Preliminary

GaN Microwave Generator
RIK2512K-40TG_H

Product Features

- 2400~2500MHz (ISM band)
- 12kW CW Peak Power @ 50V
- Built with GaN-on-SiC HEMT Transistors
- Excellent Thermal Stability and Ruggedness
- High-Frequency Stability
- Digital Controllability

Applications

- High Power Industry
- Microwave CVD Reactor
- Plasma Generation
- MW Heating and Drying
- Semiconductor Equipment

Description

RIK2512K-40TG_H is a 12kW, GaN solid-state microwave generator designed ideally for microwave heating and plasma generation applications. The RIK2512K-40TG_H provides continuous wave (CW) and/or pulse output power adjustable from 600W to 12000W at frequencies ranging between 2400MHz and 2500MHz. The RIK2512K-40TG_H is a remote-type microwave generator system with the SSPA head and power supply unit separately, providing greater system flexibility. The RIK2512K-40TG_H comes equipped with a 12kW SSPA head, 380VAC Power Supply Unit (PSU), a DC cable, a Windows-based GUI, and a PLL Synthesizer/Control Module.

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**	kW	0.6	-	12	P_O
	Step Size	kW	0.1	-	-	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)		%	-	-	54	Eff
Operating Voltage	**PSU**	V	360	-	440	VAC
	SSPA Head		-	50	-	VDC
Phase Shift	**Operating Range**	Deg	0	-	360	-
	Step Size	Deg	-	5.6	-	-
Pulse Mode	**Pulse Repetition Frequency**	kHz	0.01	-	50	-
	Pulse Length	ms	0.02	-	100	-
	Pulse Width	μs	10	-	-	-

Generator Alarm & Protection Features

PARAMETER	State	CONDITION
Output Power	Alarm	Output Power > 12.6 kW
Over-Temperature	Alarm	System Temperature > 50°C
Reflected Power	Alarm	> (Output Power*0.5)
PLL Unlock (1)	Disabled	-
Over-Temperature	Disabled	System Temperature > 55°C
Reflected Power	Disabled	Reflected Power > 6kW (without isolator)
	-	Disable Feature Off (with isolator) (2)

***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) When attached to an isolator provided by RFHIC, the reflected power entering the generator is virtually non-existent due to the features of the isolator. The reflected power entering the isolator will be automatically monitored by RFHIC's GUI software, and when the reflected power entering the isolator exceeds 50% of the output power, only the alarm feature will be activated whereas the disable feature will not be activated.

SSPA Head Mechanical Specifications

PARAMETER	UNIT	VALUE	
Dimensions (W x D x H)	mm	600 x 1232 x 760 (w/ External Isolator)	
SSPA Head Weight	kg	175	
Microwave Output Port	-	WR430	
DC & GND	-	Circular Connector 4pin (Female) x 2	
I/O Connector	-	USB, D-Sub 9-Pin, Ethernet	
Cooling Requirements	-	**Water Cooling Rate**	50 L/min, 5 bar
		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	3/4 Tapered Pipe Thread	

Remarks: Dimensions and Connectors may be subject to change.

