



SGM9153

High Speed, Capless Output Coupling Low Voltage Video Amplifier with LPF

GENERAL DESCRIPTION

The SGM9153 is a low voltage video amplifier with 6th-order LPF circuit which can operate from 2.5V to 4.0V power supply. It is designed for portable video system and system with video output applications.

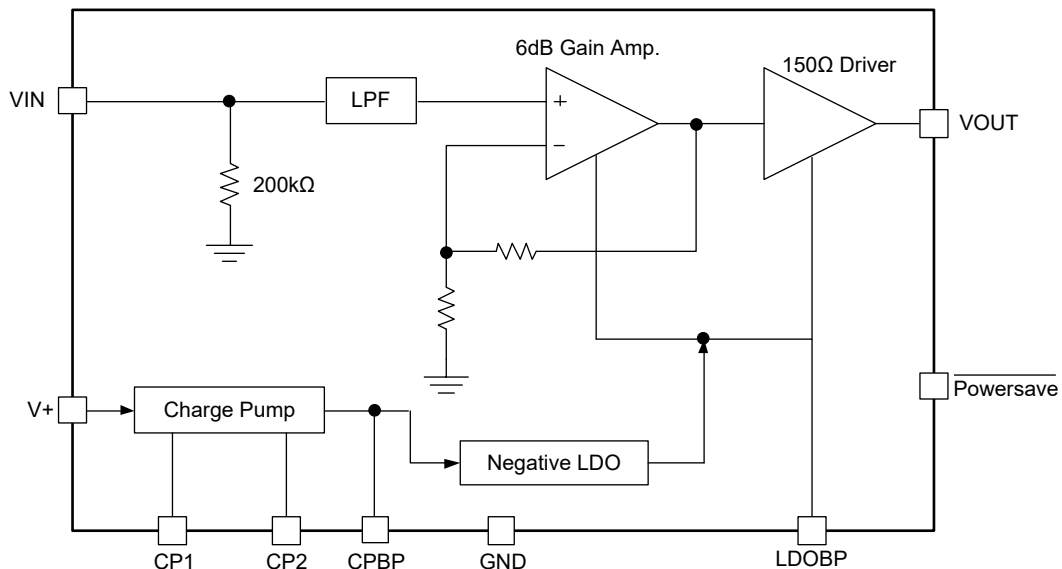
No output coupling capacitor is required for internal negative charge pump circuit.

The SGM9153 is available in Green MSOP-10 and TDFN-3×3-10L packages. It operates over an ambient temperature range of -40°C to +125°C.

FEATURES

- **Supply Voltage Range: 2.5V to 4.0V**
- **Capless Output Coupling**
- **6dB Gain**
- **Internal 75Ω Driver Circuit**
- **Internal 6th-Order 82MHz LPF**
- **Power-Save Circuit and 1.8V Logical Control**
- **Quiescent Current: 36mA**
- **-40°C to +125°C Operating Temperature Range**
- **Available in Green MSOP-10 and TDFN-3×3-10L Packages**

BLOCK DIAGRAM



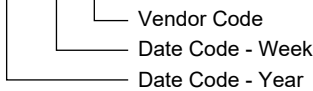
PACKAGE/ORDERING INFORMATION

MODEL	PACKAGE DESCRIPTION	SPECIFIED TEMPERATURE RANGE	ORDERING NUMBER	PACKAGE MARKING	PACKING OPTION
SGM9153	MSOP-10	-40°C to +125°C	SGM9153XMS10G/TR	SGM9153 XMS10 XXXXX	Tape and Reel, 4000
	TDFN-3x3-10L	-40°C to +125°C	SGM9153XTD10G/TR	SGM 9153D 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.

Supply Voltage, V+	5.0V
Junction Temperature	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (Soldering, 10s)	+260°C
ESD Susceptibility	
HBM.....	6000V
MM.....	400V
VOUT Pin IEC 61000-4-2 Contact Discharge	8000V

RECOMMENDED OPERATING CONDITIONS

Operating Voltage Range.....	2.5V to 4.0V
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.

