

10W Solid State Power Amplifier

17-20.5 GHz



Product Datasheet

SSPA11201721SS

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

Overview

SSPA11201721SS 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 93.7 x 88 x 24 mm



Applications

- Satellite communications
- Radar
- Mobile communications
- 5G

Available as

HPA11201721B	17-20.5 GHz bare die GaN HPA
HPA11201721BE	17-20.5 GHz bare die GaN HPA evaluation board
HPA11201721QF	17-20.5 GHz packaged GaN HPA
HPA11201721QFE	17-20.5 GHz packaged GaN HPA evaluation board
SSPA11201721SS	17-20.5 GHz GaN solid state power amplifier

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Electrical Specification

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

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

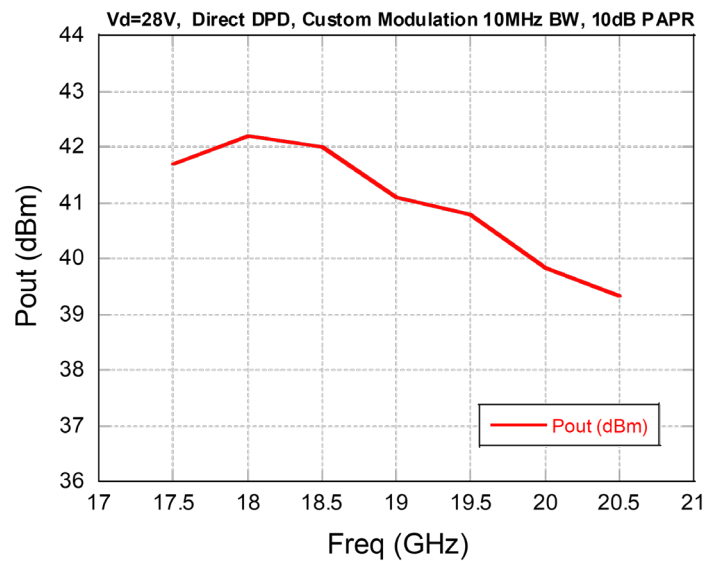
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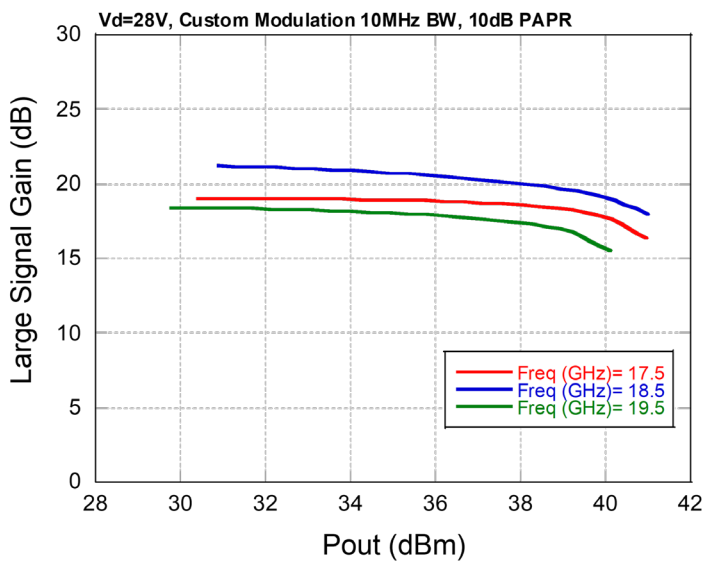


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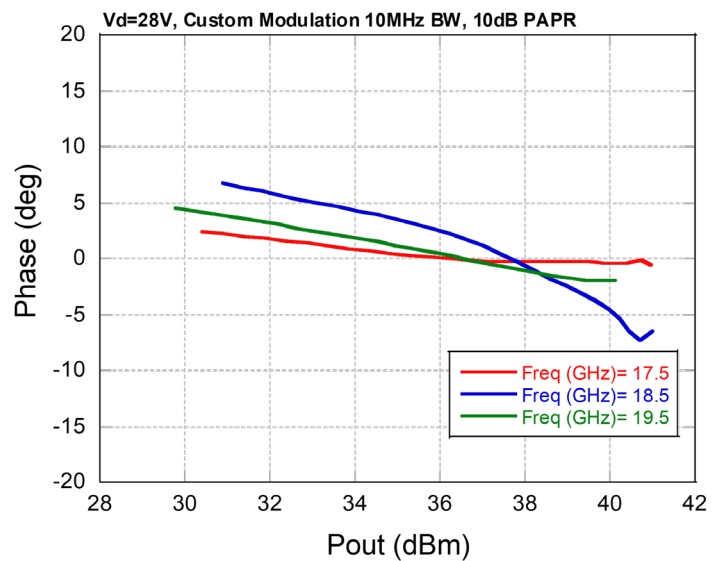
Peak Output Power vs Frequency



