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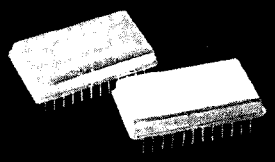


SHC803BM, CM
SHC804BM, CM

ABRIDGED DATA SHEET
For Additional Technical Information, Request PDS-512

High Speed SAMPLE/HOLD AMPLIFIER

FEATURES

- 350ns max ACQUISITION TIME
- ±0.01% THROUGHPUT NONLINEARITY
- 150ns max SAMPLE-TO-HOLD SETTLING TIME
- INPUT BUFFER (SHC803)
- 24-PIN HERMETICALLY-SEALED METAL PACKAGE

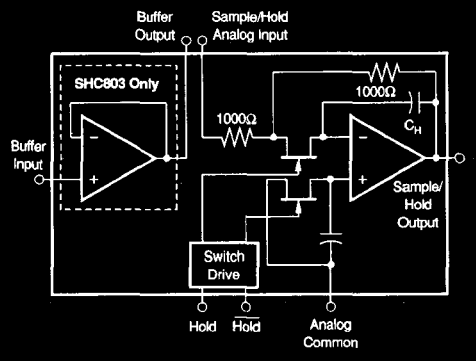
DESCRIPTION

The SHC803 and SHC804 are high speed sample/hold amplifiers designed for use in fast 12-bit data acquisition systems and signal processing systems. The SHC803 contains a fast-settling unity-gain amplifier for buffering high impedance sources or for use with CMOS multiplexers.

The SHC804 acquires a 10V signal change in less than 350ns to ±1/2LSB at 12 bits. Throughput nonlinearity error is guaranteed to be within ±1/2LSB for 12-bit systems. Stability over temperature is excellent, with only ±5ppm/°C of gain drift and ±4ppm of FSR/°C of charge offset drift over the –25 to +85°C temperature range.

The ±25ps maximum aperture uncertainty of SHC803 and SHC804 permits sampling (to ±0.01% of Full Scale Range) of signals with rates of change of up to 100V/µs. These sample/holds have been optimized for use with Burr-Brown's high speed 12-bit analog-to-digital converter, model ADC803. Together these components are capable of accurately digitizing fast changing signals at sample rates as high as 500k samples per second.

The digital inputs (HOLD and $\overline{\text{HOLD}}$) are TTL-compatible. Power supply requirements are ±15V and +5V and the specification temperature range is –25°C to +85°C. The SHC803 and SHC804 are packaged in a 24-pin dual-in-line hermetic metal package. SHC804 is pin-compatible with other sample/holds on the market with similar performance characteristics.



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SPECIFICATIONS

ELECTRICAL

At +25°C, rated power supplies and a 1kΩ output load, unless otherwise specified.

PARAMETER	SHC803/SHC804BM MIN	SHC803/SHC804BM TYP	SHC803/SHC804BM MAX	SHC803/SHC804CM MIN	SHC803/SHC804CM TYP	SHC803/SHC804CM MAX	UNITS
SAMPLE/HOLD INPUTS (without Input Buffer)							
ANALOG							
Voltage Range	±10.25	±11		*	*		V
R_{IN}		1.00			*		kΩ
DIGITAL (HOLD, $\overline{HOLD}$)							
V_{IH}	+2.0			*			V
V_{IL}			+0.8			*	V
I_{H}, V_{IN} = +2.7V			+60			*	µA
I_{L}, V_{IN} = +0.4V			−1.2			*	mA
SAMPLE/HOLD TRANSFER CHARACTERISTICS (without Input Buffer)							
ACCURACY							
Sample Mode							
Gain		−1			*		V/V
Gain Error			±0.1			*	%
Temperature Coefficient		±3	±10		±1	±5	ppm/°C
Linearity Error		±0.001	±0.005		*	*	% of FSR[1]
Zero Offset		±1	±5		±0.5	±3	mV
Temperature Coefficient		±1	±2.5		±0.5	±1.5	ppm of FSR/°C
Hold Mode							
Charge Offset		±2	±10		±1	±5	mV
Temperature Coefficient		±3	±10		±2	±4	ppm of FSR/°C
Droop Rate: at +25°C		±0.5	±5		*	*	µV/µs
+85°C			±0.5			±0.1	mV/µs
Throughput Nonlinearity			±0.01			*	% of FSR
Power Supply Sensitivity[2]: $\pm V_{CC}$			±0.002			*	% of FSR/%V_{CC}
V_{DD}			±0.003			*	% of FSR/%V_{DD}
DYNAMIC CHARACTERISTICS							
Acquisition Time (with 10V Step)							
to within: ±0.1% (±10mV)		220			*		ns
±0.01% (±1mV)		250	350		*	*	ns
Sample-to-Hold Settling Time							
to within ±0.01% (±1mV)		100	150		*	*	ns
Sample-to-Hold Transient Amplitude		60	150		*	*	mV_{PEAK}
Aperture Delay Time[3]		15	25		*	*	ns
Aperture Uncertainty		±10	±25		*	*	ps
Sample Mode: Output Slew Rate		160			*		V/µs
Full Power Bandwidth		1			*		MHz
Small Signal Bandwidth		16			*		MHz
Hold Mode Feedthrough Rejection							
(10V Square Wave Input)	±0.03	±0.005			*		%
SAMPLE/HOLD OUTPUT							
Voltage Range	±10.25	±11		*	*		V
Output Current	±50			*			mA
Short Circuit Protection		Indefinite to Common			*		
Output Impedance (at DC)		0.01	0.1		*	*	Ω
INPUT BUFFER CHARACTERISTICS (SHC803 only)							
INPUT							
Offset Voltage		±1/2	±5		*	*	mV
vs Temperature		±1.5	±2.5		*	*	ppm of FSR/°C
Bias Current			±25			*	nA
Impedance		10^8 || 5			*		Ω || pF
V_{IN} Range	±10.25	±11		*	*		V
DYNAMIC CHARACTERISTICS							
Full Power Bandwidth		320			*		kHz
Slew Rate[4]		10			*		V/µs
Settling Time[4] to ±2mV for 10V Step		2.5			*		µs
OUTPUT							
V_{OUT} Range	±10.25			*			V
Output Current	±10.25			*			mA

