

WSDU-1X8R

High Dynamic 8 Way Multicoupler 100 kHz ... 4000 MHz, 20 MHz ... 3600 MHz

Features

- wideband
- high dynamic
- lossless signal distribution
- auxiliary input / output
- variants with AC and DC supply
- optional VLF/HF suppression filter



Applications

- antenna radio signal distribution
- radio monitoring
- direction finding
- broadcast and GNSS distribution

At a Glance

Multicouplers are needed to distribute a common signal source to many outputs without loss in level and low distortion. In receiving applications a huge amount of radio signals covered in the large frequency range effort high demands to the linearity and the noise of the multicoupler. The WSDU-1X8R is the right solution for modern radio signal distribution systems that must cover the frequency range up to 4 GHz.

Simplified Block Diagram

The WSDU-1X8R distributes the signals from one input to 8 equal outputs without loss in level.



The WSDU-1X8R is available in variants with AC or DC power supply.

Lossless 1 to 8 Signal Distribution

The signal at the input is amplified by using broadband low-noise amplifiers with a wide dynamic range -weak signals are linearly amplified even if they occur next to signals with very strong levels-. As a result, the distributed input signal is made available at the eight outputs without any loss in level.

The hardware structure of the distribution offers optimal phase and amplitude balance performance.

All inputs and outputs have N female connectors.

V/UHF Receiving Systems

For the use in VHF and UHF receiving systems a variant with a 20 MHz high pass filter in the input path is available. The high pass filter suppresses unwanted signals like local radio stations in the LF and HF range.

High Port-to-Port Isolation

WSDU-1X8R features a high port-to-port isolation. The connected receivers are prevented from affecting each other, e.g. via local oscillators or synthesizers.

Auxiliary Port

For maintenance during operation the auxiliary port offers the complete signal spectrum. It can be monitored without signal interruption. Alternative the auxiliary port can be used for e.g. test signal injection.

Filters for Short Wave

For operation in short wave applications, different bandpass filters for external mounting are available. With help of this filters out band signals are effectively suppressed to avoid unwanted distortions in the short wave range. The filters can be easily mounted on the RF input socket of the WSDU-1X8R.



RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{in} / Z_{out}		50		Ohm	
low frequency	f_{min}		100	150	kHz	without high pass filter
high frequency	f_{max}	4000	5000		MHz	
low frequency	f_{min}			20	MHz	with high pass filter, note 2
high frequency	f_{max}	3600	4000		MHz	
high pass suppression	S_{21}		-23		dBr	@ 5 MHz
	S_{21}		-60		dBr	@ 1 MHz
gain	S_{21}	0.5	2.5	4.0	dB	
gain flatness	ΔS_{21}		± 1.0	± 1.5	dB	
input return loss	S_{11}		-17	-10	dB	$150 \text{ kHz} \leq f \leq 3000 \text{ MHz}$
	S_{11}		-8	-4	dB	$f > 3000 \text{ MHz}$
output return loss	S_{22}		-17	-10	dB	
reverse isolation	S_{12}		-75	-90	dB	
output isolation	S_{23}		-23	-28	dB	neighbored outputs (d=1)
	S_{23}		-60	-47	dB	distance > 1
amplitude balance	dS_{23}		± 0.1		dB	$f \leq 2500 \text{ MHz}$
	dS_{23}		± 0.3		dB	$f > 2500 \text{ MHz}$
phase balance	ϕ_{23}		± 3		deg	$f \leq 2000 \text{ MHz}$
1 dB compression	P_{1dB}	+6	+8		dBm	$f < 1000 \text{ MHz}$
	P_{1dB}	+4	+6		dBm	$1000 \text{ MHz} < f \leq 2000 \text{ MHz}$
	P_{1dB}	+2	+5		dBm	$2000 \text{ MHz} < f \leq 3500 \text{ MHz}$
3 rd order intercept	OIP3	+19	+22		dBm	$f = 1000 \text{ MHz}$, note 1
	OIP3	+14	+16		dBm	$f = 2000 \text{ MHz}$, note 1
	OIP3	+11	+13		dBm	$f = 3000 \text{ MHz}$, note 1
2 nd order intercept	OIP2	+37	+45		dBm	$f = 1000 \text{ MHz}$, note 1
	OIP2	+20	+22		dBm	$f = 2000 \text{ MHz}$, note 1
	OIP2	+20	+25		dBm	$f = 3000 \text{ MHz}$, note 1
noise figure	NF		9		dB	$f < 500 \text{ kHz}$
	NF		8	9.5	dB	$500 \text{ kHz} \leq f \leq 2000 \text{ MHz}$
	NF		9		dB	$f > 2000 \text{ MHz}$
spurious	P_{SPUR}		-125		dBm	$150 \text{ kHz} \pm 30 \text{ kHz}$
	P_{SPUR}		-118		dBm	$120 \text{ kHz} \pm 20 \text{ kHz}$
maximum input power	$P_{RF \max}$			+15	dBm	CW, no damage
maximum DC voltage	U_{DC}			20	V	all RF ports
ESD discharge resistor	R_{ESD}		4.7		k Ω	all RF ports
RF connectors	X_{RF}		N female			
monitor coupling	a		-30		dB	bidirectional

