Integrates Single Video Amplifier And Video Coaxial Control Decoder --------MS7682/MS7682M

PRODUCT DESCRIPTION

The MS7682/MS7682M integrated Single video amplifier and video coaxial control decoder. The video amplifiers integrated Single 6dB Gain rail-to-rail output driver and 3rd output reconstruction filter, it has 35MHz -3dB bandwidth and 160V/μs slew rate. The video coaxial control decoder integrated a high-speed processor, effective separation for mixed-signal. Operating from single supplies ranging from +2.7V to +5V and sinking an ultra-low 15mA quiescent current, the MS7682/MS7682M is ideally suited for battery powered applications.
The MS7682/MS7682M features a low-power shutdown pin that is activated by driving SP low. The MS7682 has lead SOP-8 package, the MS7682M has lead MSOP-8 package, and ESD (HBM) reaches 2KV.

FEATURES

- Sixth-order 35MHz (HD) Filter
- Transparent input clamping
- 6dB output driver Gain and drive dual video load
- Rail-to-Rail Output
- Input Voltage Range Includes Ground
- AC or DC Coupled Inputs
- AC or DC Coupled Outputs
- Operates from 2.7V to 5V Single power supply
- Low Power 15mA Supply Current
- Lead SOP-8/MSOP-8 package

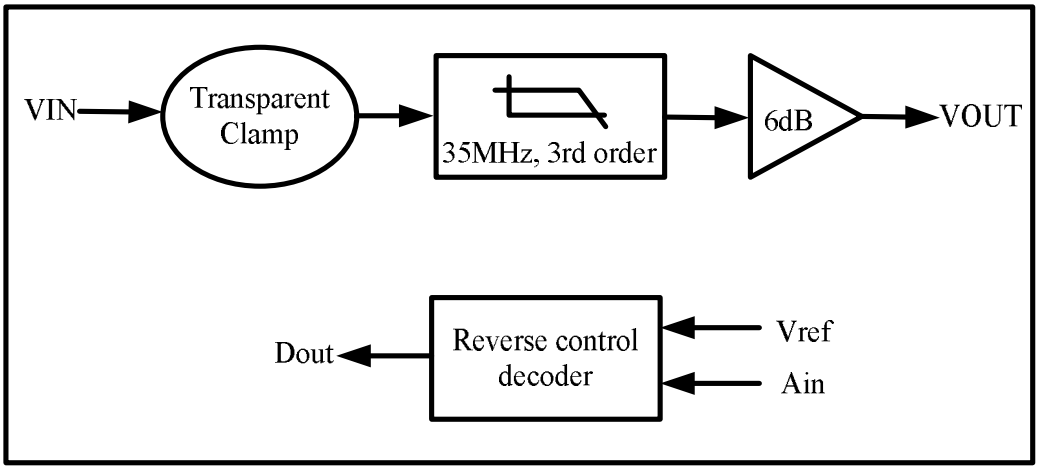
APPLICATIONS

- Video On Demand (VOD)
- Communications device
- Portable and handheld product
- AHD/TVI/CVI video driver and reverse control decoder

PACKAGE/ORDERING INFORMATION

Part Number	Package	Marking
MS7682	SOP-8	MS7682
MS7682M	MSOP-8	MS7682M

BLOCK DIAGRAM



PIN CONFIGURATIONS

MS7682/MS7682M

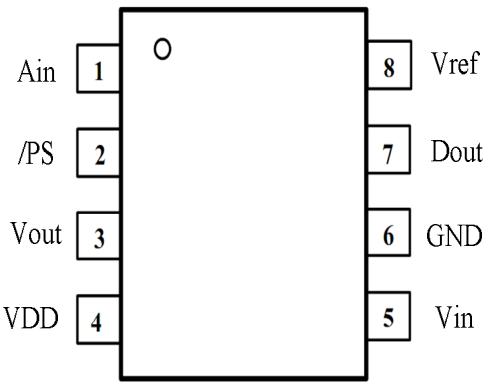


Figure1.SOP-8/MSOP-8

1. Pin Description

Pin	Name	Function
1	Ain	Reverse signal input
2	/PS	Shutdown Mode (active low)
3	Vout	Video output
4	VDD	Power supply
5	Vin	Video input
6	GND	Ground
7	Dout	Reverse control output
8	Vref	Internal reference

CAUTION

This integrated circuit can be damaged by ESD if you don't pay attention to ESD protection. 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.

