



SGM9149

13MHz, 3-Channel, 5th-Order, Standard Definition Video Filter Driver

GENERAL DESCRIPTION

The SGM9149 is a rail-to-rail, 3-channel, 5th-order output reconstruction filter with input clamps which can operate from 3.0V to 5.5V single power supply, while consuming an ultra-low 21mA quiescent current. The device is optimized for low power, wide range of television and set-top box applications.

The device has a -3dB bandwidth of 13MHz and 61V/ μ s slew rate, allowing DC- or AC-coupled output. SGM9149 can be DC-coupled or AC-coupled with input video signal to eliminate out-of-band noise, such as the output stage of DAC.

The SGM9149 is available in Green SOIC-8 and MSOP-8 packages. It operates over an ambient temperature range of -40°C to +85°C.

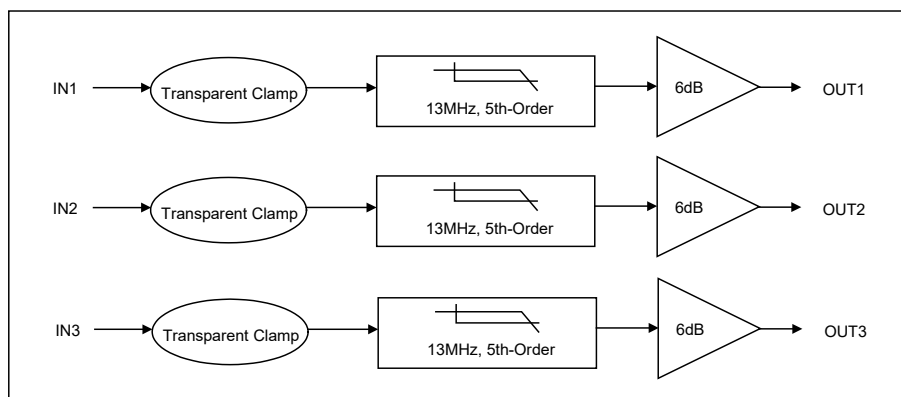
FEATURES

- **Supply Voltage Range: 3.0V to 5.5V**
- **3-Channel 5th-Order 13MHz (SD) Filter**
- **Transparent Input Clamping**
- **Internal Gain: 6dB**
- **Quiescent Current: 21mA (TYP)**
- **AC- or DC-Coupled Inputs**
- **AC- or DC-Coupled Outputs**
- **Rail-to-Rail Output**
- **-40°C to +85°C Operating Temperature Range**
- **Available in Green SOIC-8 and MSOP-8 packages**

APPLICATIONS

- Video Amplifiers
- Video Recorders
- Video on Demand (VOD)
- Cable and Satellite Set-Top Boxes
- Communication Devices

BLOCK DIAGRAM



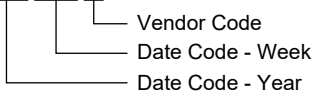
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM9149	SOIC-8	-40°C to +85°C	SGM9149YS8G/TR	SGM 9149YS8 XXXXX	Tape and Reel, 2500
	MSOP-8	-40°C to +85°C	SGM9149YMS8G/TR	SGM9149 YMS8 XXXXX	Tape and Reel, 3000

MARKING INFORMATION

NOTE: XXXXX = Date Code and Vendor Code.

XXXXX



Green (RoHS & HSF): SG Micro Corp defines "Green" to mean Pb-Free (RoHS compatible) and free of halogen substances. If you have additional comments or questions, please contact your SGMICRO representative directly.

Input Voltage Range GND - 0.3V to $V_{CC} + 0.3V$
 Supply Voltage, V_{CC} 6.0V
 Junction Temperature +150°C
 Storage Temperature Range -65°C to +150°C
 Lead Temperature (Soldering, 10s) +260°C
 ESD Susceptibility
 HBM 8000V
 MM 400V

RECOMMENDED OPERATING CONDITIONS

Operating Voltage Range 3.0V to 5.5V
 Operating Temperature Range -40°C to +85°C

OVERSTRESS CAUTION

Stresses beyond those listed in Absolute Maximum Ratings may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect reliability. Functional operation of the device at any conditions beyond those indicated in the Recommended Operating Conditions section is not implied.

