B+K PRECISION
ELECTRONIC TEST INSTRUMENTS

Model 2652

3.3GHz Spectrum Analyzer with Tracking Generator

Data Sheet

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Model 2652

B+K Precision's 2652 handheld spectrum analyzer is small and exceptionally light weight - yet delivers performance and features comparable to a full size bench spectrum analyzer. The 2652 is the most cost effective spectrum analyzer for quick and precise signal investigations, especially away from the bench. With its ease of use, great performance, and broad functionality, the 2652 is an ideal tools for engineers and technicians who perform field measurements in the 50kHz to 3.3GHz range.

Applications

- Installation, maintenance, and trouble shooting of wireless communication systems such as W-CDMA/CDMA, GSM, WLAN and Bluetooth
- Frequency response measurements of passive components such as RF cables, filters, and attenuators
- Detection of signal interference and undesired emissions
- TV and broadcasting
- Antenna alignment
- EMI compliance (E & H field measurements with optional accessories)

Superb performance improves your productivity

Advanced synthesizer-based design enables the 2652 to provide you with an accurate and detailed picture of the spectrum you are investigating.

- Single sideband phase noise – 90 dBc @ 100kHz offset
- Fast sweep speed (minimum 10 ms)
- DANL (displayed average noise level) of -110 dBm

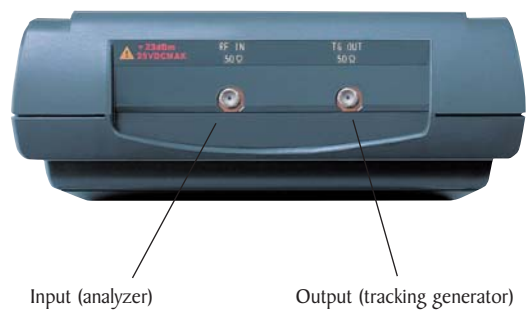
Tracking generator

The 2652 is a 2650 with a tracking generator added. The 2652 can be used to rapidly determine transmission characteristics of two-port RF devices.

Specifications of Tracking Generator	
Frequency range	5MHz to 3.3GHz
Output Level	-10dBm±1dB@ 1GHz (output level is fixed)
Output flatness	±1.5dB
Output impedance	50Ω
VSWR	<2.0
Output connector	SMA (J)

Tracking generators are ideal for tuning filters, determining the usable frequency range of amplifiers and attenuators and aligning receiver IF stages.

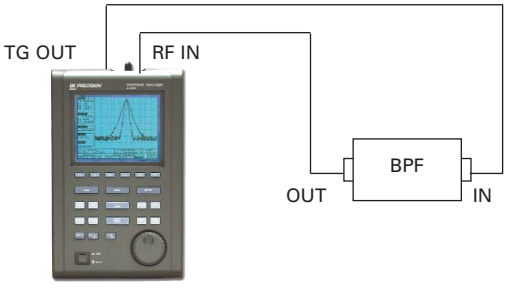
The tracking generator's output frequency is the same as the frequency the spectrum analyzer is tuned to. This lets you see the amplitude response of a circuit on the spectrum analyzer screen.

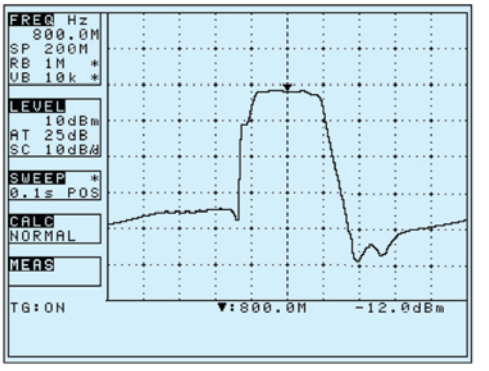


Applications

■ Characterize the frequency response of a filter

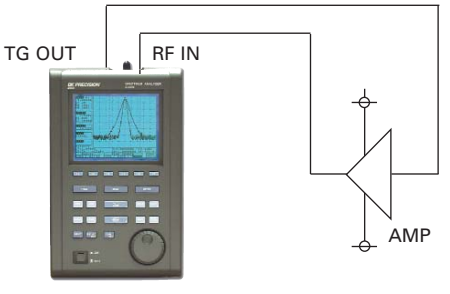
Measure the frequency response of a passive component, e.g a filter, over the 2652's full range of 5MHz to 3.3GHz.

