

GENERAL DESCRIPTION

The SGM9116 is a rail-to-rail, triple 6th-order output reconstruction filter which can operate from 3.3V to 5.5V single power supply, while consuming a low 30mA quiescent current. Compared with typical passive solutions, triple 6th-order filters provide better image quality.

The device has a -3dB bandwidth of 38.5MHz and 165V/ μ s slew rate. The drivers in SGM9116 can drive DC- or AC-coupled single (150 Ω) or dual (75 Ω) loads.

The device allows DC-coupled output. An internal level shift circuit avoids synchronous pulse limit. SGM9116 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 clamp and bias circuitry may be used if AC-coupled inputs are required.

The SGM9116 is available in a Green SOIC-8 package. It operates over an ambient temperature range of -40°C to +125°C.

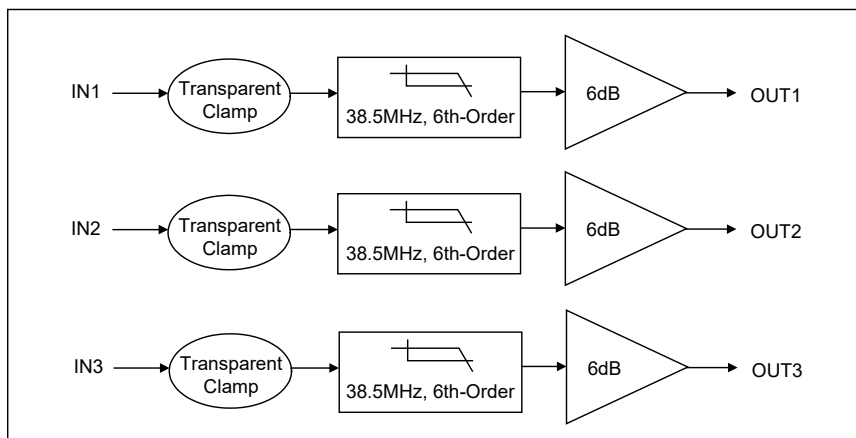
FEATURES

- **Supply Voltage Range: 3.3V to 5.5V**
- **Triple 6th-Order 38.5MHz (HD) Filters**
- **Transparent Input Clamping**
- **Internal Gain: 6dB**
- **Drive Dual Video Loads**
- **Quiescent Current: 30mA (TYP)**
- **AC- or DC-Coupled Inputs**
- **AC- or DC-Coupled Outputs**
- **Rail-to-Rail Output**
- **-40°C to +125°C Operating Temperature Range**
- **Available in a Green SOIC-8 Package**

APPLICATIONS

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

BLOCK DIAGRAM



SGM9116

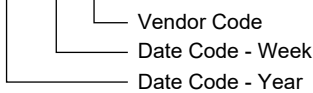
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM9116	SOIC-8	-40°C to +125°C	SGM9116XS/TR	SGM9116XS XXXXX	Tape and Reel, 4000

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 _S) + 0.3V
Supply Voltage, GND to +V _S	6.0V
Power Dissipation, P _D @ T _A = +25°C	
SOIC-8.....	0.8W
Package Thermal Resistance	
SOIC-8, θ _{JA}	128°C/W
Junction Temperature	150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s)	260°C
ESD Susceptibility	
HBM.....	8000V
CDM	2000V
MM.....	400V

RECOMMENDED OPERATING CONDITIONS

Operating Voltage Range.....	3.3V to 5.5V
Operating Temperature Range	-40°C to +125°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.

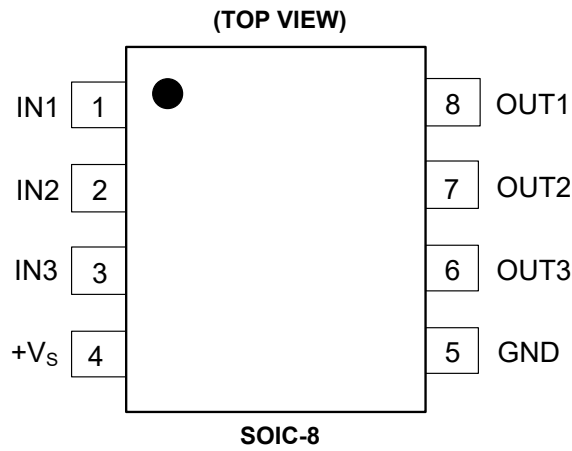
ESD SENSITIVITY CAUTION

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 CONFIGURATION



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	+Vs	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.