ABSOLUTE MAXIMUM RATINGS

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.

PARAMETER	MAXIMUM
Supply Voltage, V+ to V-	7.5V
Input Voltage	GND-0.3V to (+VS)+0.3V
Storage Temperature Range	-65℃ to +150℃
Junction Temperature	160℃
Operating Temperature Range	-40℃ to +125℃
Power Dissipation, PD @ TA = 25℃	0.8W
Package Thermal Resistance，θJA	128℃/W
Lead Temperature Range (Soldering 10 sec)	260℃
ESD Susceptibility（HBM）	2000V

ELECTRICAL CHARACTERISTICS

(At RL = 150Ω connected to GND, Vin=1Vpp，and CIN = 0.1μF, all outputs AC coupled with 220μF，unless otherwise noted).

PARAMETER	CONDITION	TYP	MIN	MAX	UNITS
DYNAMIC PERFORMANCE：Amplifier channel					
±0.1dB Bandwidth	Rl=150Ω	11.8			MHz
-3dB Bandwidth	Rl=150Ω	35			MHz
Gain		6			dB
Slew Rate	Vin=1V step，20%--80%	160			V/us
Differential Gain (DG)	NTSC & PAL DC NTSC & PAL AC	0.02 0.3			% %
Differential Phase (DP)	NTSC & PAL DC NTSC & PAL AC	0.02 0.36			
Group Delay Variation (D/DT)	f = 400KHz, 26.5MHz	1.2			ns
Crosstalk (channel to channel)	at 1MHz	-64			dB
Rise Time	2.0V step，80%--20%	8.5			ns
Fall Time	2.0V step，80%--20%	8.7			ns
Control decoding channel					
Propagation Delay	RL = 5.1kΩ，CL = 50p			270	ns
Output Swing High	I=2mA	VDD-0.1			V
Output Swing Low	I=2mA	100			mV
Input Offset Current				50	pA
INPUT CHARACTERISTICS: Amplifier channel					
Output Level Shift Voltage (VOLS)	Vin=0V，no load	235	230	370	mv
Input Bias Current (Ib)					pA
Input Voltage Clamp (VCLAMP)	Iin= -1mA	-4.5	-4	-22	mV
Clamp Charge Current	Vin=Vclp-100mV	-5		-7.2	mA
Voltage Gain（Av）	RL=150	2	1.90	2.1	V/V

OUTPUT CHARACTERISTICS：Amplifier channel					
Output Voltage High Swing	Vin=3V，RL=150Ω	4.5	4.2	4.5	V
Output Short-Circuit Current (ISC)	Vin=0.1V, out short to VDD through 10Ω	103		115	mA
POWER SUPPLY					
Operating Voltage Range			2.7	5	V
Quiescent Current	no load	6.5		6.7	mA
Operating Current	Vin=500mV	15.0		16.1	mA

APPLICATIONS INFORMATION

Functional Description

MS7682/MS7682M operates from a single +2.7V to +5V supply. In application, MS7682/MS7682M is a fully integrated solution for filtering and buffering HDTV signals in front of video decoder or behind video encoder, and reverse control decoder. MS7682/MS7682M's solution can help you save PCB size and production cost, it also improves video signal performance comparing with traditional design using discrete components. MS7682/MS7682M features a DC-coupled input buffer, 3-pole low-pass filter to eliminate out-of-band noise of video encoder, and a gain of +6dB in the output amplifier to drive 75Ω load. The AC or DC-coupled input buffer eliminates sync crush, droop, and field tilt. The output of MS7682/MS7682M also can be DC-coupled or AC-coupled.

