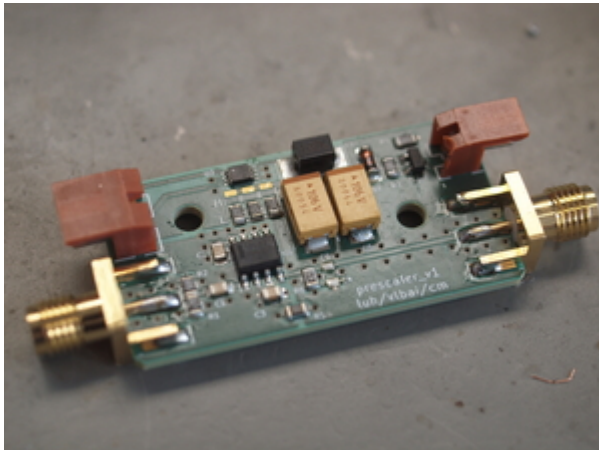


Prescaler OnSemi MC12080



*/

Funktion

This PCB is some kind of evaluation board for the

OnSemi MC12080

. This is a programmable prescaler with divisions of 10,20,40, and 80. The chip is supposed to work up to 1.1 GHz.

This PCB is intended to be used to scale down a beat note to a more usable frequency range. In specific to be measured after downscaling by a RedPitaya, which is then used for offset locking.

Optionen und Alternativen

The logic inputs for divisor selection is optional. It can also be used in a fixed mode by soldering resistors selectively.

Performance

first tests show that it works for up to 1 GHz (for now the largest frequency tested) and divisions of 80. More will follow.

tested for div = 80 (logic: 3x Low):

frequency [MHz]	min amplitude [dBm]	max amplitude [dBm] **
1	—	—
2	—	—
5	7.8	> 16
10	2	>16
20	-4	
50	-11.8	

frequency [MHz]	min amplitude [dBm]	max amplitude [dBm] **
100	-17	
200	-22.8	
500	-26.5	8
1000 *	-34	

notes:

* with $R_L = 820 \text{ Ohm}$ and $C_L = 10 \text{ pF}$ there is not the full 1.2V output swing (ca 900 mV). Maybe changing the load helps.

** start of decreasing output swing

Datum

Beginn des Projekts: März 2018

Status

prototype in testing phase

effort for reproduction: 3 PCBs left, MC12080 needs to be ordered

Entwickler

Christian Meiners, meiners@iqo.uni-hannover.de

Anwender

VLBAI

Schaltungsprinzip

The schematic is based on the testing circuit given in the
datasheet

. The logic input is based on a triple schmitt trigger, to (if necessary) convert from 3.3 V to 5 V logic. The power supply is expected to be 5 V and is filtered onboard. I recognized that the power supply is only 4.2 V coming from the RedPitaya, but it seems to work anyway.

Schaltplan

- schematic

in PDF-format

- the source is created via KiCad and can be found on the git server:
<https://git.iqo.uni-hannover.de/vlbai/prescaler.git>

Layout

- Size: 43 x 22 mm
- Supply: +5V
- Logic; 3x 3.3 V or 5V optional
- Eingang: SMA, up to 1.1 GHz
- Ausgang: SMA $f_{\text{out}} = f_{\text{in}} / \text{div}$ (1.1 GHz / 10 = 110 MHz max)
- Der Bestückungsdruck: [start_layout.pdf](#)
- Die Bestückungsliste: [start_bom.pdf](#), [start_bom.xls](#)
 - zipped gerber files for PCB ordering
- Die Source des Layouts im pcb-Format liegt auf der [Download-Seite des Wiki](#).



