



Extended Frequency Measurement Solution External Mixer Connection Function MX284090A

Signal Analyzer
MS2830A/MS2840A/MS2850A

Product Outline

The External Mixer Connection Function MX284090A software option facilitates use of Eravant/VDI external mixers recommended by Anritsu. The measurable frequency range is extended by installing this software in the signal analyzers MS2830A/MS2840A/MS2850A when connecting the analyzers to these external mixers.

■ Supported Signal Analyzers (Main Unit)

MS2830A: 9 kHz to 26.5/43 GHz

MS2840A: 9 kHz to 26.5/44.5 GHz

MS2850A: 9 kHz to 32/44.5 GHz

*Supports frequency models with 1st Local Output port

■ Recommended External Mixer Manufacturers

Eravant



ERAVANT

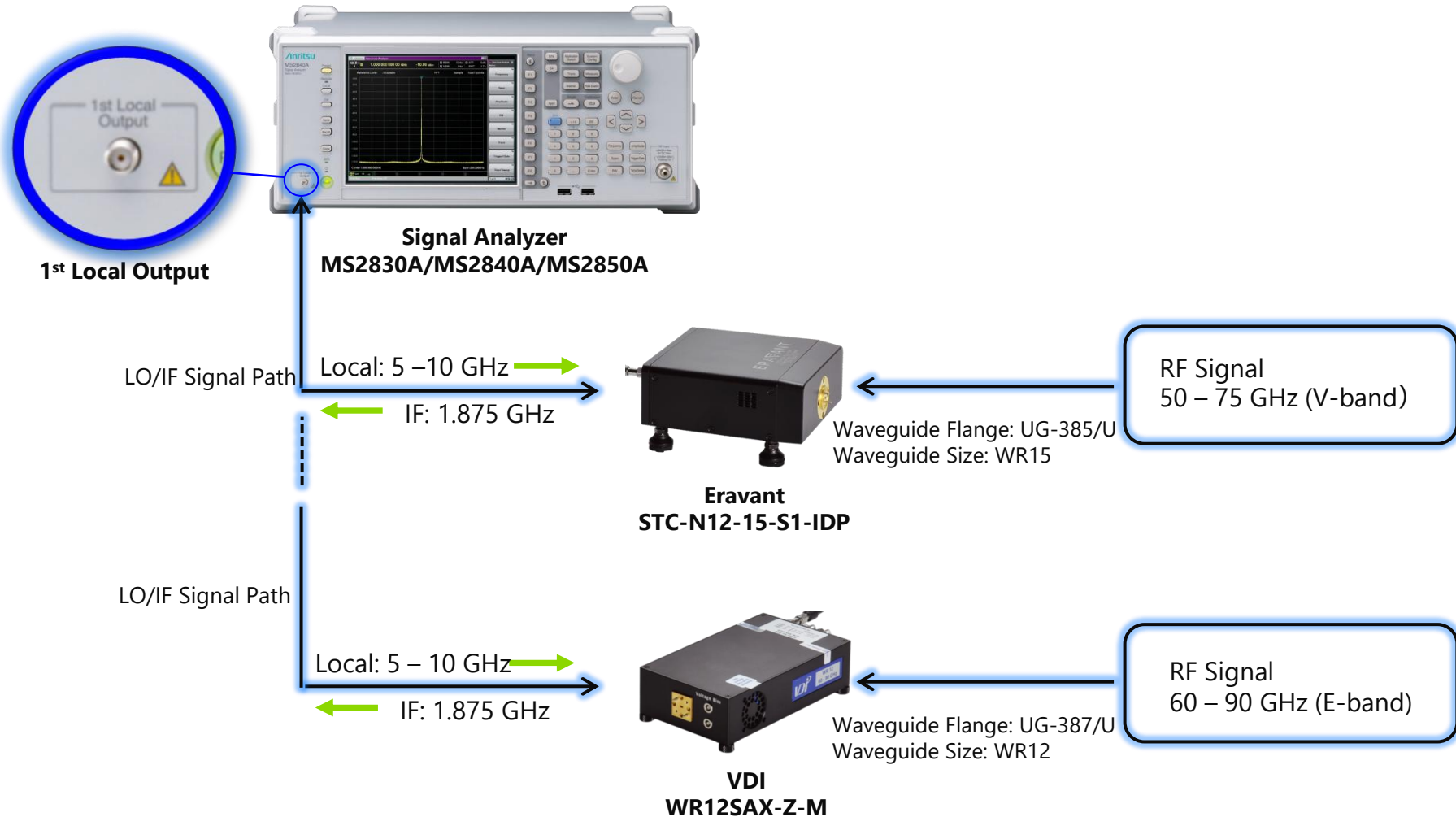
**Virginia Diodes, Inc
(VDI)**



Features: Easy Connection Configuration

Easy Setup Using LO/IF Coaxial Cables

Setup between the signal analyzer and external mixer is simple, and connecting the signal analyzer 1st Local Output port to the external mixer extends the frequency range.

