

Product Datasheet - Technical Specifications



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S-Parameter Test Module Product Manual



Product Overview

The 3601 Series S-Parameter Test Module, developed by Siyi Technology, is a frequency-extended product for vector network analyzers. It can be connected to the main VNA host to form a millimeter-wave S-parameter testing system. The host VNA controls the module's frequency switching and power settings via USB cables. This series of modules boasts high output power, wide programmable power range for output ports, precise power measurement accuracy, high spectral purity of output signals, and excellent amplitude-phase stability, significantly enhancing testing efficiency. Additionally, the compact design features a "sinking" output port configuration, making it adaptable for various testing scenarios including wafer-level testing fixtures.

Main Features

- The frequency range is 50GHz to 500GHz
- High port output power
- High frame stability
- The port output power is programmable and has a large control range
- High precision of programmed power
- High spectral purity
- The output waveguide port features a recessed design with centrifugal fans on both sides for radial cooling, ensuring minimal vibration and flexible adaptation for chip testing scenarios such as wafer clamping.
- Small size, small weight, low power consumption
- Compatible with network analyzer hosts from leading domestic and international manufacturers

Note 1: The programmable power output adjustment function requires the Syntech 3674 series vector network analyzer host. Other hosts do not support this feature.

Typical Application

The 3601 Series S-parameter Test Module, when paired with the 3674 Series Host, offers programmable adjustment of port output power across a wide range and high-precision power output capabilities. This enables efficient testing of millimeter-wave components such as chip amplifiers and mixers during power scanning scenarios. Its excellent test stability and port isolation performance meet the testing requirements for passive components like filters and couplers, ensuring low loss and high suppression. A single test can simultaneously obtain amplitude, phase, and group delay characteristics of the tested millimeter-wave network, fulfilling the demands for wide bandwidth, large dynamic range, and rapid real-time testing. This makes it an essential testing instrument for developing millimeter-wave communication equipment and related systems.

Technical Specifications

model qualification	3601NA	3601N	3601P	3601Q	3601R	3601SA	3601S	3601T
Frequency range (GHz)	50 ~ 75	60 ~ 90	75 ~ 110	110 ~ 170	140 ~ 220	170 ~ 260	220 ~ 330	330 ~ 500
Port output power (dBm)	10 (min) 15 (typ.)	10 (min) 15 (typ.)	10 (min) 12 (typ.)	10 (min) 14 (typ.)	-3 (min) 4 (typ.)	-3 (min) 2 (typ.)	-10 (min) -5 (typ.)	-15 (min) -13 (typ.)
Port power adjustment range (dB)	≥30dB	≥30dB	≥30dB	≥30dB	≥30dB	≥30dB	≥30dB	≥30dB
Port output power accuracy (dB)	±1.0dB @-5dBm	±1.0dB @-5dBm	±1.0dB @-5dBm	±1.0dB @-5dBm	±2.5dB @-20dBm	±2.5dB @-20dBm	±3.0dB @-20dBm	±3.0dB @-20dBm
System dynamic range (dB) (IFBW=10Hz)	100 (min) 120 (typ.)	100 (min) 120 (typ.)	100 (min) 120 (typ.)	100 (min) 120 (typ.)	105 (min) 115 (typ.)	105 (min) 115 (typ.)	105 (min) 115 (typ.)	90 (min) 100 (typ.)
skin tracking (dB) (IFBW=10Hz)	±0.10 (max) ±0.05 (typ.)	±0.10 (max) ±0.05 (typ.)	±0.10 (max) ±0.05 (typ.)	±0.10 (max) ±0.05 (typ.)	±0.25 (max) ±0.15 (typ.)	±0.25 (max) ±0.15 (typ.)	±0.30 (max) ±0.20 (typ.)	±0.40 (max) ±0.25 (typ.)
Track & Trace (dB) (IFBW=10Hz)	±0.10 (max) ±0.05 (typ.)	±0.10 (max) ±0.05 (typ.)	±0.10 (max) ±0.05 (typ.)	±0.10 (max) ±0.05 (typ.)	±0.25 (max) ±0.15 (typ.)	±0.25 (max) ±0.15 (typ.)	±0.30 (max) ±0.20 (typ.)	±0.40 (max) ±0.25 (typ.)
Effective Directionality (dB)	35 (min) 40 (typ.)	35 (min) 40 (typ.)	35 (min) 40 (typ.)	35 (min) 40 (typ.)	30 (min) 40 (typ.)	25 (min) 30 (typ.)	30 (min) 40 (typ.)	25 (min) 30 (typ.)
Effective load match (dB)	35 (min) 40 (typ.)	35 (min) 40 (typ.)	35 (min) 40 (typ.)	35 (min) 40 (typ.)	30 (min) 40 (typ.)	30 (min) 30 (typ.)	30 (min) 40 (typ.)	25 (min) 30 (typ.)
Port output harmonic and noise suppression 2 (dBc)	≥20 35 (typ.)	≥20 35 (typ.)	≥20 35 (typ.)	≥20 35 (typ.)	20(typ.)	20(typ.)	20(typ.)	20(typ.)
Amplitude stability (dB)	±0.10	±0.10	±0.10	±0.10	±0.25	±0.25	±0.30	±0.40
Phase stability (°)	±4	±4	±4	±6	±4	±4	±6	±6
Output connector type	WR15	WR12	WR10	WR6.5	WR5.1	WR4.3	WR3.4	WR2.2
Power Supply and Power Consumption	S-parameter test module dedicated adapter, ≤50W							
outline dimension (W×H×D, mm)	85×44.5×240 (excluding handles, feet, connectors, etc.) 88×57.5×240 (including handle, feet, connectors, etc.)							

