RFPD3020

45MHz to 1600MHz GaAs/GaN Power Doubler Hybrid

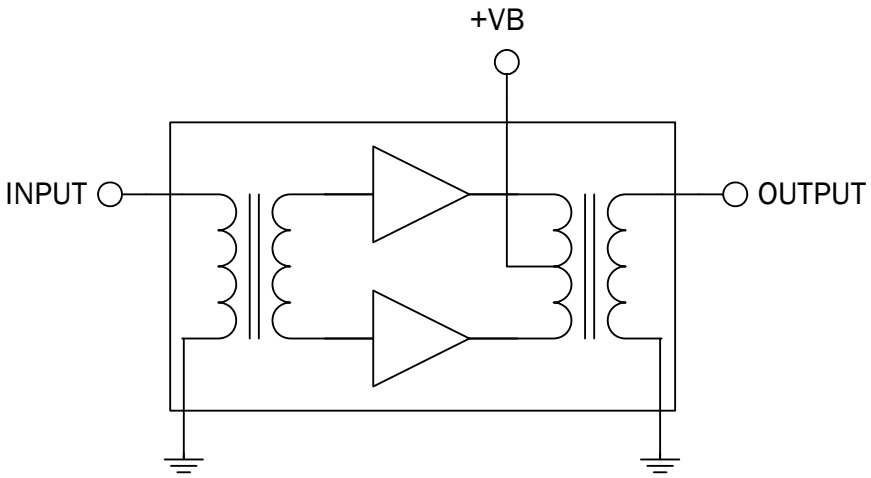
Package: SOT-115J

Features

- Excellent Linearity
- Superior Return Loss Performance
- Extremely Low Distortion
- Optimal Reliability
- Low Noise
- Unconditionally Stable Under All Terminations
- Extremely High Output Capability
- 22.5dB Min. Gain at 1600MHz
- 450mA Max. at $24V_{DC}$

Applications

- 45 MHz to 1600MHz CATV Amplifier Systems



Functional Block Diagram

Product Description

The RFPD3020 is a hybrid power doubler amplifier module. The part employs GaAs pHEMT die and GaN HEMT die, has high output capability, and is operated from 45MHz to 1600MHz. It provides excellent linearity and superior return loss performance with low noise and optimal reliability.

Ordering Information

RFPD3020	45MHz to 1600MHz GaAs/GaN Power Doubler Hybrid

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Absolute Maximum Ratings

Parameter	Rating	Unit
RF Input Voltage (single tone)	60	dBmV
DC Supply Over-Voltage (5 minutes)	30	V
Storage Temperature	-40 to +100	°C
Operating Mounting Base Temperature	-30 to +100	°C

Caution! ESD sensitive device.

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS (Restriction of Hazardous Substances): Compliant per EU Directive 2002/95/EC.

Nominal Operating Parameters

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Overall					V_B = 24V; T_{MB} = 30°C; Z_S = Z_L = 75Ω
Power Gain	21.0	21.7	22.0	dB	f = 45MHz
	22.5	23.5	24.5	dB	f = 1600MHz
Slope[1]	0.5	1.0	2.5	dB	f = 45MHz to 1600MHz
Flatness of Frequency Response			1.3	dB	
Input Return Loss	-20			dB	f = 45MHz to 320MHz
	-18			dB	f = 320MHz to 640MHz
	-16			dB	f = 640MHz to 870MHz
	-15			dB	f = 870MHz to 1200MHz
	-14			dB	f = 1200MHz to 1600MHz
Output Return Loss	-20			dB	f = 45MHz to 320MHz
	-19			dB	f = 320MHz to 640MHz
	-18			dB	f = 640MHz to 870MHz
	-13			dB	f = 870MHz to 1200MHz
	-10			dB	f = 1200MHz to 1600MHz
Noise Figure		3.0	4.0	dB	f = 50MHz to 1600MHz
Total Current Consumption (DC)		420.0	450.0	mA	
Distortion Data 45MHz to 550MHz					V_B = 24V; T_{MB} = 30°C; Z_S = Z_L = 75Ω
CTB[3]		-77	-74	dBc	V_O = 56.4dBmV at 1000MHz, 13.4dB extrapolated tilt, 79 analog channels plus 75 digital channels (-6dB offset)[2]
XMOD[4]		-71	-68	dBc	
CSO[5]		-71	-68	dBc	
CIN[6]	63	66		dB	

Notes:
1. The slope is defined as the difference between the gain at the start frequency and the gain at the stop frequency.
2. 79 analog channels, NTSC frequency raster: 55.25MHz to 547.25MHz, +43dBmV to +50dBmV tilted output level, plus 75 digital channels, -6dB offset relative to the equivalent analog carrier.
3. Composite triple beat (CTB) is defined by the NCTA.
4. Cross modulation (XMOD) is measured at baseband (selective voltmeter method), referenced to 100% modulation of the carrier being tested.
5. Composite second order (CSO) (both sum and difference products) is defined by the NCTA.
6. Carrier to intermodulation noise (CIN) is defined by ANSI/SCTE 17 (Test procedure for carrier to noise).

