COAXIAL SOLID-STATE

Amplifier Evalation Kit ZHK-2425-250+

50Ω 250W 2.4 to 2.5 GHz

PRODUCT OVERVIEW

The amplifier and the system controller are the fundamental building blocks of microwave generator subsystems. The ZHK-2425-250+ is a kit containing one of each of these core building blocks and the interconnect required to jumpstart product evaluation for the 250W microwave generator application. Higher output powers are readily achievable through power combining with up to 8 amplifiers per system controller using Mini-Circuits splitter (ex. SPL-2G42G50W4+) and combiner (ex. COM-2G42G51K0+) products. Contact our worldwide technical support team at apps@minicircuits.com for questions related to your application.

KIT COMPONENTS

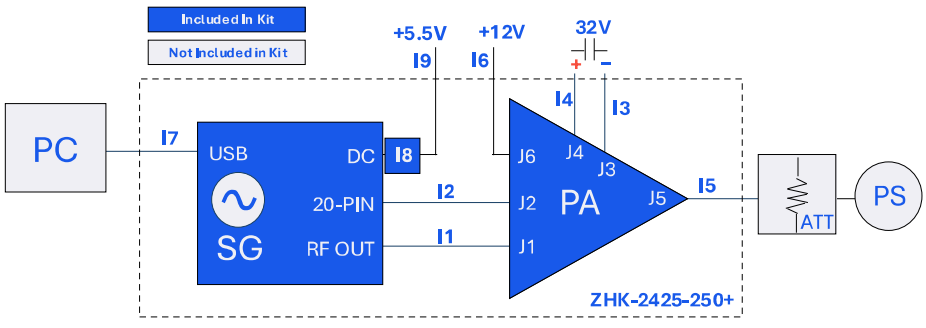
Ref.	Image	Description	Mini-Circuits P/N
PA		250W, 2.45GHz PA with Heatsink, Fan, and Speed Controller	ZHL-2425-250+
SG		Signal Source and controller Kit 2.45GHz (Includes Interconnects I2, I7, and I8. See ISC-2425-25+ datasheet for details)	ISC-2425-25+
I1		12″ SMA Male to MCX RF Cable ISC to ZHL connection	FL086-12SMMCR+
I5		12″ Hand-Flex, 300W, N-Type Interconnect Cable	141-12NM-300W+
I3, I4		3FT 12AWG Hookup Wire Red & Black w/ terminal mounting hardware 2 ea M5 Screw and Belleville Washer: McMaster 92095A308, 90895A027 Hex Driver for M5 Screw: McMaster 7289A14 2ea Insulated Ring and Spade Terminals: McMaster 7113K29, 69145K218	N/A

ADDITIONAL TOOLS REQUIRED FOR EVALUATION

Ref.	Description	Reference Part Number[1]
PC	Windows PC or Raspberry Pi, with ISC-2425-25+ GUI	See Software Download Page
32V	Power Supply, 32V, 16A+. (External Capacitor Required for PWM Evaluation See Electrical Specifications Table)	Keysight E36155A TDK-Lambda Z36-24-L-U
+12V	Power Supply, 12V, 3A+	Mini-Circuits AC/DC-12-3W
+5.5V	Power Supply, 5.5V, 1A+	Most Lab Bench Power Supplies
ATT	Attenuator or Termination 50Ω, 300W, 40dB	Bird 300-WA-FFN
For I3 & I4	Crimper, 10-12 AWG (Yellow) Insulated Terminals	Klein Tools 3005CR
For I3 & I4	Wire Stripper Tool 12AWG	Klein Tools 1011
I6	Terminal Block and/or Hookup Wires to +12V supply	McMaster 8320N61
I9	Hookup Wires, +5.5V supply to terminal block	Solid or Stranded Wire (AWG 28-14)
PS	USB Power Sensor (Optional)	Mini-Circuits PWR-8P-RC
-	Torque Wrench SMA	Mini-Circuits TRQ-516-09
-	Torque Wrench N-Type	Mini-Circuits TRQ-N20-8

1. All reference part numbers are commercial off the shelf items that satisfy the basic requirements of the test setup. These part numbers are provided for reference only and Mini-Circuits does not guarantee the availability of these parts nor the applicability of these parts to any specific application.

