WSDU-1X8SR

High Dynamic 1X8 Shortwave Signal Distribution Unit, 200 kHz … 30 MHz

Features
- extremely high dynamic
- input bandpass filter
- lightning protection
- signal clipper
- RF monitoring port
- AC or DC supply

Applications
- receiving stations
- radio monitoring
- direction finding

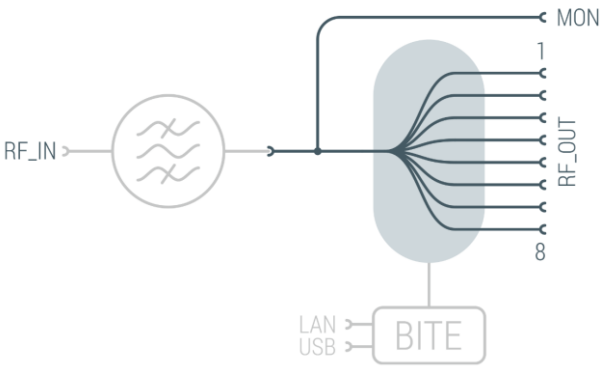
Options
- built-in test function with SNMPv2 function
- external band pass filters

Scope

WSDU-1X8SR is a wideband multicoupler, especially designed for the use in shortwave applications. Due to its excellent dynamic properties WSDU-1X8SR is suitable in applications with difficult reception conditions. The frequency range extends from 200 kHz up to more than 30 MHz.
The device is available with AC or DC power supply.

Principal Block Diagram

The WSDU-1X8SR multicoupler distributes the signals from one input to 8 equal outputs without loss in level. For input signal monitoring without interruption the device has a coupled RF monitoring port.



RF Input Protection

WSDU-1X8SR provides protection against lightning, surges and out-of-band signals. The RF input of the device is equipped with a discharge element, an over level protection and a band pass filter.

Lossless 1 to 8 Signal Distribution

The multicoupler utilizes low-noise high dynamic amplifiers. As a result, the distributed input signal is made available at the eight outputs of the multicoupler without any loss in level. The hardware structure of the distribution offers best phase and amplitude balance performance. All RF inputs and outputs have N female connectors.

Short Wave Distribution Systems

Its high dynamic range makes WSDU-1X8SR ideal for receiving applications where very strong and very weak antenna signals have to be evaluated without mutual influence.

Device Monitoring

WSDU-1X8SR device is equipped with a built-in device monitoring capability which offers optical signalization of the device health as standard.

Optionally for remote monitoring a variant with LAN and USB remote interfaces is available. Via the remote interfaces information about operating points of the internal wideband amplifier stages, the

module temperature and the device identification can be queried by ASCII strings.

The option “Remote Monitoring” supports SNMP (Simple Network Management Protocol) which enables monitoring without any effort, even in complex environments. The WSDU-1X8SR is able to identify failures and to inform the supervising system automatically. The LAN remote interface offers SNMPv2 trap function.

Optional RF Filters

With help of external filters, the operating bandwidth can be reduced. Out-of-band signals are effectively suppressed to avoid unwanted intermodulation in the operating bandwidth. The filters can be easily mounted on the RF input socket of the WSDU-1X8SR.

Three band pass filters types with integrated surge arrestors are available: 500 kHz … 30 MHz, 1 MHz … 30 MHz and 1.7 MHz … 30 MHz.

The filters can be screwed with the RF input socket of the WSDU-1X8SR device.

RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{IN}/Z_{OUT}		50		ohms	
low frequency	f_{MIN}		200	300	kHz	
high frequency	f_{MAX}	30	35		MHz	
gain	S_{21}	+2	+3	+4	dB	
input return loss	S_{11}		-25	-14	dB	VSWR < 1.5
output return loss	S_{22}		-20	-14	dB	VSWR < 1.5
reverse isolation	S_{12}		-30	-27	dB	
o-o isolation	S_{23}		-34	-27	dB	adjacent channel
o-o amplitude balance	dS_{23}		±0.02		dB	
phase balance	φ_{23}		±0.3		deg	
monitor coupling loss	S_{21MON}	-34	-31	-29	dB	
attenuations	S_{21_50k}		-25	-17	dBr	@ 50 kHz, rel. S_{21} @ 10 MHz
	S_{21_60M}		-22	-17	dBr	@ 60 MHz, rel. S_{21} @ 10 MHz
	S_{21_80M}		-40	-30	dBr	@ 80 MHz, rel. S_{21} @ 10 MHz
2nd order intercept	OIP2[2]	+65	+85		dBm	
3rd order intercept	OIP3[1]	+22	+25		dBm	f < 500 kHz
	OIP3[1]	+26	+29		dBm	500 kHz ≤ f < 1 MHz
	OIP3[1]	+32	+39		dBm	f ≥ 1 MHz
1 dB compression	P_{1dB}	+15	+18		dBm	f < 1 MHz
	P_{1dB}	+17	+20		dBm	f ≥ 1 MHz
noise figure	NF		7	9	dB	
maximum input power	P_{in}			+25	dBm	CW, no damage
maximum DC voltage	U_{DC}			24	V	all RF ports
ESD discharge resistor	R_{ESDI}		100		kΩ	RF input
ESD discharge resistor	R_{ESDO}		10		kΩ	RF outputs
RF connectors			N female			

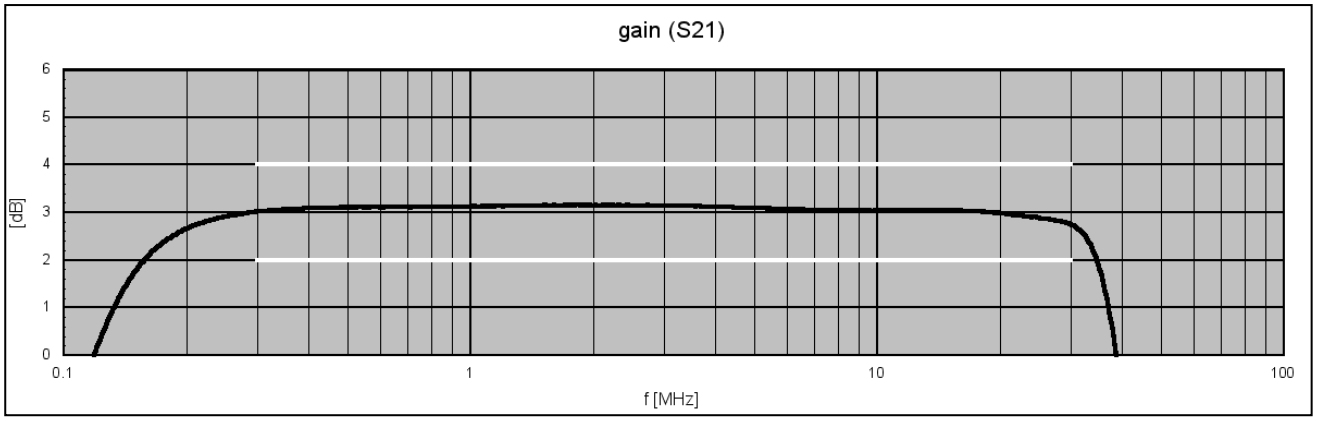
Note 1: test frequency pairs for OIP2: 1.0 / 1.3 MHz, 2.5 / 3.5 MHz, 12 / 15 MHz, 22 / 27 MHz. output level 2 x 0 dBm.

