

ADVANTEST®

Spectrum Analyzer

U3751

Compact Size and High Performance

An 8 GHz Spectrum Analyzer Based on a New Concept



Compact, Quality

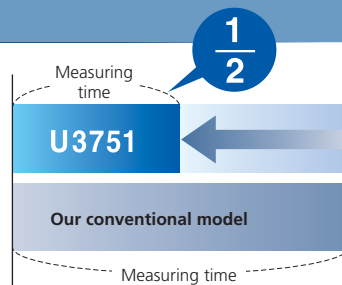
The U3751 is a portable 8 GHz spectrum analyzer that can be used in digital appliance production lines, in installation and maintenance of CATV and wireless LAN hotspots, and for a variety of other purposes.

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.

for Factory

High Throughput

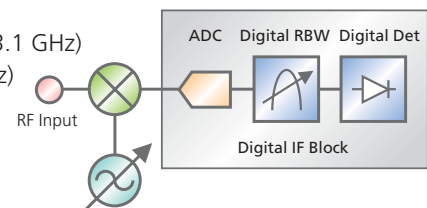
Conventional system throughput time of 875 ms is reduced by more 60%*¹ to 350 ms in the U3751 (on GPIB)*². This increased speed helps greatly to reduce test costs on production lines and other facilities.



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.

 **U3751/3771/3772 Web Demonstration**
http://green.advantest.co.jp/techinfo_e/www_e/demonstration_e/U3751/demo_index.html

And Mobility

With a digital interface, the U3751 has superb power measurement repeatability, guaranteeing an 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.

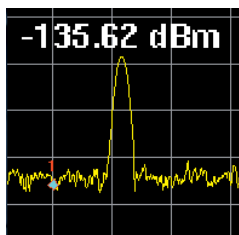
for **Field**

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.

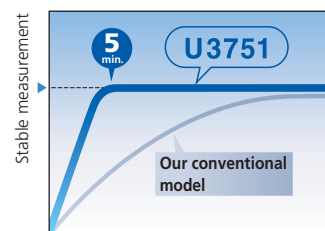
Noise level:

-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.



Time

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

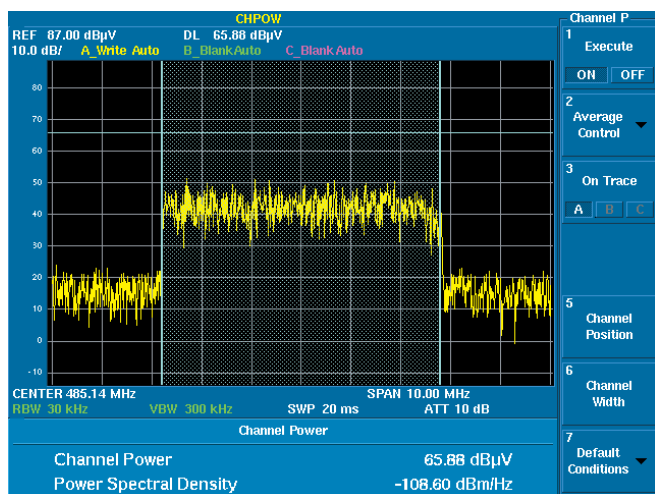
A screenshot can be saved to a USB memory device by simply specifying USB as the COPY device using soft keys. The U3751 supports the BMP and PNG formats for saving data. This feature enables measurement data to be gathered and pasted into reports in a PC environment. (USB version 1.1 is supported.)

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.

