AMP5170033

2 W Amplifier Module 5 … 1700 MHz

Features

- output power +33 dBm typ.
- high OIP3 +48 dBm typ.
- open/ short stable
- LF/HF suppression
- wide DC supply range
- optical power and status indication
- reverse polarity protected
- self test function
- status signaling contact (floating)

Applications

- HF/ UHF transmitters
- ISM315, 434, 868
- GNSS
- driver amplifier for radiating cables

At a Glance

AMP5170033 from Becker Nachrichtentechnik is a compact amplifier module in 50 ohms technology designed for the use in professional applications. 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. Internal filters and low noise voltage supplies guarantee high suppression of spurious. To avoid damages during installation the supply is protected against reverse polarity. For versatile use the amplifier works over a wide DC supply voltage range. The presence of DC power and the module status is indicated by a LED at the module. The amplifier module has an integrated heat sink.

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. This saves costs for cooling and increases life time of the amplifier.

Special Features

The high IP3 properties makes the amplifier module suitable in professional receiving systems where weak RF signals in combination with very strong signals must amplified without any distortion effects. An integrated high pass filter in the input supress unwanted signals in the VLF and HF range.
An internal self-test function monitors current consumption and module temperature. In the case of exceeding limits a floating contact is opened and the status is signalized by the LED at the module.

Tolerant to Mismatches

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

Rugged Design

The amplifier is housed is a milled aluminum case. This saves the circuits against mechanical damage and gives best shielding for avoiding EMI influences caused by radio signals coming from the environment.

RF Specification

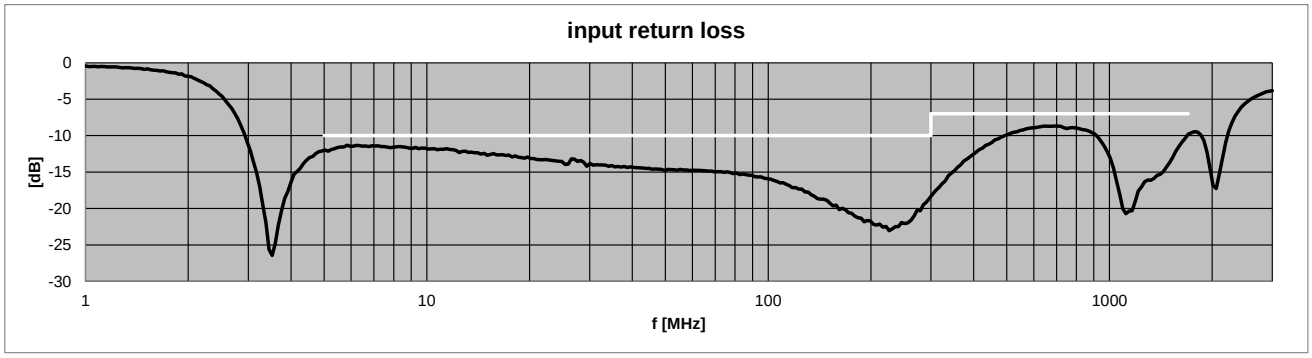
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in} / Z_{out}		50		Ω	
low frequency	f_{min}		3	5	MHz	
high frequency	f_{max}	1700	1800		MHz	
gain	S_{21}	34	36	38	dB	5 MHz ≤ f < 30 MHz
	S_{21}	33	35	37	dB	30 MHz ≤ f < 1000 MHz
	S_{21}	31	34	36	dB	1000 MHz ≤ f < 1600 MHz
	S_{21}	30	33	35	dB	f ≥ 1600 MHz
low frequency response	A_{LF}		-100	-70	dBr	@ 100 kHz, rel. to 200 MHz
	A_{LF}		-36	-25	dBr	@ 1 MHz, rel. to 200 MHz
input return loss	S_{11}		-15	-10	dB	5 MHz ≤ f ≤ 300 MHz
	S_{11}		-10	-7	dB	f > 300 MHz
output return loss	S_{22}		-6	-4	dB	f < 10 MHz
	S_{22}		-10	-6	dB	10 MHz ≤ f ≤ 1000 MHz
	S_{22}		-8	-4	dB	f > 1000 MHz
reverse isolation	S_{12}		-45	-40	dB	
3rd order intercept	OIP3[1)]	+46	+51		dBm	5 MHz ≤ f ≤ 500 MHz
	OIP3[2)]	+43	+48		dBm	500 MHz < f ≤ 1000 MHz
	OIP3[3)]	+35	+43		dBm	f > 1000 MHz
2nd order intercept	OIP2	+63	+80		dBm	5 MHz ≤ f ≤ 800 MHz
	OIP2	+50	+60		dBm	f > 800 MHz
1 dB compression	P_{1dB}	+31	+33		dBm	5 MHz ≤ f ≤ 1000 MHz
		+27	+30		dBm	1000 MHz < f ≤ 1500 MHz
		+23	+27		dBm	f > 1500 MHz
noise figure	NF		5	7	dB	5 MHz ≤ f < 10 MHz
			3	5	dB	10 MHz ≤ f ≤ 1500 MHz
maximum DC Voltage	U_{DC}			20	V	RF ports
ESD discharge resistors	R_{ESD}		4.7		kΩ	RF ports
input power	P_{in}			+5	dBm	no damage
RF connectors	X_{RF}	SMA female				

