

Agilent
E8257D/67D/47C/57C/67C
E8241A/44A/51A/54A
PSG Signal Generators

Application Note

**Easy frequency extension to 110 GHz using
Agilent's 83550 Series Millimeter-Wave Source Modules**



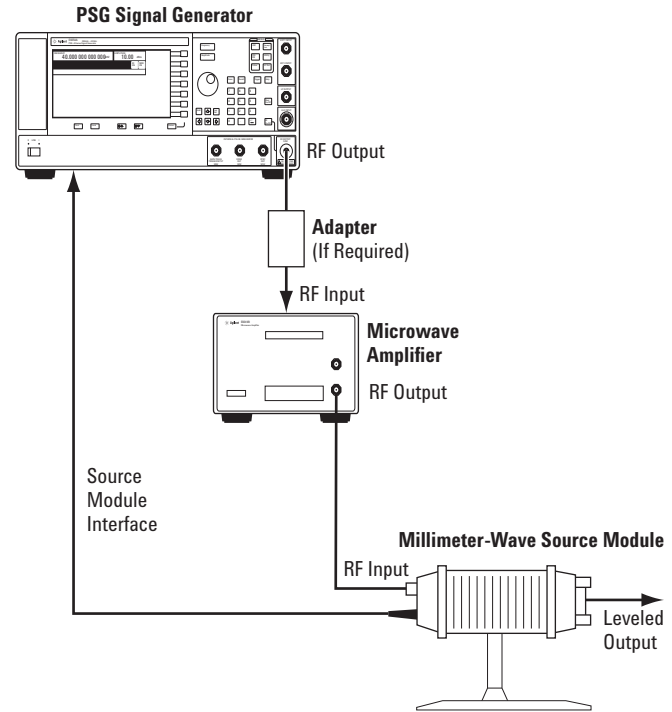
Agilent Technologies

Millimeter-Wave Source Module

Required equipment

- Agilent 83550 Series millimeter-wave source module
- microwave amplifier +17 dBm output power minimum (required for PSG signal generators without high output power Option 1EA except PSG E8267C/D¹)
- cables and adapters as required

Figure 1-1
External Millimeter-wave source module connection without PSG high output power Option 1EA



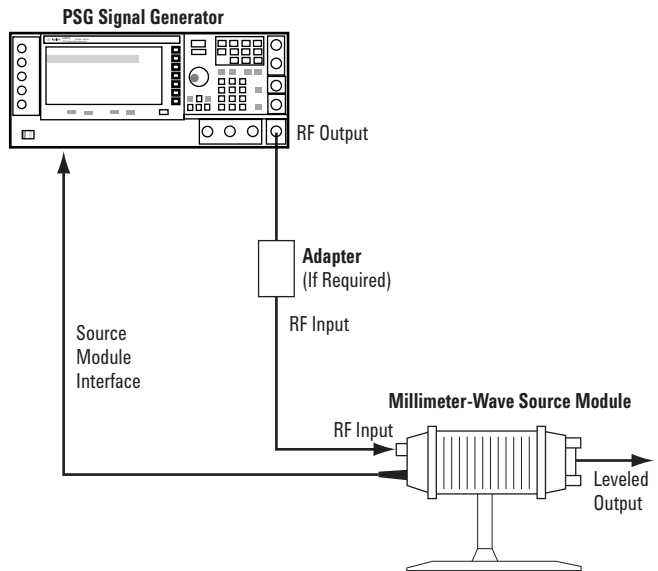
Connect the equipment

CAUTION: To prevent damage to the signal generator, turn off the line power to the signal generator before connecting the source module interface cable to the rear panel source module interface connector.

Command	Note
1. Turn off the signal generator's line power.	
2. Connect the equipment as shown. Use the setup in Figure 1-1 for signal generators without Option 1EA. Use the setup in Figure 1-2 for Option 1EA signal generators.	
Option 1EA signal generators can drive the output of millimeter-wave source modules to maximum specified power without a microwave amplifier.	
	NOTE To ensure adequate RF amplitude at the millimeter-wave source module RF input when using Option 1EA signal generators, maximum amplitude loss through the adapters and cables between the signal generator's RF output and the wave source module's RF input should be less than 1.5 dB.

1. The PSG E8267C/D vector signal generator includes the high output power option as a standard feature.

Figure 1-2
External Millimeter-
wave source module
connection with PSG
high output power
Option 1EA



Configure the signal generator

Command

1. Turn on the signal generator's line power.

Note

Upon power-up, the signal generator automatically senses the millimeter-wave source module, switches the signal generator's leveling mode to external/source module, sets the millimeter-wave source module frequency and amplitude to the source module's preset values, and displays the RF output frequency and amplitude values available at the millimeter-wave source module output. The *MMMOD* indicator in the *FREQUENCY* area and the *Millimeter* indicator in the *AMPLITUDE* area of the signal generator's display indicate that the millimeter-wave source module is active.