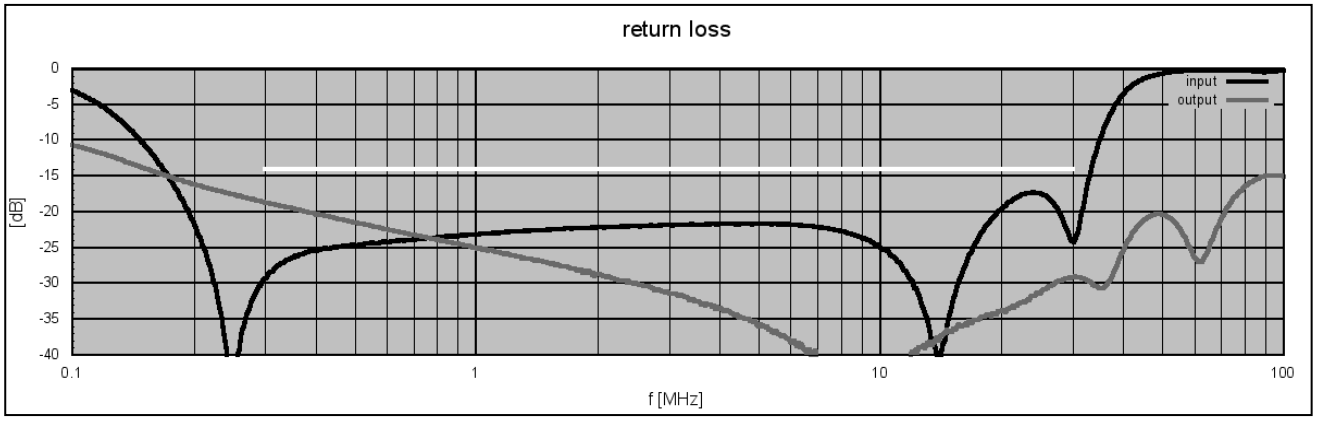
Note 2: test frequency pairs for OIP3: 290 / 310 kHz, 490 / 510 kHz, 0.9 / 1.1 MHz, 2.8 / 2.9 MHz, 29.8 / 29.9 MHz. output level 2 x 0 dBm.