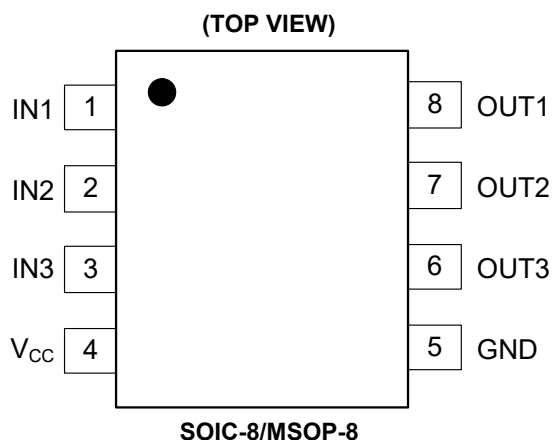
ESD SENSITIVITY CAUTION

This integrated circuit can be damaged if ESD protections are not considered carefully. SGMICRO recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because even small parametric changes could cause the device not to meet the published specifications.

DISCLAIMER

SG Micro Corp reserves the right to make any change in circuit design, or specifications without prior notice.

PIN CONFIGURATIONS



PIN DESCRIPTION

PIN	NAME	FUNCTION
1	IN1	Video Input for Channel 1.
2	IN2	Video Input for Channel 2.
3	IN3	Video Input for Channel 3.
4	V _{CC}	Power Supply.
5	GND	Ground.
6	OUT3	Filtered Output for Channel 3.
7	OUT2	Filtered Output for Channel 2.
8	OUT1	Filtered Output for Channel 1.

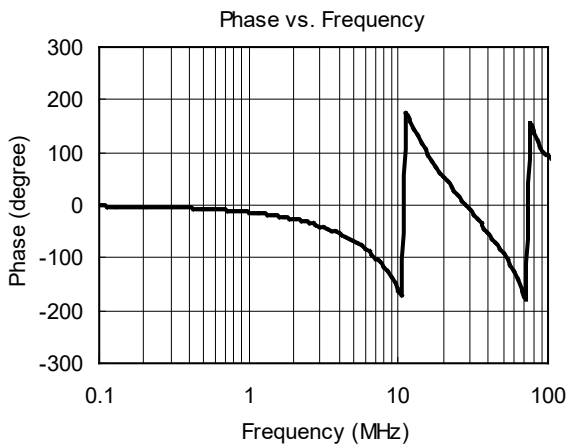
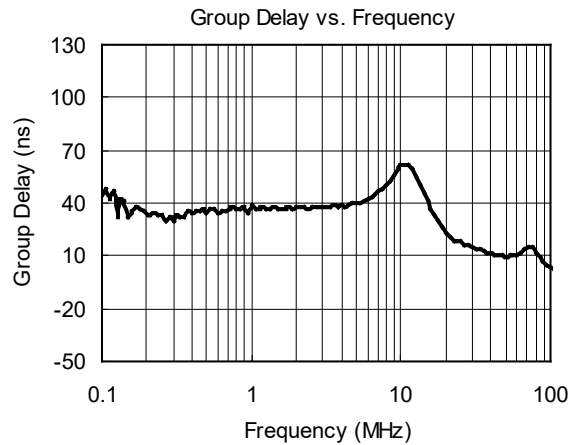
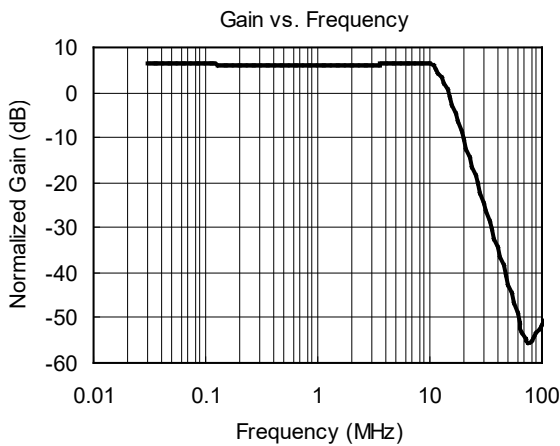
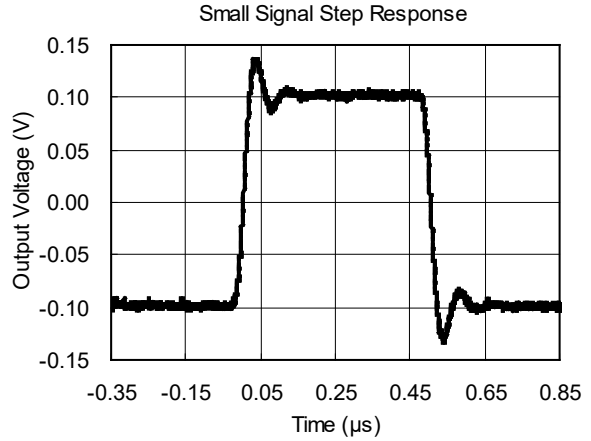
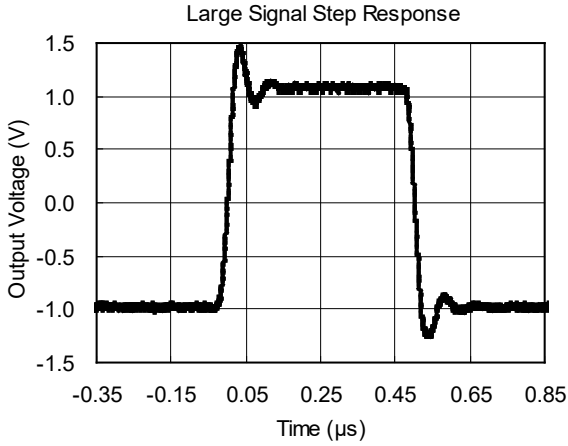
ELECTRICAL CHARACTERISTICS