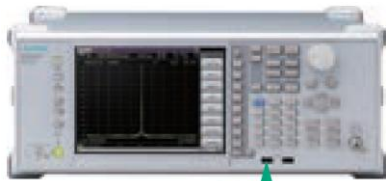


Features: Read Mixer Conversion Loss Data

Accessory USB Memory with Mixer Conversion Loss Data

An accessory USB memory provided with each mixer stores the mixer's unique conversion loss characteristics, and loss data are reflected in measured values simply by inserting the USB memory into the signal analyzer. This eliminates the need for conversion loss calibration, helping reduce work loads.

Signal Analyzer
MS2830A/MS2840A/MS2850A



Accessory USB



VDI
WR12SAX-Z-M

Accessory USB



Eravant
STC-N12-15-S1-IDP

Features: Wide Image-Response Free Measurement Span

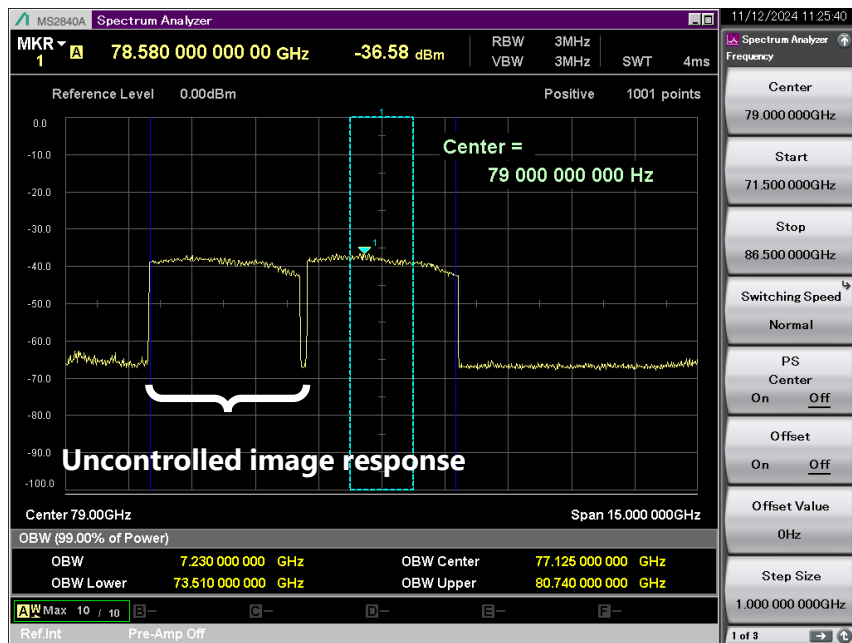
Supports Image-Response Free Bandwidth ≤ 7.5 GHz with High IF and PS Function*1

Image-response-free measurements over a wide frequency span are supported by the signal analyzers' high IF (MS2830A: 1.875 GHz, MS2840A/MS2850A: 1.8755 GHz). Furthermore, a measurement span of up to 7.5 GHz without image-response effects is achieved by using Anritsu's patented PS (Polarity Swap) function.

