OCTIV | POLY
VI Probe

Monitor Voltage, Current, Phase and Impedance of Multiple Fundamental Frequencies and their Harmonics

Interchangeable Connectors

Custom on Request

Measures
- Voltage
- Current
- Phase
- Harmonics
- Impedance

Functionality
- Time averaged
- Pulse profile
- Pulse trend
- Smith chart

Features
- Interchangeable connectors
- Compact probe design
- Frequency agile software
- API for extending software
- USB 2.0, serial and ethernet connectivity available

The Octiv Poly VI Probe is used to monitor the radio-frequency (RF) characteristics of your plasma processing equipment. Applications include fault detection and classification, chamber-to-chamber matching and process fingerprinting. Successful implementation helps to improve production yield, increase product throughput and reduce product scrappage.

The RF characteristics of the process can be correlated to process performance i.e. reference baselines can be established and fault signatures can be identified. The sensor monitors a wide range of RF parameters, suitable for use in multivariate analyseis techniques which provide extremely sensitive fault detection and classification algorithms. It enables indirect measurement of plasma parameters, helping you to understand and control the process. The Octiv Poly helps to define exact process windows and determine the health of power subsystems and process run-to-run stability.

The Octiv Poly VI Probe is a precision RF voltage, current and impedance sensor designed to sit between matching unit and RF process chamber. It is optimised to measure RF impedance in non 50 Ohm environments. It monitors multiple fundamental frequencies and their harmonics with 1% accuracy and 100 sample per second report rate. For pulsed RF applications it has 1 µs time resolution for pulse profiling. The Octiv Poly VI Probe is ideal for accurately monitoring dual frequency and triple frequency plasma systems.

The Octiv Poly has a range of 3 kV and 20 A with standard connectors and custom designs can be provided to meet most applications. It is calibrated at 5 standard fundamental frequencies: 2 MHz | 13.56 MHz | 27.12 MHz | 40.68 MHz | 60 MHz. The Octiv Poly uses unique patented VI probe technology, designed for reliable operation in simultaneous multi-frequency applications with agile frequency tuning.

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Measuring Parameters (Range)

Voltage Range	Voltage 20 – 3000 Vrms
Current Range	0.1 – 20 Arms
Phase Range	± 180°
Harmonic (Voltage, Current and Phase)	Up to 15 harmonics per frequency
Frequency Range	350 kHz - 300 MHz
Fundamental Frequencies	5 simultaneous
Power Real, Forward and Reflected (Watt)	200 mW to 12 kW (23 dBm to 70.8 dBm)*
Power Real, Forward and Reflected (dBm)	25 dBm to 70 dBm
Impedance	1 to 500 Ω
*Connector dependent	

Pulse Parameters (Time)

Voltage Time	1 µs
Current Time	1 µs
Phase Time	1 µs
Harmonic (Voltage, Current and Phase) Time	1 µs
Frequency Time	1 µs
Impedance Time	1 µs
Power Real, Forward and Reflected (Watt) Time	1 µs
Power Real, Forward and Reflected (dBm) Time	1 µs

Measuring Parameters (Accuracy)

Voltage Accuracy	± 1%
Current Accuracy	± 1%
Phase Accuracy	± 1°
Harmonic (Voltage, Current and Phase) Accuracy	± 5%
Frequency Accuracy	± 10 kHz
Impedance	± 1%
Power Real, Forward and Reflected (Watt/dBm)*	± 1%

Measuring Parameters (Accuracy)

Voltage Resolution	0.25 V
Current Resolution	10 mA
Phase Resolution	0.01°
Harmonic (Voltage, Current and Phase) Resolution	As above
Frequency Resolution	1 kHz
Impedance Resolution	± 1%
Power Real, Forward and Reflected (Watt/dBm) Resolution	± 1%

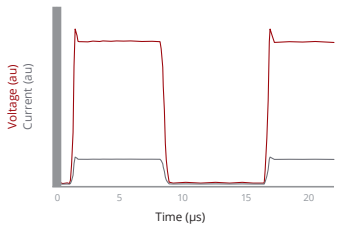
Sensor Specifications

Number of fundamentals	(F0) Maximum of 5 simultaneously
RF Power	Max 12.5 kW (limited by connector)
Operating Temperature	0 to +40° C (32 to 104° F)
Storage Temperature	-20 to +80° C (-4 to +176° F)
Uniformity	2% Maximum
Harmonic Content	Measured (No Limit within Range)
Connectors	N, HN. 7/16's, LC (Custom available on request)
Sensor Impedance	50Ω
Certification	CE mark
Calibration Cycle	12 Months
Dimensions	107mm x 70mm x 55mm

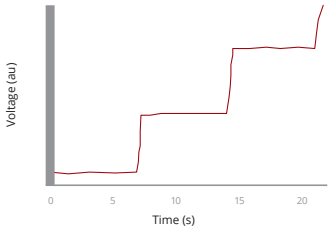
Application Software

Operating System	Windows 2000 / XP / Vista / Windows 7 / Windows 8 / Windows 10

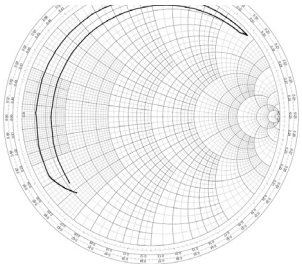
Pulse Profile



Voltage Step



Smith Chart



Harmonic Spectrum