ADVANTEST

U3751
Spectrum Analyzer

Compact Size and High Performance

An 8 GHz Spectrum Analyzer Based on a New Concept

- Frequency range: 9 kHz to 8 GHz
- High throughput, twice as fast as our conventional models
- High accuracy: ±0.8 dB between 10 MHz and 3.1 GHz
- Standard configuration includes:
  10 MHz to 8 GHz pre-amplifier
  Two-channel USB interface
  LAN port

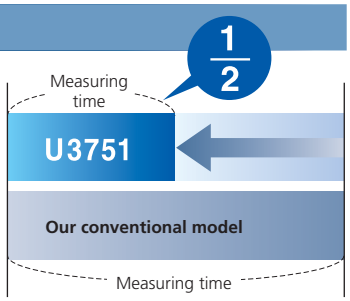
U3751

Compact, Quality for Factory

The U3751 is a portable 8 GHz spectrum analyzer that can be used in digital appliance production lines, in installation and maintenance of CATV and wireless LAN hotspots, and for a variety of other purposes.
The U3751 provides high-speed throughput twice*[1] as high as that provided by our conventional models. It also contributes to reduced tact time, an important consideration in equipment installation on production lines.

High Throughput

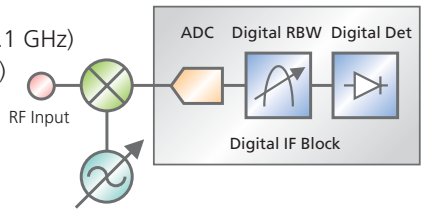
Conventional system throughput time of 875 ms is reduced by more 60%*[1] to 350 ms in the U3751 (on GPIB)*[2]. This increased speed helps greatly to reduce test costs on production lines and other facilities.



Higher Overall Amplitude Accuracy

With a digital IF section and ADVANTEST's original circuit technologies, the U3751 provides remarkably high overall amplitude accuracy:

±0.8 dB (10 MHz to 3.1 GHz)
±1.0 dB (3.1 to 8 GHz)



High Speed Calibration

Calibration is an essential requirement for improved accuracy of measurement data. With the latest techniques in circuit integration, the U3751 requires less calibration time and fewer calibration steps.

PASS/FAIL Judgment

Upper limits and lower limits can be set for limit lines on the U3751 screen, thereby enabling the discriminator to make PASS/FAIL judgments on trace data.

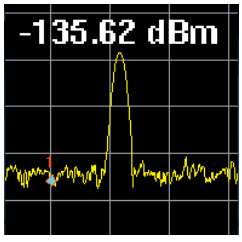
And Mobility

With a digital interface, the U3751 has superb power measurement repeatability, guaranteeing a overall amplitude accuracy of ±0.8 dB or better. In addition, the U3751 is designed to operate with batteries and warm up within five minutes, offering ease of use outdoors and in the field.

for Field

Highly Sensitive Measurement

In its standard configuration, the U3751 has a built-in pre-amplifier for boosting the signal level to a maximum of 8 GHz. This helps in analysis of faint signals of 5 GHz or more, such as those in wireless LAN, ETC, or similar systems.

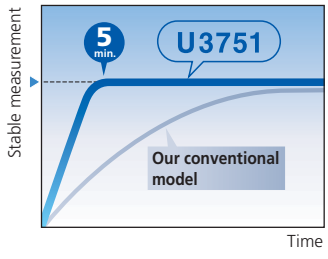


Noise level:

-135 dBm at 5 GHz, typ. (Pre-Amp. ON)

Five-Minute Warm-Up

The U3751 can warm up within five minutes. It requires less time to reach its operating temperature and can quickly be prepared for highly accurate measurement.



Operating Time of 2.5 Hours*3 with the Battery Pack

The U3751 supports three types of power: AC (100 V/200 V), DC (+11 V to +17 V), and power from a battery pack. The battery pack can be detached and easily replaced with a spare.

