AEROFLEX

The Leader in Fast Switching Synthesizers

WIRELESS TEST PRODUCTS

FastSource™ 1200

FAST SWITCHING SYNTHESIZER

- **<100 Microsecond Switching Speed**
- **Low Phase Noise: -128 dBc/Hz**
- **1 Hz Resolution**
- **Low Spurious**
- **BCD/GPIB Interface**

FastSource™ 1200

FAST SWITCHING SYNTHESIZER

Measuring and evaluating todays wireless systems and system components is a challenging task. The performance specifications of these systems are extremely diverse and include many analog, digital and complex modulation schemes over a wide frequency range.

Fastsource™ products from Aeroflex including Synthesized Sources, IQ Vector Modulators, and AWGs have been designed to meet these challenges.

The ***Fastsource™1200*** synthesizer covers the frequency range of 4.5 MHz to 6.0 GHz with a switching speed of less than 100 µsec; spurious levels are typically less than -70 dBc and phase noise at 2 GHz is typically less than -123 dBc/Hz at 10 kHz offset.

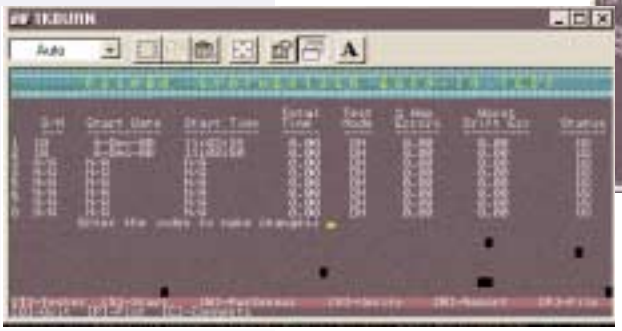
The ***Fastsource™1200*** is 30 times faster and 10 times cleaner than the nearest competitor.

The ***FastSource™1200*** is built from a set of "standard" RF modules interfaced to a common mother board. Modules can be changed without any adjustments thereby simplifying maintenance, logistics and reducing downtime.

Statistical MTBF exceeds 12000 hours.

The ***FastSource™1200*** product line supports high speed testing of not only wireless communications systems and components but also mobile network devices and Bluetooth enabled products.

It is ideally suited for customers in the OEM ATE marketplace where processing speed and thruput are paramount.



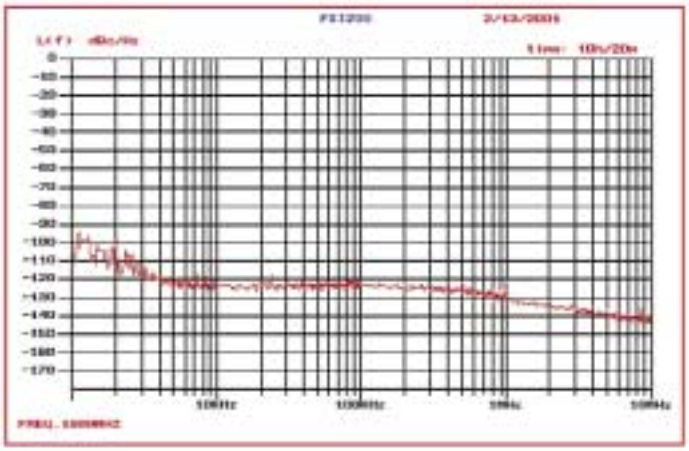
SPECIFICATIONS

Frequency Range:	4.5 MHz to 6010 MHz
Step Size:	1 Hz - 4.5 MHz to 1999 MHz 2 Hz - 2000 to 3999 MHz 4 Hz f- 4000 to 6010 MHz
Power Output:	+7 dBm
Flatness:	± 1.5 dB
Output Isolution:	<25 dB minimum between ports <5 microseconds switching time between ports
VSWR:	1.8:1
External Reference:	10 MHz, 3 dBm ±4 dB, 50 Ohms
Frequency Stability:	Same as reference Oscillator
Reference Output:	10 MHz, +3 dBm ±2dB, 50 Ohms
Phase Noise of External Reference:	-130 dBc/Hz 100 Hz offset -140 dBc/Hz 1 kHz offset -143 dBc/Hz 10 kHz offset -145 dBc/Hz 50 kHz offset
Switching Time:	<100 µseconds to within 1.0 radian of final phase
Noise Floor (10 MHz Offset):	-140 dBc/Hz 4.5 to 180 MHz -145 dBc/Hz 180 to 1000 MHz -147 dBc/Hz 1000 to 2000 MHz -138 dBc/Hz 2000 to 4000 MHz -134 dBc/Hz 4000 to 6010 MHz
Harmonics:	-25 dBc maximum 4.5 to 6010 MHz
Subharmonics: (note 1)	-60 dBc, Typical -50 dBc Max except for components at FC noted below
Spurious: (note 2)	-65 dBc Maximum 4.5 to 2000 MHz -60 dBc Maximum 2000 to 4000 MHz -55 dBc Maximum 4000 to 6010 MHz

