Microwave Frequency Synthesizers

POLARIS

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Microwave Frequency Synthesizers

Descriptions

Polaris' Microwave Frequency Synthesizers (PMFS synthesizers) operate in the frequency range from 3.4 GHz to 35 GHz and are categorized into fixed frequency synthesizers (PMFS-F synthesizers), variable frequency synthesizers (PMFS-V synthesizers), and high power synthesizers (PMFS-P synthesizers).

The PMFS synthesizers employ a fractional-N PLL architecture to provide fine frequency resolution with excellent spurious and phase noise performance. The PMFS synthesizers are available in a variety of configurations, including a RF output power and output frequency range options.

The PMFS-F synthesizers can be easily customized to any fixed frequency upon request between 3.4 GHz and 35 GHz and the PMFS-V synthesizers can change the output frequency with very simple programming command. The PMFS-V synthesizers have a non-volatile memory feature that will return to the last set frequency when power is turned on. The PMFS-P synthesizers are a high power fixed frequency synthesizers that output RF power up to 20 dBm.

Microwave Frequency Synthesizers

Features

- Very wide output frequency range from 3.4 GHz to 35 GHz
- Microwave fractional-N PLL synthesizer with low noise floor
- Easily customizable to any fixed frequency upon request (PMFS-F synthesizers)
- Very simple programming command to change the output frequency (PMFS-V synthesizers)
- High RF output power up to 20 dBm (PMFS-P synthesizers)
- Internal MCU with high performance
- Low reference spurious
- Fine frequency step size
- Phase lock indicator alarm
- Single supply voltage
- Small size

Applications

- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Local Area Networks (LAN)
- Point to point and point to multipoint microwave links

PMFS-F synthesizers - Fixed frequency synthesizers

Descriptions

Polaris' Microwave Frequency Synthesizers (PMFS synthesizers) operate in the frequency range from 3.4 GHz to 35 GHz and are categorized into fixed frequency synthesizers (PMFS-F synthesizers), variable frequency synthesizers (PMFS-V synthesizers), and high power synthesizers (PMFS-P synthesizers). The PMFS synthesizers employ a fractional-N PLL architecture to provide fine frequency resolution with excellent spurious and phase noise performance.

The PMFS-F synthesizers can be easily customized to any fixed frequency upon request between 3.4 GHz and 35 GHz.

Features

- Very wide output frequency range from 3.4 GHz to 35 GHz
- Microwave fractional-N PLL synthesizer with low noise floor
- Easily customizable to any fixed frequency upon request
- Fine frequency step size
- Low reference spurious
- Phase lock indicator alarm
- Single supply voltage
- Small size

Applications

- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Local Area Networks (LAN)
- Point to point and point to multipoint microwave links

