

4 Channel Active Antenna Combiner for Broadcast and Navigation Signals

Features

- 50 Ohm technology
- high dynamic range
- integrated GNSS phantom supply
- 19", 1 U rack mountable design

Applications

- AM/FM, DAB III, DVB-T, GNSS
- broadcast receiving systems
- facility infrastructure
- R&D
- production



Overview

MBAC is a high dynamic, four-channel active antenna combiner in 50 Ohm technology. It is especially designed as facility equipment for broadcast receiving stations.

Scalable Solutions

MBAC combines all common broadcast signals to a single output. In combination with the wideband signal distribution units of the WSDU series, large scale facility structures for automotive infotainment tests can be realized in a flexible and easy way.

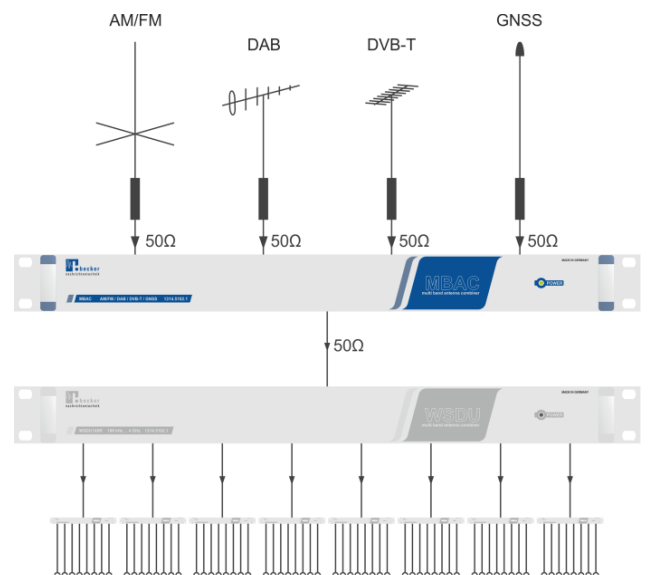
Designed for Demanding Applications

MBAC contains high dynamic preamplifiers for FM, DAB III and DVB-T. Additionally, each channel is equipped with preselection filters to suppress unwanted signals. The GNSS input also offers a 5 V phantom power source to supply active antennas with a current consumption of up to 200 mA. The AM path is equipped with a surge arrester for lightning protection.

Compact and Robust Design

Due to its compact dimensions in 19" 1 U construction,

MBAC is ideal for installation in system racks or for use as a tabletop device.



Example: MBAC in combination with the WSDU Signal Distribution to supply 64 DUTs.

Specifications

AM/FM

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
AM						
impedance	Z_{in} / Z_{out}		50		Ohm	
low frequency	f_{min}		100	150	kHz	AM
high frequency	f_{max}	26	30		MHz	
input return loss	S_{11}		-18	-12	dB	
output return loss	S_{22}		-18	-12	dB	
insertion loss AM	S_{21}	-1.5		-0.2	dB	$f < 20$ MHz
	S_{21}	-2.5		-0.5	dB	$f \geq 20$ MHz
3 rd order intermodulation	IIP3 ¹	+30			dBm	input
FM						
low frequency			85	87	MHz	FM
high frequency		108	115		MHz	
input return loss	S_{11}		-17	-12	dB	
output return loss	S_{22}		-20	-12	dB	
gain	S_{21}	8		10	dB	
suppression	S_{21}			-80	dB	$474 \text{ MHz} \leq f \leq 2 \text{ GHz}$ rel. 100 MHz
reverse isolation	S_{12}		-28	-25	dB	
noise figure	NF		3	4	dB	
3 rd order intermodulation	OIP3 ¹	+35	+38		dBm	output
1 dB compression	P1dB	+16	+18		dBm	output

Note 1: $P_{in} = 2 \times -5$ dBm; $\Delta f = 1$ MHz

DAB (Band III)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in}		50		Ohm	
low frequency	f_{min}		170	174	MHz	
high frequency	f_{max}	230	240		MHz	
input return loss	S_{11}		-13	-8	dB	
output return loss	S_{22}		-15	-10	dB	
gain	S_{21}	10		12	dB	
suppression	S_{21}			-60	dB	$f \leq 108$ MHz rel. 200 MHz
	S_{21}			-80	dB	$474 \text{ MHz} \leq f \leq 2 \text{ GHz}$ rel. 200 MHz
reverse isolation	S_{12}		-26	-23	dB	
noise figure	NF		3.0	4.5	dB	
3 rd order intermodulation	OIP3 ¹	+35	+38		dBm	output
1 dB compression	P1dB	+19	+21		dBm	output

