

WSDU-2X4E+

2-Section 4-Way plus 1x2 Multicoupler Module, 20 ... 8000 MHz

Features

- ultra wideband
- 3 independent RF channels
- useable as 1x8 configuration
- without loss in level
- high dynamic
- built-in test capability

Applications

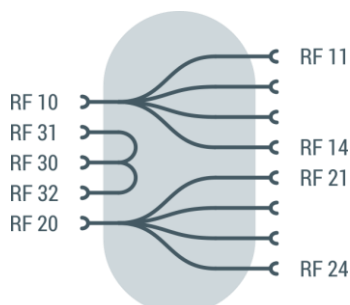
- VHF, UHF and SHF range
- radio monitoring
- receiving systems
- radio signal distributions
- R&D (Research & Development)

Scope

The WSDU-2X4E+ offers two independent 1X4 active, extremely wideband signal distributions and an additional 1X2 distribution. This means that the module can be used both as a 2-channel 1X4 distribution and as a 1X8 distribution with external cabling. The module operates in the frequency range 20 MHz to more than 8000 MHz. As a slot-in type, the module is intended for integration into the SR6-11C system platform.

Principal Block Diagram

The three multicoupler sections provide high isolation between each channel. They can operate with different signals without mutual influence.



Distribution without Loss in Level

The RF input signals are amplified using broadband low-noise amplifiers with a wide dynamic range. As a result, the distributed input signals are made available at the outputs of the multicoupler sections with a signal gain. RF input and the RF outputs are SMA female connector type, located on the rear side of the module.

Wideband Distribution Systems

The ultra-wide frequency range makes WSDU-2XE+ ideally suited for applications such as radio monitoring and in research and development (R&D).

High Output-to-Output Isolation

WSDU-2X4E+ features a high output-to-output isolation. Thus, changing the load at an output causes nearly no effects to the power level at the other outputs.

Remote Control

In combination with the SR6-CU controller module, the WSDU-2XE+ is remote controllable via standard interfaces USB and LAN with simple SCPI orientated ASCII strings. The WSDU-2X4E+ has a standby function for energy saving.

Built-In Test Function

Total current consumption, operating points of amplifier stages and internal temperature of WSDU-2X4E+ are monitored. The module status can be read out via remote interface.

RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z _{IN} /Z _{OUT}		50		Ω	
low frequency	f _{MIN}		10	20	MHz	
high frequency	f _{MAX}	8000	8500		MHz	
1X4 multicoupler	n _{1X4}	2 channels				
1X2 multicoupler	n _{1X2}	1 channel				
1X4 multicoupler sections						
gain	S ₂₁	3	4	5.5	dB	f ≤ 1000 MHz
	S ₂₁	1.5	3.5	5.5	dB	1000 MHz < f ≤ 7000 MHz
	S ₂₁	0.5	3.5	5.5	dB	f > 7000 MHz
gain flatness	ΔS ₂₁		±1		dB	
input return loss	S ₁₁		-15	-9	dB	
output return loss	S ₂₂		-20	-15	dB	f ≤ 2000 MHz
	S ₂₂		-15	-10	dB	f > 2000 MHz
reverse isolation	S ₁₂		-70	-55	dB	
output isolation	S ₂₃		-30	-20	dB	distance = 1
	S ₂₃		-50	-40	dB	distance > 1
channel isolation	CH _{ISO}		-90	-70	dB	between 1x4 couplers
1 dB compression	P _{1dB}	+3	+6		dBm	
3 rd order intercept	OIP3 ¹	+17	+21		dBm	f ≤ 1000 MHz
	OIP3 ¹	+14	+17		dBm	1000 MHz < f ≤ 4000 MHz
	OIP3 ¹	+11	+15		dBm	f > 4000 MHz
2 nd order intercept	OIP2 ²	+25	+40		dBm	40/60 MHz, 1000/1100 MHz
	OIP2 ²	+17	+30		dBm	3000/3100 MHz,3900/4000 MHz
noise figure	NF		9	11	dB	f < 100 MHz
	NF		7.5	9	dB	100 MHz ≤ f ≤ 7000 MHz
	NF		8	10	dB	f > 7000 MHz
input power	P _{RF}			+10	dBm	CW, no damage
DC voltage	U _{DC}			20	V	input and outputs
ESD discharge resistor	R _{ESD}		4.7		kΩ	input and outputs
RF connectors	X _{RF}	SMA female				
1X2 multicoupler section						
gain	S ₂₁	-1	1	2.5	dB	
gain flatness	ΔS ₂₁		±0.8		dB	
input return loss	S ₁₁		-15	-11	dB	f ≤ 6000 MHz
	S ₁₁		-12	-9	dB	f > 6000 MHz
output return loss	S ₂₂		-16	-13	dB	f ≤ 4000 MHz
	S ₂₂		-10	-7		f > 4000 MHz
reverse isolation	S ₁₂		-35	-25	dB	
output isolation	S ₂₃		-20	-17	dB	
1 dB compression	P _{1dB}	5	8		dBm	
3 rd order intercept	OIP3 ¹	+16	+21			f ≤ 4000 MHz
	OIP3 ¹	+13	+17			f > 4000 MHz
2 nd order intercept	OIP2 ²	+25	+35		dBm	40/60 MHz, 1000/1100 MHz
	OIP2 ²	+17	+35		dBm	3000/3100 MHz, 3900/4000 MHz
noise figure	NF		8	10	dB	f ≤ 100 MHz
	NF		7	9	dB	f > 100 MHz
RF input power	P _{RF}			+5	dBm	CW, no damage
DC voltage	U _{DC}			20	V	input and outputs
ESD discharge resistor	R _{ESD}		4.7		kΩ	input and outputs
RF connectors	X _{RF}	SMA female				