1 Channel Power **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.

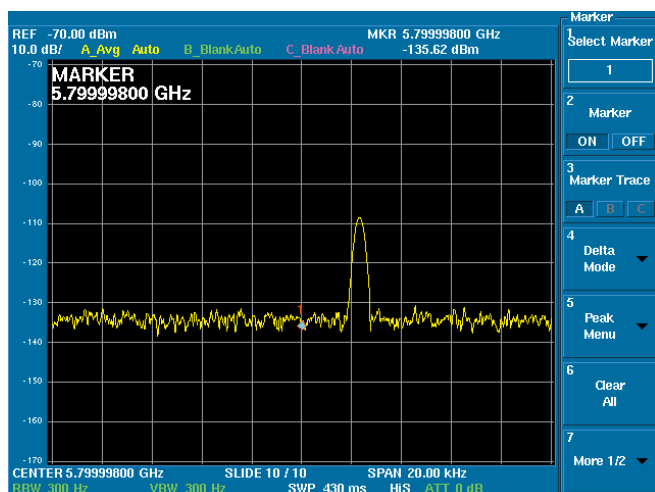


ISDB-T channel power measurement sample

3 High Sensitivity **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.

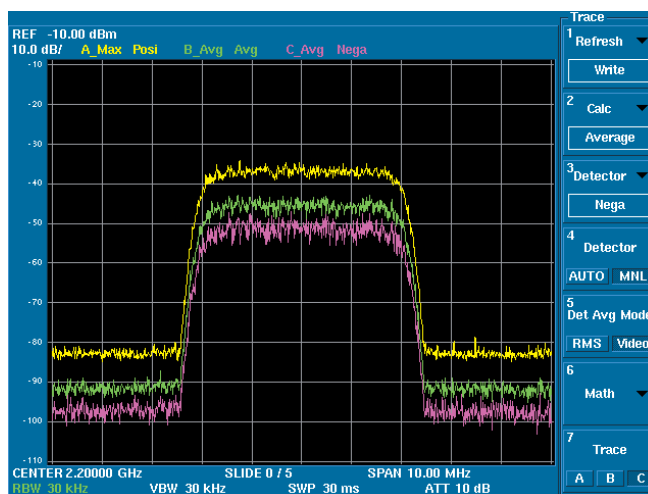
Noise level: -135 dBm at 5 GHz typ. (Pre-Amp. ON)



Measurement sample of a faint 5.8 GHz signal

3 Detector **Three-Trace Independent Detection**

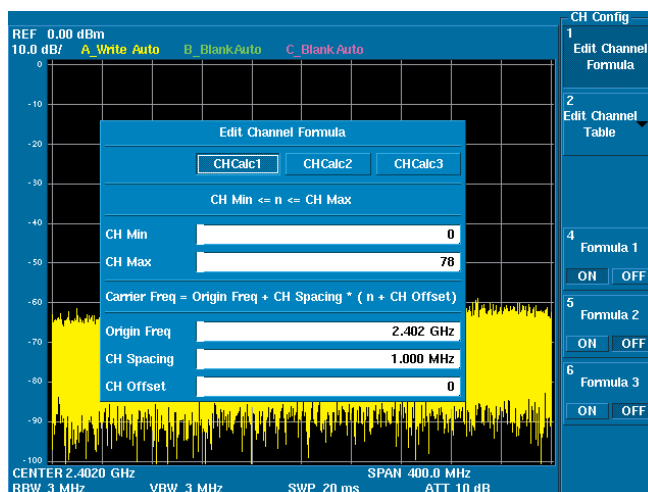
The U3751 has a function for displaying three independent traces performed simultaneously and a variety of wave-detection modes (RMS, peak, sample, et al.). The combination of the function and the calculation methods listed above facilitates such tasks as antenna adjustments.



Sample of simultaneous Posi/RMS/Sample traces

6 Channel Input **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

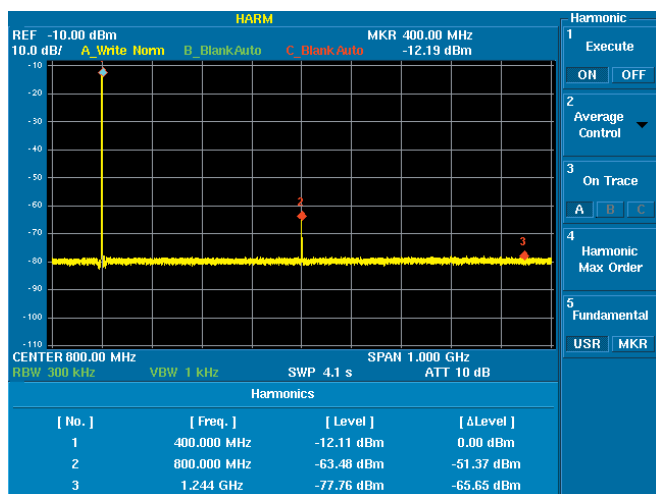
Different types of detectors:

Normal, Posi, Nega, Sample, RMS

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.

