SGM9152
1-Channel, Video Filter Driver for HD (1080p)

GENERAL DESCRIPTION

The SGM9152 is a 1-channel, 6th-order output reconstruction filter which can operate from 3.1V to 5.5V single power supply. It is designed to replace passive LC filters and drivers with an integrated device. One channel is High Definition (HDp) filter.

The device allows DC- or AC-coupled output. SGM9152 can be DC-coupled or AC-coupled with input video signal to eliminate out-of-band noise, such as the output stage of DAC. Internal bias circuitry may be used for providing constant bias voltage if AC-coupled inputs are required.

The SGM9152 is available in a Green MSOP-8 package. It operates over an ambient temperature range of -40℃ to +85℃.

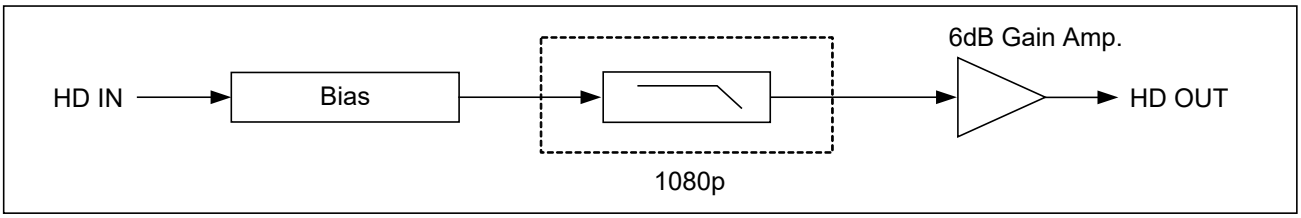
FEATURES

- **Supply Voltage Range: 3.1V to 5.5V**
- **One 6th-Order 1080p High Definition Filter**
- **Bias Mode Active with AC-Coupled Inputs**
- **Bias Mode Inactive with DC-Coupled Inputs**
- **AC- or DC-Coupled Output**
- **DC-Coupled Outputs Eliminate AC-Coupled Capacitors**
- **-40℃ to +85℃ Operating Temperature Range**
- **Available in a Green MSOP-8 Package**

APPLICATIONS

Video Recorders
Video on Demand (VOD)
Cable and Satellite Set-Top Boxes
Portable and Handheld Products
Communication Devices
TVs

BLOCK DIAGRAM

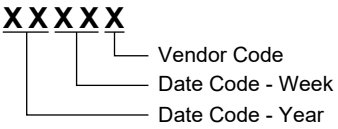


PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM9152	MSOP-8	-40℃ to +85℃	SGM9152AYMS8G/TR	SGM9152A YMS8 XXXXX	Tape and Reel, 4000

MARKING INFORMATION

NOTE: XXXXX = Date Code and Vendor Code.



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

RECOMMENDED OPERATING CONDITIONS

Operating Voltage Range ..... 3.1V to 5.5V
Operating Temperature Range ..... -40℃ to +85℃

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.

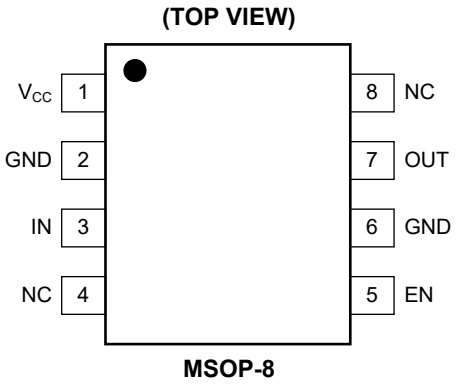
ESD SENSITIVITY CAUTION

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 CONFIGURATION



PIN DESCRIPTION

PIN	NAME	FUNCTION
1	V_{CC}	Power Supply.
2, 6	GND	Ground.
3	IN	Video Input.
4, 8	NC	No Internal Connection.
5	EN	Enable Pin.
7	OUT	Video Output.