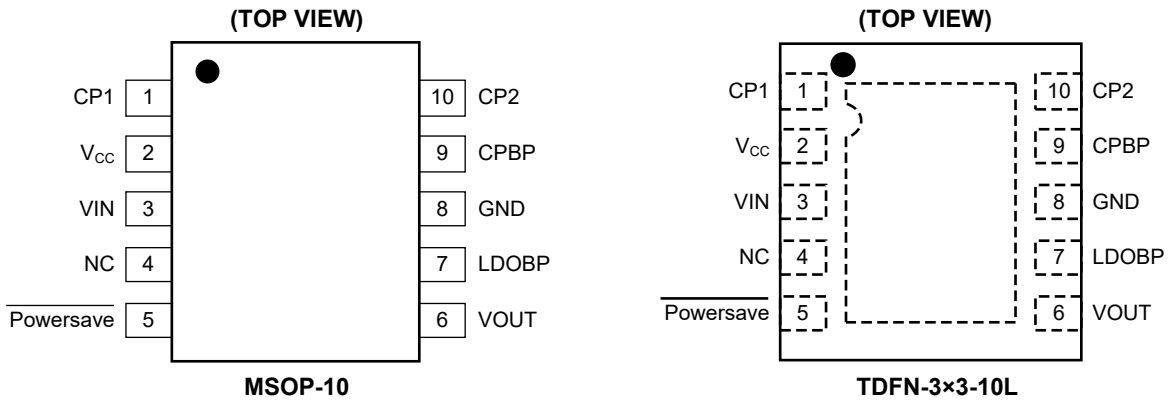
ESD SENSITIVITY CAUTION

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 CONFIGURATIONS



PIN DESCRIPTION

PIN		NAME	FUNCTION
MSOP-10	TDFN-3x3-10L		
1	1	CP1	Flying Capacitor Terminal.
2	2	V _{CC}	Power Supply.
3	3	VIN	Input.
4	4	NC	No Connection.
5	5	$\overline{\text{Powersave}}$	Power Save Control.
6	6	VOUT	Output.
7	7	LDOBP	Negative LDO Output Decoupling.
8	8	GND	Ground.
9	9	CPBP	Charge Pump Output Decoupling.
10	10	CP2	Flying Capacitor Terminal.
–	Exposed Pad	–	Exposed Pad. Can be connected to GND or left floating.

CONTROL TERMINAL

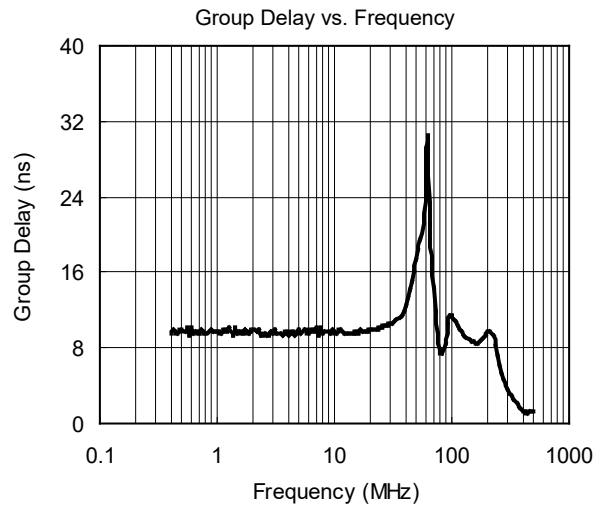
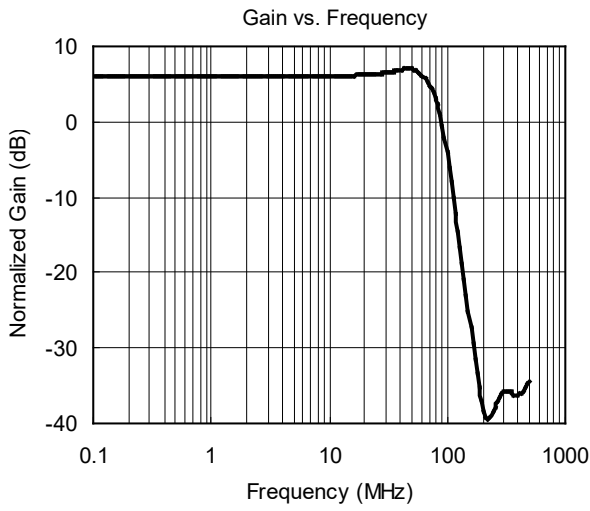
Parameter	Status	Note
$\overline{\text{Powersave}}$	H	Power-Save: OFF
	L	Power-Save: ON (Mute)
	Floating	Power-Save: ON (Mute)

