MT7553 Noise Receiver Modules

DATA SHEET / 4T-085

Maury Microwave

// JANUARY 2018

MT7553

SERIES NOISE RECEIVER MODULES AND NOISE SWITCHING MODULES

MT7553M12 with Controller

Features*

- Instantaneous Ultra-Wideband Measurements from 10 MHz – 50 GHz
- Banded Measurements from 50–75 GHz, 60–90 GHz, and 75–100 GHz
- Automates Noise Parameter Measurement Systems
- Replaces External Banded Components
- Integrated Downconverter, Bias Tees, Low-Noise Amplifier, and Switches
- Low Noise Figure

MT7553B03

MT7553B01

Expanding the Capabilities of Noise Figure Analyzers for Ultra-Wideband Noise Parameter Measurements

Introduction

Noise Parameter measurements are typically performed using a Vector Network Analyzer (VNA) to measure the S-Parameters of an amplifier, and a Noise Figure Analyzer (NFA) to measure the noise figure or noise power of an amplifier. While traditional NFAs are commonly available up to 26.5 GHz, many amplifier designers wish to test their amplifiers past this frequency limit. The MT7553 series of Noise Receiver Modules enable engineers to take ultra-wideband noise parameter measurements by extending the frequency limit of the NFA to 50, 75, 90 or 100 GHz.

MT7553B 50 GHz Noise Receiver Module

The MT7553B is much more than a simple downconverter, it is the backbone of a 50 GHz noise parameter measurement system. A downconverter accepts an input signal (commonly referred to as RF signal) at F1 and mixes it with local oscillator signal F2, resulting in an intermediate frequency (IF) of F1-F2, a frequency able to be directly measured by a NFA. The Noise Receiver Module consists of a downconverter including integrated mixer and local oscillator, as well as integrated bias networks to power the device under test, integrated RF switches to switch between VNA and NFA paths, and integrated low-noise amplifier (LNA) to improve receiver noise figure. In essence, the MT7553 replaces the entire output block, or receiver module, of our noise parameter measurement system and is designed for easy on-wafer integration. Simply connect the VNA, NFA and bias supplies to the proper module ports, and begin taking measurements. For the first time ever, fully automated frequency-swept noise parameters can be measured between 10 MHz and 50 GHz on-wafer without disconnecting or changing a single component or cable, with extremely fast and accurate results.

MT7553B01 & MT7553B03 50 GHz PNA-X Noise Receiver Modules

The MT7553B01 and MT7553B03 have been tailored for Keysight Technologies' new "one-box" solution, the PNA-X. Because the Noise Parameter and S-Parameter ports on the PNA-X are one and the same, the MT7553B01 has been designed for use with the N5245A-series PNA-X with option H29 (internal 26 GHz noise receiver) while the MT7553B03 has been designed for use with the N5245A-series PNA-X with option 029 (internal 50 GHz noise receiver). See Maury Microwave article reprint 5A-042 for the speed and accuracy benefits of using the PNA-X over traditional methods.

** See Available Models table on page 2.*

MT7553M Millimeter Wave Noise Receiver Module

The MT7553M is designed for full millimeter-wave noise parameter measurements within the TE10 waveguide band of operation. The MT7553M downconverts noise power densities from the frequency of interest to the NFA bandwidth using a double-side band swept LO technique. The MT7553M is available between 50-75 GHz (WR15), 60-90 GHz (WR12) and 75-100 GHz (WR10).

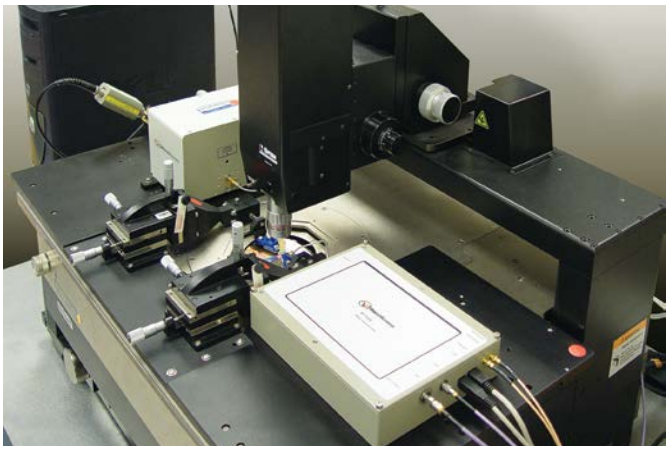
Available Noise Receiver Modules

Model	System Input Frequency (GHz)	NFA Output Frequency (GHz)	LO	Mixer	LNA	Bias Tee	RF Switch	VNA/NFA Ports	Noise Figure		Connector
									Typ	Max	
MT7553A	0.01 – 26.5	0.01 – 26.5	N/A	N/A	Internal	Internal	Internal	Separate	6	8	3.5mm female
MT7553A03	0.1 – 26.5	0.1 – 26.5	N/A	N/A	Internal	Internal	Internal	Combined	6	8	3.5mm female
MT7553B	0.01 – 50.0	0.01 – 26.5	Internal	Internal	Internal	Internal	Internal	Separate	15	20	2.4mm female
MT7553B01	0.01 – 50.0	0.01 – 26.5	Internal	Internal	Internal	Internal	Internal	Combined	15	20	2.4mm female
MT7553B03	0.1 – 50.0	0.1 – 50.0	N/A	N/A	Internal	Internal	Internal	Combined	6	8	2.4mm female
MT7553M15	50.0 – 75.0	0.01 – 26.5	Internal	Internal	Internal	External	External	Separate	12	12	WR15
MT7553M12	60.0 – 90.0	0.01 – 26.5	Internal	Internal	Internal	External	External	Separate	12	12	WR12
MT7553M10	75.0 – 100.0	0.01 – 26.5	Internal	Internal	Internal	External	External	Separate	12	12	WR10