ELECTRICAL CHARACTERISTICS

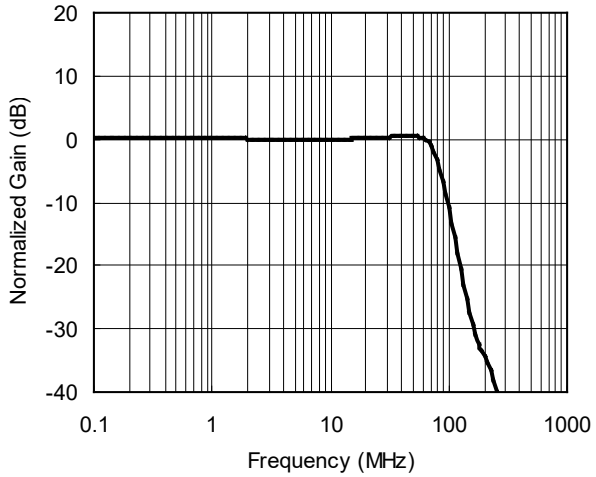
(V_{CC} = 5V, SGM9152A V_{IN} = 1V_{PP}, T_A = +25℃, R_{SOURCE} = 37.5Ω; the input is AC-coupled with 0.1μF; the output is AC-coupled with 220μF into 150Ω, referenced to 400kHz, unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
DC Electrical Characteristics					
Operating Voltage Range (V_{CC})		3.1	5	5.5	V
Quiescent Current (I_Q)	No load		15	20	mA
Output Level Shift Voltage (V_{OLS})	V_{IN} = 0V, no load		350	530	mV
Voltage Gain of SGM9152A (A_V)	R_L = 150Ω	5.75	6.1	6.35	dB
Output Voltage High Swing	V_{IN} = 3V, R_L = 150Ω to GND		4.8		V
Shutdown Current			1.3	15	μA
Video Input Voltage Range	Referenced to GND if DC-coupled		1.4		V_{PP}
Power Supply Rejection Ratio (PSRR)	DC		52		dB
V_{IH} of EN Pin		2.4			V
V_{IL} of EN Pin				0.8	V
1080p High Definition Mode Electrical Characteristics					
Channel Gain	Active video input range = 1V_{PP}		6		dB
-1dB Bandwidth of SGM9152A	R_L = 150Ω		70		MHz
-3dB Bandwidth of SGM9152A	R_L = 150Ω		79		MHz
Filter Response (Normalized Gain)	f_{IN} = 400kHz to 148MHz		26.5		dB
Group Delay Variation (D/DT)	Difference between 400kHz and 70MHz		3.5		ns
Slew Rate	2V output step, 80% to 20%		300		V/μs
Fall Time	2V output step, 80% to 20%		4		ns
Rise Time	2V output step, 80% to 20%		4		ns
Signal to Noise Ratio (SNR)	100kHz to 70MHz		-63		dB
Enable Time (t_{ON})			1.2		μs
Disable Time (t_{OFF})			0.4		μs

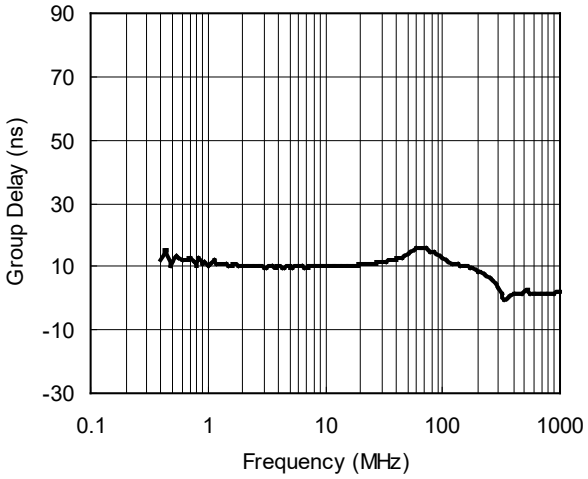
TYPICAL PERFORMANCE CHARACTERISTICS

V_{CC} = 5V, SGM9152A V_{IN} = 1V_{PP}, T_A = +25℃, R_{SOURCE} = 37.5Ω; the input is AC-coupled with 0.1μF; the output is AC-coupled with 220μF into 150Ω, referenced to 400kHz, unless otherwise noted.

