IMPULSE™

2kW Pulsed Power Modules for Advanced Magnetron Sputtering

Kurt J. Lesker® Company

PROCESS EQUIPMENT™ DIVISION

Applications

- High-Power Impulse Magnetron Sputtering
- High-Power Pulsed Magnetron Sputtering (HiPIMS/HPPMS)
- Advanced coatings for university, industrial and governmental R&D applications
- Optimal for hard coatings (ex. DLC), high density/non-porous film requirements, high aspect ratio coatings, and superior optical coatings
- Ideal for 2”, 3” & 4” circular magnetrons requiring high impulse power & pulse flexibility

Features

- Up to 200 A peak current capability for power handling and high deposition rate
- User selectable pulse width, frequency and peak current
- Real-time discharge voltage and current monitoring; integrated power feedback with touch-screen control
- Arc detection and suppression technology
- Precision master/slave module timing for substrate bias or cathode synchronization for co-deposition
- CE marked

Process

- Easy way to upgrade existing DC sputtering systems for HiPIMS/HPPMS and reactive capability
- Use your existing DC power supply as the charging supply or bias input

Options

- Single or dual module configuration in standard 2U rack enclosure to power multiple magnetron heads, i.e. cluster tools, or a pulsed substrate bias with sub µs timing
- Touch screen interface with direct parameter plus rear panel RJ-45 and RS-422 serial microcontroller interfaces
- Pair with upgraded magnetic pack for higher performance TORUS® PVD tools
- Patent Pending Positive Kick Pulse for reactive and enhanced sputtering

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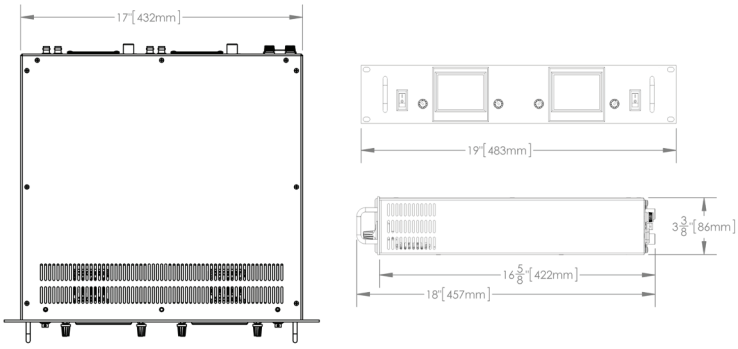
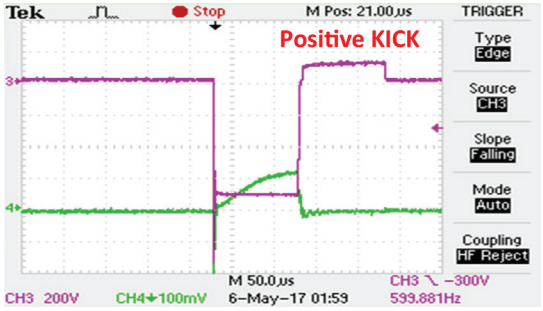
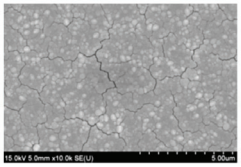
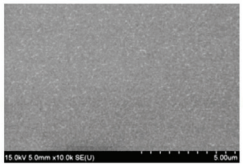


IMPULSE™ 2-2 1-V Waveform





Conventional dcMS copper deposition on silicon on showing rough surface morphology globular microstructure.



IMPULSE 2-2 HiPIMS deposition at same 500W, 10mTorr conditions showing dense, non-porous nanostructure.

Specifications

	Base Model	Advanced Kick Model
Input Power Specifications	1 phase, 100-240 VAC, 50/60 Hz, 2.5 A per module	
Input Charging Supply	1000 VDC nominal, -1250 VDC tolerant	
Time-Average Power	~ 2 kW; subject to duty factor and rep rate	
Output Peak Voltage	-1000 V nominal, -1250 V tolerant	
Output Peak Current	200 A nominal, 400 A tolerant	
Arc Detection Time	<200 ns	
Arc Arrest Time	<500 ns	
Over Current Response TIme	< 2 µs	
Peak Current Limiter	User selectable up to 400 A in High Current Operation, 200 A in High Frequency Operation	
Power Limit	User selectable up to 2kW	
Pulse Frequency	User selectable 1Hz to 2kHz (high current mode) or 1Hz to 4kHz (high frequency mode) nominal range, subject to power derating curve	
Pulse Width	User selectable, 2 µs to 500 µs nominal range	
Afterglow Time	Minimum of 4 µs; User selectable in 1 µs increments	
Quench Pulse Set Points	On/Off; User Selectable in 1 µs increments for pulse width	N/A
Positive Kick Pulse Voltage	N/A	User selectable in 1V increments from 0 to +200V using internal supply
Kick Pulse Set Points	N/A	On/Off; User selectable in 1 µs increments for pulse width
External Communications	RJ-45 & RS-422 control I/O, USB Type A, BNC sync line, BNC I-V monitor out	
Pulse Module Sync	<0.1 µs latency	
Cabling	N-type HV connector standard	
Configuration Storage	Onboard storage for 20 user selectable presets	
Physical Dimensions	2U rack 19" W (482.6 mm) x 3.5" H (88.9 mm) x 22.5" L (571.5 mm) w/ handles & plugins	
Weight	Single Mod: 26lbs, 1.8 oz. (11.84 kg) Dual Mod: 30lbs, 3.0 oz. (13.69 kg)	Single Mod: 26lbs, 14.8 oz. (12.21 kg) Dual Mod: 31lbs, 13.0 oz. (14.43 kg)
Operating Temperature	+5°C to +40°C, Forced Air Cooling	

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