

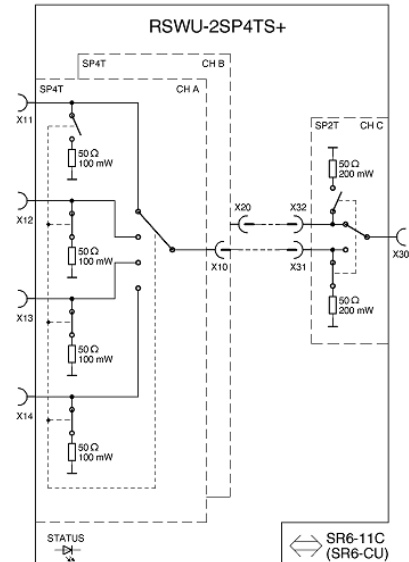
2 Channel SP4T plus 1 CH SP2T Switches, Non-reflective, 100 kHz ... 8500 MHz

## Features

- useable in SP8T configuration
- extremely wideband
- high-speed switching
- wear-free
- non-reflective
- up to 11 switching modules (22 channels) in one system rack

## Applications

- receiving systems
- RF switching matrices
- quality assurance
- final testing & verification
- R&D



## Scope

RSWU-2SP4TS+ is a two channel RF SP4T switch suitable for the frequency range 100 kHz ... 8500 MHz. It also provides an additional SP2T switch that enables versatile use as one SP8T switch. It can also be used as an auxiliary S2DT switch. All switches are non-reflective types and can easily be combined with other components in 50 Ohm technology.

RSWU-2SP4TS+ is designed as a slide-in module for integration into the SR6-11C system platform. It can be controlled either via the SR6-11C low-level 'Binary Interface' or the additional controller unit SR6-CU.

Additional to the SR6-CU module, up to ten RSWU switching modules can be integrated in one SR6-11C system rack. When using the 'Binary Interface', all 11 slots are available for switching modules.

## Remote Interfaces

The optional controller SR6-CU provides the interfaces LAN and USB. These interfaces can be used to control the RSWU modules by SCPI oriented ASCII commands.

## RF Switching Matrices

In combination with the wideband signal distribution units of the WSDU series and wideband signal combiner unit WSCU8X1R, RF cross point matrices can be realized. WSDU units are available as slide-in modules for SR6-11C, too.

## Time-critical Switching

In applications, where shortest response times are required, the switch modules can be controlled via the low-level 'Binary Interface' of the SR6-11C system rack.

This interface allows direct programming of the binary data registers inside the RSWU modules.

## Synchronous Switching

SR6-11C enables the synchronous execution of multiple commands across the whole system rack. Additionally SR6-11C provides a 'Trigger IO' interface, which allows the synchronous coupling of multiple SR6-11C system racks and other compatible devices.

## Specifications SP4T (general)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{in} / Z_{out}$		50		$\Omega$	
low frequency	$f_{min}$			100	kHz	
high frequency	$f_{max}$	8500			MHz	
output & off isolation	$S_{nm}$		-50	-36	dB	$f \leq 3000$ MHz
			-35	-27	dB	$3000 \text{ MHz} < f \leq 6000$ MHz
			-30	-20	dB	$f > 6000$ MHz
channel isolation	$S_{iso}$		-100	-90	dB	$f \leq 3000$ MHz
			-100	-85	dB	$3000 \text{ MHz} < f \leq 6000$ MHz
			-95	-80	dB	$f > 6000$ MHz
transfer power (CW, hot switch)	$P_{in \text{ hot}}$			+20	dBm	$f \geq 6$ MHz
				0	dBm	$f < 6$ MHz
RF connectors			SMA female			
switch delay	$t_{50-50}$		4		$\mu\text{s}$	50 % trigger to 50 % RF
switch on time	$t_{10-90}$		4		$\mu\text{s}$	10 % RF to 90 % RF
switch off time	$t_{90-10}$		2		$\mu\text{s}$	90 % RF to 10 % RF
maximum DC Voltage	$U_{max}$			20	V	on any RF Port
typical DC resistance	$R_{DC}$		4700		$\Omega$	on any RF Port

## Specifications SP4T (switch closed)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
insertion loss	$S_{21}, S_{12}$	-2.1	-1.4		dB	$f \leq 3000$ MHz
		-3.0	-2.1		dB	$3000 \text{ MHz} < f \leq 6000$ MHz
		-4.3	-3.3		dB	$f > 6000$ MHz
return loss	$S_{11}, S_{22}$		-11	-7	dB	$f < 1$ MHz
			-17	-10	dB	$1 \text{ MHz} \leq f \leq 5000$ MHz
			-13	-8	dB	$5000 \text{ MHz} < f \leq 7500$ MHz
			-9	-6.5	dB	$7500 \text{ MHz} < f \leq 8500$ MHz
transfer power (CW, switch closed)	$P_{in \text{ CW}}$			+30	dBm	$f \geq 6$ MHz
				0	dBm	$f < 6$ MHz
input IP3	IIP3		56		dBm	@ 8000 MHz
input IP2	IIP2		95		dBm	@ 8000 MHz

