AMP5220031H-R

1 W High Dynamic TX Amplifier Device 5 … 2200 MHz

Features

- output power +31 dBm typ.
- high OIP3 +48 dBm typ.
- VLF suppression filter
- open/short stable
- variant with TETRA suppression
- AC mains supply

Applications

- radio coverage in buildings
- FM, DAB, DVB-T, GNSS
- driver amplifier for radiating cables

At a Glance

AMP5220031H-R from Becker Nachrichtentechnik is a 19“, 1 U amplifier device in 50 Ohm technology. It is designed as driver amplifier for radiating cables to cover areas in buildings with radio signals. The robust electric and mechanic design gives solid operations over a long time. The amplifier works stable over a wide frequency range with many octaves. The wide frequency range allows the operation with all common broadcast signals including GNSS. The amplifier offers a wide AC mains supply voltage range. The presence of AC power is indicated by a LED at the front side.

Push Pull Technology

The internal wideband amplifier stages are designed in push-pull technology. This technology gives the amplifier high linearity performance and wider operation bandwidths. Compared with the linearity of single stage amplifiers the push-pull technology gives much better power efficiency with less heat generation.

Safe Operation

To prevent interferences with installed trunked radio systems (TETRA) the AMP5220031H-R is available in a variant with a band stop filter at the output. The band stop filter suppresses signals in the frequency range 380 … 430 MHz. For increasing GNSS signal level this variant has an additional equalizer filter.

Special Features

The highest IP2 and IP3 properties makes the device suitable in professional applications where weak RF signals in combination with very strong signals or digital modulated signals must amplified without any distortion effects. An integrated high pass filter in the input supress unwanted signals in the VLF and HF range.

Tolerant to Mismatches

Using RF power transistors with enough head room to maximum ratings make the amplifier robust against reverse power and therefore robust against loads at the output which are not matched. The output of the amplifier is robust against open or short load at the output.

Rugged Design

The amplifier device has aluminium housing. The internal amplifier modules additional are built in a milled aluminum case to give best shielding for avoiding EMI influences caused by radio signals coming from the environment. The RF connectors on the unit rear side are N female type.

RF Specification (Variant 1 without TETRA suppression and GNSS equalizer filter)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in} / Z_{out}		50		Ω	
low frequency	f_{min}			5	MHz	
high frequency	f_{max}	2200			MHz	
gain	S_{21}	43.0		48.5	dB	≤ 1700 MHz
	S_{21}	41.0		46.0	dB	> 1700 MHz
VLF suppression	S_{21}		-50	-25	dB	f < 1 MHz, rel. 100 MHz
input return loss	S_{11}		-20	-12	dB	
output return loss	S_{22}		-18	-10	dB	≤ 1700 MHz
	S_{22}		-9	-6	dB	> 1700 MHz
reverse isolation	S_{12}		-75		dB	
1 dB compression	P_{1dB}	+29	+31		dBm	
3rd order intercept	OIP3[1]	+43	+48		dBm	
2nd order intercept	OIP2[1]	+55	+65		dBm	
noise figure	NF		5.5	7.5	dB	
maximum input power	$P_{in\ max}$			+10	dBm	output terminated with 50 ohms
maximum DC Voltage	U_{DC}			20	V	RF ports
ESD discharge resistor	R_{ESD}		4.7		kΩ	RF input
RF connectors	X_{RF}		N female			

Note 1: Tested at P_{out} 2 x +12 dBm; Δf = 1 MHz

RF Specification (Variant 2 with TETRA suppression and GNSS equalizer filter)

