Spectrum Analyzers

Compact Design with High Performance
Pioneering 3 GHz/8 GHz Spectrum Analyzers are Now Available!

U3741/3751
The U3741/3751 portable spectrum analyzer supports a great range of applications, from use on production lines to system installation and maintenance. Its digital IF enables dramatic improvements in power measurement accuracy for digitally modulated signals. Moreover, the U3741/3751 provides twice the throughput of its predecessor. A light and compact 3 GHz/8 GHz spectrum analyzer, the U3741/3751 provides basic performance reliably and at a low cost.

- Better measuring speed due to high-speed processing (twice as fast as its predecessor)
- Dramatically improved power measurement accuracy for digitally modulated signals
- Built-in 3 GHz/8 GHz pre-amp standard
- Average display noise level: -155 dBm/Hz@1 GHz, pre-amp ON
- Tracking generator covering a frequency range of 100 kHz to 3 GHz
- Option available for measurement of phase noise characteristics
- Lightweight and compact design, with a maximum weight of only 5.6 kg
- Continuous operation of up to 2.5 hours with the battery pack

U3741/3751 Web Demonstration
Please access to the [http://www.advantest.co.jp/en-index.shtml](http://www.advantest.co.jp/en-index.shtml) and click on the following links.
### Mobility

#### Option Guide

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1) The options of 50 Ω series and 75 Ω series cannot be installed simultaneously.  2) OPT.70 cannot be installed simultaneously with OPT.53/54.  3) One must be selected from OPT.76/77.
**Compact Design with High Performance**

**5-minute warm-up time**

With the U3741/3751, warm-up time has been reduced to a scant 5 minutes (at an ambient temperature of 20 to 30°C). This shortened period virtually eliminates pre-warming time as a consideration, and permits quick and accurate measurement.

**High throughput**

This spectrum analyzer delivers data transfer speed superior to that of its predecessor. While the previous model delivered 875 ms, the U3741/3751 boasts a speed of 350 ms: double the system throughput\(^*2\) (using the GPIB interface)\(^*3\). This faster speed contributes to a significant reduction to cost of test on production lines and in similar applications.

**Improvements in overall accuracy**

Digitized IF sections and innovative circuit technology dramatically improve absolute power measurement accuracy.

\(\pm 0.8 \text{ dB (10 MHz to 3 GHz: U3741/3751)}\)

\(\pm 1.0 \text{ dB (3 to 8 GHz: U3751)}\)

**Standard USB (1.1) interface**

Screenshots in BMP or PNG format can easily be sent via USB external memory. Users can easily store data, and easily paste measurement data into reports.

**Up to 2.5 hours\(^*1\) of nonstop battery-driven operation**

The spectrum analyzer uses one of three power systems: AC (100 V/200 V), DC (+11 V to +17 V), or the battery pack. This flexibility enables measurement in a variety of applications, whether in the factory or in the field.

**Compact design**

At about half the size of its predecessor, this spectrum analyzer offers a compact design while maintaining the same level of functionality. Its form factor gives it portability, enabling it to be used anywhere.

**Extensive array of measurement functions**

Measurement functions include Channel Power, Total Power, Avg Power, OBW, ACP, Spurious measurement, Harmonics measurement, IM measurement, Noise/Hz calculation functions, multi-marker (10 markers), delta marker, peak marker functions, a channel setting function, and a 3-trace simultaneous sampling function.

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\(1\): Typical value at room temperature, without options

\(2\): Twice that of its predecessor

\(3\): Sample case where the frequency and span are specified, and the channel power measurement result is transferred
RMS Average, essential for power measurement
Power tends to be spread over a wide frequency range, and the peak factor tends to be higher in digital modulation, with its expanded communication capacity. The U3741/3751 allows precise power measurements by determining the effective values (RMS values) from instantaneous power values obtained in high-speed sampling and translating them into a power spectrum. This method also enables measurement reproducibility of 0.01 dB in power measurement of digitally modulated signals.

