GaN SSPA Microwave Generator
RIM251K6-20G

Product Features

- 2400~2500MHz (ISM band)
- 1.6 kW CW Peak Power @ 50V
- Built with GaN-on-SiC HEMT Transistors
- Digital Adjustable of Power, Frequency, Phase
- Excellent Frequency Spectrum at both low and high-power levels

Applications

- Building Block for High Power Systems
- Microwave CVD Equipment
- Plasma Generation
- MW Heating and Drying
- Semiconductor Equipment

Description

RIM251K6-20G is a 1.6kW, GaN solid-state microwave generator designed ideally for microwave heating and plasma generation applications. The RIM251K6-20G is a module type generator that provides continuous wave (CW) and or pulse output power adjustable from 100W to 1600W at frequencies ranging between 2400MHz and 2500MHz. The RIM251K6-20G is built using RFHIC's state of the art gallium-nitride (GaN) on silicon-carbide (SiC) transistors providing high power levels and high system efficiency. The RIM251K6-20G is equipped with its own phase-lock-loop (PLL) synthesizer allowing to generate a signal without any external source. This highly efficient and rugged device is targeted to replace conventional magnetrons used for industrial heating and drying applications.

Electrical Specifications

PARAMETER		UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency	Adjustable Range	MHz	2400	-	2500	F_O
	Step Size	kHz	500	-	-	Fstep
Output Power	Adjustable Range	W	100	-	1600	P_O
	Step Size	W	5	-	-	Pstep
Operating Mode		CW and or Pulse				
Power Spectrum Bandwidth		kHz	-	-	500	S_b
Frequency Accuracy & Stability		ppm	-2.5	-	2.5	Fs
Efficiency (DC to RF)		%	-	-	57	Eff
Operating Voltage		V	50	-	52	VDC
Pulse Mode	Pulse Repetition Frequency	kHz	0.01	-	2	
	Pulse Length	ms	0.5	-	100	
	Pulse Width	us	500	-	-	

Generator Alarm & Protection Features

PARAMETER	State	CONDITION
Output Power	Alarm	Output Power > 1.7 kW
Over-Temperature	Alarm	System Temperature > 50 C°
Reflected Power (2) (3)	Alarm	400W ~ 800W
PLL Unlock (1)	Disabled	
Over-Temperature	Disabled	System Temperature > 55 C°
Reflected Power	Disabled	Reflected Power > 800W

***Remarks**
(1) A phase-locked loop (PLL) is a control system that generates an output signal whose phase is related to the phase of the input signal. The PLL is equipped with a voltage-driven oscillator that constantly adjusts to match the frequency of the input signal.
(2) Use of an external isolator is mandatory for proper operation, as the internal circulator provides only limited, non-continuous mismatch protection, and any damage without documented isolator use is not covered under warranty.
(3) This product incorporates an internal circulator intended only for limited, non-continuous mismatch protection. Because reflected-power conditions during customer operation cannot be verified by RFHIC, the use of an external isolator is a mandatory system requirement for all installations. Damage resulting from load mismatch, reflected power, or inadequate external protection shall be considered the customer's responsibility. Any failure occurring without documented use of an external isolator is not covered under warranty, regardless of the nature or duration of the mismatch event.

SSPA Head Mechanical Specifications

PARAMETER	UNIT	VALUE	
Dimensions (W x D x H)	mm	200 x 361.5 x 53	
SSPA Head Weight	kg	7	
Microwave Output Port	-	7/16 DIN	
DC & GND	-	DB-5W5 4-Pin (FEMALE)	
I/O Connector		RS-232	
Cooling Requirements	-	**Water Cooling Rate**	5L/Min, 3Bar
		Cooling Water Inlet Temperature	20°C~25°C ((typ.)
		Relative humidity below dew point (non-condensing)	
		* De-ionized water shall be used to prevent system damage	
Fluid Inlet/Outlet Size	Inch	1/4 Tapered Pipe Thread	