AM/AM vs Frequency



AM/PM vs Frequency



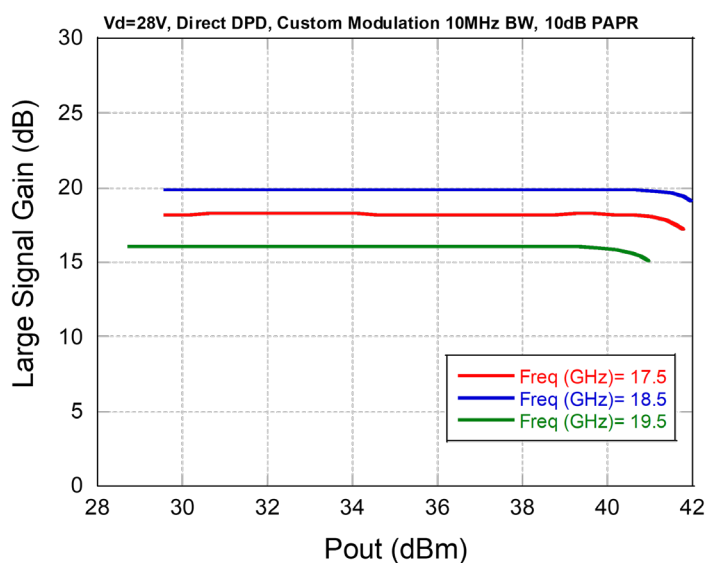
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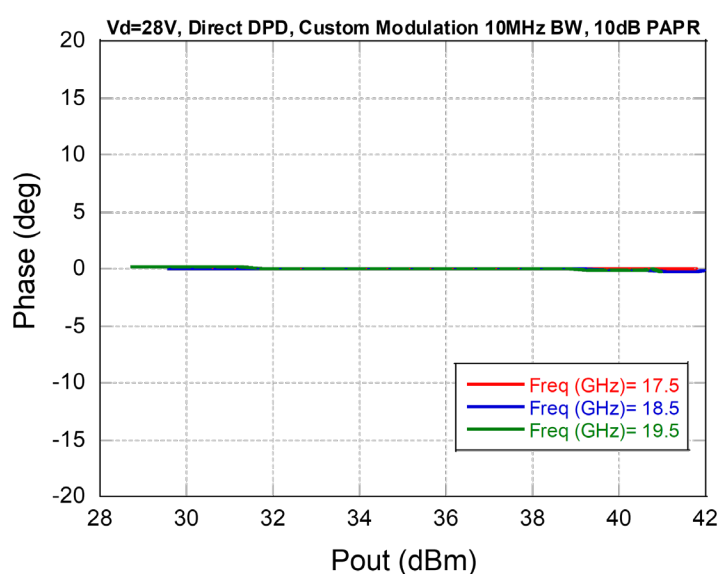


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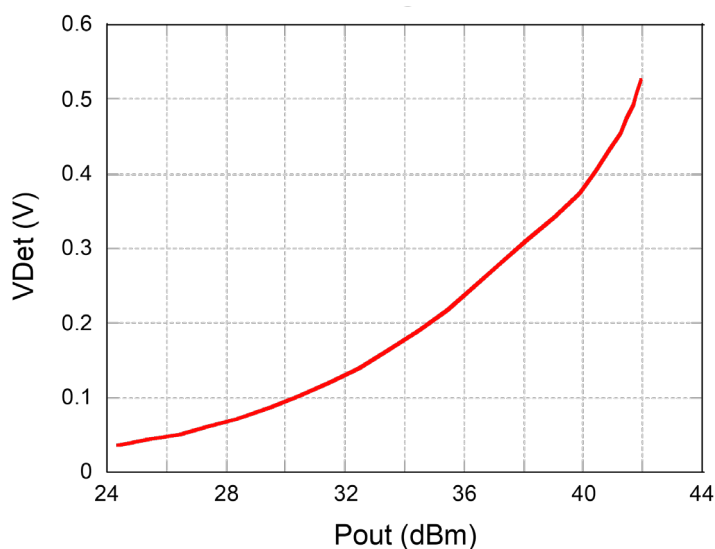
AM/AM vs Frequency DPD Applied