Pre-Amp covering the 3 GHz/8 GHz bandwidth
The U3741/3751 contains as standard a pre-amp that covers all frequency bands. In the analysis of faint signals, its input sensitivity can be equivalent to that of high-end models. Also, it effectively compensates for the loss from the antenna when measuring radio signals in an outdoor environment.

Built-in frequency counter with 1-Hz resolution
Frequency can be accurately measured by simply positioning the cursor on the target spectrum selected from multiple spectral lines. The U3741/3751 is indispensable for measuring the carrier wave frequency in a general multi-carrier system.

USER keys
An arbitrary key can be selected from the hierarchical function keys and assigned to a USER function. Users can thus configure their own, original setup for operations by assigning frequently used functions to specific software keys.

Zoom function
The measuring window and F-F mode can facilitate analysis of a specific signal in broadband measurement. Also, RBW can be changed independently, enabling high-speed measurement of the target signal in both broadband and narrowband. A variety of other signal analysis functions are also available, including those in F-T mode or T-T mode.

Spectrum emission mask function
Using tools such as a spectrum mask and limit line to judge PASS/FAIL is effective at improving production line throughput for digital appliances. Using the spectrum emission mask (SEM) function can facilitate measurement for standards such as wireless LAN.
User-friendly and Convenient Functions

Gated Sweep function
A radar or TDMA communication system controls its output transmission by turning the power on/off intermittently. To monitor the power spectrum during transmission, the Gated Sweep function is effective at analyzing the spectrum only when the signal is present and over only the area chosen. This function also includes an IF trigger that does not require synchronized signals.

Ideal for remote operation/monitoring via a LAN
This spectrum analyzer is equipped with a 10/100BASE-T LAN port as standard, so it can be operated remotely from an external PC. It can be installed in an unattended radio transmission station, and remotely operated and monitored from another station.

Searching for the location of a fault in a coaxial cable
When used with its tracking generator option and the sample software for an external PC, the U3741/3751 can measure the distance to the failure point (open/short) in a coaxial cable. This application permits this distance to be measured from one end of the coaxial cable.
**Extensive Array of Options**

**High-Purity Spectrum Analysis  OPT.70**

Phase noise measurement is indispensable to evaluation of the characteristics of high-frequency oscillation circuits or modules. The high-purity spectrum analysis option offered with the U3741/3751 can improve the phase noise measurement performance of the spectrum analyzer. Because the performance can be selected, selecting the most suitable spectrum analyzer for the device under test (DUT) is simple. At the same time, the added resolution bandwidth of 30 Hz enables reduction of the display average noise level and analysis in a high dynamic range.

**EMC Filter  OPT.28**

Option 28 adds 6 dB RBW CISPR bandwidths for EMI measurement of 200 Hz, 9 kHz, 120 kHz, and 1 MHz. A broadband sweep by the spectrum analyzer is very effective at measuring noise emitted from electrical devices. Installing OPT.28 allows measurement in CISPR-specified bandwidths. It enables simple, fast measurement using the Positive peak detector and Max Hold, which makes it effective at compensating for emitted noise. It guarantees an impulse bandwidth accuracy of 1 MHz. This capability conforms to the standard for noise measurement of 1 GHz or above.

**2 Channel Input  OPT.10 (50 Ω)/11 (75 Ω)**

With the 2 channel input option (OPT.10/OPT.11), you can set unique measurement conditions respectively for the two independent RF inputs. By synchronized sweep, respective timing measurement can be performed even at different frequencies (when sweep time is the same). Moreover, it is possible to coincide the start of different measurements by using the synchronous trigger. Unique measurement methods which are not seen in the conventional spectrum analyzers, such as reduced measuring time due to the 2 channels and space-saving at production line are offered.
**Extensive Array of Options and Accessories**

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**Tracking Generator OPT.75/76/77**

Generates synchronized signals for frequency sweeps by the spectrum analyzer.