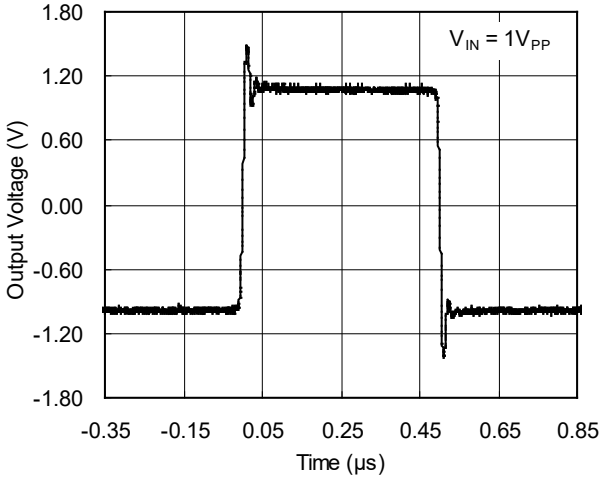
Gain vs. Frequency



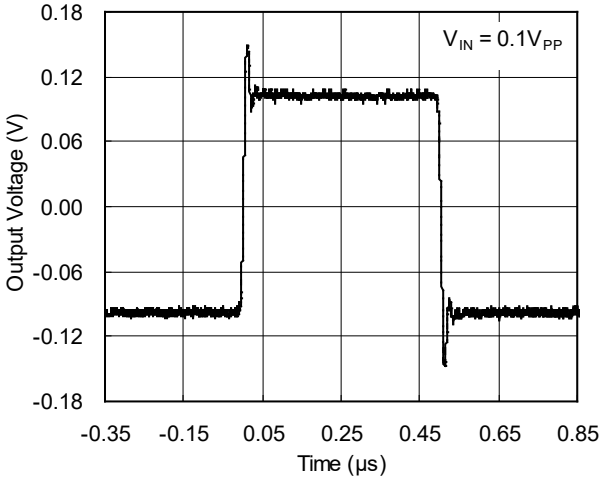
Group Delay vs. Frequency



Large Signal Step Response

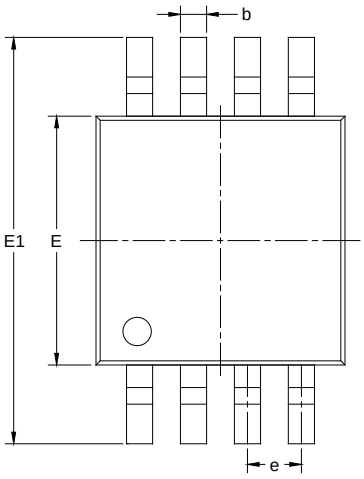


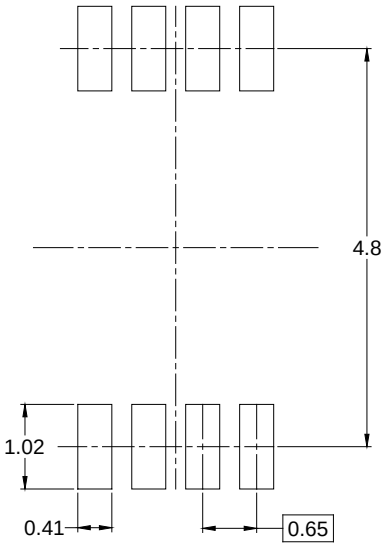
Small Signal Step Response



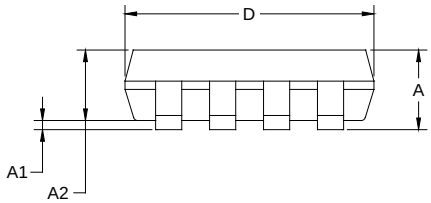
PACKAGE OUTLINE DIMENSIONS

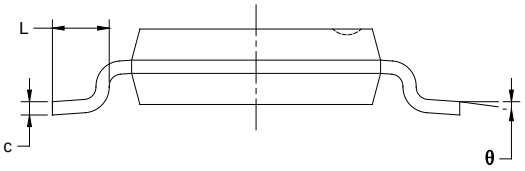
MSOP-8





RECOMMENDED LAND PATTERN (Unit: mm)