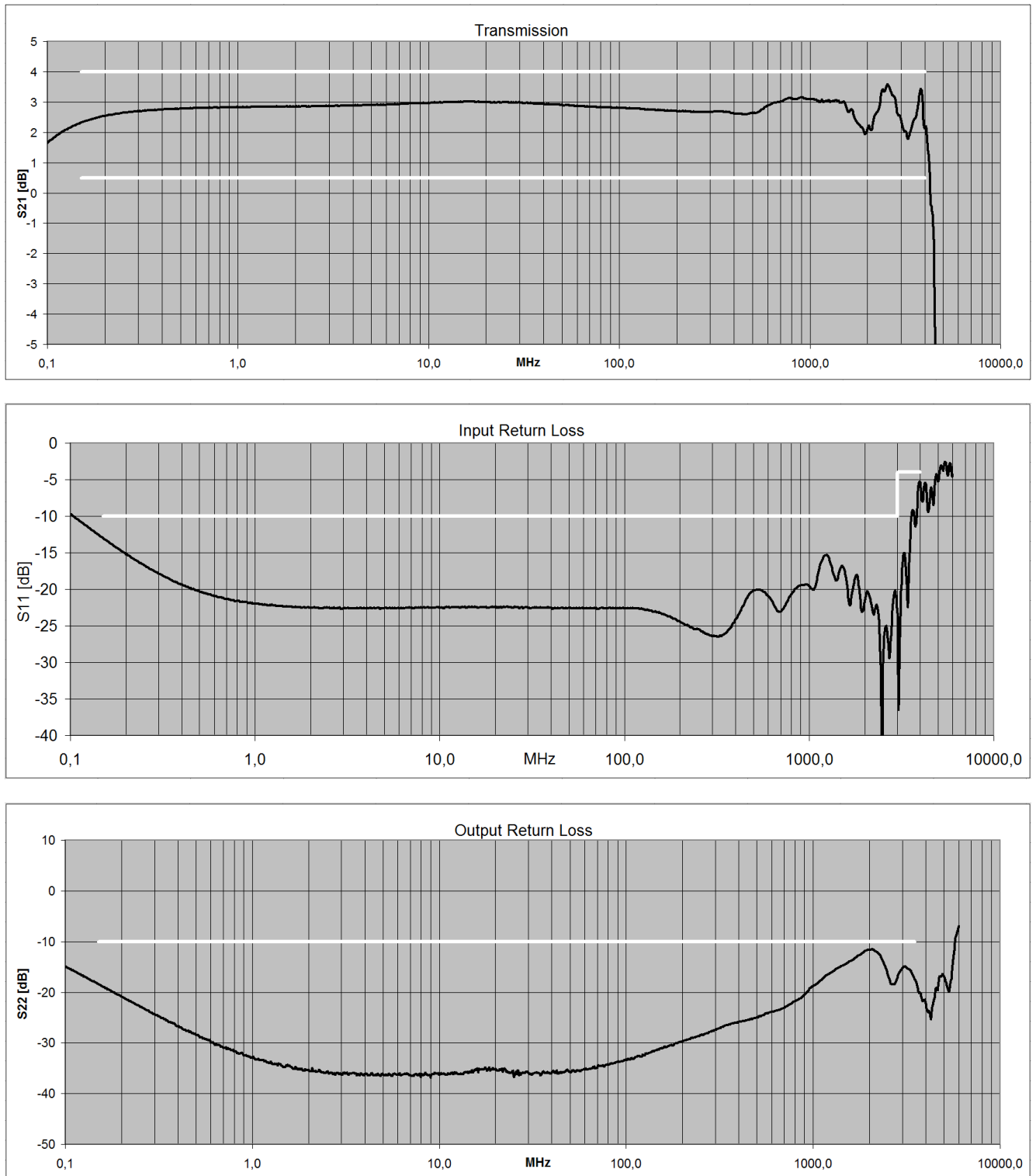
Note 1: frequency space 100 MHz

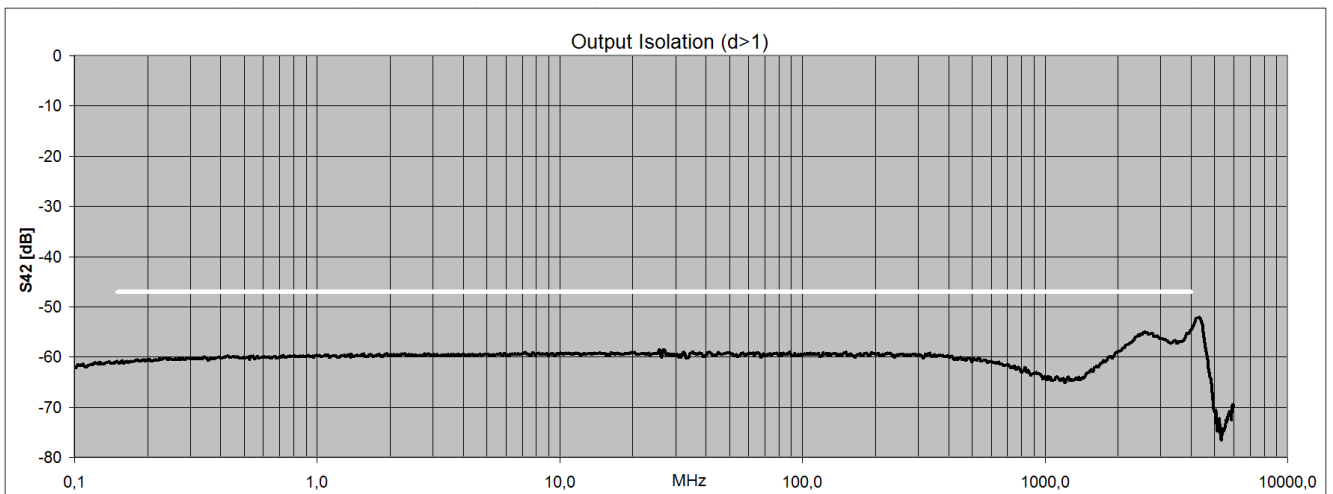
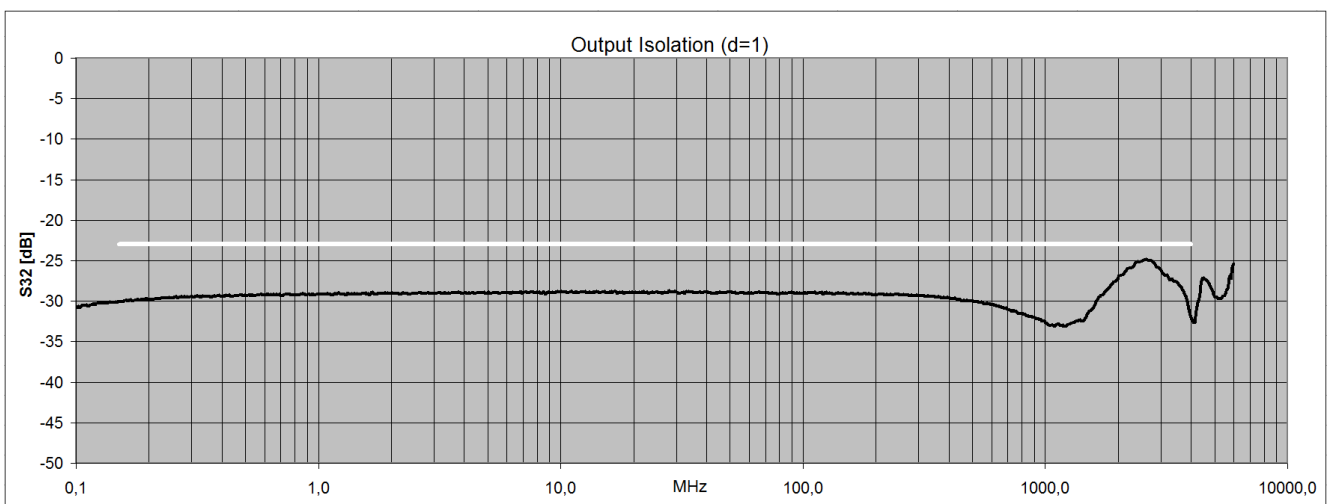