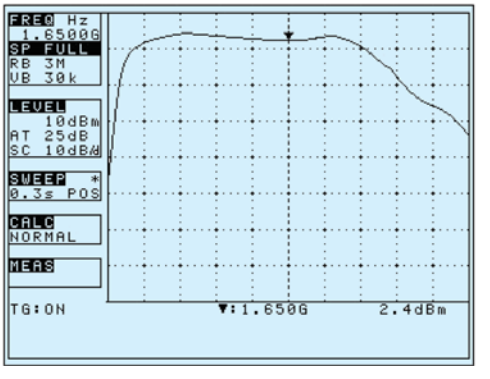




■ Gain characteristics of an amplifier

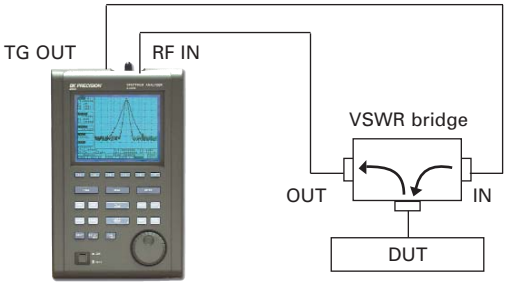
Characterize the frequency response of an active circuit such as an amplifier.

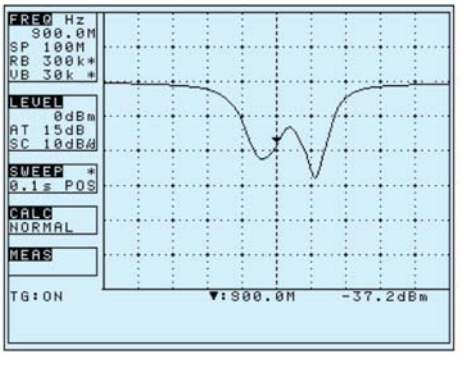




■ Return loss measurement

Measure the return loss of an electric component or circuit with a VSWR bridge configured as indicated in the figure below





Easy to use

The 2652 handheld analyzer is straightforward to operate and provides many functions to facilitate quick and easy measurements.

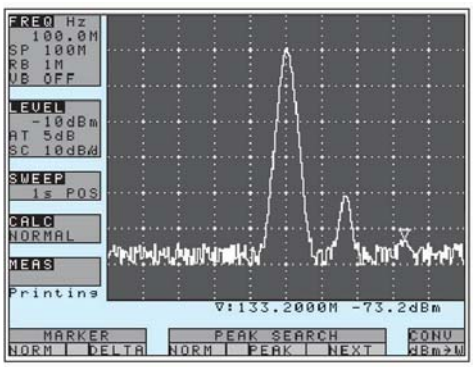
The "One button Auto Tune" function automatically scans the full frequency range, detects and centers the maximum signal and automatically configures optimum values for RBW, VBW, sweep time and reference level.

Frequency, span, and amplitude are easily configured. Marker and peak search functions enable rapid numerical measurements.

Marker Function

Two different modes are available for marker measurements:

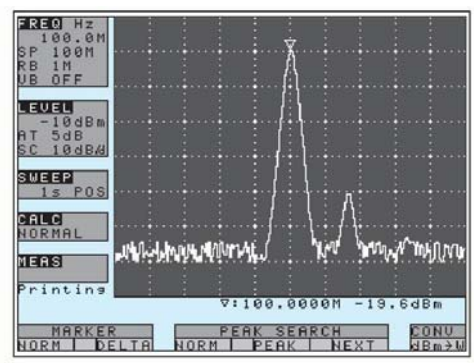
- Normal marker mode measures the frequency and level of the marked point
- Delta marker mode measures the frequency and level differences between two markers



Peak Function

Two different modes are available for peak search:

- Normal peak search mode searches for the highest level on the screen. In this mode, you can also use the NEXT button to locate the marker on the next smaller peak.
- In-zone peak search mode searches for the peak level in the range specified by the center value and width.

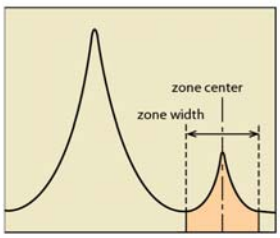


Versatile measurement and calculation functions

- Measurement functions Channel Power, Adjacent channel power, Occupied bandwidth

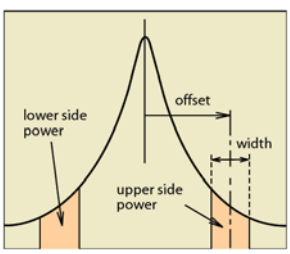
Channel power measurement

Allows you to measure both power or noise in a user specified bandwidth.



Adjacent channel power measurement

Measure the ratio of power leakage (from the wanted signal) into adjacent channels. Center frequency, adjacent channel bandwidth and offset between main carrier and adjacent channels can be set.