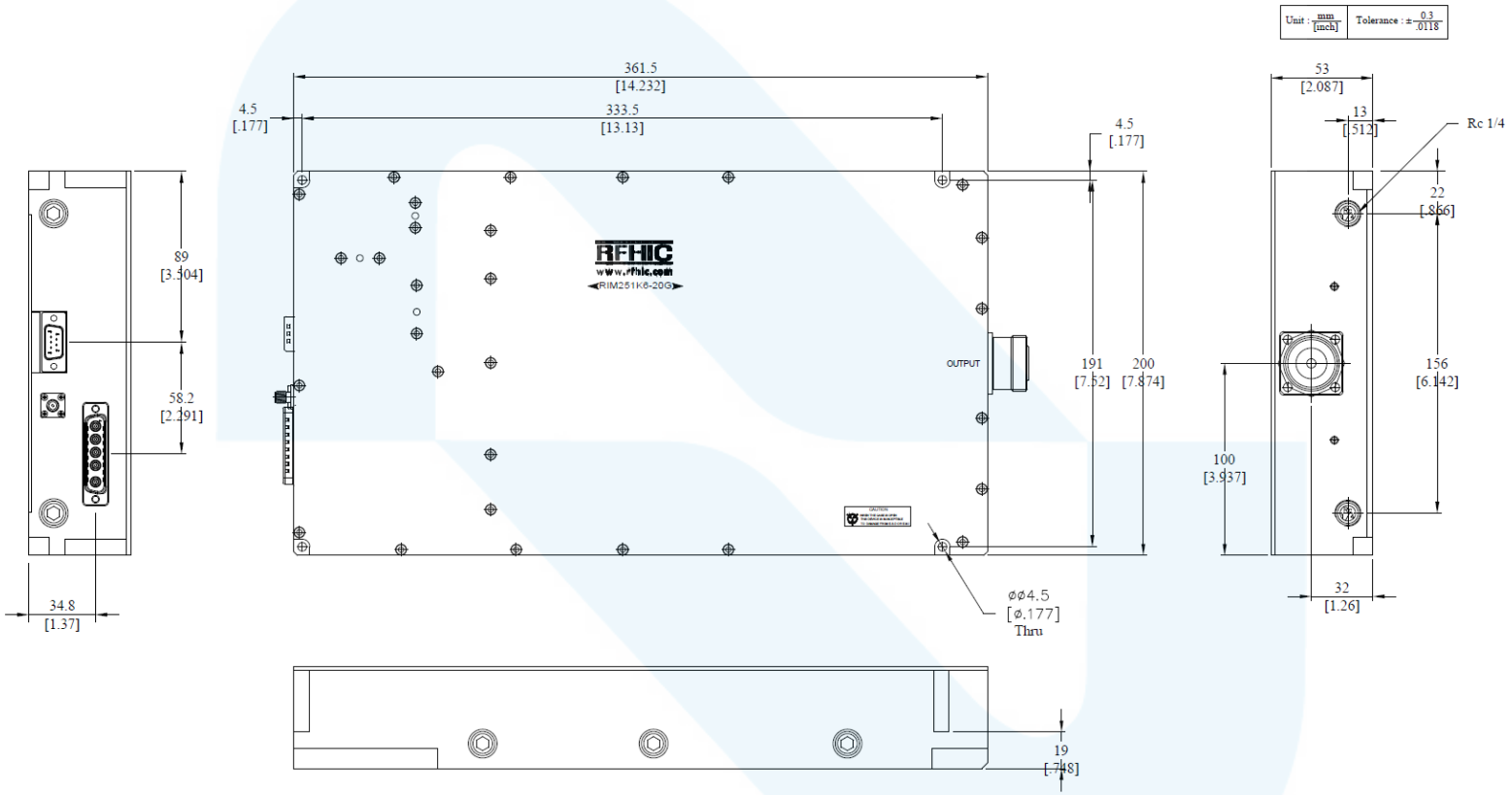
Remarks: Dimensions and Connectors may be subject to change.

Environmental Specifications

PARAMETER	UNIT	VALUE
Operating Case Temperature(1)	°C	15 ~ 50
Environmental/Storage Temperature	°C	10 ~ 40

Remarks: (1) Operating case temperature is the temperature detected at the PA temp sensor.

Mechanical Drawing



Revision History

Part Number	Release Date	Version	Description	Data Sheet Status
RIM251K6-20G	February, 2021	0.1	Initial release of datasheet	Preliminary
RIM251K6-20G	January, 2022	0.2	Pulse length specification insert, water cooling specification change, Mechanical dimension insert	Preliminary
RIM251K6-20G	June, 2024	1.0	Operating Voltage, Pulse mode specification change	In Production

Certification
This product is manufactured by a company that is certified for the AS9100D quality management system.