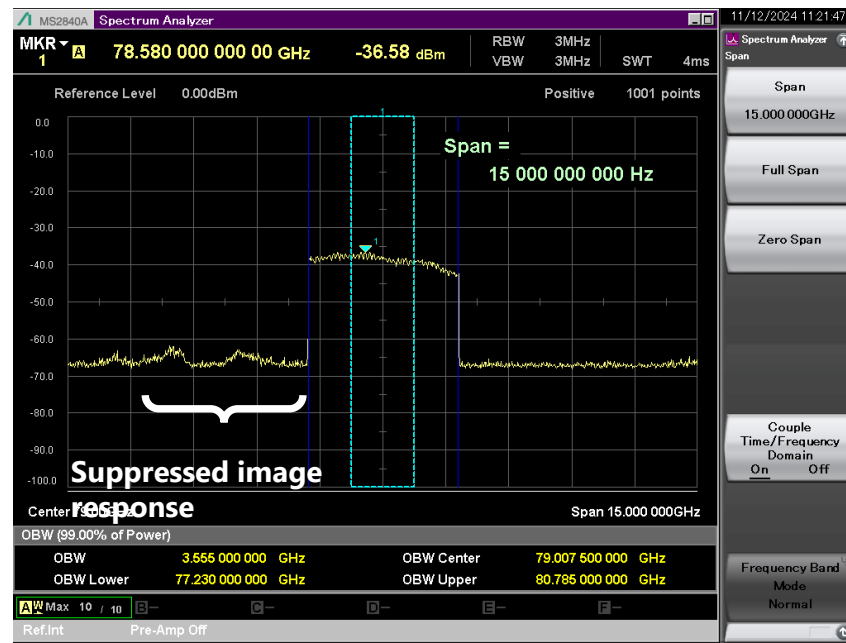
This is especially useful for wideband measurements required for time-variable signals (FMCW/pulse modulation) used by **automotive radar (60 GHz/76 GHz/79 GHz bands) and motion detection sensors (60 GHz band)**.

*1: Patented

■ Without PS Function



■ With PS Function



High-Resolution 79 GHz Band Radar (4 GHz FMCW Signal Chirp Bandwidth)

Signal Analyzer Image Suppression Functions

Unwanted signals are also generated simultaneously when measuring using external mixers without a preselector. To solve this issue, the MS2830A/MS2840A/MS2850A signal analyzers have both Signal ID and PS functions for signal identification.

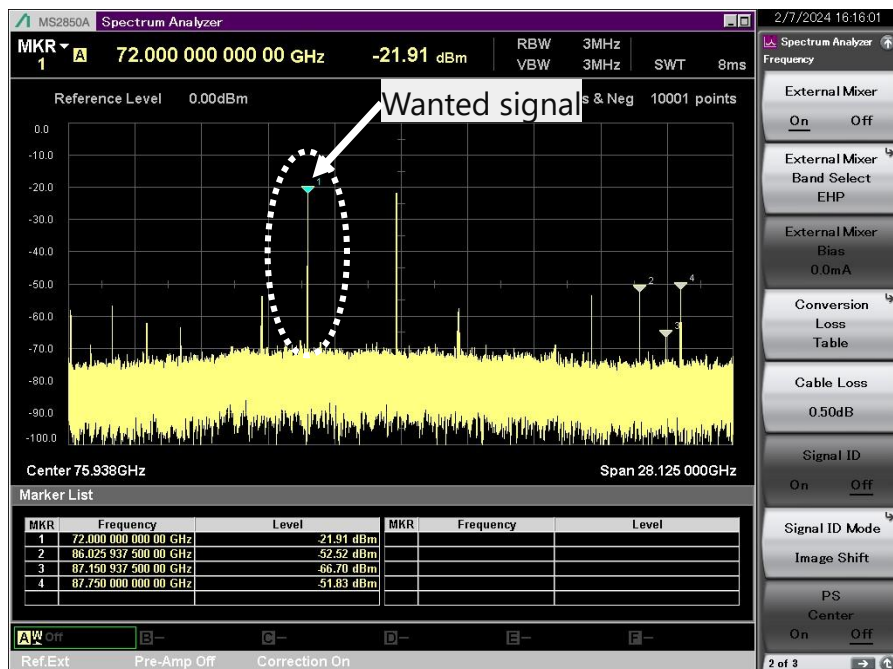
Using these functions helps identify whether signals on the screen are due either to measurement or are spurious signals generated by the Device Under Test (DUT). The details of these functions are explained on the next slide.