Gehäuse



Test



Bedienung



Bilder

Kalkulation

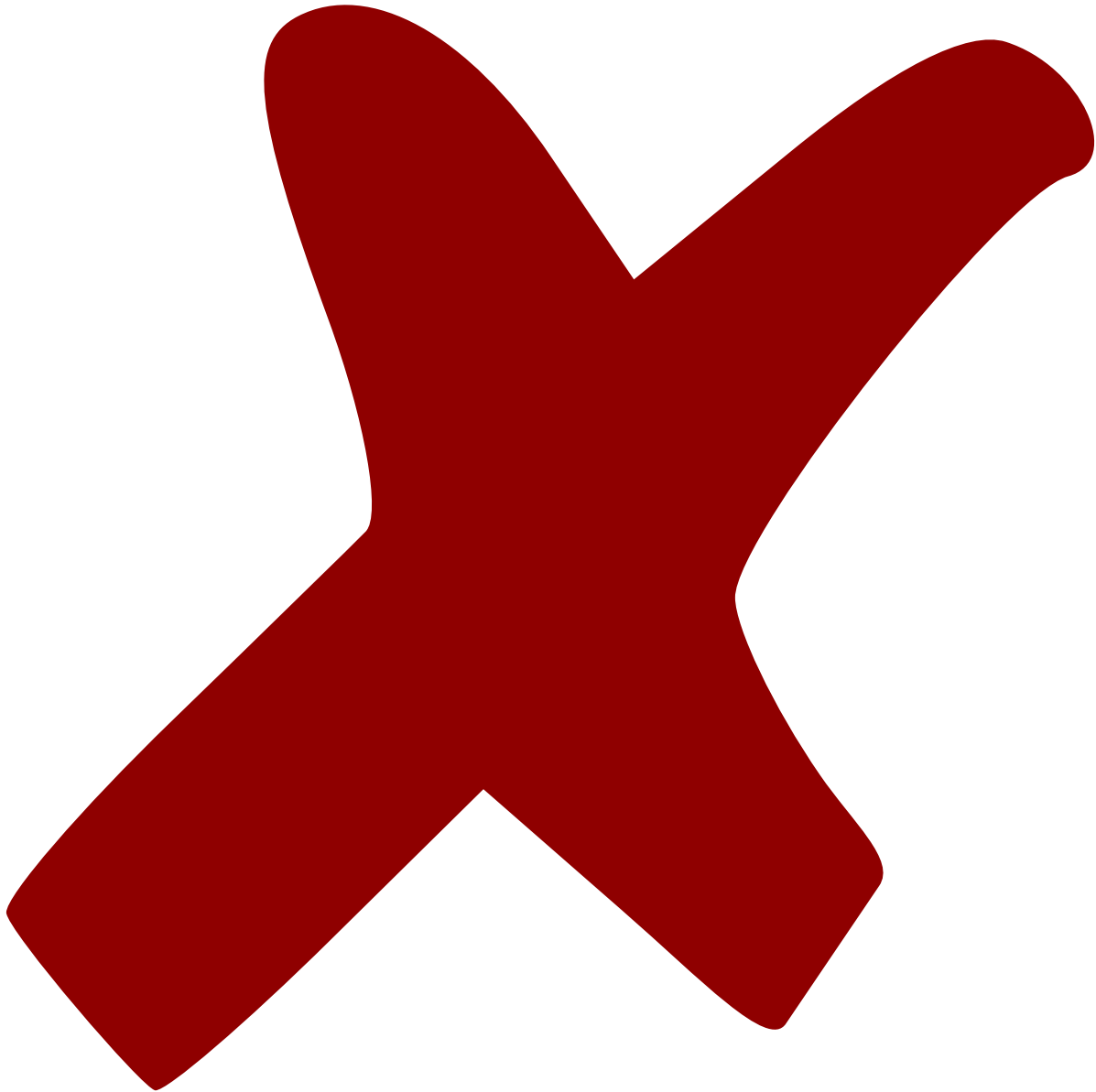


was	wieviel	E-Preis	Preis	Anmerkung
Leiterplatte	1x	??.?? €	€	1/n von XXX EUR
Gehäuse	1x	??.?? €	€	
*	?x	??.?? €	€	...
R,C	??x	0.02 €	€	Bauform 0805
Bestückung		??.00 €		bei SRM

was	wieviel	E-Preis	Preis	Anmerkung
Verschnitt			?.?? €	
		Summe	€	

Meckerliste

Was für die nächste Version zu tun ist: (



: verworfen,



: in Arbeit,



Schaltplan, aber noch nicht im Layout,

: im



: erledigt)

- there seems to be a DC offset on the output. maybe a highpass on the output would be nice to get rid of it. For now I solved this issue by cutting the line between the load resistor (changed to 470 Ohm) and the removed load capacitor and soldered a 10 nF capacitor there.
- the level of the logic input is not well defined, when disconnected. maybe add a pulldown.

From:

<https://elektroniq.iqo.uni-hannover.de/> - ElektronIQ

Permanent link:

<https://elektroniq.iqo.uni-hannover.de/doku.php?id=eigenbau:prescaler:start&rev=1522142788>

Last update: **2018/03/27 09:26**