Note 1: tested at $P_{in} = 2 \times -5$ dBm; $\Delta f = 1$ MHz



DVB-T

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in}		50		Ohm	
low frequency	f_{min}		470	474	MHz	
high frequency	f_{max}	790			MHz	
input return loss	S_{11}		-14	-8	dB	$f \leq 740$ MHz rel
output return loss	S_{22}		-14	-9	dB	$f \leq 740$ MHz
gain	S_{21}	12.0		14.5	dB	$f \leq 740$ MHz
	S_{21}	5.5		8.5	dB	$f > 740$ MHz
suppression	S_{21}			-60	dBr	$f \leq 108$ MHz rel. 600 MHz
				-40	dBr	$108 \text{ MHz} < f \leq 240 \text{ MHz}$ r.600 MHz
				-33	dBr	$410 \text{ MHz} \leq f \leq 430 \text{ MHz}$ r.600 MHz
	S_{21}			-40	dBr	$920 \text{ MHz} \leq f \leq 2 \text{ GHz}$ rel. 600 MHz
reverse isolation	S_{12}		-23	-20	dB	
noise figure	NF		3.5	4.5	dB	
3 rd order intermodulation	OIP3 ¹	+32	+36		dBm	output
1 dB compression	P1dB	+21	+23		dBm	output

Note 1: tested at $P_{in} = 2 \times -5$ dBm; $\Delta f = 1$ MHz

GNSS (GPS / GLONASS / GALILEO)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in}		50		Ohm	
low frequency	f_{min}		1555	1575	MHz	
high frequency	f_{max}	1602	1625		MHz	
input return loss	S_{11}		-14	-9	dB	
output return loss	S_{22}		-12	-7	dB	
insertion loss	S_{21}	-6	-4	-3	dB	
suppression	S_{21}		-63	-55	dB	$f \leq 960$ MHz rel. 1.6 GHz
	S_{21}			-23	dB	$1.8 \text{ GHz} \leq f \leq 2 \text{ GHz}$ rel.1.6 GHz
3 rd order intermodulation	OIP3 ¹	+30			dBm	output
phantom supply	U_{PH}	4.8		5.2	V	
	I_{PH}			200	mA	

Note 1: tested at $P_{in} = 2 \times -5$ dBm; $\Delta f = 1$ MHz

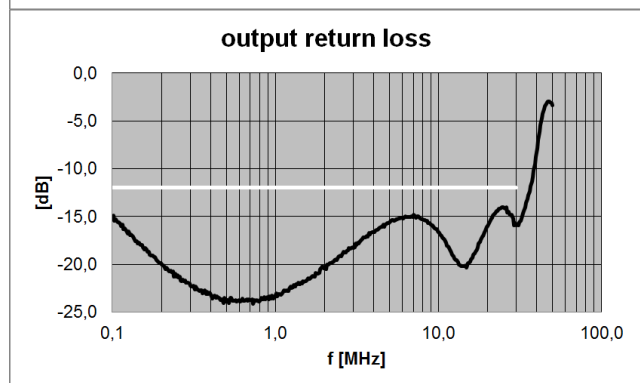
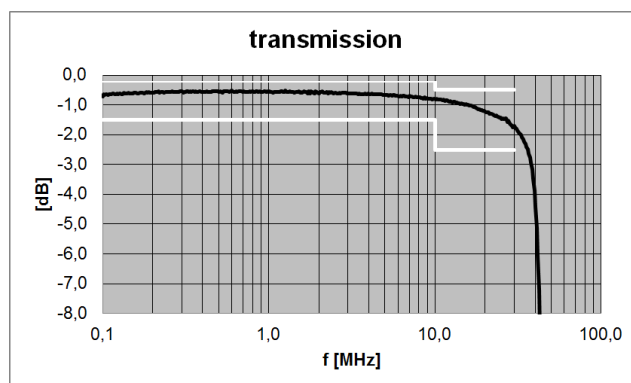
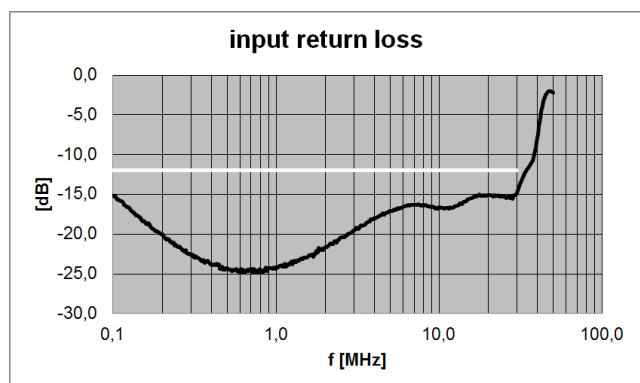
Common Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U	90	230	260	V	50 / 60 Hz AC
power consumption	P		6.5	50	VA	
dimensions	L x W x H	appr.330 x 482 x 44			mm	19" 1 U, without connectors and handles
weight	m		4100		g	
operating temp. range	T_o	+5		+40	°C	
storage temp. range	T_s	-40		+70	°C	
ordering information		MBAC		1314.5102.1		

