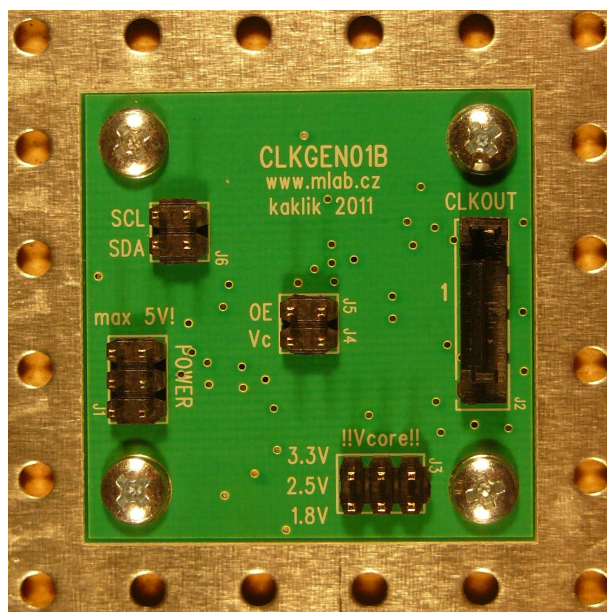# Clock generator CLKGEN01B

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Abstract

The purpose of this module is afford of reliable high quality frequency source with high stability. In addition this frequency source has a wide tunable range and very low noise at differential output. Because of this parameters it is perfectly suitable for clocking of high-end ADC in SDR applications.

Contents

1 Technical parameters
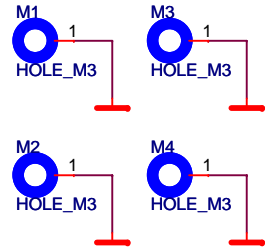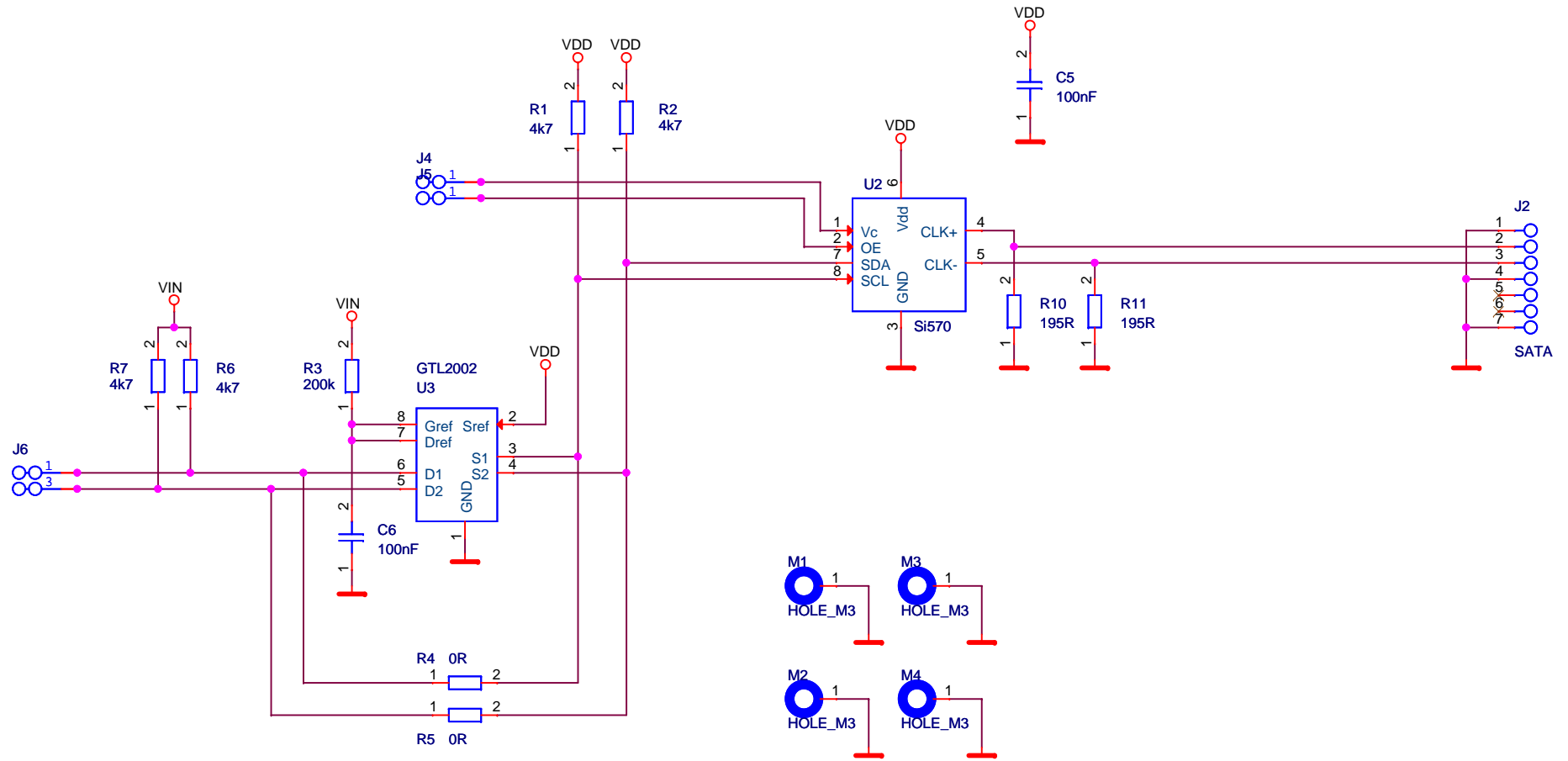
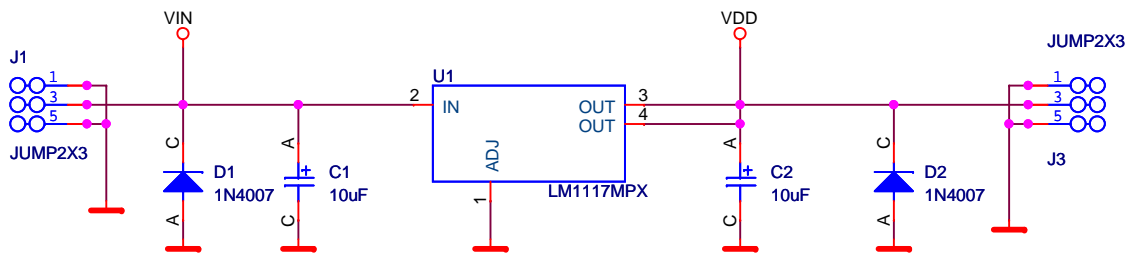| Parameter	Value	Note
POWER voltage	max 5V	160mA
Core power Vcore	+1,8V, 2,7V, 3,3V	Depends of chip type Si5XX
Frequency range	10 - 1500 MHz	Depends of chip type Si5XX, usually 10-810MHz
Phase jitter	< 0,3ps	For Si570's types