	Signal ID Function	PS Function
Target Signal	• CW • Signals with non-time-variable bands	• FMCW • Pulse Modulation
Effect	Identifies spurious signals caused by measurement system by changing measurement mixing conditions	Supports measurement of time-variable signals (e.g., chirp signals) because spurious signals avoided in principle
Notes	Peak signal levels might drop or disappear completely when measuring time-variable signals using Minimum Hold processing. Spurious signals can be distinguished for CW (Continuous Wave) signals, but signals with bandwidth might overlap even when changing mixing conditions.	Unsuppressed spurious signals are displayed in principle. *Higher-order spurious signals may be displayed at about -50 dBc.

Image Suppression Function Details (Signal ID)

When mixing conditions are changed, signals due to the measurement system will change their displayed frequency due to the change in frequency conditions, but input signals will respond without any frequency change. Signals input to the test instrument can be correctly identified by utilizing this behavior. The Signal ID (Image Suppression) function displays the lower value result (Minimum Hold processing) from measurements taken under different mixing conditions.

Example: Inputting 12 GHz CW signal at 72 GHz to RF side using frequency multiplier ($\times 6$) reproduces 7th order harmonic.



Signal ID (Suppression Mode) = Off



Signal ID (Suppression Mode) = On

Eliminates mixing spurious signals due to external mixer & displays only desired signal & harmonic components caused by RF input

Image Suppression Function Details (PS Function)

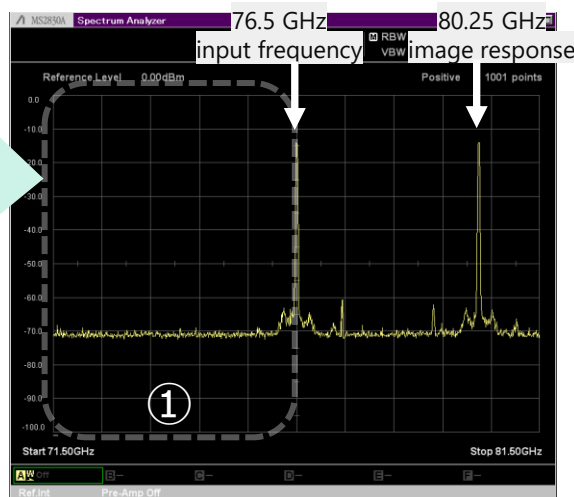
The PS (Polarity Swap) function provides correct spectrum information when measuring signals (time-variable) that are difficult to distinguish even when using the Signal ID function. Spurious signals can be limited to either above or below the input signal depending on the polarity of the mixer response, and spurious signals can be avoided in principle by changing the polarity of the mixer response at any frequency.

