PLL Synthesizer LO-45C

Features

- Wide Frequency Range
- 100 kHz Step Size
- Internal 10 MHz TCXO
- Milled aluminium enclosure

Applications

- Test & Measurement
- Research & Development
- Signal Generators

General Description

The LO-45C-series PLL synthesizers are available for various frequency ranges up to 4 GHz. The synthesizer is based on a combination of VCO, phase-locked loop and a microcontroller unit in a single enclosure.

The frequency can be easily set using I^2C or USB interface. Using the USB interface you can integrate the synthesizer easily in your lab bench test setup or use it with a embedded PC application. The I^2C interface is suitable for application in which you would like to integrate the synthesizer in your self developed instrument, controlled by your microcontroller.

All synthesizers have a integrated attenuator so you can set the output power to your desired level. The level can be set using a 12 Bit digital to analog converter (0-4095).

The synthesizer have an integrated 10 MHz temperature compensated oscillator (TCXO) as a frequency reference. The signal is fed out using a SMA connector. If you apply an external 10 MHz signal with 10 dBm of power, the internal TCXO will be shut down and the synthesizer uses your external reference.

Absolute Maximum Ratings

RF input power (Ref. Input)	+16 dBm
DC supply voltage	16.5 V
Storage temperature	-40 ... +80° C

CAUTION
Electrostatic sensitive devices!
Observe handling precautions!

RoHS compliant in accordance with EU directive (2011/65/EU)

Version 1 (20160115)

AME HF-Technik Alexander Meier • Kapellenweg 6 • 92366 Hohenfels
Telefon (09472) 911898 • Fax 911884 www.ame-hft.de

SELECTION GUIDE / SPECIFICATIONS

Available Synthesizer Models and Specifications

Model	Frequency Range (MHz)	
	min	max
LO-45C-0050	50	95
LO-45C-0150	75	150
LO-45C-1000	100	190
LO-45C-0148	127	148
LO-45C-0200	200	350
LO-45C-0485	485	520
LO-45C-1000	1000	1000
LO-45C-0400	400	1000
LO-45C-0750	750	1150
LO-45C-0988	988	1048
LO-45C-1200	1200	1550
LO-45C-2000	1200	2000
LO-45C-1505	1505	1505
LO-45C-1600	1600	2500
LO-45C-1975	1975	2015
LO-45C-2000	2000	2000
LO-45C-3000	2000	3000
LO-45C-2130	2130	2500
LO-45C-2600	2600	2800
LO-45C-3350	3350	3600
LO-45C-3970	3970	3970

Other frequency ranges are available as customized synthesizers on request.

RF Output	Min	Typ	Max
Step Size	100 kHz / 1 MHz (Option SZ1) / 10 MHz (Option SZ10)		
Frequency Accuracy (internal Reference)		2 ppm	
Frequency Stability (internal Reference) vs Temperature (+10...+40 °C) long term stability (aging, 1 year)			 1 ppm 1 ppm
Output Power[1]		0...+10 dbm	
Harmonics[1]		-10...40 dBc	<-10 dBc
Spurious [1]		<-60 dBc	
Phase Noise[12]		-80 dBc / Hz @ 10 kHz, Step Size 100 kHz	
Lock Time[1]		1...10 ms	

Frequency Reference	Min	Typ	Max
Output Frequency Power		 10 MHz -23 dBm	
Input Frequency Power	 +10 dBm	 10 MHz +10 dBm	 +16 dBm

Power Supply	Min	Typ	Max
DC supply voltage	15 V_{DC}	15 V_{DC}	15 V_{DC}
Supply current (typ.)		200...250 mA	

[1] Typical values. Exact values depends on Synthesizer Model.
[2] Phase Noise is improved for narrowband synthesizers or increased step size (Opt. SZ1/SZ10)

SPECIFICATIONS

General / Enviromental Specifications	Min	Typ	Max
Enclosure		milled aluminium	
Outline dimensions (LxWxH) without connectors		78,5x60x20 mm	
Weight (net)		180 g	
Operating temperature range		+10 ... +40° C	
Connectors		SMA female (RF, Ref) SUB D 9 PIN male (Control)	

Pinout 9 PIN SUB D Connector

PIN	
1	+15 V Power Supply
2	+5V USB Connector
3	USB D- (white)
4	USB D+ (green)
5	GND (USB/Power Supply)
6	Alarm Out (Open Collector, out of lock)
7	I^2C SDA
8	I^2C SCK
9	Ext. ALC Input (Option ALC), DC 0...1 V

Output Power Setting

Without the ALC option you can set the output power of the synthesizer using an integrated attenuator. The power level will be set as a 12 bit value (0-4095), 0 means lowest output power, 4095 means maximum output power.
The output power is not leveled.