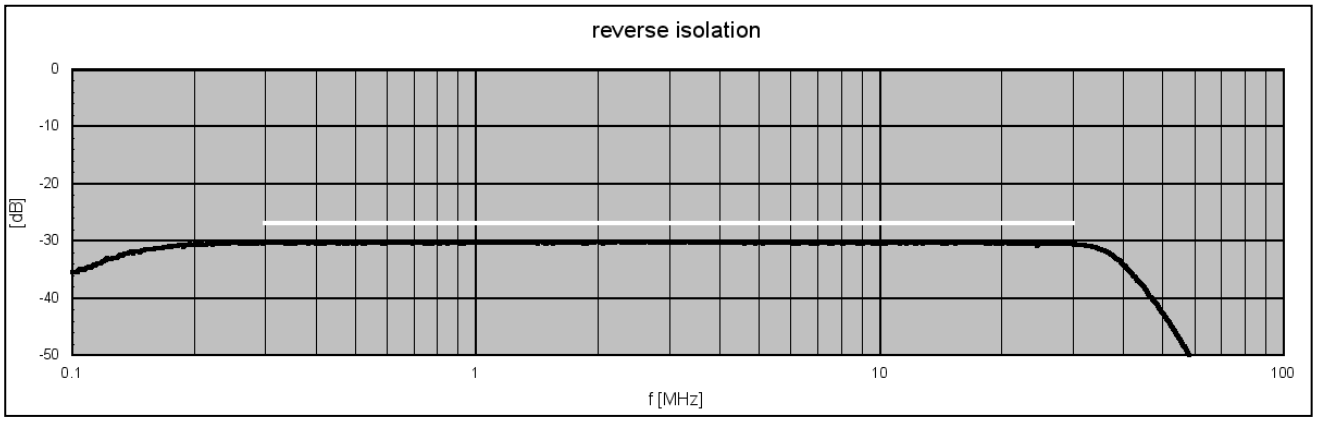
Common Specification

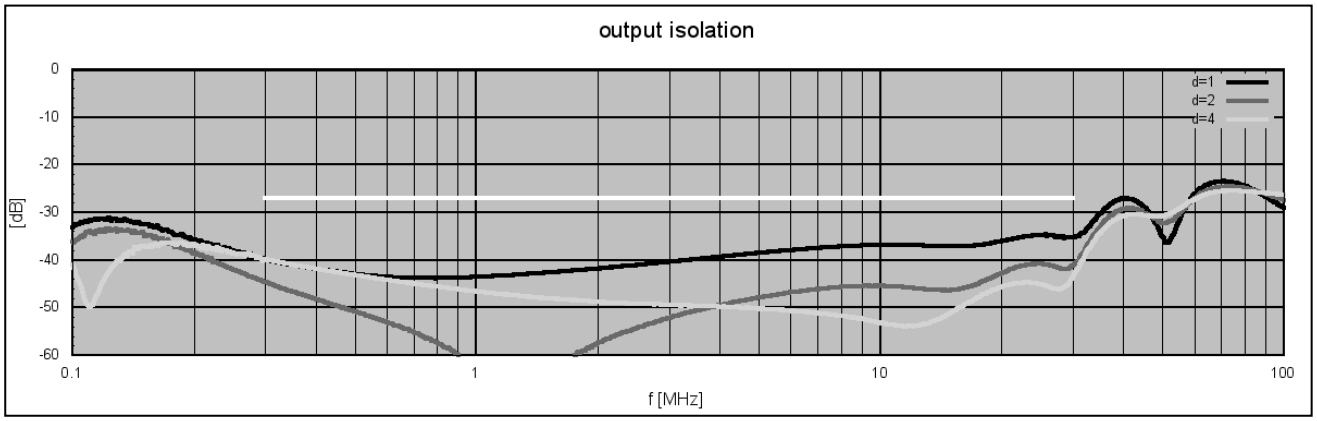
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
AC supply variant						
voltage supply range	U_{AC}	90	230	260	V	50 / 60 Hz AC
power consumption	P		12	50	W	
power socket	X_{AC}	IEC-60320 C14				country specific mains cable
DC supply variant						
voltage supply range	U_{DC}	22	24	30	V	
power consumption	I_{DC}		250		mA	@ 24 V
power socket	X_{DC}	3 pole XLR male				
Dimensions and weight						
dimensions	W x H x D	approx. 482 x 44 x 265			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	
Remote interfaces						Option Device Monitoring only
remote ports	LAN	10/100BaseT		TCP/IP		RJ45
	LAN	SNMPv2 trap function				
	USB	2.0 (high speed)				USB type B
Product conformity						
Electromagnetic compatibility	EU: in line with EMC directive (2014/30/EC)					applied harmonized standards: EN61326-1 (for use in control and laboratory environment), EN55035 EN55032 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-1X8SR	P/N: 1502.6102.1				variant with AC supply
	WSDU-1X8SR	P/N: 1502.6102.3				variant with DC supplym
	WSDU-1X8SR	P/N: 1502.6102.2				AC supply with Device Monitoring
	WSDU-1X8SR	P/N: 1502.6102.4				DC supply with Device Monitoring