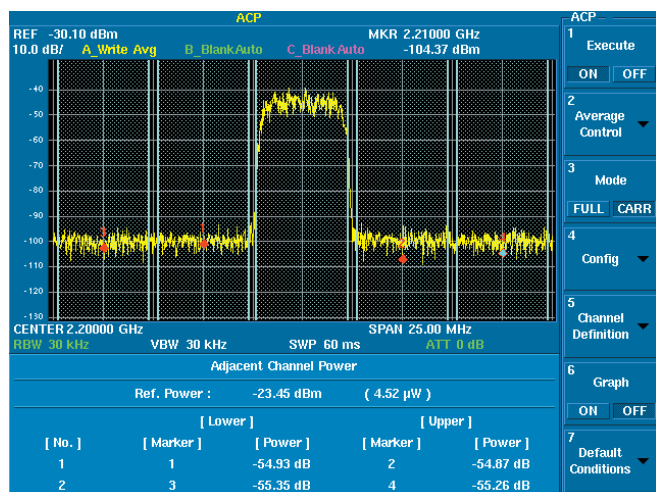


Sample of harmonic distortion measurement on a transmitter with a 400 MHz bandwidth

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

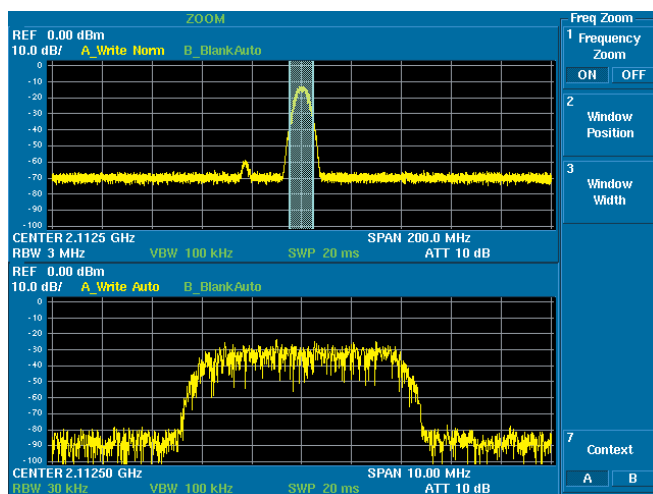
Other measurement functions:

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

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.

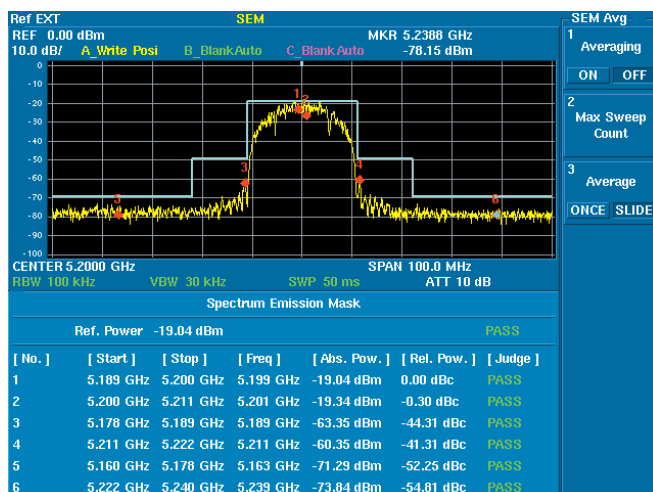


Dual-window broadband and narrowband measurement sample

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.



