

YSPA20-13R7-14R5-S

Ku-Band Power Amplifier, 13.7 – 14.5 GHz, 300 W Output Power

Key Features

- Output Power: ≥ 300 W (CW)
- Power Gain: ≥ 20 dB
- Efficiency: $\geq 30\%$
- Built-in OVP/OCF/OTP Protection
- BJ140 (WR62) Waveguide Output

Applications

- Satellite Communication Uplinks
- Ku-Band Microwave Relay Links
- Test & Measurement Systems
- Broadband Wireless Transmitters
- Radar Front-Ends

Electrical Specifications				
Parameter	Min.	Typ.	Max.	Unit
Frequency Range	13.7	-	14.5	GHz
Output Power(CW)	300	-	-	W
Power Gain	-	20	-	dB
Gain Flatness	-	-	±1	dB
IMD3 (Two-Tone, 48 dBm per tone)	27 (at some freq.)	30 (at most freq.)	-	dBc
Power Added Efficiency	30	48.6	-	%
Supply Voltage	-	+24	-	V
Operating Current	-	-	48	A
Enable Control (EN)	0 (OFF)	-	+5 (ON)	V
Environmental Specifications				
Parameter	Min.	Typ.	Max.	Unit
Operating Temperature	0	-	+65	°C
Storage Temperature	-20	-	+65	°C
Relative Humidity	≤95% , non- condensing			
Mechanical Specifications				
Input Connectors	SMA-Female			
Output Connectors	BJ140 (WR62) Waveguide			
Control Interface	HCZZ0001-6 (6-pin, mating housing HC-JK-1.25-6Y)			
Power Supply Interface	Wire-soldering terminals (dual +24V / GND pairs)			
Housing Material	Copper base / Aluminum upper			
Surface Finish	Silver plating			
Weight				
Dimensions ¹	182×129×34 mm [7.17×5.08×1.34 in]			
Ruggedness				
Parameter	Condition		Description	
Over-Temperature Protection	Internal temp. exceeds limit		RF output disabled	
Over-Voltage Protection	Supply voltage exceeds limit		RF output disabled	
Over-Current Protection	Operating current exceeds limit		RF output disabled	
Interface Definitions				

Table 1 – DC Power Supply Interface (Wire-Soldering)

Pin No.	Signal	Definition	Board Label
1	+24 V	Supply positive	VCC
2	GND	Supply ground	GND
3	+24 V	Supply positive	VCC
4	GND	Supply ground	GND

Table 2 – Control Interface (6-Pin Connector HCZZ0001-6)

Pin No.	Signal	Function	Note
1	RX+	Serial receive (plus)	RS-422
2	RX-	Serial receive (minus)	RS-422
3	TX-	Serial transmit (minus)	RS-422
4	TX+	Serial transmit (plus)	RS-422
5	EN	Amplifier enable	+5 V = ON, 0 V = OFF
6	GND	Control signal ground	-

Serial Communication Protocol

Parameter	Specification
Interface	RS-422 (via control connector, pins 1–4)
Baud Rate	115200 bps
Data Bits	8
Stop Bits	1
Parity	None
Transmission Mode	Auto-reply (once per second)

Telemetry Data Returned (1 frame per second):

- Temperature: 1 channel
- Voltage: 1 channel
- Current: 8 channels (individual internal stage monitoring)

Table 3 – Return Data Frame Format (12 Bytes, Fixed Length)

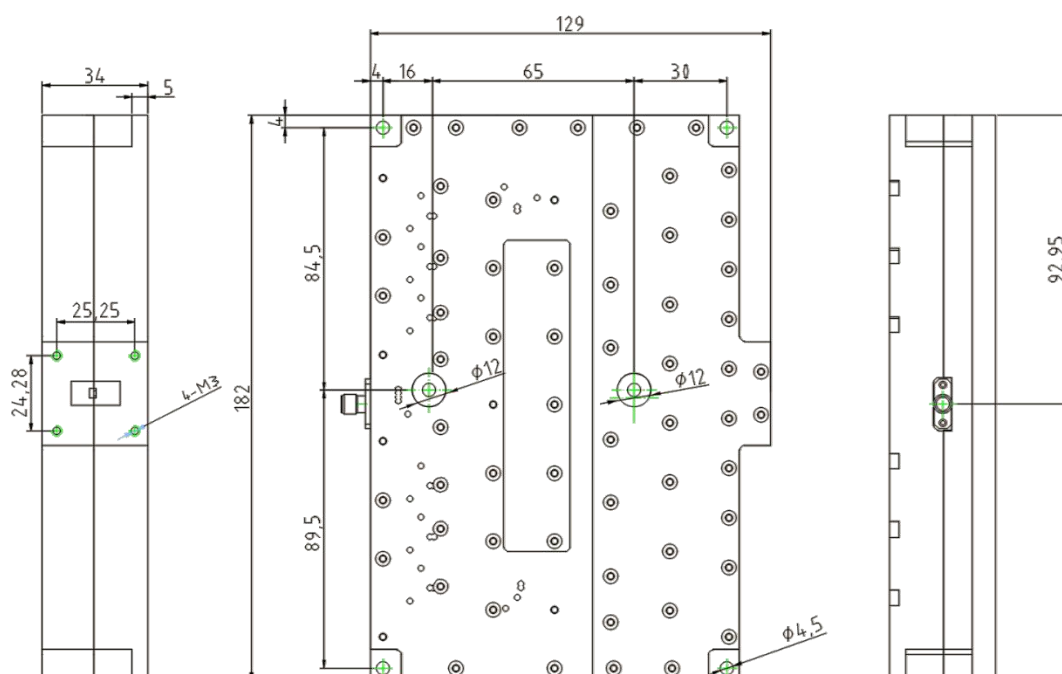
Byte No.	Field	Byte Length	Description
1	Frame Header	1	0xAA
2	Temperature	1	-40 ~ +125 °C, two's complement; 0xD8 = -40°C, 0x7D = +125°C
3-4	Voltage	2	Resolution 0.1 V; e.g., 28.3 V → 0x010x1B
5	Current Channel 2	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
6	Current Channel 3	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
7	Current Channel 4	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
8	Current Channel 5	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
9	Current Channel 6	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
10	Current Channel 7	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
11	Current Channel 8	1	0 ~ 25.6 A; 1 A → 0x0A, 10 A → 0x64
12	Frame Trailer	1	0xBB

Test Data – Ku-Band 300 W Power Amplifier

Test Conditions: VD = +24 V, VG = -2.55 V, Quiescent Current = 5.5 A, Ambient Temperature = 25°C

NO.	Freq. (GHz)	Pout (dBm)	Current (A)	IMD3 (dBc)	DC Power (W)	Efficiency (%)	Spurious (dBc)
1	13.7	55.7	39.6	28/29	950.4	39.09	>70
2	13.8	56.9	42	31/32	1008	48.59	-
3	13.9	56.1	40.8	33/34	979.2	41.6	-
4	14.0	56.3	40.4	33/34	969.6	44	-
5	14.1	55.8	42.9	33/34	1029.6	36.93	-
6	14.2	55.4	41.9	33/34	1005.6	34.48	-
7	14.3	55.2	45	32/33	1080	30.66	-
8	14.4	56	44.1	31/32	1058.4	37.61	-
9	14.5	55.2	43.7	30/32	1048.8	31.57	-

Outline Drawing (Units: mm/[inch], Tolerance: ± 0.2 mm)



Note 1: Excluding Connectors