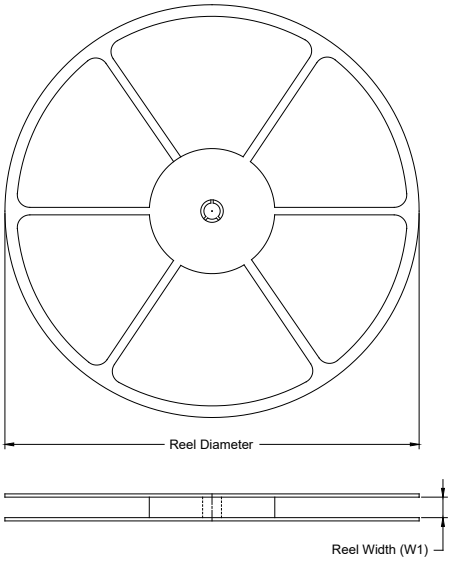


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.250	0.380	0.010	0.015
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.650 BSC		0.026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

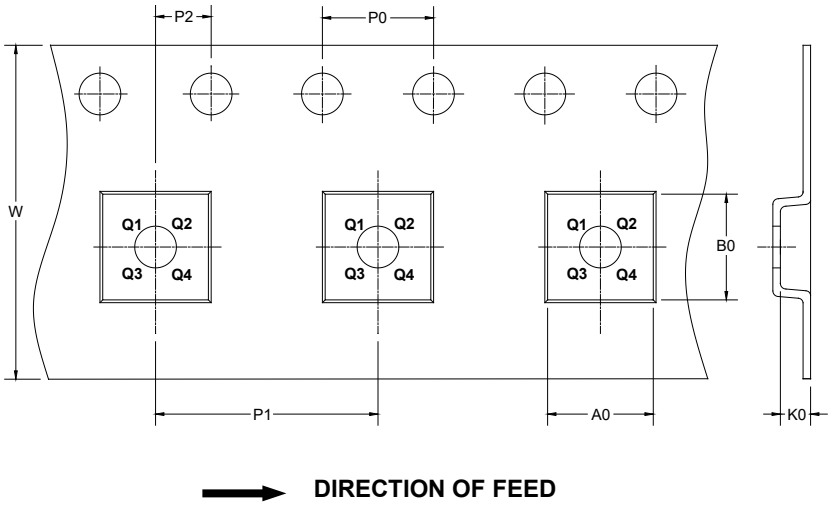
NOTES:
1. Body dimensions do not include mode flash or protrusion.
2. This drawing is subject to change without notice.

TAPE AND REEL INFORMATION

REEL DIMENSIONS



TAPE DIMENSIONS



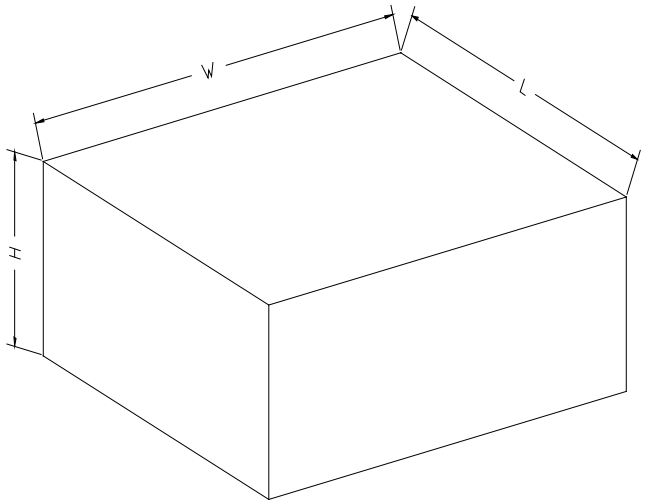
NOTE: The picture is only for reference. Please make the object as the standard.

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
MSOP-8	13″	12.4	5.20	3.30	1.50	4.0	8.0	2.0	12.0	Q1

DD0001

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