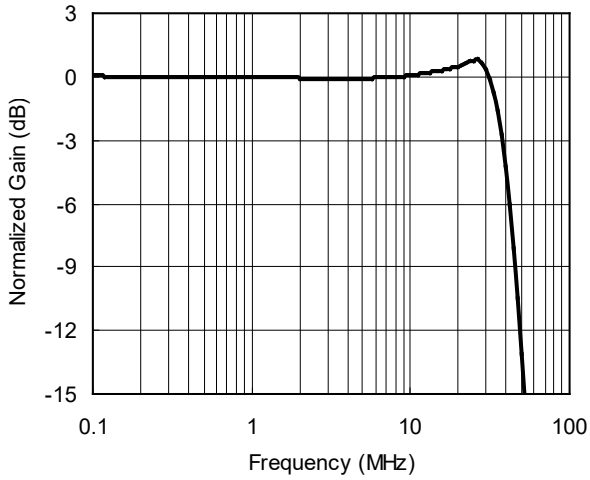
ELECTRICAL CHARACTERISTICS(At $V_S = 5.0V$, $R_L = 150\Omega$ connected to GND and $C_{IN} = 0.1\mu F$, unless otherwise noted.)

PARAMETER	CONDITIONS	SGM9116					
		TYP	MIN/MAX OVER TEMPERATURE			UNITS	MIN/MAX
		+25°C	+25°C	-40°C to +125°C			
Input Characteristics							
Output Level Shift Voltage (V_{OLS})	$V_{IN} = 0V$, no load	325	580	715	mV	MAX	
Clamp Charge Current	$V_{IN} = V_{CLAMP} - 100mV$	-4.7	-5.5	-6.1	mA	MIN	
Voltage Gain (A_V)	$R_L = 150\Omega$	6	5.7	5.6	dB	MIN	
			6.3	6.4	dB	MAX	
Output Characteristics							
Output Voltage High Swing	$V_{IN} = 3.0V$, $R_L = 150\Omega$ to GND	4.79	4.68	4.62	V	MIN	
Power Supply							
Operating Voltage Range (V_{CC})				3.3	V	MIN	
				5.5	V	MAX	
Power Supply Rejection Ratio (PSRR)	$V_S = 3.5V$ to $5.5V$	54	38	37	dB	MIN	
Quiescent Current (I_Q)	$V_{IN} = 0V$	30	46	59	mA	MAX	
Dynamic Performance							
-0.1dB Bandwidth	$R_L = 150\Omega$	30.5			MHz	TYP	
-3dB Bandwidth	$R_L = 150\Omega$	38.5			MHz	TYP	
Filter Response (Normalized Gain)	$f_{IN} = 74.25MHz$	-31			dB	TYP	
Slew Rate	2V Output step, 80% to 20%	165			V/ μs	TYP	
Differential Gain Error (DG)	PAL DC-coupled	0.6			%	TYP	
	PAL AC-coupled	0.34			%	TYP	
Differential Phase Error (DP)	PAL DC-coupled	0.89			°	TYP	
	PAL AC-coupled	0.54			°	TYP	
Group Delay Variation (D/DT)	$f = 400kHz$, 20MHz	3			ns	TYP	
Crosstalk (Channel-to-Channel)	at 1MHz	-80			dB	TYP	
Fall Time	2V Output step, 80% to 20%	7			ns	TYP	
Rise Time	2V Output step, 80% to 20%	7.5			ns	TYP	

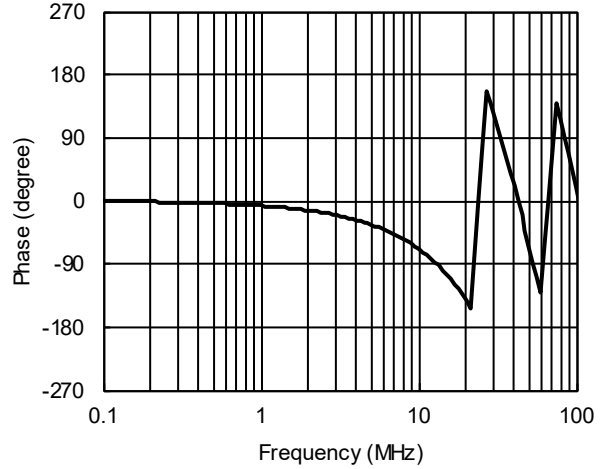
TYPICAL PERFORMANCE CHARACTERISTICS

At $V_S = 5.0V$, $R_L = 150\Omega$ connected to GND and $C_{IN} = 0.1\mu F$, unless otherwise noted.