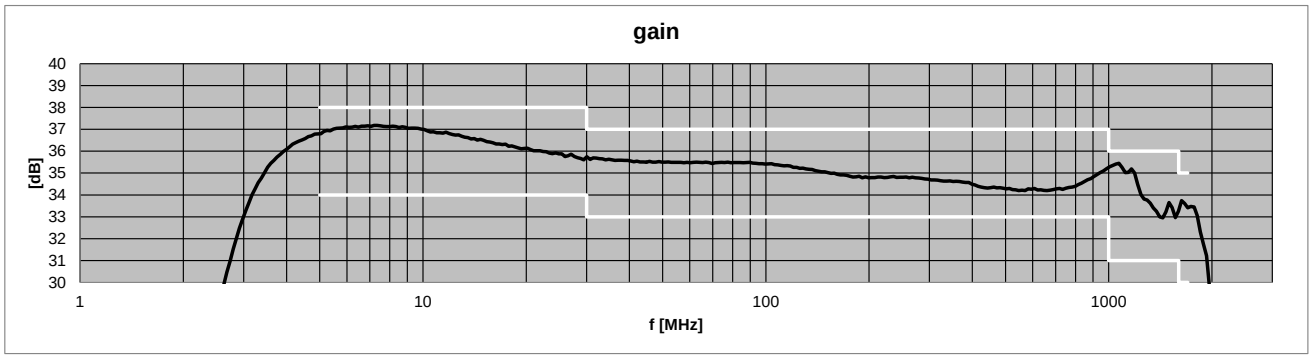
Note 1: Tested at P_{out} 2 x +23 dBm; Δf = 2 MHz
Note 2: Tested at P_{out} 2 x +20 dBm; Δf = 2 MHz
Note 3: Tested at P_{out} 2 x +17 dBm; Δf = 2 MHz