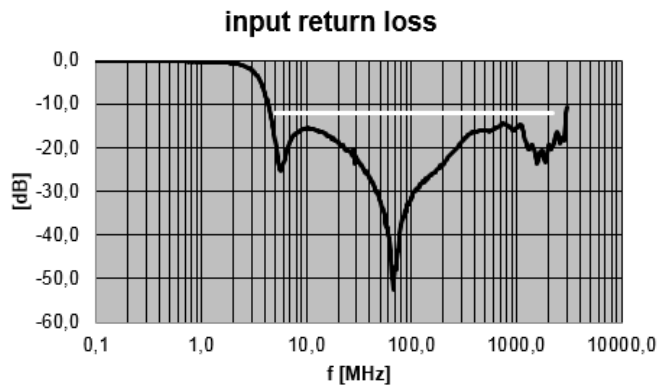
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Zin / Zout		50		Ω	
low frequency	fmin			5	MHz	
high frequency	fmax	2200			MHz	
gain	S21	25.0	28.0	30.0	dB	f ≤ 15 MHz
	S21	28.0	30.0	32.0	dB	15 MHz ≤ f ≤ 200 MHz
	S21	30.0	32.0	34.0	dB	f = 500 MHz
	S21	37.0	40.0	43.0	dB	f ≥ 1000 MHz
TETRA suppression						
frequency range	fSUPP	380		430	MHz	
suppression	S21		-60	-40	dB	
VLF suppression	S21		-50	-25	dB	f < 1 MHz, rel. 100 MHz
input return loss	S11		-12	-8	dB	f < 50 MHz
	S11		-20	-11	dB	50 MHz ≤ f ≤ 1500 MHz
	S11		-12	-8	dB	f > 1500 MHz
output return loss	S22		-16	-10	dB	f ≤ 1500 MHz
	S22		-12	-6	dB	f > 1500 MHz
reverse isolation	S12		-75		dB	
1 dB compression	P1dB	+28	+30		dBm	
3rd order intercept	OIP31	+43	+48		dBm	
2nd order intercept	OIP21	+55	+65		dBm	
noise figure	NF		8.0	10.0	dB	
maximum input power	Pin max			+10	dBm	output terminated with 50 ohms
maximum DC Voltage	UDC			20	V	RF ports
ESD discharge resistor	RESD		4.7		kΩ	RF input
RF connectors	XRF		N female			

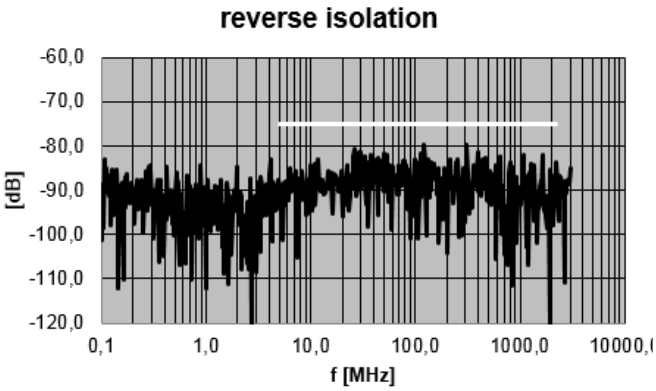
Note 1: Tested at P_{out} 2 x +12 dBm; Δf = 1 MHz