ELECTRICAL CHARACTERISTICS(V_{CC} = 3.0V, V_{IN} = 1V_{PP}, T_A = +25°C, output is capless coupled into 150Ω, referenced to 400kHz, unless otherwise noted.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
DC Electrical Characteristics					
Operating Voltage Range (V _{CC})		2.5		4.0	V
Quiescent Current (I _Q)	No Signal		36	50	mA
Power Save Mode Current (I _{SAVE})	No Signal, Power Save Mode		0.1	1	μA
Voltage Gain (A _V)	R _L = 150Ω	5.6	6	6.4	dB
Power Save Input Voltage	Power Save Mode Enable			0.4	V
	Power Save Mode Disable	1.5			V
Power Save Pin Internal Pull Low Resistor			500		kΩ
Standard Definition Mode Electrical Characteristics					
-1dB Bandwidth	R _L = 150Ω		70		MHz
-3dB Bandwidth	R _L = 150Ω		82		MHz
Filter Response (Normalized Gain)	f _{IN} = 400kHz to 148MHz		30		dB
Propagation Delay (T _{PDSD})	Delay from Input to Output, 400kHz to 70MHz, 150Ω		6.2		ns
Slew Rate	Up, 150Ω		295		V/μs
	Down, 150Ω		305		
Charge Pump Frequency (F _{CP})			190		kHz
Fall Time	2V output step, 80% to 20%		3.9		ns
Rise Time	2V output step, 80% to 20%		4.1		ns
Signal to Noise Ratio (SNR)	100kHz to 70MHz, 150Ω		62		dB

TYPICAL PERFORMANCE CHARACTERISTICS

$V_{CC} = 3.0V$, $V_{IN} = 1V_{PP}$, $T_A = +25^{\circ}C$, output is capless coupled into 150Ω , referenced to 400kHz, unless otherwise noted.)



TYPICAL APPLICATION CIRCUITS

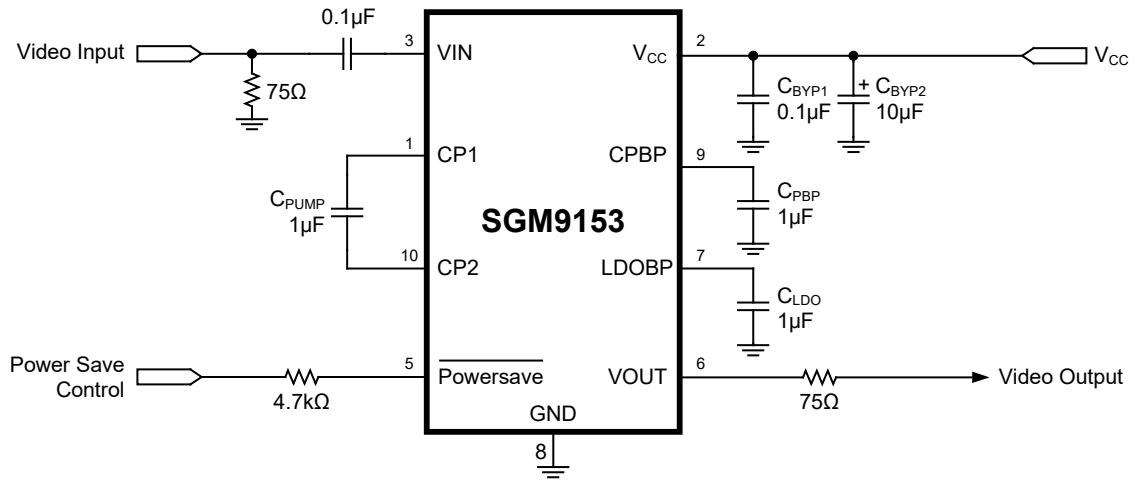


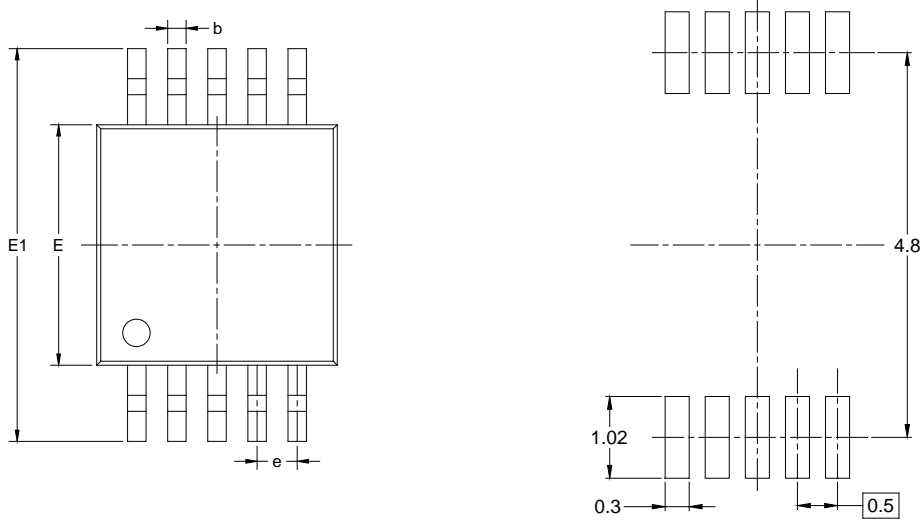
Figure 1. Standard Circuit

NOTE:

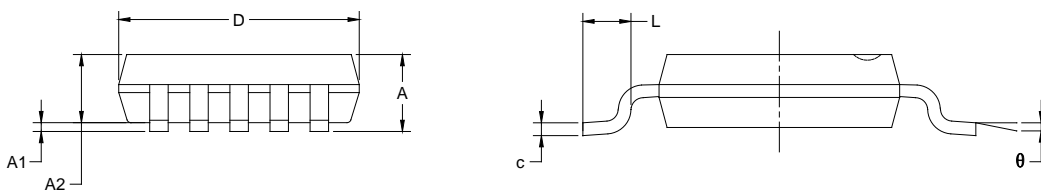
In order to get good performance, it's important to select the right C_{PUMP} , C_{PBP} , C_{LDO} , C_{BYP1} and C_{BYP2} in applications. All tests are performed with circuit set up with X5R and X7R capacitors. Capacitors having high dissipative loss, such as Y5V capacitor, may cause performance degradation and unexpected system behavior.

PACKAGE OUTLINE DIMENSIONS

MSOP-10



RECOMMENDED LAND PATTERN (Unit: mm)



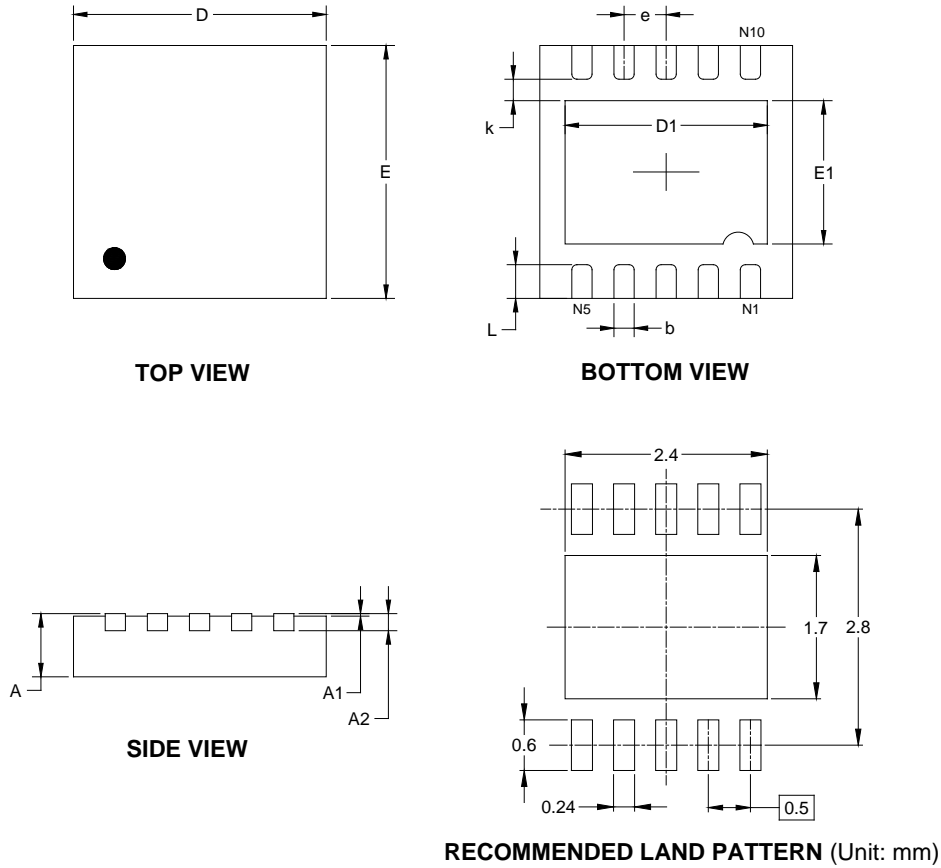
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.820	1.100	0.032	0.043
A1	0.020	0.150	0.001	0.006
A2	0.750	0.950	0.030	0.037
b	0.180	0.280	0.007	0.011
c	0.090	0.230	0.004	0.009
D	2.900	3.100	0.114	0.122
E	2.900	3.100	0.114	0.122
E1	4.750	5.050	0.187	0.199
e	0.500 BSC		0.020 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.

PACKAGE OUTLINE DIMENSIONS

TDFN-3x3-10L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A2	0.203 REF		0.008 REF	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.103
E	2.900	3.100	0.114	0.122
E1	1.500	1.800	0.059	0.071
k	0.200 MIN		0.008 MIN	
b	0.180	0.300	0.007	0.012
e	0.500 TYP		0.020 TYP	
L	0.300	0.500	0.012	0.020

NOTE: 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-10	13"	12.4	5.20	3.30	1.20	4.0	8.0	2.0	12.0	Q1
TDFN-3×3-10L	13"	12.4	3.35	3.35	1.13	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

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