## Specifications SP4T (switch open)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
output return loss	$S_{22}$		-15	-7	dB	$f \leq 1$ MHz
			-20	-13	dB	$1 \text{ MHz} \leq f \leq 4500$ MHz
			-13	-9	dB	$4500 \text{ MHz} < f \leq 7500$ MHz
			-12	-6.5	dB	$f > 7500$ MHz
terminated power	$P_{term}$			+20	dBm	$f \geq 6$ MHz
				0	dBm	$f < 6$ MHz



**Specifications SP2T (general)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
impedance	$Z_{in} / Z_{out}$		50		$\Omega$	
low frequency	$f_{min}$			100	kHz	
high frequency	$f_{max}$	8500			MHz	
output & off isolation	$S_{nm}$		-55	-45	dB	$f \leq 3000$ MHz
			-45	-40	dB	$3000 \text{ MHz} < f \leq 6000$ MHz
			-40	-30	dB	$F > 6000$ MHz
channel isolation	$S_{ISO}$		-100	-90	dB	$100 \text{ kHz} \leq f \leq 6000$ MHz
			-95	-80	dB	$6000 \text{ MHz} < f \leq 8500$ MHz
transfer power (CW, hot switch)	$P_{in \text{ hot}}$			+20	dBm	$f \geq 6$ MHz
				0	dBm	$f < 6$ MHz
RF connectors		SMA female				
switch delay	$t_{50-50}$		4.5		$\mu\text{s}$	50 % trigger to 50 % RF
switch on time	$t_{10-90}$		4		$\mu\text{s}$	10 % RF to 90 % RF
switch off time	$t_{90-10}$		5		$\mu\text{s}$	90 % RF to 10 % RF
maximum DC Voltage	$U_{max}$			20	V	on any RF Port
typical DC resistance	$R_{DC}$		4700		$\Omega$	on any RF Port

**Specifications SP2T (switch closed)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
insertion loss	$S_{21}, S_{12}$	-1.9	-1		dB	$f \leq 3000$ MHz
		-2.2	-1.5		dB	$3000 \text{ MHz} < f \leq 6000$ MHz
		-3.3	-2.0		dB	$f > 6000$ MHz
input return loss	$S_{11}$		-20	-8	dB	
output return loss	$S_{22}$		-10	-9	dB	$f < 1$ MHz
			-15	-10	dB	$1 \text{ MHz} \leq f \leq 5000$ MHz
			-13	-8	dB	$f > 5000$ MHz
transfer power (CW, switch closed)	$P_{in \text{ CW}}$			+34	dBm	$f \geq 6$ MHz
				+13	dBm	$f < 6$ MHz
input IP3	IIP3		+60		dBm	@ 834 / 1950 / 2700 MHz
input IP2	IIP2		+110		dBm	@ 834 / 1950 MHz

**Specifications SP2T (switch open)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
output return loss	$S_{22}$		-17	-9	dB	
terminated power	$P_{term}$			+23	dBm	$f \geq 6$ MHz
				+13	dBm	$f < 6$ MHz



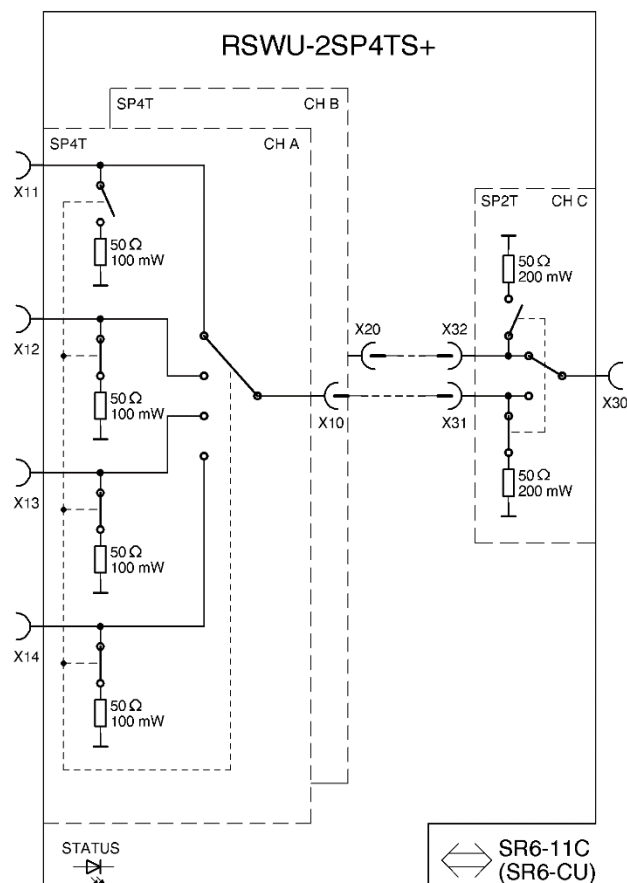
## Typical Specifications “virtual SP8T”