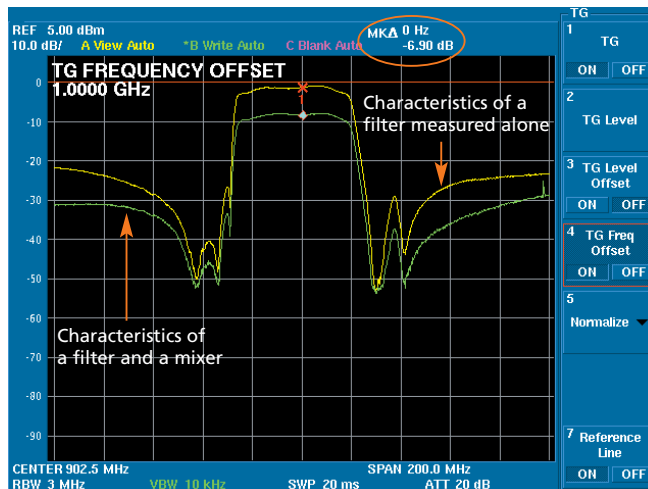
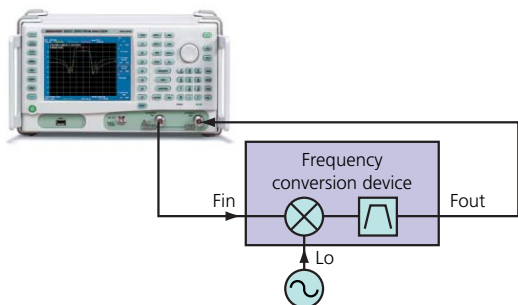
IEEE802.11b S.E.M measurement sample

Tracking Generator Option (OPT. 74)

The tracking generator generates signals synchronized with the frequency sweep of the spectrum analyzer, within a range of 10 MHz to 3 GHz.

Frequency Characteristic Evaluation

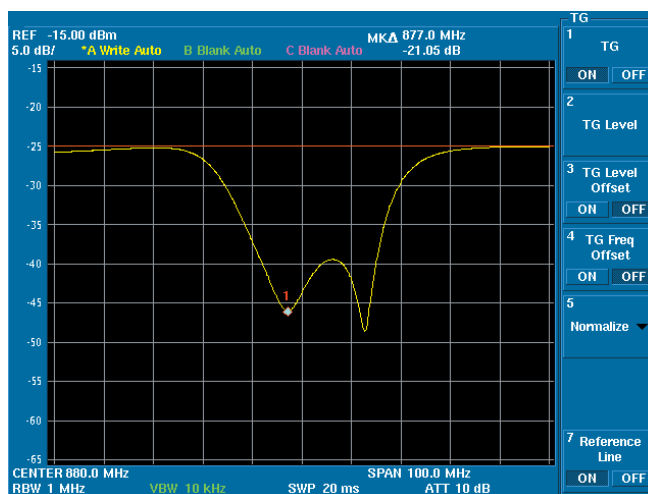
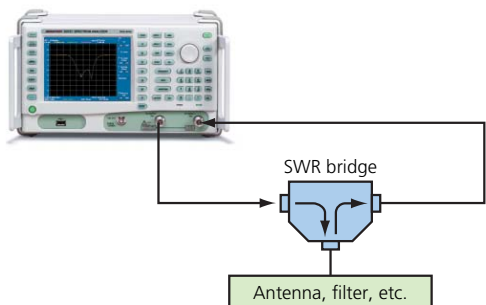
When used with the normalization function, the U3751 can directly measure cable loss, filter characteristics, and other characteristics. Also, the frequency offset function of the tracking generator allows measurement of frequency characteristics and conversion loss characteristics of mixers and other frequency conversion devices.