PS Function Outline (Example)

Positive Polarity

Local frequency lower than input frequency

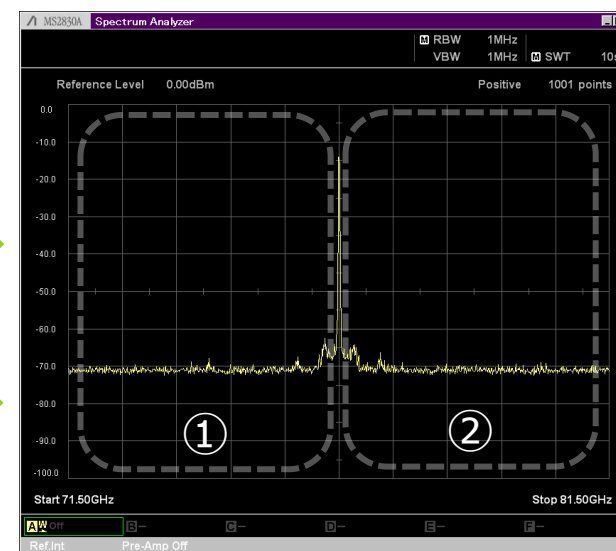
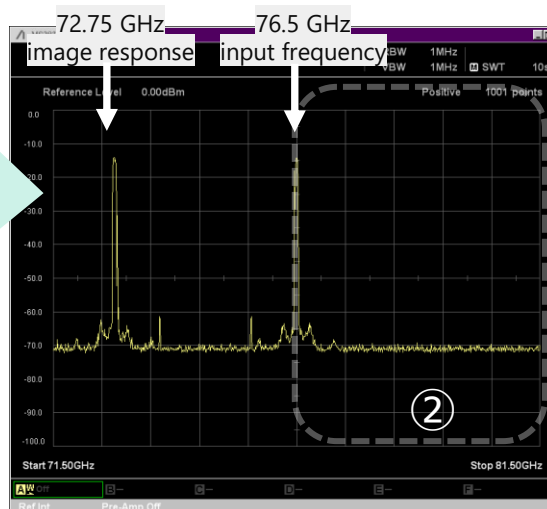
Image responses at frequencies higher the input frequency.
Region ① unaffected by image responses.



Negative Polarity

Local frequency higher than input frequency

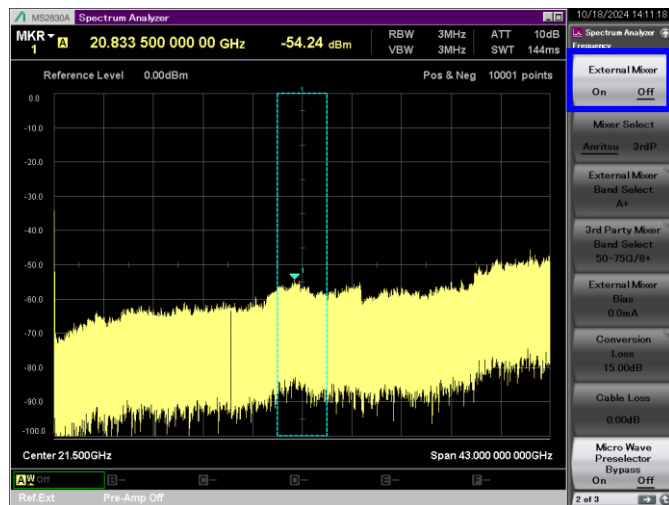
Image responses at frequencies lower than input frequency.
Region ② unaffected by image responses.



From measurement screen center, left side uses positive polarity (region ①) and right side uses negative polarity (region ②) supporting measurement without displaying image responses