Note 1: @ FC +4.0 to 4.25, 5F/2 may be -45 dBc
@ Offset ≤ ±2.8 MHz from the carrier, spurs will be as follows:
FC < 180 MHz: -60 dBc
180 MHz< FC < 1.0 GHz: -66 dBc
1.0 GHz< FC < 2.0 GHz: -60 dBc
2.0 GHz< FC < 4.0 GHz: -54 dBc
4.0 GHz< FC < 6.01 GHz: -48 dBc

For 1.0 GHz<FC>2 Hz, fixed spurs at the following frequencies may be -60 dBc: 1175, 1225, 1275, 1325, 1375, 1425, 1475, 1525, 1575 & 1625 MHz.

Residual FM:	<7 Hz 4.5 to 2000 MHz <16 Hz 2000 to 4000 MHz <32 Hz 4000 to 6010 MHz
Frequency Control:	Parallel BCD positive or negative true with strobe. Strobe normally low, trigger on trailing edge GPIB (IEEE-488)
"Power On" Flag:	+5 volt output on Programming Connector
Remote On/Off (RF):	0 MHz = Off
On/Off Ratio:	<25 dBc
Logic Connector:	50 Pin receptacle, AMP 554216-3
Initialization:	Unit initializes with RF Off
Random Vibration:	10 Hz to 300 Hz @ 1.2G RMS
Power:	Autoranging: 50-60 HZ 100 to 130 VAC, 180 to 250 VAC
Dimensions:	19.0" W X 3.5" H X 22.28" D (Chassis Width 16.72")
Temperature Range:	+10˚ to +45˚C
Certification:	TUV



Note 2: For FC less than 180 MHz a spur may exist between 1609 MHz and 1960 MHz at -35 dBc: A fixed 800 MHz spur may exist at -60 dBc on all carrier frequencies.

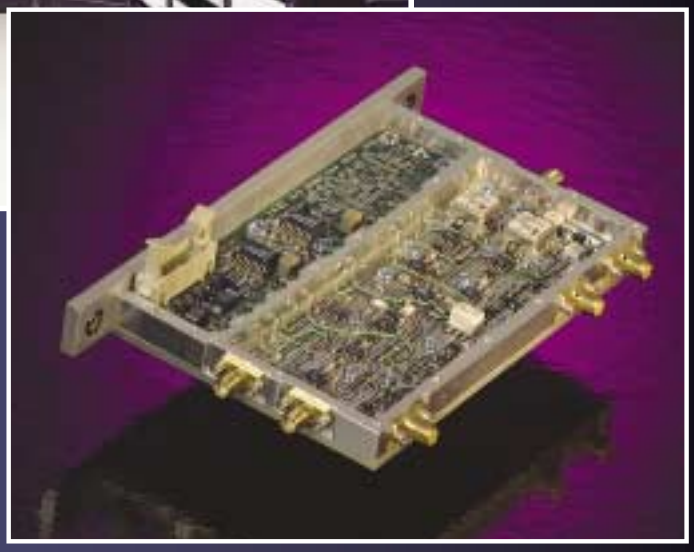
Note: Specifications are subject to change without notice.

Factory Automation is used extensively throughout the manufacturing and test process of all *FastSource*™ products. Computer controlled test stations are utilized at board test, system test, burn in and final ATP.

Our *FastSource*™ products are fully monitored, and data collected at +40˚C, during the 8 day burn in process. The units are also subjected to thermal ESS, shock and vibration.

Bar coding of each module and system during the manufacturing process assures that configuration and QA processes are documented and maintained as part of our ISO process.