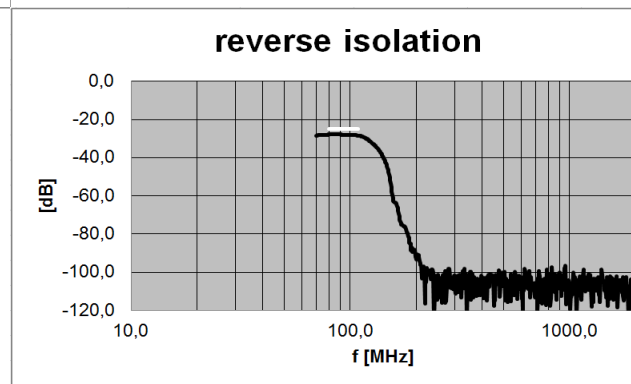
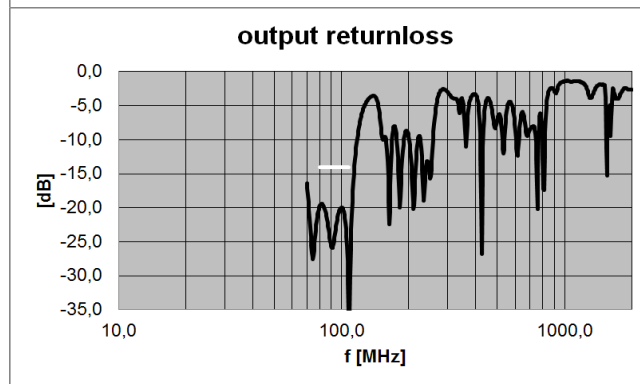
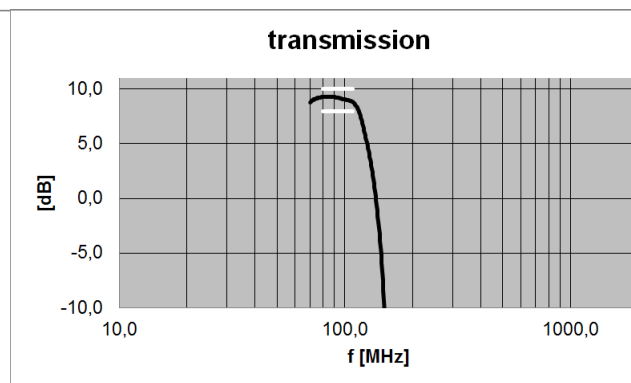
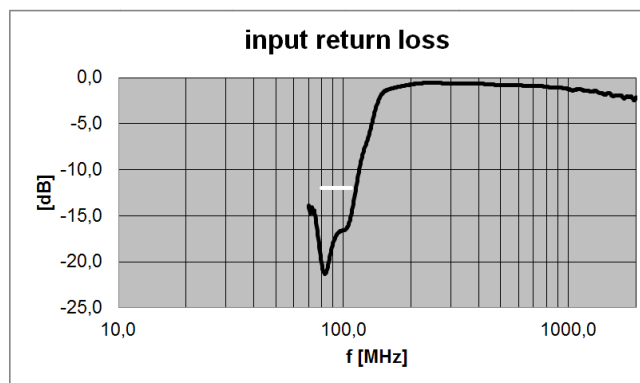