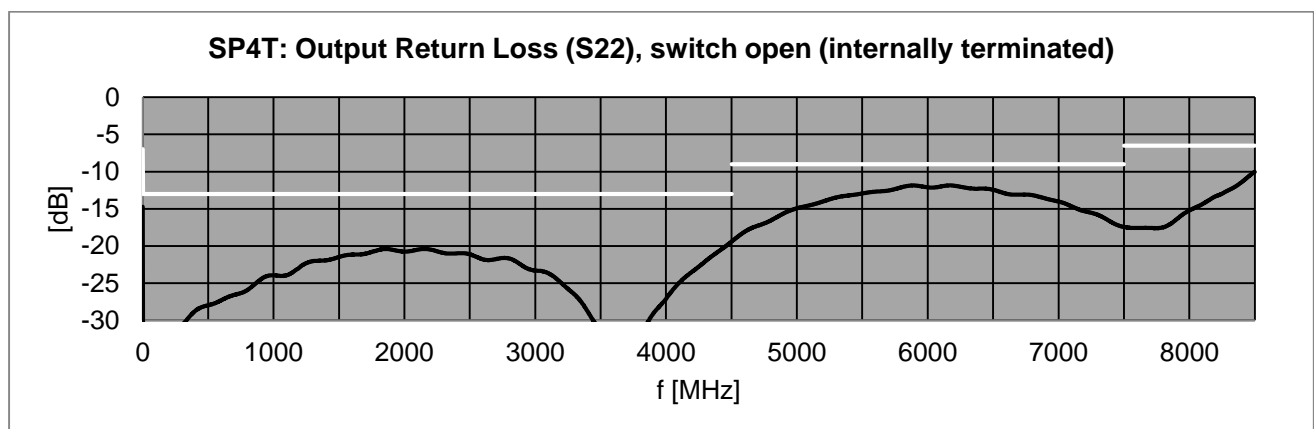
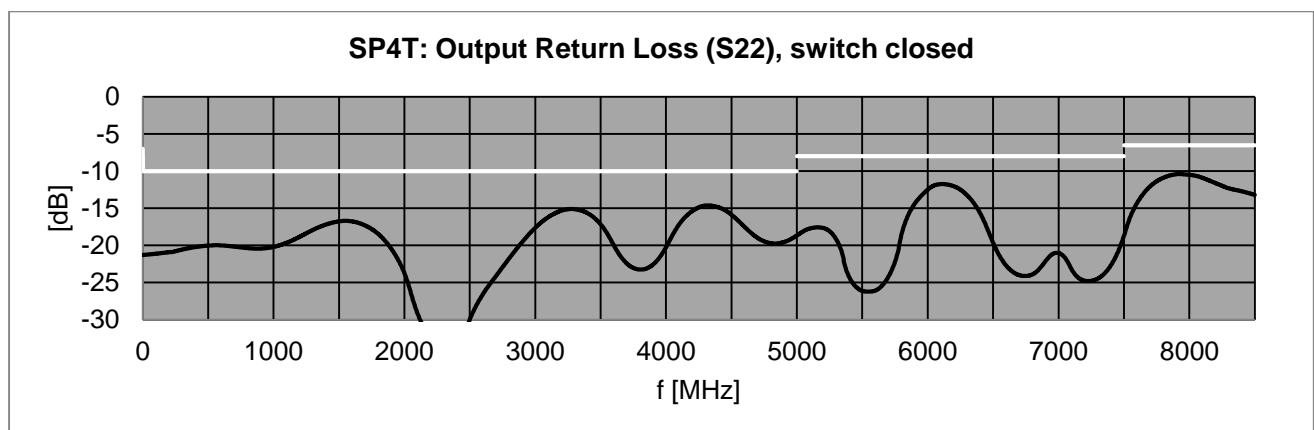
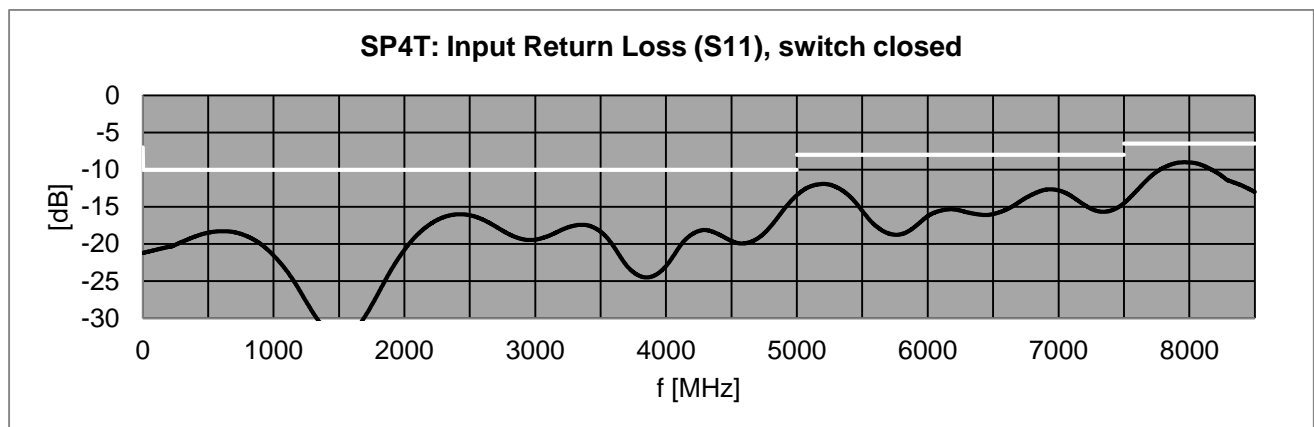
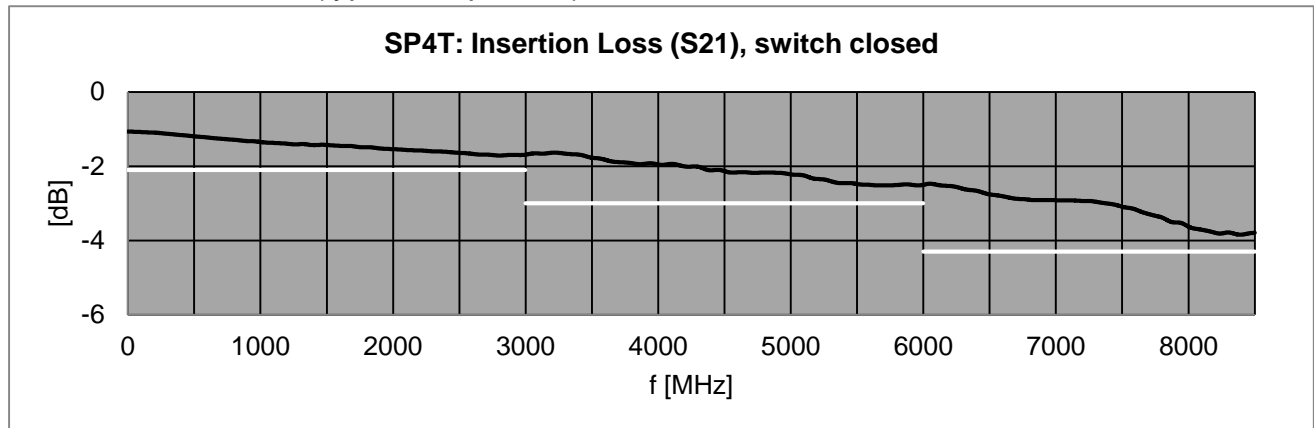
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
insertion loss	$S_{21}, S_{12}$		-2.5		dB	$f \leq 3000$ MHz
			-4		dB	$3000 \text{ MHz} < f \leq 6000$ MHz
			-5.5		dB	$f \geq 6000$ MHz
input return loss	$S_{11}$		-20		dB	$f \leq 1$ MHz
			-12		dB	$1 \text{ MHz} < f \leq 7500$ MHz
			-10		dB	$f \geq 7500$ MHz
output return loss	$S_{22}$		-10		dB	$f \leq 1$ MHz
			-15		dB	$1 \text{ MHz} < f \leq 5000$ MHz
			-13		dB	$f \geq 5000$ MHz