Burn-In Racks



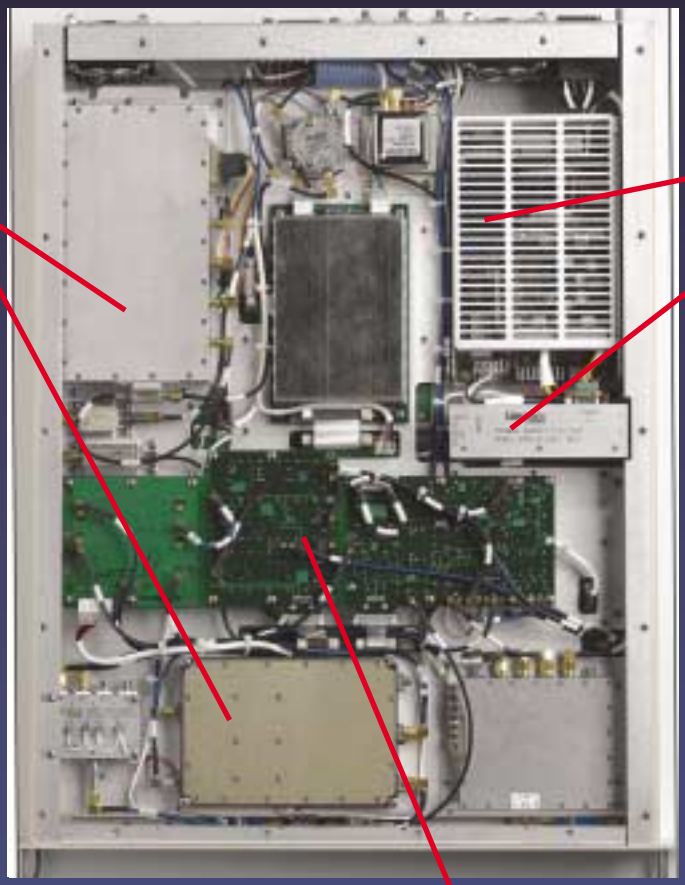
5B Module

Microwave Module

Sub-Assembly Test

FastSource™1200 Architecture

Packaging includes both open PC Board designs as well as traditional microwave housings.



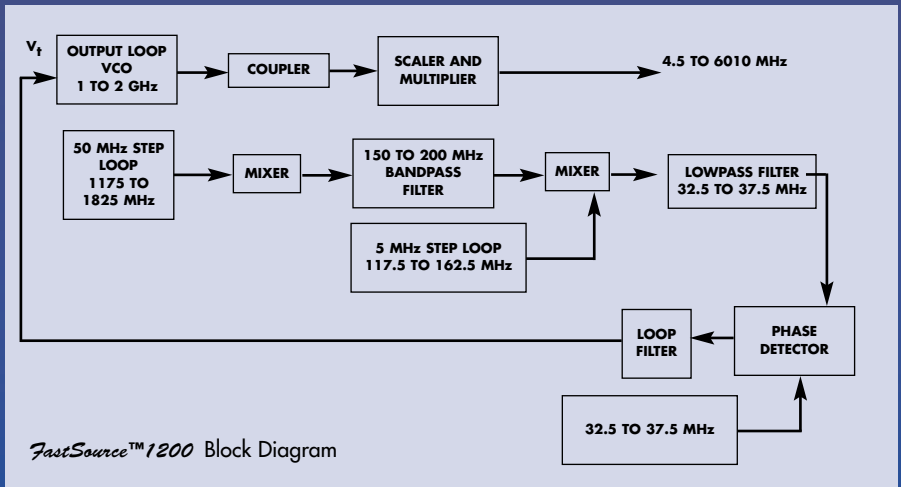
Power supply and custom filter assembly insures optimum RF performance.

All PC boards utilize automated SMT construction for consistent quality and performance.

Design Features

In selecting a design approach, foremost consideration was given to phase noise performance and switching speed requirements.

A multiloop design was chosen over a singleloop configuration to meet the resolution criterion. An output loop frequency range of 1 to 2 GHz is beat down to a narrower VHF range using a stepped LO where a low noise variable-frequency reference is generated. The LO comprises a 100 MHz crystal oscillator and amplifier driving a step-recovery diode comb generator, and exhibits a phase noise level that is at least 3 dB below the system noise specification.



