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Challenges of Modern RF Plasma Processes for Industrial Applications

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Modern RF Plasma processes like sputter, CVD and etch are requiring more and more precise metrology and control function of RF generators. These have to include accurate measurement of the RF output especially as the plasma load does not have a fixed impedance and the RF generator will often encounter non 50 ohm loads at its output as well as additional features like arc handling, pulsing and synchronization.
The latest developments of state-of-the-art RF generators which use industry leading RF metrology systems to ensure the power is delivered in an efficient and stable manner to the process chamber are shown. The achievable measurement accuracy is comparable to that from a network analyzer across a wide range of impedance.

Modern Processes are also uses sweep frequency therefore state of thr art power technology needs tuning capability to quickly respond to impedance changes without upsetting the stability of the process.
Also pulsed RF waveforms are often desirable in plasma etch or deposition processes. The RF generator delivers this requirement and need to be capable of synchronizing the pulses with other generators even if the RF frequency is different. Results for different processes are shown and discussed.

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