Note 1: $P_{in} = 2 \times -10$ dBm, specified and tested for $\Delta f = 50$ MHz

Note 2: $P_{in} = 2 \times -10$ dBm, specified and tested for mentioned frequency pairs

OIP2 & OIP3 values are the average of the upper and lower intermodulation distortion.



RF Specification configured as 1X8 multicoupler

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
gain	S_{21}		5		dB	$f \leq 1000$ MHz
	S_{21}		3		dB	$f > 1000$ MHz
gain flatness	ΔS_{21}		± 2		dB	
input return loss	S_{11}		-16		dB	
output return loss	S_{22}		-17		dB	$f \leq 6500$ MHz
	S_{22}		-13		dB	$f > 6500$ MHz
reverse isolation	S_{12}		-90		dB	
output isolation	S_{23}		-30		dB	distance = 1
	S_{23}		-50		dB	distance > 2
1 dB compression	P_{1dB}		+6		dBm	$f \leq 3000$ MHz
	P_{1dB}		+5		dBm	$f > 3000$ MHz
3 rd order intercept	$OIP3^1$		+19		dBm	$f \leq 1500$ MHz
	$OIP3^1$		+16		dBm	$1500 \text{ MHz} < f \leq 4000 \text{ MHz}$
	$OIP3^1$		+14		dBm	$f > 4000$ MHz
2 nd order intercept	$OIP2^2$		+38		dBm	40/60 MHz
	$OIP2^2$		+33		dBm	1000/1100 MHz
	$OIP2^2$		+26		dBm	3000/3100 MHz, 3900/4000 MHz
noise figure	NF		11		dB	$f < 100$ MHz
	NF		9.5		dB	$f \geq 100$ MHz
RF input power	P_{RF}			+5	dBm	CW, no damage
DC voltage	U_{DC}			20	V	input and outputs
ESD discharge resistor	R_{ESD}		4.7		k Ω	input and outputs
RF connectors	X_{RF}	SMA female				