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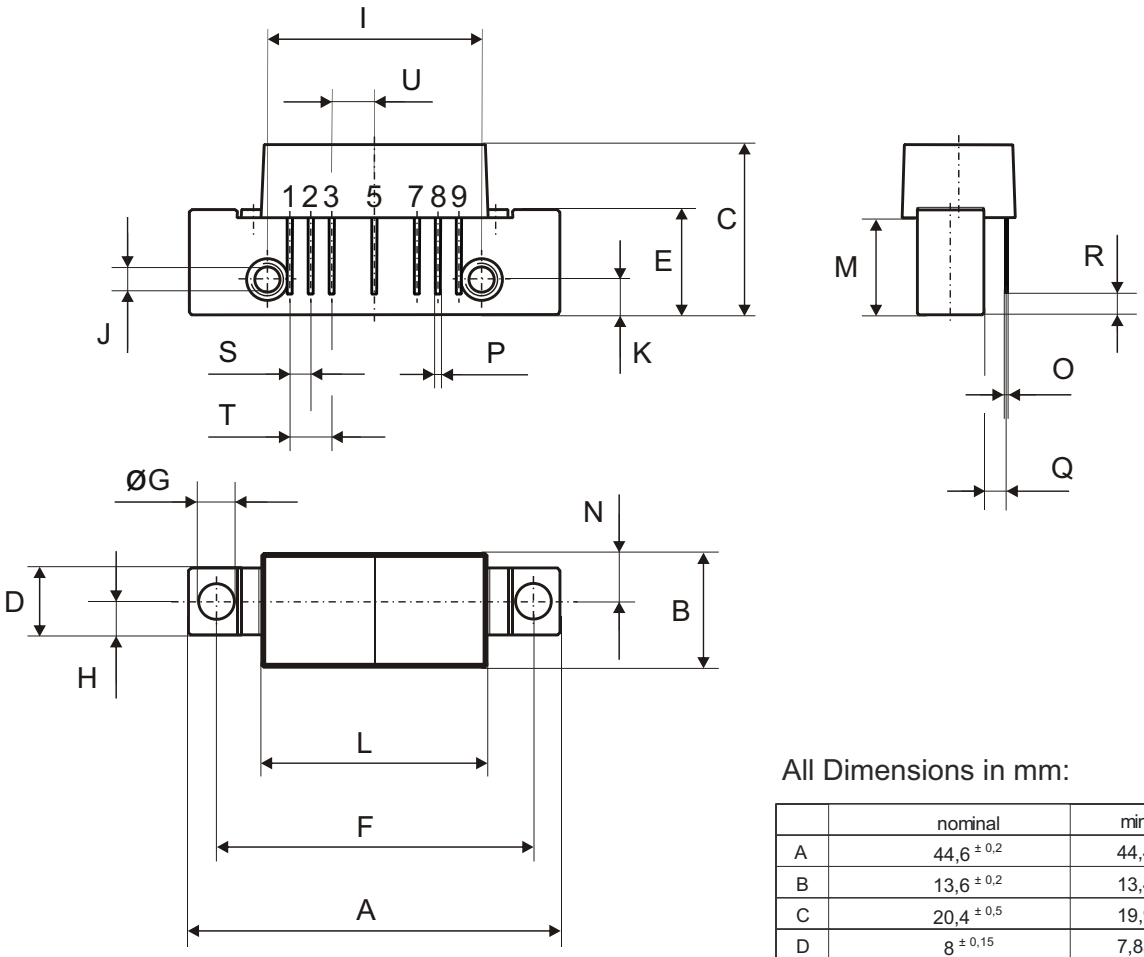
Package Drawing



All Dimensions in mm:

	nominal	min	max
A	44,6 ± 0,2	44,4	44,8
B	13,6 ± 0,2	13,4	13,8
C	20,4 ± 0,5	19,9	20,9
D	8 ± 0,15	7,85	8,15
E	12,6 ± 0,15	12,45	12,75
F	38,1 ± 0,2	37,9	38,3
G	4 +0,2 / -0,05	3,95	4,2
H	4 ± 0,2	3,8	4,2
I	25,4 ± 0,2	25,2	25,6
J	UNC 6-32	-	-
K	4,2 ± 0,2	4,0	4,4
L	27,2 ± 0,2	27,0	27,4
M	11,6 ± 0,5	11,1	12,1
N	5,8 ± 0,4	5,4	6,2
O	0,25 ± 0,02	0,23	0,27
P	0,45 ± 0,03	0,42	0,48
Q	2,54 ± 0,3	2,24	2,84
R	2,54 ± 0,5	2,04	3,04
S	2,54 ± 0,25	2,29	2,79
T	5,08 ± 0,25	4,83	5,33
U	5,08 ± 0,25	4,83	5,33

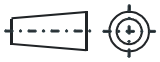
Pinning:

0 5 10mm
scale

1	2	3	4	5	6	7	8	9
INPUT	GND	GND		+VB		GND	GND	OUTPUT

Notes:

European Projection



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