

# FS1000 Series

## Fast Switching Synthesizer



Supports hundreds of fast switching, high spectral purity applications.

### Description:

The Aeroflex FastSource 1000 RF source represents a milestone in Synthesizer development and reflects years of design experience in Fast Switching Synthesis.

Designed specifically to meet the needs of today's Telecommunications industry, this high speed source offers a cost effective solution without sacrificing performance. The source covers a frequency range of 4.5 MHz to 6.0 GHz with a switching speed of 100 Microseconds. Spurious levels are greater than -65 dBc and Phase noise at 1.0 GHz is greater than -130 dBc/Hz at 10 KHz offset.

### Specifications:

**Frequency Range:** 4.5 MHz to 6010 MHz

**Step Size:** 2 Hz - 2000 MHz  
2 Hz - 2000 to 4000 MHz  
4 Hz - 4000 to 6010 MHz

**Power Output:** +7 dBm

**Flatness:**  $\pm 1.5$  dB

**Output Isolation:**

25 dB minimum between ports  
<5 microseconds switching time between ports

**VSWR:** 1.8:1

**External Reference:** 10 MHz, 3 dBm  $\pm 4$  dB, 50  $\Omega$

**Frequency Stability:**

Same as Reference Oscillator

**Reference Output:**

10 MHz, +3 dBm  $\pm 2$  dB, 50 W

### Features:

- <100 Microsecond switching
- Low phase noise -130 dBc/Hz
- 2 Hz resolution
- Low spurious
- Dual configuration available

#### Phase Noise of External Reference:

dBc/Hz	Offset
-130	100 Hz
-140	1 KHz
-143	10 KHz
-145	50 KHz

#### Switching Time:

<100  $\mu$  seconds to within 1.0 radian of final phase

#### Noise Floor:

10 MHz OFFSET	Frequency Range
-140 dBc/Hz	4.5 to 180 MHz
-145 dBz/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

## Specifications (con't):

### Output Phase Noise:

OFFSET	<250 MHz		.25 to <5 GHz		0.5 to <1.0 GHz		1.0 to <2.0 GHz		2.0 to <4.0 GHz		4.0 to <6.0 GHz	
	Typ.	Guar.	Typ.	Guar.	Typ.	Guar.	Typ.	Guar.	Typ.	Guar.	Typ.	Guar.
10 kHz	-125	-122	-135	-132	-131	-127	-125	-122	-119	-116	-113	-110
20 kHz	-127	-124	-137	-133	-133	-129	-127	-124	-121	-118	-115	-112
100 kHz	-128	-125	-138	-134	-134	-130	-128	-123	-122	-118	-116	-113

### Harmonics

-25 dBc max. 4.5 to 6010 MHz

### Sub Harmonics:

-60 dBc, Typical  
 -50 dBc Max except for components at FC noted below  
 @ FC=4.0 to 4.25, 5F/2 may be -45 dBc  
 @ Offsets  $\leq \pm 2.8$  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 GHz, fixed spurs at the following frequencies may be -60 dBc: 1175, 1225, 1275, 1325, 1375, 1425, 1475, 1525, 1575 and 1625 MHz

### Spurious:

dBc (maximum)	Frequency Range
-65	4 to 2000 MHz
-60	2000 to 4000 MHz
-55	4000 to 6010MHz

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 all carrier frequencies

## Physical Dimensions:

**Dimensions:** 16.75" W X 5.22" H X 23.86" D

### Residual FM:

Residual FM	Frequency Range
< 7	4 to 2000 MHz
< 16	2000 to 4000 MHz
< 32	4000 to 6010MHz

### Frequency Control:

Parallel BCD positive or negative true with strobe. Strobe normally low, trigger on trailing edge

**Output Fault:** TTL level logic, "1" normal operation

**Remote On/Off (RF):** 0 MHz = Off  
 On/Off Ratio  
 < 25 dBc

**Logic Connector:** 50 Pin receptacle, AMP 554216-3

**Initialization:** Unit will initialize with RF Off

**Random Vibration:** 10 Hz to 300 Hz @ 1.2 G RMS

**Power:** 105 to 125 VAC, 50-60 Hz

**Temperature Range:** +10° to +45 °C

### CONFIGURATION

S = Single Synthesizer  
 D = Dual, Two independent synthesizers in a common chassis

# FS1000 Series Fast Switching Synthesizer

## Programming Input (BCD Connector)

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

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

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ISO 9001:2008 certified



Our passion for performance is defined by three attributes represented by these three icons: solution-minded, performance-driven and customer-focused.