

## WSDU-1X8S

High Dynamic 1X8 Shortwave Multicoupler Module 300 kHz ... 30 MHz

### Features

- wideband
- high dynamic
- lossless in level
- input band pass filter
- lightning protection
- built-in test function (option)
- compact 6 U slot-in module
- RF monitoring port

### Applications

- shortwave signal distributions
- antenna signal distributions
- receiving systems
- radio monitoring
- direction finding



### Scope

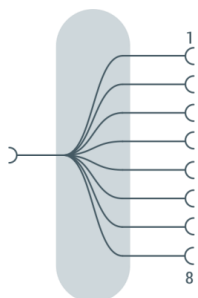
Slot-in module WSDU-1X8S is a wideband multicoupler, especially designed for the use in professional shortwave receiving systems. Due to its excellent dynamic properties, the WSDU-1X8S is suitable for applications with difficult reception conditions. The frequency range extends from 300 kHz up to 30 MHz.

WSDU-1X8S has a monitoring output. Via this monitoring port tests at signals can be done without interruption of operation.

The slot-in module is foreseen for integration into the SR6-11C system platform.

### Principal Block Diagram

The WSDU-1X8S multicoupler distributes the signals from one input to 8 equal outputs without loss in level. Additionally the module has a DC bypass between RF\_IN and RF\_OUT5 for e.g. phantom supply.



### Distribution without Loss in Level

The multicoupler utilizes low-noise high dynamic amplifier stages. As a result, the distributed input signal is made available at the eight outputs of the multicoupler without any loss in level.

All RF ports have SMA female connectors, located on the rear side of the module.

### RF Input Protection

The WSDU-1X8S provides protection against lightning, surges and out-of-band signals. The RF input of the device is equipped with a discharge element and an over level protection with clipping diodes. An additional bandpass filter suppresses unwanted out-of-band signals.

### Remote Control

In combination with the SR6-CU controller module, the WSDU-1X8S is remote controllable via standard interfaces USB and LAN with simple SCPI orientated ASCII strings.

The WSDU-1X8S has a standby function for energy saving.

### Built-In Test Function

Total current consumption, operating points of amplifier stages and internal temperature of WSDU-1X8S are monitored. The module status can be read out via remote interface.

## RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z <sub>IN</sub> /Z <sub>OUT</sub>		50		Ω	
low frequency	f <sub>MIN</sub>		200	300	kHz	
high frequency	f <sub>MAX</sub>	30	35		MHz	
gain	S <sub>21</sub>	+2	+3	+4	dB	
input return loss	S <sub>11</sub>		-25	-14	dB	VSWR < 1.5
output return loss	S <sub>22</sub>		-20	-14	dB	VSWR < 1.5
reverse isolation	S <sub>12</sub>		-30	-27	dB	
o-o isolation	S <sub>23</sub>		-34	-27	dB	
o-o amplitude balance	ΔS <sub>21</sub>		±0.02	±0.5	dB	
o-o phase balance	dφ <sub>21</sub>		±0.3	±1.0	°	
monitor coupling loss	S <sub>21MON</sub>	-34	-31	-29	dB	
attenuations	S <sub>21_50k</sub>		-25	-17	dBr	@ 50 kHz, rel. S <sub>21</sub> @ 10 MHz
	S <sub>21_60M</sub>		-22	-17	dBr	@ 60 MHz, rel. S <sub>21</sub> @ 10 MHz
	S <sub>21_80M</sub>		-40	-30	dBr	@ 80 MHz, rel. S <sub>21</sub> @ 10 MHz
2 <sup>nd</sup> order intercept	OIP2 <sup>1</sup>	+65	+85		dBm	
3 <sup>rd</sup> order intercept	OIP3 <sup>2</sup>	+22	+25		dBm	f < 500 kHz
	OIP3 <sup>2</sup>	+26	+29		dBm	500 kHz ≤ f < 1 MHz
	OIP3 <sup>2</sup>	+32	+39		dBm	f > 1 MHz
1 dB compression	P <sub>1dB</sub>	+15	+18		dBm	f < 1 MHz
	P <sub>1dB</sub>	+17	+20		dBm	f ≥ 1 MHz
noise figure	NF		7	9	dB	
maximum input power	P <sub>in</sub>			+25	dBm	CW, no damage
DC bypass	U <sub>DC</sub>	RF_IN to OUT_5				
DC bypass voltage	U <sub>BYP</sub>			24	V	
DC bypass current	I <sub>BYP</sub>			200	mA	
DC bypass resistance	R <sub>BYP</sub>		9	11	Ω	
DC bypass bandwidth	BW <sub>BYP</sub>		25		kHz	
maximum DC voltage	U <sub>DC</sub>			24	V	all RF ports
ESD discharge resistor	R <sub>ESDO</sub>		10		kΩ	RF outputs, excluding RFOUT5
RF connectors		SMA 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.