- **OPT.75**
  - Output impedance: 75 Ω
  - Output frequency range: 100 kHz to 2.2 GHz

- **OPT.76**
  - Output impedance: 50 Ω
  - Output frequency range: 100 kHz to 3 GHz

- **OPT.77**
  - Output impedance: 50 Ω
  - Output frequency range: 100 kHz to 6 GHz

**Function for return loss measurement**

The SWR bridge can be used to measure reflection characteristics of an antenna or filter. It can determine the return loss and evaluate the VSWR.

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**Time-domain analysis OPT.53 (1 CH)/54 (2 CH)**

At center frequency, the signal within measurement bandwidth (BW) is digitized, and basic time-domain analysis functions including time vs. frequency, time vs. phase, time vs. power, FFT analysis are offered. The measurement bandwidth is 100Hz to 3 MHz, and the number of IQ waveform record samples are 1M samples (I/Q). The resolution equivalent to 1Hz RBW is realized in FFT analysis.

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**Accessories**

Many accessories are available, including an easy-to-carry transit case and a battery pack, useful for field work.
## Specifications

### Frequency

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>U3741: 9 kHz to 3 GHz, 9 kHz to 2.2 GHz (with the OPT.15 installed)</th>
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<tbody>
<tr>
<td>Pre-Amp:</td>
<td>10 MHz to 3 GHz, 10 MHz to 2.2 GHz (with the OPT.15 installed)</td>
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</table>

Synchronization frequency range:
- U3741: 9 kHz to 3 GHz
- U3751: 9 kHz to 8 GHz

Frequency reading accuracy:

- ± (marker read value x frequency reference accuracy + span x span accuracy + residual FM)

Frequency reference stability:

- Aging rate: ±2 x 10^-6/year
- Temperature stability: ±2.5 x 10^-6 (0 to 50°C)

Resolution bandwidth:

- U3741: 100 Hz to 1 MHz (1 to 3 steps)
- U3751: 100 Hz to 3 MHz (1 to 3 steps)

Accuracy:

- ± (counter read value x frequency reference accuracy + residual FM + 1 LSB)

Display bandwidth range:

- 10 Hz to 3 MHz (1 to 3 steps)

### Sweep

Sweep time:

- Setting range: 20 ms to 1000 s (spectrum mode)
- 50 μs to 1000 s (zero span)

Accuracy:

- < ±2% (zero span)

Sweep mode:

- Continuous, single, gated

Trigger function:

- Free run, video, external, IF

### Amplitude range

Measurement range:

- Displayed average noise level to +30 dBm
- Displayed average noise level to 134 dBµV (with the OPT.15 installed)

Maximum safe input level:

- Attenuator > 10 dB
- Pre-Amp OFF: +30 dBm, 134 dBµV (with the OPT.15 installed)
- Pre-Amp ON: +13 dBm, 120 dBµV (with the OPT.15 installed)
- U3741: ±50 VDC max.
- U3751: ±15 VDC max.

Input attenuator range:

- 0 to 50 dB (10 dB steps)

Display range:

- 100/50/20/10/5 dB, linear

Scale unit:

- dBm, dBµV, dBµVemf, dBpW, W, V

Reference level setting range:

- -140 to +40 dBm
- -31.2 to 148.8 dBµV (with the OPT.15 installed)

Detection mode:

- Normal, Positive peak, Negative peak, Sample, RMS, and Average

## Amplitude accuracy

### Calibration signal

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<tr>
<th>Frequency</th>
<th>Level</th>
<th>Accuracy</th>
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<td>20 MHz</td>
<td>-20 dBm (75 Ω, with the OPT.15 installed)</td>
<td>±0.3 dB, ±0.4 dB (with the OPT.15 installed)</td>
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</tbody>
</table>