S-Parameters (typical responses)

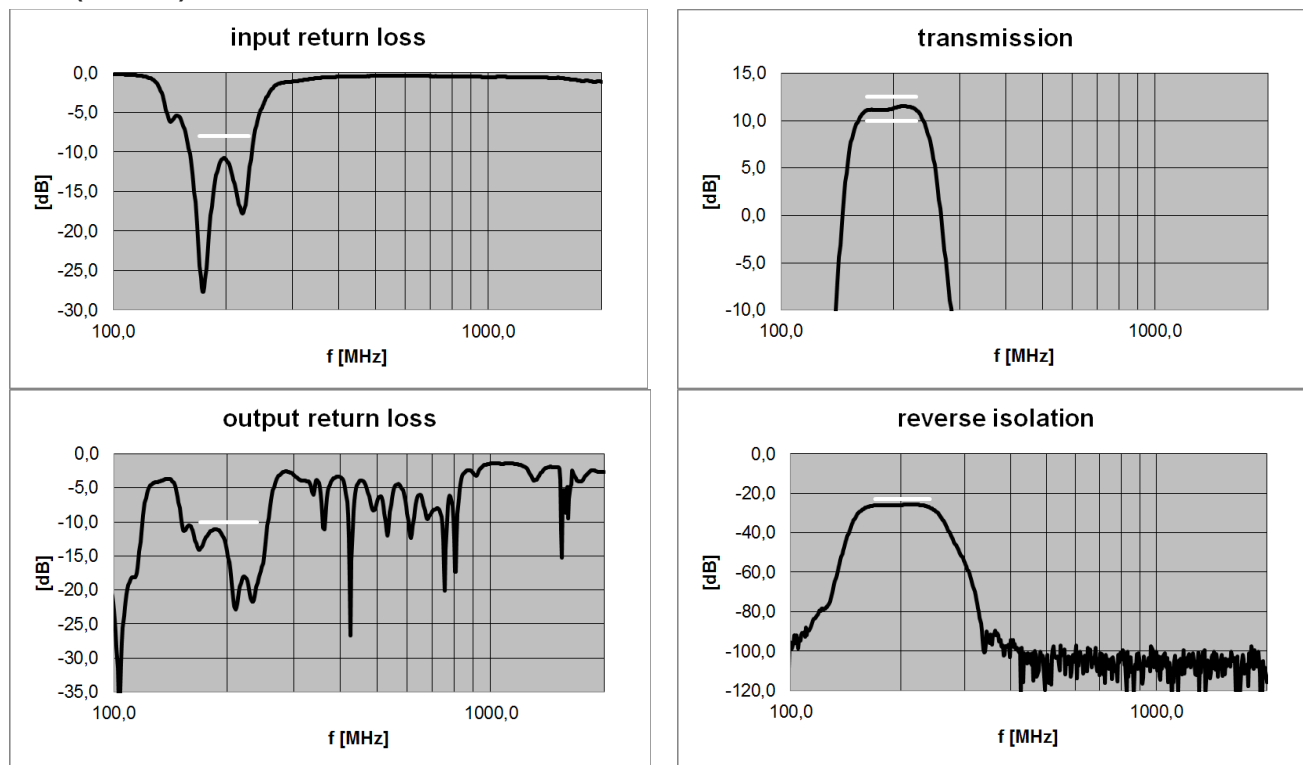
AM