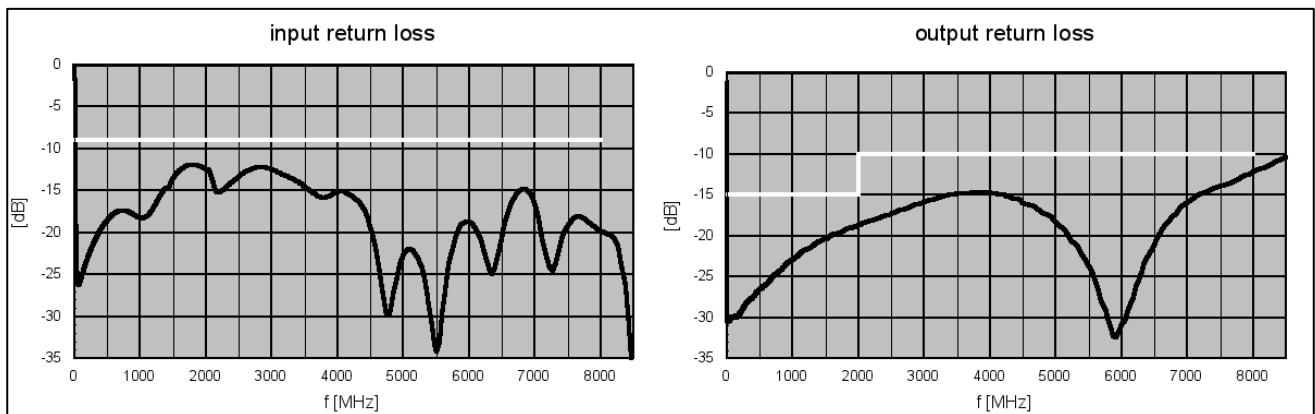
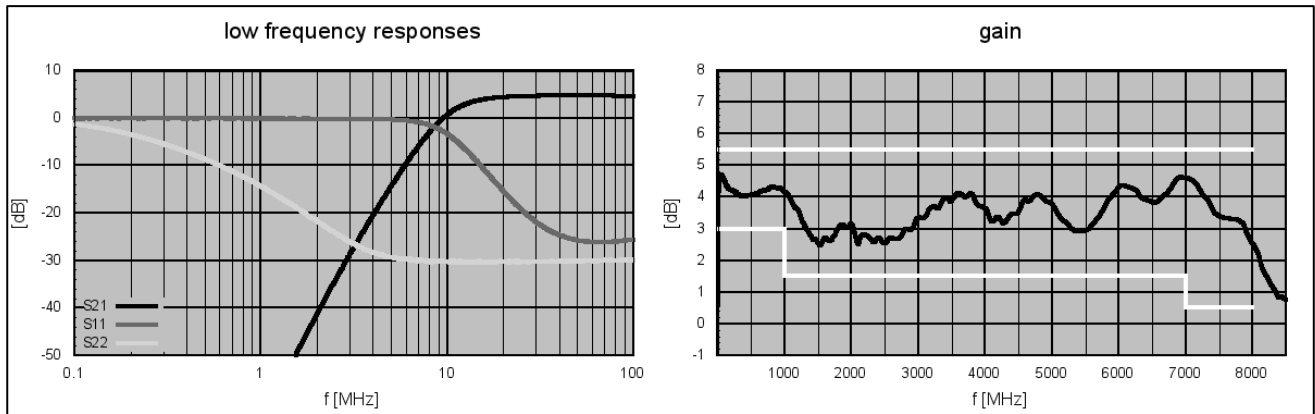
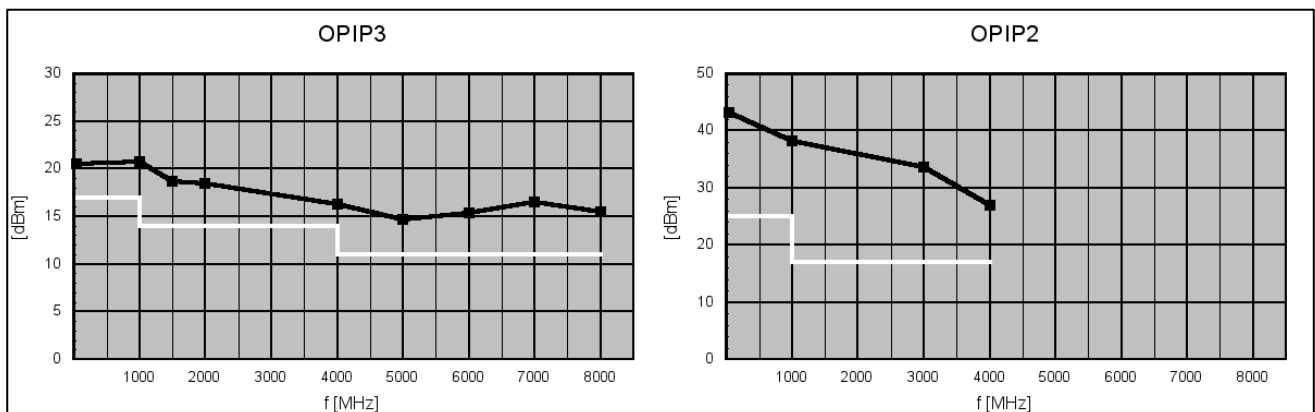