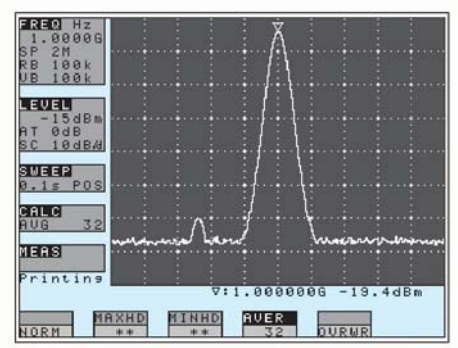


Additionally, the user can select from any of the following three measurement methods, based on the carrier wave definition: Total power, Peak (reference level) and in-band.

■ Calculation functions: Min/Max hold, average and over write

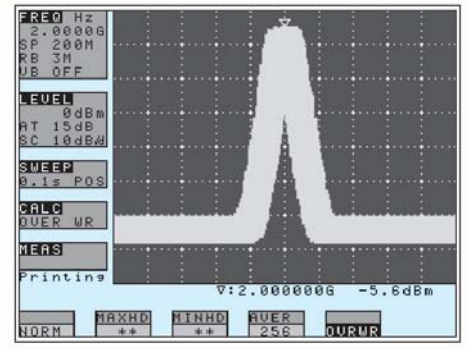
Average

The analyzer continuously sweeps, then calculates and displays the average value over the total number of sweeps . The number of sweeps can be set between 2 and 256. Averaging is useful for detecting signals buried in the noise floor.



Over Write

The results of each consecutive sweep are displayed rather than clearing the screen after each sweep.
This lets you observe the long term variations of a signal.

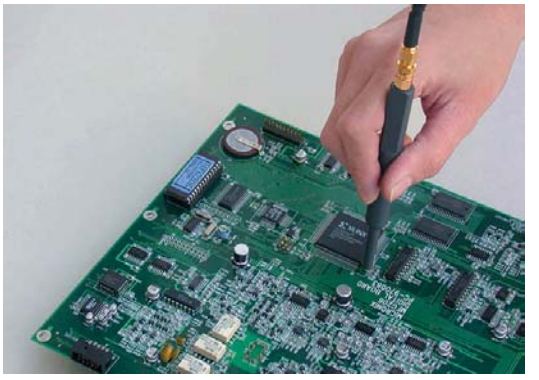


■ Electric field strength measurement

(with optional dipole antennas) for the detection of EMI (electromagnetic interference) trouble spots

■ Magnetic field strength measurement

Using the optional PR26M magnetic field probe, precisely measure the magnetic field distributions on an IC or a printed circuit board



Easily document your measurements

Intuitive Windows 98/NT/2000/XP compatible Software for frequency spectrum download, additional analysis and report generation (option AK 2650).

- Continuously sweep and transfer trace data to the PC.
- Store trace data in text or csv (comma separated values) format. Capture 1001 spectrum data points (4 times the number of display dots) for more detailed analysis
- Save the present screen to bitmap or to the clipboard
- Control all instrument settings from the PC
- Generate a hard copy of the display by connecting the optional printer PT2650 directly to the 2652.

