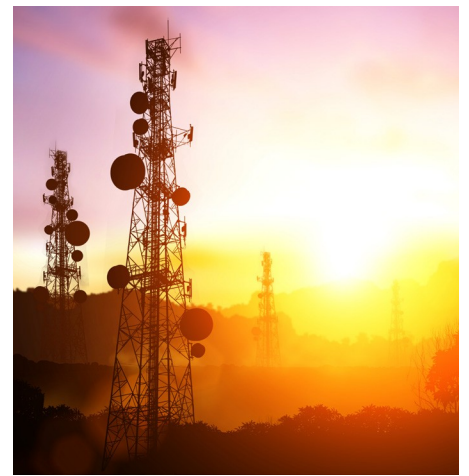
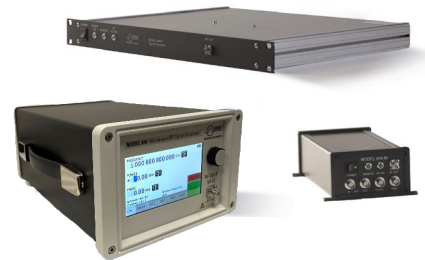


# Model 845 RF/Microwave Signal Generator



## Features

- Frequency Range from 9 kHz to 26.5 GHz
- Adjustable Output Power from -90 dBm to +25 dBm
- Frequency and Power Switching Time Down to 30 us
- USB, LAN, GPIB Interfaces

## Applications

- ATE
- R&D Low Noise Signal Source
- Signal Simulation
- Aerospace and Defense
- Low Noise Microwave Source for R&D



### Model 845 v. 2.66

9 kHz to 26.5 GHz RF / Microwave Signal Generator

## DEFINITIONS

- The specifications in the following pages describe the warranted performance of the instrument for  $23 \pm 5$  °C after a 30-minute warm-up period (unless otherwise stated).

**Min/Max:** Parameter range that is guaranteed by product design, and/or production tested. Warranted performance specifications include guard-bands to account for the expected statistical performance distribution, measurement uncertainties, and changes in performance due to environmental conditions.

**Typical:** Expected mean values, not warranted performance.

## INTRODUCTION

- **Very compact, portable analogue signal generator models with a range from 9 kHz (with option 9K) up to 26.5 GHz.**

The Model 845 is a series of low-noise and fast-switching microwave signal generators covering a continuous frequency ranges from as low as 100 kHz up to 12, 20, and 26 GHz, respectively, with a 0.001 Hz resolution. The Model 845 provide an accurately levelled output power range and high spurious suppression. Advanced frequency synthesis with fractional-N divider makes for low SSB phase noise and micro-Hz resolution.

Available Options:

- **Option HP** delivers higher maximum output power to a level up to +27 dBm.
- **Option PE3** is an optional power level extension to accurately level below -90 dBm.
- **Option FS** substantially enhances the switching speed
- **Option LO** removes all built-in modulation capabilities if not needed (Model 845-20, Model 845-26 only)
- **Option B3** adds an internal rechargeable battery module
- **Option 9K** low frequency extension down to 9 kHz (Model 845-20, Model 845-12 only)
- **Option 1URM** modifies form-factor to a 19" rack-mountable 1U enclosure

The standard Model 845-XX includes amplitude modulation (AM), DC-coupled, low distortion wideband frequency modulation (FM), PM, FSK and PSK, frequency chirp, and fast pulse modulation with internal pulse train generator. Three internal modulations sources are available. All modulation modes of the Model 845-XX can be combined. This allows the generation of complex modulation signals for modern communication and location systems. The combination of pulse modulation and FM simulates Doppler effects or chirp signals. Simultaneous AM and pulse modulation provide the types of signal occurring in pulse radar applications with rotating antenna. The combination of FM and AM can be used to check fading effects of FM receivers.

All Model 845-XX allow fast analog and digital sweeps including flexible list sweeps, where frequency, power and dwell times can be set individually. A flexible triggering capability simplifies synchronization within test environments.

All Model 845-XX operate with an ultra-stable temperature compensated 100 MHz reference (OCXO) to ensure minimal drift and can be phase-locked to any stable external reference in a range from 1 to 250 MHz. Additionally, optimum phase synchronous signals can be achieved by bypassing internal and feeding a 100 MHz signal directly as reference.

The Model 845-XX support various standard interfaces such as USB-TMC, LAN, and GPIB. Applications for the 845-XXG include:

- R&D low noise microwave source
- Production testing (industry-leading switching times; high dynamic range)
- Service and maintenance (battery operation)
- Signal simulation (Radar, WiMax, UWB)
- Aerospace & Defence (Pulse modulator, Chirps)

# SPECIFICATIONS



| PARAMETER                           | MIN                                                            | TYPICAL                                  | MAX                                                            | NOTE                                                                                                                                                |
|-------------------------------------|----------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency range</b>              | 100 kHz<br>100 kHz<br>100 kHz<br>9 kHz                         |                                          | 12.0 GHz<br>20.0 GHz<br>26.0 GHz                               | 845-12<br>845-20, settable to 20.5 GHz<br>845-26, settable to 30 GHz<br>Option 9 kHz                                                                |
| resolution                          |                                                                | 0.001 Hz                                 |                                                                |                                                                                                                                                     |
| Phase resolution                    |                                                                | 0.1 deg                                  |                                                                |                                                                                                                                                     |
| Frequency / Amplitude settling time |                                                                | 200 $\mu$ s                              | 300 $\mu$ s<br>30 $\mu$ s                                      | option FS                                                                                                                                           |
| <b>SSB Phase noise standard</b>     |                                                                |                                          |                                                                |                                                                                                                                                     |
| <b>500 MHz</b>                      |                                                                |                                          |                                                                |                                                                                                                                                     |
| 10 Hz offset                        |                                                                | -74 dBc/Hz                               |                                                                |                                                                                                                                                     |
| 1kHz offset                         |                                                                | -126 dBc/Hz                              |                                                                |                                                                                                                                                     |
| 100 kHz offset                      |                                                                | -137 dBc/Hz                              |                                                                |                                                                                                                                                     |
| <b>4 GHz</b>                        |                                                                |                                          |                                                                |                                                                                                                                                     |
| 10 Hz offset                        |                                                                | -68 dBc/Hz                               |                                                                |                                                                                                                                                     |
| 1kHz offset                         |                                                                | -108 dBc/Hz                              |                                                                |                                                                                                                                                     |
| 100 kHz offset                      |                                                                | -119 dBc/Hz                              |                                                                |                                                                                                                                                     |
| <b>20 GHz</b>                       |                                                                |                                          |                                                                |                                                                                                                                                     |
| 10 Hz offset                        |                                                                | -51 dBc/Hz                               |                                                                |                                                                                                                                                     |
| 1kHz offset                         |                                                                | - 91 dBc/Hz                              |                                                                |                                                                                                                                                     |
| 100 kHz offset                      |                                                                | - 104 dBc/Hz                             |                                                                |                                                                                                                                                     |
| Wideband noise                      |                                                                | -150 dBc/ Hz                             |                                                                |                                                                                                                                                     |
| <b>Amplitude Noise at 10 GHz</b>    |                                                                | -130 dBc/Hz<br>-140 dBm                  |                                                                | Pout=+10 dBm, 100 kHz offset<br>noise floor                                                                                                         |
| <b>Output power</b>                 |                                                                |                                          |                                                                | Check maximum output power<br>plots on page 10                                                                                                      |
| <b>Standard</b>                     |                                                                |                                          |                                                                |                                                                                                                                                     |
| 100 kHz to fmax                     | -20 dBm                                                        |                                          | +15 dBm                                                        |                                                                                                                                                     |
| <b>Option PE3 only</b>              |                                                                |                                          |                                                                |                                                                                                                                                     |
| 100 kHz to fmax                     | -90 dBm                                                        |                                          | +12 dBm                                                        |                                                                                                                                                     |
| <b>Option HP only</b>               | -20 dBm<br>-20 dBm<br>-20 dBm<br>-20 dBm                       |                                          | +18 dBm<br>+25 dBm<br>+23 dBm<br>+20 dBm                       | < 200 MHz<br>0.2 to 5.5 GHz<br>5.5 to 16 GHz, see plot<br>16- 24 GHz, see plot                                                                      |
| <b>Options HP and PE3</b>           | -20 dBm<br>-90 dBm<br>-90 dBm<br>-90 dBm<br>-90 dBm<br>-90 dBm |                                          | +18 dBm<br>+22 dBm<br>+20 dBm<br>+18 dBm<br>+15 dBm<br>+12 dBm | < 200 MHz<br>0.2 to 10 GHz<br>10 to 16 GHz<br>16 to 20 GHz<br>20 to 24 GHz<br>> 24 GHz                                                              |
| <b>Level resolution</b>             |                                                                | 0.01 dB                                  |                                                                |                                                                                                                                                     |
| <b>Level uncertainty, ALC on</b>    |                                                                | 0.3 dB<br>0.6 dB<br><br>3.0 dB<br>1.0 dB | 1.0 dB<br>1.5 dB<br>3.0 dB<br><br>3.0 Db                       | -15 to +15 dBm<br>-65 dBm to -15 dBm, option PE3<br>< -65 dBm, f<10 GHz option PE3<br>< -65 dBm, f>10 GHz option PE3<br>> 15 dBm to Pmax, option HP |

