GOOD WILL INSTRUMENT CO., LTD.
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# USG Specifications

The specifications apply when the USG is powered on for at least 30 minutes under +20˚C to +30˚C.

## USG-LF44

| | | |
|---|---|---|
| Frequency Range | 34.5 MHz to 4.4 GHz | |
| Output Power | -30 dBm to 0 dBm | in 1 dB steps |
| Internal Reference Frequency | 25 MHz , aging ±1 ppm at first year | |
| Frequency Accuracy (0 dBm Output Level) | ± 150 Hz at 100 MHz | |
| Frequency Resolution | 10 kHz | |
| Output Isolation | ≤ -75 dBc ,Output Control | On / Off |

| | |
|---|---|
| Mode Control | Fixed Frequency / Single Sweep / CW Sweep / Hopping/Power Sweep |
| Step Dwell | ≤ 1000 ms in 1* ms steps |
| Frequency Offset | -50 kHz to 50 kHz in 10 kHz steps |
| Output Flatness | -1dBm~3.5dBm typical (at 0 dBm Output) |

| | | |
|---|---|---|
| Phase noise | < -97 dBc/Hz | 10 kHz offset @ 1.0 GHz, typical -100 dBc/Hz |
| | < -107 dBc/Hz | 100 kHz offset @ 1.0 GHz, typical -110dBc/Hz |
| 2nd Harmonics | | 0 dB Attenuation |
| | ≤ -15 dBc, typical | 34.5 MHz to 2.0 GHz, fundamental |
| | ≤ -10 dBc, typical | 2.0 GHz to 3.0 GHz, fundamental |
| | ≤ -25 dBc, typical | 3.0 GHz to 4.4 GHz, fundamental |

| | | |
|---|---|---|
| 3rd Harmonics | | 0 dB Attenuation |
| | ≤ -5 dBc, typical | 34.5 MHz to 2.0 GHz, fundamental |
| | ≤ -20 dBc, typical | 2.0 GHz to 3.0 GHz, fundamental |
| | ≤ -40 dBc, typical | 3.0 GHz to 4.4 GHz, fundamental |

| | |
|---|---|
| Spurious related to Resolution settings | (Single Point Mode) Spurious related to the fundamental output |

| | | |
|---|---|---|
| ≤ -30 dBc, typical<br>Resolution < 1 MHz | ≤ -65 dBc, typical<br><br>≤ -60 dBc, typical | Resolution ≥ 1 MHz |

## USG-0103

| | | |
|---|---|---|
| Frequency Range | 100 MHz to 300 MHz | |
| Output Power | -30 dBm to 0 dBm ,in 1 dB steps | |
| Internal Reference | 25 MHz aging ±1 ppm at first year | |
| Frequency Accuracy | ± 150 Hz at 100MHz, 0 dBm Output | |
| Frequency Resolution | 10 kHz | |
| Output Isolation | ≤ -75 dBc Output Control On / Off | |
| Mode Control | Fixed Frequency / Single Sweep / CW Sweep / Hopping/power sweep | |
| Step Dwell | ≤ 1000 ms in 1* ms steps | |
| Frequency Offset | -50 kHz to 50 kHz in 10 kHz steps | |
| Output Flatness ( typical ) | -1 dBm~-2dbm, | |
| Phase noise | < -100 dBc/Hz, typical | 10 kHz offset @ 200 MHz |
| | < -110 dBc/Hz | 100 kHz offset @ 200 MHz |
| 2nd Harmonics | ≤ -45 dBc, typical | 0 dB Attenuation<br>> 100 MHz, fundamental |
| 3rd Harmonics | ≤ -7dBc, typical<br>≤ -35 dBc, typical | 0 dB Attenuation<br>≤ 150 MHz, fundamental<br>> 150 MHz, fundamental |
| Spurious related to Resolution settings (Single Point Mode) | ≤ -30 dBc, typical<br>≤ -65 dBc, typical | Resolution < 1 MHz<br>Resolution ≥ 1 MHz |
| Spurious related to the fundamental output | ≤ -60 dBc, typical | |

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# USG-0818

| | | |
|---|---|---|
| Frequency Range | 800 MHz to 1.8 GHz | |
| Output Power | -30 dBm to 0 dBm | in 1 dB steps |
| Internal Reference | 25 MHz aging ±1 ppm at first year | |
| Frequency Accuracy | ± 1.2 kHz at 800MHz, 0 dBm Output | |
| Frequency Resolution | 10 kHz | |
| Output Control | On / Off | |
| On / Off Isolation | ≤ -75 dBc | |
| Mode Control | Fixed Frequency / Single Sweep / CW Sweep / Hopping/power sweep | |
| Step Dwell | ≤ 1000 ms in 1* ms steps | |
| Frequency Offset | -50 kHz to 50 kHz in 10 kHz steps | |
| Accuracy | typical | |
| Output Flatness | -1dBm~-0.5dBm (O dBm output Level) | |
| Phase noise | < -97 dBc/Hz | 10 kHz offset @ 1.3 GHz |
| | < -102 dBc/Hz | 100 kHz offset @ 1.3 GHz |
| 2nd Harmonics | | 0 dB Attenuation |
| | ≤ -25 dBc, typical | >800 MHz, fundamental |
| 3rd Harmonics | | 0 dB Attenuation |
| | ≤ -25 dBc, typical | ≤900 MHz, fundamental |
| | ≤ -35 dBc, typical | >900 MHz, fundamental |