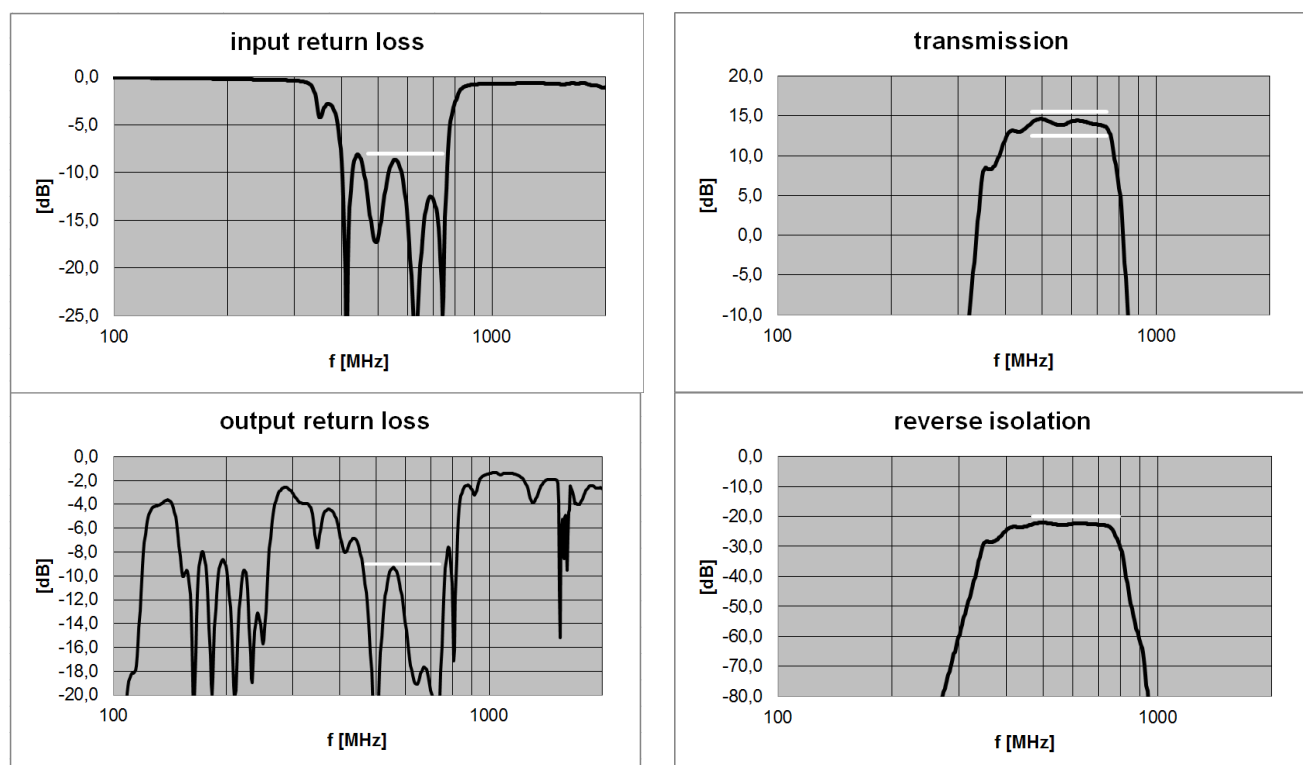
FM



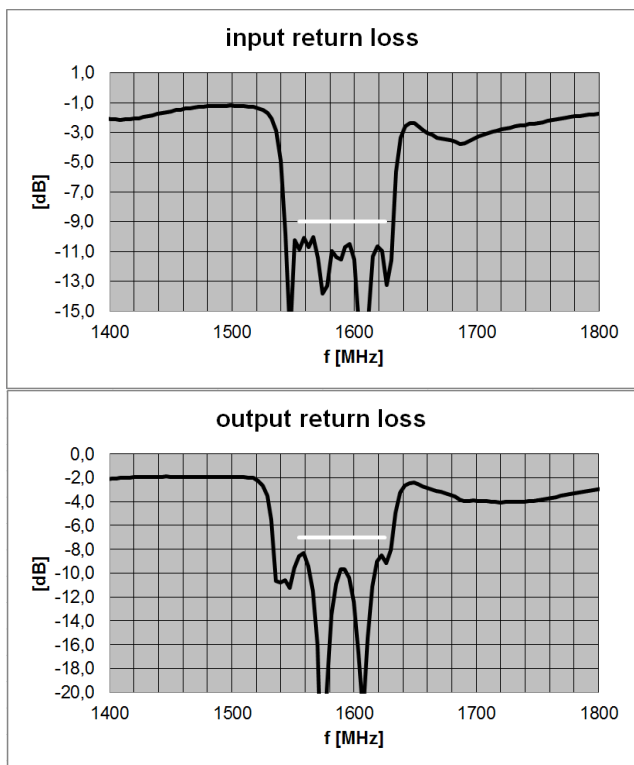
DAB (Band III)