## Common Specifications

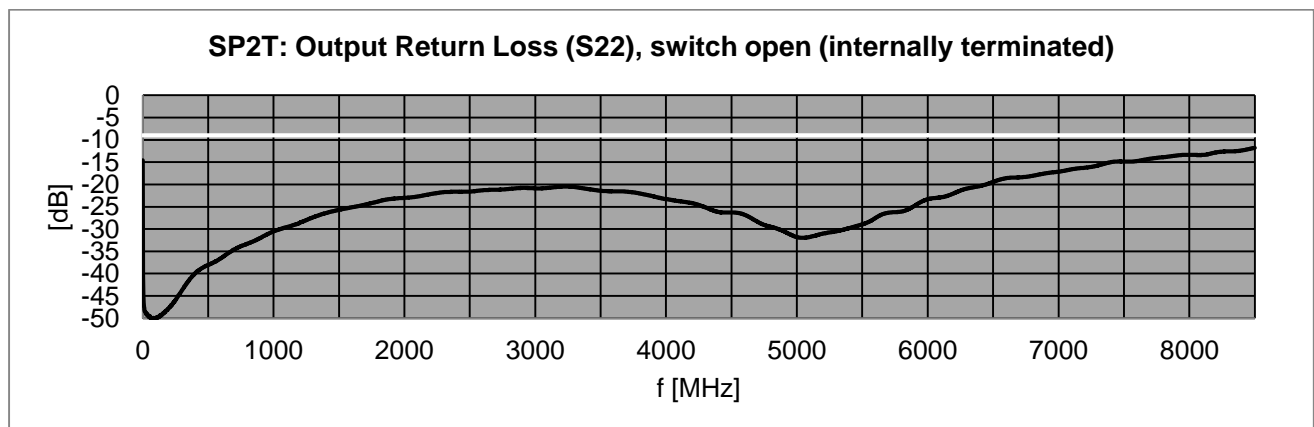
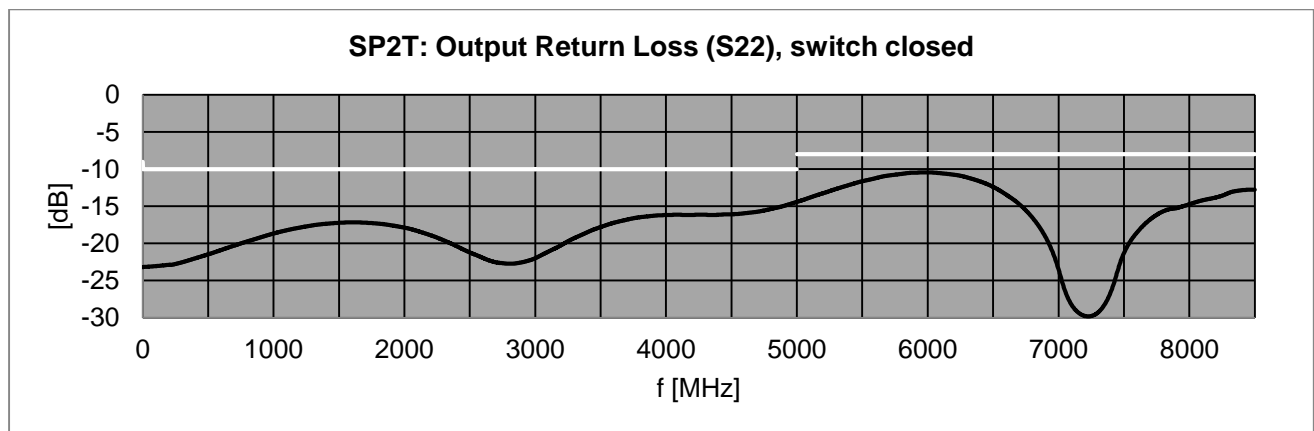
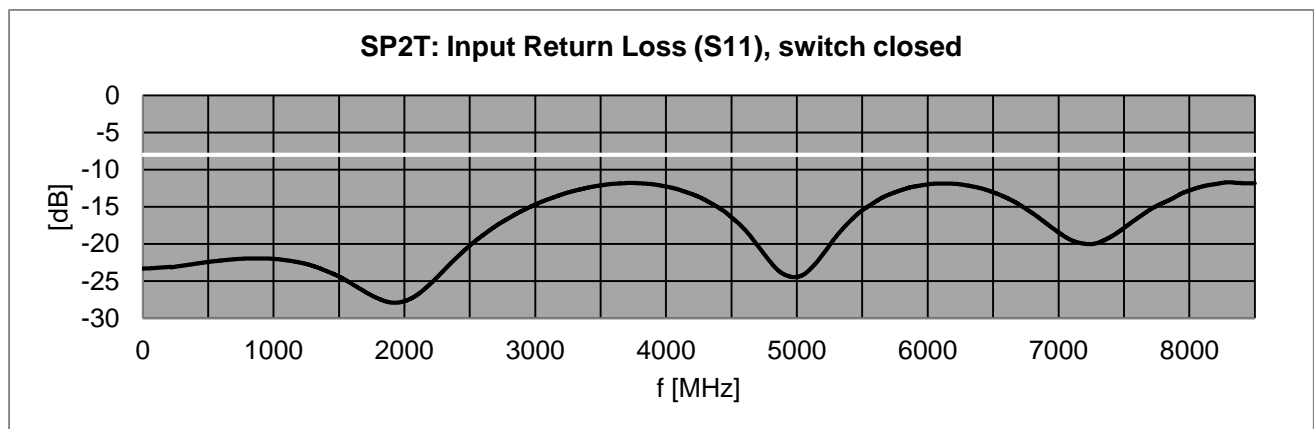
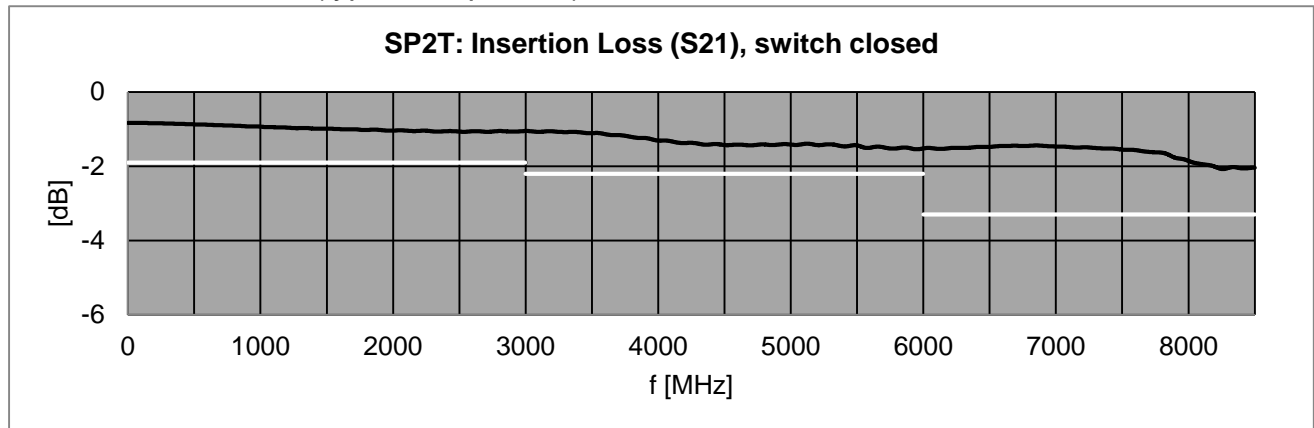
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
power supply	U	23.5	24.0	24.5	V	via SR6-11C
power consumption	P		1		W	
dimensions (L x W x H)		approx. 197 x 30 x 262			mm	6 U, 6 HP
weight	m		1250		g	
operating temp. range	$T_o$	+5		+60	°C	
storage temp. range	$T_s$	-40		+70	°C	
ordering information		RSWU-2SP4TS+		1408.4040.1		