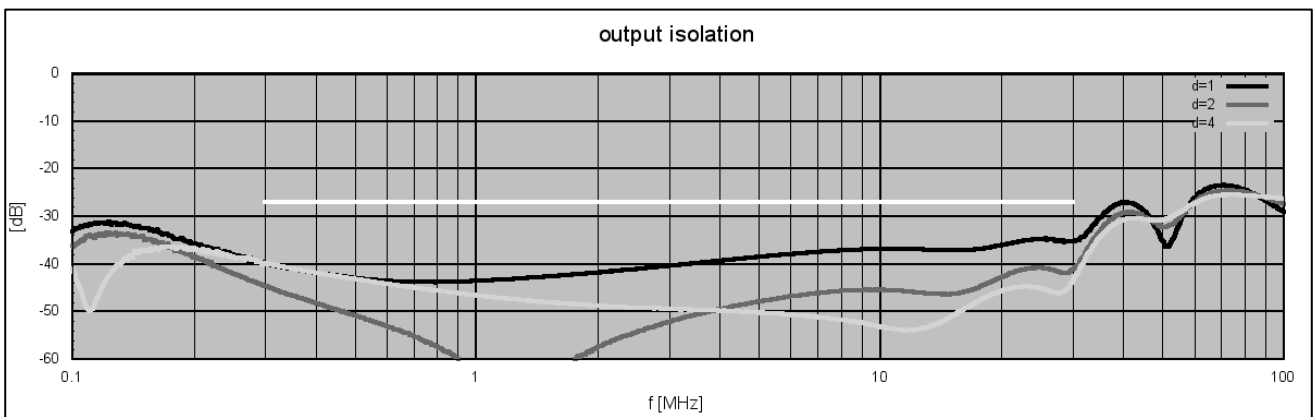
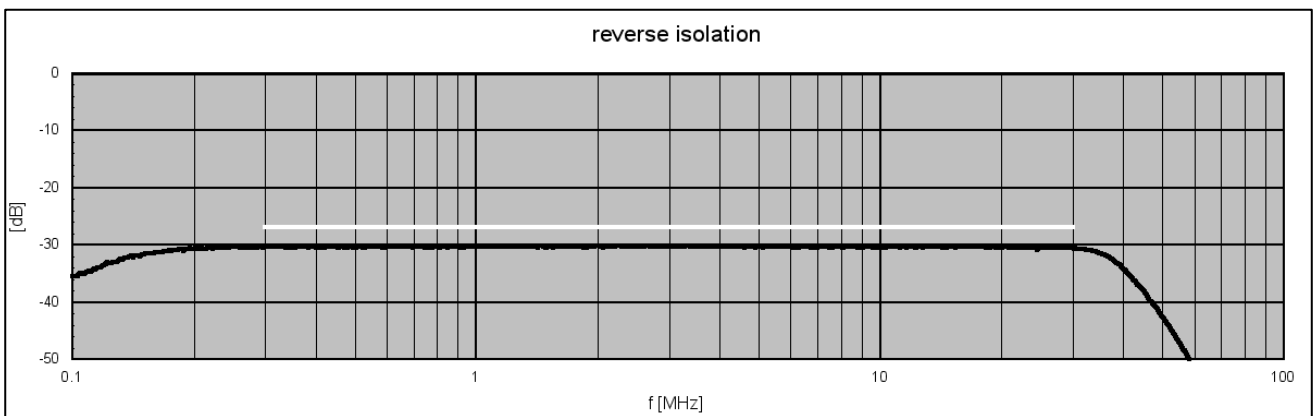
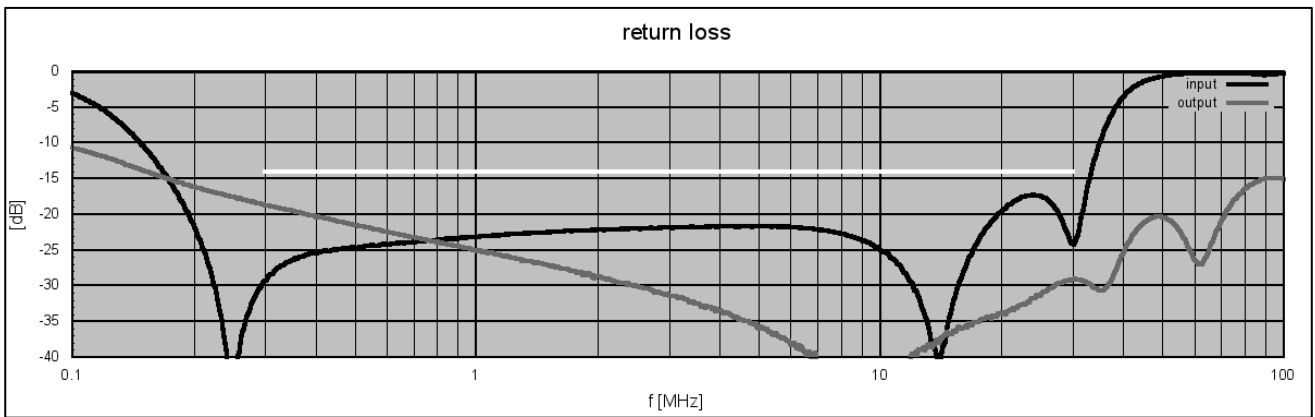
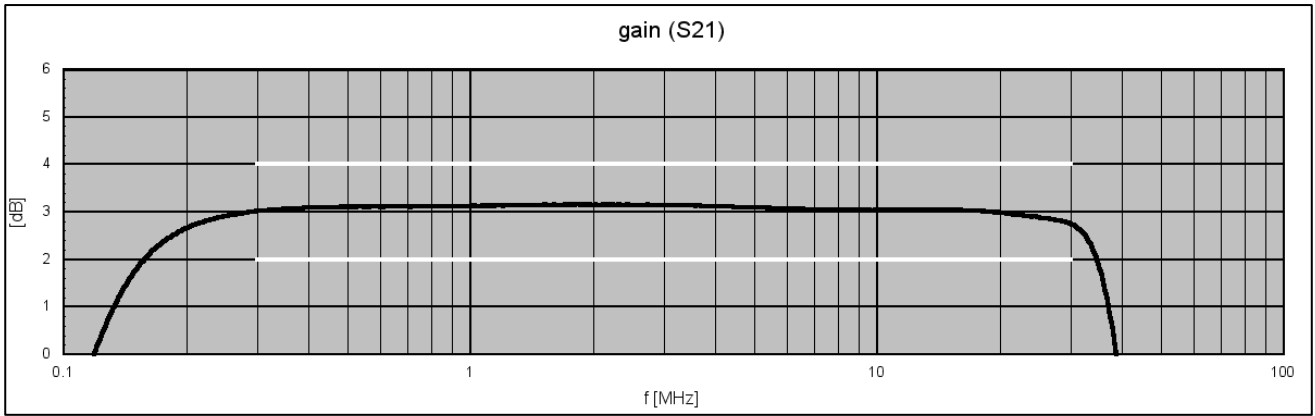
Note 2: test frequency pairs for OIP3: 290 / 310 kHz, 490 / 510 kHz, 0.9 / 1.1 MHz, 2.8 / 2.9 MHz, 29.8 / 29.9 MHz.  
Output level 2 x 0 dBm.

