

# Retrofit: 2 MHz, 13.56 MHz and 27.12 MHz RF Generators

Simple solutions for replacing your aging RF generators with a modern replacement

The Advanced Energy (AE) Retrofit Program aims to replace existing generators of any make and model with a new AE product. By retrofitting your existing, aged 2 MHz, 13.56 MHz or 27.12 MHz RF generator with a new Paramount® generator, Total Cost of Ownership improvements can be realized through reduced tool down time, improved process and wafer yields, and efficiency gains.



## Overview

As semiconductor tools and process power components age, factories are seeing increases in failure rates and repair costs of those components. A retrofit of your existing RF generator to a Paramount provides a reset of the unit life, and an upgrade in unit capability and reliability. A retrofit maximizes tool uptime while reducing overall maintenance costs.

Many installed RF generators are discontinued, aging, or becoming difficult and costly to repair. Retrofitting with an AE Paramount is the preferred service option as:

- Used equipment available on the market is in unknown condition
- Repairing existing units could be limited in the future due to obsolete components

## Total Cost of Ownership (TCO)

TCO in the process power space on a semiconductor tool extends beyond the transactional cost of a repair:

- Tool down time: lost production dollars
- Wafer scrap
- Wafer yield
- Operational costs (efficiency)

## Benefits

- Increased uptime with longer mean time between failures (MTBF)
- Lower overall maintenance costs
- Improved performance, equivalent to processes on new tools
- Additional features allow for enhanced process control or new process development
- Higher efficiency for decreased operating costs
- Enhanced plasma stability and process repeatability
- CEX and pulsing options available

## Features

- Includes 12-month, whole-box warranty
- Supports wafer fabrication with partnership of AE refurbishment experts
- Resets the clock on aging tools
- Provides cost-effective, modern replacement for discontinued or aging process power components
- Presents an efficient upgrade process that is replicable for subsequent tools
- Retrofit kit designed to be a seamless replacement

## Return on Investment (ROI)<sup>1</sup>

The AE Quality Advantage – Maximizing Uptime

### With a retrofit to a Paramount product:

- Save up to **60%** annually on repair and maintenance costs with new units<sup>2</sup>
- See a five-year ROI<sup>3</sup> of **211%**
- Break even in **1.61** years

<sup>1</sup> Figures are for illustrative purposes only. Contact AE for a customized ROI calculation specific to your install base. Trade-in and volume discounts are also available.

<sup>2</sup> Annual savings achieved through reduced tool downtime, improved process and wafer yields, and efficiency gains.

<sup>3</sup> Figures calculated off of 30-unit population.

## Specification Comparison – 2 MHz, 13.56 MHz, and 27.12 MHz RF Generators to Paramount

Each retrofit kit contains all required interfaces and adapters, making the transition to a newer product seamless by eliminating unexpected equipment changes.

Feature	Existing RF Generator			Paramount			Benefits to Retrofit
Frequency	1.8 to 2.17 MHz	12.882 to 14.238 MHz	27.12 MHz	1.8 to 2.17 MHz	12.882 to 14.238 MHz	27.12 MHz	No change to frequency
Output Power	2500 W / 5000 W	2500 W		2500 W / 5000 W	2500 W		No change
Power Accuracy	± 1%			± 1%			Tight process control
Reflected Power	500 W			500 W			No change
Sag/Surge Protection	Not Available			SEMI 47			Fewer process interruptions
Pulsing	Single Level Pulsing			Single Level Pulsing	Optional Multi Level Pulsing		Additional capabilities provided
Analog Interface	25 pin D-sub			25 pin D-sub			No change to analog interface
RF Output Connector	Type N Female	C-Type		Type N Female	Type HN Female		Adapter provided, if required
Input Power	208 V, 3ph			208 V, 3ph			No electrical panel rewiring required
Height	5.25"	8.72"		5.25"	5.23"	5.04"	Retrofit product fits in standard 19" rack, but rack ear extensions can be provided for any mismatched dimensions
Width	19"			17.7"	8.5"	19.04"	
Depth	20.5"	22.1"		22.3"	17.4"	26.6"	
Weight	55 lbs	90 lbs		60 lbs	35 lbs	60 lbs	Paramount is typically lighter
Cooling	Water			Water and Air			Same cooling method
Coolant Rate	2 gpm			2 gpm			No change to water consumption
Water Fittings	¼" NPT	⅜" NPT		⅜" NPT			Adapter provided, if different
Efficiency	< 50%			> 65%			Decreased operating costs

## Get in Touch

To learn more about your retrofit options, contact Advanced Energy Technical Support at [technical.support@aei.com](mailto:technical.support@aei.com) or reach out to your local Service Center.

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