



D33 METER

About D33 METER

D33 meter is designed to and developed by our company and has recognition in the industry. D33 measurements are computer interfaced. Total operations are performed by PC and are fully automatic. The following the main accessories:

- Force head
- Main unit
- Standard Samples - 4 Nos.
- Probes - 3 Nos.
- Power Cord - 2 Nos.
- Operating Manual - 1 No



About Us

Marine India is a Professional company, working in design development and production of material research systems for the welfare of Indian Scientific Natured Groups. The main thrust of our company is to produce highly advanced adaptable and low cost systems to suit both Indian and Foreign research facilities.

Main Product Line

- PE loop tracer system
- BH loop tracer systems
- Resistance measurement systems
- Electromagnets
- DC polling unit
- AC/DC power supplies
- Source Measure Unit
- LCR Meter/Impedance analyzers interfacing, software's
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d_{33} → Electrodes are perpendicular to 3 axis.
 Charge / electrode area
 Pressure → Indicates that the piezo electric induced strain or the applied stress is in 3 direction.

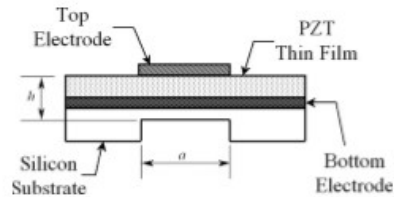
$$\text{Therefore } d_{33} = \frac{Q/A}{F/A} = \frac{Q}{F} \text{ C/N} \quad \text{Since } Q = C \times V$$

$$d_{33} = \frac{C \times V}{F} \text{ C/N}$$

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Application Oriented Basic Science Group



Specifications

d_{33} range: 0-9999.9pC/N

Piezoelectric coefficient range
accuracy +/- 2%

Resolution: ± 1 count up to ± 3 .

Frequency: Variable upto 2KHz
Factory set – 80Hz

Capacitance Load: 100nF

Static force approx 10N
Dynamic pressure range 1-100MPa

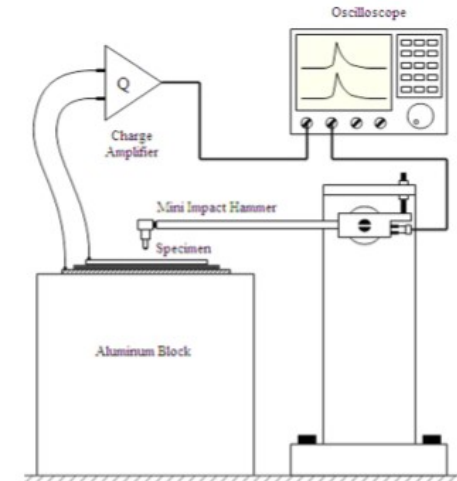
Voltage range 10

Basic operation

The d_{33} meter is based on the Berlincourt principle for the determination of the piezo-electric strain constant d_{33} . The oscillator provides ac voltage to the electromagnetic driver fixed in the Force Head. Thus a force is exerted on the test sample and the output in terms of d_{33} value is read by DMM. The Force Head is so designed that it facilitates measurement of d_{33} on a variety of piezo-electric elements, sizes & shapes, including discs, blocks, rings, tubes etc. Different types of probes are provided for different geometries.

Piezoelectric constants can be measured by the method as under:

1. Static method – (Static Measurement set-up)
2. Quasistatic Method – (d meter)
3. Resonance Method – (Piezo Test Set-up)



References

- Solid State Lab (SSPL) Delhi
- IIT Chennai
- Delhi University
- DMRL Hyderabad
- Haryana university
- IIT Chennai
- NPL Delhi
- Mahatma Gandhi university
- Cochin University

The full list is very exhaustive but above is only few major references.