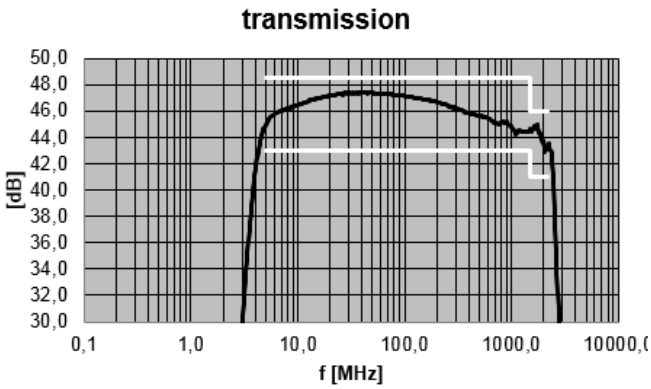
Common Specification

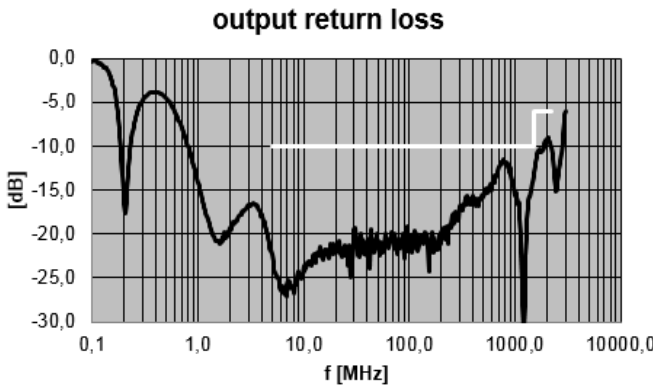
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U_{AC}	90		260	V	AC, 50 … 400 Hz
power consumption	P_{AC}		13		W	
power socket	X_{AC}	IEC-60320 C14				country specific power cable
dimensions	W x H x D	approx. 482 x 44 x 145			mm	without connectors
weight	m		2.2		kg	
operating temp. range	T_o	+5		+40	°C	housing surface
storage temp. range	T_s	-40		+70	°C	
ordering information	AMP5220031H-R			1404.5102.1		Variant 1: without TETRA suppression filter
	AMP5220031H-R			1404.5102.2		Variant 2: with TETRA suppression and GNSS equalizer filter

S-Parameters Variant 1 (typical responses)

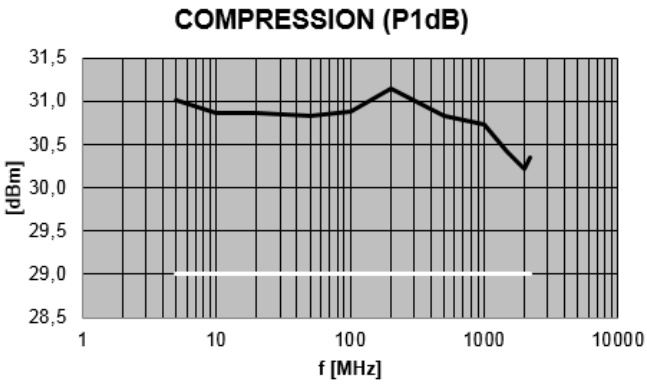


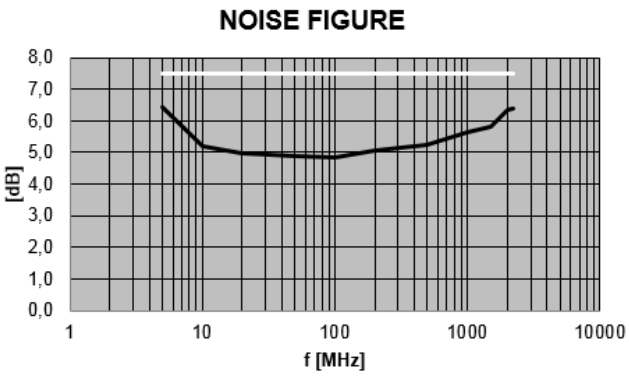




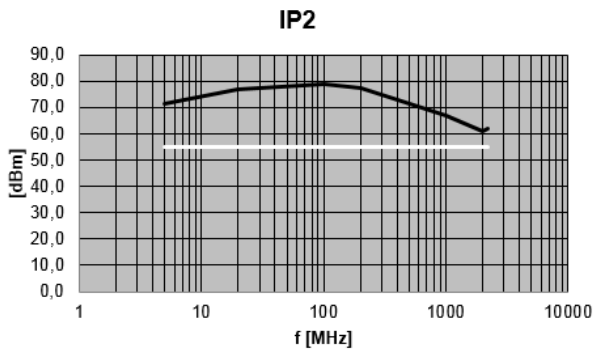


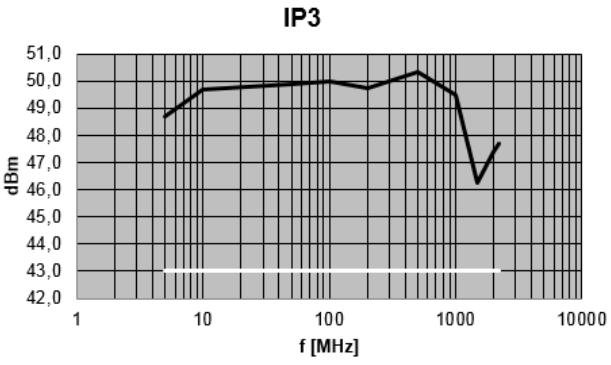
Dynamic Range Variant 1 (typical responses)