DVB-T



GNSS



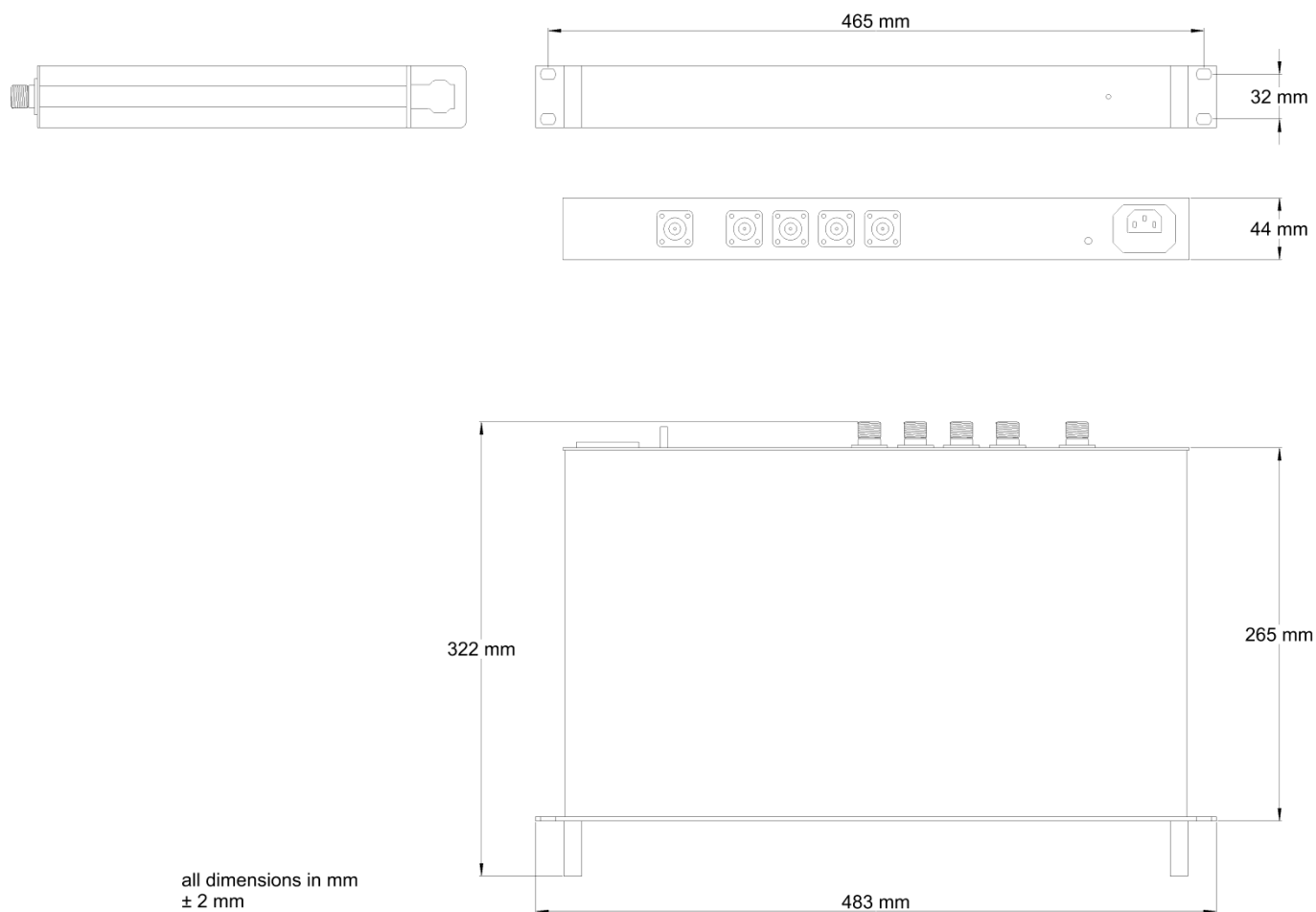
Front View



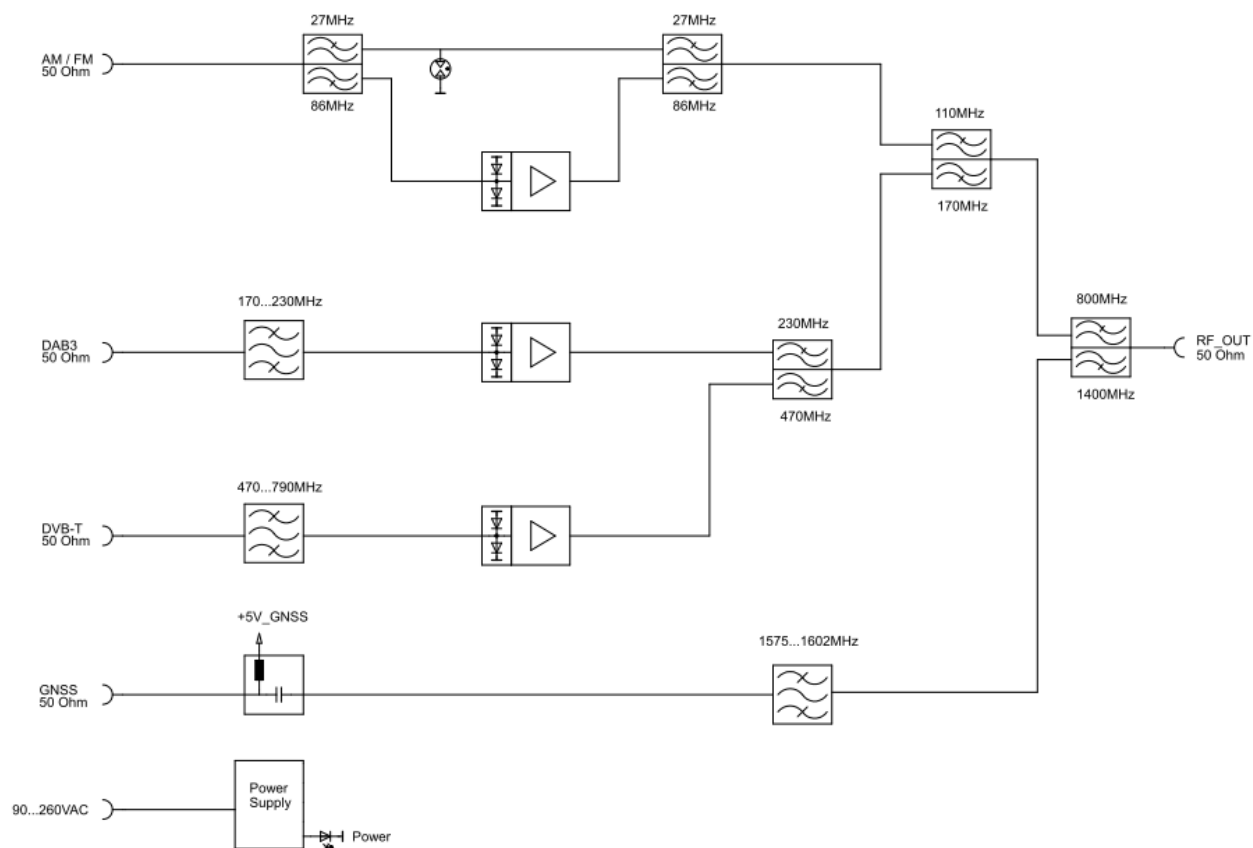
Rear View



Mechanical Drawing



Block Diagram



Related Products

Product	Description	P/N
WSCU8X1R	High Dynamic 8 Way Signal Combiner 100 kHz ... 4000 MHz, 50 Ω	1208.6102.1
WSDU1X8	High Dynamic 8 Way Multicoupler Module 100 kHz ... 4000 MHz, 50 Ω	1202.6100.1
WSDU1X8R	High Dynamic 8 Way Multicoupler 100 kHz ... 4000 MHz, 50 Ω	1107.6102.1