Measuring frequency conversion loss characteristics of a mixer

Return Loss Measurement

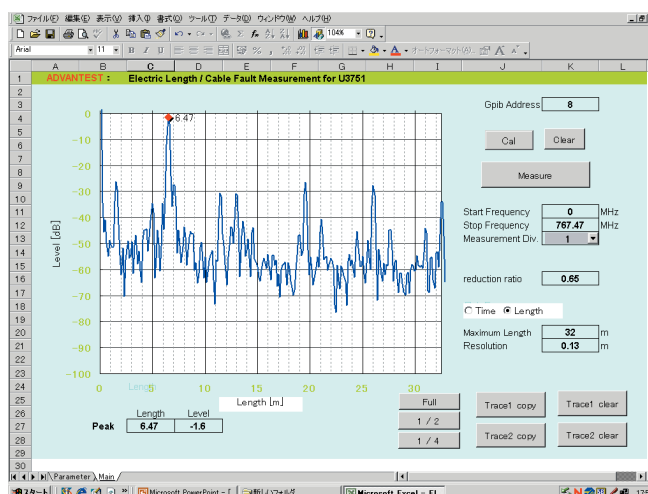
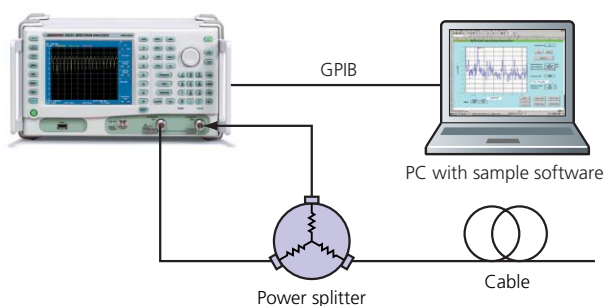
With an SWR bridge, the U3751 can measure the reflection characteristics of an antenna or filter. It can also read return loss, as well as evaluate VSWR.



Return loss measurement of a filter

Measurement of Distance to a Cable Fault Location

When used with the sample software running on a personal computer, the U3751 can measure the distance to a fault in a coaxial cable (open or short).

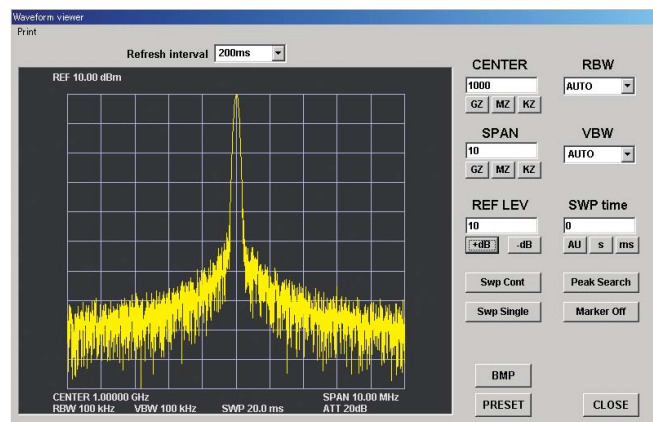
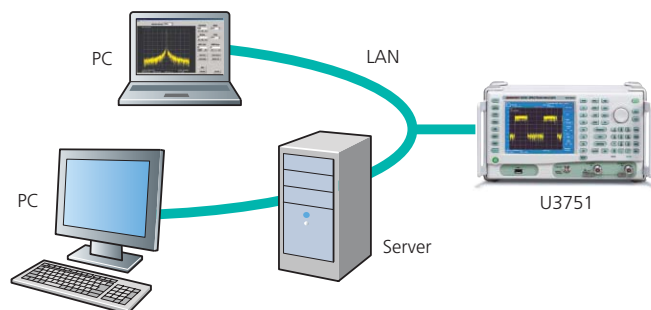


