

### 1.0 Features

- Three PLLs with deep reference, feedback, and post dividers to provide precision clock frequencies
- Multiple outputs provide several clocking options
- Outputs may be tristated for board testing
- S0, S1, and S2 inputs modify output frequencies for design flexibility
- 3.3V operation
- Accepts 5 to 30MHz crystals
- Custom frequency patterns, pinouts, and packages are available. Contact your local AMI Sales Representative for more information.

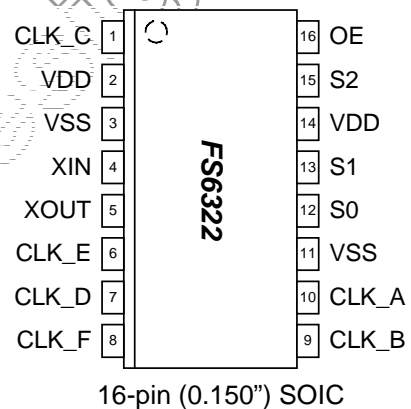
### 2.0 Description

The FS6322 is a ROM-based CMOS clock generator IC designed to minimize cost and component count in a variety of electronic systems.

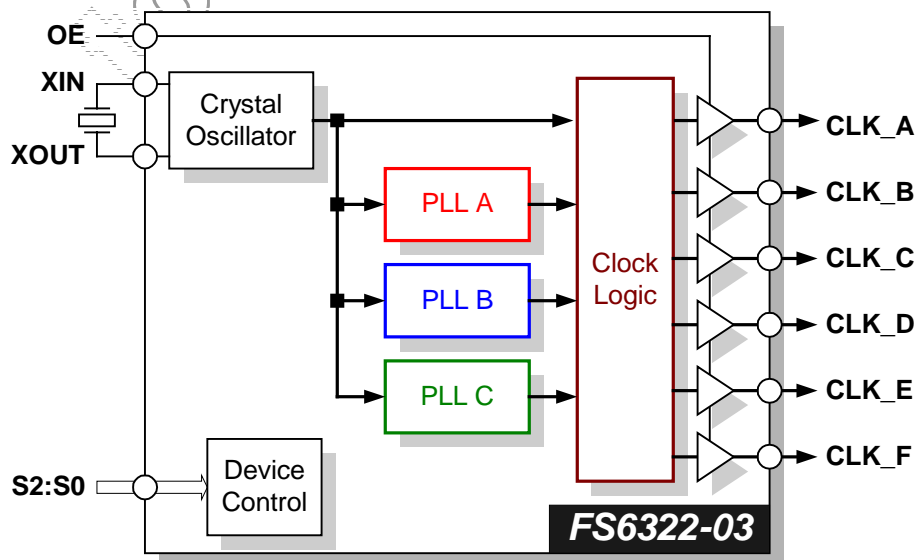
Three low-jitter phase-locked loops (PLLs) drive up to five low-skew clock outputs to provide a high degree of flexibility. The device is packaged in a 16-pin SOIC to minimize board space.

High-resolution divider capability permits generation of desired frequencies.

**Figure 1: Pin Configuration**



**Figure 2: Block Diagram**



# FS6322-03

## Three-PLL Clock Generator IC



**Table 1: Pin Descriptions**

Key: AI = Analog Input; AO = Analog Output; DI = Digital Input; DI<sup>U</sup> = Input with Internal Pull-Up; DI<sup>D</sup> = Input with Internal Pull-Down; DIO = Digital Input/Output; DI-3 = Three-Level Digital Input, DO = Digital Output; P = Power/Ground; # = Active Low pin

PIN	TYPE	NAME	DESCRIPTION
1	DO	CLK_C	C clock output
2	P	VDD	Power supply (5V to 3.3V)
3	P	VSS	Ground
4	AI	XIN	Crystal oscillator feedback
5	AO	XOUT	Crystal oscillator drive
6	DO	CLK_E	E clock output
7	DO	CLK_D	D clock output
8	DO	CLK_F	F clock output
9	DO	CLK_B	A clock output
10	DO	CLK_A	B clock output
11	P	VSS	Ground
12	DI	S0	Frequency select control input
13	DI	S1	Frequency select control input
14	P	VDD	Power supply (5V to 3.3V)
15	DI	S2	Frequency select control input
16	DI	OE	Output enable input: logic-high enables outputs; logic-low tristates outputs (high impedance)

**Table 2: Frequency Table – FS6322-03 (3.3volt)**

S2	S1	S0	FREF	CLK_A (pin 10)	CLK_B (pin 9)	CLK_C (pin 1)	CLK_D (pin 7)	CLK_E (pin 6)	CLK_F (pin 8)
0	0	0	14.919	OFF	48.00026	OFF	24.61635	14.91900	OFF
0	0	1	14.31818	14.31818	8.00000	66.00000	20.00000	24.57598	48.00000
0	1	0	11.0592	27.00000	16.93440	22.57920	33.86880	22.57920	33.86880
0	1	1	11.0592	27.00000	22.57920	33.86880	45.15840	33.86880	33.86880
1	0	0	14.919	OFF	48.00026	29.49105	24.61635	14.91900	OFF
1	0	1	14.31818	14.31818	8.00000	83.00071	20.00000	24.57598	48.00000
1	1	0	11.0592	27.00000	18.43200	24.57600	36.86400	24.57600	33.86880
1	1	1	11.0592	27.00000	24.57600	36.86400	49.15200	36.86400	33.86880

### 3.0 Electrical Specifications

**Table 3: Absolute Maximum Ratings**

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. These conditions represent a stress rating only, and functional operation of the device at these or any other conditions above the operational limits noted in this specification is not implied. Exposure to maximum rating conditions for extended conditions may affect device performance, functionality, and reliability.

