Operating Temperature: -10~+50°C.
For Industrial Application: Operating Temperature: -20~+60°C.
For other Application: Operating Temperature: -40~+70°C.

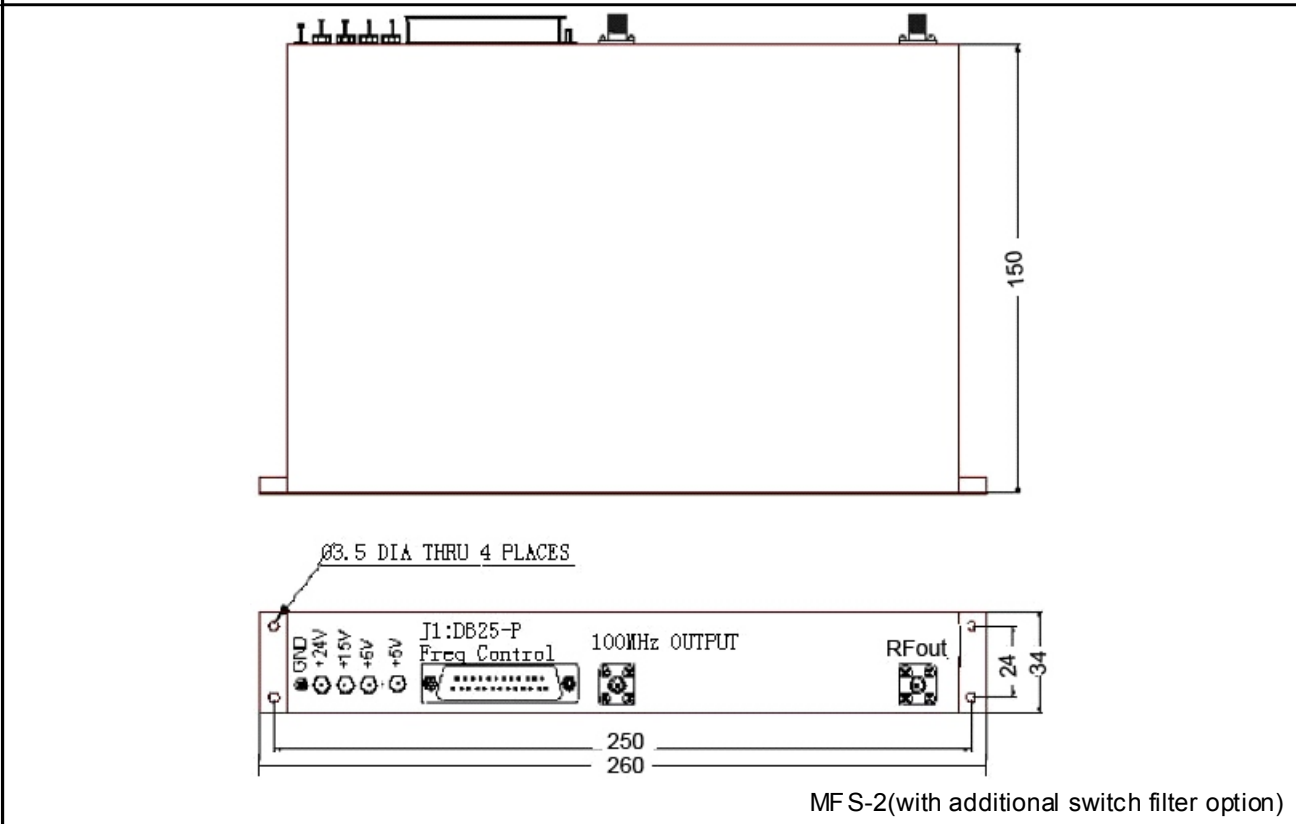
Outline Drawings (Size: mm)

Frequency Control Port J1: TTL Control (J30J-P or DB25-P)

PIN Number	Item	Description
1-16	F0-F 15	Frequency Code F0-F15 3.3-5V level
17	LD	Lock Indication
18-24	NC	NC (Self Test, Non-connection)
25	GND	Ground

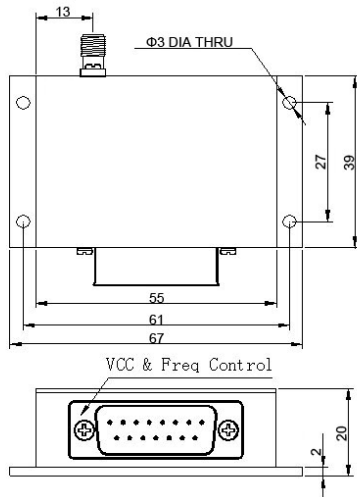


MFS-1



Frequency Control Port(DB15 PIN)

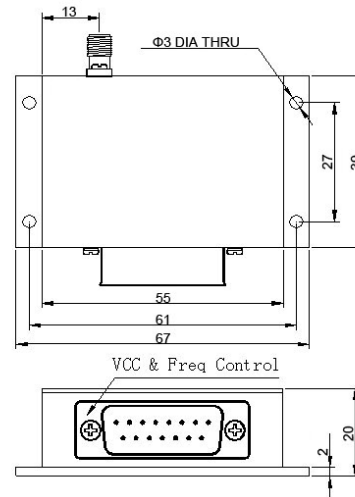
PIN Number	Item	Description
1-9	F0-F8	Parallel Frequency Code F0-F8, 3.3-5V, TTL level
10	GND	Ground
11,12	VCC	Power Supply
13	LD	Lock Indication
14,15	NC	NC(Self Test, Non-connection)



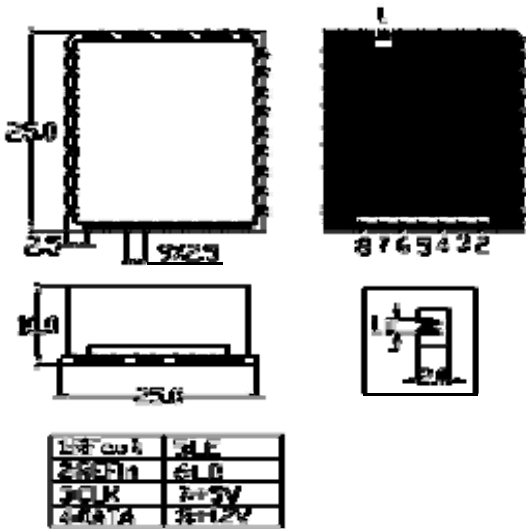
UFS-1

Frequency Control Port(DB15 PIN)

PIN Number	Item	Description
1-9	F0-F8	Frequency Control, PI0, SPI, RS232, RS485 protocol choice
10	GND	Ground
11,12	VCC	Power Supply
13	LD	Lock Indication
14,15	NC	NC(Self Test, Non-connection)



KFS-1



SFS-1