Comb/ Pulse Generator Module MD-CG1

Features of PulsGen-M

- **ECL compatible differential output**
- **Harmonics from 30 MHz to 18 GHz**
- **Typical output power of -35 dBm up to 4 GHz for a 200 MHz input signal**
- **Output amplitude ripple typically less than 3 dB_{pp} up to 4 GHz**
- **Broadband input allows generation of single pulses**

Applications of PulsGen-M

Direct IQ-generation
Frequency multipliers
Signal generator
Spectrum analysis
EMC source
Broad band test equipment

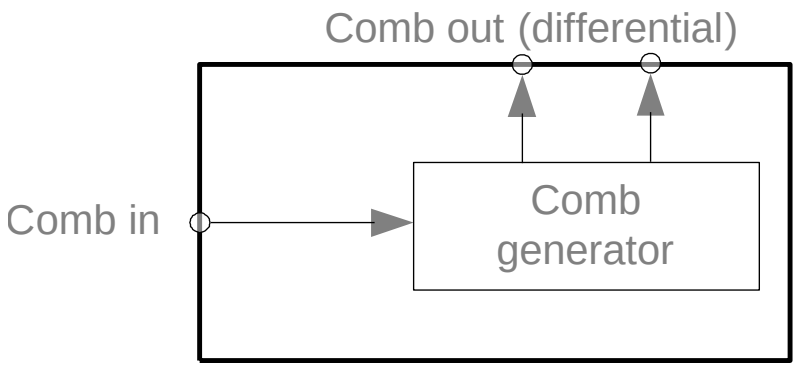

Fig. 1: Functional diagram of the comb/puls-generator module **PulsGen-M**.

Product description

Fig. 2 shows the comb/puls-generator module **PulsGen-M** (product number MG-CG1) in the simple application setup. It can be used with an external 30 MHz to 4 GHz signal source to drive this comb/puls-generator module. Power requirements for the external signal source are easy to meet. The PulsGen-M can be driven with 0 dBm input power. Other commercial comb/ pulse generators usually require higher input power so that in most cases the user needs an external amplifier to meet the comb generator input power requirements.
This is the reason, that every low power instrument can drive this comb/pulse generator. Arbitrary waveform generators as well as any high-speed D/D- or D/A-converter can drive this PulsGen-M. This combination allows to generate any IQ-signal in the GHz-range.

The output power of the comb/pulse generator depends upon the input frequency. For a 100 MHz input, the 100^{th} harmonic is a 10 GHz tone whereas for a 200 MHz input, the 50^{th} harmonic is a 10 GHz tone. The power of the respective harmonic will be 3 dB higher for a 200 MHz input as compared to a 100 MHz input. Therefore the user should select the correct input frequency to get the required output harmonic frequencies and power. Typical output harmonics power spectrums as well as time domain measurements of the MG-CG1 are shown in Fig. 3 to Fig. 6.

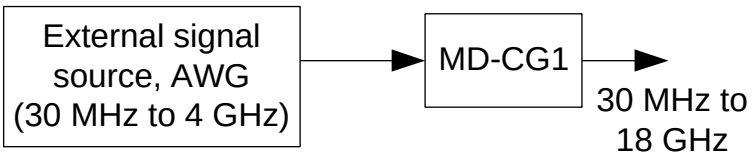

Fig. 2: MD-CG1 used with an external

Specifications

Parameter	Min	Typ	Max	Unit	Remarks
Comb in	0.03		4.0	GHz	
Comb input power	0		15	dBm	
Comb out	0.1		18	GHz	
Comb output power		-35		dBm	Up to 4 GHz for 200 MHz input
Amplitude Ripple		3		dB_{pp}	Up to 4 GHz for 200 MHz input
Comb output power		-58		dBm	At 10 GHz for 200 MHz input
Current consumption		150	200	mA	For + 5V and – 5V respectively

Electrical specification

Input power supply: ± 5 V_{DC} (2 cinch connectors).

