



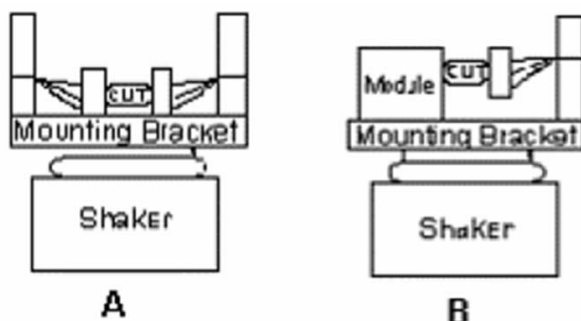
Vibration Test Proposal

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■ Vibration test for automotive environment

An automotive vibration test is specified to verify mechanical properties of automotive components
cf.)SAE/USCAR-2 Revision4
5.4.6 Vibration/Mechanical Shock



Test set up

Vibration conditions

Frequency (hz)	Power Spectral Density (g ² /hz)
5.0	0.00200
12.5	0.24800
77.5	0.00320
145.0	0.00200
200.0	0.01180
230.0	0.00032
1000.0	0.00002
Grms = 1.81	

Vibration shall be 8 hours in each of three mutually perpendicular axes (X,Y,Z).
Mechanical properties shall be recorded after aging the samples for 48 hours at ambient conditions.



Currently an automotive vibration test is not used to verify optical power changes.

This should be considered, however, because the optical communication system needs to operate under the above vibration conditions.

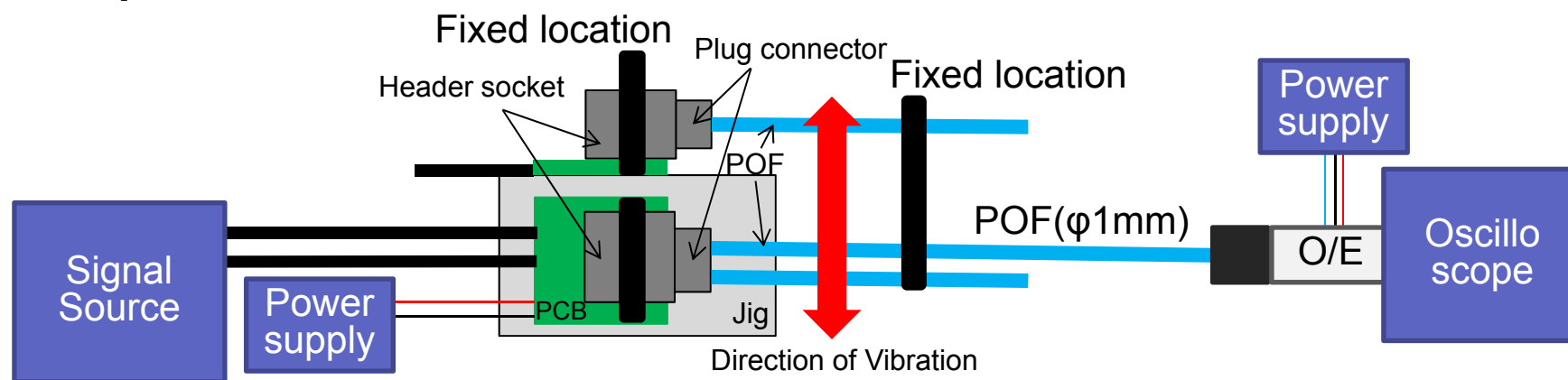


■ Proposed vibration test

【Purpose】

To confirm the effects of vibrations on the power budget in multilevel communication.

【Set up】



Schematic diagram for vibration test

【Procedure】

Operate header socket with constant optical power and detect using an O/E converter connected to an oscilloscope.

