

# 10W Solid State Power Amplifier

## 17-20.5 GHz



Product Datasheet

### K-HPA10W-1721-SSPA

10 W GaN Solid State Power Amplifier for K-band applications.

### Overview

K-HPA10W-1721-SSPA is an integrated High Power Amplifier module operating from 17-20.5 GHz, delivering over 10 W of saturated power across the band. The module is biased from a single 25-28 V DC supply and activated through an enable signal.

Power and temperature detect functionality are incorporated to facilitate system integration and telemetry. The module casing dimensions is 63 x 60 x 25 mm (See page 6).



### Features

- Frequency range 17-20.5 GHz
- Power >10 W saturated
- Integrated temperature and power detector
- Single 25-28 V DC supply
- Enable pin
- 2.92 mm RF I/O connectors
- Dimensions 63 x 60 x 25 mm



### Applications

- Satellite communications
- Radar
- Mobile communications
- 5G

#### Available as

K-HPA10W-1721	17-20.5 GHz bare die GaN HPA
K-HPA10W-1721-EVAL	17-20.5 GHz bare die GaN HPA evaluation board
K-HPA10W-1721-SM	17-20.5 GHz packaged GaN HPA
K-HPA10W-1721-SM-EVAL	17-20.5 GHz packaged GaN HPA evaluation board
K-HPA10W-1721-SSPA	17-20.5 GHz GaN solid state power amplifier

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### Electrical Specification

Freq 17-20.5 GHz,  $T_a=25\text{ }^\circ\text{C}$ ,  $V_d=28\text{ V}$ ,  $I_{dq}=300\text{ mA}$ ,  $Z_o=50\text{ }\Omega$

Parameter	Test Conditions	Min	Typ	High	Unit
Operational Frequency Range		17.0		20.5	(GHz)
Small Signal Gain	17-18.5		24		(dB)
	18.5-20.5		21		
Input VSWR	17.5-20.5 GHz		1.9		-
Output VSWR	17.5-20.5 GHz		1.9		-
Output Power at Saturation	17-19 GHz		41		(dBm)
	19-20.5 GHz		39.5		

### Absolute Maximum Ratings

Parameter	Rating
Voltage	30 V
Current	2.5 A
Input Power (Pin)	25 dBm
Power Dissipation (PDISS) (70 °C)	44 W

Baseplate Temperature 85 °C

Exceeding any one or combination of these limits may cause permanent damage to this device. Sustained operation near these survivability limits is not recommended.

### Recommended Operating Conditions

Parameter	Rating
Voltage	28 V
Baseplate Temperature	< 70 °C

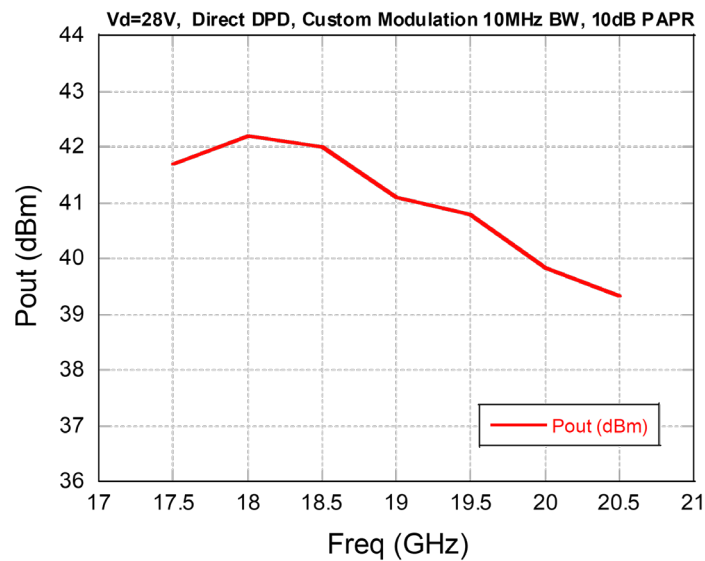
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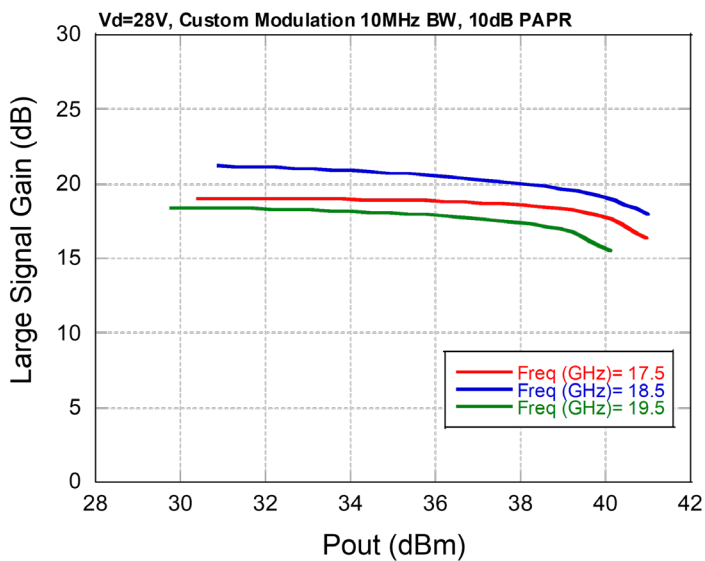


