Surface Mount PLL Synthesizers

POLARIS

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Surface Mount PLL Synthesizers

Descriptions

Polaris' surface mount PLL synthesizers operate in the frequency range from 3.4 GHz to 13.6 GHz and are available in a surface mountable package measuring 26.2 mm x 26.2 mm x 4.0 mm. These synthesizers employ a microwave fractional-N PLL architecture to provide fine frequency resolution with excellent spurious and phase noise.

These synthesizers are categorized into fixed frequency synthesizers (PSPS-F synthesizers) and variable frequency synthesizers (PSPS-V synthesizers).

The PSPS-F synthesizers can be easily customized to any fixed frequency upon request and the PSPS-V synthesizers can change the output frequency with very simple programming command. The PSPS-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 13.6 GHz
- Microwave fractional-N PLL synthesizer with low noise floor
- Low reference spurious
- Fine frequency step size
- Internal MCU with high performance
- Phase lock indicator alarm
- Single supply voltage
- Internal LDO regulator with low noise
- Very simple programming command to change output frequency (PSPS-V synthesizers)
- Small size

Applications

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

PSPS-F synthesizers - Fixed frequency synthesizers

Specifications

Parameters		Units	Specifications				Remarks
			Min.	Typ.	Max.		
Single Frequency		GHz	3.4	-	13.6		
Frequency Step Size		MHz	0.001	1	125		
Impedance (Input/Output)		Ω	50				
RF Output Power		dBm	-7		2		
Spurious		dBc		-75	-65		
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	10 GHz	12 GHz	
	100 Hz	dBc/Hz	-91	-85	-82	-80	
	1 KHz		-103	-97	-94	-92	
	10 KHz		-108	-102	-99	-97	
	100 KHz		-110	-104	-101	-99	
	1 MHz		-133	-127	-124	-122	
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	-	250	300		
Operating Temperating		℃	-20 to 70				Option T: -35 to 50
Storage Temperature		℃	-40 to 85				
Size (L x W x H)		mm	26.2 x 26.2 x 4.0				

Ordering Information

PSPS-F-aaa-b...b

- aaa: Reference Frequency (MHz)
- b...b: Output Frequency (MHz)

Example

PSPS-F-50-12595

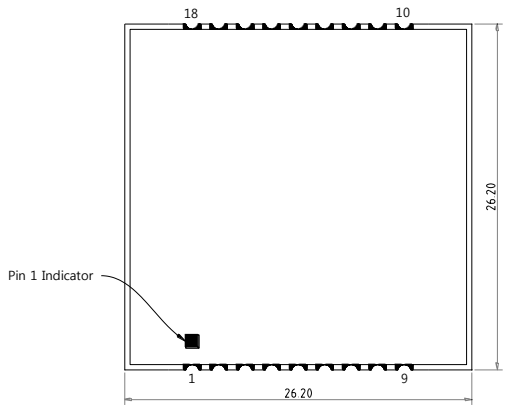
. 50: Reference Frequency 50 MHz

. 12595: Output Frequency 12,595 MHz

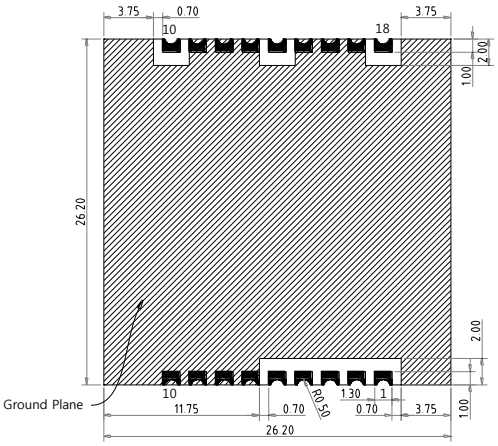
Outline Drawings

Dimensions are in millimeters.

Top View



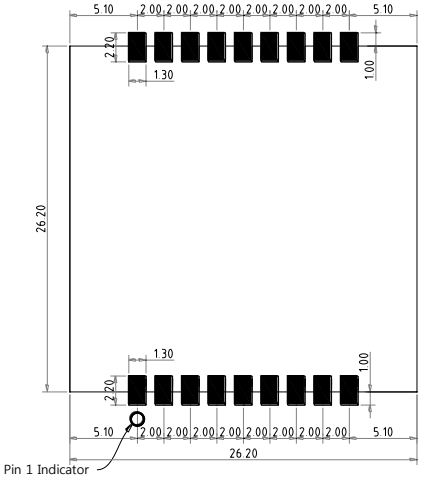
Bottom View



Denotes copper layout with solder mask over bare copper.

Denotes copper land pattern free of solder mask.

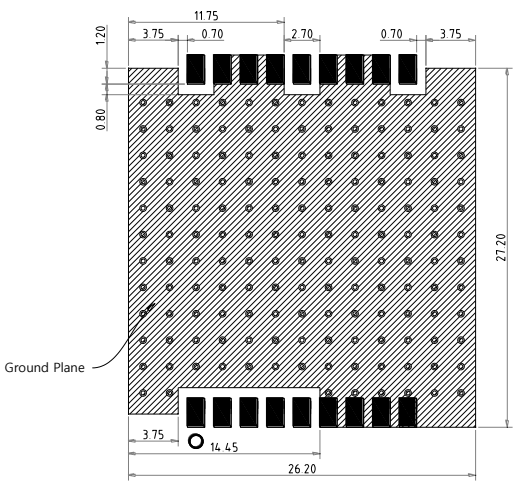
Footprint



Denotes copper land pattern free of solder mask.