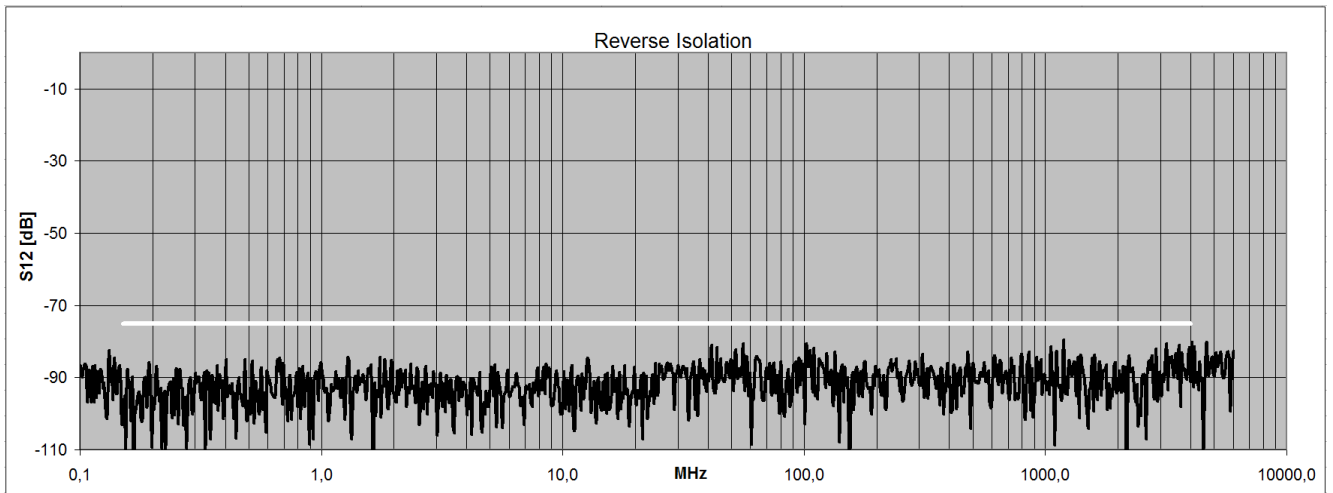
Common SpecificationBecker Nachrichtentechnik GmbH ■ Kapellenweg 3 ■ 53567 Asbach - Germany ■ www.becker-rf.com