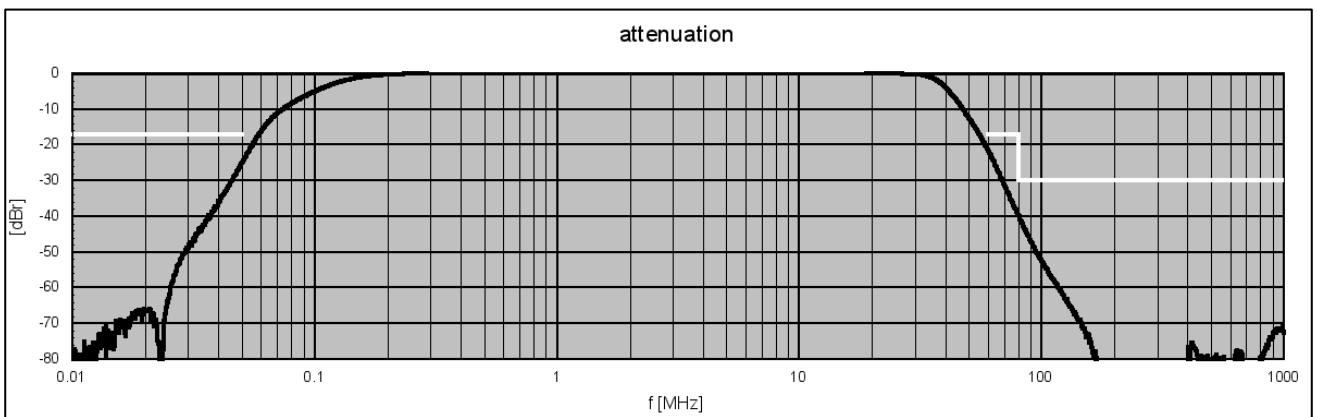
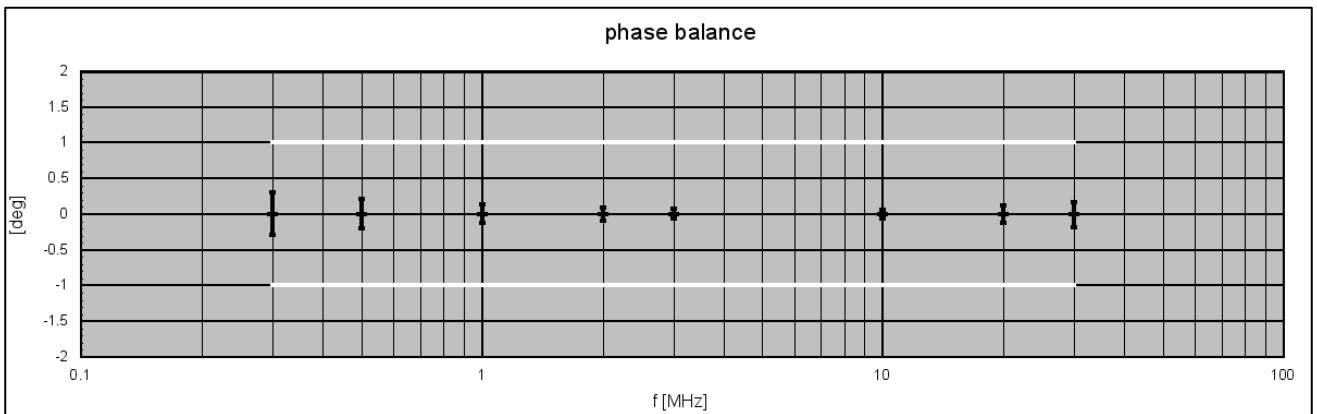
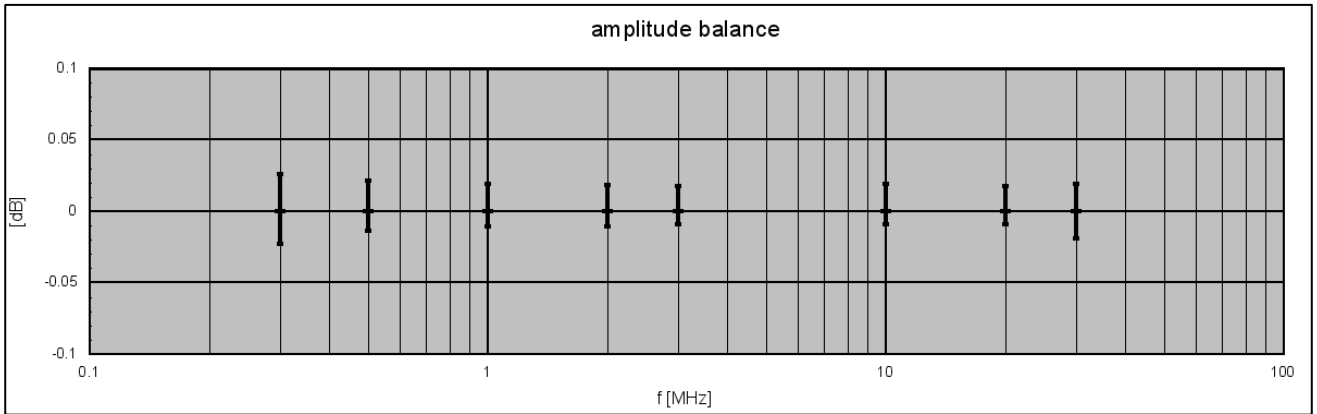
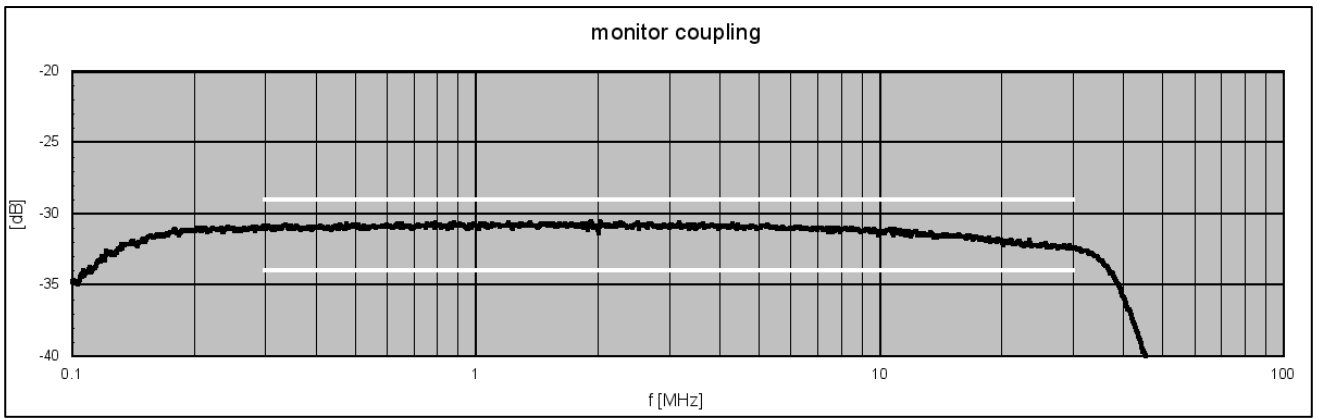
## Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U <sub>DC</sub>	23.5		24.5	V	DC
power consumption	P <sub>OPR</sub>		6		W	operation
	P <sub>STB</sub>		1		W	standby
dimensions	W x H x D	approx. 30 x 262 x 197			mm	6 U, 6 HP
weight	m		1.3		kg	
operating temp. range	T <sub>o</sub>	-10		+65	°C	module surface
storage temp. range	T <sub>s</sub>	-40		+70	°C	
relative humidity	RH			95	%	
mean time between failure	MTBF		30000		h	
ordering information		WSDU-1X8S		1502.6100.1		

