



2 MHz TO 5.8 GHz | 10W TO 25 kW

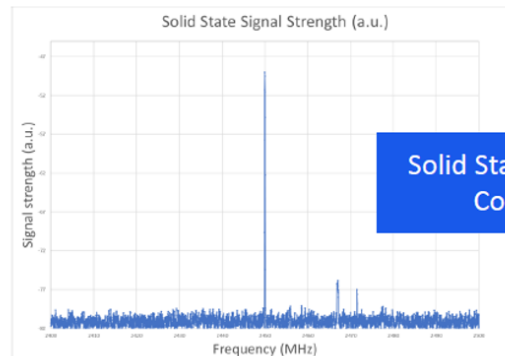
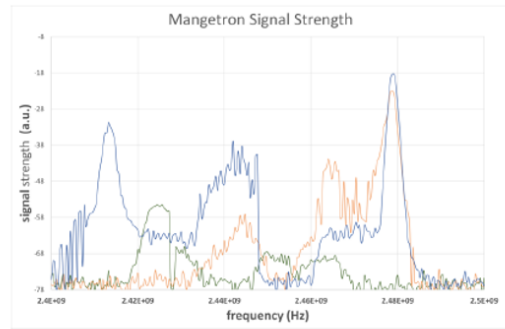
# ISM RF Energy Solutions

Building-Block Modules  
& Turnkey Systems

# Why Solid State?

## Advantages

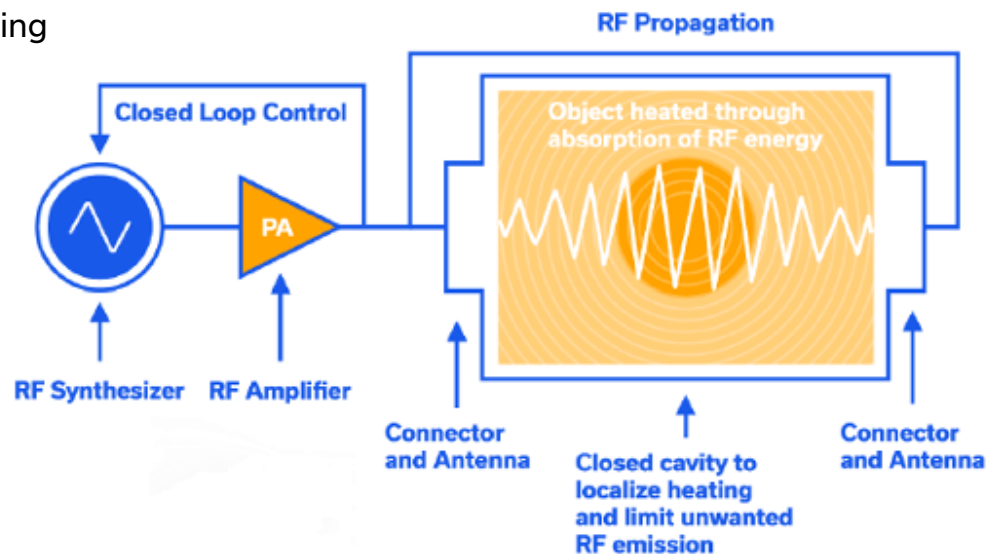
- Unprecedented control over frequency and power to the load
- Dynamic adaptation to variable load conditions via feedback to the process
- Efficient energy delivery to the target and better process yields
- Low voltage requirements compared to magnetrons and tubes
- Small form factors allow easy integration and flexible system layout
- Lower cost of ownership



**Solid State Enables Control!**

## Applications

- Plasma generation
- Dielectric heating
- Industrial heating & drying
- Semiconductor processing
- Medical treatments



# Why Mini-Circuits?

## Things Just Got Simpler

### ROBUST DESIGNS

- Built-in monitoring & protection
- Rugged construction
- In-house production & qualification

### ENABLING FEATURES

- Flexible building-block modules
- Turnkey integrated systems
- Easy-to-use hardware & software

### PEACE OF MIND

- 50+ years design & manufacturing experience
- Industry-leading supply-chain stability
- Knowledgeable, accessible engineering support

## System Building Blocks

- Signal Source & Control
- Solid State Power Amplifiers
- Passive Components
  - Splitters
  - Combiners
- RF Interconnect Products