Note 2: Under constant temperature and humidity conditions of 25°C, the instrument is preheated for 1 hour, and the test state remains unchanged. After 1 hour, the stability is maintained.

Note 3: The typical value test metrics were obtained through collaboration with Siyi Technology's 3674E Vector Network Analyzer.

● Standard configuration

	Name	Description
1	Power line	Standard 3-core power cord, 1
2	User's manual	One copy of the document or electronic version
3	Work certificate	One copy of factory certificate for each unit
4	Power adapter	One dedicated adapter per two S-parameter test modules
5	Aluminum Alloy Box	1 modular suitcase

● Option

	Option Number	Option name	function	remarks
1	3601-H01	New-generation S-parameter test module with spread spectrum cable	4-port host spread spectrum link cable	1 module per purchase. Must be selected for first purchase.
2	71124	adaptor	2.4mm (f) -3.5mm (m)	F/G/H/K/L are mandatory for four-port host spread spectrum. Each host requires four ports.
3	3674E	vector network analyzer	S-parameter test module spread spectrum host	S20+400 optional (spreading spectrum required) 4
4	3674F	vector network analyzer	S-parameter test module spread spectrum host	S20+400 optional (spreading spectrum required) 4
5	3674G	vector network analyzer	S-parameter test module spread spectrum host	S20+400 optional (spreading spectrum required) 4
6	3674H	vector network analyzer	S-parameter test module spread spectrum host	S20+400 optional (spreading spectrum required) 4
7	3674K	vector network analyzer	S-parameter test module spread spectrum host	S20+400 optional (spreading spectrum required) 4
8	3674L	vector network analyzer	S-parameter test module spread spectrum host	S20+400 optional (spreading spectrum required) 4
9	32156	Waveguide calibration piece	50GHz ~ 75GHz	1 box
10	32155N	Waveguide calibration piece	60GHz ~ 90GHz	1 box
11	32141	Waveguide calibration piece	75GHz ~ 110GHz	1 box
12	32155	Waveguide calibration piece	110GHz ~ 170GHz	1 box
13	32155R	Waveguide calibration piece	140GHz ~ 220GHz	1 box
14	32155S	Waveguide calibration piece	170GHz ~ 260GHz	1 box
15	20302	Waveguide calibration piece	220GHz ~ 330GHz	1 box
16	20301T	Waveguide calibration piece	330GHz ~ 500GHz	1 box

Note 4: For the 3674 series host, the 400+S20 optional package (spreading spectrum is mandatory) must be selected. When choosing any two or more of the 201/203/205/401/403/405 optional packages, please consult the technical staff for guidance.