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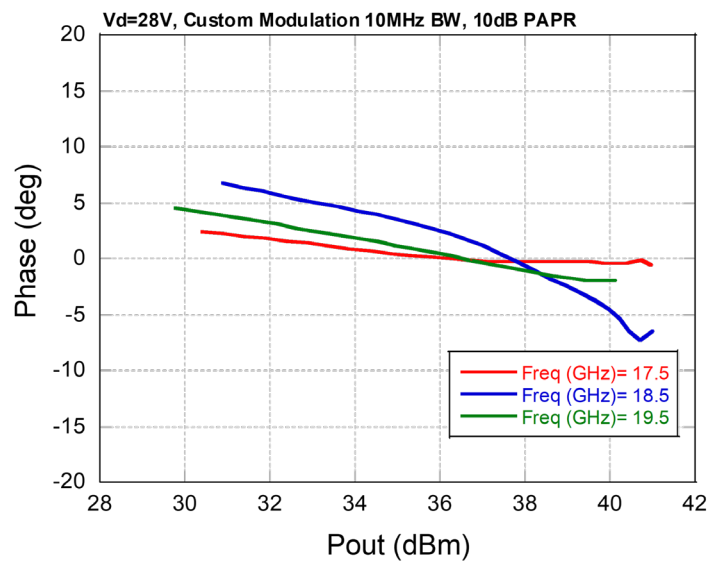
### Peak Output Power vs Frequency



### AM/AM vs Frequency



### AM/PM vs Frequency



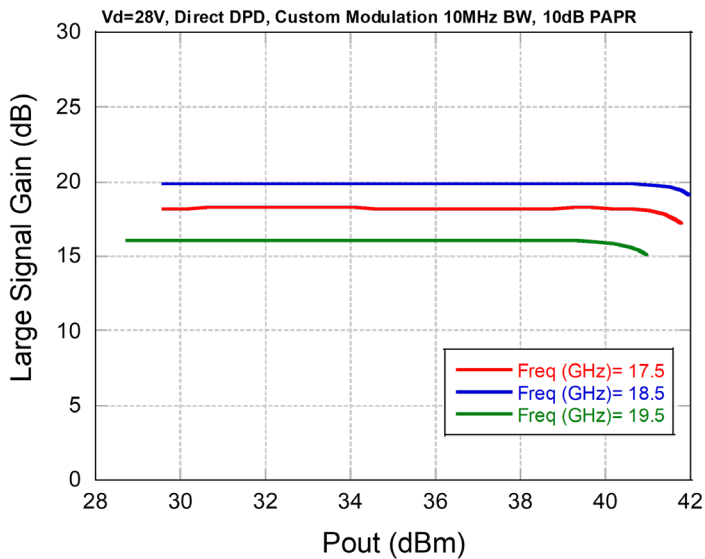
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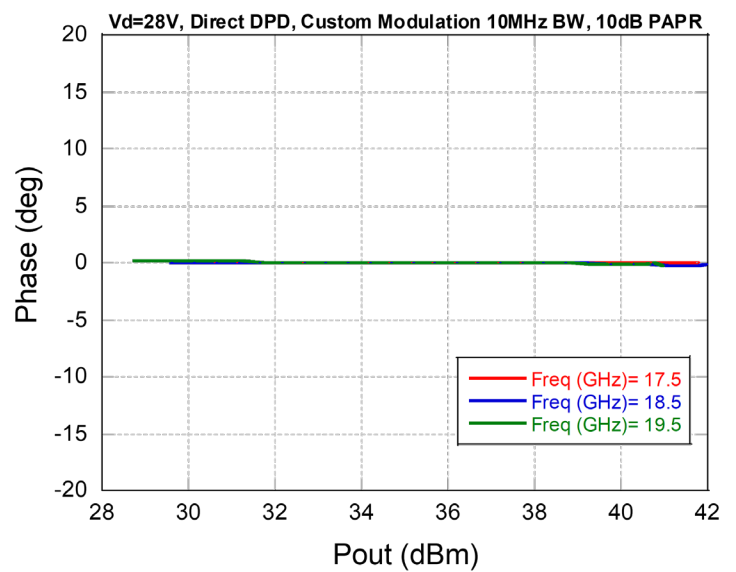