**1: Comparison with our conventional models*

**2: In a sample setup where channel power measurement results are transferred with certain frequency and span settings specified*

**3: Typical value at room temperature and without any option attached*

USB Interface Included in the Standard Configuration

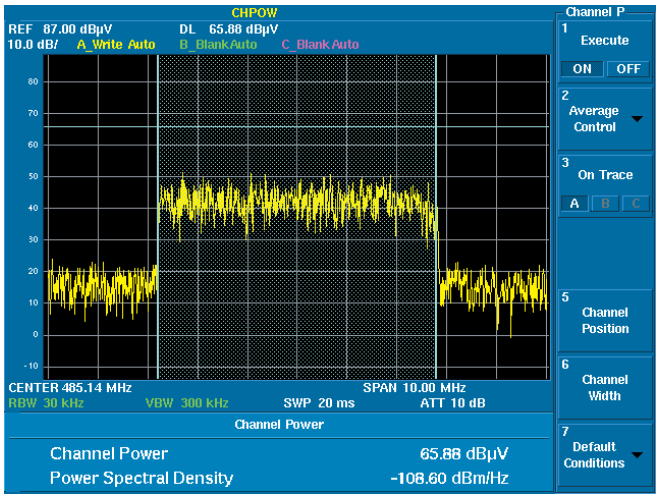
A screenshot can be saved to a USB memory device by simply specifying USB as the COPY device using soft keys. The U3751 supports the BMP and PNG formats for saving data. This feature enables measurement data to be gathered and pasted into reports in a PC environment. (USB version 1.1 is supported.)

Functions for Full-Fledged Analysis

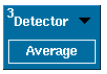
The U3751 is a complete spectrum analyzer containing all of our high-frequency measuring technologies. It combines the analysis functions of a full-featured spectrum analyzer with ease of operation. The U3751 can handle all kinds of measurement demands on its own.

RMS Detection Supported

For more accurate power measurement of broadband modulation, the U3751 supports RMS detection as well as conventional sample detection. With RMS detection and digital IF technology, the U3751 is a portable spectrum analyzer capable of highly accurate power measurement.

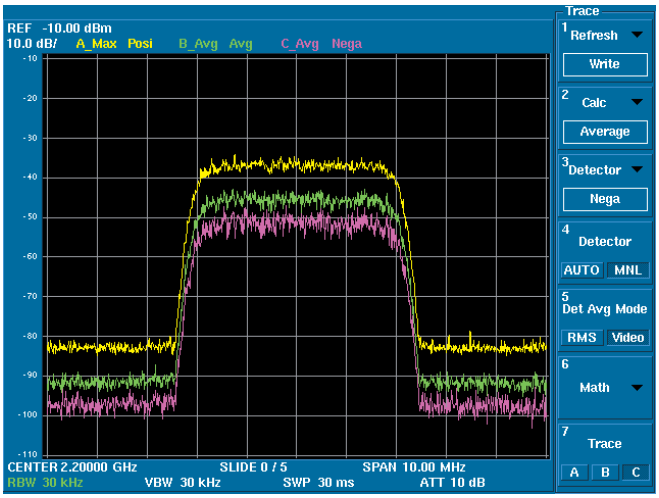


ISDB-T channel power measurement sample



Three-Trace Independent Detection

The U3751 has a function for displaying three independent traces performed simultaneously and a variety of wave-detection modes (RMS, peak, sample, et al.). The combination of the function and the calculation methods listed above facilitates such tasks as antenna adjustments.

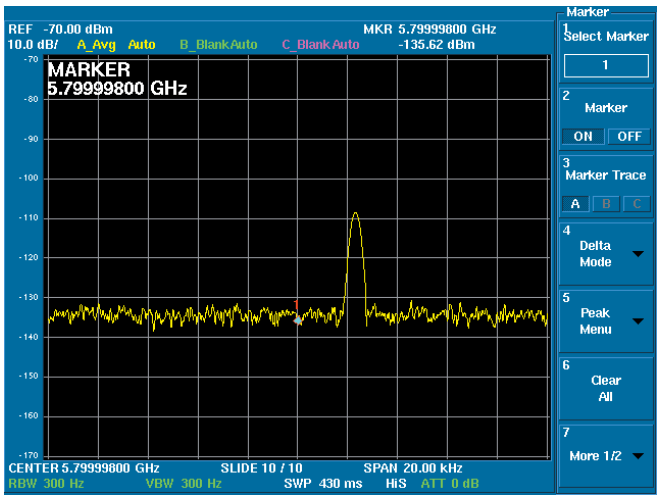


Sample of simultaneous Posi/RMS/Sample traces

Pre-Amplifier for Signal Boosts up to 8 GHz

The U3751 includes a pre-amplifier for boosting the signal level to a maximum of 8 GHz, enabling highly sensitive measurement.