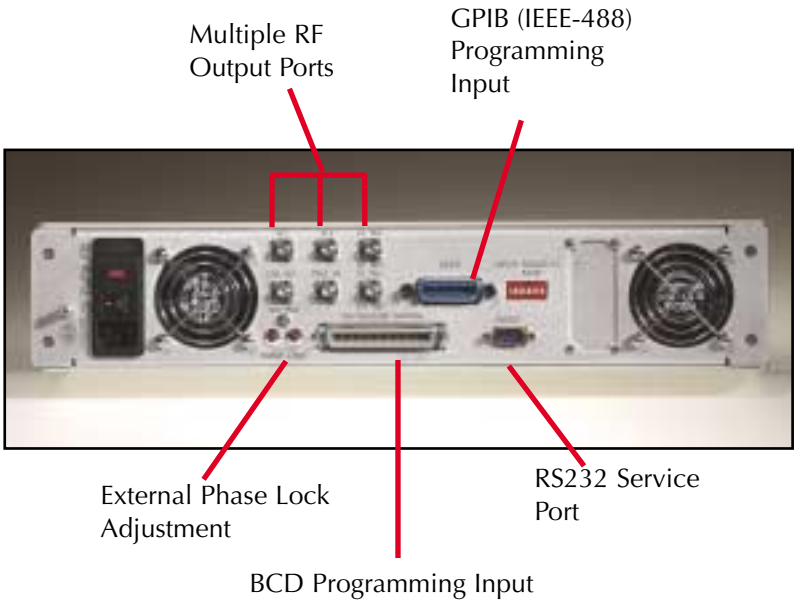
FastSource™1200 Block Diagram

PROGRAMMING INPUT

SIGNAL	PIN	PIN	SIGNAL
Logic Ground	50	25	NC
400MHz	49	24	Strobe
NC	48	23	NC
NC	47	22	NC
NC	46	21	Chassis Ground
Power on Flag	45	20	8 MHz
200 MHz	44	19	4 MHz
100 MHz	43	18	2 MHz
1 Hz	42	17	1 MHz
80 MHz	41	16	20 MHz
40 MHz	40	15	10 MHz
MUX	39	14	2 GHz
800 MHz	38	13	1 GHz
8 Hz	37	12	2 Hz
4 Hz	36	11	4 GHz
80 Hz	35	10	20 Hz
40 Hz	34	9	10 Hz
800 Hz	33	8	200 Hz
400 Hz	32	7	100Hz
8 kHz	31	6	2 kHz
4 kHz	30	5	1 kHz
80 kHz	29	4	20 kHz
40 kHz	28	3	10 kHz
800 kHz	27	2	200 kHz
400 kHz	26	1	100 kHz

Note: Mating Connector is 3M P/N 3564-1001 (50 Pin Ribbon. Ball mount, Plug)

FastSource™ REAR PANEL



The ***FastSource***™ frequency synthesizer family represents a milestone in the development of high speed, low noise signal sources. Designed specifically to meet the needs of today's fast-paced telecommunications test industry, this product offers a high-performance, cost effective solution for the increasingly complex demands of the ATE market.

Drawing on Aeroflex's expertise in both direct and ndirect synthesizer design, the ***FastSource***™ combines the best features of both. The classic compromise between direct and indirect synthesizer designs is essentially a tradeoff between speed and spectral purity. Direct analog synthesizer design utilizes wideband, open loop circuits to maximize frequency switching speed, usually at the expense of noise floor performance. Indirect synthesizer design, based on phase-locked loops, optimizes noise performance by using relatively narrow PLL bandwidths. The resulting response times are on the order of several tens to hundreds of microseconds.

Direct analog designs are hardware-intensive, requiring numerous RF and microwave filters to suppress spurious responses. In applications where sub-microsecond switching speed is not essential, these designs tend to be cost-prohibitive. Indirect designs offer better noise floor and spurious performance than the typical direct design, but the slower response time can be the limiting factor for throughput of an ATE system. Indirect designs nevertheless offer a major cost advantage over direct.

With the ***FastSource***™ design, Aeroflex has successfully combined high speed and low noise performance in a single, cost effective product. This unique combination offers ATE system designers a solution to demands for greater throughput with more stringent test requirements.

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