## Block Diagram

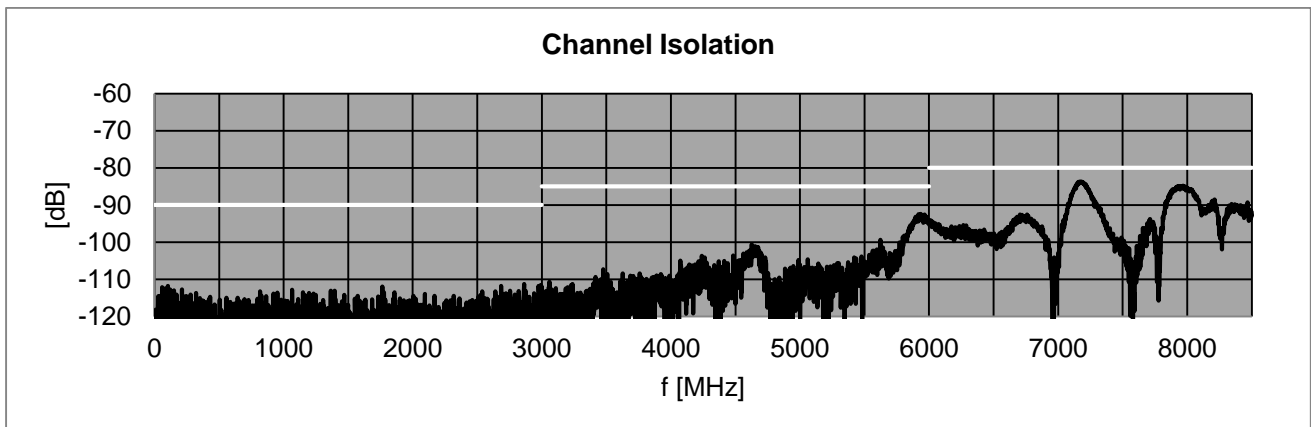
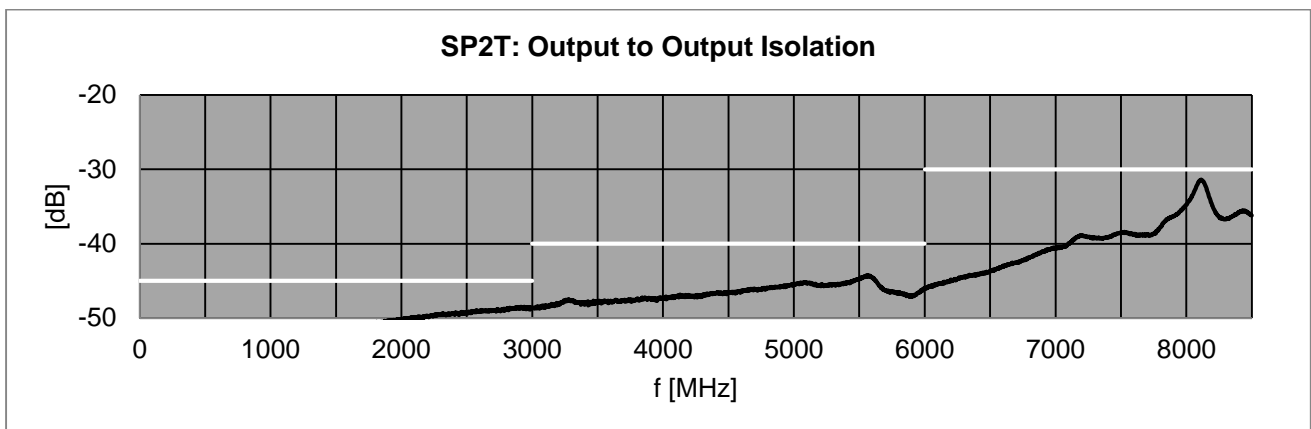
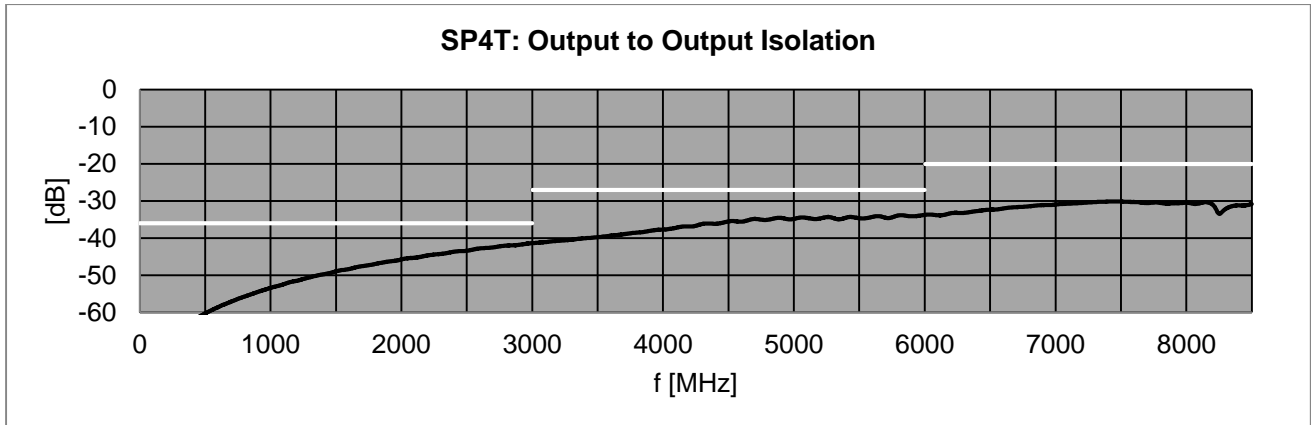