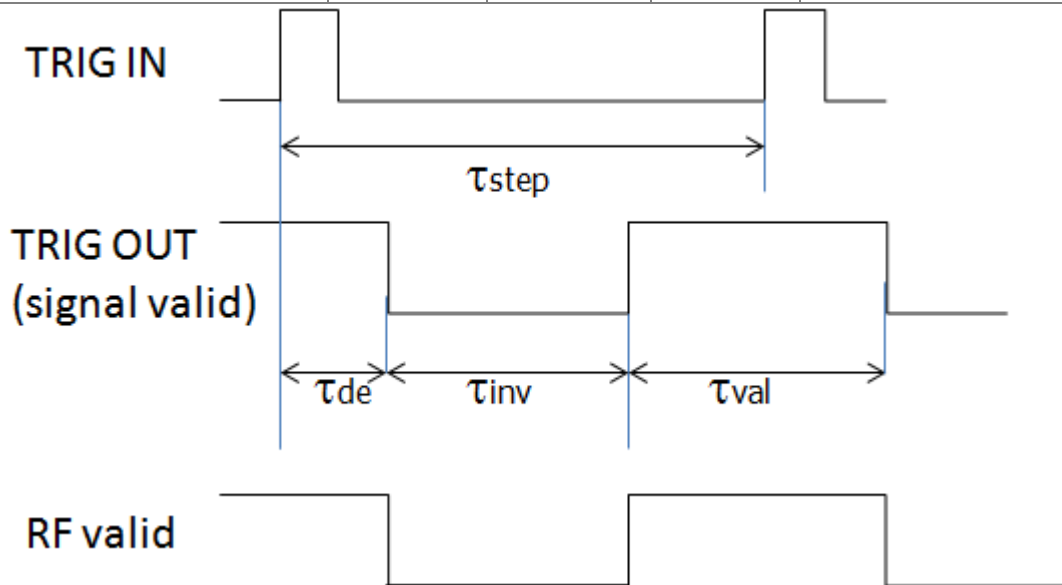
|                                                                                                                                                                                     |  |                                                                                      |                                                                                      |                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------------------------------------|
| Temperature effects                                                                                                                                                                 |  | 0.015 dB/ °C                                                                         |                                                                                      | 0 to 45 °C                              |
| <b>User flatness correction</b>                                                                                                                                                     |  | up to 2000 points                                                                    |                                                                                      |                                         |
| <b>Output impedance</b><br>VSWR                                                                                                                                                     |  | 50 Ω<br>1.5<br>2.0                                                                   |                                                                                      | < 20 GHz<br>> 20 GHz                    |
| <b>Reverse Power Protection</b>                                                                                                                                                     |  |                                                                                      |                                                                                      |                                         |
| DC Voltage                                                                                                                                                                          |  |                                                                                      | ±15 V                                                                                |                                         |
| RF power                                                                                                                                                                            |  |                                                                                      | 30 dBm                                                                               |                                         |
| <b>Spectral purity at + 5 dBm</b>                                                                                                                                                   |  |                                                                                      |                                                                                      |                                         |
| Output harmonics                                                                                                                                                                    |  | -40 dBc                                                                              | -30 dBc                                                                              | See plot                                |
| Sub-harmonics                                                                                                                                                                       |  | -75 dBc<br>-50 dBc                                                                   | -65 dBc<br>-40 dBc                                                                   | < 20 GHz<br>> 20 GHz                    |
| Non-harmonic spurious<br>< 312 MHz<br>> 312 to 625 MHz<br>> 625 MHz to 1.5 GHz<br>> 1.5 GHz to 2.5 GHz<br>> 2.5 GHz to 5 GHz<br>> 5 GHz to 10 GHz<br>> 10 GHz to 20 GHz<br>> 20 GHz |  | -80 dBc<br>-75 dBc<br>-75 dBc<br>-70 dBc<br>-65 dBc<br>-60 dBc<br>-55 dBc<br>-50 dBc | -66 dBc<br>-70 dBc<br>-65 dBc<br>-65 dBc<br>-60 dBc<br>-55 dBc<br>-50 dBc<br>-45 dBc | CW +10 dBm, > 3 kHz offset              |
| Residual FM @ 10 GHz                                                                                                                                                                |  | 15 Hz                                                                                |                                                                                      | 0.3 kHz to 3 kHz, weighted (ITU-T), RMS |
| Residual AM @ 10 GHz                                                                                                                                                                |  | 0.02 %                                                                               |                                                                                      | RMS value (0.01 kHz to 15 kHz)          |



## Sweeping Capability

Sweeps can be performed with combined internal or external AM/FM/PM/pulse modulation running. With modulation enabled, the minimum step time increases to 2 ms.

| PARAMETER                                      | MIN                       | TYPICAL                  | MAX                       | NOTE      |
|------------------------------------------------|---------------------------|--------------------------|---------------------------|-----------|
| <b>Digital power / frequency / list sweeps</b> |                           |                          |                           |           |
| Sweep type: linear, logarithmic, random        |                           |                          |                           |           |
| Step time ( $\tau_{step}$ )                    | 400 $\mu$ s<br>40 $\mu$ s |                          | 19998 s                   | Option FS |
| Dwell time ( $\tau_{val}$ )                    | 10 $\mu$ s                |                          | 9999 s                    |           |
| Off-time (incl. transient time) ( $t_{off}$ )  | 0                         |                          | 9999 s                    |           |
| Transient time ( $\tau_{inv}$ )                |                           |                          | 270 $\mu$ s<br>30 $\mu$ s | Option FS |
| Timing delay ( $\tau_{de}$ )                   |                           | 2 to 10 $\mu$ s<br>50 ns |                           | Option FS |
| Time resolution                                |                           | 0.1 $\mu$ s<br>5 ns      |                           | Option FS |
| Timing accuracy per point                      |                           | 3 $\mu$ s<br>5 ns        |                           | Option FS |



## Frequency Chirps

(linear ramp, up/down)

|                            |       |  |                   |                      |
|----------------------------|-------|--|-------------------|----------------------|
| Bandwidth                  | 10 %  |  |                   | of carrier frequency |
| Dwell time ( $t_{dwell}$ ) | 10 ns |  | 10000 $\mu$ s     |                      |
| Slope                      |       |  | 100 MHz / $\mu$ s |                      |
| Number of frequencies      |       |  | 65,000            |                      |