Scale display accuracy

- ±0.5 dB/10 dB, ±0.5 dB/80 dB, ±0.2 dB/1 dB

Overall amplitude accuracy:

- After calibration, with the pre-amp OFF, and at a temperature ranging from 20 to 30°C

U3741:

- Reference level 0 dBm,
  - input signal level -10 to -50 dBm
  - ±1.0 dB (9 kHz to 3 GHz)
  - ±0.8 dB (10 MHz to 3 GHz)

With the OPT.15 installed:

- Reference level 108.8 dBµV
  - Input signal level 98.8 to 58.8 dBµV
  - ±2.1 dB (9 kHz to 2.2 GHz)
  - ±0.9 dB (10 MHz to 2.2 GHz)

U3751:

- Reference level 0 dBm,
  - input signal level -10 to -50 dBm
  - Image suppression OFF
  - ±1.5 dB (9 kHz to 10 MHz)
  - ±0.8 dB (10 MHz to 3.1 GHz)
  - ±1.0 dB (3.1 GHz to 8 GHz)

### Dynamic range

Displayed average noise level:

- Reference level < -45 dBm (63.8 dBµV, with the OPT.15 installed)
- U3741:
  - Frequency 10 MHz to 3 GHz
  - Pre-Amp OFF: -123 dBm + 2f (GHz) dB (f < 2.5 GHz)
  - -123 dBm + 2.5f (GHz) dB (f ≥ 2.5 GHz)
  - -12 dBµV + 2f (GHz) dB (f ≤ 2.2 GHz, with the OPT.15 installed)
  - Pre-Amp ON: -138 dBm + 3f (GHz) dB
    - -27 dBµV + 3f (GHz) dB (f ≥ 2.2 GHz, with the OPT.15 installed)

U3751:

- Frequency 10 MHz to 8 GHz
- Pre-Amp OFF: -123 dBm + 2f (GHz) dB (f < 3.1 GHz, band 0)
  - -122 dBm + 1f (GHz) dB (f ≥ 3 GHz, band 1)
  - Pre-Amp ON: -138 dBm + 3f (GHz) dB (f < 3.1 GHz, band 0)
    - -139 dBm + 1.3f (GHz) dB (f ≥ 3 GHz, band 1)
- 1 dB gain compression
  - Frequency > 20 MHz
  - U3741:
    - Pre-Amp OFF: > -5 dBm
    - > 82 dBµV (with the OPT.15 installed)
  - Pre-Amp ON: > -5 dBm
  - > 102 dBµV (with the OPT.15 installed)

U3751:

- Frequency > 20 MHz
  - Pre-Amp OFF: > -8 dBm
  - > 82 dBµV (with the OPT.15 installed)

Second harmonic distortion

- U3741:
  - < -70 dBc (Pre-Amp OFF, Frequency > 20 MHz, Mixer input level -30 dBm (77 dBµV, with the OPT.15 installed))
  - < -70 dBc (Pre-Amp OFF, Frequency > 200 MHz, Mixer input level -40 dBm)

U3751:

- < -75 dBc typ. (Pre-Amp OFF, Frequency > 300 MHz, Mixer input level -30 dBm)

Third order intermodulation distortion

- U3741:
  - < -60 dBc (Pre-Amp OFF, Mixer input level -20 dBm (88.8 dBµV, with the OPT.15 installed), Frequency > 10 MHz, 2 signal separation > 200 kHz)

U3751:

- < -50 dBc (Pre-Amp OFF, Mixer input level -20 dBm, Frequency 10 MHz to 8 GHz, 2 signal separation > 200 kHz)
### Image/multiple/out of band response

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<th>Response</th>
<th>Notes</th>
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<td>&lt; -60 dBc</td>
<td>(Mixer input level -20 dBm (88.8 dBµV, with the OPT.15 installed))</td>
</tr>
<tr>
<td>U3751</td>
<td>&lt; -60 dBc</td>
<td>(Mixer input level -30 dBm, Image suppression ON)</td>
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### Residual response

