SSM5000A Series

Switch Matrix

DataSheet

EN02A

SIGLENT TECHNOLOGIES CO.,LTD

Contents

1   General Description

SSM5000A series switch matrix, can expand the number of test ports of network analyzer, signal source, spectrum analyzer and other equipment. The series names are like SSM5*XYZ*A, The *X* represents different operating frequency, *Y* represents the number of combiner ports, *Z* represents the number (divided by 6) of division ports. When *X* is 1, the operating frequency range covers 9 kHz-9 GHz, when it is 3, covers 100 kHz-26.5 GHz. And the series are with up to 4 input ports and up to 24 output ports, supporting USB, LAN, Direct Control communication modes. The Direct Control interface on the switch matrix can further expand the number of test ports and support a simplified multi-port calibration algorithm, which can greatly improve the efficiency of calibration. In addition to SIGLENT instruments, it also supports other brand instruments. It is suitable for 19-inch standard chassis and can be widely used in multi-port test environments such as antennas and 5G component modules.

2   Features

- Characteristic impedance: 50 Ω
- Highest frequency: 9 GHz (or 26.5GHz)
- Maximum number of input ports: 4
- Maximum number of output ports: 24
- RF connector: 3.5 mm female
- Maximum input power: 20 dBm
- Maximum input DC voltage: 35 V
- Interface: LAN, USB Device, Direct Control (in), Direct Control (out)
- Screen size: 2.4-inch

3 Block Diagrams

Different model can be obtained by different sub-module combination. For example, the SSM5144A switch matrix consists of 8 switch sub-modules, including four 1-4 switches and four 2-6 switches.
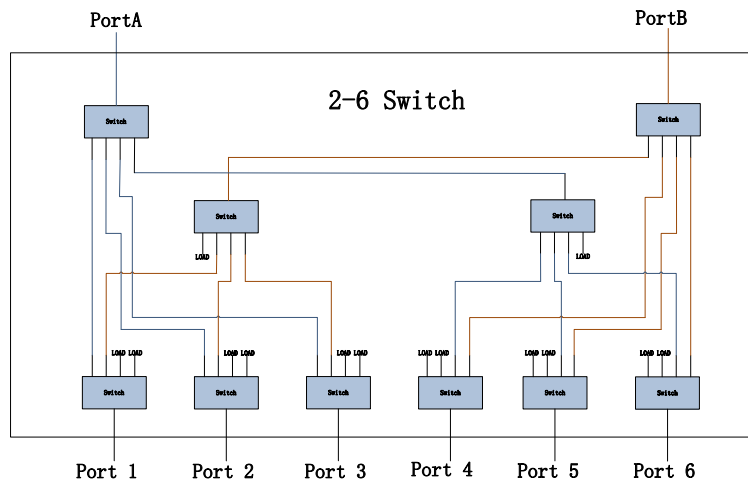
SSM5321A (2 Ports input, 6 Ports Output)
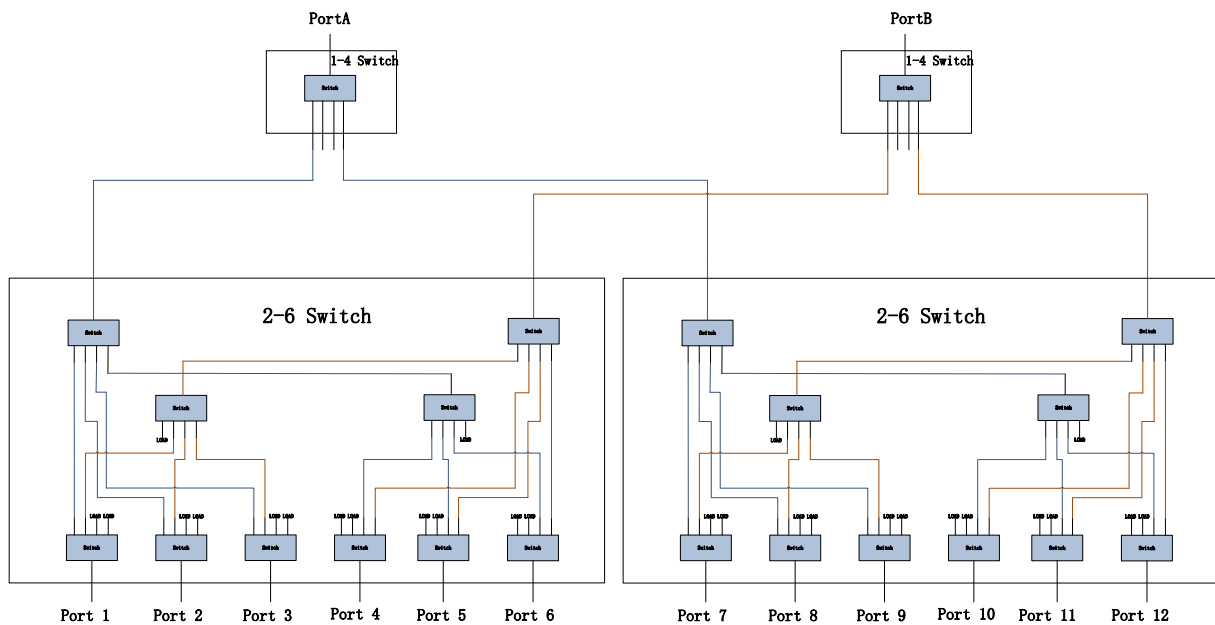
SSM5122A (2 Ports input, 12 Ports Output)