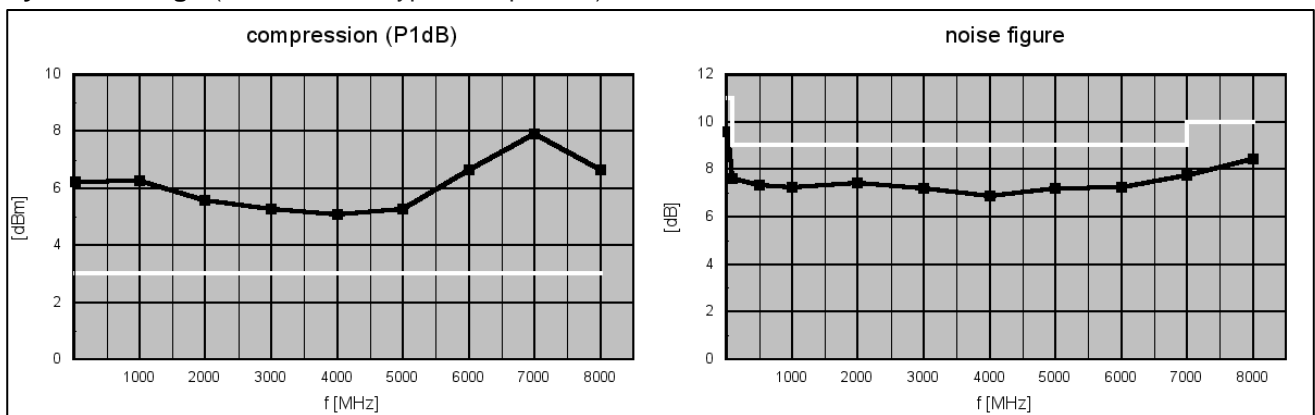
Note 1: $P_{in} = 2 \times -10$ dBm, specified and tested for $\Delta f = 50$ MHz