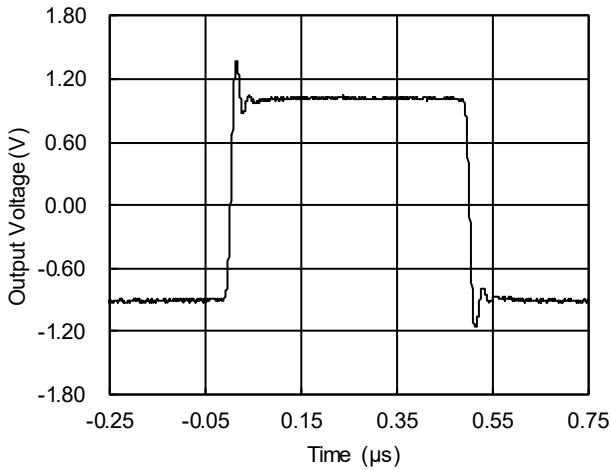
Gain vs. Frequency



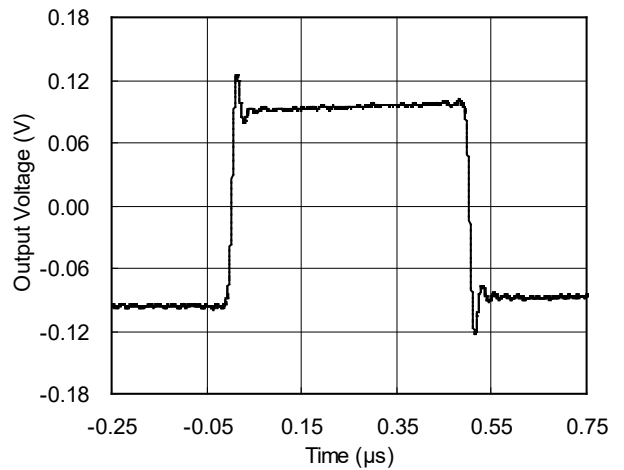
Phase vs. Frequency



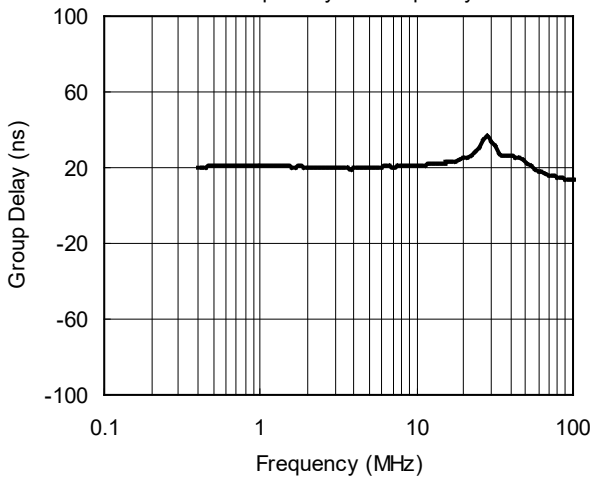
Large Signal Step Response



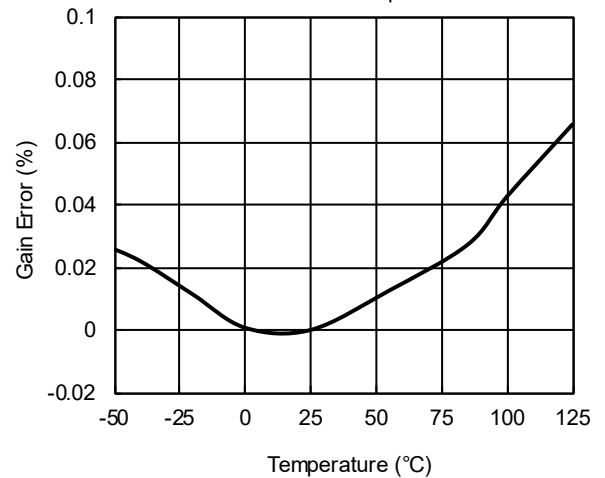
Small Signal Step Response



Group Delay vs. Frequency



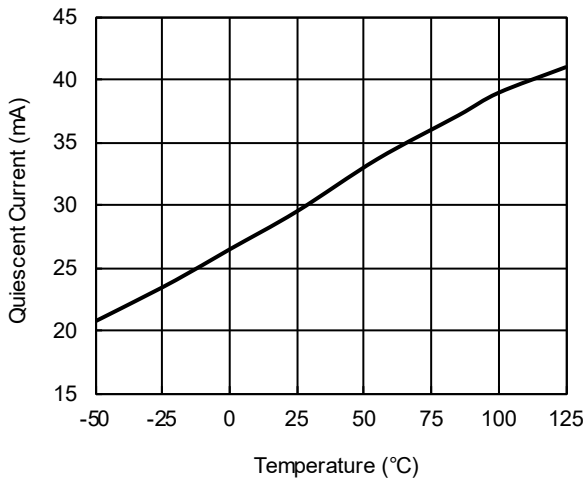
Gain Error vs. Temperature



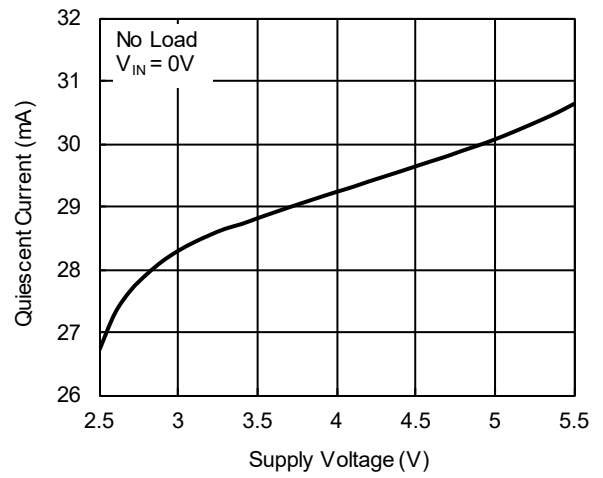
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