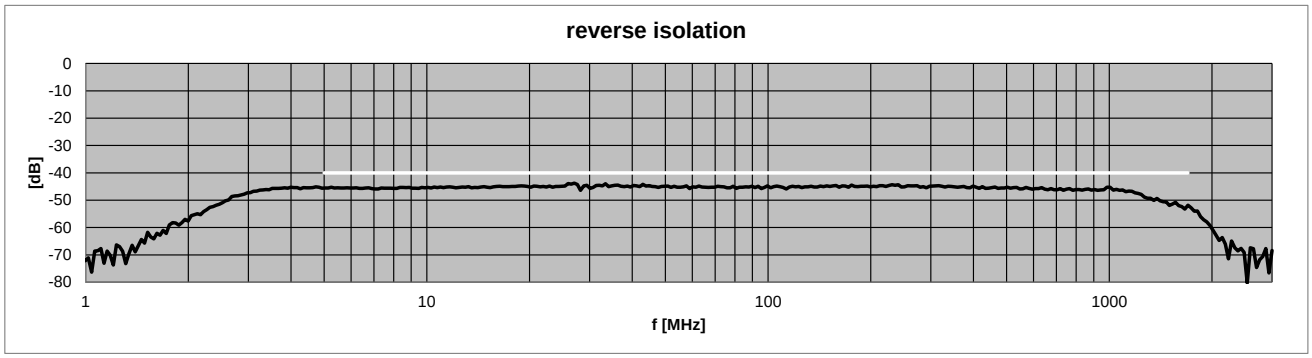
Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
supply voltage	U_{DC}	11		29	V	DC
current consumption	I_{DC12V}	640	750	890	mA	@ 12V DC
	I_{DC24V}	350	380	420	mA	@ 24V DC
dimensions	W x H x D	approx. 124 x 38 x 75			mm	
weight	m		360		g	
current threshold	I_{THRES}		±20		%	failure if current consumption exceeds
temperature threshold	T_{THRES}		+80		°C	failure if temperature exceeds, hysteresis approx. 5K
failure signalling		STATUS LED				gn / rd
		floating relay contacts				SPDT
SPDT switching current	I_{SW}			1	A	DC
SPDT switching voltage	U_{SW}			42	V	DC
power socket	X_{DC}	Würth WR-TBL3251-5-3.5-W				
power plug	X_{DCP}	Würth WR-TBL3641-5-3.5				part of delivery
operating temp. range	T_O	0		+70	°C	module surface
storage temp. range	T_s	-40		+70	°C	
ordering information	AMP5170033			1401.5011.1		

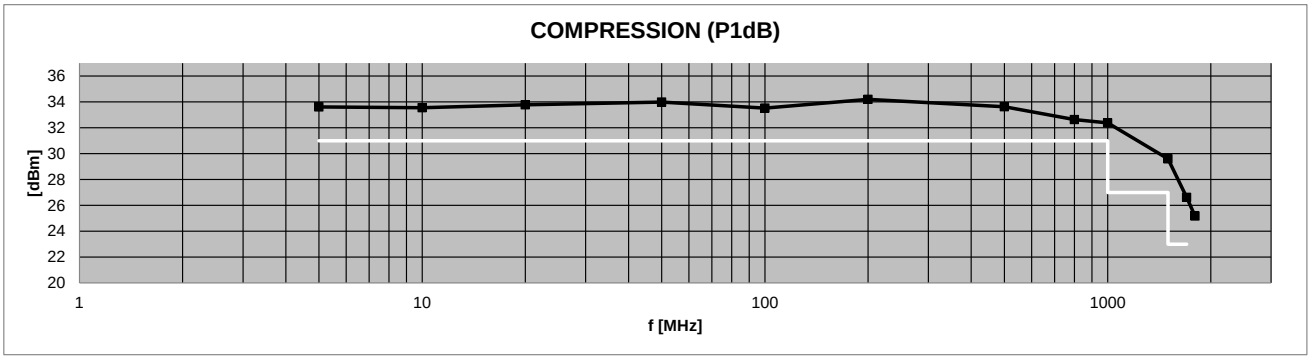
S-Parameters (typical responses)