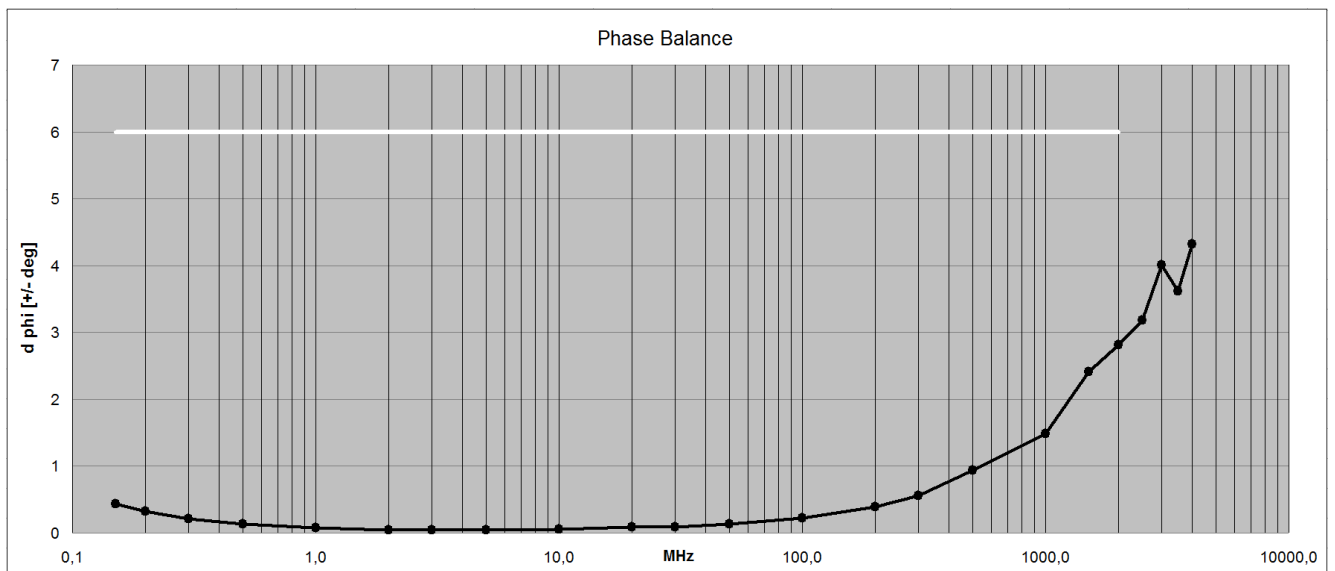
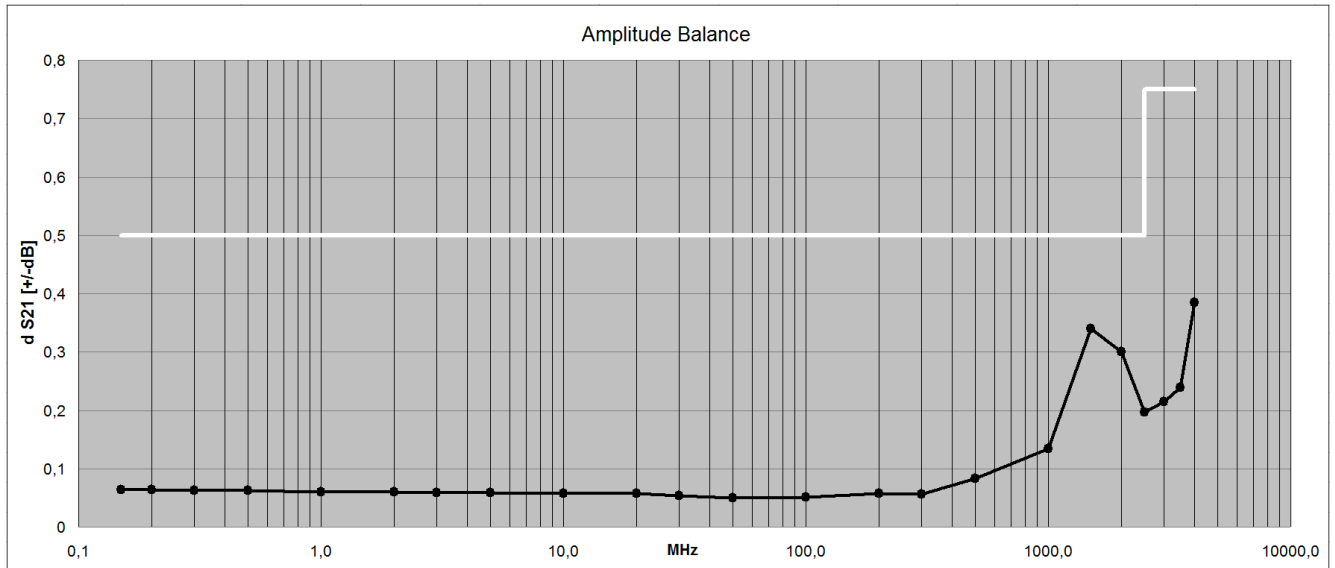
Quality Made in Germany