Spurious related to Resolution settings (Single Point Mode) Spurious related to the fundamental output

| | |
|---|---|
| ≤ -30 dBc, typical | Resolution < 1 MHz |
| ≤ -65 dBc, typical | Resolution ≥ 1 MHz |

Spurious related to the fundamental output

≤ -65 dBc, typical

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# USG-2030

| | |
|---|---|
| Frequency Range | 2.0 GHz to 3.0 GHz |
| Output Power | -30 dBm to 0 dBm , in 1 dB steps |
| Internal Reference | 25 MHz aging ±1 ppm at first year |
| Frequency Accuracy | ± 3 kHz at 2 GHz, 0 dBm Output |
| Frequency Resolution | 10 kHz |
| Output Control | On / Off |
| On / Off Isolation | ≤ -75 dBc |
| Mode Control | Fixed Frequency / Single Sweep / CW Sweep / Hopping/Power Sweep |
| Step Dwell | ≤ 1000 ms in 1* ms steps |
| Frequency Offset | -50 kHz to 50 kHz in 10 kHz steps |

| Accuracy | | |
|---|---|---|
| Output Flatness | ± 1 dB, ref. to 2500MHz | at 0 dBm Output |
| Phase noise | < -93 dBc/Hz<br>< -100 dBc/Hz | 10 kHz offset @ 2.5 GHz<br>100 kHz offset @ 2.5 GHz |
| 2nd Harmonics | ≤ -30 dBc, typical | 0 dB Attenuation<br>2.0 GHz to 3.0 GHz, fundamental |
| 3rd Harmonics | ≤ -45 dBc, typical | 0 dB Attenuation<br>2.0 GHz to 3.0 GHz, fundamental |
| Spurious related to Resolution settings (Single Point Mode) | ≤ -30 dBc, typical<br>≤ -65 dBc, typical | Resolution < 1MHz<br>Resolution ≥ 1MHz |
| Spurious related to the fundamental output | ≤ -65 dBc, typical | |

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# USG-3044

| | | |
|---|---|---|
| Frequency Range | 3.0 GHz to 4.4 GHz | |
| Output Power | -30 dBm to 0 dBm | in 1 dB steps |
| Internal Reference | 25 MHz aging ±1 ppm at first year | |
| Frequency Accuracy | ± 4.5 kHz at 3 GHz, 0 dBm Output | |
| Resolution | 10 kHz | |
| Output Control | On / Off | |
| On / Off Isolation | ≤ -75 dBc | |
| Mode Control | Fixed Frequency / Single Sweep / CW Sweep / Hopping/Power Sweep | |
| Step Dwell | ≤ 1000 ms in 1* ms steps | |
| Frequency Offset | -50 kHz to 50 kHz in 10 kHz steps | |
| Accuracy | | |
| Output Flatness | ± 2 dB, ref. to 0 dBm Output | |
| Phase noise | < -88 dBc/Hz | 10 kHz offset @ 3.7 GHz |
| | < -94 dBc/Hz | 100 kHz offset @ 3.7 GHz |
| 2nd Harmonics | ≤ -25 dBc, typical | 0 dB Attenuation 3.0 GHz to 4.4 GHz, fundamental |
| 3rd Harmonics | ≤ -40 dBc, typical | 0 dB Attenuation 3.0 GHz to 4.4 GHz, fundamental |
| Spurious related to Resolution settings (Single Point Mode) | ≤ -30 dBc, typical | Resolution < 1MHz |
| | ≤ -65 dBc, typical | Resolution ≥ 1MHz |
| Spurious related to the fundamental output | ≤ -65 dBc, typical | |

*: Minimum step depends on the computer being used. This min. step will be automatically adjusted by the PC software. 1ms is achieved on a faster system.

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# Common Specifications

| | |
|---|---|
| Software for PC: | |
| a. Primary RF supports operating system: Windows 2000/XP/Vista/7/8 | |
| b. Java USG Control Panel: Windows 2000/XP/Vista/7/8 Linux/OS X | |
| Software for mobile device: | |
| For Android 4.0 and higher with OTG* | |
| Interface | USB 2.0 |
| USB Connector Type | Mini-B |
| Supply Voltage | 5V nominal |
| RF Connector Type | N-type male |
| Impedance | 50 ohm nominal |
| Output VSWR | < 1.5:1 ,Output level @ -30dBm |
| Max. DC voltage | +/-25VDC |
| Max. Reverse Power | +30dBm |

*Warning: Some Android devices with OTG support cannot run the USG app due to the OTG driver modifications by vendors.