Real-time Spectrum Analyzer

New 3026

Features – Benefits	Applications
2 MHz Real-time Signal Capture	Cellular/PCS Manufacturing Test
Simultaneous Time and Frequency Domain Capture	Pager Manufacturing Test
50 Hz to 3 GHz Frequency Coverage	RF Component Manufacturing Test Including DLL and Synthesizer Settling
Frequency, Time and Phase Analysis	Network Ingress Monitoring and Analysis
25,000 Frames/Second Measurement Speed	CATV Return-path Ingress Monitoring
Display Update Rate of 40 Microseconds	Radar System Fault Location and Maintenance
	Microwave Data Link Fault Location
	Computer Manufacturing/Test for EMC
	Surveillance

For your local Tektronix representative see the list in the back of this catalog or outside the U.S. call: 1-503-627-1916, inside the U.S. call: 1-800-426-2200.

CE

GPIB IEEE-488

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

SONY Tektronix

ISO9002 Certified JMI-0113

The new 3026 real-time Spectrum Analyzer provides design engineers and manufacturing final test evaluators of communications equipment an affordable product that can be used to quickly evaluate a design or the final product for transient (Burst) phenomena that otherwise might not show up until it is in the end user's hands.

The 3026 offers a full 2 MHz of real-time bandwidth with measurement speed of 25,000 frames/second and a 1024 point update interval of 160 microseconds. The captured events can be conveniently displayed in a variety of formats selectable by the user: Spectrum, Spectrogram and Waterfall. The analyzer architecture makes it possible to capture time domain data and frequency domain data simultaneously.

To catch instantaneous phenomenon like a transmitter startup, or the beginning of a digital TDMA or CDMA transmission, the 3026 provides frequency domain and time domain real-time triggering with a mask pattern that is easily edited in the built-in editor.

Application Examples

DIGITAL CELLULAR/PCS DESIGN, TEST AND MANUFACTURE

Current spectrum analyzers do not do a very good job of analyzing burst or intermittent signals. They sweep over a band of frequencies and are therefore not able to capture simultaneously the spectrum over a band of frequencies. This makes it difficult, or sometimes impossible, for a developer to identify problems, such as phase jumps, which will adversely affect a digitally modulated system.

Transient noise burst problems that are often associated with high frequency solid state communications equipment can be captured with a measurement speed of 25,000 frames/second and a 1024 point update interval of 160 microseconds reducing intermittent problem test time.

EMC

Common Carrier and CATV Network operators have to deal with Ingress that can disrupt trans-

mission in both the forward and return paths. This interference is often impulsive in nature and very difficult to capture with a conventional spectrum analyzer. The 3026 with its real-time capture capability allows rapid detection and analysis of such interference.

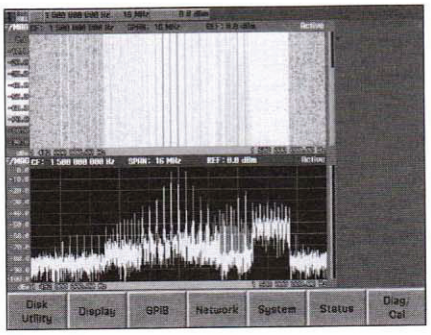
In the screen photo (1) (lower section of photo) below an interfering burst 4.8 MHz above the spectrum center is captured for analysis. In the upper spectrogram section the amplitude vs. frequency of the complete spectrum is displayed as a function of time (vertical axis). In the Spectrogram display, each line of pixels represents a frame, with the most recent frame displayed at the bottom.

TRANSITIONAL SIGNAL ANALYSIS

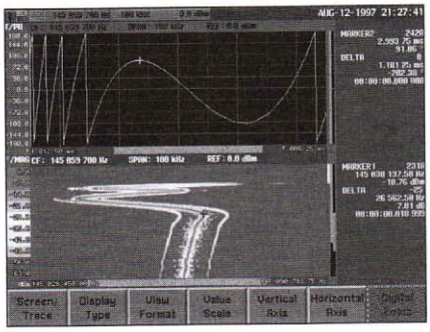
Bursting signals such as TDMA employ Phase Locked Loops (PLL) for frequency stability, a critical measurement of interest is the frequency change as the transmitter is keyed on and off.

The 3026 can capture this transition in time, frequency and phase as shown in this screen capture.

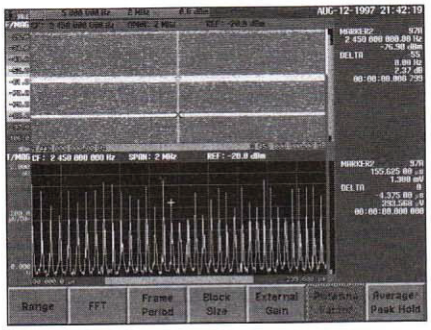
In the lower portion of the photo (2), we can see the change in Frequency vs. Time (spectrogram) and in the upper portion of the display we can see the phase change during transmitter activation. From this example, we find this transceiver makes a significant frequency, amplitude and phase shift until it stabilizes.



