

# SGM8067

# 1.5GHz, Rail-to-Rail Output CMOS Operational Amplifier

## PRODUCT DESCRIPTION

The SGM8067 is rail-to-rail output voltage feedback amplifiers offering ease of use. It has a wide input common-mode voltage range and output voltage swing, making them easy to use on single supplies as low as 2.5 V.

The SGM8067 provide excellent overall performance. It offer High Gain-Bandwidth Product to 1.5GHz and offer a typical low power of 16 mA/amplifier.

The SGM8067 is low distortion and fast settling make it ideal for buffering high speed A/D or D/A converters. The SGM8067 has a power-down disable feature that reduces the supply current to 75 $\mu$ A. These features make the SGM8067 ideal for portable and battery-powered applications where size and power are critical. All are specified over the extended  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$  temperature range.

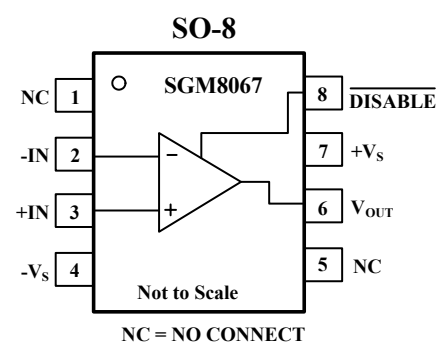
## FEATURES

- High Gain-Bandwidth Product: 1.5GHz
- Gain of 6 stable
- Rail-to-Rail Output  
2mV Typical  $V_{os}$
- Operates on 2.5 V to 5.5V Supplies
- Input Voltage Range =  $-0.2\text{ V}$  to  $+3.8\text{ V}$  with  $V_s = 5\text{V}$
- Low Power  
16 mA/Amplifier Typical Supply Current  
SGM8067 75 $\mu$ A when Disabled
- Small Packaging  
SGM8067 Available in SO-8

## APPLICATIONS

Imaging  
Photodiode Preamp  
Professional Video and Cameras  
Hand Sets  
DVD/CD  
Base Stations  
Filters  
A-to-D Driver

## PIN CONFIGURATIONS (Top View)



# ELECTRICAL CHARACTERISTICS : $V_S = +5V$

(  $R_F = 402\Omega$ ,  $R_L = 150\Omega$ , unless otherwise noted)

PARAMETER	CONDITION	SGM8067							
		TYP	MIN/MAX OVER TEMPERATURE					UNITS	MIN/MAX
		+25°C	+25°C	0°C to 70°C	-40°C to 85°C	-40°C to 125°C			
<b>DYNAMIC PERFORMANCE</b>									
Small-Signal Gain-Bandwidth	G = +5, $R_L = 50\Omega$	195						MHz	TYP
	G = +10, $R_L = 150\Omega$	150						MHz	TYP
	G = +10, $R_L = 1K\Omega$	200						MHz	TYP
Gain-Bandwidth Product		1500						MHz	TYP
<b>NOISE/DISTORTION PERFORMANCE</b>									
Input Voltage Noise	f = 1MHz	4						nV/ $\sqrt{Hz}$	TYP
Differential Gain Error (NTSC)	G = +2, $R_L = 150\Omega$							%	TYP
Differential Phase Error (NTSC)	G = +2, $R_L = 150\Omega$							degree	TYP
<b>DC PERFORMANCE</b>									
Input Offset Voltage ( $V_{OS}$ )		2						mV	TYP
Input Offset Voltage Drift								$\mu V/^\circ C$	TYP
Input Bias Current ( $I_B$ )		6						PA	TYP
Input offset Current ( $I_{OS}$ )		2						PA	TYP
Open-Loop Gain ( $A_{OL}$ )	$V_O = 0.3V$ to $4.7V$ , $R_L = 150\Omega$	80	75	75	74	70		dB	MIN
	$V_O = 0.2V$ to $4.8V$ , $R_L = 1K\Omega$	104	90	90	89	80		dB	MIN
<b>INPUT CHARACTERISTICS</b>									
Input Common-Mode Voltage Range ( $V_{CM}$ )		-0.2 to +3.8						V	TYP
Common-Mode Rejection Ratio (CMRR)	$V_{CM} = -0.1V$ to $+3.5V$	80	66	65	64	62		dB	MIN
<b>OUTPUT CHARACTERISTICS</b>									
Output Voltage Swing from Rail	$R_L = 150\Omega$	0.12						V	TYP
	$R_L = 1K\Omega$	0.03						V	TYP
Output Current		120	100	98	93	87		mA	MIN
Closed-Loop Output Impedance	f < 100kHz	0.015						$\Omega$	TYP
<b>POWER-DOWN DISABLE</b>									
$\overline{DISABLE}$ Voltage-Off			0.8					V	MAX
$\overline{DISABLE}$ Voltage-On			2					V	MIN
<b>POWER SUPPLY</b>									
Operating Voltage Range			2.5	2.7	2.7	2.7		V	MIN
			5.5	5.5	5.5	5.5		V	MAX
Quiescent Current		16						mA	TYP
Supply Current when Disabled		75	120	127	130	139		$\mu A$	MAX
Power Supply Rejection Ratio (PSRR)	$\Delta V_S = +2.7V$ to $+5.5V$ , $V_{CM} = (-V_S) + 0.5$	80	66	66	65	63		dB	MIN