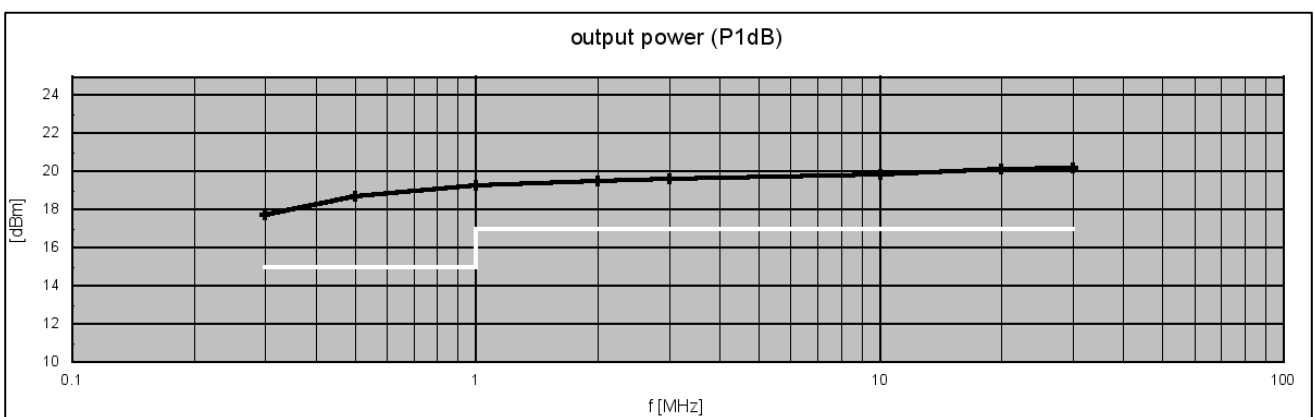
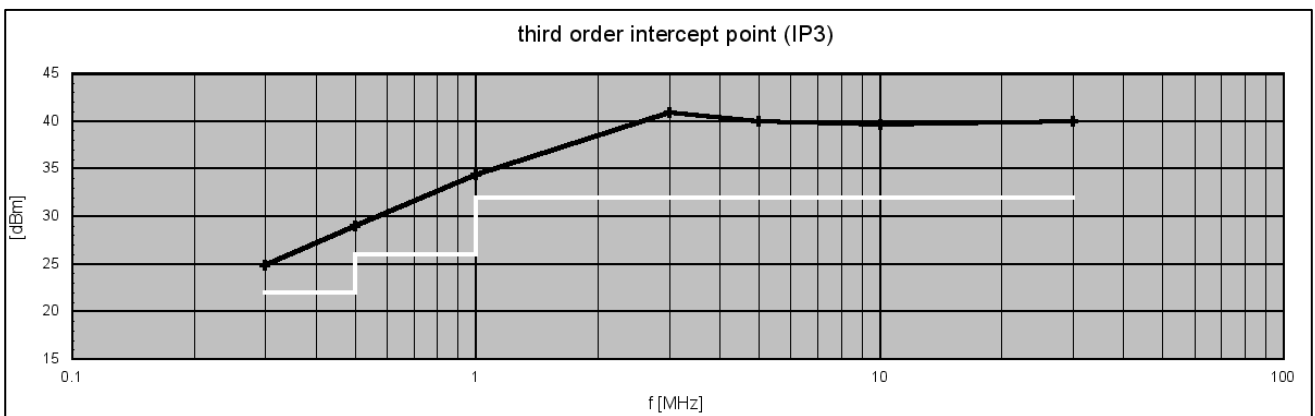
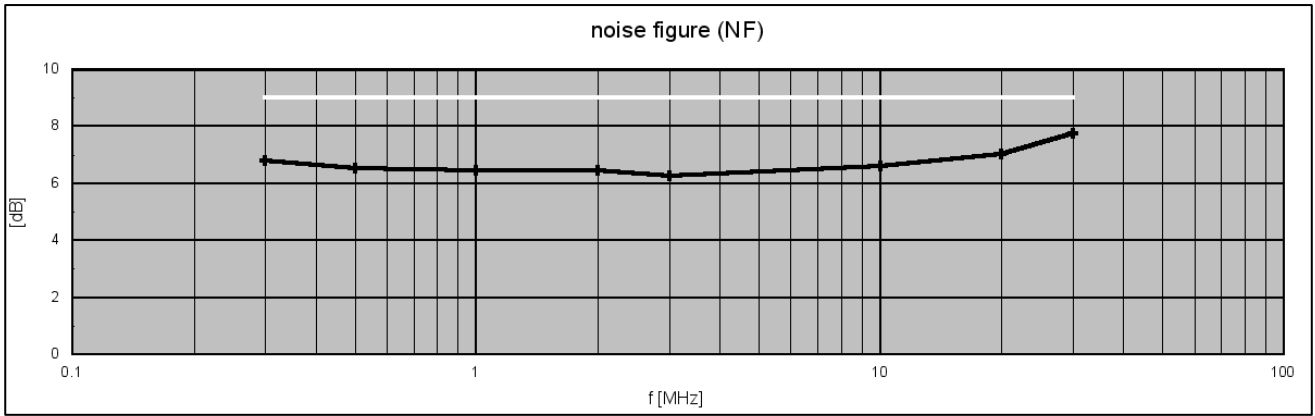