**S-Parameters SP4T (typical responses)**

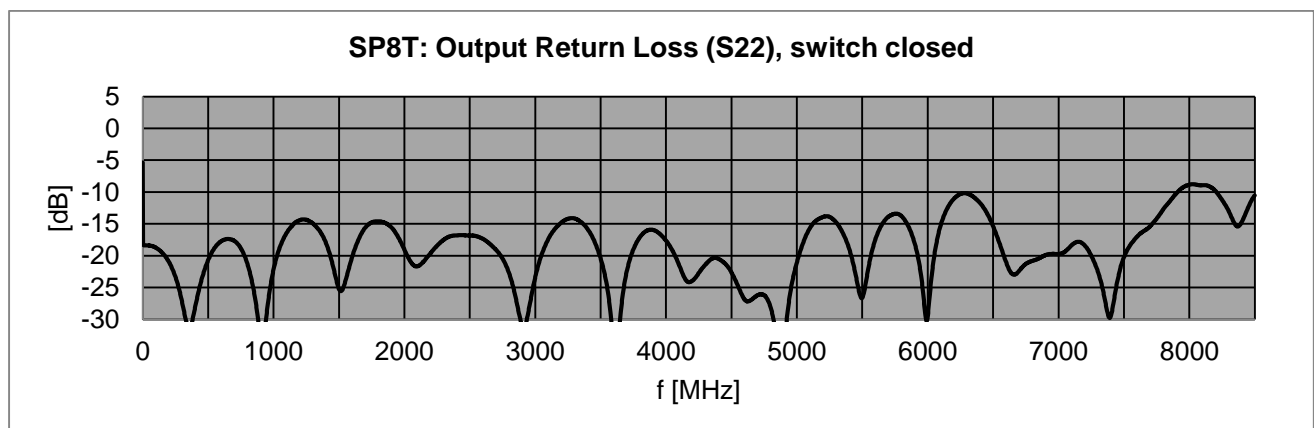
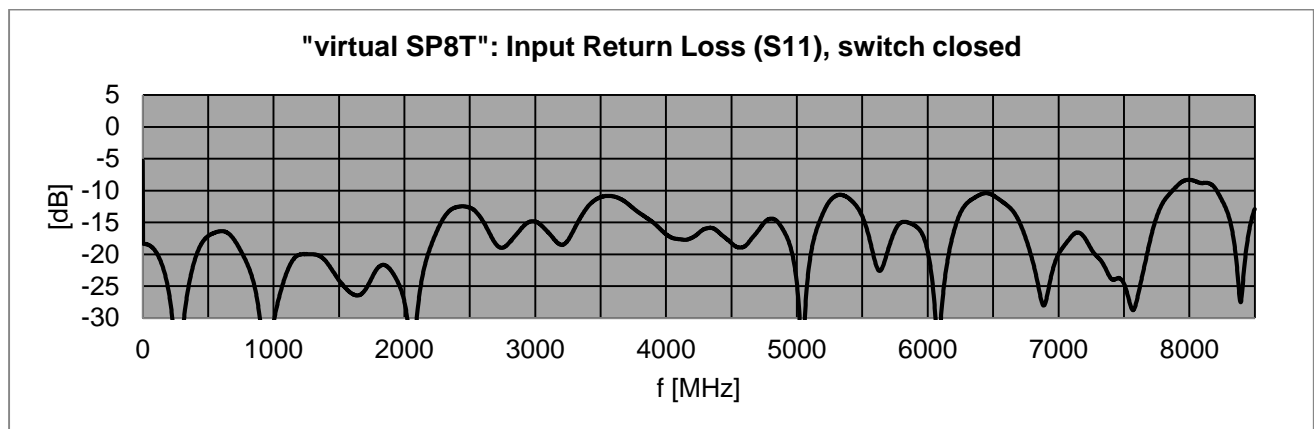
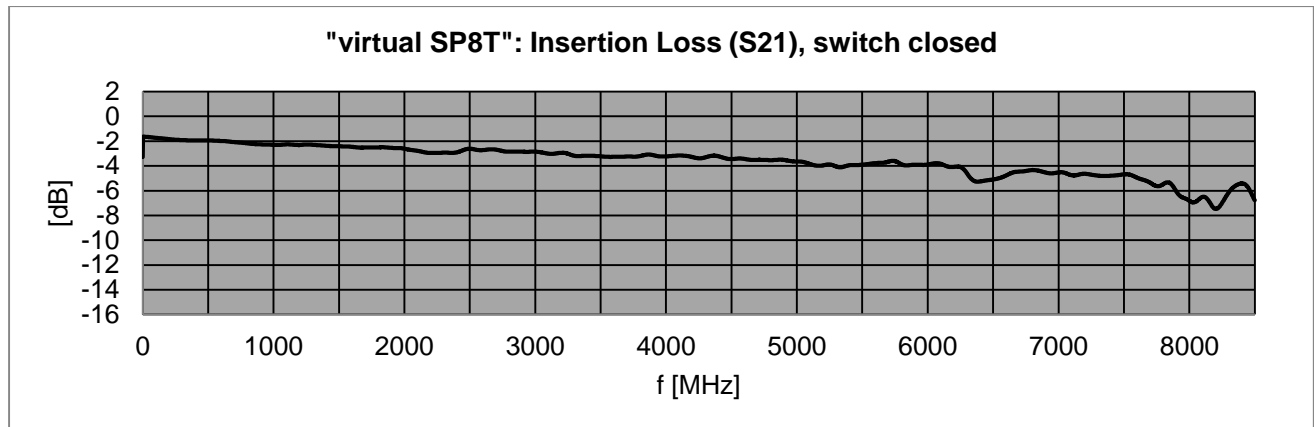
## S-Parameters SP2T (typical responses)