Specifications

	model 2652
Frequency section	
Frequency range	50kHz to 3.3GHz
Center frequency	
Resolution	100kHz (Set with rotary encoder, numeric or function key)
Accuracy	within ±(30 + 20T)kHz ± 1dot @ frequency span: 200kHz to 10MHz, RBW: 30kHz, 23 ± 5°C within ±(100 + 700T)kHz ± 1dot @ frequency span: 20MHz to 3.3GHz, RBW: 100kHz, 23 ± 5°C T: Sweep time(s)
RBW frequency error	within ±6% of RBW (@ RBW: 3kHz to 30kHz) within ±30% of RBW(@ RBW: 100kHz to 3MHz)
Frequency span	
Range	0Hz (zero span), 200kHz to 2GHz (1-2-5 sequence) and 3.3GHz
Accuracy	within ±3% ± 20TkHz ± 1dot @frequency span: 200kHz to 10MHz, 23 ± 5°C within ±3% ± 200TkHz ± 1dot @frequency span: 20MHz to 3.3GHz, 23 ± 5°C T: Sweep time(s)
Display resolution (horizontal)	Frequency span/250 The unit displays 251 horizontal dots but stores 1001 trace data points internally which can be captured via RS232C interface
Resolution bandwidth (-3dB bandwidth)	
Range	3kHz to 3MHz (1-3 sequence) and AUTO
Accuracy	within ±20%
Shape Factor	1:12 (typical, 3dB:60dB)
Video bandwidth	100Hz to 1MHz (1-3 sequence), AUTO
SSB phase noise	-90dBc/Hz (typical) @100kHz offset, RBW: 3kHz, VBW: 100Hz, Sweep time: 0.3s
Spurious response	less than -60dBc
Harmonics	less than -40dBc @100MHz to 3.3GHz
Amplitude section	
Reference level	
Range	+10 to -60dBm (1dB step)
Accuracy	within ±0.8dB ± 1dot @center frequency: 100MHz, RBW: 3MHz, VBW: 1MHz, ATT: 0dB, 23 ± 5°C
Unit	dBm, dBV, dBmV, dBμV, dBμV/m, dBμA/m (dBμV/m and dBμA/m are available for certain measurement functions)
Average noise level	-110dBm (typical) @center frequency: 100MHz, RBW: 3kHz, VBW: 100Hz
Frequency response	Within ±2.0dB ± 1dot @50kHz to 100MHz Within ±1.0dB ± 1dot @100MHz to 3.3GHz
Input impedance	50Ω
Input VSWR	< 2.0
Input attenuator	
Operating range	0 to 25dB (1dB step), coupled with reference level
Switching error	within ±0.6dB @100MHz
RBW switching error	within ±0.6dB
Display resolution (vertical)	200 dots
Display scale	
Scale	10dB/div, 2dB/div
Accuracy	within ±0.8dB/10dB ± 1dot within ±0.2dB/2dB ± 1dot within ±1.6dB/70dB ± 1dot
Input damage level	+23dBm (CW average power), 25VDC
Sweep section	
Sweep time	
Range	10ms to 30s and AUTO (1-3 step) @frequency span: 0 to 2GHz
	30ms to 30s and AUTO (1-3 step) @full span
Accuracy	within ±0.1% ± 1dot @frequency span: 0 to 2GHz within ±1.5% ± 1dot @frequency span: full span
Trigger mode	AUTO (frequency span: zero span)
Detection mode	Positive peak, Negative peak, Sample
Measurement and Calculation Functions	
Marker	NORM: displays frequency (7 digits max) and level (4 digits max) at marker point. DELTA: displays Δf (Frequency) and ΔdBx (level).
Peak search	NORM: searches peak point within 10div (full freq. range). This mode also supports NEXT peak (up to 10). ZONE: searches peak point within a zone designated by center and width.
Calculations	NORM, MAX HOLD, MIN HOLD, AVERAGE, OVER WRITE MAX/MIN HOLD: 2 to 1024 AVERAGE: 2 to 256
Measurements	Measure Channel power, Adjacent channel leakage power, Occupied frequency bandwidth, Electric field strength (requires antenna), Magnetic field strength (requires magnetic field probe).
AUTO tuning	Automatically scans the full bandwidth, detects the maximum level spectrum and centers it onscreen. Automatically adjusts reference level, RBW, VBW and sweep time to optimum values.
Tracking Generator	
Frequency range	5MHz to 3.3GHz
Output Level	-10dBm fixed (± 1dB @1GHz)
Output flatness	±1.5dB
Output impedance	50Ω
VSWR	< 2.0
Output connector	SMA (J)
General	
Input connector	SMA (J)
Save/Load	
Save	Saves100 traces and 100 setups
Load	Loads 1 trace and 1 setup
Communication	
Interface	RS-232C
Baud rate	2,400 to 38,400bps
Hard copy	Allows direct hard copy with optional printer.
Display	
Display	LCD
Backlight	CFL backlight
Resolution	320 (H) x 240 (V) dots
Power source	
Battery	Ni-MH battery
Operating time	Approx. 110 min with backlight turned off. (Battery fully charged)
External DC source	DC jack, +4.75 to +5.25VDC / 4A
Environmental and size	
Operating temperature	0 to 50°C (Guaranteed at 23 ± 10°C, without soft carrying case)
Operating humidity	less than 40°C/80%RH (Guaranteed at less than 33°C/70%RH, without soft carrying case)
Storage temperature	-20 to 60°C, less than 60°C/70%RH
Dimensions	162 (W) x 70 (H) x 260 (D) mm (excluding projections and stand) 6.38(W) x2.76(H) x 10.25(D) inch
Weight	approx. 4 lbs (1.8kg) including battery approx. 3.3 lbs (1.5kg) without battery

Accessories

Two Year Warranty

Accessories Included	Instruction Manual, NI-MH battery BP2650, AC-Adapter BC 2650, Soft carrying case, Accessory Pouch, Fuse
Optional	PC Software AK2650 w. RS232 cable, Printer PT2650, magnetic field probe PR 26M, Dipole Antennas AN301-AN306

NOTE: Specifications and information are subject to change without notice. Please visit www.bkprecision.com for the most current product information.