**S-Parameters (typical responses)**





**Dynamic Range (typical responses)**

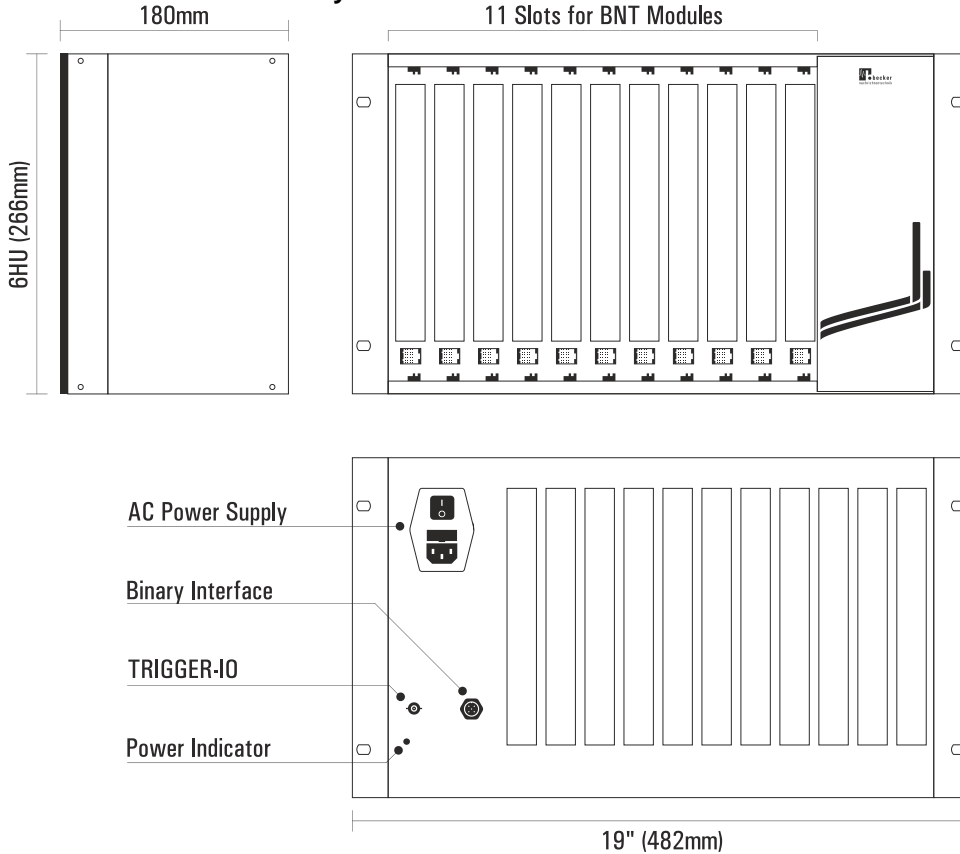


### SR6-11C System Platform

The WSDU-1X8S module is foreseen for the integration into the SR6-11C system platform. 11 slots in the SR6-11C can be used for modules like RF switches, matrices, multicouplers,

attenuators, BIAS-Ts, level detectors, bidirectional splitters/combiners for signal conditioning and a controller unit.