Subject to change in specification and design without notice.
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EU Directive 2015/863

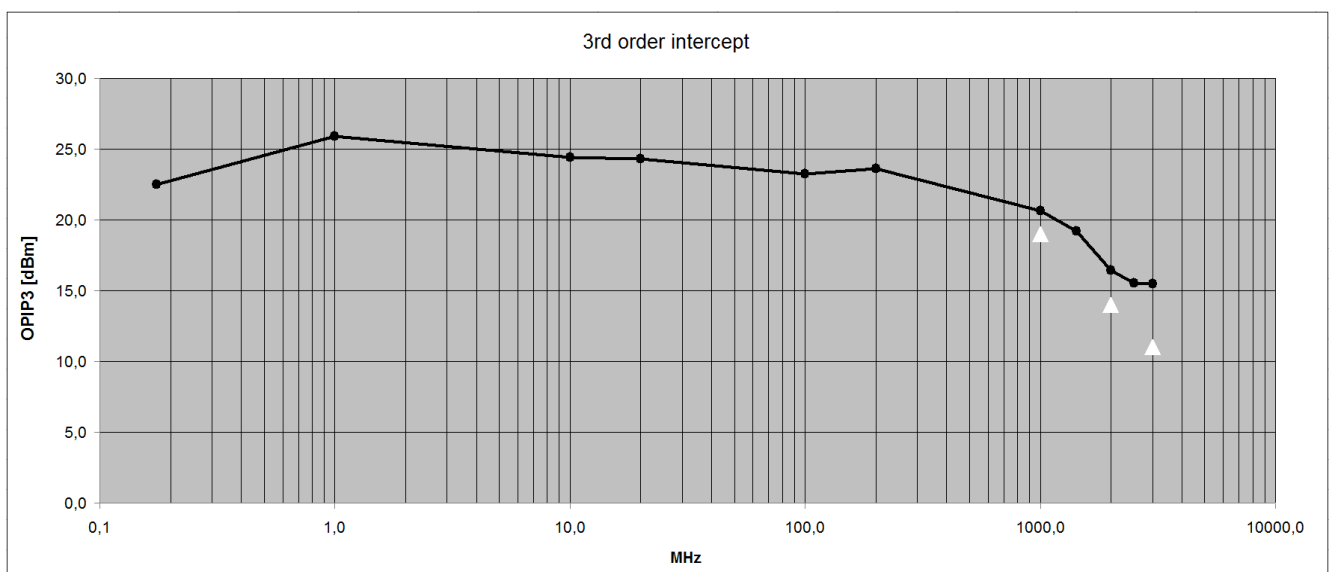
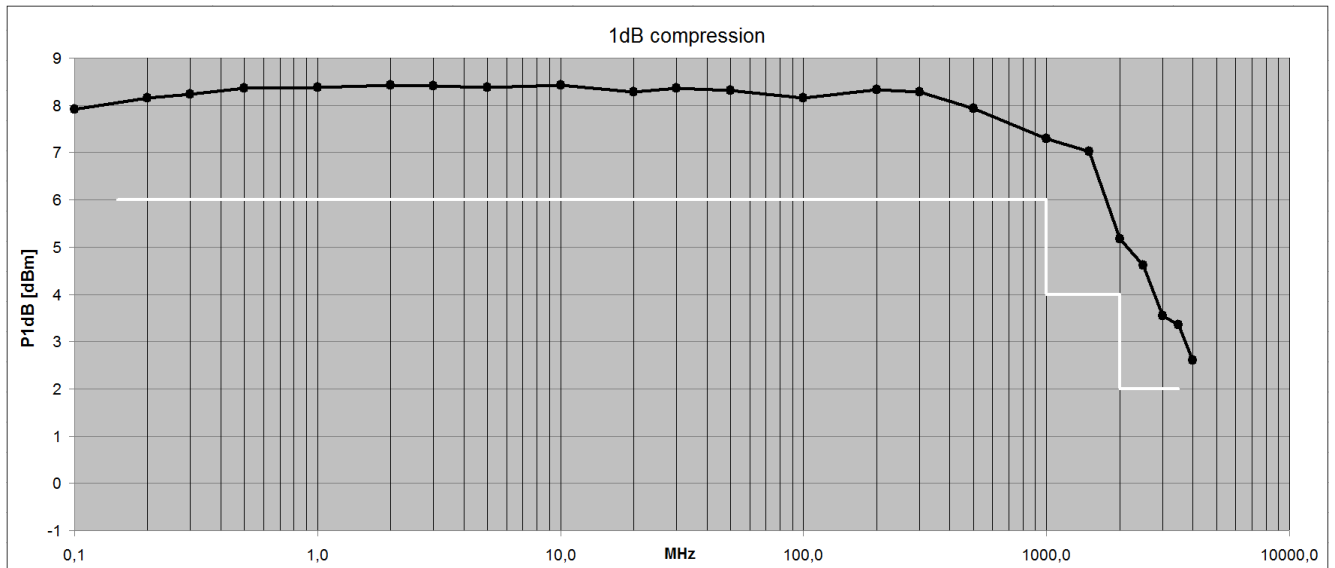
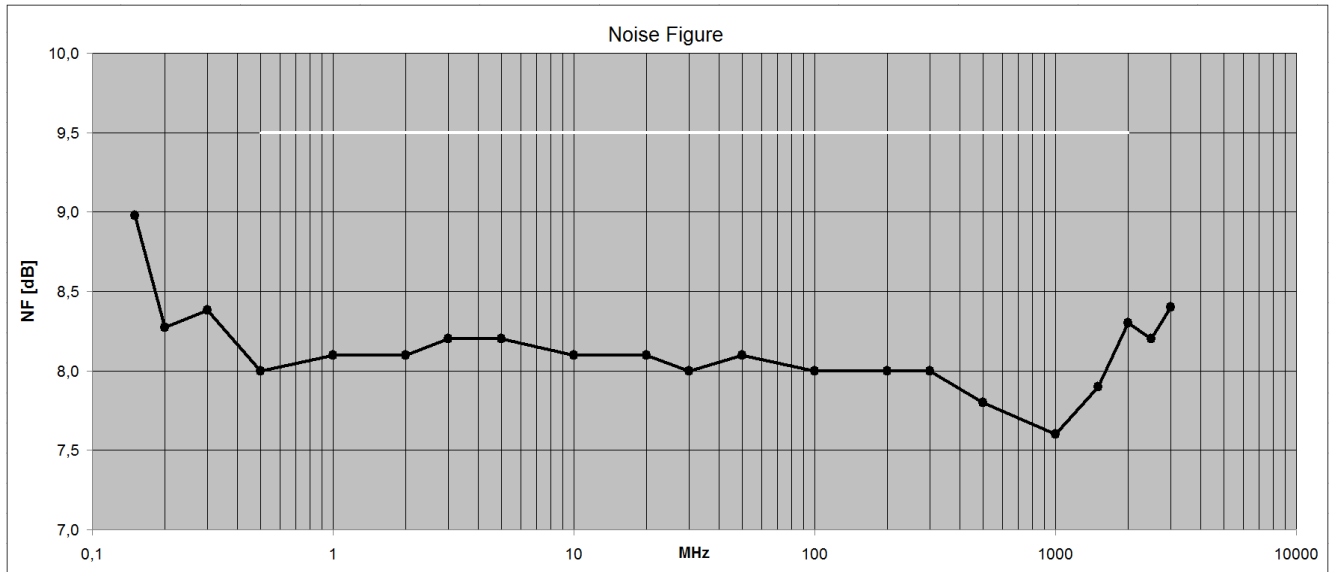
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
AC supply variant						
voltage supply range	U _{AC}	90	230	260	V	50 / 60 Hz AC
power consumption	P		18	50	W	
power socket	X _{AC}	IEC-60320 C14				country specific mains cable
DC supply variant						
voltage supply range	U _{DC}	22	24	30	V	
power consumption	P		15		W	
power socket	X _{AC}	XLR male				
Dimensions and weight						
dimensions	W x H x D	approx. 482 x 44 x 145			mm	19" 1 U, without connectors and handles
weight	m		3.5		kg	
Environment Conditions						
operating temp. range	T _o	+5		+45	°C	
storage temp. range	T _s	-40		+70	°C	
Product conformity						
Electromagnetic compatibility	EU: in line with EMC directive (2014/30/EC)				applied harmonized standards: EN 61326-1 (for use in industrial environment), EN 61326-2-1, EN 55011 (class B), EN 61000-3-2, EN 61000-3-3	
Electrical safety	EU: in line with low voltage directive (2014/35/EC)				applied harmonized standard: EN 61010-1	
Ordering information	WSDU-1X8R		P/N: 1107.6102.1		AC supply	
	WSDU-1X8R		P/N: 1107.6102.2		DC supply	
	WSDU-1X8R		P/N: 1107.6102.3		20 MHz HP-filter, AC supply	
	WSDU-1X8R		P/N: 1107.6102.4		20 MHz HP-filter, DC supply	