($T_A = +25^\circ\text{C}$, at $R_L = 150\Omega$ connected to GND, $V_{IN} = 1V_{PP}$ and $C_{IN} = 0.1\mu\text{F}$, all outputs AC-coupled with $220\mu\text{F}$, referenced to 400kHz, unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Input Characteristics					
Output Level Shift Voltage (V_{OLS})	$V_{IN} = 0V$, no load		370	570	mV
Input Voltage Clamp (V_{CLAMP})	$I_{IN} = -3.5\text{mA}$		-116		mV
Clamp Charge Current	$V_{IN} = V_{CLAMP} - 100\text{mV}$		-5.1		mA
Voltage Gain (A_V)	$R_L = 150\Omega$	5.6	6	6.4	dB
Output Characteristics					
Output Voltage High Swing	$V_{IN} = 3.0V$, $R_L = 150\Omega$ to GND		4.69		V
Power Supply					
Operating Voltage Range		3		5.5	V
Power Supply Rejection Ratio (PSRR)	$V_{CC} = 3.5V$ to $5.0V$		50		dB
Quiescent Current (I_Q)	$V_{IN} = 0V$		21	28.5	mA
AC Performance					
-0.1dB Bandwidth	$R_L = 150\Omega$		10.7		MHz
-1dB Bandwidth	$R_L = 150\Omega$		11.7		MHz
-3dB Bandwidth	$R_L = 150\Omega$		13.2		MHz
Filter Response (Normalized Gain)	$f_{IN} = 27\text{MHz}$		25.7		dB
Slew Rate	2V output step, 80% to 20%		61		V/ μs
Differential Gain (DG)	PAL DC-coupled		0.29		%
	PAL AC-coupled		0.29		%
Differential Phase (DP)	PAL DC-coupled		0.60		°
	PAL AC-coupled		0.58		°
Group Delay Variation (D/DT)	Difference between 400kHz and 6.5MHz		5.2		ns
Crosstalk (Channel-to-Channel)	$f = 1\text{MHz}$		-64		dB
Fall Time	2V output step, 80% to 20%		19.5		ns
Rise Time	2V output step, 80% to 20%		19.8		ns

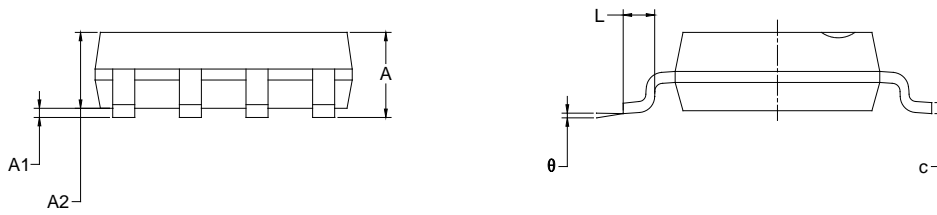
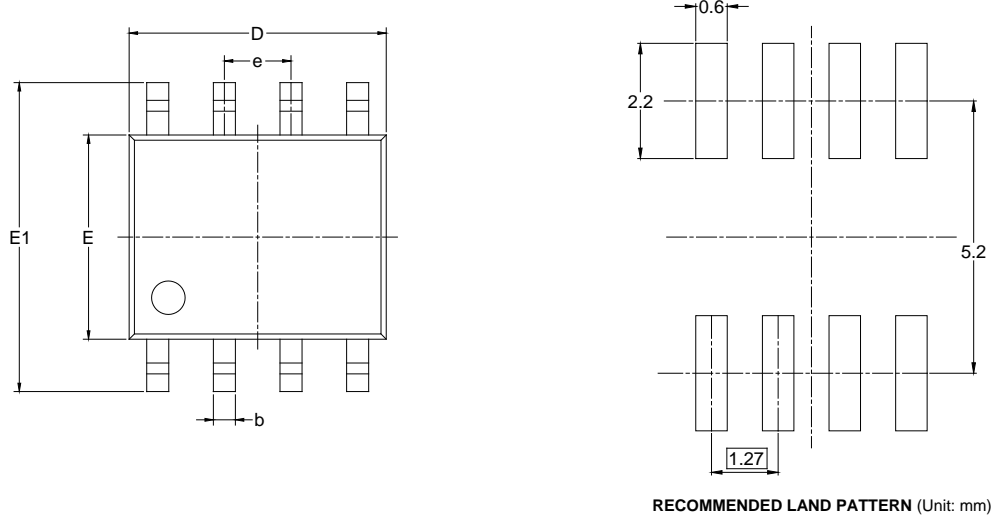
TYPICAL PERFORMANCE CHARACTERISTICS