SSM5124A (2 Ports input, 24 Ports Output)

SSM5142A、SMM5342A(4 Ports input, 12 Ports Output)
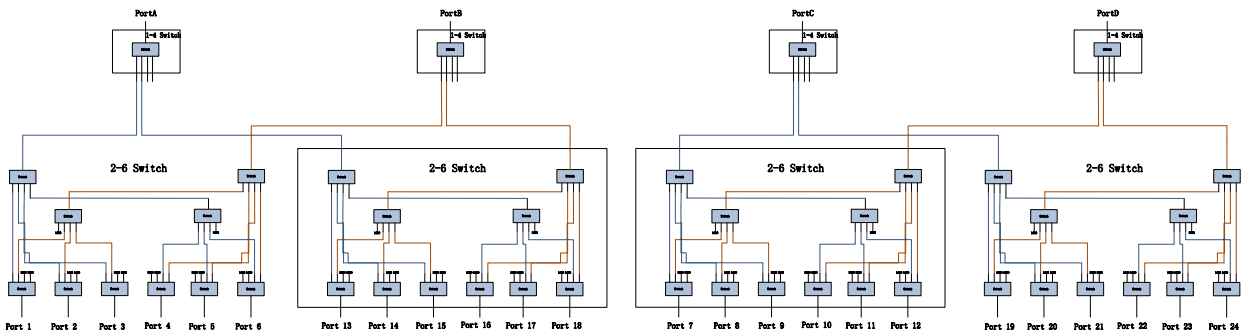
SSM5144A (4 Ports input, 24 Ports Output)

4 Application Scenarios

Application scenario 1:

The switch matrix is used to expand the test ports of network analyzer and measure S parameters of multiple devices, according to the specific test requirements, the matrix switch can be extended into 24 single ports, 12 full 2 ports, 8 full 3 ports, 6 full 4 ports, 4 full 6 ports, 3 full 8 ports, 2 full 12 ports, 1 full 24 ports, etc. The figure below shows scaling to 4 full 6 ports. In this case, you only need to perform full 6-Port calibration on four group of ports 1-6, 7-12, 13-18 and 19-24. DUT1, DUT2, DUT3 and DUT4 devices can be tested by software, greatly improving the test efficiency.
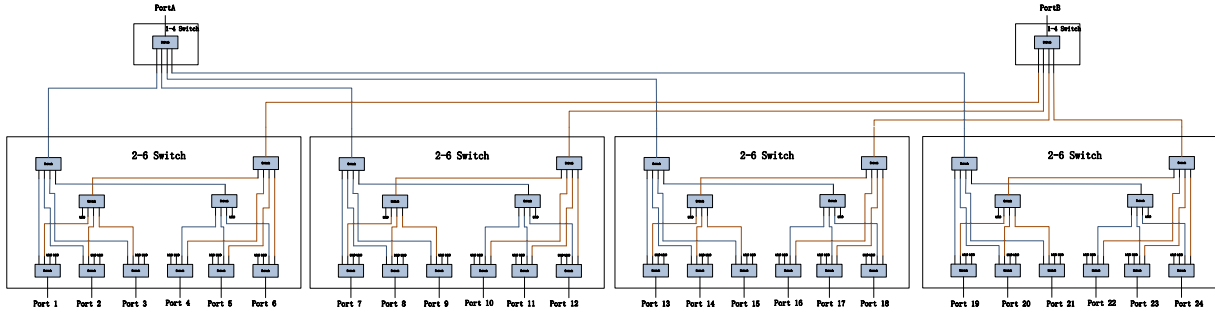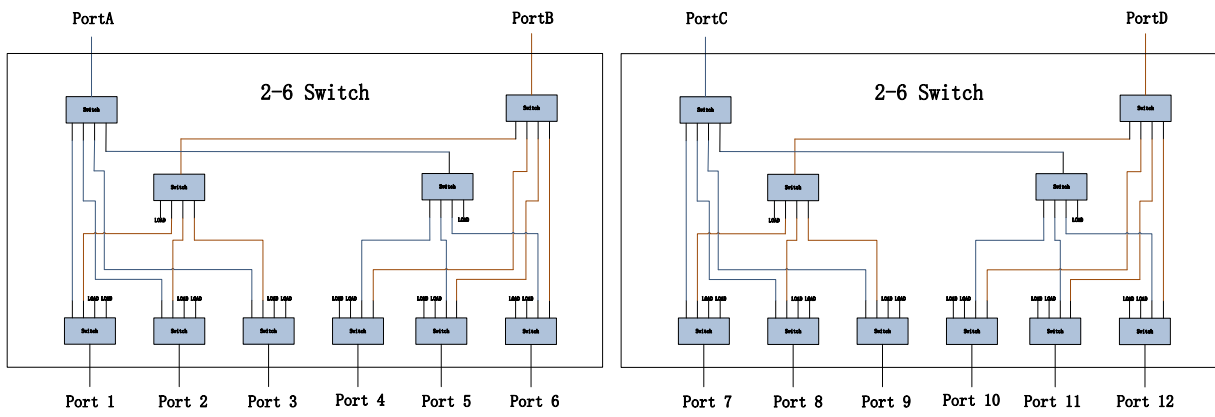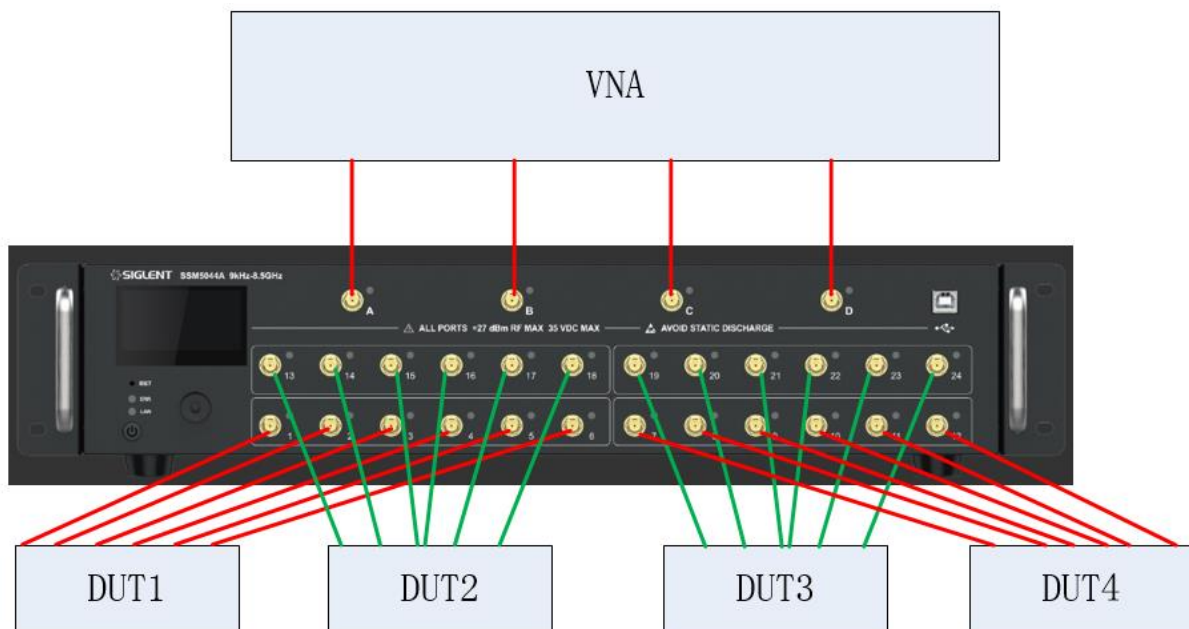