Shutdown Mode

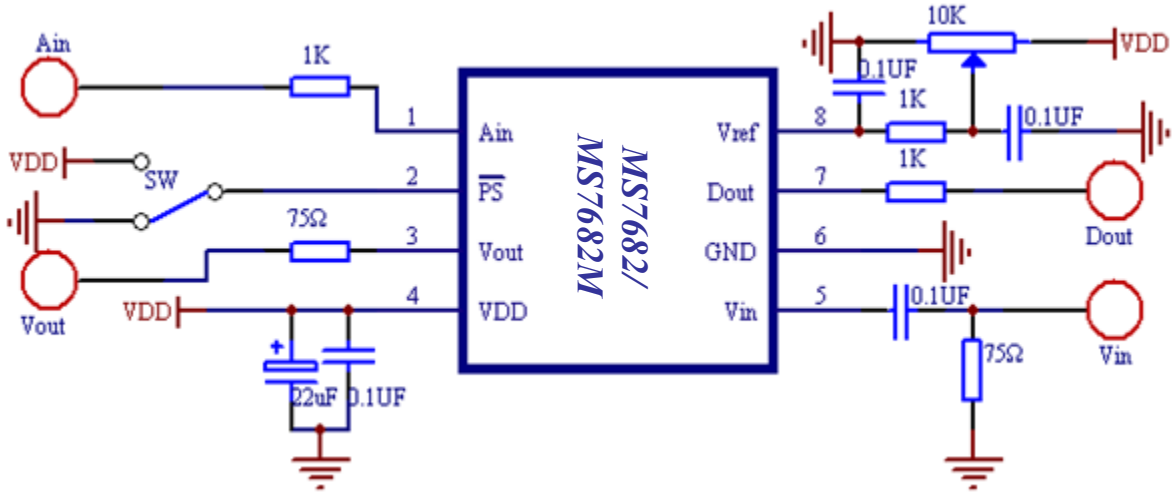
The MS7682/MS7682M features a low-power shutdown pin that is activated by driving SP low. In shutdown mode, the output is in a high impedance state, supply current is reduced. Driving SP high will turn the comparator on. The SP pin should not be left unconnected due to the fact that it is a high impedance input. When left unconnected, the output will be at an unknown voltage. Also do not three-state the SP pin.

Power-Supply Bypassing and Layout

Correct power supply bypassing is very important for optimizing video performance in design. One 0.1μF and one 10μF capacitors are always used to Bypass VCC pin of MS7682/MS7682M, please place these two capacitors as close to the MS7682/MS7682M output pin as possible, a large ground plane is also needed to ensure optimum performance. The input and output termination resistors should be placed as close to the related pin of MS7682/MS7682M as possible to avoid performance degradation. The PCB traces at the output side should have 75Ω characteristic impedance in order to match the 75Ω characteristic impedance cable connecting external load. In design, please keep the board trace at the inputs and outputs of the MS7682/MS7682M as short as possible to minimize the parasitic stray capacitance and noise pickup.