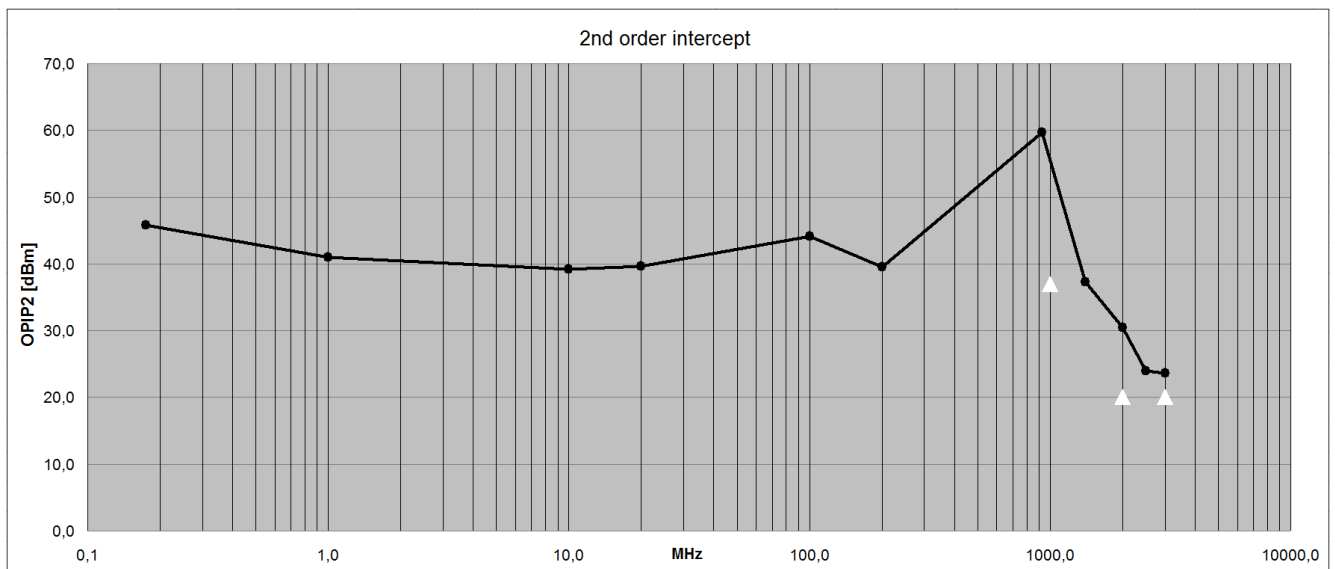
S-Parameters (typical responses)

Isolation (typical responses)

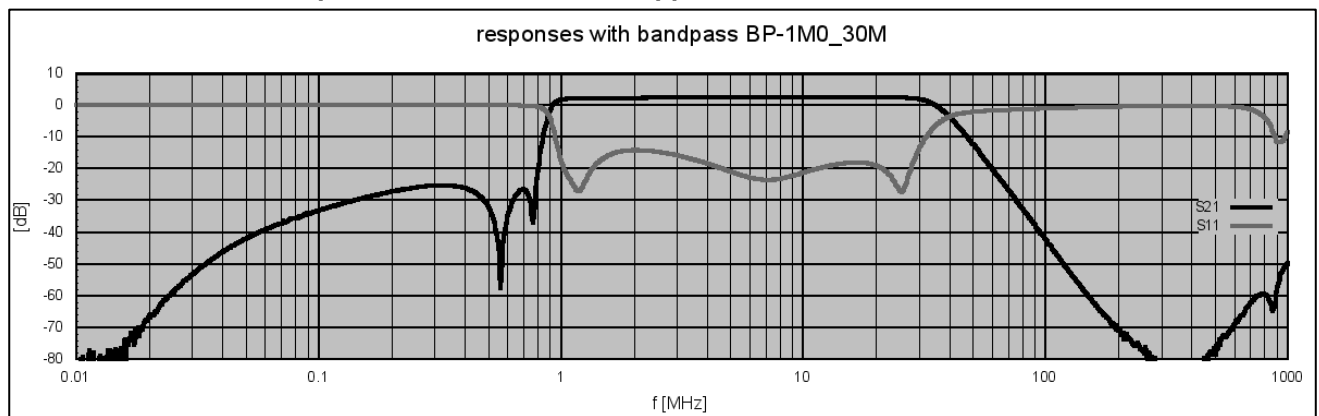
Balances (typical responses)

Dynamic Range (typical responses)





S-Parameters with band pass filter for short wave application



Transmission and input return loss with 1 ... 30 MHz band pass filter BP-1M0_30M installed in RF input.

Appearance of external mountable filter



Filters for short wave with different bandwidths are available. See table related products.

