RSWM-4X8SR

4X8 Shortwave Switching Matrix 300 kHz … 30 MHz

Features
- wideband
- high dynamic
- internal input band pass filters
- internal lightning protection
- built-in test function
- high pass filters for VLF suppression available

Applications
- radio monitoring
- military
- intelligence service
- homeland security
- short wave receiving systems

At a Glance

RSWM-4X8SR is a wideband -non-blocking- switching matrix for professional short wave radio applications. It has four inputs and eight outputs and is designed in 50 Ohms technology.
The non-blocking structure offers to the full access of up to all 8 outputs to one input without a degrading in RF performance.
The RSWM-4X8SR is AC mains supplied and is housed in a compact 19", 3 U casing.

Excellent RF Characteristics

The device´s extremely high dynamic and excellent properties in terms of linearity makes it suitable in difficult receiving applications for a reception of weak signals with a presence of very strong transmitting stations.

RF Input Protection

The RSWM-4X8SR provides protection against lightning, surges and out-of-band signals. All RF inputs are equipped with a discharge element and an over level protection with clipping diodes. And a bandpass filter suppresses unwanted out-of-band signals.

Wear-free switching

The RF switches used in the RSWM-4X8SR are wear-free semiconductors for an operation with a low requirement in maintenance.

Remote control

RSWM-4X8SR can be controlled via LAN or USB remote interface with SCPI-99 oriented ASCII strings.
The USB interface is a virtual COM-port which can be controlled like RS232 serial interface.

Built-In Test Function

Current consumptions of amplifier stages and internal temperatures of the RSWM-4X8SR are monitored. The module status can be read out via remote interfaces.

Optional Band Pass Filters

The RSWM-4X8SR covers the frequency range 300 kHz … 30 MHz. In applications where the lower frequency range is not of interest different Band Pass Filters for mounting on the input connectors are available. The Band Pass Filters are standard available with the high pass corner frequencies 500 kHz, 1 MHz and 1.7 MHz. These filters give an effective suppression of unwanted out-of-band signals in the lower frequency range and give an additional suppression in the upper out-of-band frequency range.

RF Specification

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	Z_{iN}/Z_{OUT}		50		Ω	
low frequency	f_{MIN}		200	300	kHz	
high frequency	f_{MAX}	30	35		MHz	
gain	S_{21}	1	2	3	dB	
gain flatness	$\Delta S21$		±0.2		dB	
input return loss	S_{11}		-25	-14	dB	
output return loss	S_{22}		-20		dB	
reverse isolation	S_{12}		-31		dBr	
o-o isolation	S_{23}		-36		dBr	connected to the same input
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[1]	+64	+80		dBm	
3rd order intercept	OIP3[2]	+21	+24		dBm	f < 500 kHz
	OIP3[2]	+25	+28		dBm	500 kHz ≤ f < 1 MHz
	OIP3[2]	+31	+38		dBm	f > 1 MHz
1 dB compression	P_{1dB}	+14	+17		dBm	f < 1 MHz
	P_{1dB}	+16	+19		dBm	f ≥ 1 MHz
noise figure	NF		7	9	dB	
maximum DC voltage	P_{RF_DC}			24	V	CW, no damage
maximum input power	P_{RF_IN}			+25	dBm	CW, no damage
RF connectors	X_{RF}		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
voltage supply range	U_{AC}	90	230	260	V	50 / 60 Hz AC
power consumption	P_{AC}		35		W	
power socket	X_{AC}		IEC-60320 C14			country specific mains cable
Dimensions and weight						
dimensions	W x H x D		approx. 482 x 133 x 390		mm	19" 3 U, without connectors and handles
weight	m		16		kg	
Environment conditions						
operating temp. range	T_o	+5		+45	°C	
storage temp. range	T_s	-40		+70	°C	
Remote interfaces						
remote ports	LAN		10/100BaseT	TCP/IP		RJ45
	USB		2.0 (high speed)			USB type B
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		RSWM-4X8SR	P/N: 1205.4312.1			