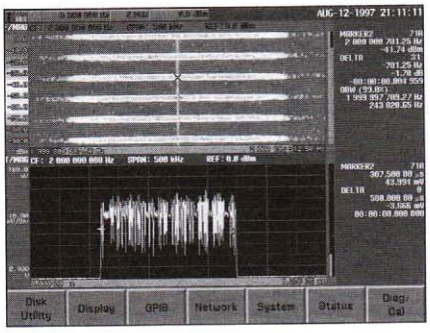
1) Signal Ingress.



2) PLL Frequency Settling.



3) Pulsed Signal.



4) CDMA Mobile Phone.

CHARACTERISTICS

FREQUENCY RELATED

Frequency Range –
RF Mode: 10 MHz to 3 GHz.
Baseband Mode: 50 Hz to 10 MHz.

Frequency Span –
RF Mode: 100 Hz to 3 GHz.
Baseband Mode: 100 Hz to 10 MHz.

Stability of Frequency Standard –
$\pm$ 5 x 10^{-9}/day.

Residual FM – 3 Hz max.

Spectrum Purity – -100 dBc/Hz (10 kHz offset).

Center Frequency Settability – 0.1 Hz.

AMPLITUDE RELATED

Reference Level Range –
RF mode: –50 to +30 dBm.
Baseband Mode: –30 to +30 dBm.

Input Impedance – 50 Ω.

Flatness –
±2.0 dB (>500 Hz).
+2.0, –5.0 dB (≤500 Hz).

Input Equivalent Noise –
-140 dBm/Hz at 1 GHz.

2nd Harmonic Distortion –
≤–70 dBc (–10 dBfs Input Level).

3rd Order Distortion –
≤–60 dBc (<20 MHz, ≤–10 dBfs Input).
≤–70 dBc (<20 MHz, ≤–10 dBfs Input).

A/D Converter – 12-Bits, 25.6 MS/s.

FFT points – 1024, 256.

FFT window – Blackman-Harris, Hamming, Rectangle.

MINIMUM FRAME UPDATE RATE

Span	1024 point	512 point
500 kHz to 5 MHz	16 µs	
500 kHz to 2 MHz		40 µ
50 kHz to 200 kHz	400 µs	400 µs
5 kHz to 20 kHz	4 ms	4 ms
500 Hz to 2 kHz	40 ms	40 ms
200 Hz	100 ms	100 ms
100 Hz	200 ms	200 ms

TRIGGER RELATED

Trigger Mode – Auto/Normal (Frequency and Time Events).

SYSTEM CONTROLLER

486DX4-100 (100 MHz Clock), 32 MB 60 ns Fast Page SIMM (non-parity), 2.5 inch 3 MB Solid State Drive, 2.5 inch 2.1 GB Hard Disk, 3.5 inch 2 HD (1.44 MB) Floppy Disk, On Board Ethernet LAN I/F, ISA Half Size GPIB.

POWER

Line Voltage Range – 90 to 250 VAC.
Line Frequency – 48 to 63 Hz.
Maximum Power – 300 W.
Maximum Current – 4 A.
Fuse Rating – 6 A, 250 V, Fast blow.
Primary Circuit Dielectric Voltage Withstand Test – 1500 V rms, 50 Hz for 15 seconds, without breakdown.

PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Height	165	6.5
Width	376	14.8
Depth	495	19.5
Weight	**kg**	**lb.**
Net	13	29

WARRANTY

One year parts and labor.

SAFETY

UL3111-1, CSA231, EN61010-1, IEC61010-1.
Self-declaration – EN61010-1 with second amendment.

For more comprehensive and environmental specifications, please see the Tektronix website.

ORDERING INFORMATION

For price information: Outside the U.S. contact your local Tektronix representative, inside the U.S. see the price list in the back of this catalog.

3026
Real Time Spectrum Analyzer.

Includes: (For U.S.) User Manual (Japanese 070-A676-02), Programmer's Manual (Japanese 070-A682-00), Application Software, Utility (VIEW3026, 3.5 in. Floppy, 062-A225-00), Power Cord (Power Cable Assy, 161-A005-00), 3-2 Adapter (103-0013-00).

Includes: (All other countries) User Manual (English 071-0418-00), Programmer's Manual (Japanese 071-0419-00), Application Software, Utility (VIEW3026, 3.5 in. Floppy, 062-A255-00), Power Cord (Power Cable Assy, 161-0230-01).

OPTIONS

Opt. 1R – Rackmount Kit.

INTERNATIONAL POWER PLUGS

Opt. A1 – Universal Euro 220 V, 50 Hz.
Opt. A2 – United Kingdom 240 V, 50 Hz.
Opt. A3 – Australian 240 V, 50 Hz.
Opt. A4 – North American 240 V, 60 Hz.
Opt. A5 – Switzerland 220 V, 50 Hz.
See page 619 for description.

MEASUREMENT SERVICE OPTIONS

Opt. C3 – Three years of calibration services.
Opt. C5 – Five years of calibration services.
Opt. D1 – Cal Data Report.
Opt. D3 – Test data (requires Opt. C3).
Opt. R3 – Repair warranty extended to cover three years.

OPTIONAL ACCESSORIES

Transit Carrying Case – Order 016-1157-00.

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