T_A = +25°C, at R_L = 150Ω connected to GND, V_{IN} = 1V_{PP} and C_{IN} = 0.1μF, all outputs AC-coupled with 220μF, referenced to 400kHz, unless otherwise noted.



PACKAGE OUTLINE DIMENSIONS

SOIC-8

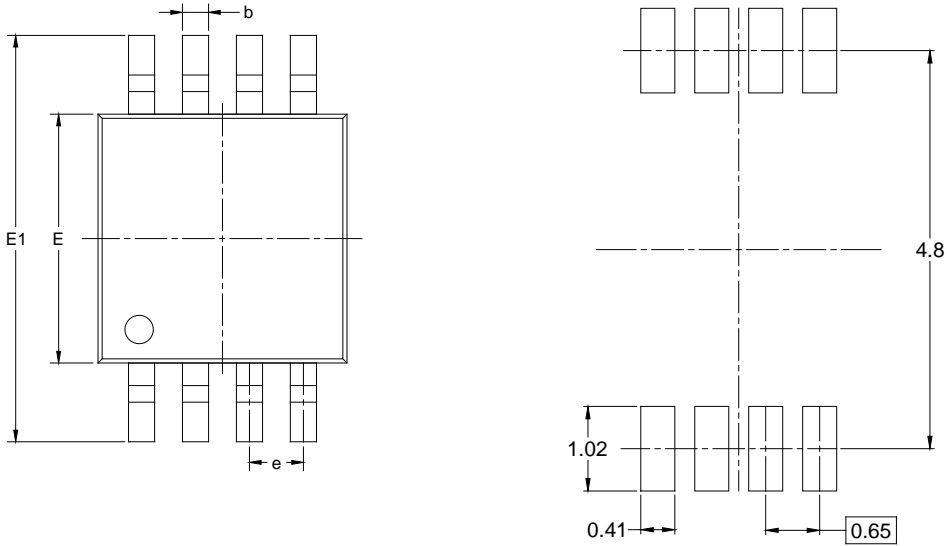


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.27 BSC		0.050 BSC	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

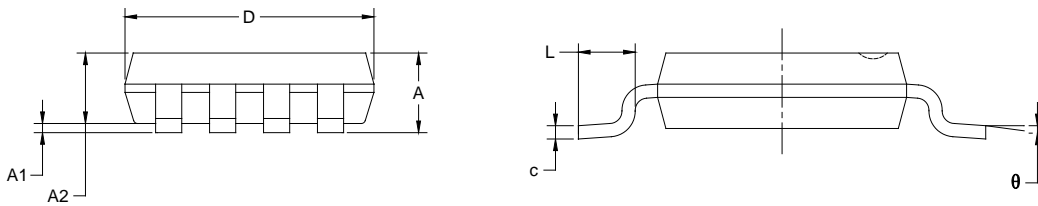
- NOTES:
 1. Body dimensions do not include mode flash or protrusion.
 2. This drawing is subject to change without notice.

PACKAGE OUTLINE DIMENSIONS

MSOP-8



RECOMMENDED LAND PATTERN (Unit: mm)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.650 BSC		0.026 BSC	
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°

NOTES:

1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF TAPE AND REEL

Package Type	Reel Diameter	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
SOIC-8	13"	12.4	6.40	5.40	2.10	4.0	8.0	2.0	12.0	Q1
MSOP-8	13"	12.4	5.20	3.30	1.50	4.0	8.0	2.0	12.0	Q1

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PACKAGE INFORMATION

CARTON BOX DIMENSIONS



NOTE: The picture is only for reference. Please make the object as the standard.

KEY PARAMETER LIST OF CARTON BOX

Reel Type	Length (mm)	Width (mm)	Height (mm)	Pizza/Carton
13"	386	280	370	5

DD0002