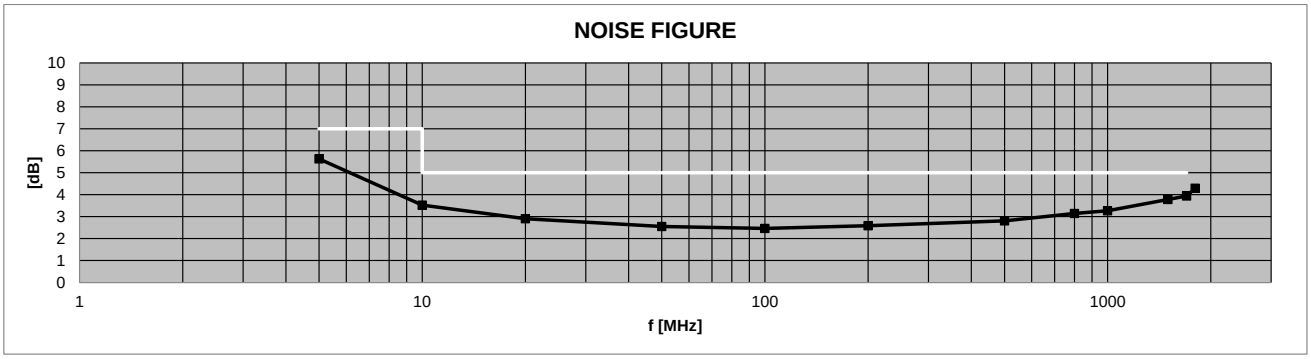




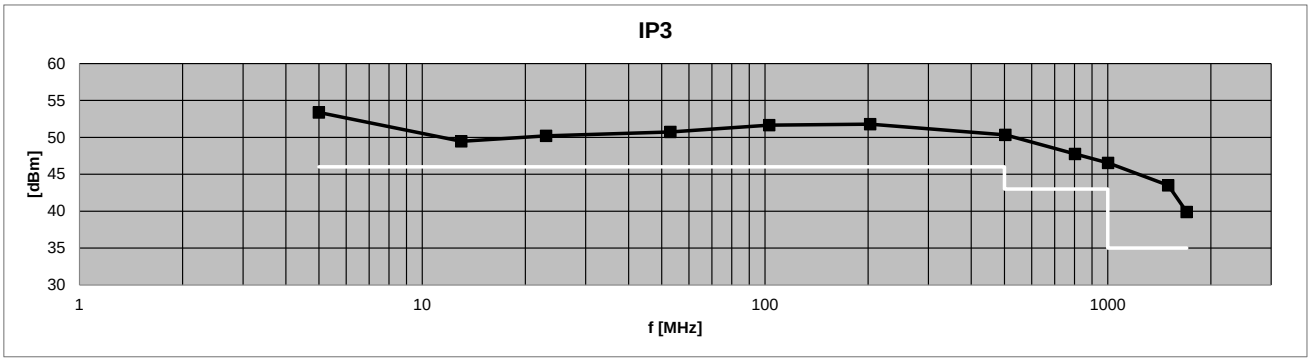


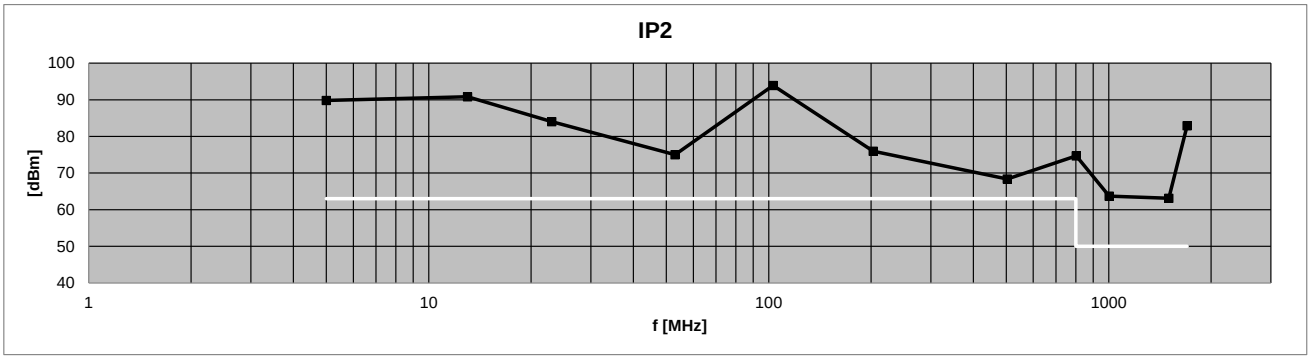
Dynamic Range (typical responses)