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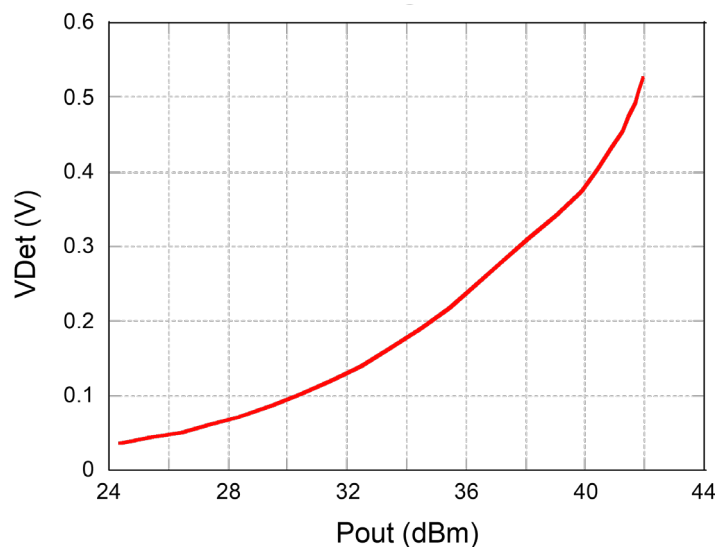
### AM/AM vs Frequency DPD Applied



### AM/PM vs Frequency DPD Applied



### Power Detect Voltage vs Pout



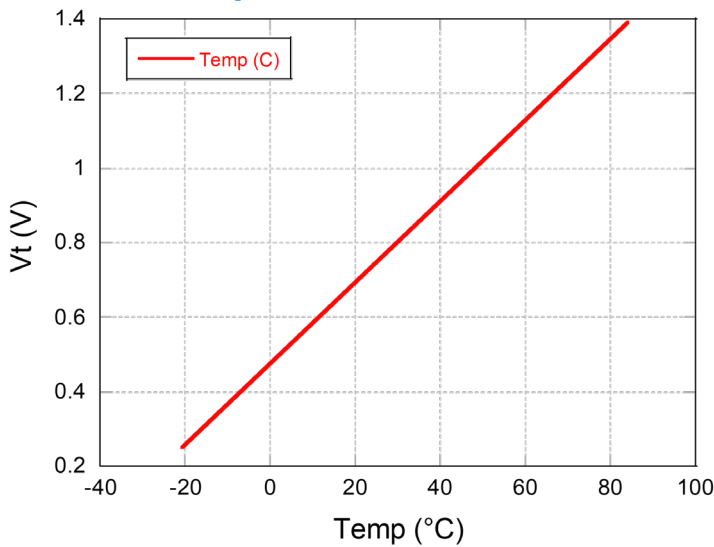
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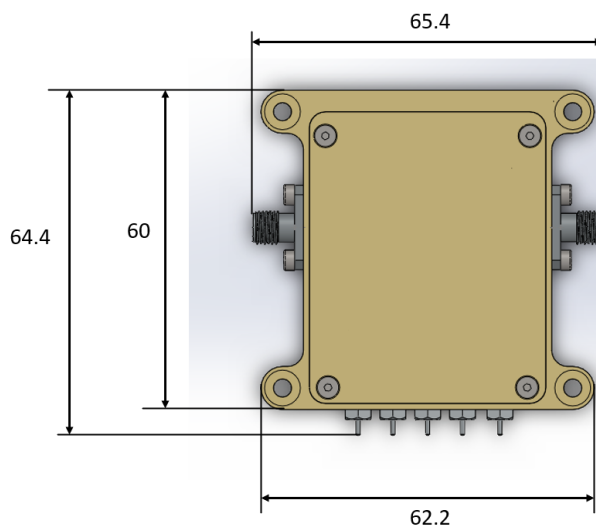
### Temperature Detect Voltage vs Temperature



Ensure the module is bolted down to an adequate heat sink before operation. A thermal interface material should be used between the base of the module and the heat sink.

The on-board temperature sensor is located close to the HPA, however there will be a temperature offset of approx. 45 °C to the base of the part.

### Dimensions



TOTAL HEIGHT - 24

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### Power Sequence

The K-HPA10W-1721-SSPA module is powered using a single supply voltage. It is recommended to use a voltage in the range 25-28V depending on requirements. (see K-HPA10W-1721-SM datasheet).

Gate voltages are generated internally, and correct bias sequencing is handled within the module.

Power Up Sequence	Power Down Sequence
1. Set EN (Enable) to +5 V	1. Switch OFF the RF signal
2. Apply DC Voltage to 28 V Pin. Verify that current is <50 mA	2. Set EN to +5 V
3. Set EN pin to 0 V. Verify that current is in the range 200 mA -300 mA	3. Switch OFF the DC Voltage to 28 V Pin
4. Apply RF signal	4. Set EN to 0 V

### Connection Pins



Pin	Connection
1. 28 V	28 V DC power, maximum current 2.2 A
2. GND	Ground
3. EN	SSPA enable
4. Vt	SSPA temperature detect voltage
5. Vp	SSPA power detect voltage

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