PARAMETER	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage, dc ( $V_{SS} = \text{ground}$ )	$V_{DD}$	$V_{SS}-0.5$	7	V
Input Voltage, dc	$V_I$	$V_{SS}-0.5$	$V_{DD}+0.5$	V
Output Voltage, dc	$V_O$	$V_{SS}-0.5$	$V_{DD}+0.5$	V
Input Clamp Current, dc ( $V_I < 0$ or $V_I > V_{DD}$ )	$I_{IK}$	-50	50	mA
Output Clamp Current, dc ( $V_I < 0$ or $V_I > V_{DD}$ )	$I_{OK}$	-50	50	mA
Storage Temperature Range (non-condensing)	$T_S$	-65	150	°C
Ambient Temperature Range, Under Bias	$T_A$	-55	125	°C
Junction Temperature	$T_J$		150	°C
Lead Temperature (soldering, 10s)			260	°C
Input Static Discharge Voltage Protection (MIL-STD 883E, Method 3015.7)			2	kV



**CAUTION: ELECTROSTATIC SENSITIVE DEVICE**

Permanent damage resulting in a loss of functionality or performance may occur if this device is subjected to a high-energy electrostatic discharge.

**Table 4: Operating Conditions**

PARAMETER	SYMBOL	CONDITIONS/DESCRIPTION	MIN.	TYP.	MAX.	UNITS
Supply Voltage	$V_{DD}$	$5V \pm 10\%$	4.5	5	5.5	V
		$3.3V \pm 10\%$	3	3.3	3.6	
Ambient Operating Temperature Range	$T_A$		0		70	°C
Crystal Resonator Frequency	$f_{XIN}$		5		30	MHz
Output Load Capacitance	$C_L$				15	pF

# FS6322-03

## Three-PLL Clock Generator IC



### 4.0 Package Information

**Table 5: 16-pin SOIC (0.150") Package Dimensions**

	DIMENSIONS			
	INCHES		MILLIMETERS	
	MIN.	MAX.	MIN.	MAX.
A	0.061	0.068	1.55	1.73
A1	0.004	0.0098	0.102	0.249
A2	0.055	0.061	1.40	1.55
B	0.013	0.019	0.33	0.49
C	0.0075	0.0098	0.191	0.249
D	0.386	0.393	9.80	9.98
E	0.150	0.157	3.81	3.99
e	0.050 BSC		1.27 BSC	
H	0.230	0.244	5.84	6.20
h	0.010	0.016	0.25	0.41
L	0.016	0.035	0.41	0.89
$\theta$	0°	8°	0°	8°

The drawing includes a top view of the package with pins numbered 1 to 16. Dimensions A through  $\theta$  are indicated. A note specifies 'ALL RADII: 0.005" TO 0.01"'. The side view shows the package height H and lead height h. The lead detail view shows a lead with a length L, a thickness h, a 45-degree angle, and a 7-degree typical angle  $\theta$ . The base plane and seating plane are also indicated.

**Table 6: 16-pin SOIC (0.150") Package Characteristics**

PARAMETER	SYMBOL	CONDITIONS/DESCRIPTION	TYP.	UNITS
Thermal Impedance, Junction to Free-Air 16-pin 0.150" SOIC	$\theta_{JA}$	Air flow = 0 m/s	95	°C/W
Lead Inductance, Self	$L_{11}$	Corner lead	4.0	nH
		Center lead	3.0	
Lead Inductance, Mutual	$L_{12}$	Any lead to any adjacent lead	0.4	nH
Lead Capacitance, Bulk	$C_{11}$	Any lead to $V_{SS}$	0.5	pF

### 5.0 Ordering Information

ORDERING CODE	DEVICE NUMBER	PACKAGE TYPE	OPERATING TEMPERATURE RANGE	SHIPPING CONFIGURATION
11825-803	FS6322-03	16-pin (0.150") SOIC (Small Outline Package)	0°C to 70°C (Commercial)	Tape and Reel
11825-813	FS6322-03	16-pin (0.150") SOIC (Small Outline Package)	0°C to 70°C (Commercial)	Tubes

Contact Factory Prior to New Designs

**Copyright © 1999 American Microsystems, Inc.**

Devices sold by AMI are covered by the warranty and patent indemnification provisions appearing in its Terms of Sale only. AMI makes no warranty, express, statutory implied or by description, regarding the information set forth herein or regarding the freedom of the described devices from patent infringement. AMI makes no warranty of merchantability or fitness for any purposes. AMI reserves the right to discontinue production and change specifications and prices at any time and without notice. AMI's products are intended for use in commercial applications. Applications requiring extended temperature range, unusual environmental requirements, or high reliability applications, such as military, medical life-support or life-sustaining equipment, are specifically not recommended without additional processing by AMI for such applications.

**American Microsystems, Inc., 2300 Buckskin Rd., Pocatello, ID 83201, (208) 233-4690, FAX (208) 234-6796, WWW Address: <http://www.amis.com> E-mail: [tgp@amis.com](mailto:tgp@amis.com)**