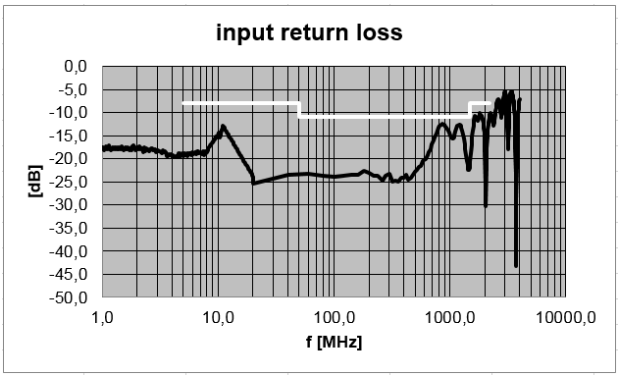


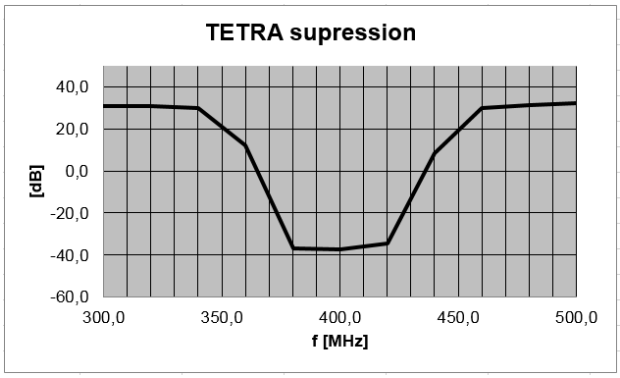
Linearity Variant 1 (typical responses)

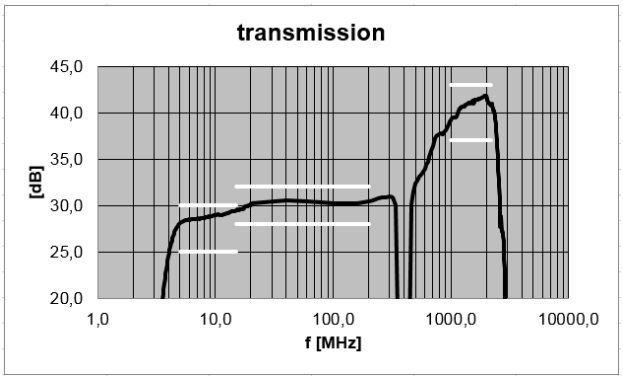


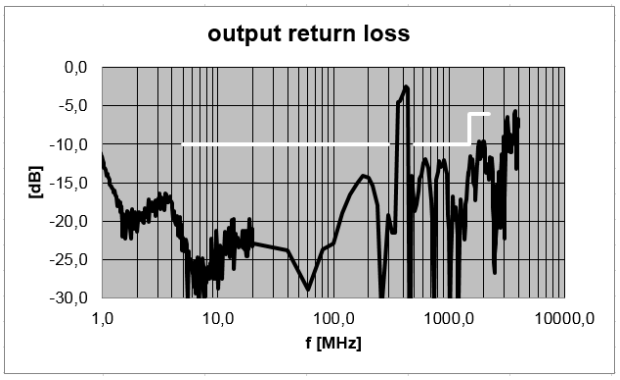


S-Parameters Variant 2 (typical responses)

