

Picosecond Pulse Generator Module

PPM0731



- Compact
- Long operation life time
- Extremely high voltage rise rate
- Low jitter

Based on Drift Step Recovery Diodes (DSRD) and Silicon Avalanche Shapers (SAS) - new types of semiconductor devices, which allow obtaining best-in-class voltage rise rate, high reliability, low jitter, and long operation lifetime.

PPM0731 pulse generator module can be used for the high-performance ultra-wideband (UWB) radars, and other applications which require high voltage picosecond rise time pulses with up to 50kV/ns voltage rise rate and low jitter. It has no internal triggering and requires external triggering pulse generator as well as external dual voltage DC power supply. PPM0731 has over temperature and over frequency protections, and temperature stabilization system which helps to reduce the temperature drift of the output pulses. Pulse generator module is designed for the operation with matched 50 Ohm load, for example, UWB antenna. In case of the operation with unmatched load please connect the generator by the cable with a length of 50 cm or more.

Pulse amplitude	6...7 kV (see Fig.2)
Pulse polarity, waveform	positive, bell-like
Pulse rise time	< 200 ps (120 ps typical)
Pulse width (FWHM)	< 500 ps (350 ps typical)
Max repetition rate	10 kHz (continuous)
Jitter (RMS)	< 20 ps
Jitter (peak-to-peak)	< 100 ps
Output connector	N type
Input triggering connector	SMA type
Triggering pulse	+5V, 10 ns ... 200 ns width
Power supply	
low voltage	+24V DC; 0.3A
high voltage	+160V DC; 0.3A

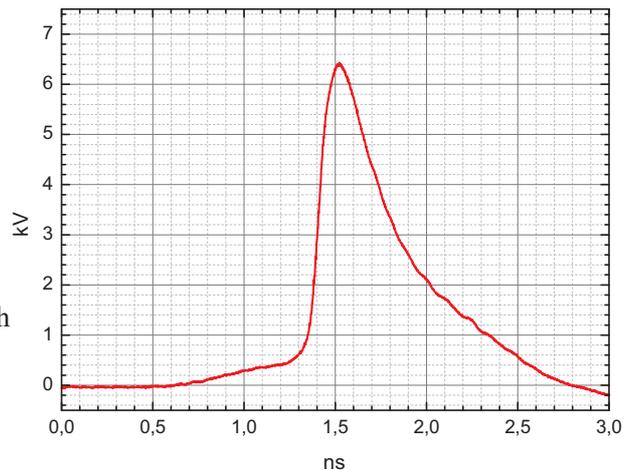
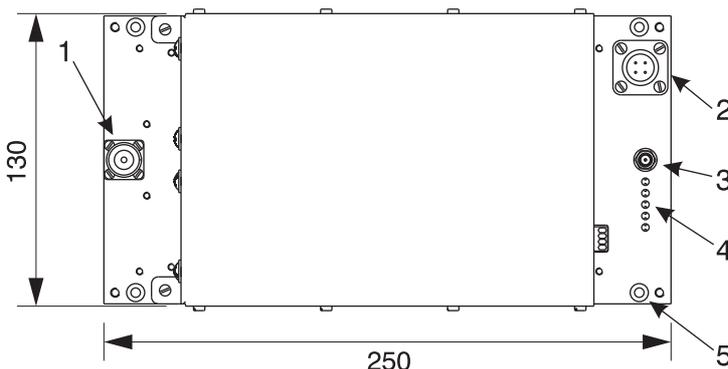
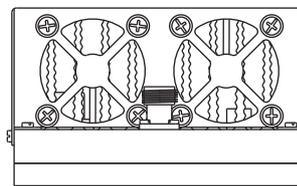
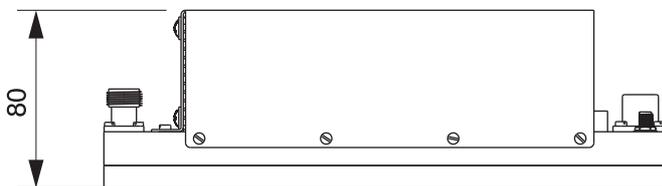


Fig.1. Typical output pulse waveform.