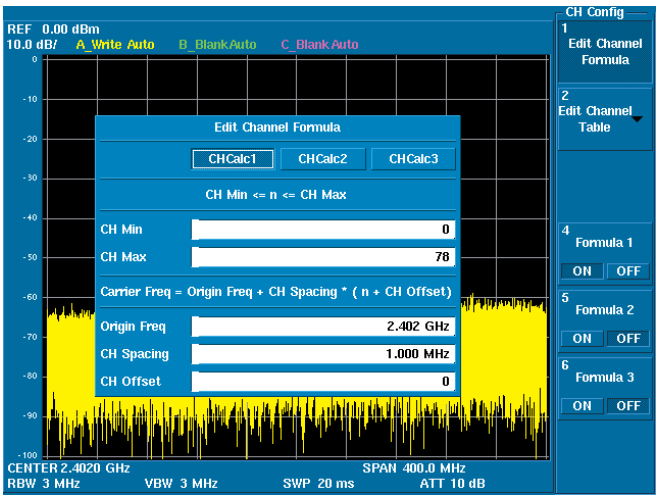
Noise level: -135 dBm at 5 GHz typ. (Pre-Amp. ON)



Measurement sample of a faint 5.8 GHz signal

Channel Setting Function

The channel setting function is useful for measuring telecommunication and broadcast channels over radio waves. The U3751 has two types of channel setting methods: calculation and table. The channel setting function can handle differences among broadcast channels in various countries.



Bluetooth channel measurement sample

Various Measurement Functions

Marker functions:
Multi-marker (10 markers)/delta marker/peak search

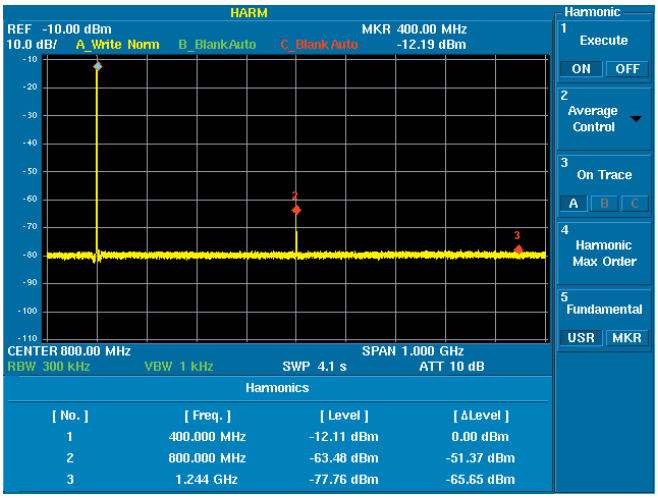
Different types of detectors:
Normal, Posi, Nega, Sample, RMS

Other measurement functions:
Channel power, Total power, Average power, OBW, ACP, Spectrum emission mask, Spurious measurement, Noise-Hz conversion, frequency counter, and more

5 Harmonic

Harmonics Measurement Function

The harmonics measurement function of the U3751 is suitable for high-frequency testing of radio devices. With input of the frequency of a fundamental wave or setting of a marker, the U3751 can easily be used to make a high-frequency measurement.

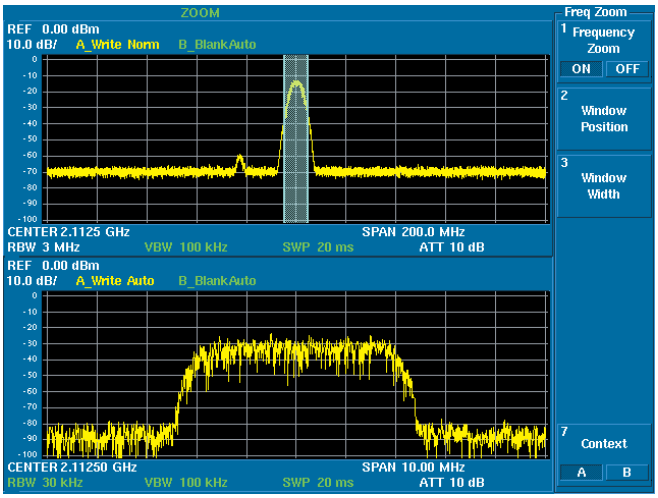


Sample of harmonic distortion measurement on a transmitter with a 400 MHz bandwidth

3 Freq Zoom

Zoom Functions

A window and F-F mode are used for easy analysis of a specific signal from a broadband measurement. RBW settings can be changed, so broadband and narrowband analyses of measured signals can be performed quickly. In addition, F-T mode, T-T mode, and other types of signal analysis are available.