SPECIFICATIONS (CONT)

ELECTRICAL

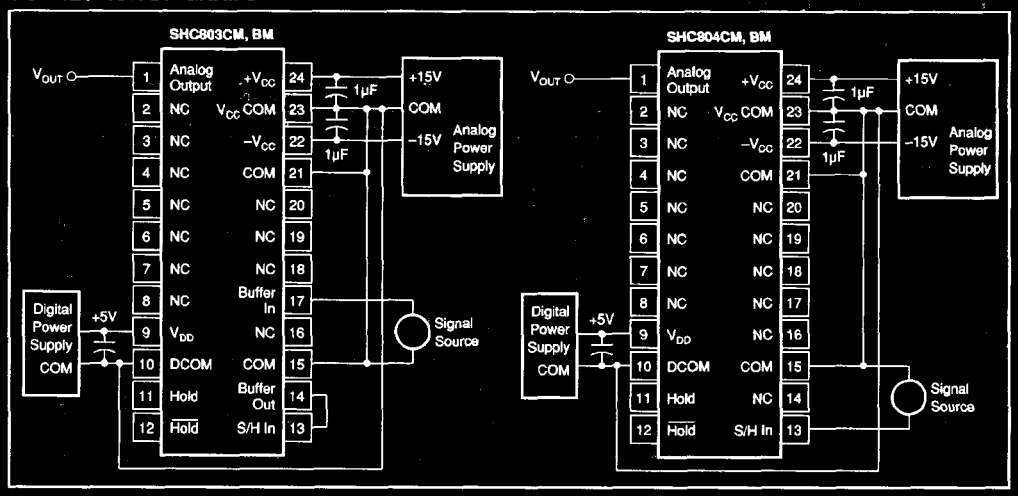
At +25°C, rated power supplies and a 1kΩ output load, unless otherwise specified.

PARAMETER	SHC803/SHC804BM			SHC803/SHC804CM			UNITS
	MIN	TYP	MAX	MIN	TYP	MAX	
POWER SUPPLY REQUIREMENTS							
Rated Voltage: $\pm V_{CC}$	±13.5	±15	±16.5	*	*	*	V
V_{DD}	+4.75	+5.00	+5.25	*	*	*	V
Quiescent Current (No Load)							
SHC804: $+V_{CC}$		30	35		*	*	mA
$-V_{CC}$		15	20		*	*	mA
V_{DD}		5	10		*	*	mA
SHC803: $+V_{CC}$		33	40		*	*	mA
$-V_{CC}$		18	25		*	*	mA
V_{DD}		5	10		*	*	mA
Power Dissipation: SHC804		700	875		*	*	mW
SHC803		790	1100		*	*	mW
TEMPERATURE RANGE							
Specification	–25		+85	*		*	°C
Storage	–55		+125	*		*	°C

* Specification same as SHC803/SHC804BM.

NOTES: (1) FSR means Full Scale Range and is 20V for SHC803 and SHC804. (2) Sensitivity of offset plus charge offset. (3) With respect to HOLD. For $\overline{\text{HOLD}}$ add 5ns typical. (4) With buffer connected to the sample/hold amplifier.

CONNECTION DIAGRAMS



PIN ASSIGNMENTS

PIN	NAME	DESCRIPTION
1	Sample/Hold Output	Analog voltage output
2	NC	Not connected
3	NC	Not connected
4	NC	Not connected
5	NC	Not connected
6	NC	Not connected
7	NC	Not connected
8	NC	Not connected
9	V_{DD}	Logic supply
10	DCOM	Logic supply common
11	HOLD	Logic "1" = HOLD
12	$\overline{HOLD}$	Logic "0" = HOLD
13	S/H In	SHC804 input; for SHC803 connect pin 13 to pin14
14	Buffer Out, SHC803 only	Not connected for SHC804
15	COM	Signal common
16	NC	Not connected
17	Buffer In, SHC803 only	Not connected for SHC804
18	NC	Not connected
19	NC	Not connected
20	NC	Not connected
21	COM	Signal common
22	$-V_{CC}$	–15V supply
23	V_{CC} COM	Analog to power common, connected to case
24	$+V_{CC}$	+15V supply

ABSOLUTE MAXIMUM RATINGS

Input Overvoltage	±15V
$+V_{CC}$ to V_{CC} COMMON	0 to +18V
$-V_{CC}$ to V_{CC} COMMON	0 to –18V
Voltage on Digital Inputs (pins 11 and 12)	–0.5V to +7V
Power Dissipation	1500mW
V_{DC} to DCOM	–0.5V
Analog Output	Indefinite Short to V_{CC} COM

NOTE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. Exposure to absolute maximum conditions for extended periods may affect device reliability.

PACKAGE INFORMATION[1]

MODEL	PACKAGE	PACKAGE DRAWING NUMBER
SHC803BM	24-Pin	113
SHC803CM	24-Pin	113
SHC804BM	24-Pin	113
SHC804CM	24-Pin	113

NOTE: (1) For detailed drawing and dimension table, please see end of data sheet, or Appendix D of Burr-Brown IC Data Book.