Application scenario 2:

Using a switch matrix with a signal source and spectrum analyzer, the signal source and spectrum analyzer are extended to 24 ports, which can be used to test the transmission and receiving parameters of multiple DUTs. In this case, S parameter calibration is not required, only the line loss of each channel needs to be calibrated. When testing the transmission performance, the software switches to 24 ports in turn, then the expansion of the signal source is completed; when testing the receiving performance, the software can also switch to 24 ports in turn to complete the expansion of the spectrum analyzer. The matrix switch can greatly reduce the number of signal source and spectrum analyzer, therefore save cost and improve test efficiency.
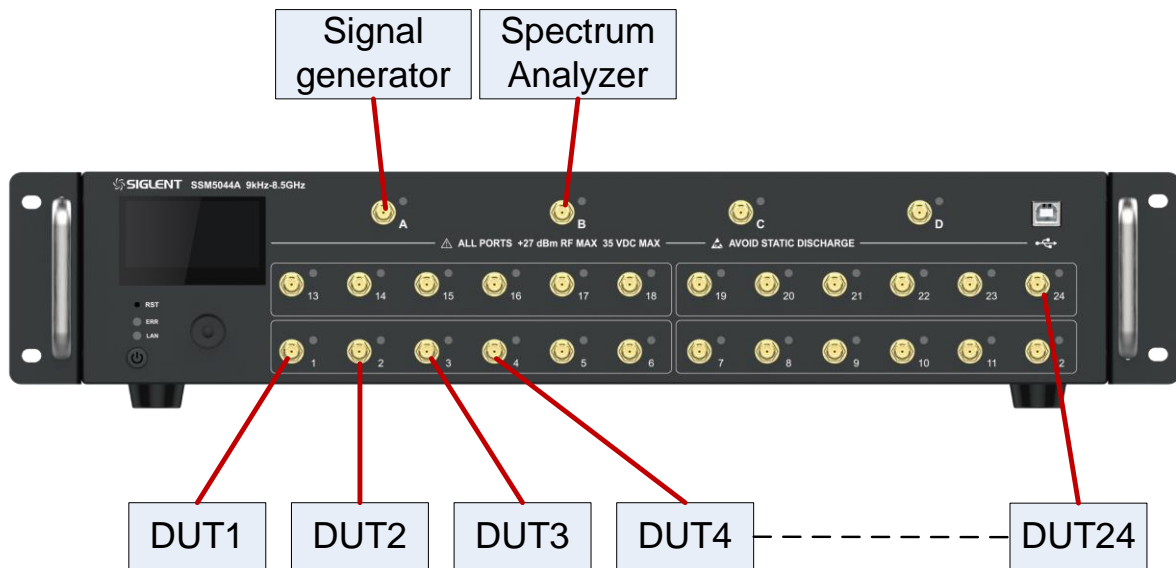
5   Definitions

