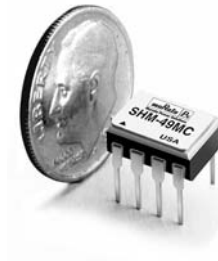


New SMT Package

FEATURES

- Small 8-pin DIP or SMT package
- 200ns max. acquisition time to $\pm 0.01\%$
- 100ns max. sample-to-hold settling time to $\pm 0.01\%$
- 16MHz small signal bandwidth
- 74dB feedthrough attenuation
- ± 25 picoseconds aperture uncertainty
- 415mW maximum power dissipation



GENERAL DESCRIPTION

Murata Power Solution's SHM-49 is a high-speed, highly accurate sample/hold designed for precision, high-speed analog signal processing applications. The SHM-49 features excellent dynamic specifications including a maximum acquisition time of only 200 nanoseconds for a 10V step to $\pm 0.01\%$.

Sample-to-hold settling time, to $\pm 0.01\%$ accuracy, is 100 nanoseconds maximum with an aperture uncertainty of ± 2 picoseconds.

The SHM-49 is a complete sample/hold circuit, containing a precision MOS hold capacitor and a MOSFET switching configuration which results in faster switching and better feedthrough attenuation. Additionally, a FET input amplifier design allows faster acquisition and settling times while maintaining a considerably lower droop rate.

INPUT/OUTPUT CONNECTIONS

Pin	Function
1	+5v Digital Supply
2	S/H Control
3	Analog Input
4	Analog Return
5	-15v Supply
6	Analog Output
7	+15v Analog Supply
8	Power Ground

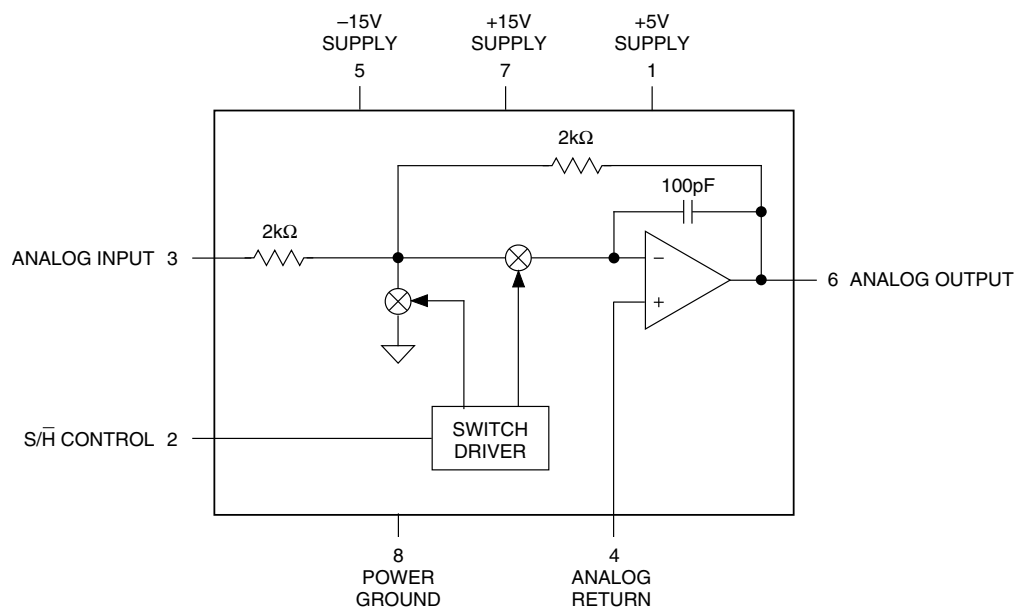


Figure 1. Functional Block Diagram

Absolute Maximum Ratings

±15V Supply Voltages	±18V
+5V Supply Voltages	-0.5V to +7V
Analog Input	±18V
Digital Input	-0.5V to +5.5V
Output Current	±65 mA

Functional Specifications

(Apply over the operating temperature range with ±15V and +5V supplies unless otherwise specified.)