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<th>Response</th>
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<td>U3741</td>
<td>&lt; -90 dBm</td>
<td>(Frequency &gt; 1 MHz, Pre-Amp OFF)</td>
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<td>U3751</td>
<td>&lt; -80 dBm</td>
<td>(Frequency 10 MHz to 8 GHz, Pre-Amp OFF)</td>
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### Inputs/outputs

**RF input**
- **Connector:** N-type female
- **Impedance:** 75 Ω (nominal, with the OPT.15 installed)
- **VSWR:** Input attenuator ≥ 10 dB

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<tr>
<th>Model</th>
<th>Response</th>
<th>Notes</th>
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<td>&lt; 1.5 : 1</td>
<td>(10 MHz ≤ Frequency ≤ 3.0 GHz)</td>
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<tr>
<td>U3751</td>
<td>&lt; 1.7 : 1</td>
<td>(Frequency &gt; 3.0 GHz)</td>
</tr>
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</table>

**Calibration signal output**
- **Connector:** BNC female
- **Impedance:** 75 Ω (nominal, with the OPT.15 installed)
- **Frequency:** 20 MHz
- **Level:** -10 dB

**Frequency reference input**
- **Connector:** BNC female
- **Impedance:** 75 Ω (nominal)
- **Frequency (MHz):** 1, 1.544, 2.048, 5, 10, 12.8, 13, 13.824, 14.4, 15.36, 15.4, 16.8, 19.2, 19.44, 19.6608, 19.68, 19.8, 20, 26
- **Level:** 0 to +16 dBm

**External trigger input**
- **Connector:** BNC female
- **Impedance:** 10 kΩ (nominal), DC coupling
- **Level:** 0 to +5 V

**21.4 MHz IF output**
- **Connector:** BNC female
- **Impedance:** 75 Ω (nominal)
- **Level:** Approx. mixer input level + 10 dB

**Battery mount**
- **Connector:** AntonBauer QR mount

### OPT.10/11  2 Channel Input (50 Ω/75 Ω)

**Cross talk between input channels (between RF input 1 and RF input 2):**
- < -90 dBc (Input level: -10 dBm (OPT.10)/98.8 dBµV (OPT.11), Input attenuator 0 dB, Preamplifier off)

**RF input 2**
- **Connector:** N type female
- **Impedance (nominal):** 50 Ω (OPT.10)/75 Ω (OPT.11)
- **VSWR:** < 1.5 : 1 (Input attenuator > 10 dB)

**External trigger input:** An external trigger input can be selected as a trigger input of RF input 2 when installing the OPT.10/11. The input connector is only 1 system.

**21.4 MHz IF output:** Only IF output which supports RF input 1, when installing the OPT.10/11.

### OPT.20 High-Stability Frequency Reference Source

**Frequency reference stability**
- **Aging rate:** ±2 x 10^-8/day
- **Warm-up drift:** ±5 x 10^-8 (+25°C, 10 minutes after power-on)
- **Temperature stability:** ±5 x 10^-8 (0 to +40°C, with reference to 25°C)

### OPT.28 EMC Filter

**6 dB bandwidth:** 200 Hz, 9 kHz, 120 kHz, 1 MHz

**Battery mount**
- **Connector:** XLR-4
- **Voltage range:** +11 to +17 V

**GPIB:** IEEE-488 bus connector

**USB:** USB 1.1

**Video output connector:** D-sub15 pin female

**LAN connector:** RJ45 type, 10/100 base-T

**Audio output:** Small monophonic jack

**OPT.53/54 Time-Domain Analysis (1 ch/2 ch)**

**RF range:** Follows the U3741/3751.

**RF amplitude range:** Follows the dynamic range of the U3741/3751.

**Wave recording method:** I/Q vector time waveform

**Measuring bandwidth (BW):** 100 Hz to 3 MHz (1 to 3 steps)

**IQ sampling rate:** 713 Hz (BW 100 Hz) to 21.4 MHz (BW 3 MHz)

**IQ waveform recording time:** 49 msec (BW 3 MHz) to 1000 sec (BW 100 Hz)

**Number of IQ waveform recording samples:** 1 M samples (I/Q)

1) The noise level follows the dynamic range of the U3741/3751.
OPT.70 High-Purity Spectrum Analysis