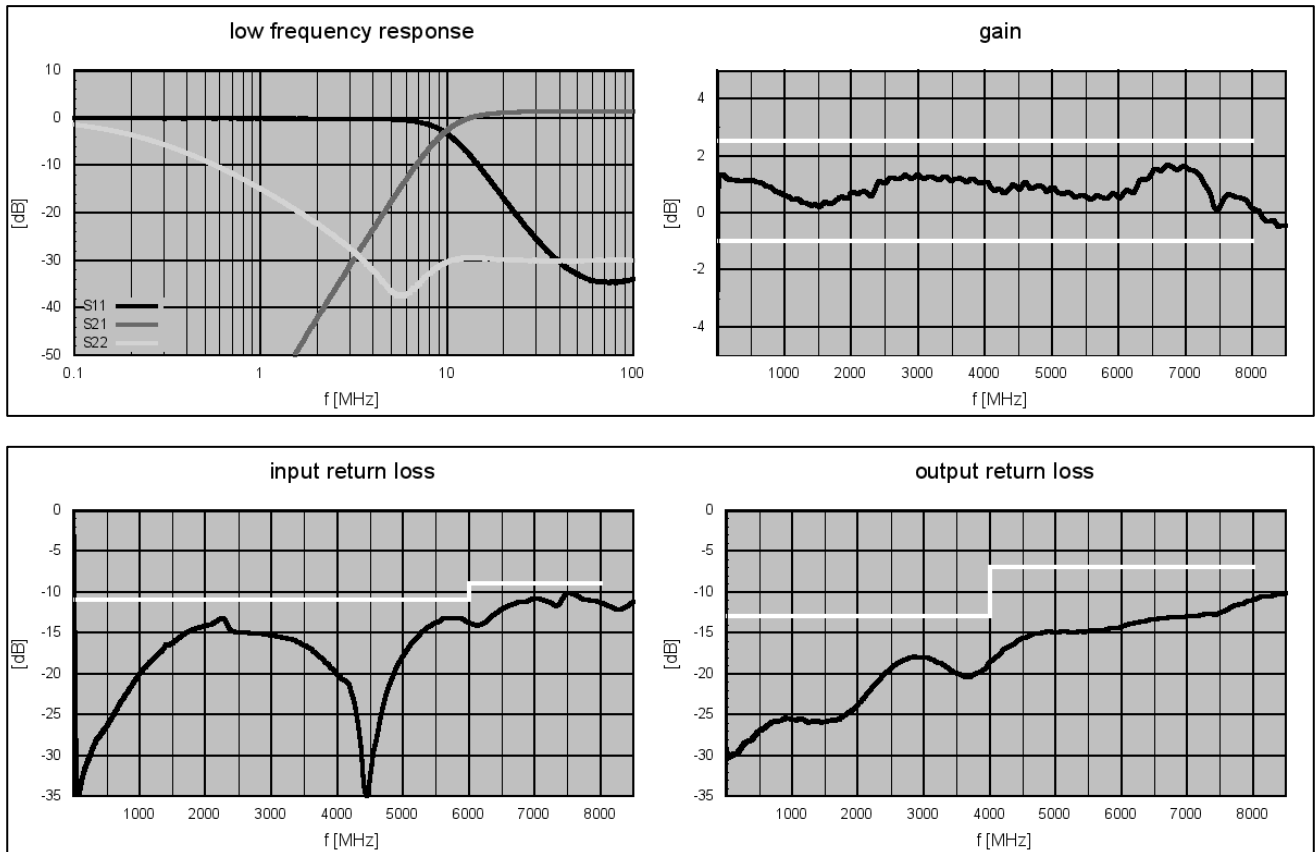
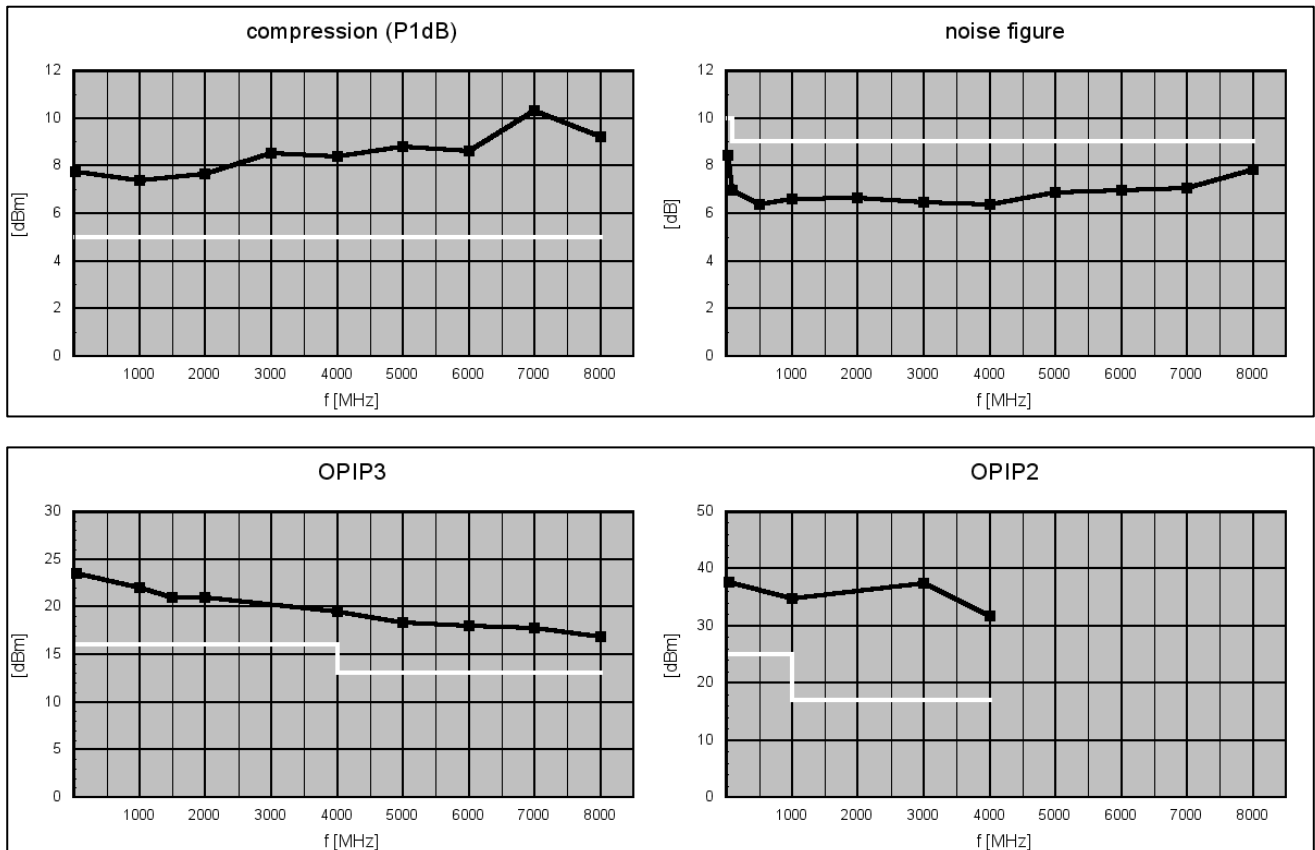
Note 2: $P_{in} = 2 \times -10$ dBm, specified and tested for mentioned frequency pairs