Reference Input/Output

Without the REF or REFOUT Option, the reference port connector is a combined input/output. If you will apply an external reference frequency of 10 MHz and +10 dBm, the internal TCXO will be shut down. Please take care to use at least a +10 dBm signal to avoid spurious signals due to insufficient reference signal level.

Available Options

Option ALC:
For leveled output power using an external (PA and) detector. The ALC loop set point will be set by the user interface (e.g. USB) as a 12 bit value (0-4095 = 0-2V). The ALC loop actual value (0-2 V DC) will be connected to PIN 9 of the SUB-D connector. For example, if you set the set point to value 2048 (=1 V), the ALC loop levels the output power until the ALC actual value will be 1 V DC. A set point of 0 will be the lowest output power.

Option REFOUT: Reference Port is Output only
With this option the reference port is an 10 MHz reference output only.

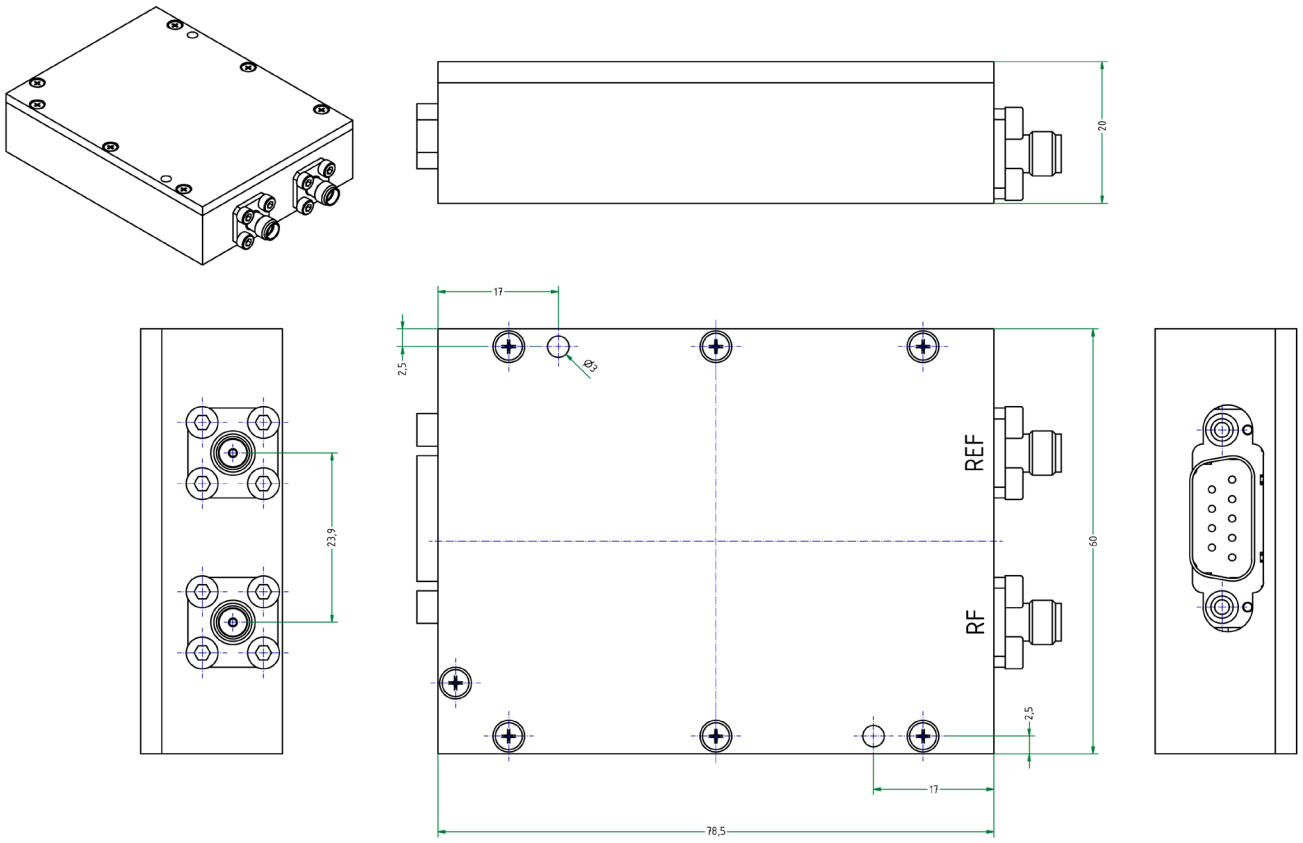
Option REF: Reference Port is Input only (0 dBm)
With this option the reference port is an 10 MHz / 0 dBm input port only. You will just need a 0 dBm reference instead of +10 dBm without this option.