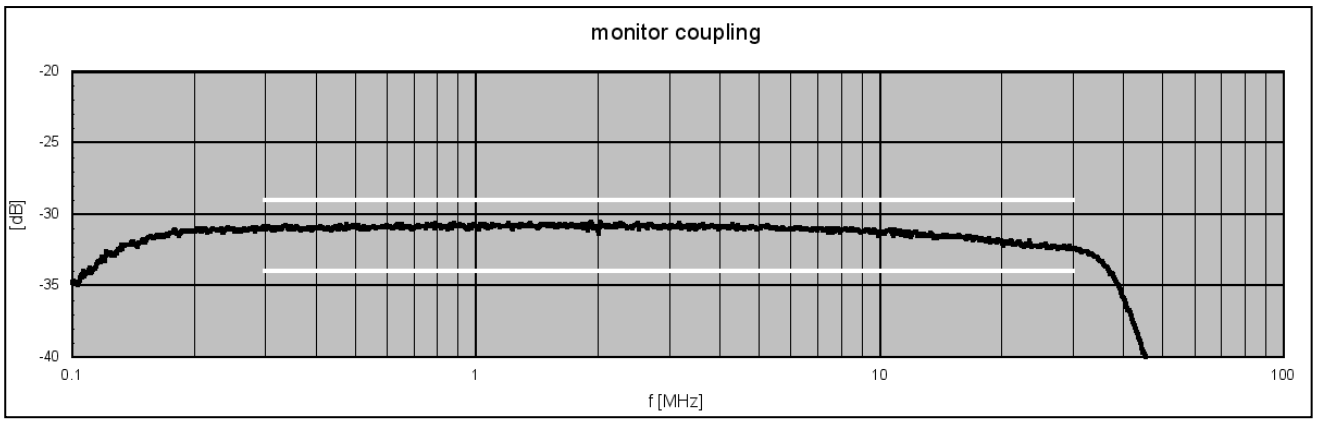
S-Parameter (typical responses)