Front View

Recommended PCB Layout



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Several holes of Φ 0.3 on ground plane are recommended for good grounding.

Pin Out Details	
1	N/C (Open)
2	N/C (Open)
3	N/C (Open)
4	N/C (Open)
5	REF_IN (Reference Input)
6 – 9	GND
10	LD (Lock Detect)
11 – 13	GND
14	RF_OUT (RF Output)
15 - 17	GND
18	VCC

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PSPS-V synthesizers - Variable frequency synthesizers

Specifications

Parameters		Units	Specifications				Remarks
			Min.	Typ.	Max.		
Center Frequency		GHz	3.4		13.6		
Maximum Frequency Variable Range		-	±10 % of Center Frequency				
Frequency Step Size		MHz	0.001	1	125		
Impedance (Input/Output)		Ω	50				
RF Output Power		dBm	-7		2		
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	10 GHz	12 GHz	
	100 Hz	dBc/Hz	-91	-85	-82	-80	
	1 KHz		-103	-97	-94	-92	
	10 KHz		-108	-102	-99	-97	
	100 KHz		-110	-104	-101	-99	
	1 MHz		-133	-127	-124	-122	
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	-	250	300		
Programming Commands		-	See Note 1				
Operating Temperating		℃	-20 to 70				Option T: -35 to 50
Storage Temperature		℃	-40 to 85				
Size (L x W x H)		mm	26.2. x 26.2 x 4.0				

Note 1

- UART communication protocol:
  Baud rate (115200), Data (8bit), Parity (none), Stop (1bit), Flow control (none)
- Command for changing the output frequency (KHz):
  F xxxxxxxx (example: F 6401000 = 6,401,000 KHz)
- Results are returned as ASCII strings terminated with <CR><LF>

Ordering Information

PSPS-V-aaa-b...b-c...c

- aaa: Reference Frequency (MHz)
- b...b: Center Frequency (MHz)
- c...c: Frequency Variable Range (MHz)

Example

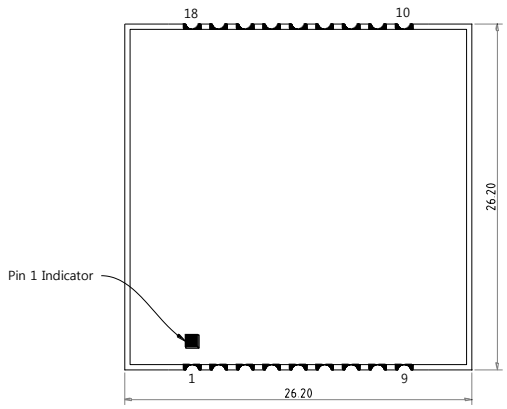
PSPS-V-100-10930-500

. 100: Reference Frequency 100 MHz
. 10930: Output Frequency 10,930 MHz
. 500: Frequency Variable Range 500 MHz

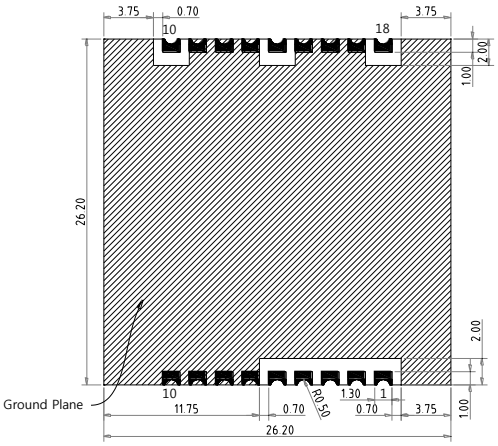
Outline Drawings

Dimensions are in millimeters.

Top View



Bottom View



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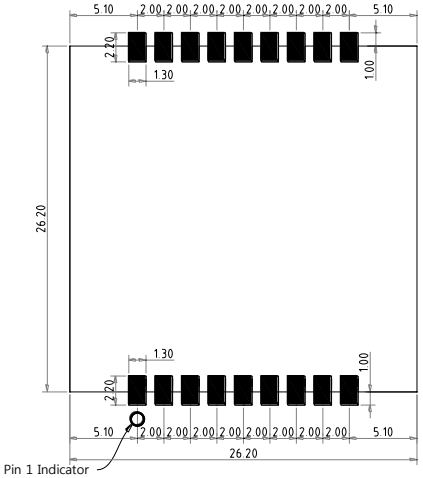

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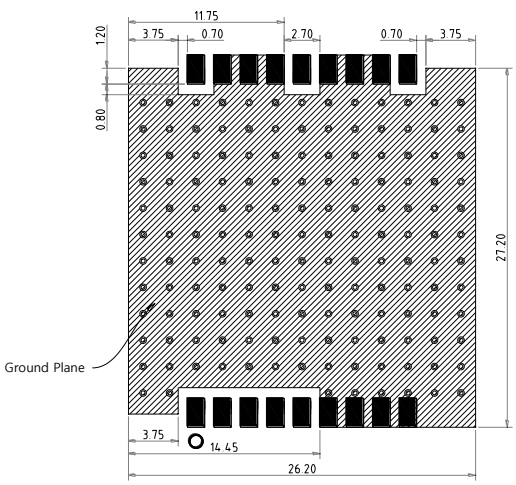
Front View

Recommended PCB Layout



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Pin Out Details	
1	N/C (Open)
2	N/C (Open)
3	TXD (UART TXD)
4	RXD (UART RXD)
5	REF_IN (Reference Input)
6 – 9	GND
10	LD (Lock Detect)
11 – 13	GND
14	RF_OUT (RF Output)
15 - 17	GND
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