# XSA800 Series Spectrum Analyzer Specifications

All technical specifications are guaranteed when the following conditions are met, unless otherwise stated:

- The instrument has been preheated for 30 minutes before use.
- The instrument is in the calibration cycle and has been self-calibrated.

"Typical" and "nominal" for this product are defined as follows

- Typical: Refers to the performance of the product under certain conditions.
- Nominal: Refers to the approximate value under product application process.

| | | |
|---|---|---|
| Frequency | | |
| Frequency Range | XSA805（TG） | 0 to 500.000 MHz |
| | XSA810（TG） | 0 to 1.000000 GHz |
| | XSA815（TG） | 0 to 1.500000 GHz |
| Frequency Resolution | 1 Hz | |
| Frequency Span | | |
| Span Range | 0 Hz, 100 Hz to max frequency of instrument | |
| Span Uncertainty | ± span / (sweep points-1) | |
| Internal Reference Frequency | | |
| Reference Frequency | 10.000000 MHz | |
| Reference Frequency Accuracy | ±[ (days since last calibrate × freq aging rate) + temperature stability + initial accuracy ] | |
| Temperature stability | 0℃ to 50℃, reference to 25℃<br>< 0.5 ppm | |
| Aging rate | <1 ppm/year | |
| Frequency Readout Accuracy | | |
| Marker frequency resolution | span / (number of sweep points - 1) | |
| Marker frequency uncertainty | ±(frequency indication × reference frequency accuracy + 1% × span + 10% × resolution bandwidth + marker frequency resolution) | |
| Frequency Counter | | |
| Resolution | 1 Hz, 10 Hz, 100 Hz, 1 kHz | |
| Uncertainty | ±(frequency indication × reference frequency accuracy + counter resolution) | |
| Frequency Span | | |
| Range | 0 Hz, 100 Hz to maximum frequency of instrument | |
| Uncertainty | ± span / (number of sweep points - 1) | |
| SSB Phase Noise (20℃ to 30℃,fc=1 GHz) | | |
| Carrier Offset | 10 kHz | < -80 dBc/Hz |
| | 100 kHz | < -100 dBc/Hz |
| | 1 MHz | < -115dBc/Hz |
| Residual FM (20℃ to 30℃, RBW = VBW = 1 kHz) | | |
| Residual FM | < 50 Hz (nominal) | |
| Bandwidth | | |
| Resolution Bandwidth(-3dB) | 1 Hz to 1 MHz (1-3-5-10 steps by sequence) | |
| RBW accuracy | < 5%, typical | |

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| Resolution Filter Shape Factor (60 dB : 3 dB) | <5 typical | | |
| Video Bandwidth (-3 dB) | 10 Hz to 1 MHz(1-3-5-10 steps by sequence) | | |
| Resolution bandwidth (-6 dB) (EMI) | 200 Hz,9 kHz,120 kHz,1 MHz<br>200 Hz, 9 kHz, 120 kHz, 1 MHz | | |
| Amplitude and level | | | |
| Amplitude measurement range | DANL to +10 dBm, 100 kHz to 10MHz, Preamp Off<br>DANL to +20 dBm, 10 MHz to 1.5 GHz, Preamp Off | | |
| Reference Level | -80 dBm to +30 dBm, 0.1dBm by step | | |
| Preamp | 20 dB, nominal, 100 kHz to 1.5 GHz | | |
| Input Attenuator Range | XSA805（TG）<br>XSA810（TG）<br>XSA815（TG） | 0 to 40 dB, in 1 dB step | |
| Max Input DC Voltage | 50 V | | |
| Max continuous power | +20dBm, average continuous power | | |
| Max. damage level | +30 dBm（1 W） | | |
| Display Average Noise Level<br>(attenuation = 0 dB, RBW = VBW = 100 Hz, sample detector, trace average ≥ 50, 20℃ to 30℃, input impendence = 50 Ω) | | | |
| Preamp Off | 0 to 1 MHz | | -95 dBm (Typical), <-88 dBm |
| | 1 MHz to 500 MHz | | -140 dBm (Typical), <-130dBm |
| | XSA810（TG） | 500 MHz to 1 GHz | |
| | XSA815（TG） | 500 MHz to 1.5 GHz | -138 dBm (Typical), <-128dBm |
| Preamp On | 0 to 1 MHz | | -135 dBm (Typical), <-128 dBm |
| | 1 MHz to 500 MHz | | -160 dBm (Typical), <-150 dBm |
| | XSA810（TG） | 500 MHz to 1 GHz | |
| | XSA815（TG） | 500 MHz to 1.5 GHz | -158 dBm (Typical), <-148 dBm |
| Level Display | | | |
| Logarithmic level axis | 1 dB to 255 dB | | |
| Linear level axis | 0 to reference level | | |
| Number of display points | 513 | | |
| Number of traces | 5 | | |
| Trace detectors | positive-peak, negative-peak, normal, sample, RMS, voltage average | | |
| | quasi-peak | | |