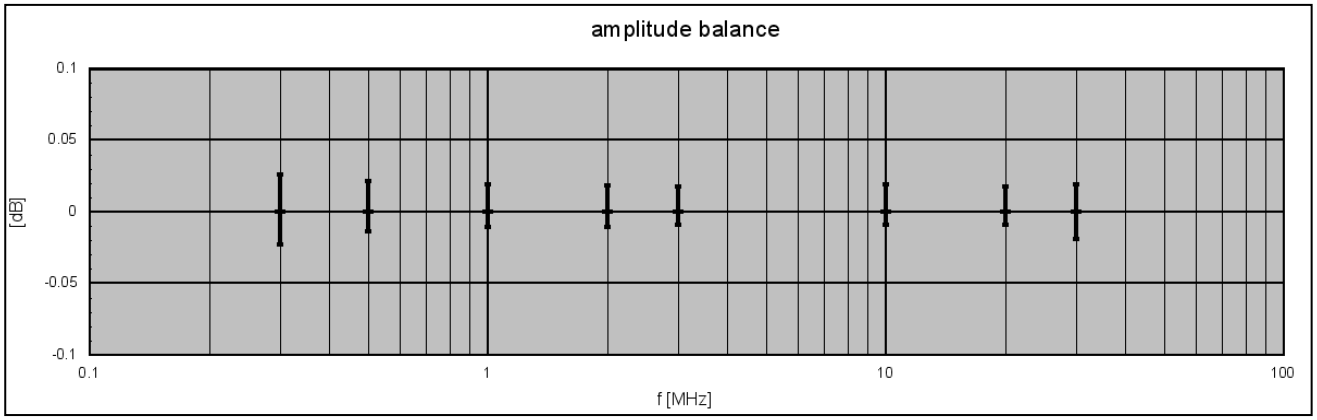


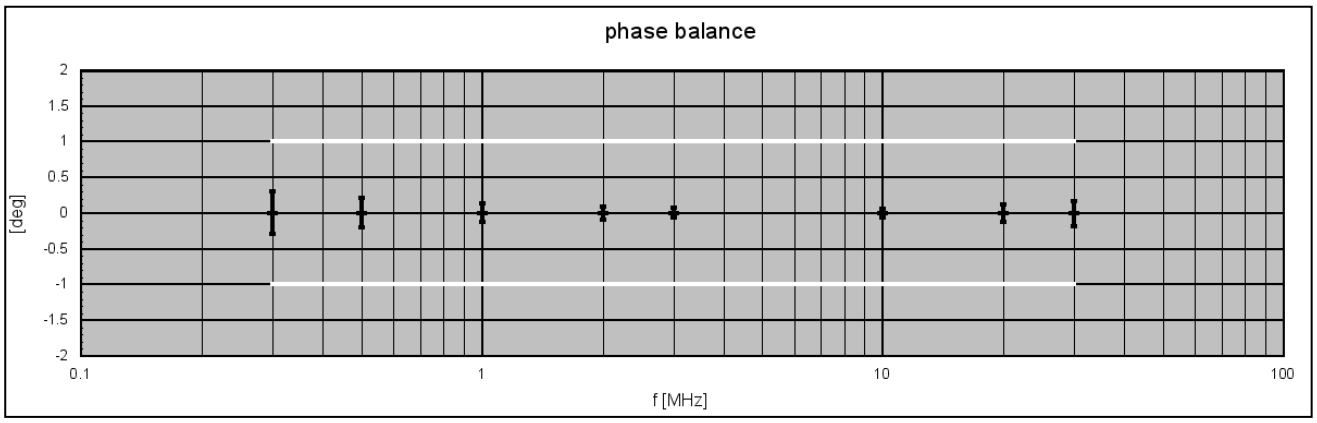


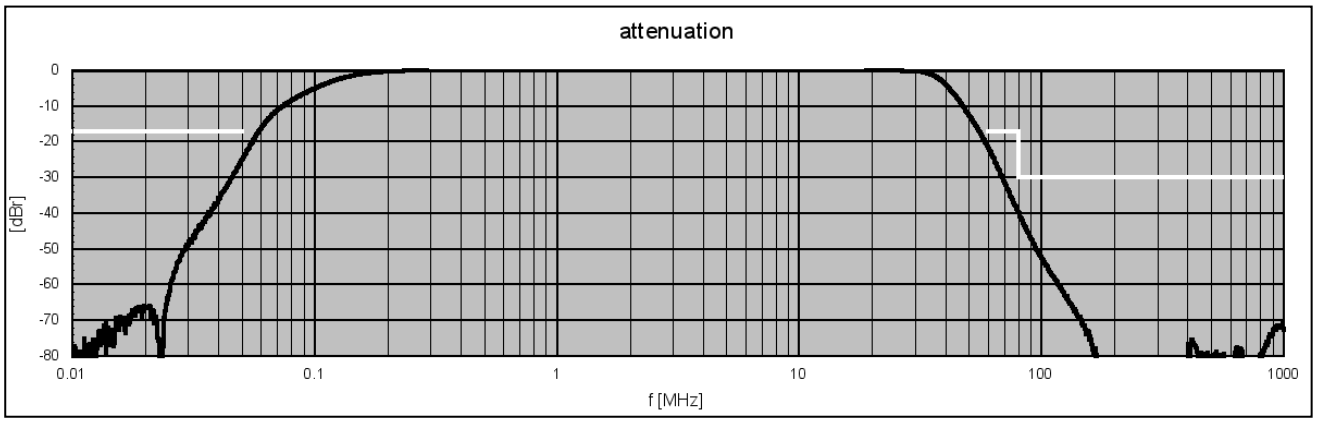




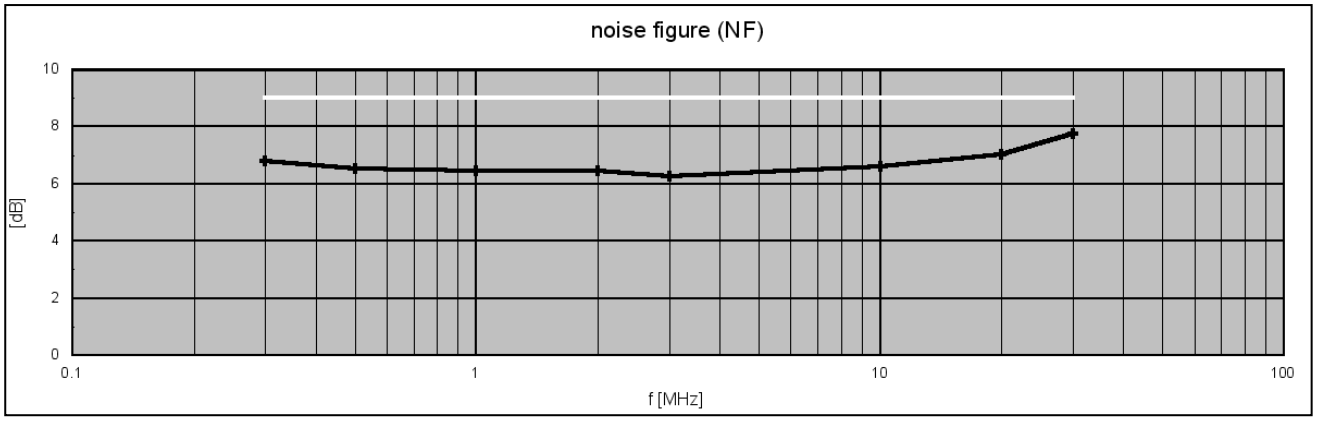