Specifications

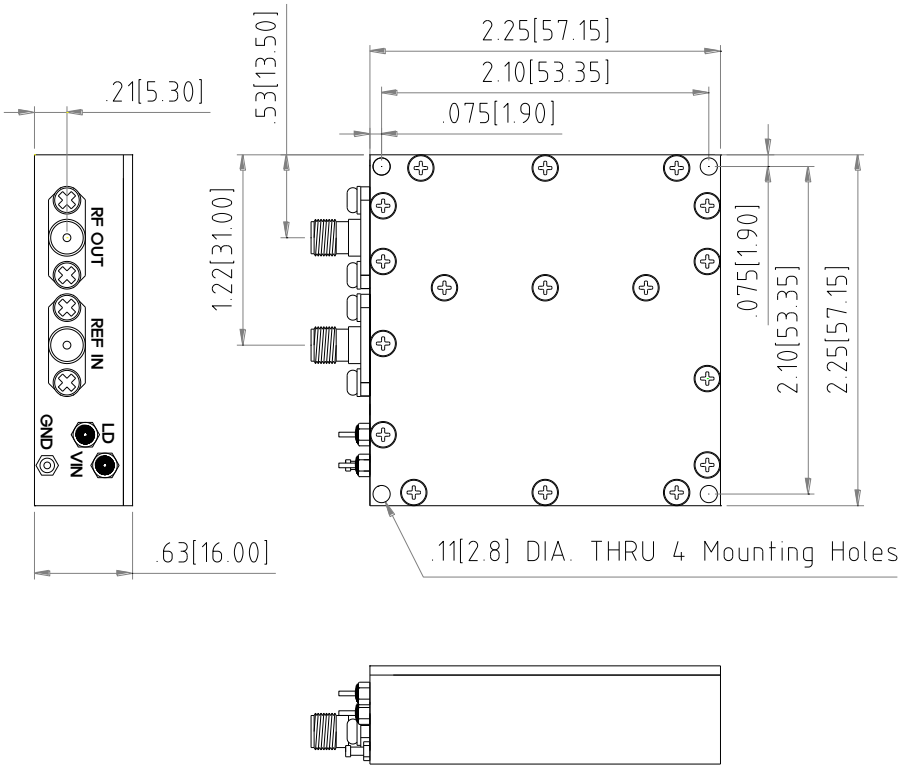
Parameters		Units	Specifications				Remarks
			Min.	Typ.	Max.		
Single Frequency		GHz	3.4 to 35				Option-F1: 3.4 to 6.8 Option-F2: 6.8 to 9 Option-F3: 9 to 13.6 Option-F4: 13.6 to 24 Option-F5: 24 to 35
Frequency Step Size		MHz	0.001	1	125		
Impedance (Input/Output)		Ω	50				
RF Output Power at 25 ℃		dBm	11	16			
PFD/Refernce Spurious		dBc		-75	-65		
Integer Boundary Spurious		dBc	Contact Factory				
Harmonics		dBc		-25	-15		
Frequency Stability		ppm	Same as the reference				
Phase Noise (typ.) at PFD=100 MHz	Frequency / Offset		3.4 GHz	6.8 GHz	12 GHz	24 GHz	
	100 Hz	dBc/Hz	-91	-85	-79	-73	
	1 KHz		-103	-97	-91	-85	
	10 KHz		-108	-102	-96	-90	
	100 KHz		-110	-104	-98	-92	
	1 MHz		-133	-127	-121	-115	
External Reference	Frequency	MHz	10 to 250				
	Input Power	dBm	-4	0	4		
Phase Lock Indicator Alarm		-	3.3 V (Locked), 0V (Unlocked)				
Supply Voltage		Vdc	5.5	6	6.5		
Current Consumption		mA	Consult Factory				
Connectors	RF Output (RF OUT)	-	SMA-Jack				
	Reference (REF IN) Note1	-	SMA-Jack				
	Supply Voltage (Vin)	-	EMI Feed-thru				
	Phase Lock-Detect (LD)	-	EMI Feed-thru				
	GND	-	Turret Thread Mount Terminal				
Operating Temperating		℃	-20 to 70				
Storage Temperature		℃	-40 to 85				
Housing (L x W x H)		mm	57.15 x 57.15 x 16				

Note 1

The 'REF IN' connector is not provided on units with internal reference.

Housing Drawings

The 'REF IN' connector is not provided on units with internal reference.



Ordering Information

PMFS-F-a-bbb-c...c-dd-ee

- a: I = Internal Reference
  E = External Reference
- bbb: Reference Frequency (MHz)
- c...c: Output Frequency (MHz)
- dd: Output Power (dBm)
- ee: Supply Voltage

Example

PMFS-F-E-100-23950-13-6

. E: External Reference
. 100: Reference Frequency = 100 MHz
. 23950: Output Frequency = 23,950 MHz
. 13: Output Power = 13 dBm
. 6: Supply Voltage = 6 V

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PMFS-V synthesizers – Variable frequency synthesizers

Descriptions

Polaris' Microwave Frequency Synthesizers (PMFS synthesizers) operate in the frequency range from 3.4 GHz to 35 GHz and are categorized into fixed frequency synthesizers (PMFS-F synthesizers), variable frequency synthesizers (PMFS-V synthesizers), and high power synthesizers (PMFS-P synthesizers). The PMFS synthesizers employ a fractional-N PLL architecture to provide fine frequency resolution with excellent spurious and phase noise performance.

The PMFS-V synthesizers can change the output frequency with very simple programming command. The PMFS-V synthesizers have a non-volatile memory feature that will return to the last set frequency when power is turned on.