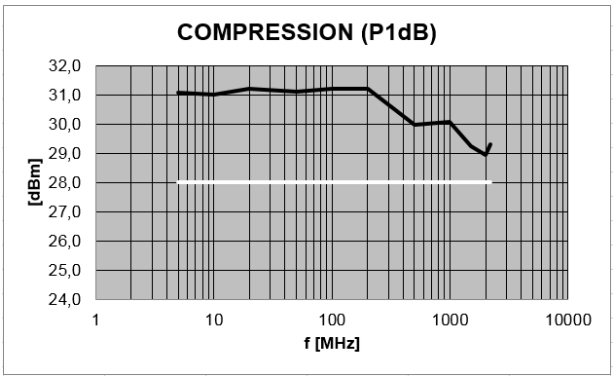


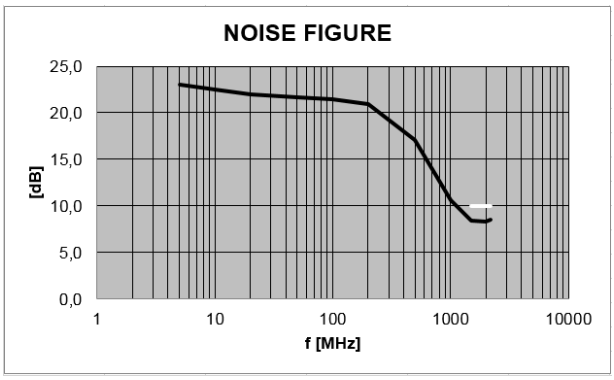




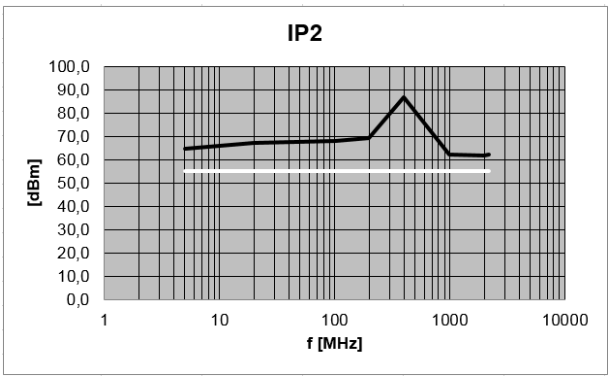


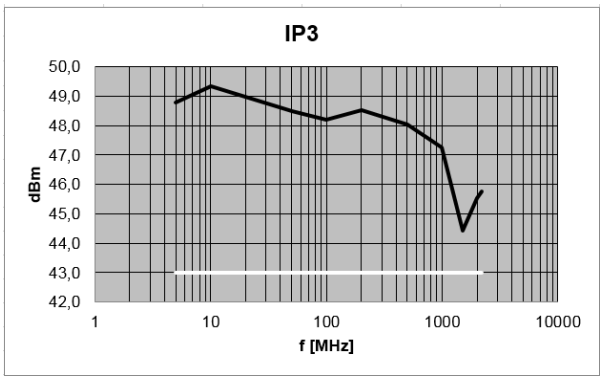
Dynamic Range Variant 2 (typical responses)





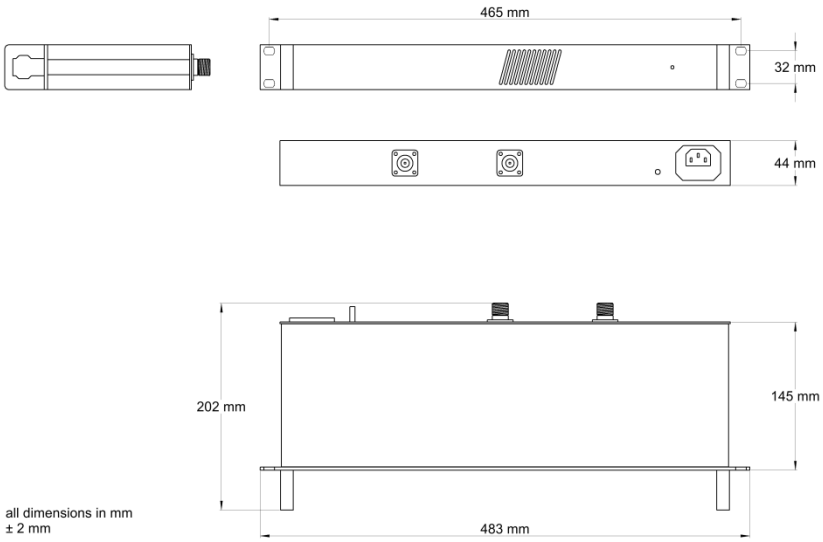
Linearity Variant 2 (typical responses)





Appearances

Dimensions



Related Products

Product	Description	P/N
AMP40100034-R	4 W Wideband Amplifier 19” Device 40 … 1000 MHz	1209.5002.1
AMP5220031-R	1 W High Dynamic TX Amplifier Device 5 … 2200 MHz	1404.5102