- 1 - output N-type connector
- 2 - power supply connector
- 3 - input triggering SMA connector
- 4 - control LED
- 5 - 4x mounting holes, 4.2mm dia, 222mm x 118mm footprint

*) All dimensions are in mm

see next page

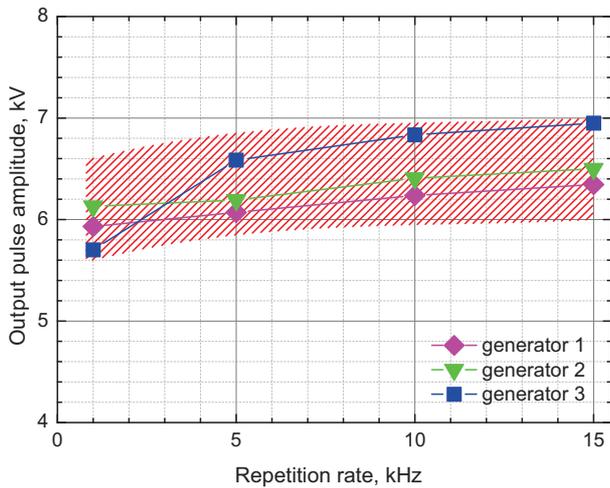


Fig.2. The pattern-filled area is the possible output pulse amplitudes depending on the repetition rate. As an example, measured amplitudes of three generators are presented.

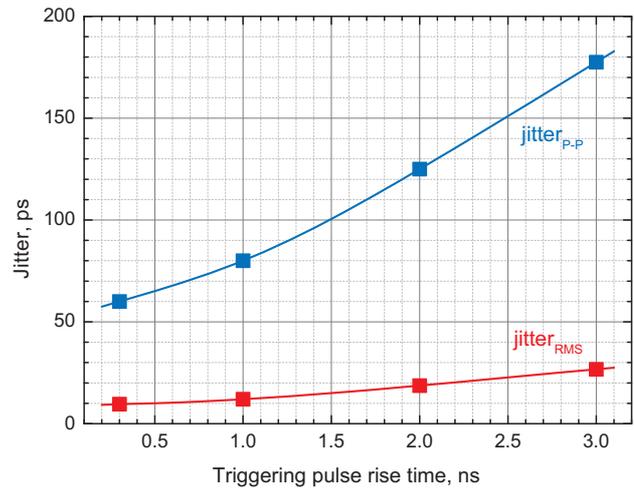


Fig.3. Output pulse jitter_{RMS} and jitter_{P-P} VS triggering pulse front rise time.

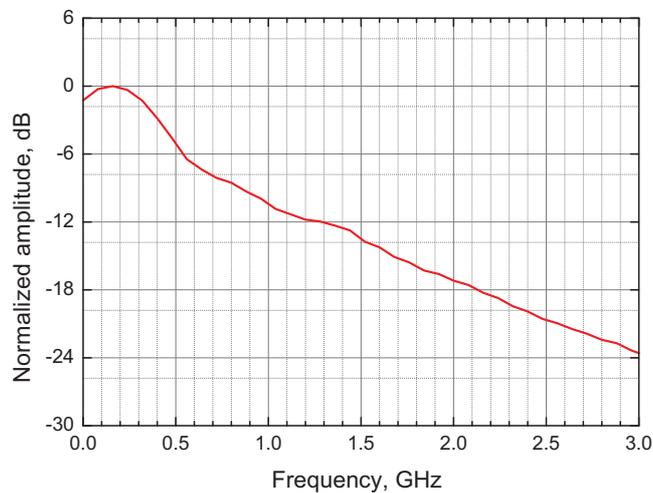


Fig.4. Output pulse spectrum.

PPM0731 delivery set includes:

1. PPM0731 pulse generator module.
2. PS601 fixed DC power supply voltage AC-DC converter.
3. N-SM141(50)-open semirigid 50 cm length output cable assembly with one N-type connector.
4. SMA-RG316(100)-SMA 100 cm length cable assembly with SMA connectors for the triggering pulses feeding.

Accessories:

1. PI-5/100 pulse inverter.
2. N-SM141(50)-N semirigid 50 cm length output cable assembly with two N-type connectors.

Recommended models of the triggering pulse generators:

1. LeCroy 9210 with 9214 or 9211 module (old, only used are available, but cheap and very good).
2. Berkeley Nucleonics 745T (inexpensive, excellent pulse front 350 ps, low pulse-to-pulse jitter, significant pulse width drift, min step of the pulse width 5 ns).
3. Stanford Research DG645 (good parameters).
4. Keysight 81160A (modern, excellent parameters, very expensive).
5. Tektronix AFG31251 (modern and good, but expensive; 2 ns triggering pulse rise time results in increased output pulse jitter).