Window for measuring distance to a cable fault location

Functions That Are Simple and Easy to Use

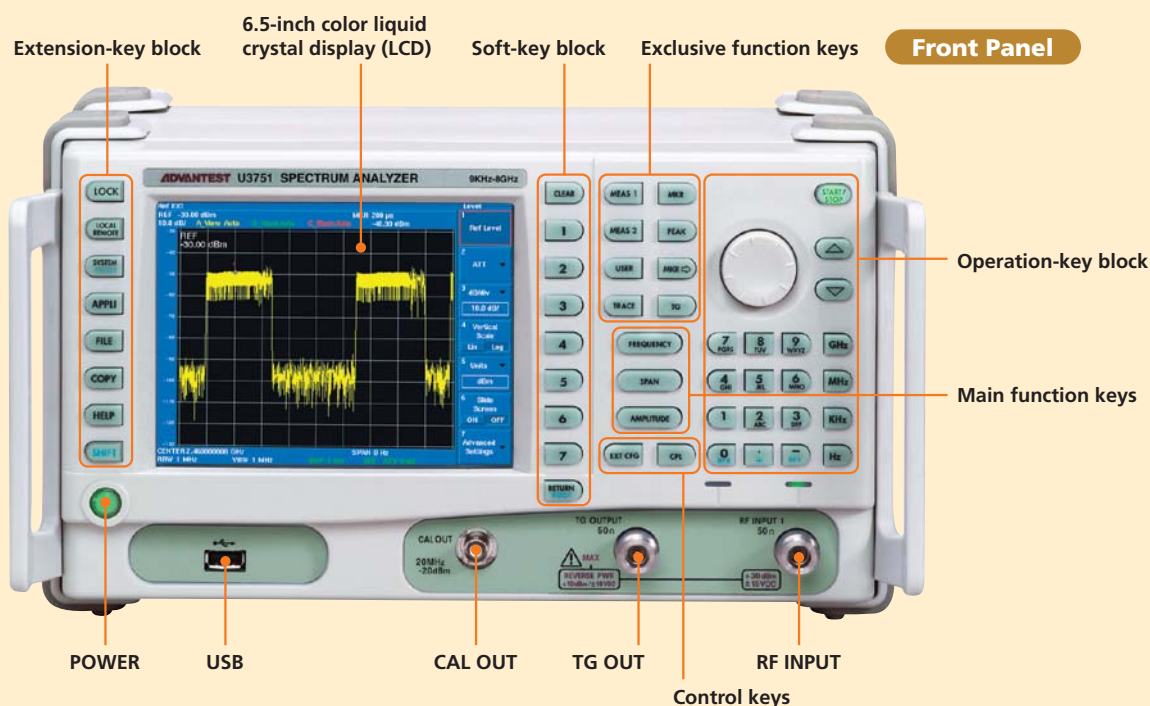
Optimal for Monitoring, Remote Control via a LAN

A 10/100BASE-T LAN port is provided as standard equipment, enabling remote control from a personal computer. The U3751 can be installed at a remote-controlled station, such as an unattended, wireless transmission station, and signal output can be measured and observed through remote control and monitoring from a distant location.