Features

- Very wide output frequency range from 3.4 GHz to 35 GHz
- Microwave fractional-N PLL synthesizer with low noise floor
- Very simple programming command to change the output frequency
- Fine frequency step size
- Low reference spurious
- Phase lock indicator alarm
- Single supply voltage
- Small size

Applications

- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Local Area Networks (LAN)
- Point to point and point to multipoint microwave links

Specifications

Parameters		Units	Specifications				Remarks
			Min.	Typ.	Max.		
Center Frequency		GHz	3.4 to 35				Option-F1: 3.4 to 6.8 Option-F2: 6.8 to 9 Option-F3: 9 to 13.6 Option-F4: 13.6 to 24 Option-F5: 24 to 35
Frequency Variable Range		-	10 % of Center Frequency				
Frequency Step Size		MHz	0.001	1	125		
Impedance (Input/Output)		Ω	50				
RF Output Power at 25 ℃		dBm	11	16			
PFD/Refernce Spurious		dBc		-75	-65		
Integer Boundary Spurious		dBc	Contact Factory				
Harmonics		dBc		-25	-15		
Frequency Stability		ppm	Same as the reference				
Phase Noise (typ.) at PFD=100 MHz	Frequency / Offset		3.4 GHz	6.8 GHz	12 GHz	24 GHz	
	100 Hz	dBc/Hz	-91	-85	-79	-73	
	1 KHz		-103	-97	-91	-85	
	10 KHz		-108	-102	-96	-90	
	100 KHz		-110	-104	-98	-92	
	1 MHz		-133	-127	-121	-115	
External Reference	Frequency	MHz	10 to 250				
	Input Power	dBm	-4	0	4		
Phase Lock Indicator Alarm		-	3.3 V (Locked), 0V (Unlocked)				
Supply Voltage		Vdc	5.5	6	6.5		
Current Consumption		mA	Consult Factory				
Frequency Control		-	See Note 1				
Connectors	RF Output (RF OUT)	-	SMA-Jack				
	Reference (REF IN) Note 2	-	SMA-Jack				
	Supply Voltage (Vin)	-	EMI Feed-thru				
	Phase Lock-Detect (LD)	-	EMI Feed-thru				
	UART TXD (TXD)	-	EMI Feed-thru				3.3 V UART Interface
	UART RXD (RXD)	-	EMI Feed-thru				3.3 V UART Interface
	GND	-	Turret Thread Mount Terminal				
Operating Temperating		℃	-20 to 70				
Storage Temperature		℃	-40 to 85				
Housing (L x W x H)		mm	57.15 x 57.15 x 16				

Note 1

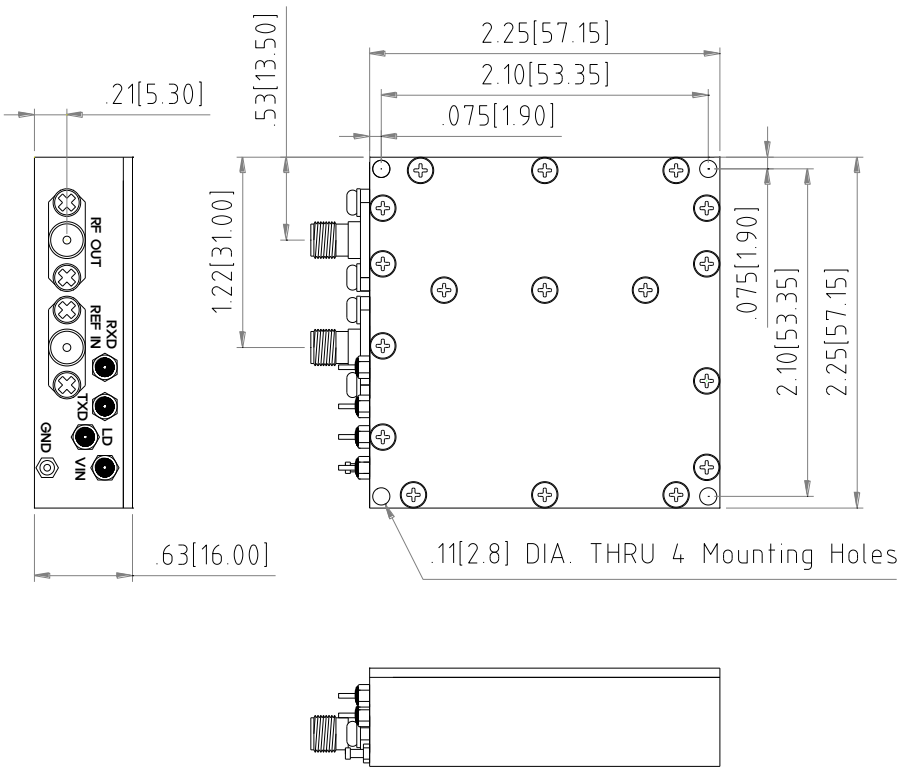
- Connect the UART interface cable between PMFS-V synthesizer and PC/Controller.
- Set communication protocol of the PC or Controller.
  Baud rate (115200), Data (8bit), Parity (none), Stop (1bit), Flow control (none)
- Enter a programming command to change the output frequency in KHz.
  F xxxxxxxx (example: F 6401000 → 6,401,000 KHz)