Setting External Mixer Functions

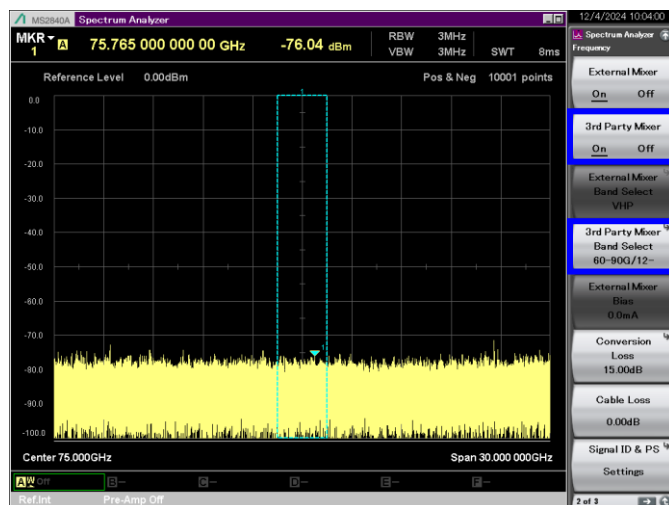
The MS2830A/MS2840A external mixer function is used by enabling the external mixer function using the External Mixer: On/Off setting on the second page of [Frequency].



Setting procedure

[Frequency] – (second page) [External Mixer] = On

After enabling the external mixer function, the MS2830A/MS2840A/MS2850A supplies local signals matched to each band by selecting the appropriate band for the mixer in use, enabling spectrum observation.



Setting procedure

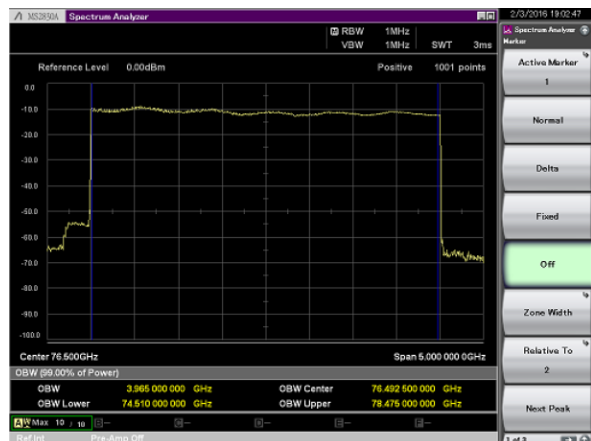
[3rd Party Mixer] = On

Select appropriate band at [3rd Party Mixer Band Select]

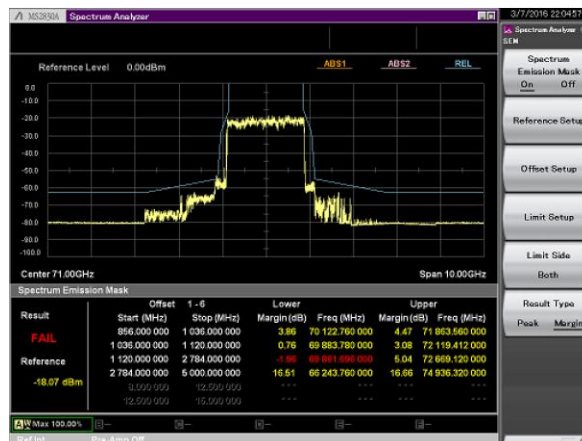
- When using **Eravant STC-N12-15-S1-IDP**
→ Select **[50-75 GHz Mixing order 8+]**
- When using **VDI WR12 SAX-M**
→ Select **[60-90 GHz Mixing order 12-]**

External Mixer Software Bundle

The MS2830A/MS2840A/MS2850A spectrum analyzer and signal analyzer test functions can be used even when using an external mixer. The spectrum analyzer tests include support for SEM (Spectrum Emission Mask) and OBW (Occupied Bandwidth) measurements. Additionally, the signal analyzer tests support signal analyses, including Chirp signals, etc.