Physical dimensions

Width x Depth x Height:	85 x 100 x 35 (mm).
Weight:	350 g.

Typical performance

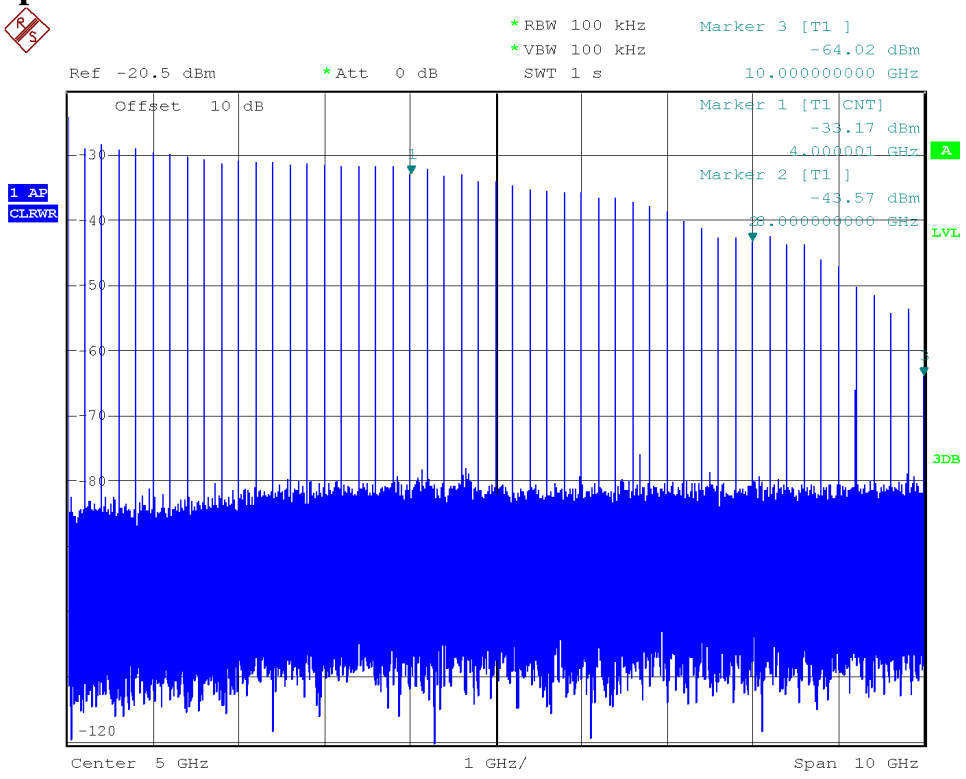

Fig. 3: MG-CG1 output spectrum up to 10 GHz for an input signal at with at 200 MHz