Specifications: All products are guaranteed to meet published specifications at room temperature (approximately 25℃), unless otherwise noted.

Typical: Performance deemed typical implies that 80 percent of the measurement results will meet the typical published performance with a 95th percentile confidence level at room temperature (approximately 25℃). Typical performance is not warranted and does not include measurement uncertainty.

Nominal: This value indicates the expected mean or average performance, or an attribute whose performance is by design, such as the 50 Ohm connector. The typical published performance with a 95th percentile confidence level at room temperature (approximately 25℃). Typical performance is not warranted and does not include measurement uncertainty.

6   Specifications

SSM51**YZ**A Series:

Specification	notes		9kHz-10MHz	10MHz-2GHz	2GHz-3.5GHz	3.5GHz-5GHz	5GHz-9GHz
Insertion loss (dB): (any input port and any selected output port)	SMM5122A, SMM5124A, SMM5142A, SMM5144A						
	Port A to port 1 to 3, 7 to 9, 13 to 15, 19 to 21;		< 3.6	< 4.7	< 5.5	< 6.7	< 9.2
	Port B to port 4 to 6, 10 to 12, 16 to 18, 22 to 24;						
	Port C to port 7 to 9, 13 to 15 , 19 to 21;						
	Port D to port 10 to 12, 16 to 18, 22 to 24;						
	Port A to port 4 to 6, 10 to 12, 16 to 18, 22 to 24;		< 3.6	< 6	< 8	< 9.1	< 13.5
	Port B to port 1 to 3, 7 to 9, 13 to 15, 19 to 21;						
	Port C to port 10 to 12, 16 to 18, 22 to 24;						
	Port D to port 7 to 9, 13 to 15 , 19 to 21;						
Isolation (dB): (any input port and any unselected output port)			< -75	< -95	< -90	< -80	< -65
Load matching (Return Loss): (any selected test port)			< -6.3, -15 (typ.)	< -9, -18 (typ.)	< -9, -18 (typ.)	< -9, -20 (typ.)	< -8, -18 (typ.)
Load matching (Return Loss): (any unselected test port)			< -12, -19 (typ.)	< -9, -19 (typ.)	< -9, -19 (typ.)	< -10, -21 (typ.)	< -10, -18 (typ.)

SSM53**YZ**A Series:

Specification	notes	100kHz-10MHz	10MHz-5GHz	5GHz-10GHz	10GHz-15GHz	15GHz-20GHz	20GHz-26.5GHz
Insertion loss (dB): (any input port and any selected output port)	SMM5321A, SMM5342A						
	Port A to port 1 to 3;	< 2.5	< 4.8	< 7.5	< 9	< 11.5	< 19
	Port B to port 4 to 6;						
	Port C to port 7 to 9;						
	Port D to port 10 to 12;						
	Port A to port 4 to 6;	< 3.8	< 7.3	< 11	< 13	< 15.6	< 23
	Port B to port 1 to 3;						
	Port C to port 10 to 12;						
	Port D to port 7 to 9;						
Isolation (dB): (any input port and any unselected output port)		< -70	< -85	< -80	< -75	< -70	< -70
Load matching (Return Loss): (any selected test port)		< -8, -13 (typ.)	< -13, -17 (typ.)	< -13, -17 (typ.)	< -12, -17(typ.)	< -14, -20(typ.)	< -8, -16(typ.)
Load matching (Return Loss): (any unselected test port)		< -13, -15 (typ.)	< -15, -17 (typ.)	< -13, -15 (typ.)	< -14, -16 (typ.)	< -15, -20 (typ.)	< -11, -13 (typ.)