## Reference Frequency

REF IN input and REF OUT output are at rear panel

| PARAMETER                                             | MIN                    | TYPICAL              | MAX      | NOTE                                                            |
|-------------------------------------------------------|------------------------|----------------------|----------|-----------------------------------------------------------------|
| <b>Internal reference frequency</b>                   |                        | 100 MHz              |          |                                                                 |
| Initial accuracy                                      |                        |                      | ±40 ppb  | calibrated at 23 ± 3 °C at time of calibration, user adjustable |
| Temperature stability (0 to 50 degC)                  |                        |                      | ±100 ppb |                                                                 |
| Aging 1 <sup>st</sup> year                            |                        | 0.5 ppm              |          |                                                                 |
| Aging per day (after 30days operations)               |                        |                      | 5 ppb    |                                                                 |
| Warm-Up time                                          |                        | 5 min                |          |                                                                 |
| Output of internal reference                          |                        | 10 MHz<br>10/100 MHz |          |                                                                 |
| Output power                                          |                        | 0 dBm                |          |                                                                 |
| Output impedance                                      |                        | 50 Ω                 |          |                                                                 |
| Bypass Internal reference Input                       | 100 MHz, -5 to +10 dBm |                      |          | High phase synchronous mode                                     |
| Phase Lock to External Reference External Input Range | 1 MHz                  |                      | 250 MHz  | User programmable                                               |
| Reference input level                                 | -5 dBm                 | 0 dBm                | +13 dBm  |                                                                 |
| Lock Range                                            |                        |                      | ±1.5 ppm |                                                                 |
| Reference input impedance                             |                        | 50 Ω                 |          |                                                                 |



## Multi-Purpose Output (FUNC OUT)

Output is FUNC OUT at rear panel

| PARAMETER                                                    | MIN                                                             | TYPICAL      | MAX                      | NOTE                                   |
|--------------------------------------------------------------|-----------------------------------------------------------------|--------------|--------------------------|----------------------------------------|
| <b>MULTIFUNCTION GENERATOR</b>                               |                                                                 |              |                          |                                        |
| sine, triangle, square wave                                  |                                                                 |              |                          |                                        |
| Frequency range                                              | 1 Hz<br>1 Hz                                                    |              | 3 MHz<br>1 MHz<br>50 kHz | sine<br>triangle<br>square             |
| Frequency resolution                                         |                                                                 | 0.1 Hz       |                          |                                        |
| Output voltage amplitude peak-peak                           | 10 mV                                                           | 5V           | 2 V                      | Sine, triangle<br>Square (CMOS output) |
| Harmonic Distortion                                          |                                                                 | 1 %          |                          | < 100 kHz, 1 Vpp                       |
| Output impedance                                             |                                                                 | 50 Ω<br>CMOS |                          | Sine, triangle<br>square wave          |
| <b>VIDEO OUTPUT (of internal pulse modulator)</b>            |                                                                 |              |                          |                                        |
| Output                                                       |                                                                 | CMOS         |                          |                                        |
| Period                                                       | 30 ns                                                           |              | 50 s                     |                                        |
| Pulse Width                                                  | 15 ns                                                           |              | 50 s                     |                                        |
| RF delay                                                     |                                                                 | 10 ns        |                          |                                        |
| <b>TRIGGER OUT Synchronization mode for multiple sources</b> |                                                                 |              |                          |                                        |
| Modes                                                        | Trigger on sweep start<br>Trigger on each point<br>Signal Valid |              |                          | Option FS                              |



## Trigger (TRIG IN)

Input is TRIG IN at rear panel

| PARAMETER                            | MIN                                                        | TYPICAL            | MAX          | NOTE                              |
|--------------------------------------|------------------------------------------------------------|--------------------|--------------|-----------------------------------|
| Trigger Types                        | <b>Continuous, single, gated, gated direction</b>          |                    |              |                                   |
| Trigger Source                       | <b>RF key, external, bus (GPIO, LAN, USB)</b>              |                    |              |                                   |
| Trigger Modes                        | <b>Continuous free run, trigger and run, reset and run</b> |                    |              |                                   |
| Trigger latency                      |                                                            | 2 $\mu$ s<br>5 ns  |              | Option FS                         |
| Trigger uncertainty                  |                                                            | 5 $\mu$ s<br>10 ns |              | Option FS                         |
| External Trigger delay               | 50 $\mu$ s<br>50 ns                                        |                    | 40 s<br>10 s | programmable<br>Option FS         |
| External Delay Resolution            |                                                            | 15 ns<br>10 ns     |              | Option FS                         |
| Trigger Modulo                       | 1                                                          |                    | 255          | Execute only on Nth trigger event |
| Trigger Polarity                     | Rising, falling                                            |                    |              |                                   |
| External trigger input threshold     | 0.85 V                                                     | 0.9 V              | 0.95 V       | TTL compatible                    |
| External trigger input voltage range | -0.5 V                                                     |                    | +5.5 V       | TTL compatible                    |
| External trigger input hysteresis    |                                                            | 60 mV              |              |                                   |



## Trigger Output (TRIG OUT)

see Multi-Purpose Output (FUNC OUT)



## Modulation Capabilities (not with option LO)

Combination of AM/PM/FM/PULSE are possible. See user manual for more details.

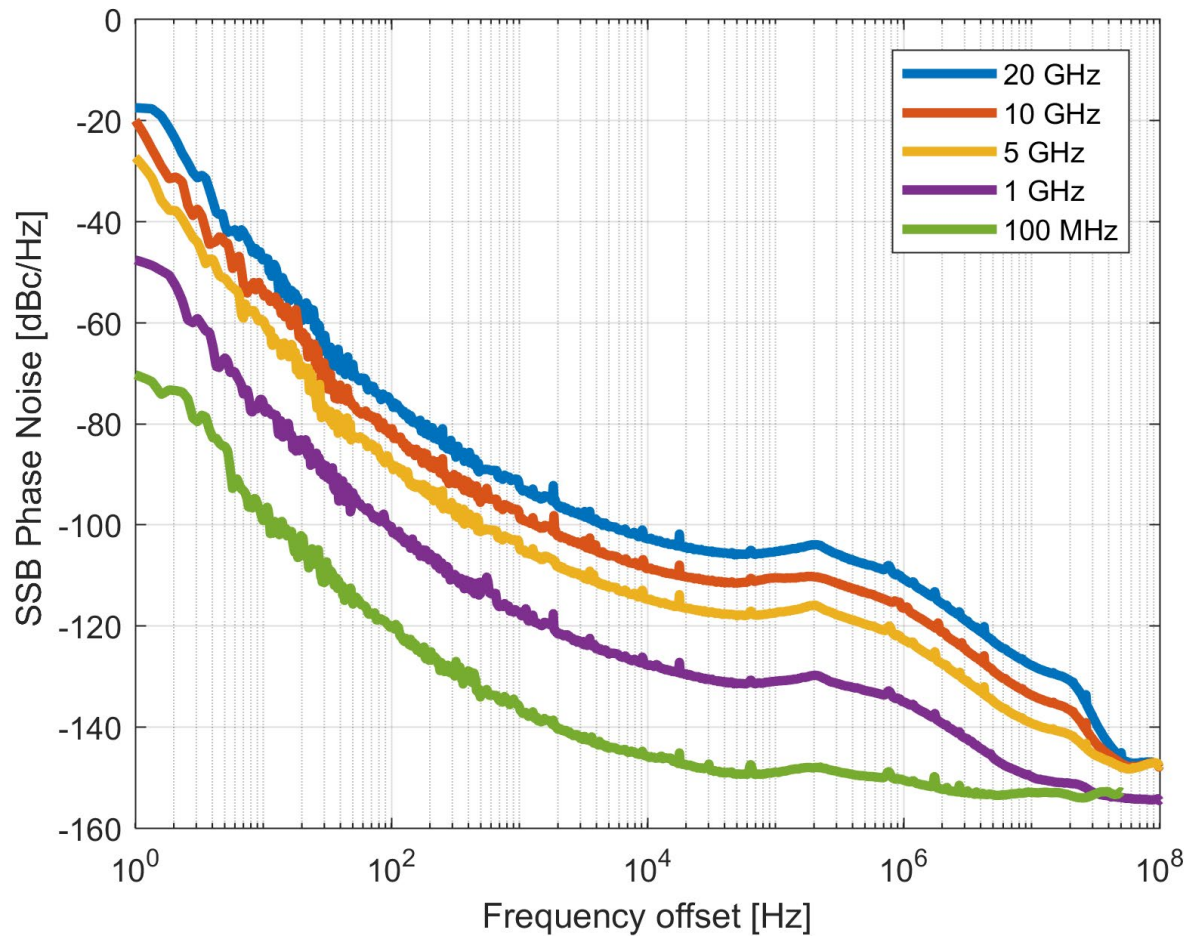
| PARAMETER                          | MIN             | TYPICAL             | MAX                      | NOTE                                   |
|------------------------------------|-----------------|---------------------|--------------------------|----------------------------------------|
| <b>Multifunction Generator</b>     |                 |                     |                          |                                        |
| sine, triangle, square wave        |                 |                     |                          |                                        |
| Output is FUNC OUT at rear panel   |                 |                     |                          |                                        |
| Frequency range                    | 10 Hz<br>10 Hz  |                     | 3 MHz<br>1 MHz<br>50 kHz | sine<br>triangle<br>square             |
| Frequency resolution               |                 | 0.1 Hz              |                          |                                        |
| Output voltage amplitude peak-peak | 10 mV           | 5V                  | 2 V                      | Sine, triangle<br>Square (CMOS output) |
| Harmonic Distortion                |                 | 1 %                 |                          | < 100 kHz, 1 Vpp                       |
| Output impedance                   |                 | 50 $\Omega$<br>CMOS |                          | Sine, triangle<br>square wave          |
| <b>Pulse Modulation</b>            |                 |                     |                          |                                        |
| On/off ratio                       |                 | 75 dB<br>(typical)  |                          | <b>at +10 dBm</b>                      |
| Repetition frequency               | DC              |                     | 10 MHz                   |                                        |
| Pulse width                        | 30 ns<br>500 ns |                     | 5 s<br>5 s               | ALC hold<br>ALC on                     |
| Pulse rise/fall time               |                 | 7 ns                |                          |                                        |