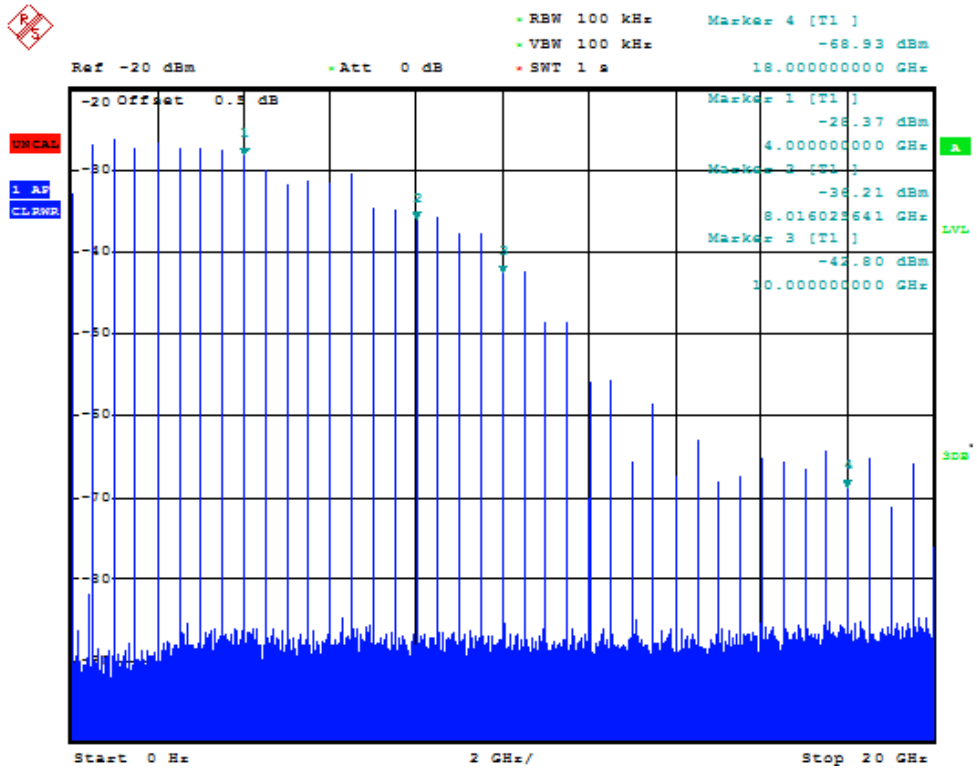

Fig. 4: MG-CG1 output spectrum up to 20 GHz for an input signal at 500 MHz

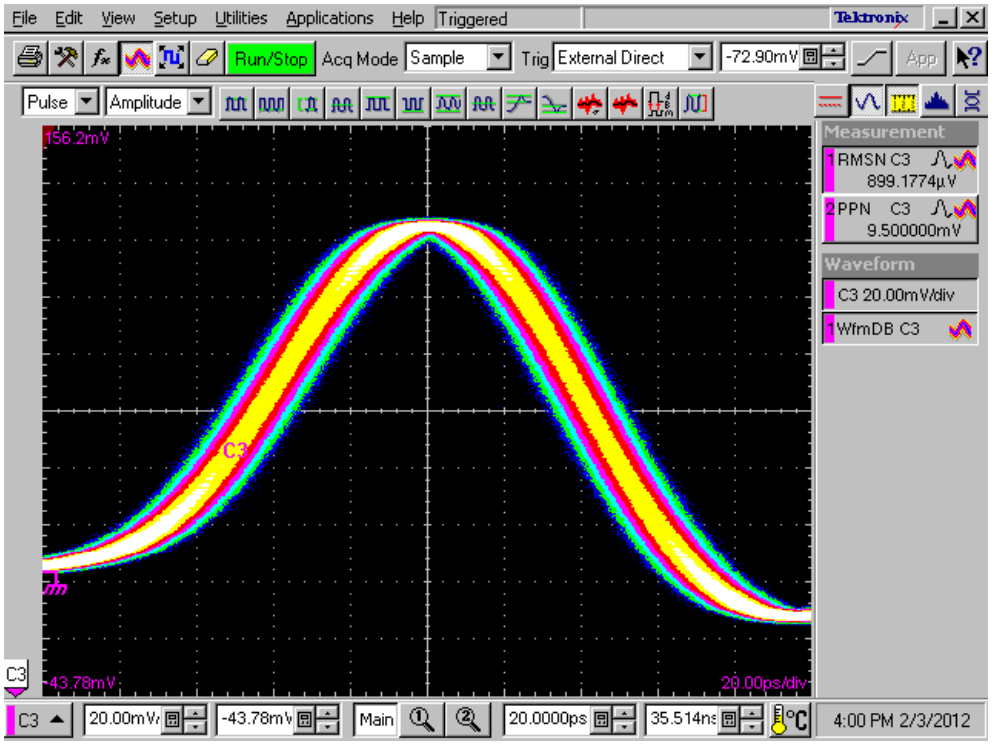

Fig. 5: Time domain measurement of a single spike for an input signal at 200 MHz

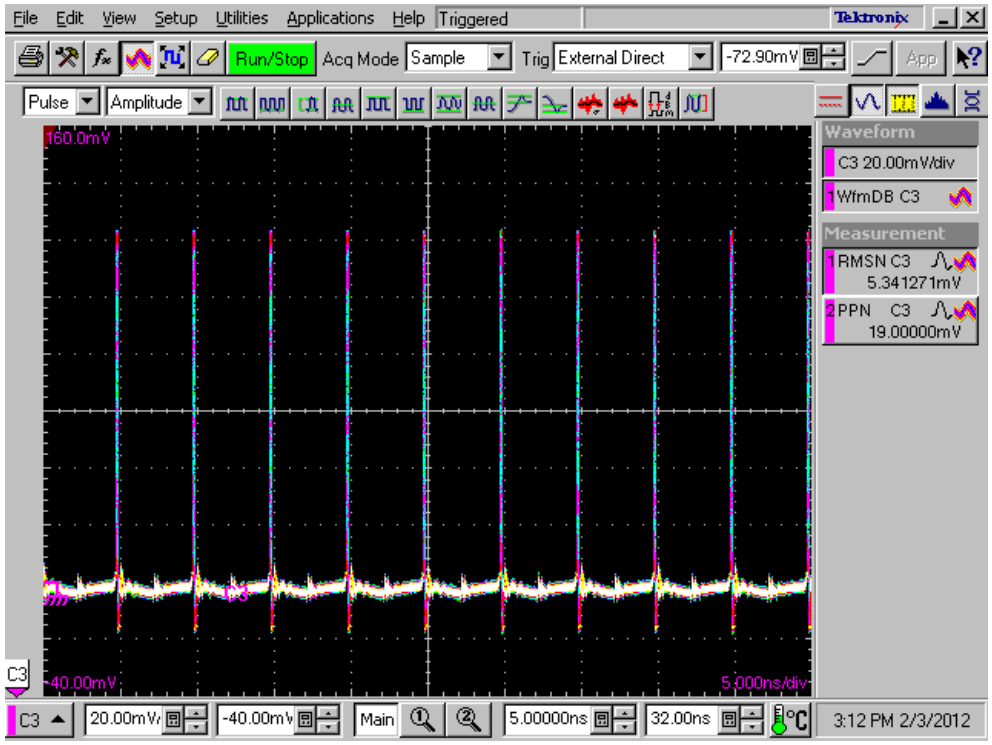

Fig. 6: Time domain measurement of a comb for an input signal at 200 MHz

Application Circuits

Frequency multiplier

Commonly comb generators are limited to a few hundred MHz input frequency. The MG-CG1 can cope with an input signal of up to 4 GHz.

With this set up the user can extend the frequency range of their synthesizer. For example if a user has a synthesizer going up to 3 GHz the 6th harmonic of the MG-CG1 will give 18 GHz output. Since each harmonic is separated by 3 GHz, it is easy to use a band pass filter to remove the unwanted frequency components. Fig. 7 shows the example setup.

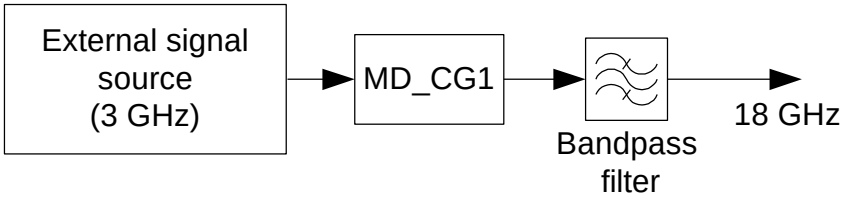

Fig. 7: PulsGen-M used to extend the frequency range of an external source.

Ordering number

Model: MG-CG1.

Contact information

Heuermann HF-Technik GmbH
Auf dem Anger 29, 52076 Aachen, Germany
Mail: Info@HHFT.de
Tel.: +49 2408/9379019 Fax: +49 2408/9379952