7 Remote Control

USB	Universal Serial Bus (USB Host*1, USB Device*2)
LAN	Local Area Network (10M/100M, RJ-45)
Direct Control	Direct Control (In, Out)

8 Switch Time

USB	10 us
LAN	10 us
Direct Control	10 us

9 General Information

Description	Characteristics
Operating Temperature range	18 to 28℃
Permissible temperature range	0 to 50℃
Storage temperature	-40℃ to 60℃
Humidity	85%: 40℃, 24 hours
Altitude	0 to 3000m
Size	W×H×D =88.5mm×425mm×417.6mm
Weight	5.3 kg--6.65 kg(Vary from models)
EMC	
Conducted disturbance: CISPR 11/EN 55011	CLASS A group 1, 150 kHz-30 MHz
Radiated disturbance: CISPR 11/EN 55011	CLASS A group 1, 30 MHz-1 GHz
Electrostatic discharge (ESD): IEC 61000-4-2/ EN61000-4-2	4.0 kV(contact), 8.0 kV(air)
Radio-frequency electromagnetic field Immunity: IEC 61000-4-3/EN 61000-4-3	10 V/m (80 MHz to 1 GHz); 3 V/m (1.4 GHz to 2 GHz); 1 V/m (2.0 GHz to 2.7GHz)
Electrical fast transients (EFT): IEC 61000-4-4/EN 61000-4-4	2 kV (AC power ports)
Surges: IEC 61000-4-5/EN 61000-4-5	1 kV (Line to line) 2 kV (Line to ground)
Radio-frequency continuous conducted Immunity: IEC 61000-4-6/EN 61000-4-6	3 V, 0.15-80 MHz
Voltage dips and interruptions: IEC 61000-4-11/EN 61000-4-11	Voltage dips: 0% UT during 1 cycle; 40% UT during 10/12 cycles; 70% UT during 25/30 cycles Voltage interruptions: 0% UT during 250 cycles
Safety UL 61010-1:2012/R: 2018-11; CAN/CSA-C22.2 No. 61010-1:2012/A1:2018-11. UL 61010-2-030:2018; CAN/CSA-C22.2 No. 61010-2-030:2018.	

10   Ordering Information

Items	Description	Frequency range	Order number
Products	2 input ports, 12 output ports	9 kHz ~ 9 GHz	SSM5122A
	2 input ports, 24 output ports	9 kHz ~ 9 GHz	SSM5124A
	4 input ports, 12 output ports	9 kHz ~ 9 GHz	SSM5142A
	4 input ports, 24 output ports	9 kHz ~ 9 GHz	SSM5144A
	2 input ports, 6 output ports	100 kHz~26.5 GHz	SSM5321A
	4 input ports, 12 output ports	100 kHz~26.5 GHz	SSM5342A
Standard Accessories	One Quick-start, One Power-cable, One USB-cable, One certificate of qualification		

11　Contact Us

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SIGLENT®

About SIGLENT

SIGLENT is an international high-tech company, concentrating on R&D, sales, production and services of electronic test & measurement instruments.

SIGLENT first began developing digital oscilloscopes independently in 2002. After more than a decade of continuous development, SIGLENT has extended its product line to include digital oscilloscopes, isolated handheld oscilloscopes, function/arbitrary waveform generators, RF/MW signal generators, spectrum analyzers, vector network analyzers, digital multimeters, DC power supplies, electronic loads and other general purpose test instrumentation. Since its first oscilloscope was launched in 2005, SIGLENT has become the fastest growing manufacturer of digital oscilloscopes. We firmly believe that today SIGLENT is the best value in electronic test & measurement.

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