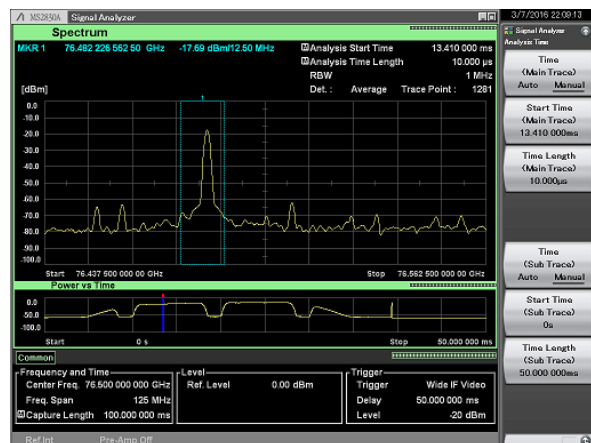
OBW Measurement Function



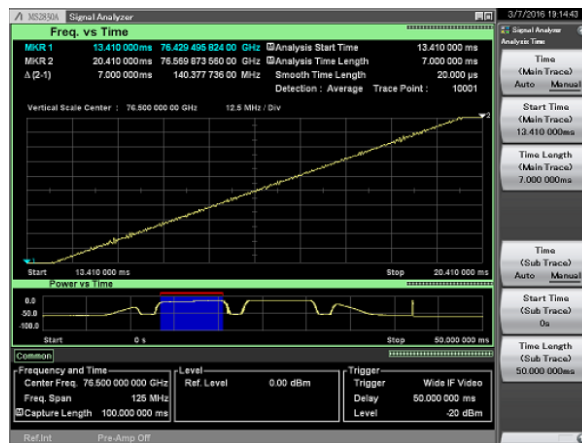
SEM Measurement Function



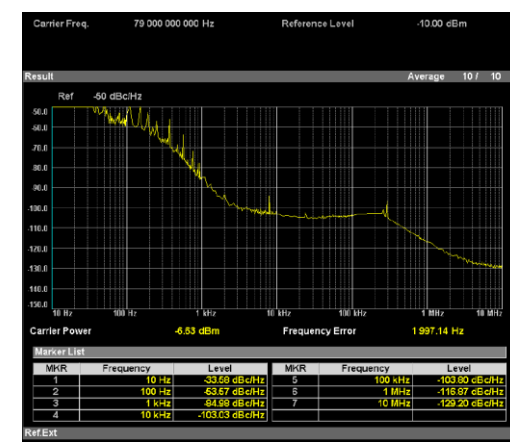
Noise Floor Attenuation Function*1



SA Function (Spectrum)



Chirp Signal Analysis (Frequency vs Time)



Phase Noise Measurement Function*2

*1: Dedicated MS2840A/MS2850A option. Requires MS2840A-051/MS2850A-051 hardware option.

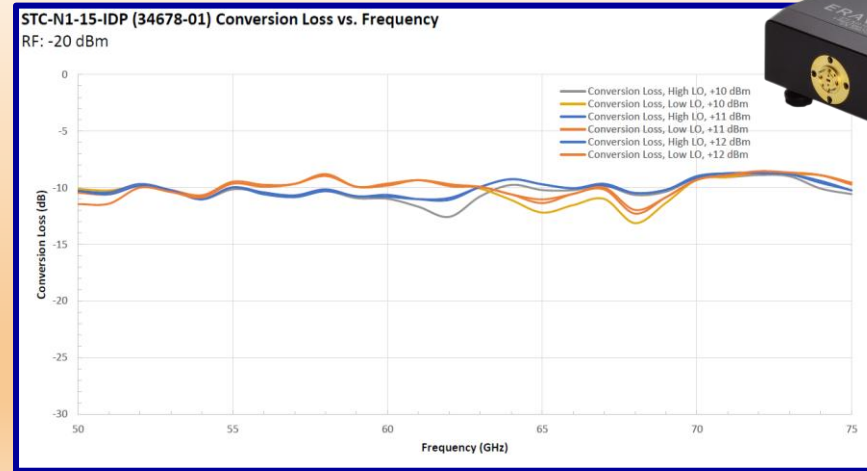
*2: Requires MS2830A-010/MS2840A-010/MS2850A-010 hardware option.