Frequency span
Range: 1 kHz to Full, zero span
Accuracy: < ±1%

Resolution bandwidth
Range: U3741: 30 Hz to 1 MHz (1 to 3 steps) U3751: 30 Hz to 3 MHz (1 to 3 steps)
Accuracy: < ±2.2%

Spectrum purity:
≤ -98 dBc/Hz (offset 10 kHz, span ≤ 1 MHz) ≤ -102 dBc/Hz (Typical)

Displayed average noise level: Reference level < -45 dBm,
Resolution bandwidth 30 Hz
U3741:
Pre-Amp OFF: -126 dBm + 2f (GHz) dB (f < 2.5 GHz)
-126 dBm + 2.5f (GHz) dB (f ≥ 2.5 GHz)
Pre-Amp ON: -141 dBm + 3f (GHz) dB
U3751:
Pre-Amp OFF: -126 dBm + 2f (GHz) dB (f ≤ 3.1 GHz, band 0)
-125 dBm + 1f (GHz) dB (f ≥ 3 GHz, band 1)
Pre-Amp ON: -141 dBm + 3f (GHz) dB (f ≤ 3.1 GHz, band 0)
-142 dBm + 1.3f (GHz) dB (f ≥ 3 GHz, band 1)

OPT.75 Tracking Generator (75 Ω, 2.2 GHz)

Frequency range: 100 kHz to 2.2 GHz
Output level range: 107 to 47 dBµV (0.5 dB steps)
Output level accuracy: ±0.5 dB (20 MHz, 97 dBµV, +20 to +30°C)
Output level flatness: Using 20 MHz and 97 dBµV as a reference
≤ 1.0 dB (1 MHz to 1 GHz)
≤ 1.5 dB (100 kHz to 2.2 GHz)
TG leakage: < 31 dBµV (Input attenuator 0 dB)
VSWR: ≤ 2.0 : 1 (Output level ≤ 97 dBµV)
Maximum allowable level: 117 dBµV, ±10 VDC

OPT.76 Tracking Generator (50 Ω, 3 GHz)

Frequency range: 100 kHz to 3 GHz
Output level range: 0 to -60 dBm (0.5 dB steps)
Output level accuracy: ±0.5 dB (20 MHz, -10 dBm, +20 to +30°C)
Output level flatness: Using 20 MHz and -10 dBm as a reference
≤ 1.0 dB (1 MHz to 1 GHz)
≤ 1.5 dB (100 kHz to 3 GHz)
TG leakage: < -80 dBm (Input attenuator 0 dB)
Output impedance: 50 Ω (nominal)
VSWR: ≤ 2.0 : 1 (Output level ≤ -10 dBm)
Maximum allowable level: +10 dBm, ±10 VDC

OPT.77 Tracking Generator (50 Ω, 6 GHz)  

Frequency range: 100 kHz to 6 GHz
Output level range: 0 to -30 dBm (0.5 dB steps)
Output level accuracy: ≤ 0.5 dB (20 MHz, -10 dBm, +20 to +30°C)
Output level flatness: 20 MHz on -10 dBm criterion, at +20 to +30°C
≤ 1 dB (1 MHz to 1 GHz)
≤ 1.5 dB (100 kHz to 3.1 GHz)
≤ 2.0 dB (100 kHz to 6 GHz)
TG leakage: < -80 dBm (Input attenuator: 0 dB)
Output impedance: 50 Ω (nominal)
VSWR: ≤ 2.0 : 1 (Output level ≤ -10 dBm)
Maximum allowable level: +10 dBm, ±10 VDC

※2) The OPT.77 is not allowed to be installed on the U3741.