Note 2

- The 'REF IN' connector is not provided on units with internal reference.

Housing Drawings

The 'REF IN' connector is not provided on units with internal reference.



Ordering Information

PMFS-V-a-bbb-c...c-d...d-ee-ff

- a: I = Internal Reference
  E = External Reference
- bbb: Reference Frequency (MHz)
- c...c: Center Frequency (MHz)
- d...d: Variable Range of Center Freq. (MHz)
- ee: Output Power (dBm)
- ff: Supply Voltage

Example

PMFS-V-E-100-20000-2000-13-6

. E: External Reference
. 100: Reference Frequency = 100 MHz
. 20000: Output Frequency = 20,000 MHz
. 2000: Variable Range = 2,000 MHz
. 13: Output Power = 13 dBm
. 6: Supply Voltage = 6 V

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PMFS-P synthesizers – High power synthesizers

Descriptions

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The PMFS-P synthesizers are a high power fixed frequency synthesizers that output RF power up to 20 dBm.

Features

- Very wide output frequency range from 3.4 GHz to 35 GHz
- Microwave fractional-N PLL synthesizer with low noise floor
- High output power up to 20 dBm
- Easily customizable to any fixed frequency upon request
- Fine frequency step size
- Low reference spurious
- Phase lock indicator alarm
- Single supply voltage
- Small size

Applications

- VSAT/Satellite Communication Systems
- Test Equipment
- Microwave Transmitters & Receivers
- Cable TV Links (CATV)
- LMDS
- Local Area Networks (LAN)
- Point to point and point to multipoint microwave links

Specifications

Parameters		Units	Specifications				Remarks
			Min.	Typ.	Max.		
Single Frequency		GHz	3.4 to 35				Option-F1: 3.4 to 6.8 Option-F2: 6.8 to 9 Option-F3: 9 to 13.6 Option-F4: 13.6 to 24 Option-F5: 24 to 35
Frequency Step Size		MHz	0.001	1	125		
Impedance (Input/Output)		Ω	50				
RF Output Power at 25 ℃		dBm	17	20			
PFD/Refernce Spurious		dBc		-75	-65		
Integer Boundary Spurious		dBc	Contact Factory				
Harmonics		dBc		-25	-15		
Frequency Stability		ppm	Same as the reference				
Phase Noise (typ.) at PFD=100 MHz	Frequency / Offset		3.4 GHz	6.8 GHz	12 GHz	24 GHz	
	100 Hz	dBc/Hz	-91	-85	-79	-73	
	1 KHz		-103	-97	-91	-85	
	10 KHz		-108	-102	-96	-90	
	100 KHz		-110	-104	-98	-92	
	1 MHz		-133	-127	-121	-115	
External Reference	Frequency	MHz	10 to 250				
	Input Power	dBm	-4	0	4		
Phase Lock Indicator Alarm		-	3.3 V (Locked), 0V (Unlocked)				
Supply Voltage		Vdc	5.5	6	6.5		
Current Consumption		mA	Consult Factory				
Connectors	RF Output (RF OUT)	-	SMA-Jack				
	Reference (REF IN) Note1	-	SMA-Jack				
	Supply Voltage (Vin)	-	EMI Feed-thru				
	Phase Lock-Detect (LD)	-	EMI Feed-thru				
	GND	-	Turret Thread Mount Terminal				
Operating Temperating		℃	-20 to 70				
Storage Temperature		℃	-40 to 85				
Housing (L x W x H)		mm	57.15 x 57.15 x 27				

Note 1

The 'REF IN' connector is not provided on units with internal reference.