At $V_S = 5.0V$, $R_L = 150\Omega$ connected to GND and $C_{IN} = 0.1\mu F$, unless otherwise noted.

Quiescent Current vs. Temperature

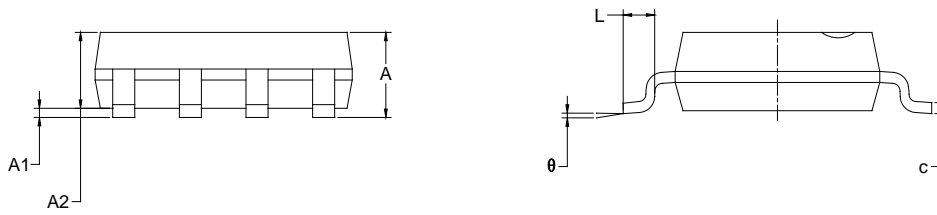
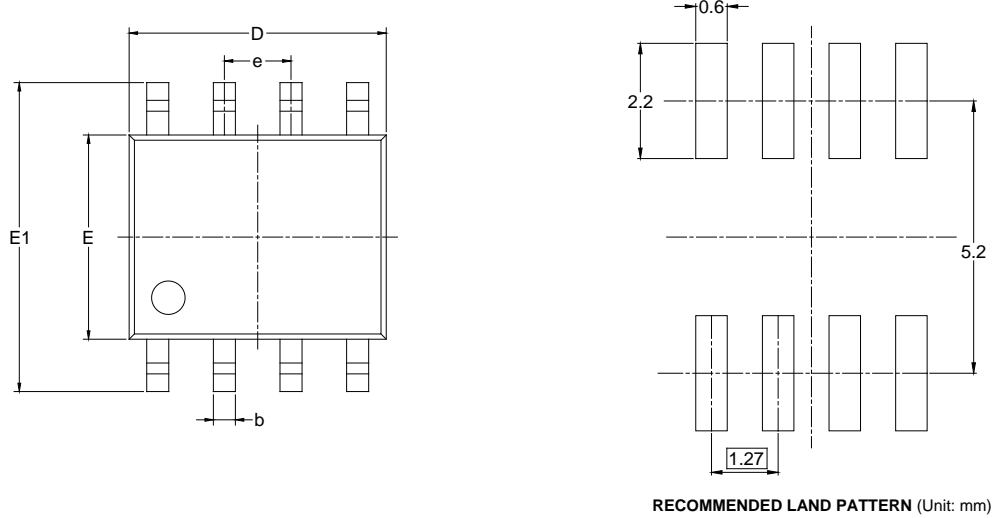


Quiescent Current vs. Supply Voltage



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.

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

DD0001

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