Environmental Specifications

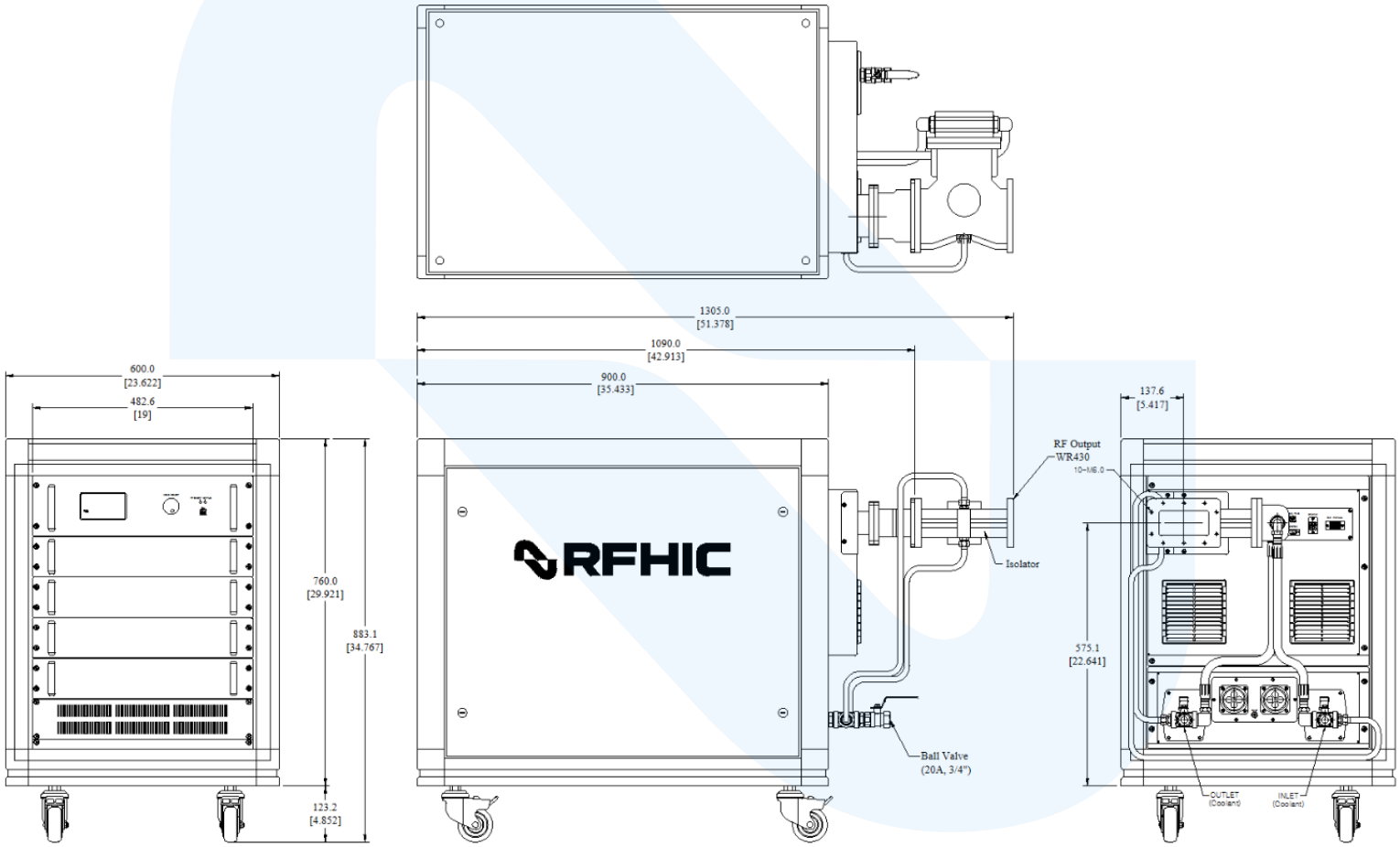
PARAMETER	UNIT	VALUE
Operating Case Temperature (1)	°C	15 ~ 50
Environmental/Storage Temperature	°C	10 ~ 40

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

GaN SSPA Head (RIK2512K-20G)

Figure 1: RIK2512K-40TG_H GaN SSPA Head Front & Side View

GaN SSPA Head Dimension (RIK2512K-20G)



