Preliminary

GaN Microwave Generator
RIK2512K-40TG

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 is a 12kW, GaN solid-state microwave generator designed ideally for microwave heating and plasma generation applications. The RIK2512K-40TG provides continuous wave (CW) and or pulse output power adjustable from 600W to 12000W at frequencies ranging between 2400MHz and 2500MHz. The RIK2512K-40TG is a remote-type microwave generator system with the SSPA head and power supply unit separately, providing greater system flexibility. The RIK2512K-40TG comes equipped with a 12kW SSPA head, 380VAC Power Supply Unit (PSU), a DC cable, a Window-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	380		415	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	us	10	-	-	-

Generator Alarm & Protection Features

PARAMETER	State	CONDITION
Output Power	Alarm	Output Power > 12.5 kW
Over-Temperature	Alarm	System Temperature > 50 C°
Reflected Power	Alarm	3kW ~ 6kW
PLL Unlock (1)	Disabled	-
Over-Temperature	Disabled	System Temperature > 55 C°
Reflected Power	Disabled	Reflected Power > 6kW

***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.

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	Approx. 120	
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**	50L/Min, 5Bar
		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

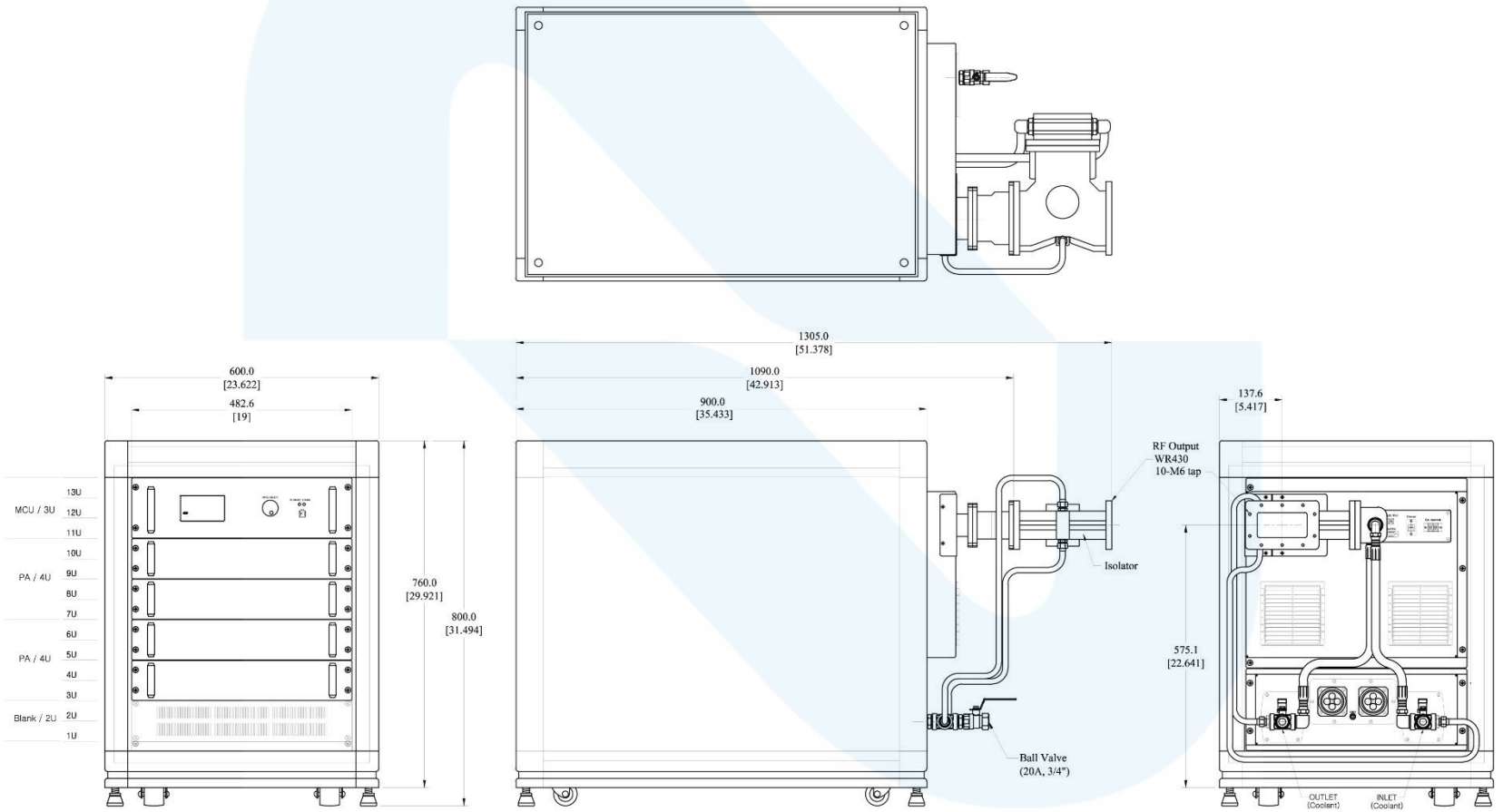
PARAMETER	UNIT	VALUE
Operating Case Temperature(1)	°C	15~50
Environmental/Storage Temperature	°C	10 ~ 40

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

GaN SSPA Head (RIK2512K-20G)

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

GaN SSPA Head Dimension (RIK2512K-20G)



Power Supply Unit Specifications (DMPS-42KW)

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: 42kW_DMPS_ Power Supply Unit Front View

Figure 2: 42kW_DMPS_ Power Supply Unit Front View

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

KS Q 9100:2018
AS9100 D

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