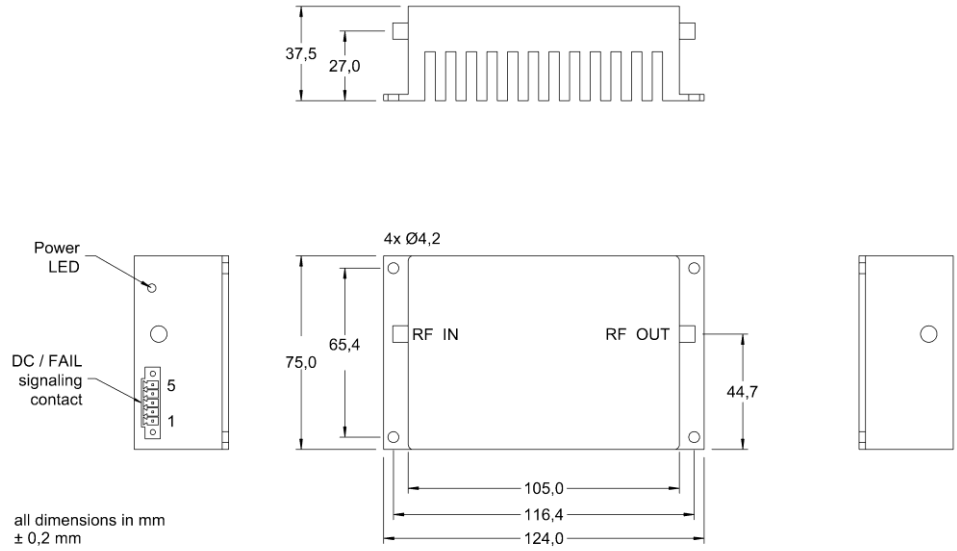


Linearity (typical responses)



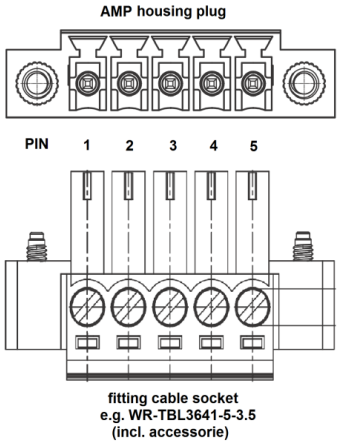


Dimensions



PIN Assignment DC / STATUS (floating contacts)

PIN	Designation	Remark
1	GND	Ground
2	+UB	DC supply voltage
3	REL_COM	relay common
4	REL_OK	OK when closed
5	REL_FAIL	failure when closed



Related Products

Product	Description	P/N
AMP1053043H	20 W Power Amplifier Module 10 ... 530 MHz	1001.5001.x
AMP2000600040L	13 W Power Amplifier Module 2000 … 6000 MHz	1711.5001.1
AMP300600040L	10 W Power Amplifier Module 300 … 6000 MHz	1801.5001.1
AMP20280035	4.5 W Wideband Amplifier Module 20 … 2800 MHz	1209.5001.x
AMP3060036	4 W Ultra High Linearity, Full Redundant, Wideband Amplifier Module 30 ... 600 MHz with heat sink	1602.5001.1
AMP3060036L	4 W Ultra High Linearity, Full Redundant, Wideband Amplifier Module 30 ... 600 MHz for mounting on heat sink	1602.5001.2
AMP590033	2 W Booster Amplifier Module 5 … 900 MHz	0901.5011.x
AMP590033H	2 W Amplifier Module 5 … 900 MHz	0901.5001.x
AMP5170033	2 W Amplifier Module 5 … 1700 MHz	1401.5011.1
AMP5220031	1 W High Dynamic Amplifier Module 5 … 2200 MHz	1005.5101.x
AMP018032	1.3 W High Linearity Amplifier Module 100 kHz…80 MHz	1002.5701.x
AMP5270026	400 mW High Dynamic Amplifier Module 5 … 2700 MHz	1005.5201.x
AMP10850026	400 mW Ultra Wideband Amplifier Module 10 ... 8500 MHz	1305.5001.x
LNA1080014	400 mW Low Noise Amplifier Module 10 … 800 MHz	0901.5501.x

Remark: All modules with P/N extension with ".x" are available with horizontal or vertical orientated DC power connector.