|                                                        |                                                                          |                |                           |                                                                                                                                           |
|--------------------------------------------------------|--------------------------------------------------------------------------|----------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Duty cycle                                             | 0.05 %                                                                   |                | 99.95 %                   |                                                                                                                                           |
| Pulse resolution                                       |                                                                          | 15 ns          |                           |                                                                                                                                           |
| Polarity                                               |                                                                          | selectable     |                           |                                                                                                                                           |
| External input threshold                               | 0.85 V                                                                   | 0.9 V          | 0.95 V                    | TTL compatible                                                                                                                            |
| External input voltage range                           | -0.5 V                                                                   |                | +5.5 V                    | TTL compatible                                                                                                                            |
| External input hysteresis                              |                                                                          | 60 mV          |                           |                                                                                                                                           |
| Delay (to RF)                                          |                                                                          | 20 ns          | 40 ns                     |                                                                                                                                           |
| <b>Pulse Pattern Modulation</b>                        |                                                                          |                |                           | Using internal pattern generator<br><b>at +10 dBm</b>                                                                                     |
| On/off ratio                                           |                                                                          | 75 dB          |                           |                                                                                                                                           |
| Pulse bit width                                        | 30 ns<br>500 ns                                                          |                |                           | ALC hold<br>ALC on                                                                                                                        |
| Pulse rise/fall time                                   |                                                                          | 30 ns<br>7 ns  |                           | <5 GHz<br>>5 GHz                                                                                                                          |
| Programmable pattern length                            | 2                                                                        |                | 4192                      |                                                                                                                                           |
| Duty cycle                                             | 0.05 %                                                                   |                | 99.95 %                   |                                                                                                                                           |
| Pulse bit resolution                                   |                                                                          | 30 ns<br>10 ns |                           | Option FS                                                                                                                                 |
| Polarity                                               |                                                                          | selectable     |                           |                                                                                                                                           |
| <b>Frequency Modulation</b>                            |                                                                          |                |                           |                                                                                                                                           |
| Maximum Frequency deviation (peak)                     | $> 0.05 \cdot f$<br>$N \cdot 200 \text{ MHz}$                            |                |                           | $< 1.25 \text{ GHz}$<br>1.25 GHz to 2.5 GHz (N=0.125)<br>2.5 GHz to 5 GHz (N=0.25)<br>5 GHz to 10 GHz (N=0.5)<br>> 10 GHz to 20 GHz (N=1) |
| Deviation accuracy<br>< 100 kHz rate<br>> 100 kHz rate |                                                                          | 0.5 %<br>2 %   | 2 %<br>5 %                |                                                                                                                                           |
| Distortion                                             |                                                                          | < 1 %          |                           | 1 kHz rate, 50 kHz deviation                                                                                                              |
| Modulation rate                                        | DC                                                                       |                | 800 kHz                   | > -3dB frequency response                                                                                                                 |
| Modulation waveforms                                   | Sine, triangle, FSK                                                      |                |                           |                                                                                                                                           |
| External input sensitivity<br>AC coupled<br>DC coupled | 0 to $N \cdot 200 \text{ MHz} / V$<br>0 to $N \cdot 100 \text{ MHz} / V$ |                |                           | adjustable for $\pm 1 \text{ V}$ range<br>discr. values; $\pm 5 \text{ V}$ range                                                          |
| Total harmonic distortion                              | < 1%                                                                     |                |                           | 1 kHz rate & $N \cdot 1 \text{ MHz}$ deviation                                                                                            |
| <b>Phase Modulation</b>                                |                                                                          |                |                           |                                                                                                                                           |
| Phase deviation (peak)                                 | 0                                                                        |                | $N \cdot 300 \text{ rad}$ |                                                                                                                                           |
| Modulation rate                                        | DC                                                                       |                | 800 kHz                   | > -3dB frequency response<br>Max. phase deviation degrades<br>above 20 kHz modulation rate                                                |
| Modulation waveforms                                   | Sine, triangle, FSK                                                      |                |                           |                                                                                                                                           |
| External Input sensitivity                             | Settable 0.1 rad/V to 360 rad/V                                          |                |                           |                                                                                                                                           |
| Total harmonic distortion                              | < 1%                                                                     |                |                           | 1 kHz rate & $N \times 100 \text{ rad}$<br>deviation                                                                                      |
| <b>Amplitude Modulation</b>                            |                                                                          |                |                           |                                                                                                                                           |
| Modulation rate                                        | 0.1 Hz                                                                   |                | 50 kHz                    |                                                                                                                                           |
| Modulation waveforms                                   | Sine, triangle, square                                                   |                |                           |                                                                                                                                           |