NOTE Refer to the millimeter-wave source module specifications for the specific frequency and amplitude ranges.

2. If the *RF OFF* annunciator is displayed, press [RF On/Off].

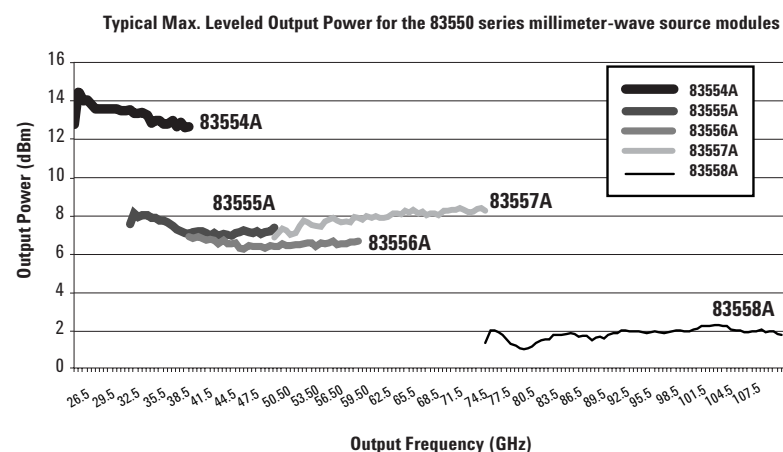
Leveled power is now available at the output of the millimeter-wave source module.

To obtain flatness-corrected power, refer to "Obtain Flat-Port Power with Agilent's PSG User Flatness Correction," or External Leveling Functions Product note 5988-2410EN.

Performance specifications and typical¹ for the 83550 Series millimeter-wave source modules using the Agilent PSG signal generators as the driving source.

Table 1. 83550 Series millimeter-wave source modules

Agilent PSG signal generators	83554A	83555A	83556A	83557A	83558A
Frequency characteristics					
Range	26.5 – 40 GHz	33 – 50 GHz	40 – 60 GHz	50 – 75 GHz	75 – 110 GHz
Maximum leveled power	9 dBm	3 dBm	3 dBm	3 dBm	0 dBm
Minimum settable power	-5 dBm	-5 dBm	-5 dBm	-5 dBm	-5 dBm
Power level accuracy at 0dBm	±2.0 dB	±2.0 dB	±2.0 dB	±2.0 dB	±2.0 dB
Power flatness (maximum leveled power)	±1.5 dB	±1.5 dB	±1.5 dB	±2.0 dB	±2.0 dB
Source output SWR					
Leveled	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0	≤ 2.0
External pulse modulation					
Rise/fall time (typical)	40 ns	40 ns	50 ns	50 ns	50 ns
Minimum RF pulse width					
(typical)	500 ns	500 ns	500 ns	1 us	1 us
On/off ratio (typical)	> 80 dB	> 80 dB	> 80 dB	> 80 dB	> 80 dB
Pulse repetition frequency					
Leveled (typical)	100 Hz – 500 kHz	100 Hz – 500 kHz	100 Hz – 500 kHz	100 Hz – 500 kHz	100 Hz – 500 kHz
Unleveled (typical)	100 Hz – 5 MHz	100 Hz – 5 MHz	100 Hz – 5 MHz	100 Hz – 5 MHz	100 Hz – 5 MHz



Related Agilent Literature

Agilent PSG Signal Generators, Brochure, Literature number 5989-1324EN

Agilent E8267D PSG Vector Signal Generator, Data Sheet, Literature number 5989-0697EN

Agilent E8257D PSG Analog Signal Generator, Data Sheet, Literature number 5989-0698EN

Agilent 8757D Scalar Network Analyzers, Configuration Guide, Literature number 5967-6177E

Agilent 8757D Scalar Network Analyzer, Data Sheet, Literature number 5091-2471E

Agilent 83554A/83555A/83556A Millimeter-Wave Source Modules, Data Sheet, Literature number 5954-8364

Agilent 83557A/83558A Millimeter-Wave Source Modules, Data Sheet, Literature number 5958-0398



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Product specifications and descriptions in this document subject to change without notice.

1. Specifications describe the instrument's warranted performance over the temperature range 0° to 55° C (except where noted). Supplemental characteristics are intended to provide information useful in applying the instrument by giving typical but non-warranted performance parameters. These are denoted as "typical," "nominal," or "approximately."