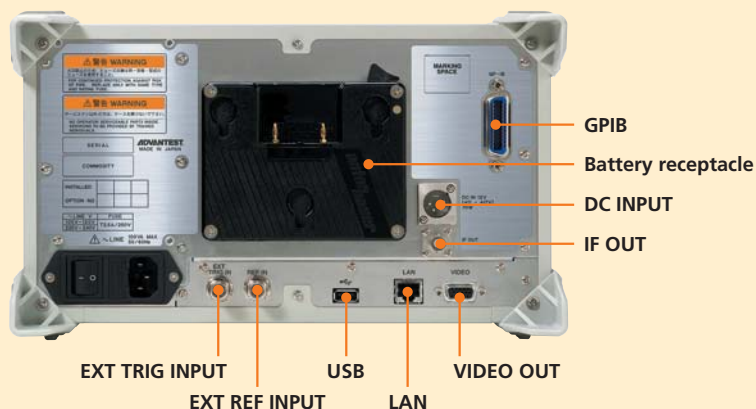


Window for remote control and monitoring from a personal computer via a LAN

Easy-to-use Key Layout



Rear Panel



Specifications		Dynamic range	
Frequency		Displayed average noise level: Frequency: 10 MHz to 8 GHz; Ref. level: <-45 dBm; RBW: 100 Hz Band 0, preamplifier: off: -123 dBm + 2 f (GHz) dB Band 1, preamplifier: off: -122 dBm + 1 f (GHz) dB Band 0, preamplifier: on: -138 dBm + 3 f (GHz) dB Band 1, preamplifier: on: -139 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)	
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 readout accuracy:	±(Marker readout x frequency reference accuracy + SPAN x SPAN accuracy)		
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, mixer level: >-50 dBm, CW and single signal)		
Accuracy:	±(Counter readout x frequency reference accuracy + residual FM + 1LSB)		
Frequency stability			
Residual FM (zero span):	<60 Hz p-p/100 ms (internal frequency reference)		
Frequency span			
Range:	5 kHz to Full, zero span		
Accuracy:	<±1% of Span		
Spectrum purity:	-85 dBc/Hz, offset: 10 kHz; span: <200 kHz		
Resolution bandwidth			
Range:	100 Hz to 3 MHz (1-3 steps)		
RBW accuracy:	±12%		
Video bandwidth range:	10 Hz to 3 MHz (1-3 steps)		
Sweep		Inputs/Outputs	
Sweep time		RF Input	
Sweep time:	20 ms to 1000 s (spectrum mode) 50 µs to 1000 s (zero span)	Connector:	N type female
Accuracy:	<±2% (zero span)	Impedance:	50Ω (nominal)
Sweep mode:	REPEAT, SINGLE	VSWR:	<1.7 : 1 (<3.0 GHz), input attenuator: >10 dB <2.0 : 1 (>3.0 GHz), input attenuator: >10 dB
Trigger		Calibration output	
Source:	Free, Video, EXT, IF	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 0 to +16 dBm
		Level:	
		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
Amplitude range		General specifications	
Measurement range:	Noise to +30 dBm	Operating environment range	
Maximum input level:	Input attenuator: ≥10 dB +30 dBm (preamplifier off) +13 dBm (preamplifier on) ±15 VDC max.	Temperature:	0 to +50°C
Input attenuator range:	0 to 50 dB by 10 dB steps	Humidity:	Relative humidity: 85% or less (without condensation)
Display range:	100, 50, 20, 10, 5 dB, Linear	Storage environment range:	-20 to +60°C, Relative humidity: 85% or less
Unit:	dBm, dBmV, dBµV, dBµVemf, dBpW, W, V	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
Reference level range:	-140 to 40 dBm	DC power input:	DC: +11 to +17 V 100 VA or less (A.C. operation) 70 W or less (D.C. operation)
Detector:	Normal, Posi-peak, Nega-peak, Sample, RMS	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)
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., image suppression: off, 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)		

Option 20 High stability frequency reference

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

OPT.74 Tracking Generator

Frequency range:	10 MHz to 3 GHz
Frequency offset	
Range:	0 to 1 GHz
Resolution:	1 kHz
Accuracy:	± 200 Hz
Output level range:	0 to -30 dBm (0.5 dB step)
Output level accuracy:	± 0.5 dB (20 MHz, -10 dBm, +20 to +30 °C)
Output level flatness:	Reference signal level: -10 dBm; frequency: 20 MHz ± 1.0 dB (10 MHz to 1 GHz) ± 1.5 dB (10 MHz to 3 GHz)
Output level switching uncertainly:	Reference level: -10 dBm ± 1.0 dB (10 MHz to 1 GHz) ± 2.0 dB (10 MHz to 2.6 GHz) ± 3.0 dB (10 MHz to 3 GHz) ± 5.0 dB (10 MHz to 3 GHz)
Frequency offset off:	± 3.0 dB (10 MHz to 3 GHz)
Frequency offset on:	± 5.0 dB (10 MHz to 3 GHz)
Spurious output:	Output level: -10 dBm
Harmonic:	≤ -20 dBc
Non-harmonic:	≤ -25 dBc (frequency offset off)
TG leakage:	≤ -80 dBm (input attenuator: 0 dB)
Output impedance:	50Ω (nominal)
VSWR:	$\leq 2.0 : 1$ (output level: ≤ -10 dBm)
Maximum allowable input:	+10 dBm, ± 10 VDC

Bluetooth® is a trademark owned by Bluetooth SIG, Inc., U. S. A.

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 bag:	A129001
Transit case:	A129002





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