Piezomechanik GmbH

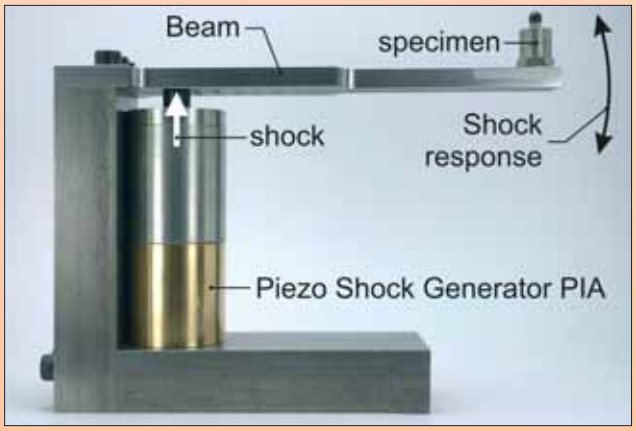
Piezo-Pyro-Shock-Simulator PPSS

The ignition of a pyro charge is used in launchers, space crafts to separate structural subsystems or in a destructive way in ammunitions. It is of highest interest to know the reaction of mechanical structures on such impacts with regard to potential damages and functional failures. Careful testing of mechanical, electronic or optical components with respect to high g - transient excitation is therefore a must. With the increasing degree of miniaturization with its specific high frequency eigenmodes, the need for high frequency containing transient excitation of structures became important.

For testing smaller components, the setup of conventional test arrangement using pyro-shockers, mechanical hammers etc. is exaggerated und bulky and allows rather low repetition rates.
Piezo-shockers are the alternative with its specific features

- High g-rates (Thousands of +/- g-s)
- High reproducibility of pulse shape
- Electrically variable pulse characteristics
- High repetition rates
- The PPSS can be operated as **high power shaker** by using a harmonic input signal

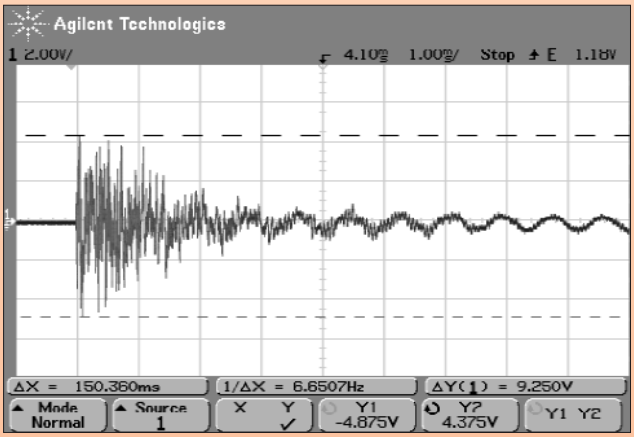
A piezo-shock-generator PIA is highly preloaded to a shock transfer-mechanism:
an extremely stiff steel beam in the shown case.
The superposition of the ringing of the piezo-shocker and the steel beam provides the pyro-shock-simulating acceleration burst.
The test specimen is fixed to the beam's tip or other suitable positions.



The shock-response-spectrum (SRS) can easily be varied:
A, by varying the piezo-shock-generator's position relative to the beam length;
B, by using other shapes of beams with more complex eigen-mode structures;
C, by varying pulse shapes and sequences.

Piezo-pyro-shock-simulator PPSS 15 kN/40
Exciter voltage 750 Volts/150 Amperes
Free length of beam: 170 mm from fix mount
Contact point of PIA: 25 mm from fix mount
Beam's tip displacement (static) @ 750 V : 180 µm

Accelerations, peak: + 4.480 g
– 4.980 g
Rise time: < 20 µsec (measured by PCB 352 B 01)
Burst duration: up to 10 msec, depending on details of set up.



Acceleration response

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