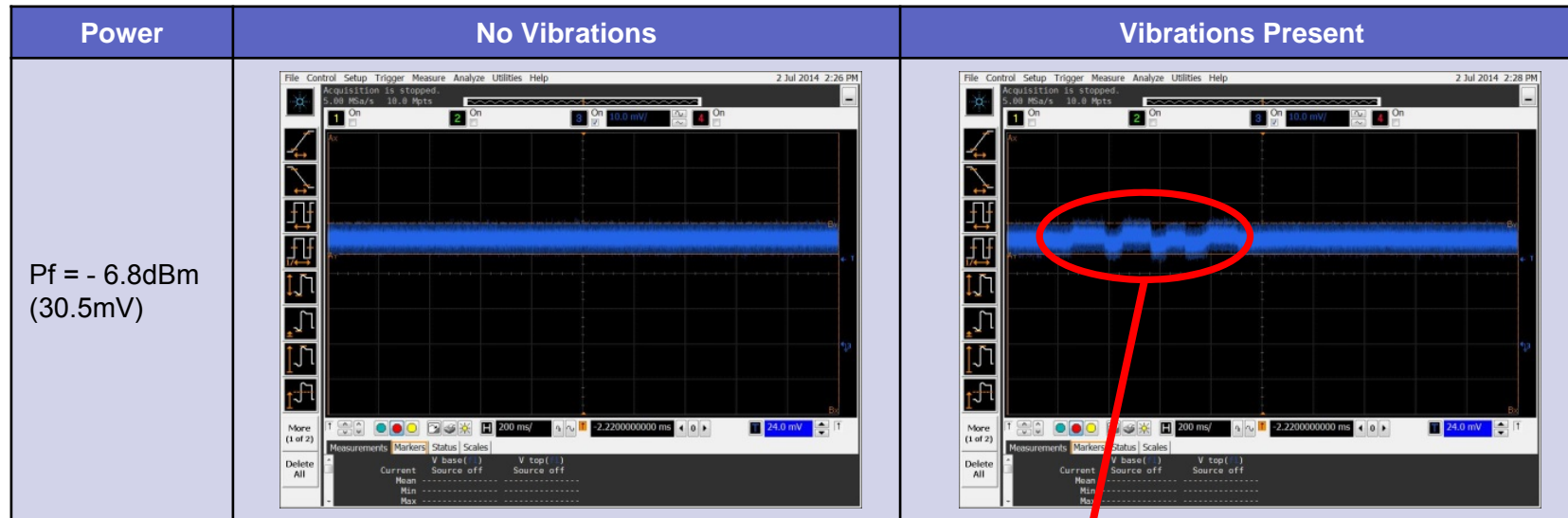
Apply vibration to the jig with frequencies of 0, 5, 20, 50, 100 and 200Hz, one by one.

Record waveforms where amplitude changes can be seen.



Results

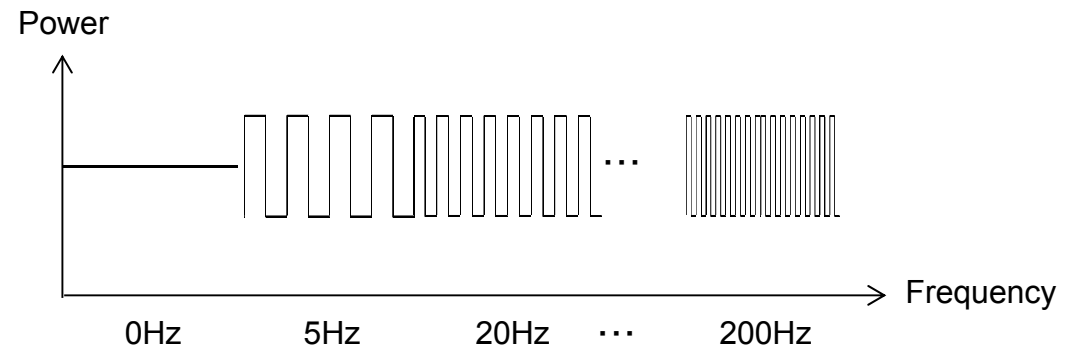
Ex) Optical power changes when the connector is poked by hand



Amplitude changes due to external vibrations

【Next step】

Perform vibration test to confirm amplitude changes



Expected result



■ Summary

- **Currently an automotive vibration test is not used to verify optical power changes**
- **The behavior of the header socket and inline connector needs to be confirmed under vibration conditions**
- **Amplitude changes needs to be confirmed when the optical power is changed**