2 Description of construction

2.1 Circuit

The circuit of this module is optimized for direct connection microprocessor which has same or higher output logic levels over to Si5XX chip. An voltage level translator is integrated in this design for low cost applications the voltage level translator can be bypassed by null resistors.

In applications where the voltage level translator is used the internal lower voltage can be stabilised by integrated linear voltage stabilizer. But external supply voltage (5V) must not be excess.

Schematic — Clock generator

VDD VDD

R1 4k7
R2 4k7

VDD
C5 100nF

J4
J5

U2 Si570
Vc
OE
SDA
SCL
Vdd
CLK+
CLK-
GND

R10 195R
R11 195R

J2
SATA

VIN VIN

R7 4k7
R6 4k7
R3 200k

VDD

GTL2002
U3
Gref Sref
Dref
D1 S1
D2 S2
GND

C6 100nF

J6

M1 HOLE_M3
M3 HOLE_M3
M2 HOLE_M3
M4 HOLE_M3

R4 0R
R5 0R

M5 FIDU
M6 FIDU_PASTE

J1 JUMP2X3
VIN

D1 1N4007
C1 10uF

U1 LM1117MPX
IN
OUT
OUT
ADJ

VDD
C2 10uF
D2 1N4007

JUMP2X3
J3

Firma

MLAB

Author
kaklik

Size A4	Project Name Clock	Schematic Name Clock generator	Rev A

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As is shown in schematic diagram the output is presumed as differential, but single sided CMOS output chip can be populated.

2.2 EMI supression

As consequence of purpose this module which is a signal generator this module can be a serious source of parasite "noise". Thus proper EMI isolation is required. Good suppression of noise radiation can be achieved by using high conductive base such as ALBASE.

2.3 Mechanical construction

The module is mounted on base by four screws. The prefect working required high conducive mount on metal base.

3 Testing

Because of need high frequency blocking up to 1.5GHz the module is designed on two layer strongly metalized PCB.

3.0.1 Setting

On start up a preset frequency is sent at output. But there is option to calibrate the clock source by I2C bus.

4 Software tools

In combination with other modules the generator can be tunned via computer. One of simple solution is use of PIC18F4550v01A module and firmware from [2] This allow use of every software working with [3], for example USBSynth [4].

References

[1] Old original construction of Si570 Board http://wb6dhw.com/inactive.html

[2] PIC emulator of USB synthesizer DG8SAQ http://www.qrpradio.org/pub/softrocks/manuals/Softr Group Files 210109/21 9V1AL/02 UBW Emulator/README.txt

[3] Wideband RF Synthesizer http://www.mydarc.de/dg8saq/SI570/index.shtml

[4] USB Synth http://www.mydarc.de/dg8saq/hidden/USB_Synth3.zip