Key Mixer Functions and Features

Eravant STC-N12-15-S1-IDP

The Eravant STC-N12-15-S1-IDP extends the spectrum analyzer measurement frequency range to 50 – 75 GHz.

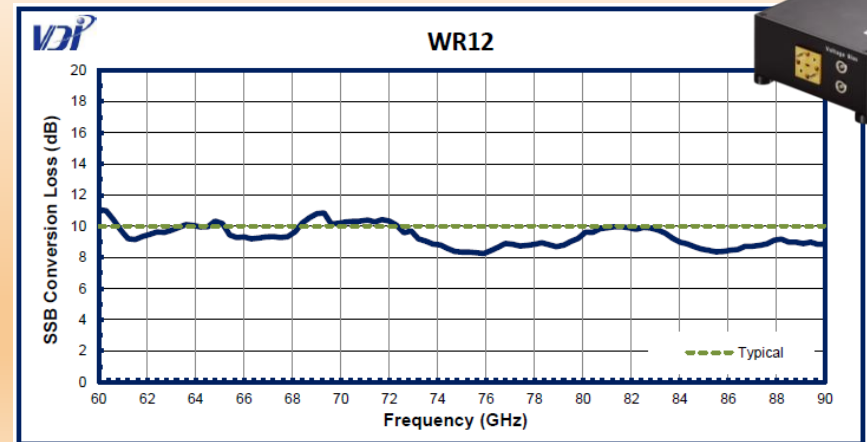
- RF Input Frequency: 50 GHz – 75 GHz
- IF Output: 1.875 GHz (typ.)
- LO Input Frequency: 6.25 GHz – 9.38 GHz
- LO Power: +10 dBm to +12 dBm
- Conversion Loss: 12 dB (typ.)
- RF Input Power Damage Level: +5 dBm (max.)



VDI WR12SAX-Z-M

The VDI WR12SAX-Z-M extends the spectrum analyzer measurement frequency range to 60 – 90 GHz.

- RF Band (GHz): 60 GHz – 90 GHz
- RF Input Flange (UG-387/U-M): WR-12
- Multiplication Factors: 12
- LO Input (GHz): 5 – 7.5 (Low), 10 – 15 (High)
- RF Power Limits Compr./Damage (typ. dBm): -10/0
- Conversion Loss (typ. dB): 10



Ordering Information

■ Software Options

Model	Name	Remarks
MX284090A	External Mixer Connection Function	Same software option for all MS2830A/MS2840A/MS2850 spectrum analyzers

■ Recommended External Mixers

Maker	Model	Name	Frequency band	Frequency range	LO Multiplier	Waveguide flange	Wave guide size
Eravant	STC-N12-15-S1-IDP	V-Band Full Waveguide Band Down-Converter	V-band	50 – 75 GHz	8	UG-385/U	WR 15
VDI	WR12SAX-Z-M	Spectrum Analyzer Extender (SAX)	E-band	60 – 90 GHz	12	UG-387/U	WR 12

■ Recommended Base Configuration (typical) Refer to the catalog for options not included in the following table.

	Model	Name	Remarks
Signal Analyzer Base Configuration	MS2830A	Signal Analyzer	MS2830A Main Unit (required)
	MS2830A-044 MS2830A-045	26.5 GHz Signal Analyzer 43 GHz Signal Analyzer	Select either Opt-044 or Opt-045 frequency option
	MX284090A	External Mixer Connection Function	Required
Application Parts	J1692B	Coaxial Cord, 1 m	SMA-P • SUCOFLEX126E • SMA-P, DC to 18 GHz, 50Ω
Recommended External Mixers	STC-N12-15-S1-IDP	V-Band Full Waveguide Band Down-Converter	Eravant Frequency range: 50 – 75 GHz
	WR12SAX-Z-M	Spectrum Analyzer Extender (SAX)	VDI Frequency range: 60 – 90 GHz