OIP2 & OIP3 values are the average of the upper and lower intermodulation distortion.

Common Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U_{DC}	23.5		24.5	V	DC
power consumption	P_{OPR}		5		W	operation
	P_{STB}		1		W	standby
dimensions	W x H x D	approx. 30 x 262 x 197			mm	6 U, 6HP
weight	m		1.2		kg	
operating temp. range	T_o	+5		+55	°C	ambiance
storage temp. range	T_s	-40		+70	°C	
ordering information		WSDU-2X4E+		1501.6200.1		

S-Parameters (1X4 sections, typical responses)**Dynamic Range (1X4 sections, typical responses)**

S-Parameters (1X2 section, typical responses)**Dynamic Range (1X2 sections, typical response)**

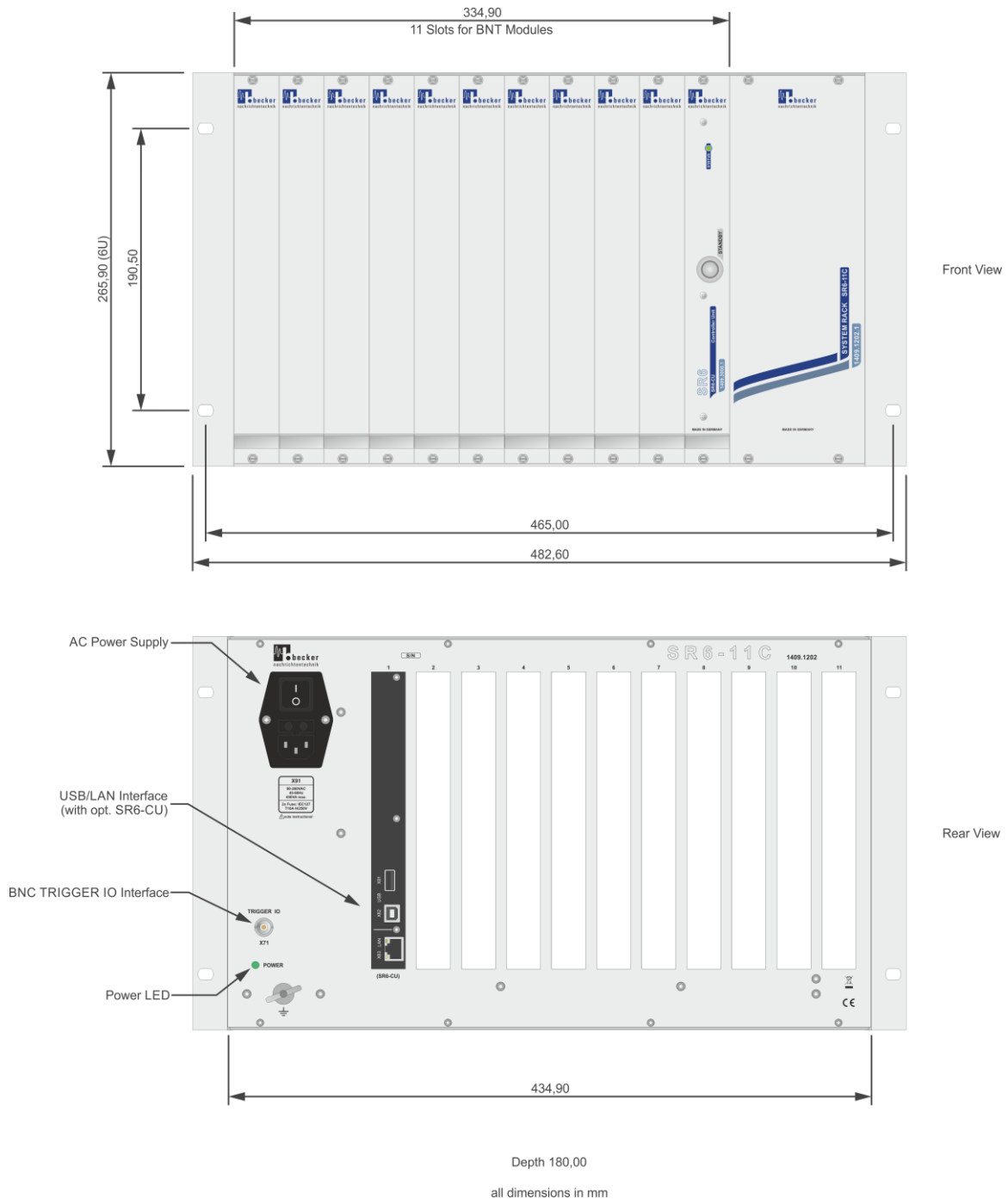
Appearances

SR6-11C System Platform

The WSDU-2X4E+ 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, bi-directional

splitters/combiners for signal conditioning and a controller unit. For the module health monitoring the WSDU-2X4E+ a SR6-CU controller unit is required.

Dimensions of SR6-11C System Platform



Front View



SR6-11C System Platform



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
Unidirectional Products: Active Multicouplers, Matrices, Level Detectors		
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-1X8U	Ultra-Wideband 8-Way Multicoupler Module, 100 kHz ... 18000 MHz	2109.6000.1
WSDU-1X8S	High Dynamic 1x8 Shortwave Multicoupler Module, 300 kHz ... 30 MHz	1502.6100.1
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-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	1205.4100.1
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
Bi-Directional Products: Switches, Matrices, Attenuators, Delay Lines, BIAS-Ts, Splitters/Combiners, Filters		
BSDU-1X8A	8 Way Bi-directional Signal Conditioning Splitter Module, 500 ... 9000 MHz	2109.6200.1
BSDU-2X4A	2 Section 4 Way Bi-directional Signal Conditioning Splitter Module, 500 ... 9000 MHz	2109.6250.1
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
FBS-1590	L1 Band GNSS Notch Filter	1511.5100.1