Housing Drawings

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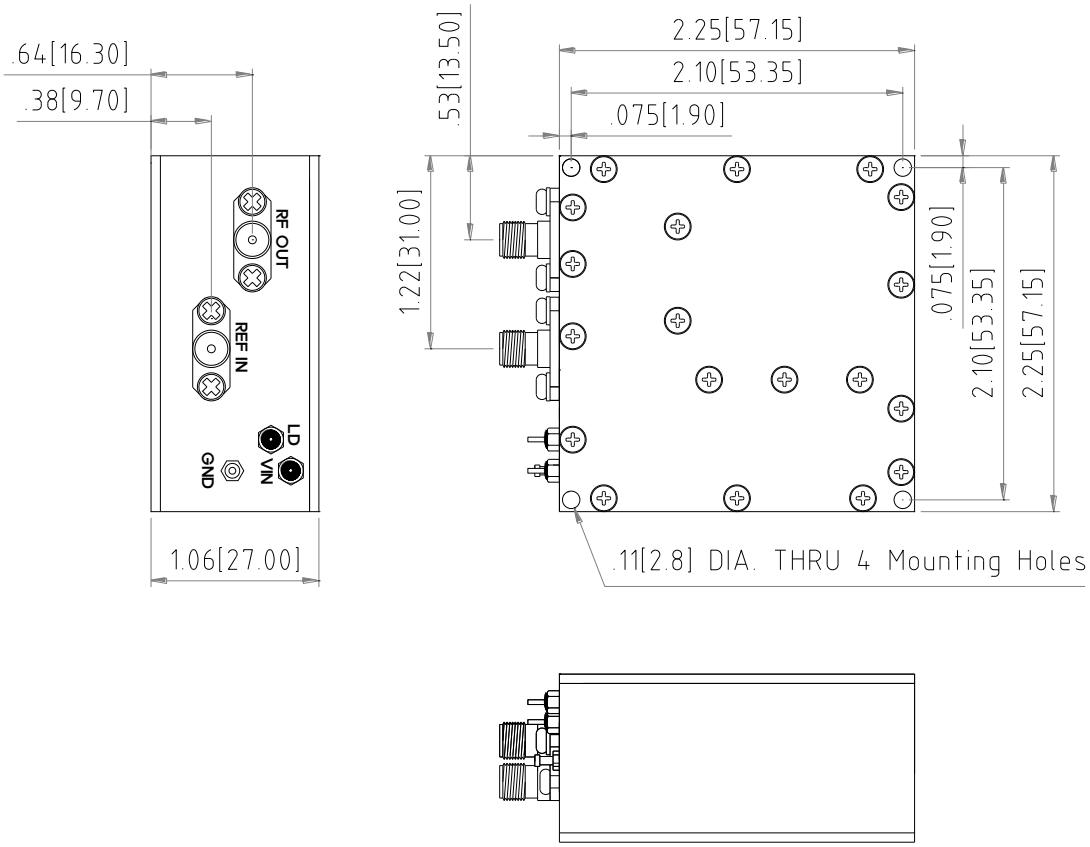

Ordering Information

PMFS-P-a-bbb-c...c-dd-ee

- a: I = Internal Reference
  E = External Reference
- bbb: Reference Frequency (MHz)
- c...c: Output Frequency (MHz)
- dd: Output Power (dBm)
- ee: Supply Voltage

Example

PMFS-P-E-100-23950-20-6

. E: External Reference
. 100: Reference Frequency = 100 MHz
. 23950: Output Frequency = 23,950 MHz
. 20: Output Power = 20 dBm
. 6: Supply Voltage = 6 V

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