Available Noise Switching Modules

Model	Frequency (GHz)	Bias Tee	RF Switch	Connector
MT7553N26	0.1 – 26.5	Internal	Internal	3.5mm female
MT7553N50	0.1 – 50.0	Internal	Internal	2.4mm female

MT7553N26 Noise Switching Module.

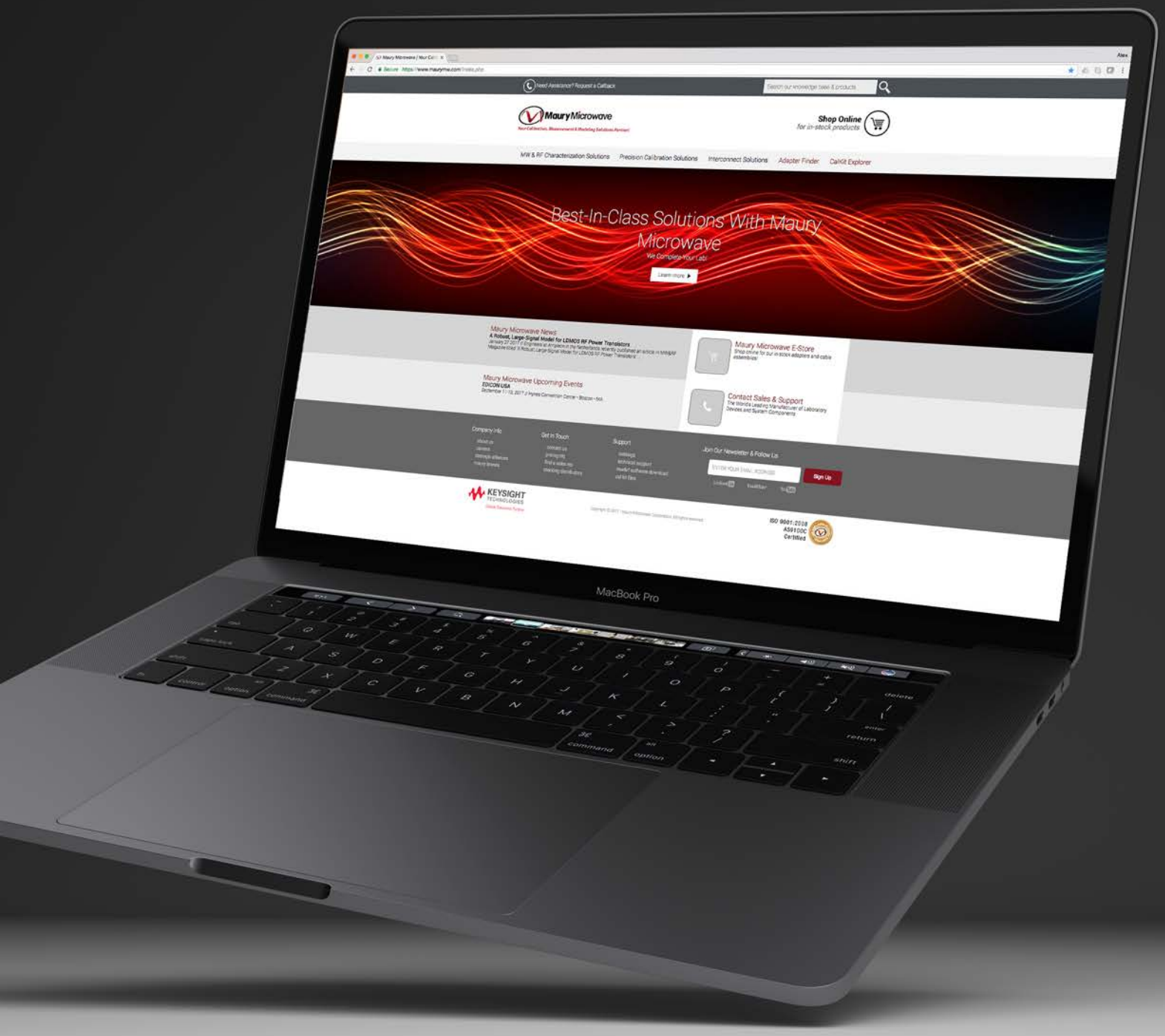


MT7553B in a typical on-wafer setup for making noise parameter measurements.

VISIT OUR WEB STORE

TO LEARN MORE ABOUT

OUR PRODUCTS



www.maurymw.com

Maury Microwave

DATA SHEET / 4T-085

CONTACT US:
W / maurymw.com
E / maury@maurymw.com
P / +1-909-987-4715
F / +1-909-987-1112
2900 Inland Empire Blvd
Ontario, CA 91764