### Dimensions of SR6-11C System Platform



### Appearances



WSDU-1X8S front view



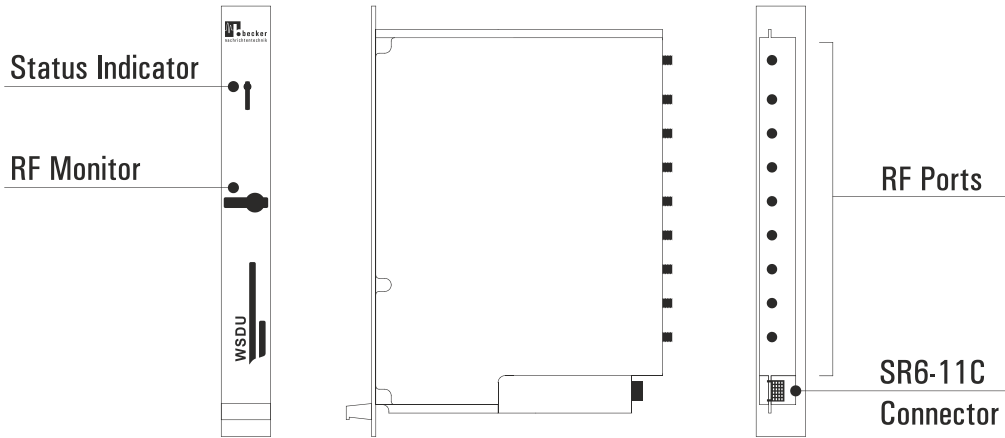
WSDU-1X8S rear view



SR6-11C front view



Technical Drawing



**Related Products**

Product	Description	P/N
SR6-11C	System Platform with 11 Slots for Modules	1409.1202.1
SR6-CU	Controller Unit with LAN and USB Remote Interface	1409.3000.1
<b>Unidirectional Products: Active Multicouplers, Matrices, Level Detectors</b>		
WSDU-1X8A	8 Way High Dynamic Signal Conditioning Multicoupler 100 kHz ... 4000 MHz	1807.6300.1
WSDU-2X4A	2 Section 4 Way High Dynamic Signal Conditioning Multicoupler 100 kHz ... 4000 MHz	1807.6400.1
WSDU-1X8L	8 Way Multicoupler Module 100 kHz ... 4000 MHz	1807.6100.1
WSDU-2X4L	2 Section Hi Dynamic 4 Way Multicoupler Module 100 kHz ... 4000 MHz	1807.6200.1
WSDU-2X4E+	2 Section 1x4 plus 1x2 Multicoupler Module 20 ... 8000 MHz	1501.6200.1
WSDU-1X8S	High Dynamic 1x8 Shortwave Multicoupler Module 300 kHz ... 30 MHz	1502.6100.1
WSDU-1X2PM	2 Channel, 5 W Multicoupler with ALC Capability 20 MHz...3000 MHz	1606.6000.1
RSWM-4X4	4x4 Switching Matrix -Non-blocking-, 100 kHz ... 4000 MHz or 20 MHz ... 4000 MHz	1205.4100
RSWM-4X4E	4x4 Ultra-Wideband Switching Matrix -Non-blocking-, 20 MHz ... 8000 MHz	2001.4100.1
RFLD-8RE	8 Channel True Power RF Level Detector, 1 MHz ... 8000 MHz	1505.8000.1
<b>Bidirectional Products: Switches, Matrices, Attenuators, Delay Lines, BIAS-Ts, Splitters/Combiners, Filters</b>		
RSWU-2SP4TS+	2 Channel Non-reflective SP4T Switches plus 1 Channel SPDT Switch, 100 kHz ... 8500 MHz	1408.4010.1
RSWU-8SPSTS	8 Channel Non-reflective SPST Switch 100 kHz ... 8500 MHz	1408.4000.1
RSWU-4SPDTS	4 Channel Non-reflective SPDT Switch 100 kHz ... 8500 MHz	1408.4020.1
RSWU-8SPST-CS	8 Channel High Isolation SPST with DC Load Simulation, 100 kHz ... 7500 MHz	1811.4100.1
BSWM-4X4E	4x4 High Isolation Bi-Directional Switching Matrix –Blocking-, 100 kHz ... 7500 MHz	1205.4600.1
ATT-8E	8 Channel Digital Step Attenuator 0 ... 31.75 dB, 100 kHz ... 8000 MHz	1503.4000.1
DLL-4	4 Channel Programmable Delay Line 0 ... 1700 ps, 250 MHz ... 4000 MHz	1303.4200.1
PT-4CS	4 Channel Programmable DC Sink 0 ... 400 mA, 100 kHz ... 8500 MHz	1605.2020.1
PT-4CL	4 Channel Wideband DC Load, 100 kHz ... 8500 MHz	1605.2040.1
BSDU-2X4A+	2 Section 4 Way, Bi-Directional Signal Conditioning plus 2 Way Splitter/Combiner, 500 MHz ... 7500 MHz	1903.6100.1
BSDU-2X4+	2 Section 4 Way Wideband Bi-Directional plus 2 Way Splitter/Combiner, 500 MHz ... 7500 MHz	1903.6200.1
FBS-1590	L1 Band GNSS Notch Filter	1511.5100.1