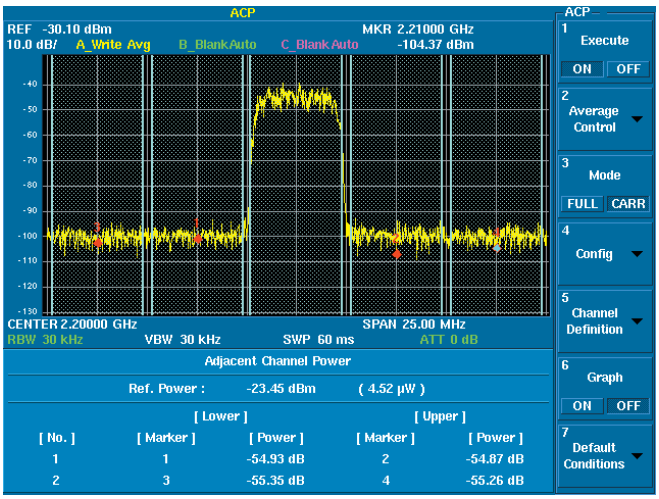


Dual-window broadband and narrowband measurement sample

5 ACP

ACP Measurement Function

This function measures ratios between carrier power and adjacent channel power. Up to five adjacent channels can be specified, and channel bands can be specified.

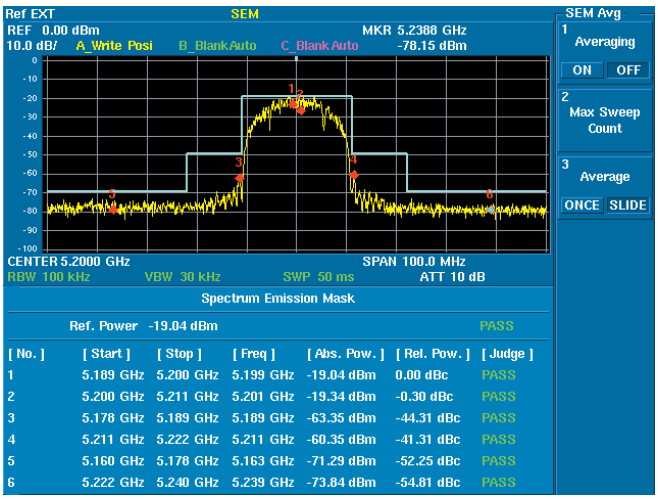


3GPP ACLR measurement sample

6 Spectrum Emission

Spectrum Emission Mask Function

PASS/FAIL judgment made with spectrum masks or limit lines is a good way to increase productivity in the production of digital appliances. The Spectrum Emission Mask (SEM) function facilitates measurement of licensed radio waves on wireless LANs and other media.



IEEE802.11b S.E.M measurement sample

Specifications

Frequency

Frequency range:	9 kHz to 8 GHz
Frequency band:	9 kHz to 3.1 GHz (Band 0) 3.0 to 8 GHz (Band 1)
Preamplifier:	10 MHz to 8 GHz
Frequency reference	
Aging:	2 x 10^{-6}/year
Temperature stability:	2.5 x 10^{-6} (0 to 50°C)
Frequency counter	
Resolution:	1 Hz to 1 kHz (RBW: <100 kHz, input signal level: >-50 dBm, CW and single signal)
Frequency stability	
Residual FM (zero span):	<60 Hz p-p/100 ms (internal frequency reference)
Frequency span	
Range:	0, 10 kHz to Full
Accuracy:	<±1% of Span
Spectrum purity:	-85 dBc/Hz, offset: 10 kHz; span: <200 kHz
Resolution bandwidth	
Range:	300 Hz to 3 MHz (1-3 steps)
RBW accuracy:	±12%
Video bandwidth range:	10 Hz to 3 MHz (1-3 steps)

Sweep

Sweep time	
Sweep time:	20 ms to 1000 s (spectrum mode) 50 µs to 1000 s (zero span)
Accuracy:	<±2% (zero span)
Sweep mode:	REPEAT, SINGLE
Trigger	
Source:	Free, Video, EXT, IF

Amplitude range

Measurement range:	Noise to +30 dBm
Maximum input level:	Input attenuator: ≥10 dB +30 dBm (preamplifier off) +13 dBm (preamplifier on) ±15 VDC max.
Input attenuator range:	0 to 50 dB by 10 dB steps
Display range:	100, 50, 20, 10, 5 dB, Linear
Unit:	dBm, dBmV, dBµV, dBµVemf, dBpW, W, V
Reference level range:	-140 to 40 dBm
Detector:	Normal, Posi-peak, Nega-peak, Sample, RMS

Amplitude accuracy

Calibration signal	
Frequency:	20 MHz
Level:	-20 dBm
Accuracy:	±0.3 dB
Scale fidelity	
Log:	±0.5 dB/10 dB ±0.5 dB/80 dB ±0.2 dB/1 dB
Level measurement accuracy:	After Cal., preamplifier: off; temperature range: 20 to 30°C; input attenuator: 10 dB; REF: 0 dBm; and input signal level: -10 to -50 dBm ±1.5 dB (9 kHz to 10 MHz) ±0.8 dB (10 MHz to 3.1 GHz) ±1.0 dB (3.1 to 8 GHz)