## S-Parameters Isolation (typical responses)

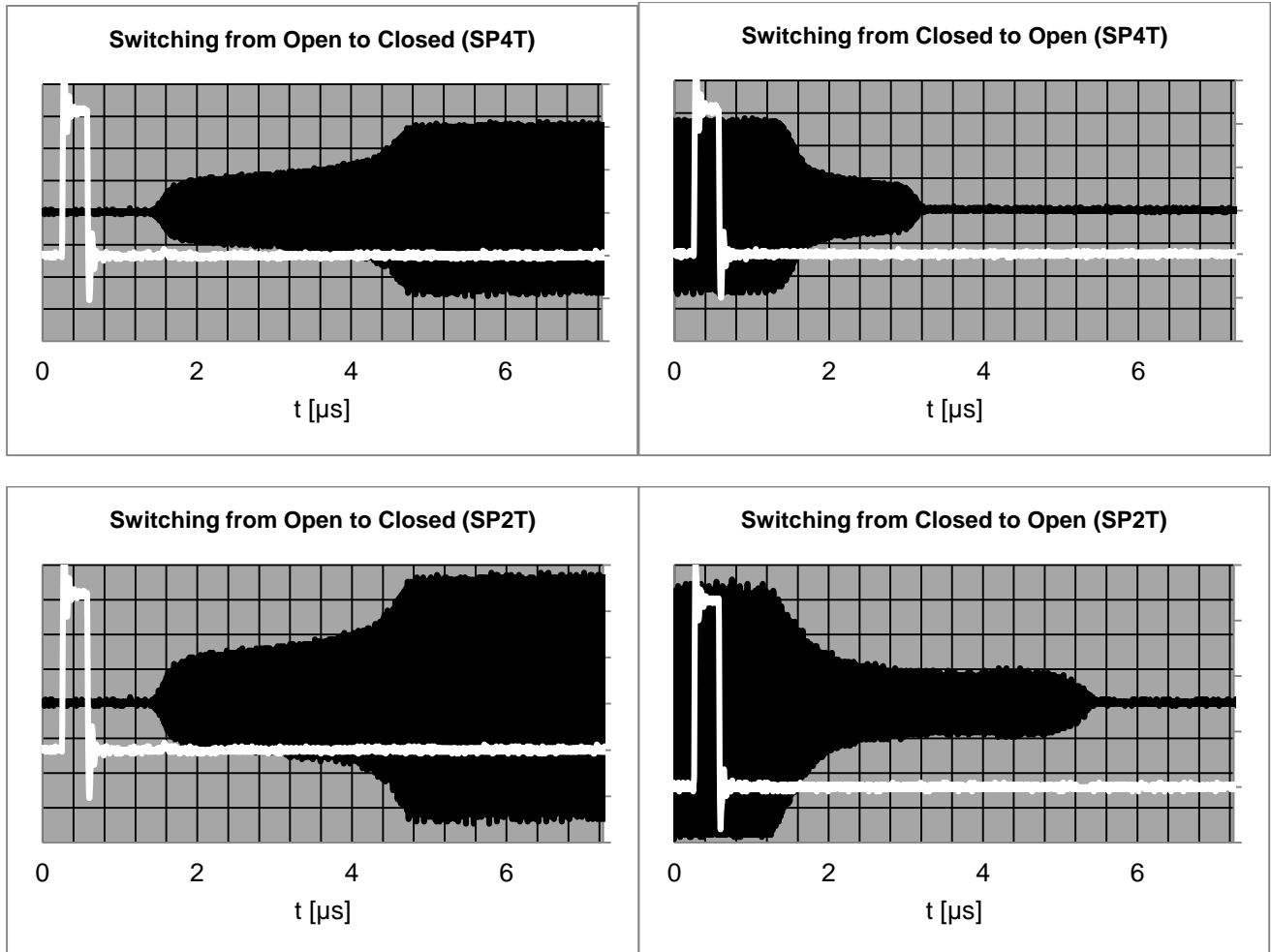


## S-Parameters „virtual SP8T“ (typical responses)





## Switching Characteristics (typical responses)



## Front View



## Rear View



## Related Products

Product	Description	P/N
SR6-11C	System Platform with 11 Slots	1409.1202.1
SR6-CU	Controller Unit with LAN and USB	1409.3000.1
WSDU1X8	8 Way Multicoupler 100 kHz ... 4000 MHz	1202.6100.1
WSDU-2X4E+	2 Channel 1X4 plus 1 Channel 1X2 Multicoupler Module 20 ... 8000 MHz	1501.6200.1
WSCU8X1R	High Dynamic 8 Way Combiner 100 kHz ... 4000 MHz, 50 $\Omega$	1208.6102.1
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