Front View

S-Parameters with band pass filter

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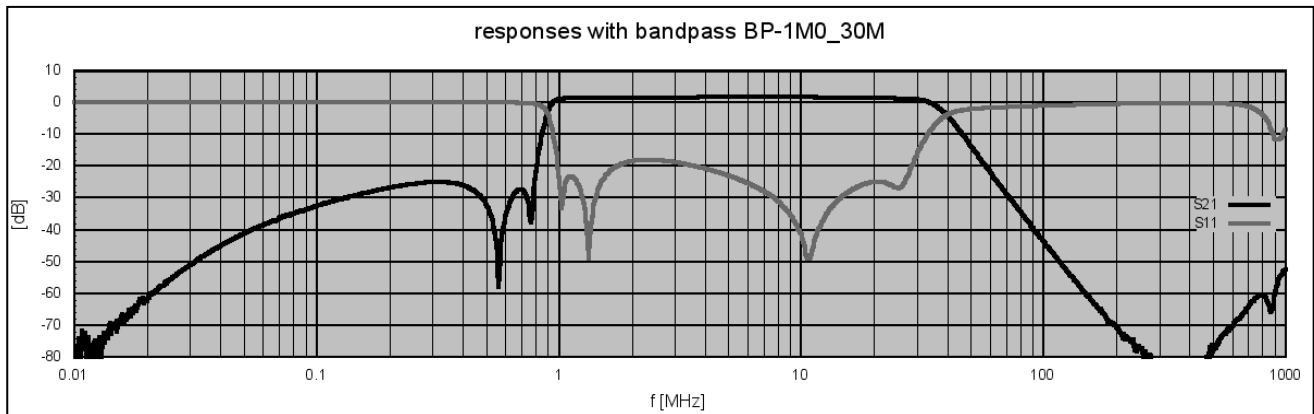
Transmission and input return loss with 1 … 30 MHz band pass filter BP-1M0_30M installed in RF input.

Appearance of external mountable filter

Band Pass Filters with different high pass corner frequencies are available. See table related products.

Related Products (Band Pass Filters for external mounting)

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 Products (Switching Matrices)

Product	P/N	Description
RSWM-4X4R	1205.4102.x	Wideband Non-Blocking 4X4 Switching Matrix 2 variants: 100 kHz … 4000 MHz and 20 MHz … 4000 MHz, LAN remote interface with SNMPv2 trap function.
RSWM-4X8R	2103.4302.1	Wideband Non-Blocking 4X8 Switching Matrix 20 MHz … 4000 MHz, LAN remote interface with SNMPv2 trap function.
RSWM-8X8R	2103.4502.1	Wideband Non-Blocking 8X8 Switching Matrix 20 MHz … 4000 MHz, LAN remote interface with SNMPv2 trap function.
RSWM-4X4ER	1205.4202.1	Extremely Wideband Non-Blocking 4X4 Switching Matrix 20 … 8000 MHz, LAN remote interface with SNMPv2 trap function.
RSWM-4X8ER	2103.4402.1	Extremely Wideband Non-Blocking 4X8 Switching Matrix 20 … 8000 MHz, LAN remote interface with SNMPv2 trap function.
RSWM-8X8ER	2103.4602.1	Extremely Wideband Non-Blocking 8X8 Switching Matrix 20 … 8000 MHz, LAN remote interface with SNMPv2 trap function.
BSWM-4X4ER	1205.4502.1	4X4 Bidirectional Blocking Wideband Switching Matrix 100 kHz … 8000 MHz, LAN remote interface with SNMPv2 trap function.
BSWM-4X8ER	2103.4702.1	4X8 Bidirectional Blocking Wideband Switching Matrix 100 kHz … 8000 MHz, LAN remote interface with SNMPv2 trap function.
BSWM-8X8ER	2103.4802.1	8X8 Bidirectional Blocking Wideband Switching Matrix 100 kHz … 8000 MHz, LAN remote interface with SNMPv2 trap function.