monitor coupling
-20
-25
-30
-35
-40
[dB]
0.1
1
10
100
f [MHz]

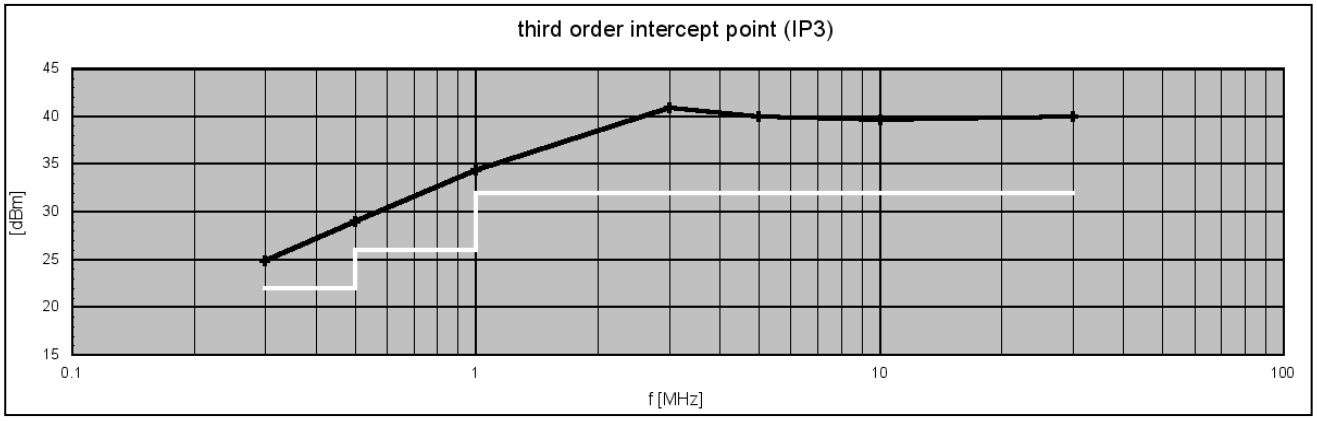

amplitude balance
0.1
0.05
0
-0.05
-0.1
[dB]
0.1
1
10
100
f [MHz]