Please refer to product manual for complete system specifications.
Specifications may change without notification.

OPT.70 High-Purity Spectrum Analysis

Frequency span
Range: 1 kHz to Full, zero span
Accuracy: < ±1%

Resolution bandwidth
Range: U3741: 30 Hz to 1 MHz (1 to 3 steps) U3751: 30 Hz to 3 MHz (1 to 3 steps)
Accuracy: < ±2.2%

Spectrum purity:
≤ -98 dBc/Hz (offset 10 kHz, span ≤ 1 MHz) ≤ -102 dBc/Hz (Typical)

Displayed average noise level: Reference level < -45 dBm,
Resolution bandwidth 30 Hz
U3741:
Pre-Amp OFF: -126 dBm + 2f (GHz) dB (f < 2.5 GHz)
-126 dBm + 2.5f (GHz) dB (f ≥ 2.5 GHz)
Pre-Amp ON: -141 dBm + 3f (GHz) dB
U3751:
Pre-Amp OFF: -126 dBm + 2f (GHz) dB (f ≤ 3.1 GHz, band 0)
-125 dBm + 1f (GHz) dB (f ≥ 3 GHz, band 1)
Pre-Amp ON: -141 dBm + 3f (GHz) dB (f ≤ 3.1 GHz, band 0)
-142 dBm + 1.3f (GHz) dB (f ≥ 3 GHz, band 1)

OPT.75 Tracking Generator (75 Ω, 2.2 GHz)

Frequency range: 100 kHz to 2.2 GHz
Output level range: 107 to 47 dBµV (0.5 dB steps)
Output level accuracy: ±0.5 dB (20 MHz, 97 dBµV, +20 to +30°C)
Output level flatness: Using 20 MHz and 97 dBµV as a reference
≤ 1.0 dB (1 MHz to 1 GHz)
≤ 1.5 dB (100 kHz to 2.2 GHz)
TG leakage: < 31 dBµV (Input attenuator 0 dB)
VSWR: ≤ 2.0 : 1 (Output level ≤ 97 dBµV)
Maximum allowable level: 117 dBµV, ±10 VDC

OPT.76 Tracking Generator (50 Ω, 3 GHz)

Frequency range: 100 kHz to 3 GHz
Output level range: 0 to -60 dBm (0.5 dB steps)
Output level accuracy: ±0.5 dB (20 MHz, -10 dBm, +20 to +30°C)
Output level flatness: Using 20 MHz and -10 dBm as a reference
≤ 1.0 dB (1 MHz to 1 GHz)
≤ 1.5 dB (100 kHz to 3 GHz)
TG leakage: < -80 dBm (Input attenuator 0 dB)
Output impedance: 50 Ω (nominal)
VSWR: ≤ 2.0 : 1 (Output level ≤ -10 dBm)
Maximum allowable level: +10 dBm, ±10 VDC

OPT.77 Tracking Generator (50 Ω, 6 GHz)  

Frequency range: 100 kHz to 6 GHz
Output level range: 0 to -30 dBm (0.5 dB steps)
Output level accuracy: ≤ 0.5 dB (20 MHz, -10 dBm, +20 to +30°C)
Output level flatness: 20 MHz on -10 dBm criterion, at +20 to +30°C
≤ 1 dB (1 MHz to 1 GHz)
≤ 1.5 dB (100 kHz to 3.1 GHz)
≤ 2.0 dB (100 kHz to 6 GHz)
TG leakage: < -80 dBm (Input attenuator: 0 dB)
Output impedance: 50 Ω (nominal)
VSWR: ≤ 2.0 : 1 (Output level ≤ -10 dBm)
Maximum allowable level: +10 dBm, ±10 VDC

※2) The OPT.77 is not allowed to be installed on the U3741.