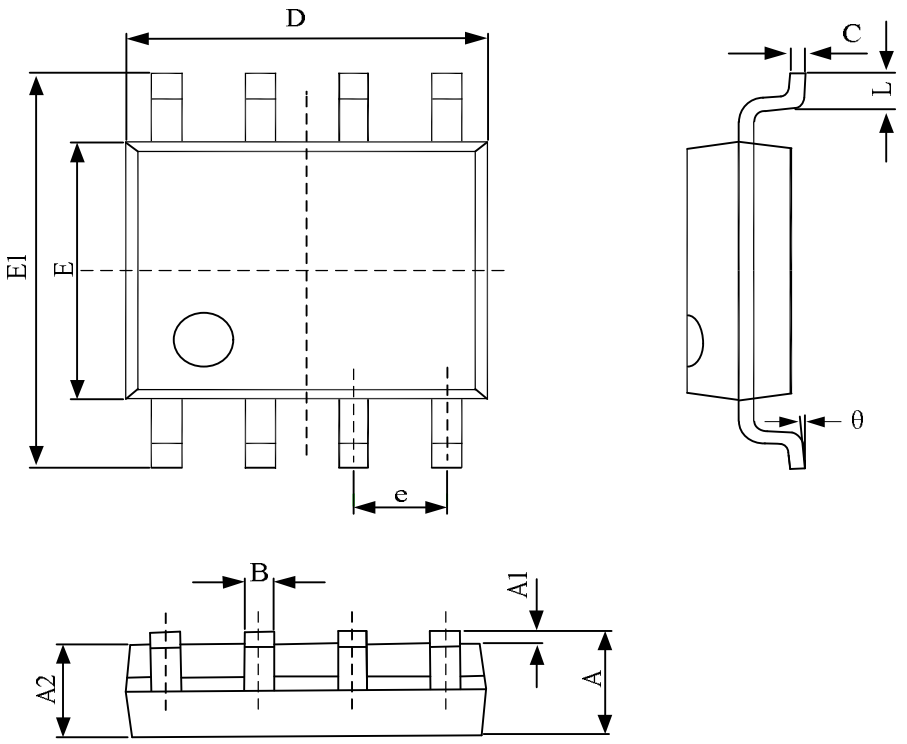
Typical Application Diagram

The following schematic is normally used.



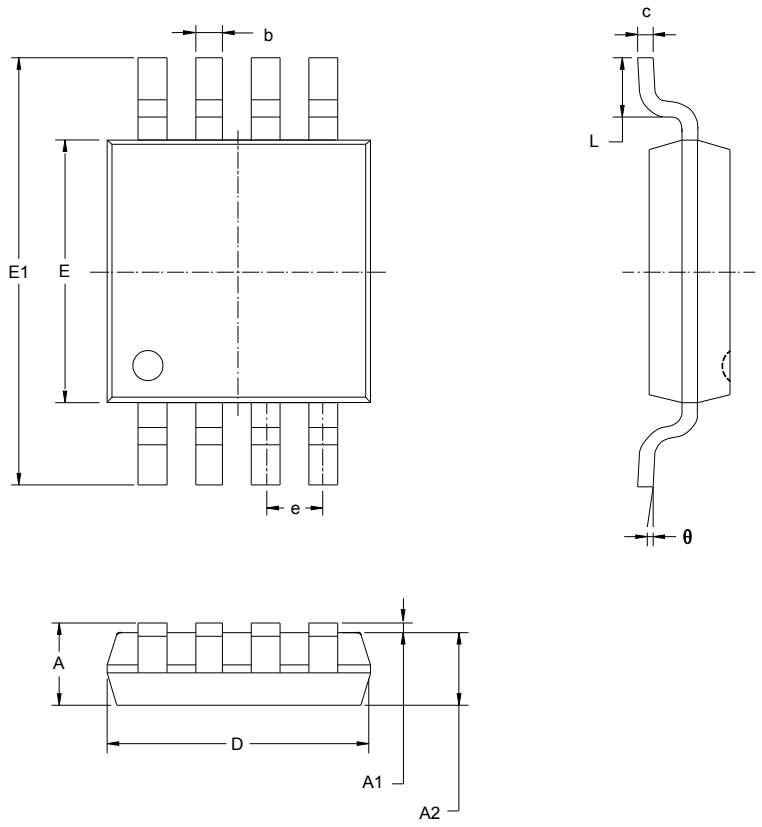
PACKAGE OUTLINE DIMENSIONS

SOP-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
θ	0°	8°	0°	8°

MSOP-8



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	0.650BSC		0.026BSC	
L	0.400	0.800	0.016	0.031
θ	0°	6°	0°	6°