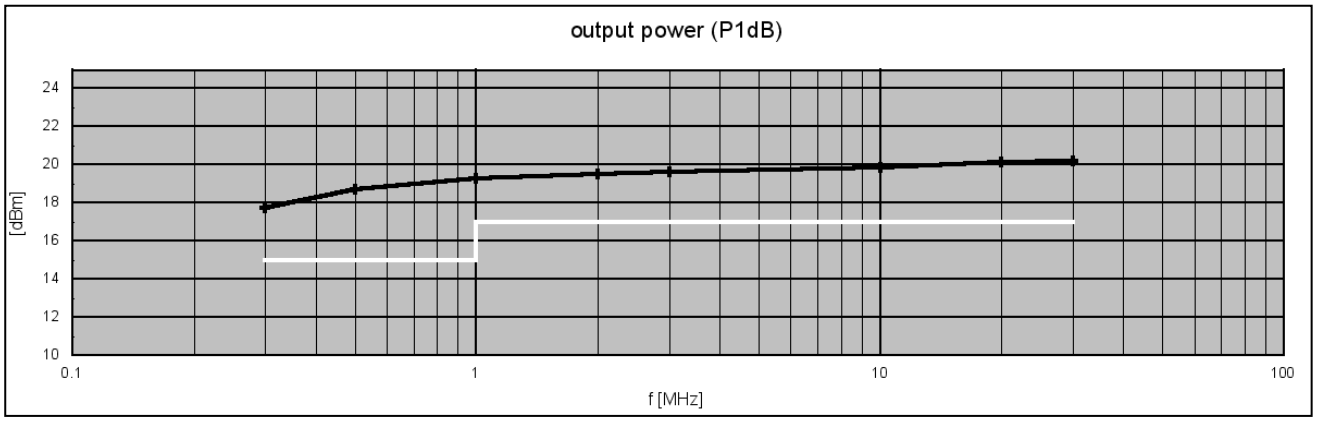

phase balance
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
[deg]
0.1
1
10
100
f [MHz]


attenuation
0
-10
-20
-30
-40
-50
-60
-70
-80
[dBr]
0.01
0.1
1
10
100
1000
f [MHz]

Dynamic Range (typical responses)







Appearances

Front View

Rear View Variant with AC supply and Device Monitoring, P/N: 1502.6102.2)

Band Pass Filters (External mountable on RF input socket)

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 MHz ≤ f ≤ 200 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 MHz ≤ f ≤ 200 MHz, N RF connectors (male / female) R&S P/N: 3663.7171.02
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 MHz, 45 dB typ. 80 MHz ≤ f ≤ 200 MHz, N RF connectors (male / female)

Related Multicoupler Products

Product	P/N	Description
WSDU-1X8LR	1107.6152	High Dynamic 8 Way Multicoupler for Broadcast Signals 100 kHz … 4000 MHz AC or DC power supply
WSDU-2X4LR	1107.6252	High Dynamic 2 Section 4 Way Multicoupler for Broadcast Signals 100 kHz … 4000 MHz AC or DC power supply
WSDU-1X8R	1107.6102	High Dynamic 8 Way Multicoupler 100 kHz … 4000 MHz AC or DC power supply
WSDU-2X4R	1107.6202	High Dynamic 2 Section 4 Way Multicoupler 100 kHz … 4000 MHz AC or DC power supply
WSDU-1X8AR	1807.6302	8 Way High Dynamic Signal Conditioning Multicoupler 100 kHz…4000 MHz AC or DC power supply
WSDU-1X8SR	1502.6102	High Dynamic 1X8 Shortwave Signal Distribution Unit 200 kHz … 30 MHz AC or DC power supply Variant with LAN remote interface with SNMPv2 trap function available
WSDU-2X4SER	2306.6102	2-Section 4-Way Signal Distribution Unit Section A: 200 kHz … 30 MHz Section B: 20… 8000 MHz AC or DC power supply Variant with LAN remote interface with SNMPv2 trap function available
WSDU-1X8ER	1501.6302	Extremely Wideband 1 to 8 Signal Distribution Unit 20 … 8000 MHz AC or DC power supply Variant with LAN remote interface with SNMPv2 trap function available
WSDU-2X4ER	1501.6202	Extremely Wideband 2 Section 1X4 Signal Distribution Unit 20 MHz… 8000 MHz AC or DC power supply Variant with LAN remote interface with SNMPv2 trap function available
WSDU-1X8UR	2109.6002	Ultra-Wideband 8-Way Signal Distribution Unit 100 kHz … 18 GHz AC or DC power supply LAN remote interface with SNMPv2 trap function