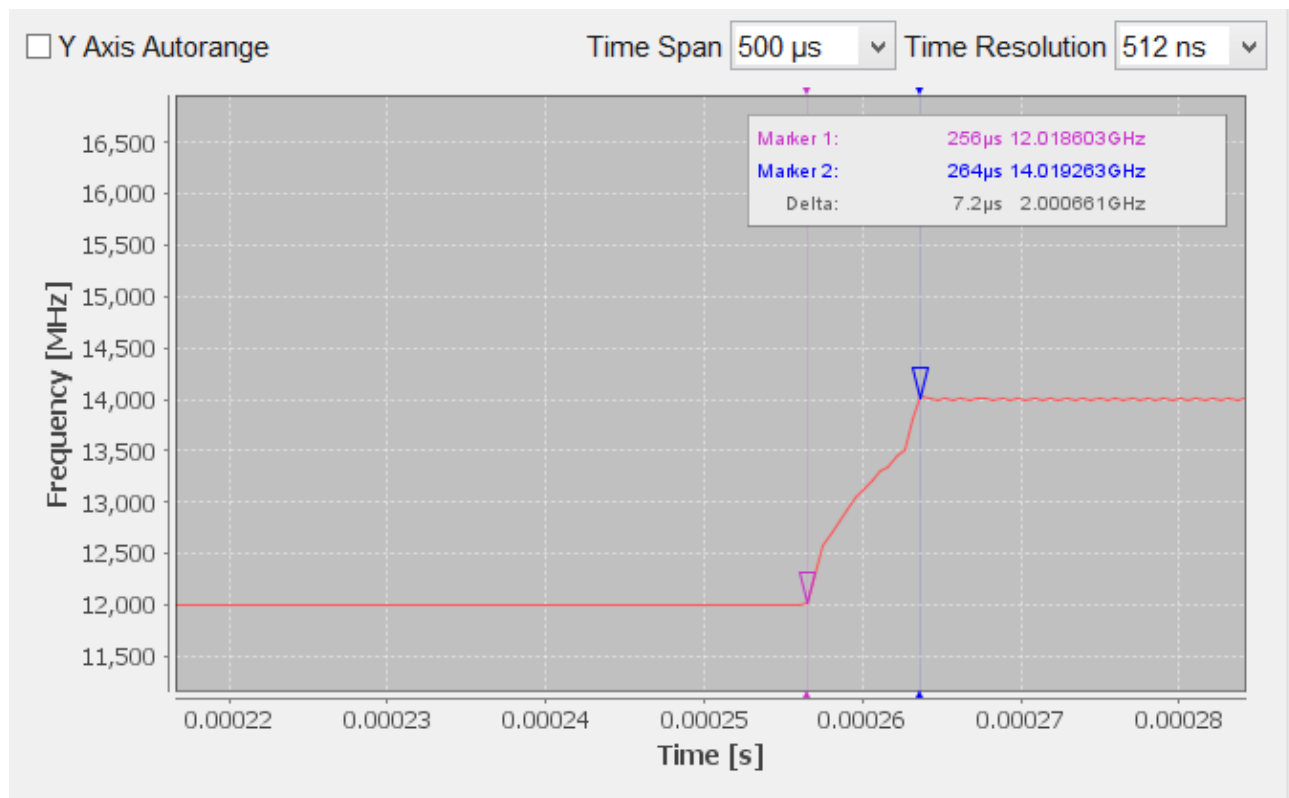
|                        |     |      |                         |
|------------------------|-----|------|-------------------------|
| Modulation depth       | 0 % | 90 % | settable                |
| Distortion (sine wave) |     | 2 %  | at 60% modulation depth |

## PERFORMANCE CURVES

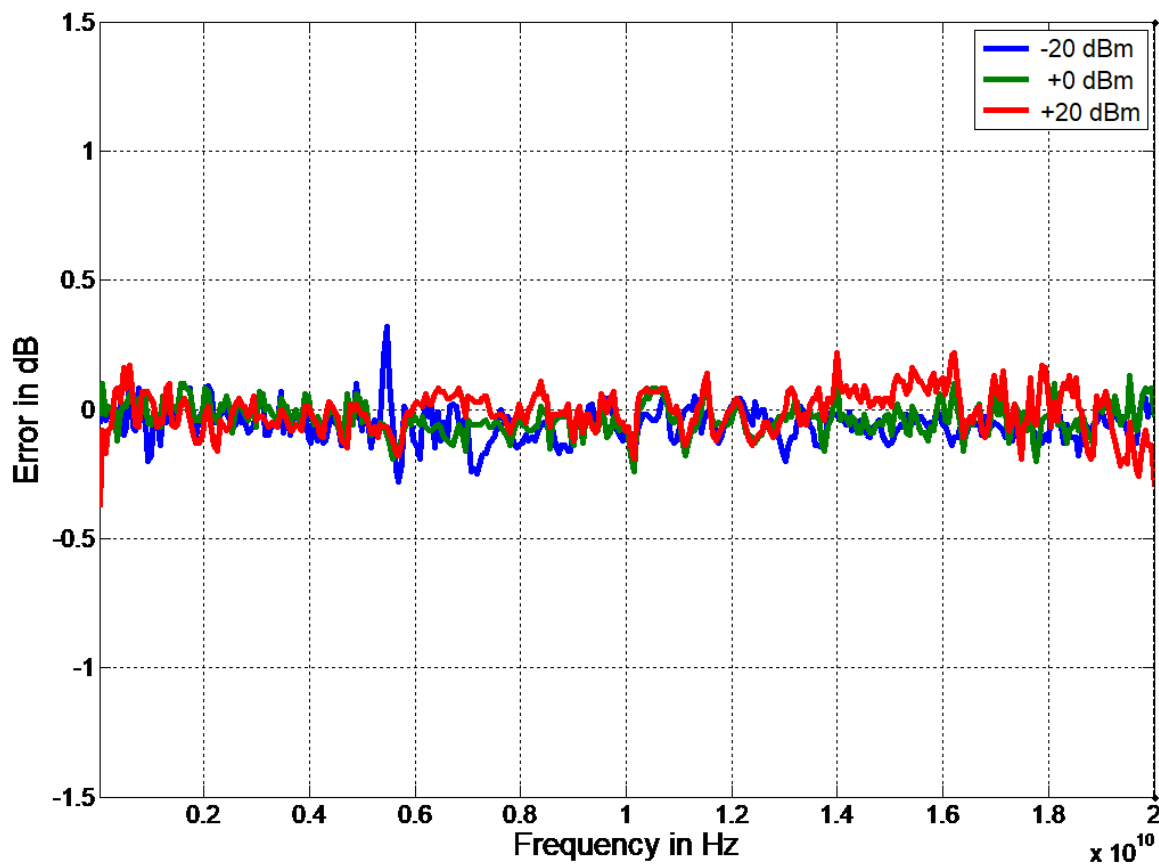
### Typical performance curves Phase Noise Performance (1 Hz to 100 MHz offset) at different frequencies