Option SZ1: Step Size 1 MHz (improved Phase Noise)
The phase noise will be much lower if the step size is increased.

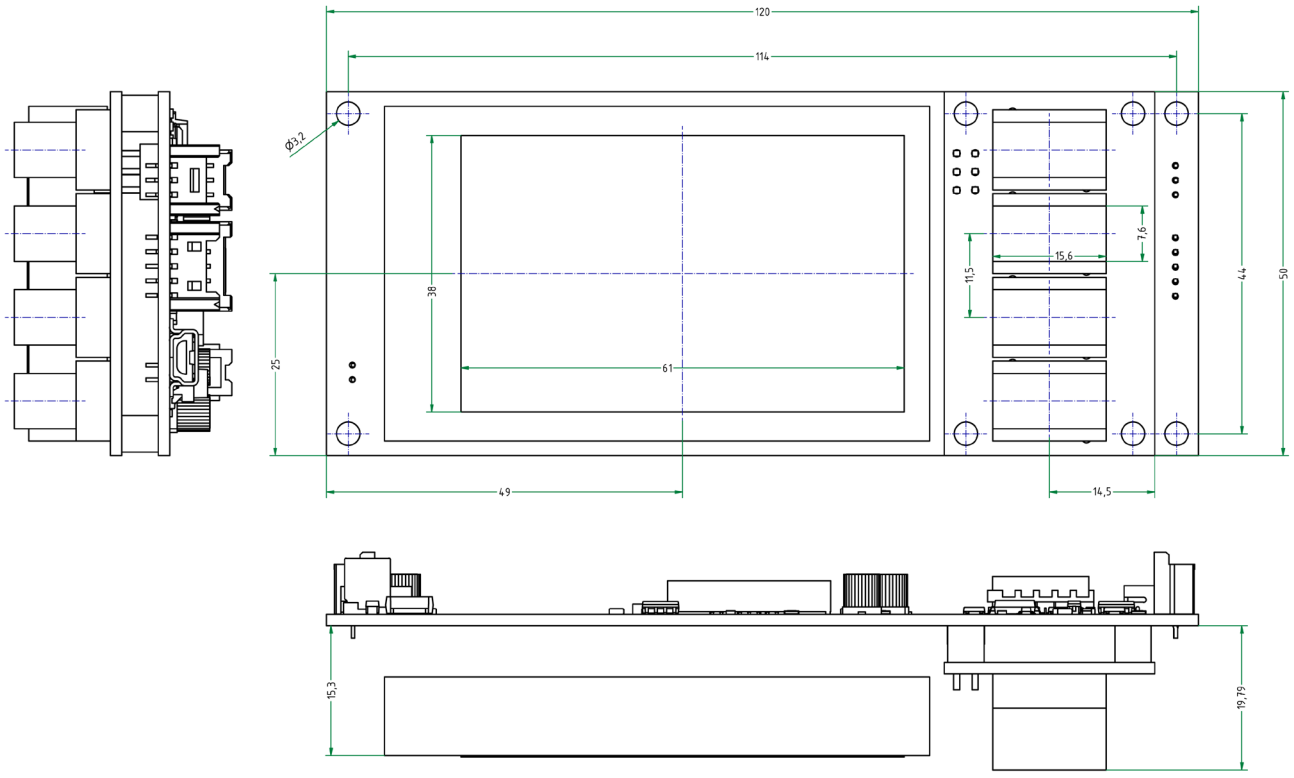
Option SZ10: Step Size 10 MHz (improved Phase Noise)
The phase noise will be much lower if the step size is increased.

OUTLINE DRAWING

PLL Synthesizer



Frequency Input Modul



TEST REPORT

Test Report for customized Synthesizer only

Parameter	Min	Typ	Max
Model		-	
Frequency Range	-		-
Output Power	-		-
Phase Noise		- dBc/Hz @ 100 Hz -dBc/Hz @ 1 kHz - dBc/Hz @ 10 kHz - dBc/Hz @ 100 kHz - dBc/Hz @ 1 MHz	