AM/PM vs Frequency DPD Applied



Power Detect Voltage vs Pout



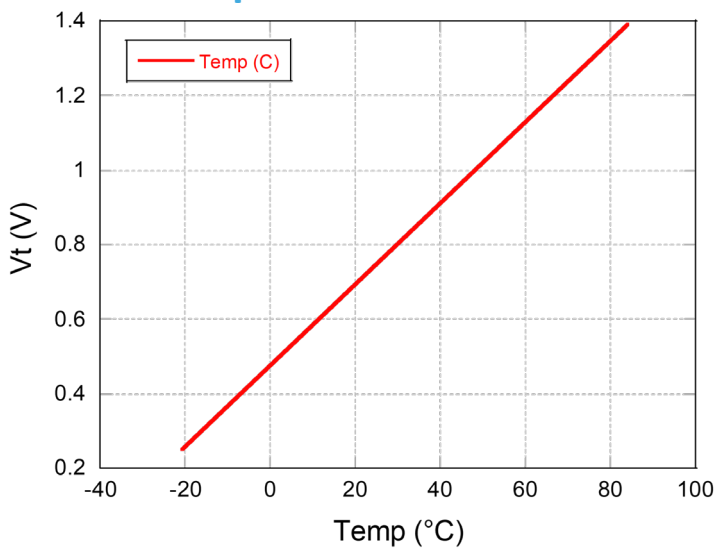
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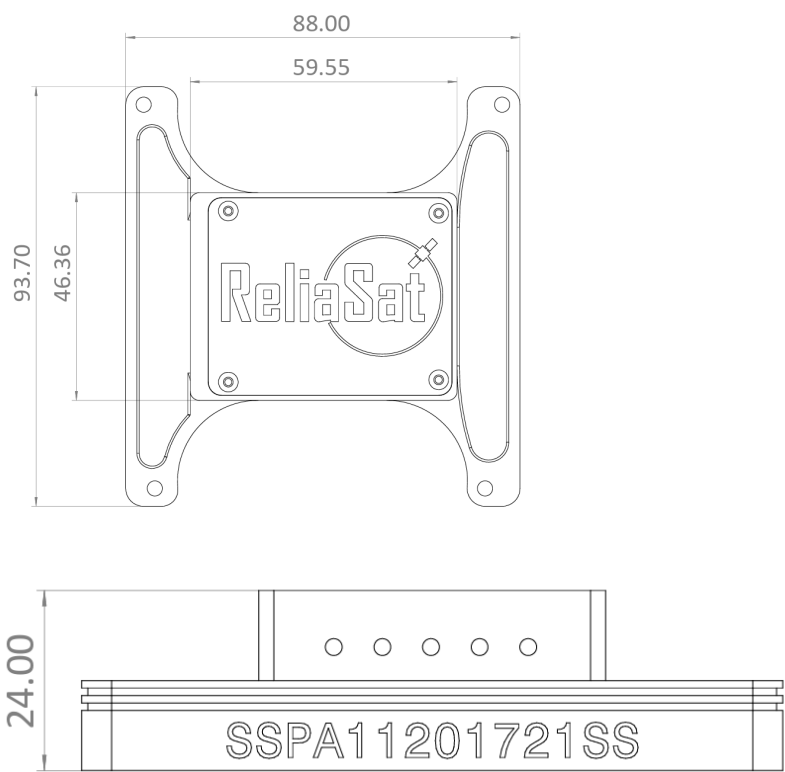
Temperature Detect Voltage vs Temperature



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



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Power Sequence

The SSPA11201721SS module is powered using a single supply voltage. It is recommended to use a voltage in the range 25-28V depending on requirements. (see HPA11201721QF 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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