Specifications subject to change without notice.

## PACKAGE/ORDERING INFORMATION

MODEL	ORDER NUMBER	PACKAGE DESCRIPTION	PACKAGE OPTION	MARKING INFORMATION
SGM8067	SGM8067XS/TR	SO-8	Tape and Reel	SGM8067XS

### ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V+ to V- ..... 7.5 V

Internal Power Dissipation

SO-8 Package ..... 0.8 W

Common-Mode Input Voltage

.....  $(-V_s) - 0.5 V$  to  $(+V_s) + 0.5 V$

Storage Temperature Range .....  $-65^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$

Junction Temperature .....  $160^{\circ}\text{C}$

Operating Temperature Range .....  $-55^{\circ}\text{C}$  to  $+150^{\circ}\text{C}$

Lead Temperature Range (Soldering 10 sec)

.....  $260^{\circ}\text{C}$

#### NOTES

1. Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

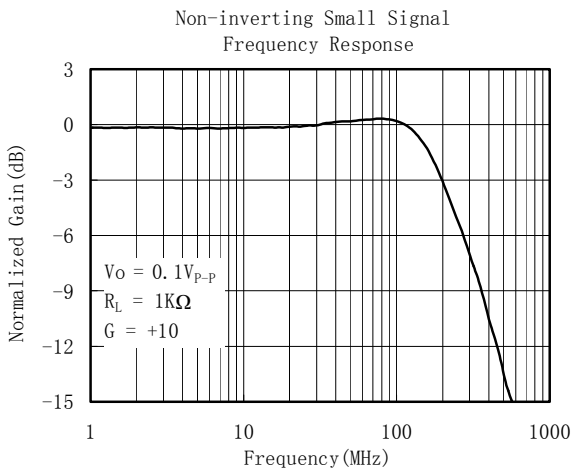
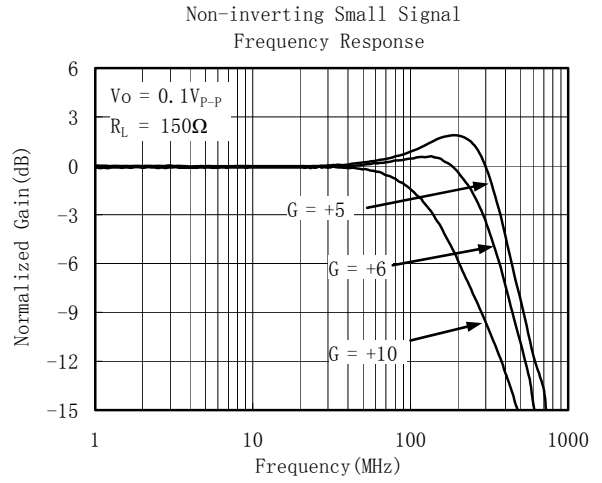
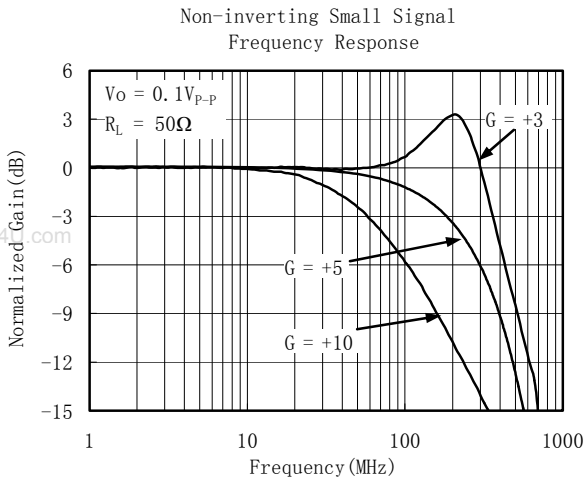
### CAUTION