ANALOG INPUT/OUTPUT	MIN.	TYP.	MAX.	UNITS
Input/Output Voltage Range				
±15V Nominal Supply	±10	±11.5	—	Volts
±12V Nominal Supply	±7	±8.5	—	Volts
Input Impedance	—	1000	—	Ω
Output Current	—	—	±65	mA
Output Impedance	—	0.1	—	Ω
Capacitive Load	100	250	—	pF

DIGITAL INPUT				
Input Logic Levels				
Logic 1	+2.0	—	+5.0	Volts
Logic 0	0	—	+0.8	Volts
Loading				
Logic 1	—	—	+5	μA
Logic 0	—	—	-5	μA

TRANSFER CHARACTERISTICS				
Gain	—	-1	—	V/V
Gain Error, +25°C	—	±0.05	±0.5	%
Linearity Error ①	—	±0.005	±0.01	%FS
Sample Mode Offset, +25°C	—	±2	7	mV
Sample-to-Hold Offset (Pedestal), +25°C ②	—	±2.5	±25	mV
Gain Drift	—	±0.5	±15	ppm/°C
Sample Mode Offset Drift ①	—	±3	±15	ppm of FSR/°C
Sample-to-Hold Off. (Pedestal) Drift	—	±5	±20	ppm of FSR/°C

DYNAMIC CHARACTERISTICS				
Acquisition Time				
10V to ±0.01%FS (±1 mV)				
+25°C	—	160	200	ns
-55 to +125°C	—	—	265	ns
10V to ±0.1%FS (±10 mV)				
+25°C	—	100	150	ns
-55 to +125°C	—	—	215	ns
10V to ±0.01%FS (±100 mV)				
1V to ±1%FS (±10 mV)	—	90	—	ns
1V to ±1%FS (±10 mV)	—	75	—	ns
Sample-to-Hold Settling Time				
10V to ±1%FS (±100 mV)	—	60	100	ns
1V to ±0.01%FS (±10 mV)	—	40	80	ns
Sample-to-Hold Transient	—	100	—	mVp-p
Aperture Delay Time	—	10	15	ns
Aperture Uncertainty (Jitter)	—	±25	±50	ps
Output Slew Rate	±200	±300	—	V/μs
Small Signal BW (-3dB)	10	16	—	MHz
Output Droop				
+25°C	—	±0.5	±15	μV/μs
0 to +70°C	—	±15	±30	μV/μs
-55 to +125°C	—	±1.2	±2.4	mV/μs
Feedthrough Rejection	69	74	—	dB

POWER REQUIREMENTS	MIN.	TYP.	MAX.	UNITS
Voltage Range				
+15V Supply	+11.5	+15.0	+15.5	Volts
-15V Supply	-11.5	-15.0	-15.5	Volts
+5V Supply	+4.75	+5.0	+5.25	Volts
Power Supply Rejection Ratio	—	±0.5	±1	mV/V
Quiescent Current Drain				
+15V Analog Supply	—	+12	+13.5	mA
-15V Supply	—	-12	-13.5	mA
+5V Supply	—	+1	-1.5	Volts
Power Consumption	—	365	415	mW

PHYSICAL/ENVIRONMENTAL	
Operating Temp. Range, Case	
SHM-49MC/GC	0 to +70°C
SHM-49MM/GM	-55 to +125°C
Storage Temperature Range	-65 to +150°C
Thermal Impedance	
θjc	15°C/W
θca	35°C/W
Package Type	8-pin ceramic DIP (MC/MM) or SMT (GC/GM)

Footnotes:

- ① Full Scale (FS) = 10V. Full Scale Range (FSR) = 20V.
- ② Sample-to-hold offset error (pedestal) is constant regardless of input/output level.

Ordering Information

MODEL	OPERATING TEMP. RANGE
SHM-49MC	0 to +70°C
SHM-49MM	-55 to +125°C
SHM-49GC	0 to 70°C
SHM-49GM	-55 to 125°C

For availability of high-reliability versions of the SHM-49, contact Murata Power Solutions.

TECHNICAL NOTES

- All ground pins should be tied together and connected to system analog ground as close to the package as possible. It is recommended to use a ground plane under the device and solder ground pins directly to it. Take care to ensure that no ground potentials can exist between ground pins.
- External 0.1μF to 4.7μF tantalum bypass capacitors are required in critical applications.
- A logic 1 on S/H puts the unit in the sample mode. A logic 0 puts the unit in hold mode.
- The maximum capacitive load to avoid oscillation is typically 250pF. Recommended resistive load is 500Ω, although values as low as 250Ω may be used. Acquisition and sample-to-hold settling times are relatively unaffected by resistive loads down to 250Ω and capacitive loads up to 50pF. Greater load capacitances will affect both acquisition and settling time.
- Gain and offset adjusting can be accomplished using the external circuitry shown in Figure 2. Adjust offset with a 0V input. Adjust gain with a ±FS input. Adjust so that the output in the hold mode matches the input.