Front View

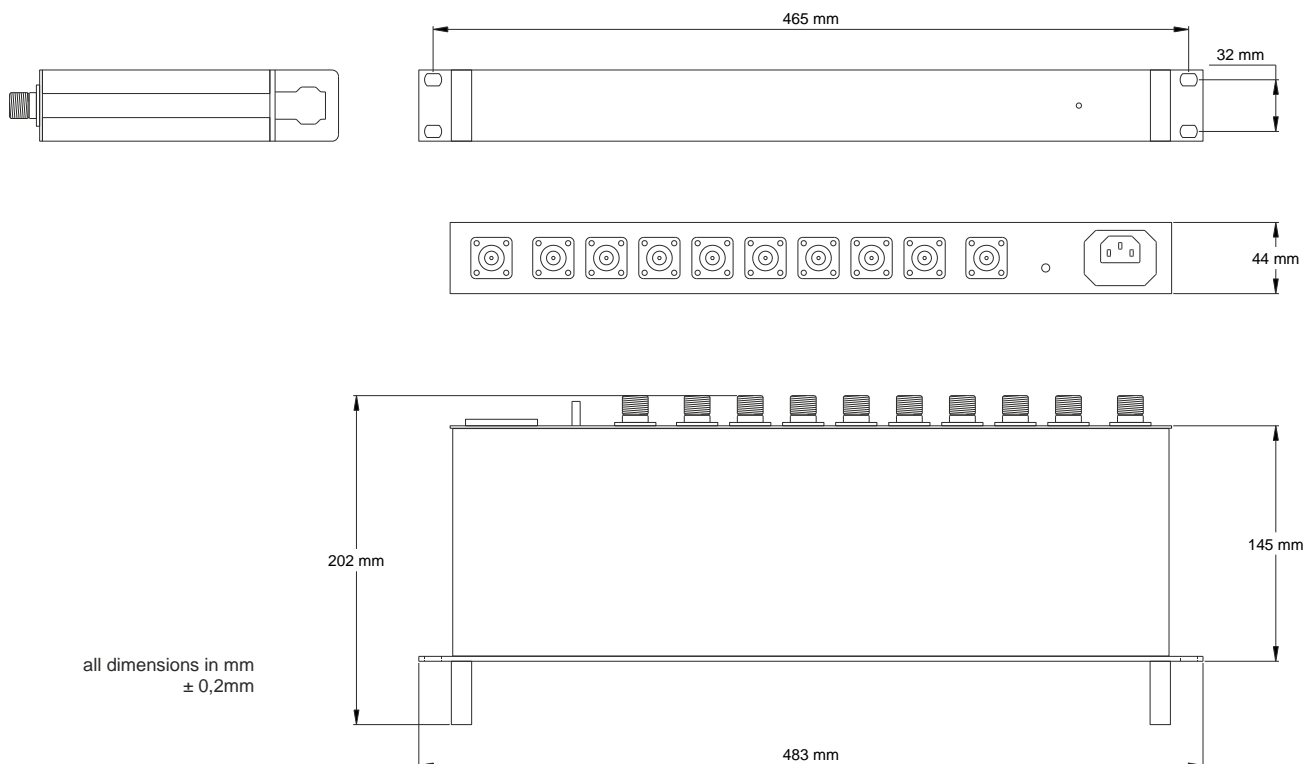


Rear View



Variant with AC supply

Dimensions



Related Products (External filters for short wave applications)

Product	P/N	Description
BP-0M5_30M	1502.6301.1	Band Pass Filter Module 0.5 ... 30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter, stop band rejections: 30 dB typ. $f < 400$ kHz, 45 dB typ. $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$, N RF connectors (male / female)
BP-1M0_30M	1502.6311.1	Band Pass Filter Module 1.0 ... 30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter, stop band rejections: 30 dB typ. $f < 800$ kHz, 45 dB typ. $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$, N RF connectors (male / female)
BP-1M7_30M	1502.6321.1	Band Pass Filter Module 1.7 ... 30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter, stop band rejections: 30 dB typ. $f < 1.3 \text{ MHz}$, 45 dB typ. $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$, N RF connectors (male / female)
LP-30M	1107.6301.1	30 MHz Low Pass Filter Module Passband DC...30 MHz 90 V surge arrestor and 100 kΩ ESD resistor to GND at input, level limiter, stop band rejection: 45 dB typ. @ $80 \text{ MHz} \leq f \leq 200 \text{ MHz}$, N RF connectors (male / female)

Related Products (Multicouplers and Matrices)

Product	P/N	Description
WSDU-1X8SR	1502.6102.x	High Dynamic 1X8 Shortwave Signal Distribution Unit 200 kHz ... 30 MHz LAN remote interface with SNMPv2 trap function. Variants with AC or DC power supply.
WSDU-1X8R	1107.6102.x	High Dynamic 8 Way Multicoupler 100 kHz ... 4000 MHz. Variants with AC or DC power supply.
WSDU-2X4R	1107.6202.x	High Dynamic 2 Section 4 Way Multicoupler 100 kHz ... 4000 MHz. Variants with AC or DC power supply.
WSDU-1X8ER	1501.6302.x	Extremely Wideband 1 to 8 Signal Distribution Unit 20 ... 8000 MHz LAN remote interface with SNMPv2 trap function. Variants with AC or DC power supply.
WSDU-2X4ER	1501.6102.x	Extremely Wideband 2 Section 1X4 Signal Distribution Unit 20 MHz... 8000 MHz. LAN remote interface with SNMPv2 trap function. Variants with AC or DC power supply.
RSWM-4X4R	1205.4102.x	Wideband 4X4 Switching Matrix, non-blocking- 2 variants: 100 kHz ... 4000 MHz and 20 MHz ... 4000 MHz, LAN remote interface with SNMPv2 trap function.
RSWM-4X4ER	1205.4202.1	Extremely Wideband 4X4 Switching Matrix 20 ... 8000 MHz, -non-blocking- LAN remote interface with SNMPv2 trap function.