2.4 TO 2.5 GHz | UP TO 6 kW

# Building-Block Modules

Flexible & Scalable for Your System Needs

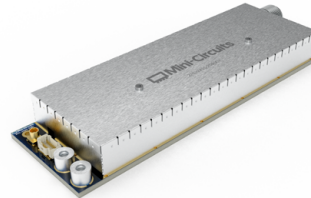


2.4 TO 2.5 GHz | +25 dBm

## Signal Generator & Controller

ISC-2425-25+

- -30 to +25 dBm output power range
- Closed-loop and feed-forward RF power control modes
- Standalone or multi-channel operation (coherent or incoherent modes)
- User-friendly GUI & full API included
- USB, I2C, RS422 & RS485 control interfaces



2.4 TO 2.5 GHz | 300W

## Solid State Power Amplifier

ZHL-2425-250X+

- 300W saturated output power
- Suitable for CW and pulsed signals
- High gain, 42 dB
- High efficiency, 60%
- Built-in monitoring and protection for temperature, current forward, and reflected power
- User-friendly I2C control interface

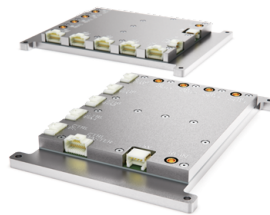


2.4 TO 2.5 GHz | 1 kW

## High-Power 4-Way Combiner

COM-2G42G51K0+

- Combine 4x 250W signals into a 1 kW energy source
- 1.2 kW RF power handling
- 0.1 dB insertion loss
- Low amplitude & phase unbalance (0.15 dB, 1°)
- 14x N-Type to 1x 7/16 DIN connectors
- Patented design



2.4 TO 2.5 GHz PHASE & AMPLITUDE CONTROL

## 4-Way Splitter

SPL-2G42G50W4+

- Drive up to 4 amplifier stages from ISC-2425-25+ controller
- Match phase and amplitude on 4 independent system paths
- 360-degree variable phase shift
- 30 dB attenuation range, 0.5 dB steps
- Easy control and amplifier interfacing via I2C bus.



2.4 TO 2.5 GHz | UP TO 6 kW

# Turnkey Systems

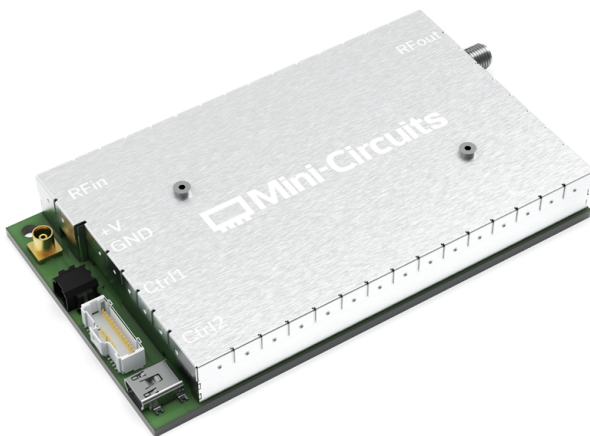
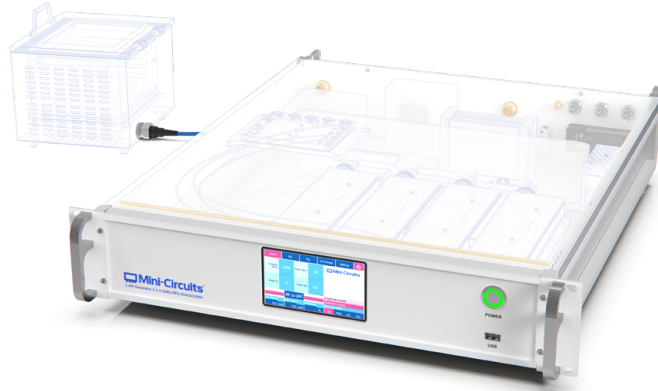
Plug-and-Play Rack-Mount Solutions

2.4 GHz TO 2.5 GHz

## 1 kW Signal Source

RFS-2G42G51K0+

- Output power from 1W up to 1 kW
- Suitable for CW and pulsed signals
- High gain, 53 dB typical
- Built-in signal source, monitoring and control
- 2U 19" rack mount
- Easy to use with multiple control interfaces
- User-friendly GUI, Full API and touchscreen control from front panel



2.4 GHz TO 2.5 GHz

## 50W Signal Source

RFS-2G42G5050+

- Integrated power supply, RF source & control in a compact housing (4.3 x 2.6 x 0.6")
- Handles CW or pulsed signals
- High gain, 53 dB and high efficiency, 42%
- Built-in monitor, control and sig gen functions
- Rugged and robust, fully protected
- USB or RS-232 interface