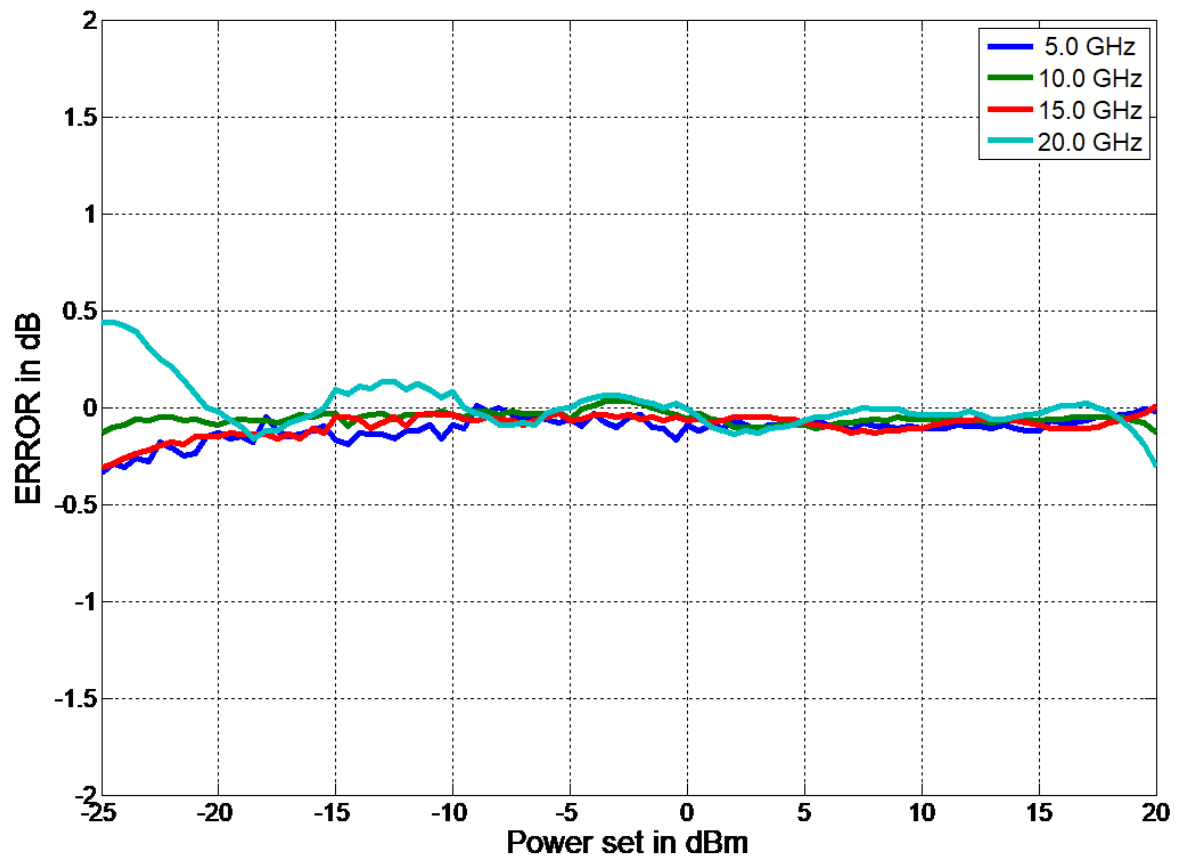


## Typical Switching transient from 12 GHz to 14 GHz step

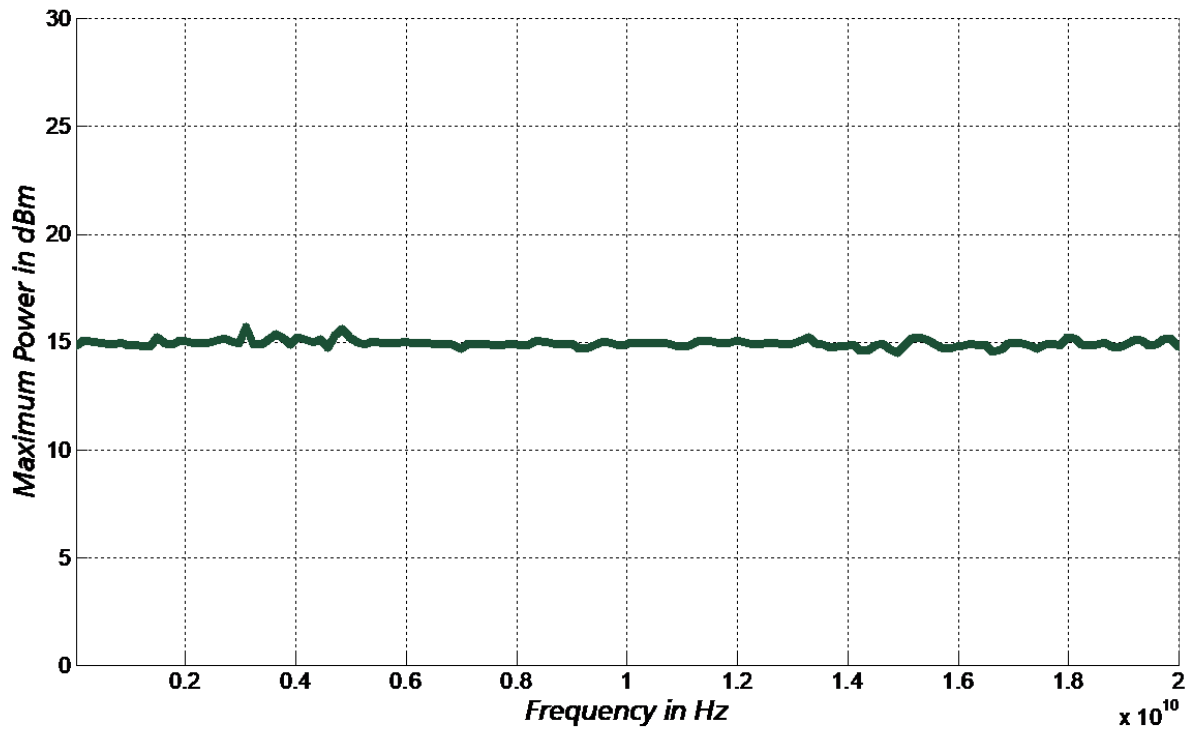


## Typical Frequency Response 0 to 20 GHz at -20, 0, and +20 dBm