This integrated circuit can be damaged by ESD. Sheng Bang Micro Electronics 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 very small parametric changes could cause the device not to meet its published specifications.

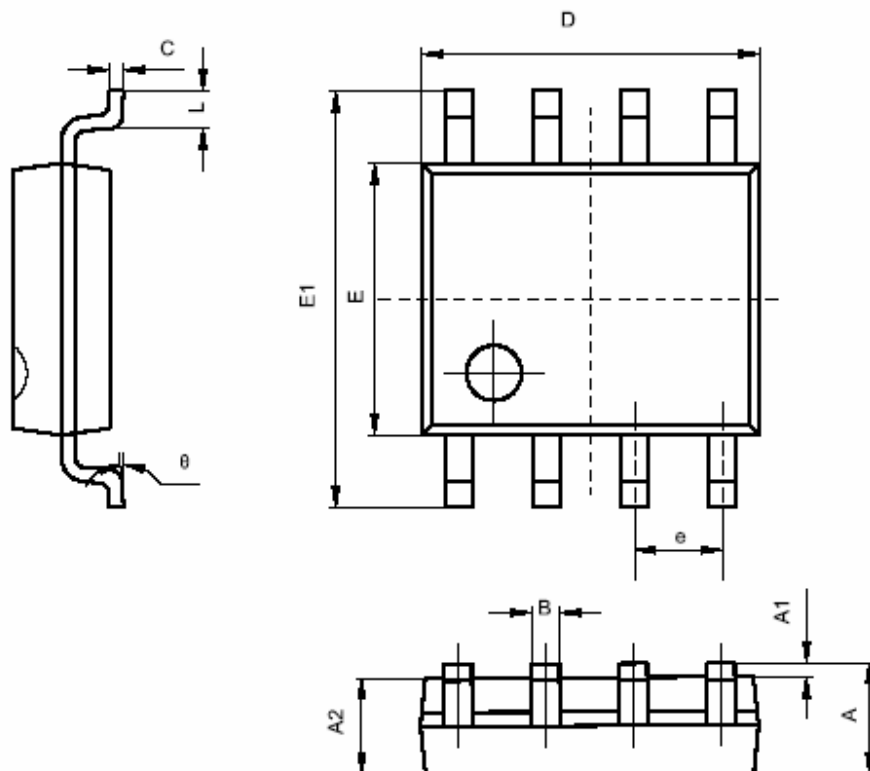
# TYPICAL PERFORMANCE CHARACTERISTICS

At  $T_A = +25^\circ\text{C}$ ,  $V_S = +5\text{V}$ , unless otherwise noted.



# PACKAGE OUTLINE DIMENSIONS

## SO-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	0.190	0.250	0.007	0.010
D	4.780	5.000	0.188	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.300	0.228	0.248
e	1.270TYP		0.050TYP	
L	0.400	1.270	0.016	0.050
theta	0°	8°	0°	8°