U3751 Web Demonstration

More detailed information on the U3751 spectrum analyzer and its features is available on the Internet.
Access the URL below to read it.

http://green.advantest.co.jp/techinfo_e/www_e/demonstration_e/U3751/index.html

Dynamic range

Displayed average noise level:	Frequency: 10 MHz to 8 GHz; Ref. level: <-45 dBm; RBW: 300 Hz
Band 0, preamplifier: off:	-118 dBm + 2 f (GHz) dB
Band 1, preamplifier: off:	-117 dBm + 1 f (GHz) dB
Band 0, preamplifier: on:	-133 dBm + 3 f (GHz) dB
Band 1, preamplifier: on:	-134 dBm + 1.3 f (GHz) dB
Gain compression (1 dB):	Frequency: 10 MHz to 8 GHz
Preamplifier: off:	>-8 dBm
Preamplifier: on:	>-25 dBm
Second harmonic distortion:	<-70 dBc (preamplifier: off; mixer level: -40 dBm; frequency: >200 MHz) <-75 dBc typ. (preamplifier: off; mixer level: -30 dBm; frequency: >300 MHz)
Third order intermodulation:	-50 dBc (frequency: 10 MHz to 8 GHz; preamplifier: off; mixer level: -20 dBm; 2-signal separation: 200 kHz)
Image/Multiple/ Out-of-band response:	<60 dBc (image suppression: ON)
Residual responses:	<-80 dBm (frequency: 10 MHz to 8 GHz; preamplifier: off)

Inputs/Outputs

RF Input	
Connector:	N type female
Impedance:	50Ω (nominal)
VSWR:	<1.7 : 1 (<3.0 GHz), input attenuator: >10 dB <2.0 : 1 (>3.0 GHz), input attenuator: >10 dB
Calibration output	
Connector:	BNC female
Impedance:	50Ω (nominal)
Frequency:	20 MHz
Level:	-20 dBm
Frequency reference input	
Connector:	BNC female
Impedance:	50Ω (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 coupled
Trigger level:	0 to +5 V
21.4 MHz IF Output	
Connector:	BNC female
Impedance:	50Ω (nominal)
Level:	Approx. mixer input level: +10 dB (at 20 MHz)
Battery mount	
Connector:	Antonbauer QR mount
External DC input	
Connector:	XLR-4
Voltage range:	+11 to +17 V
GPIB:	IEEE-488 bus connector
USB:	USB1.1
Video output Connector:	D-sub 15-pin female
LAN Connector:	RJ45 type, 10/100 base -T

General specifications

Operating environment range	
Temperature:	0 to +50°C
Humidity:	Relative humidity: 85% or less (without condencation)
Storage environment range:	-20 to +60°C, Relative humidity: 85% or less
AC power input:	Automatic switching to 100 VAC or 200 VAC 100 VAC: 100 to 120 VAC, 50/60 Hz 200 VAC: 200 to 240 VAC, 50/60 Hz
DC power input:	DC: +11 to +17 V
Power consumption:	100 VA or less (A.C. operation) 70 W or less (D.C. operation)
Mass:	5.6 kg or less (without option)
Dimensions:	approx. 308 (W) x 175 (H) x 209 (D) mm (without protrusion) approx. 337 (W) x 190 (H) x 307 (D) mm (with handles, feet, and protectors)

Option 20 High stability frequency reference

Reference frequency stability	
Aging:	±2 x 10^{-8}/day
	±1 x 10^{-7}/year
Warm-up drift (nominal):	±5 x 10^{-8}
	(+25°C, 10 min. after turning the power on)
Temperature drift:	±5 x 10^{-8} (0 to +40°C, with reference to 25°C)

Please be sure to read the product manual thoroughly before using the products.
Specifications may change without notification.

Ordering information

Main unit	
Spectrum analyzer:	U3751
Accessories	
Power cable:	A01412
Input cable:	A01037-0300
N-BNC adapter:	JUG-201A/U
Ferrite core:	ESD-SR-120
Option	
High-stability frequency reference crystal:	OPT.20
Tracking generator:	OPT.74
Accessories (optional)	
Battery pack:	A870008
Charger:	A870009
75Ω impedance converter:	ZT-130NC
DC power cable:	A114020
Carrying case:	A129001
Transit case:	A129002