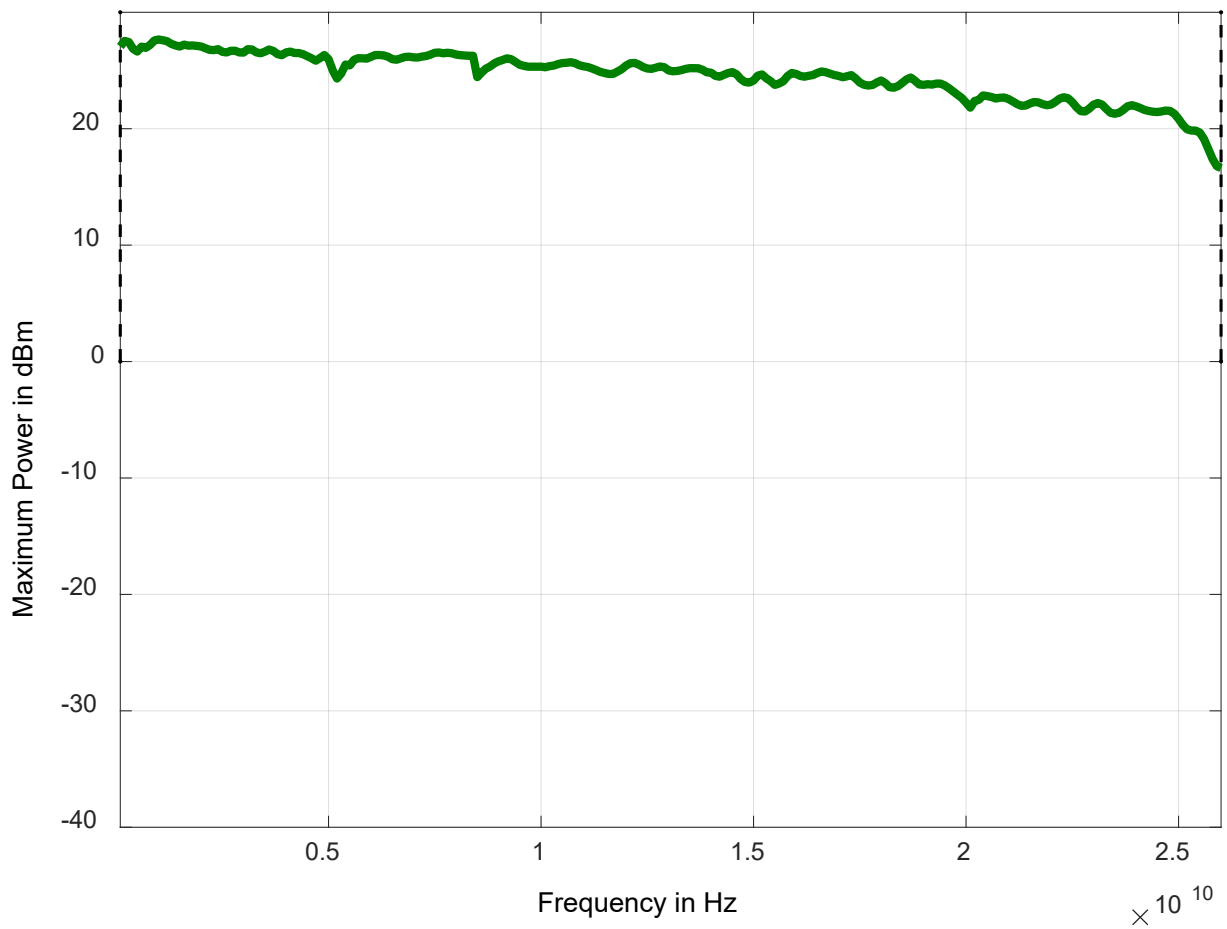




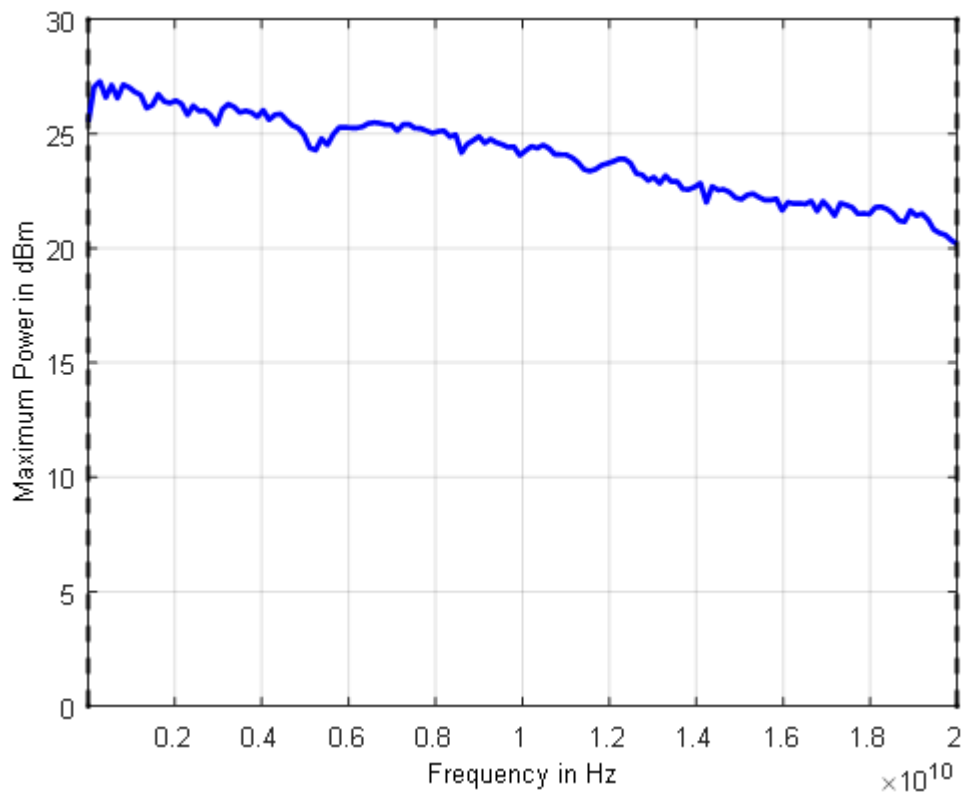
 Typical Maximum Output Power (standard)



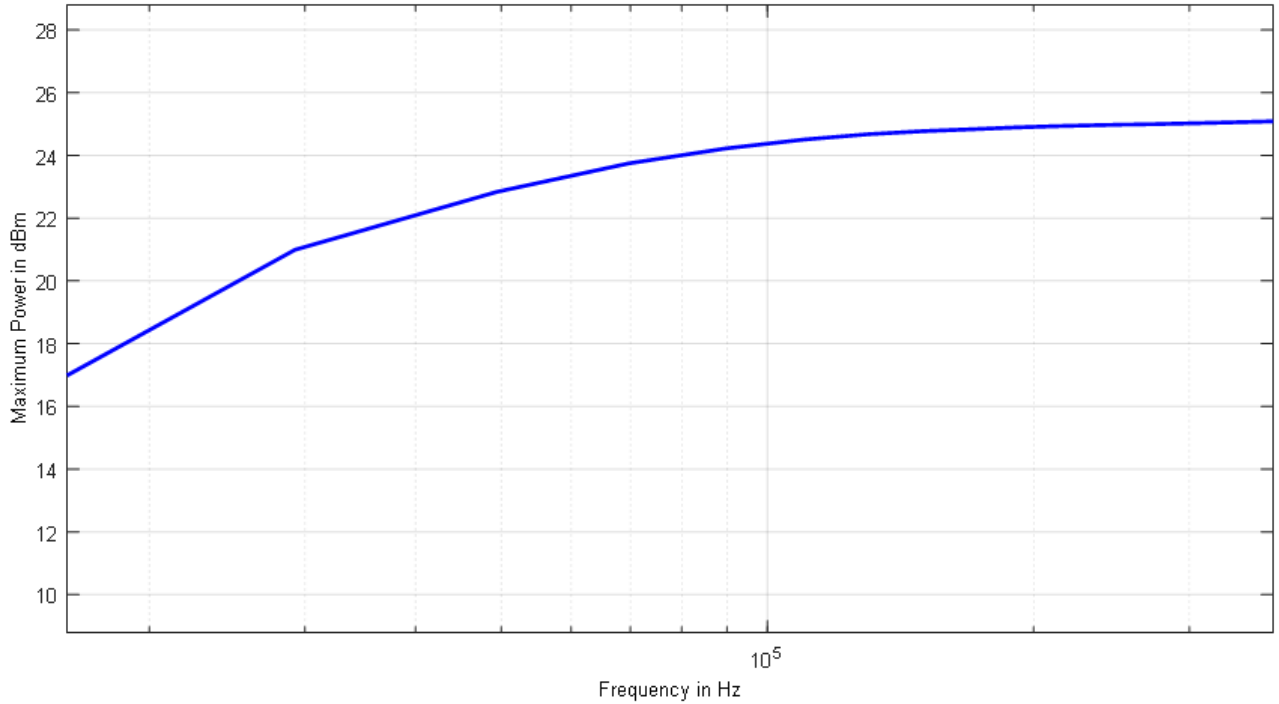
 Typical Maximum Output Power (option HP)