Power Supply Unit Specifications

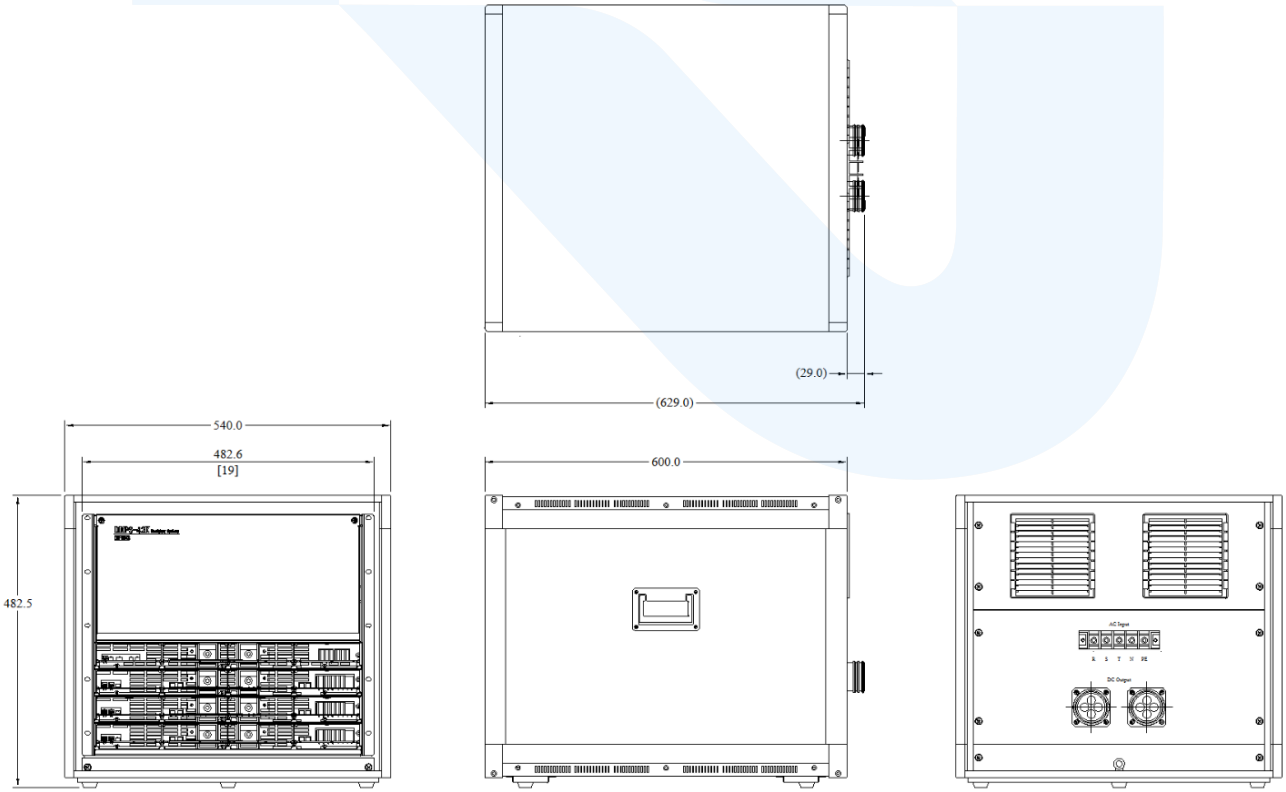
PARAMETER	UNIT	VALUE
Input Voltage	VAC	3Ø4W400 ±10%
Frequency	Hz	45-66
Power Factor	%	≥ 98 Typ.
PSU Efficiency	%	96
Output Voltage	VDC	50
Output Current	A	660 max.
Weight	kg	68
Dimensions (W x D x H)	mm	483 x 427 x 400
Cooling	-	Air Cooling

PSU Image

Figure 2: Power Supply Unit Front View

Figure 3: Power Supply Unit Rear View

PSU Dimension



Revision History

Part Number	Release Date	Version	Description	Data Sheet Status
RIK2512K-40TG	May, 2021	0.1	Initial release of datasheet	Preliminary
RIK2512K-40TG	January, 2022	0.2	Addition of frequency and power step size, Environmental Specifications. Change in water cooling requirements	Preliminary
RIK2512K-40TG	April, 2022	0.2	Change in Fluid Inlet/Outlet size.	Preliminary
RIK2512K-40TG_H	May, 2022	0.3	Change in PSU Specification	Preliminary
RIK2512K-40TG_H	October, 2022	0.4	Added Dimension layout	Preliminary
RIK2512K-40TG_H	June, 2023	0.5	Change Specifications	Preliminary
RIK2512K-40TG_H	September, 2026	0.6	Added Dimension layout	Preliminary

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