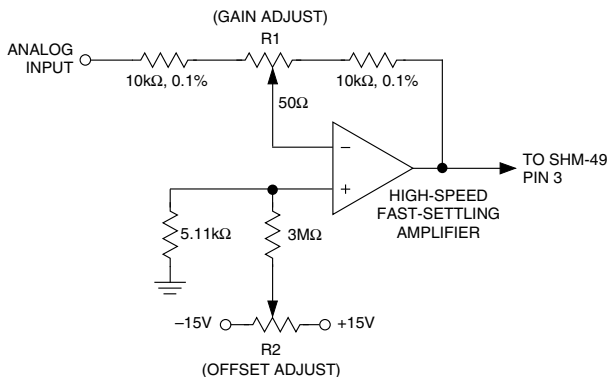
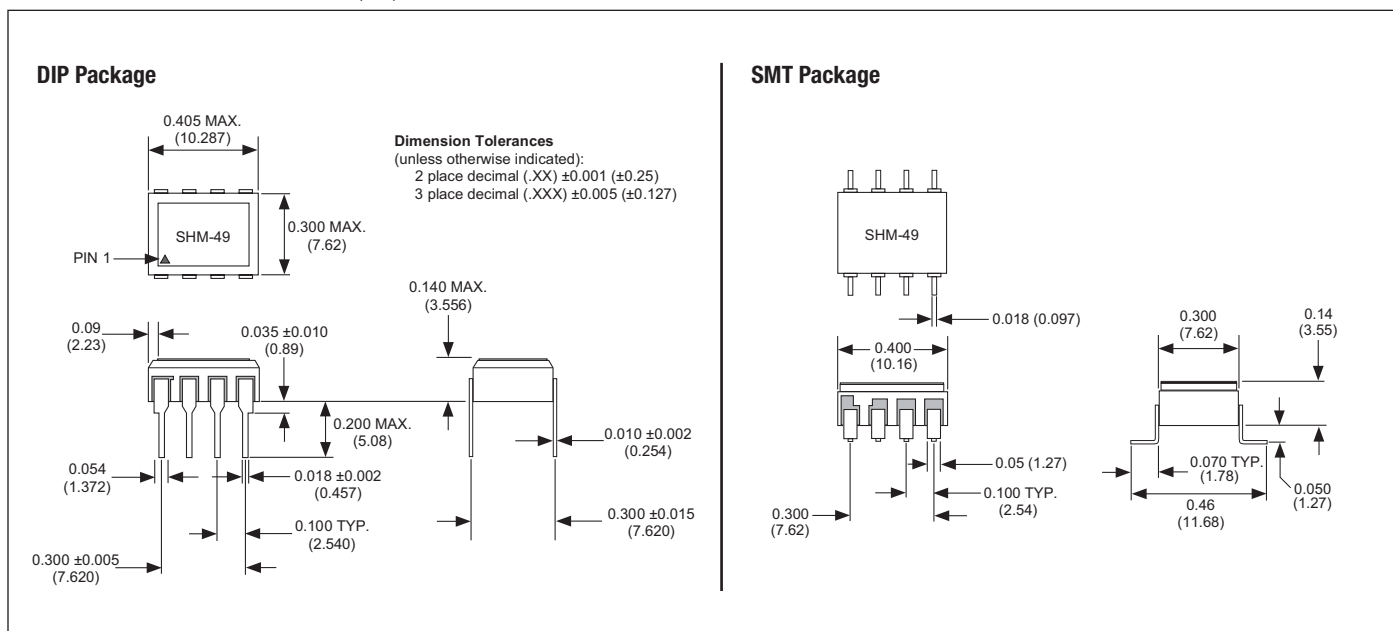


Figure 2. Offset and Gain Adjustments

MECHANICAL DIMENSIONS Inches (mm)



ISO 9001
REGISTERED

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