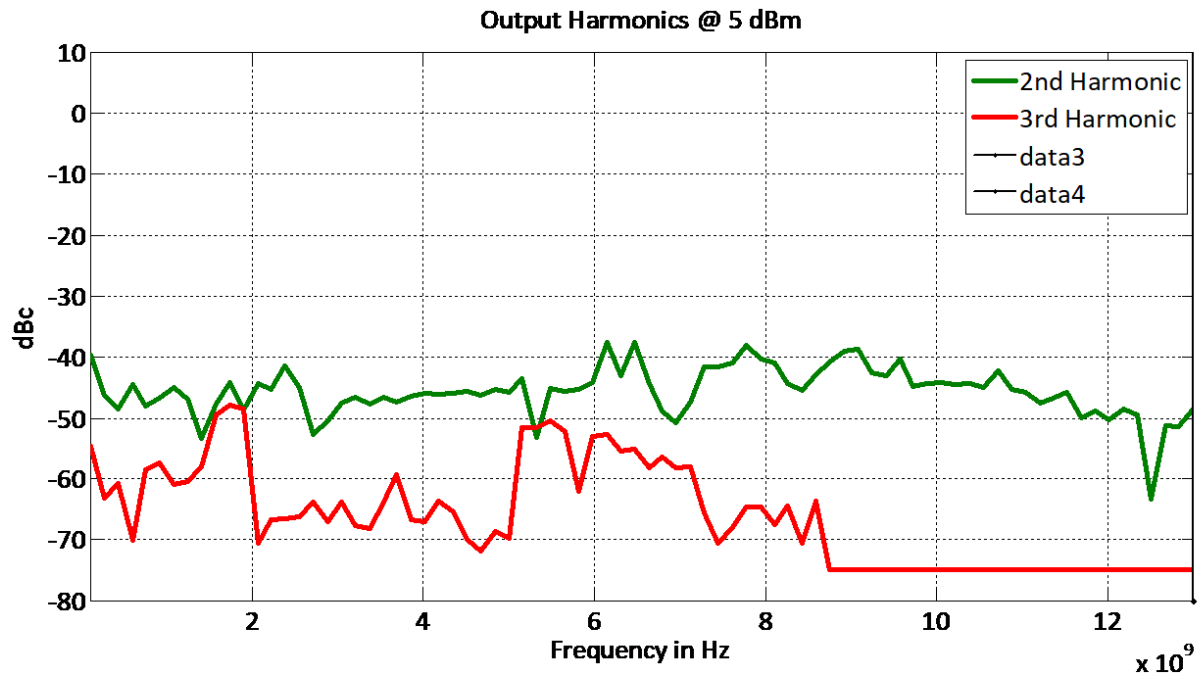


**Typical Maximum Output Power (options PE3 and HP)**

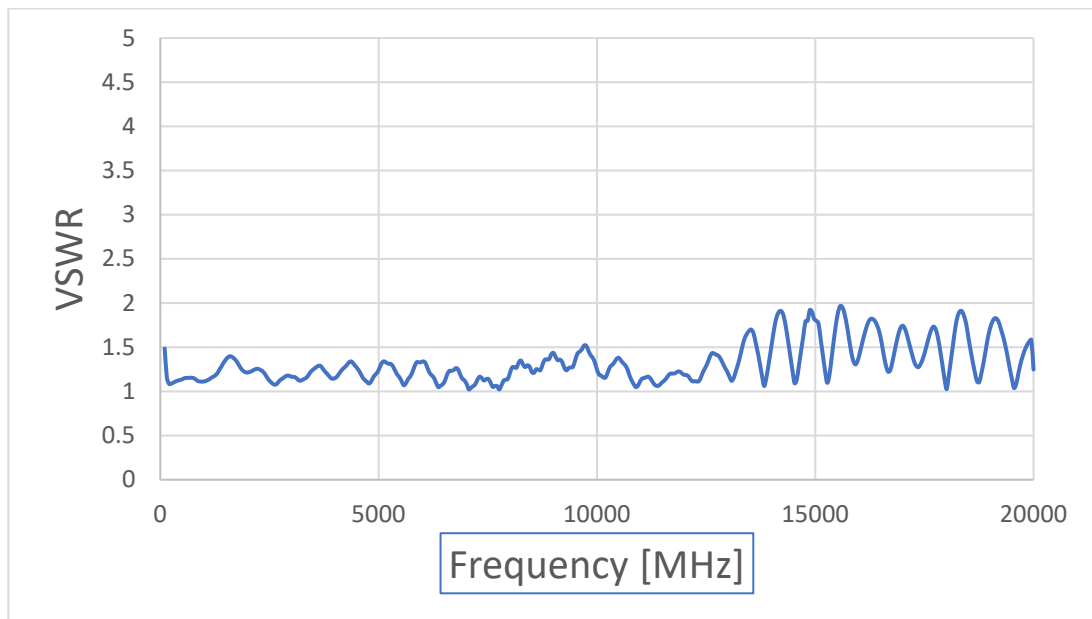


**Typical Maximum Output Power from 9 kHz to 1 MHz (options 9k)**





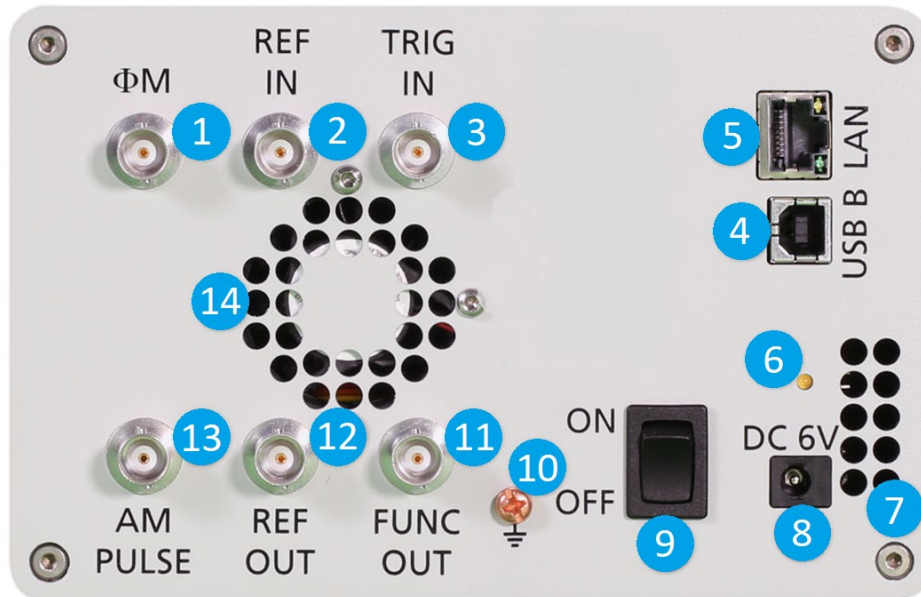
Typical VSWR (845-20)





1. **Rotary Button** The rotary button is used to change the value selected on the screen.
2. **RF 50  $\Omega$  connector** This female N- type respectively SMA connector provides the output for generator signals. The impedance is 50 ohm. The reverse power damage level is +30 dBm maximum. The maximum allowed DC level is +/- 10 V. Please check the data sheets for more details.

## Rear



1.  **$\Phi$ M** This BNC female Connector is the input for FM and PM.
2. **REF IN** This BNC female Connector is the input for the reference signal.
3. **TRIG IN** This BNC female Connector is the trigger input.
4. **USB B** The USB B connector is used to connect the device to a computer.
5. **LAN** The LAN connector is used to connect the device to a network.
6. **Battery LED** In case the device has a rechargeable battery, this LED indicates whether the battery is charged or not.
7. **Fan Holes** The air intake of the fan.
8. **Power Supply** Connect the BNC's power adaptor to this connector to supply the device with energy.
9. **ON/OFF Switch** Turns the device on or off.
10. **Ground Screw**
11. **FUNC OUT** This BNC female Connector is the output for the function signal.
12. **REF OUT** This BNC female Connector is the output for the reference signal.
13. **AM PULSE** This BNC female Connector is the input for the AM and the PULSE Modulation signal.
14. **Fan Holes** The holes by which the air is extruded.

## ORDERING INFORMATION

| HOST MODEL | PRODUCT      | DESCRIPTION                                                                                                                                                                                                                             |
|------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 845-12     | 845-12       | 12 GHz MW Signal Generator                                                                                                                                                                                                              |
| 845-20     | 845-20       | 20 GHz MW Signal Generator                                                                                                                                                                                                              |
| 845-26     | 845-26       | 26 GHz MW Signal Generator                                                                                                                                                                                                              |
| 845-12/20  | Option 9K    | Frequency range extension to 9 kHz                                                                                                                                                                                                      |
| 845-12/20  | Option PE3   | Mechanical step attenuator (12 & 20 GHz version)                                                                                                                                                                                        |
| 845-26     | Option PE3   | Mechanical step attenuator (26 GHz version)                                                                                                                                                                                             |
| 845-xx     | Option HP    | Higher output power                                                                                                                                                                                                                     |
| 845-xx     | Option FS    | Ultra-fast switching speed                                                                                                                                                                                                              |
| 845-xx     | Option B3*   | Internal rechargeable battery module                                                                                                                                                                                                    |
| 845-xx     | Option GPIB* | GPIB interface<br>                                                                                                                                    |
| 845-xx     | Option EB6   | External power bank adapter cable with voltage converter for 12 to 25 V supply<br>Required input connector: Inner / outer diameter 2.1 / 5.5 mm<br> |
| 845-xx     | Option 1URM  | 19" 1U rack-mount module<br><br><br>Dimensions 1.7 in H x 16.8 in W x 18.1 in L [42 mm H x 426 mm W x 460 mm L]                                     |
| 845-xx     | Option REAR  | Move output to rear panel                                                                                                                                                                                                               |
| 845-20 /26 | Option LO    | Remove modulation                                                                                                                                                                                                                       |
| 845-xx     | Option OEM   | OEM package                                                                                                                                                                                                                             |

## GENERAL CHARACTERISTICS

### Remote programming interfaces

Ethernet 100BaseT LAN interface,  
USB 2.0 host & device  
GPIB (IEEE-488.2,1987) with listen and talk (optional)  
Control language SCPI Version 1999.0

**Power requirements** 6.25 ± 0.2 VDC; 20 W maximum

**Mains adapter supplied:** 100-240 VAC in/ 6 V 6.0 A DC out

**Environmental** (Levels similar to MIL-PRF-28800F Class 3/4)

Environmental stress Samples of this product have been type tested to be robust against the environmental stresses of storage, transportation, and end-use; those stresses to temperature, humidity, shock, vibration, altitude, and power line conditions.

**Operating temperature range** 32 to 104 F (0 to 40 °C)

**Storage temperature range** -40 to 158 F (-40 to 70 °C)

**Operating and storage altitude** up to 15,000 feet (4600 m)



EMC complies and EMC regulations and directives for emission and immunity to interference (EN 61326-1 Industrial, EN/IEC 61326-2-1)

Safety complies with applicable Safety regulation in line with IEC/EN 61010-1

**Weight** ≤ 6 lbs (2.5 kg) net, ≤ 8 lbs (4 kg) shipping

### Dimensions

116.9 mm H x 173.6 mm W x 261.7 mm L (incl. connectors)

[4.60 in H x 6.83 in W x 10.30 in L]

**Recommended calibration cycle** 24 months