APPLICATION CIRCUIT 250W GENERATOR TEST SETUP



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ZHK-2425-250+
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SAFETY INSTRUCTIONS.

WARNING: FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN BODILY INJURY, DEATH, OR PROPERTY DAMAGE.
For your own safety, this section provides instructions for avoiding potential dangers when using this product.

QUALIFIED PERSONNEL
This product should be operated by qualified personnel only. Qualified personnel are individuals who are familiar with the operation of the product and the hazards involved with such operation.

DAMAGED OR MISSING HARDWARE
Do not operate the product if there is physical damage or hardware is missing.

MAXIMUM RATINGS
The maximum ratings in this data sheet should never be exceeded. Stress above one or more maximum ratings may cause permanent damage to the product and may permanently and irreversibly affect the quality and reliability of the product, which may increase the risk of bodily injury, death, or property damage.

HAZARDOUS RF VOLTAGES
The RF voltages inside the product and on the center pin of the RF output connector can be hazardous. Contact with the internal components of the product or the center pin of the RF output connector may lead to burns or electrical shock. Disconnect power before removing the protective cover from the product. Note that removing the protective cover from the product will void the express warranty specified in Mini-Circuits Standard Terms.

To reduce the risks presented by these hazards:
1. never operate the product without its protective cover,
2. always connect the RF output connector to a load before the power source is applied to the product, and
3. always place the product in a non-operating condition before disconnecting or connecting the load to the RF output connector.

COOLING
RF Power amplifiers always need proper cooling. Failure to properly cool the product may increase the risk of bodily injury, death, or damage to property or the product.

Some products contain water cooling systems to help cool down the product. If this data sheet indicates that the product contains a water cooling system, proper waterflow as specified in this data sheet is required to keep the temperature of the product within the temperature range that is specified in this data sheet.

Some products also contain built-in protection circuitry designed to shut-off the amplifier at excessive high temperatures or at other excessive operating conditions. Even if this data sheet indicates that the product contains protective circuitry, such protective circuitry is not a substitute for proper handling in accordance with these instructions. Accordingly, do not rely on the protective circuitry to prevent injury or damage to property or the product.

MAINTENANCE CAUTION
Maintenance or repair of the product must only be performed by qualified personnel when the product is in a non-operating condition and disconnected from its power source. Note that performance of maintenance or repairs to the product will void the express warranty specified in Mini-Circuits Standard Terms.

ENVIRONMENTAL CONDITIONS
Unless otherwise stated in this data sheet, this product is designed to be operated under the environmental conditions set forth in this data sheet, as well as the following conditions:

- Indoor use only
- Temperature of 5°C to 40°C (non-condensing)

WARNING SIGNS
In addition to being qualified before operating the product, pay attention to all warning signs and danger symbols. Failure to heed warnings signs and danger symbols, or to follow their associated instructions, may result in bodily injury, death, or property damage.

NOTES
A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/terms/viewterm.html

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Environmental Specifications **ENV23T27**

All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

Specification	Test/Inspection Condition	Reference/Spec
Operating Temperature	0°C to +65°C	----
Storage Temperature	-20°C to +85°C	----
Stabilization Bake	125°C, 24 hours (Non-operating)	----
Thermal Imaging	200W REFL, 250W FWD, 25°C Base	----
DC Burn In-Elevated Temperatur	+60°C (Ambient) with Bias.Bias Conditions: +32V ~540mA 500 Hrs. Base plate temperature: 65°C	---
Humidity Storage	Temp: 85°C, Humidity: 85% RH, Non-operating for 1000 Hrs.	----
Thermal Shock	-40°C to +150°C 15 min dwell at extreme temperatures, 1 min transfer 250 cycles	MIL-STD-202, Method 107
ESD Gun Contact	Air Discharge: ±2.0 kV, ±4.0 kV, ±8.0 kV. Contact Discharge: ±2.0 kV, ±4.0 kV, ± 6.0 kV, ±8.0Kv Non-operating Condition. 10 positive & 10 negative charges at each location	IEC 61000-4-2
Drop Test	1.0m drops onto concrete of packed box in 6 orientations	IEC 60068-2-31
Vibration	Sinusoidal vibration, 20 - 2000 Hz, 4 min sweeps, 16 min along each of 3 axes, amplitude limits of 20 G and 0.06 in	MIL-STD-883, Method 2007 Test A