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| Trace functions | | clear write, max hold, min hold, average, view, blank, trace math |
| Units of level axis | | dBm, dBμW, dBpW, dBmV, dBμV, W, V |
| Frequency response<br>(20℃ to 30℃, 30% to 70% relative humidity, input attenuation=10 dB, reference frequency=50 MHz) | | |
| Preamp Off<br>(fc≥0K) | | ±0.7 dB |
| Preamp On<br>(fc≥50 MHz) | | ±1.0 dB |
| Input Attenuation Switching Uncertainty | | |
| Setting range | | 0 dB to 40 dB, in 1 dB step |
| Switching uncertainty | | fc = 50 MHz, relative to 10 dB, 20℃ to 30℃ |
| | | ＜0.5 dB |
| Absolute Amplitude Uncertainty | | |
| Uncertainty | | fc = 50 MHz, peak detector, preamplifier off, attenuation = 10 dB, input signal level = -10dBm, 20℃ to 30℃ |
| | | ＜0.4 dB |
| RBW Switching Uncertainty | | |
| Uncertainty | | relative to 10 kHz RBW |
| | | ＜0.1 dB |
| Reference Level | | |
| Range | | -80 dBm to +30 dBm, in 1 dB step |
| Resolution | log scale | 0.01 dB |
| | linear scale | 4 digits |
| Preamplifier input signal range 0 dBm to -50 dBm | | |
| Gain | 100 kHz to 1.5 | 20 dB (nominal) |
| Level Measurement | | |
| Uncertainty | | 95% confidence level, S/N > 20 dB, RBW = VBW = 1 kHz, preamplifier off, attenuation = 10 dB, -50 dBm < input level ≤ 0 dBm, fc > 10 MHz, 20℃ to 30℃ |
| RF Input VSWR (attenuation ≥ 10 dB) | | |
| VSWR | 300 kHz to 1.5 GHz | ＜1.5 (nominal) |
| Distortion and spurious response | | |
| Second harmonic distortion | | fc ≥ 50 MHz, Preamp off, signal input -20 dBm, attenuation = 10 dB |
| | | -45 dBc |
| Third-order intermodulation | | fc ≥ 50 MHz, two -20 dBm tones at input mixer spaced by 200 kHz, attenuation = 0 dB |
| | | ＞+10 dBm |
| 1 dB Gain Compression | | |

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|---|---|---|
| 1dB compression of input mixer (P1dB) | fc ≥ 50 MHz, 0 dB RF attenuation | |
| | >0 dBm, nominal | |
| Residual response | connect 50 Ω load at input port, 0 dB input attenuation, 20℃ to 30℃ | |
| | <-90 dBm, typical | |
| Intermediate frequency | ＜ -60 dBc | |
| System related sidebands | referenced to local oscillators, referenced to A/D conversion, referenced to subharmonic of first LO, referenced to harmonic of first LO | |
| | ＜ -60 dBc | |
| Input related spurious | -30 dBm signal at input mixer | |
| | <-60 dBc | |
| Sweep | | |
| Sweep Time | Span≥10 Hz | 10 ms to 3000 s |
| | Zero Span | 20 us to 3000 s |
| Sweep time uncertainty | span ≥ 100 Hz: 5% (nominal)<br>zero span (sweep time setting value > 1 ms): 5% (nominal) | |
| Sweep Mode | Continuous, Single | |
| Trigger | | |
| Trigger source | free run, video, external | |
| External trigger level | 5 V TTL level | |
| Tracking Generator (Option) | | |
| Frequency Range | XSA805（TG） | 100 kHz to 500.000 MHz |
| | XSA810（TG） | 100 kHz to 1.000000 GHz |
| | XSA815（TG） | 100 kHz to 1.500000 GHz |
| Output power level range | -40 dBm to 0 dBm | |
| Output power level resolution | 1 dB | |
| Output flatness | relative to 50 MHz<br>±3 dB | |
| Maximum safe reverse level | Harmonic spurious | -30 dBc (Tracking generator output power = -10 dBm) |
| | Non-harmonic spurious | -40 dBc(Tracking generator output power = -10 dBm) |
| Tracking generator to input terminal | -60 dB (Tracking generator output power = 0 dBm) | |

**Input/Output**

| **RF Input** |
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|---|---|
| Impedance | 50 Ω, typical |
| Connector | N Type Female |
| **Tracking generator output** | |
| Impedance | 50 Ω, typical |
| Connector | N Type Female |
| **Internal reference** | |
| frequency | 10 MHz |
| output level | +3 dBm to +10 dBm, +8 dBm (typical) |
| Impedance | 50 Ω, typical |
| Connector | BNC female |
| **External reference** | |
| frequency | 10 MHz ± 5 ppm |
| output level | 0 dBm to + 10 dBm |
| Impedance | 50 Ω, typical |
| Connector | BNC female |
| **External Trigger Input** | |
| Impedance | 1 kΩtypical |
| Connector | BNC female |
| **Audio interface** | |
| Impedance | 30 Ω, typical |
| Connector | 3.5 mm |
| **USB Host** | |
| Connector | A Plug |
| Protocol | USB version 2.0 |
| **USB Device** | |
| Connector | B Plug |
| Protocol | version 2.0 |
| **HDMI** | |
| Connector | A Plug |
| Protocol | version 1.4 |
| **LAN** | |
| 10/100Base，RJ-45 | |
| **Display** | |
| Type | TFT LCD |
| Resolution | 1280*800 |
| Size | 9 inches |
| Color | 65536 |
| **Mass Memory** | |
| Mass memory | Flash disk (internal storage 256 MByte), USB storage device (not supplied) |
| **Power Supply** | |
| Input voltage range, AC | 100 V to 240 V |
| AC supply frequency | 50 Hz to 60 Hz |
| Power consumption | 28 W (nominal) |
| **Temperature** | |

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|---|---|
| Operating | 0 ℃ to 40 ℃ |
| Storage | -20 ℃ to 60 ℃ |
| **Humidity** | |
| 0℃ to 30℃ | ≤ 95% relative humidity |
| 30℃ to 40℃ | ≤ 75% relative humidity |
| **Altitude** | |
| operating height | up to 3,000m |
| **Appearance** | |
| Dimensions | 375 mm (Width)×185 mm (Height)×120 mm (Depth) |
| Weight | Approx. 3.7 kg (without package) |

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V1.0.1