27 MHz | UP TO 6 kW

# Building-Block Modules

## 4-Channel Driver & Power Amplifier Pair

27 MHz

### 1.7kW Solid State Power Amplifier

RFE-24M30M1K7X+

- 1.7kW output power
- Supports CW & pulsed signals
- 26 dB gain with 5W input drive level
- 80% efficiency
- Built-in temperature & current monitoring
- Built-in emergency switch off
- Water cooled

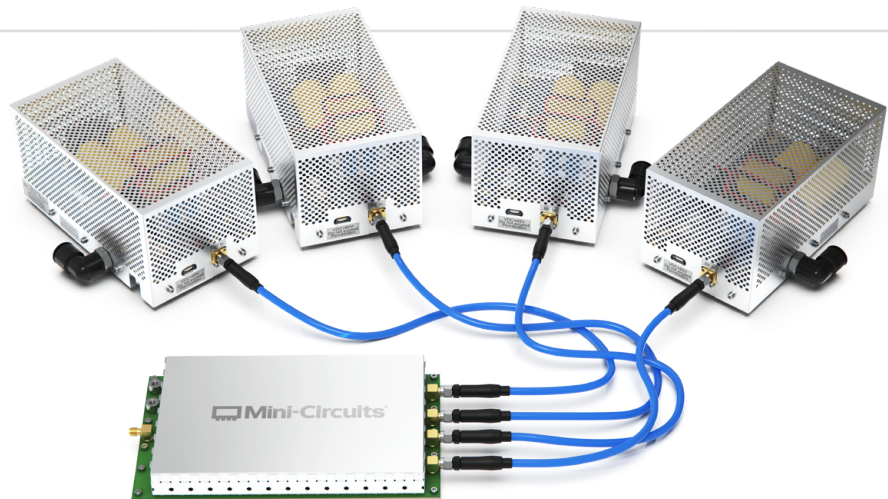
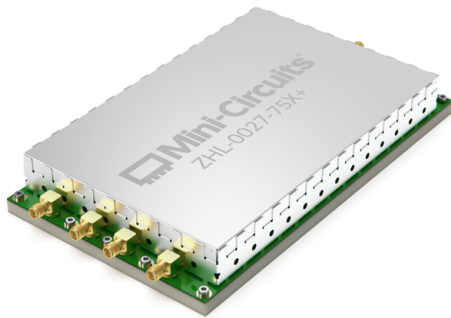


27 MHz

### 4 x 19W Solid State Driver Amplifier

RFE-24M30M075X+

- One input, four 19W outputs
- Supports CW & pulsed signals
- 16 dB gain at P3dB
- 55% efficiency
- Integrated harmonic suppression
- Built-in temperature & current monitoring
- Built-in emergency switch off



Drive up to  
4x 1.7 kW Paths




# Scalable from 10W to 25 kW

Power Range

10W to 1.8 kW

1 kW to 3 kW

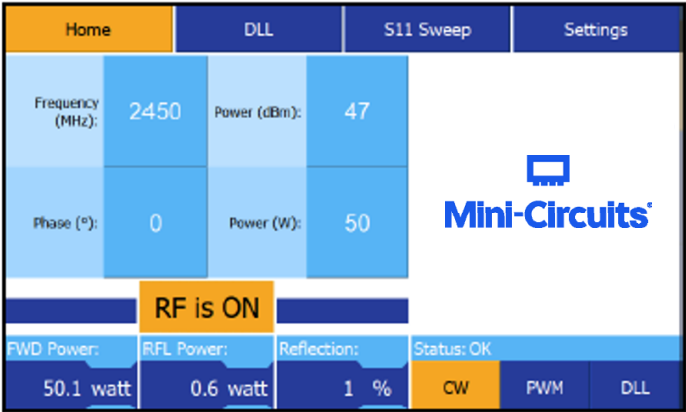
1 kW to 3 kW

Format	Building Block Modules	Integrated Systems (2U-3U)	Rack-Mount Systems (6U to 24U)
Model Series	<ul style="list-style-type: none"> <li>• ZHL-</li> <li>• RFE-</li> <li>• RFS-</li> <li>• SPL-</li> <li>• ISC-</li> </ul>	<ul style="list-style-type: none"> <li>• RFE-</li> <li>• RFS-</li> </ul>	<ul style="list-style-type: none"> <li>• RFS-</li> </ul>

## Full Software Support

- User-friendly GUI control software included
- Full API with plain-text command language for programming
- Set frequency, power and phase
- Configure generator state at power-up
- Track real-time optimum S21 frequency (analog or digital locked loop)
- CW and pulse width modulation signals
- Real-time forward and reflected power monitoring



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