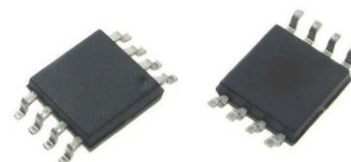


## Single Channel Video Operational Amplifier and Coaxial Control Decoder

### PRODUCT DESCRIPTION

The MS7337M integrates single-channel video amplifier and video coaxial control decoder. Video amplifier integrates rail-to-rail output driver with 6dB gain and 6th order filter. The -3dB bandwidth is up to 81MHz. The video coaxial control decoder integrates high-speed processor to effectively separate mixed signal.

The single power supply ranges from +2.7V to +5.5V and operating current is 36mA, which is ideally suited for battery-powered applications.



MSOP8

### FEATURES

- Single Channel, 81MHz, 6th Order (FHD) Filter
- Transparent Sync-tip Input Clamp
- 6dB Gain Output Driver and Drive Dual Video Load
- Rail-to-Rail Output
- Input Voltage Range Includes Ground
- AC or DC Coupled Input
- AC or DC Coupled Output
- Single Power Supply: 2.7V to 5.5V
- MSOP8 Package
- Low Power Dissipation, Operating Current: 36mA

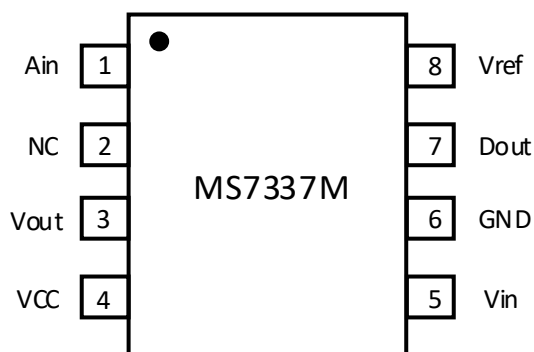
### APPLICATIONS

- Consumer Video
- Portable and Handheld Product
- AHD/TVI/CVI Analog HD Video Driver and Reverse Control Decoder

### PRODUCT SPECIFICATION

Part Number	Package	Marking
MS7337M	MSOP8	MS7337M

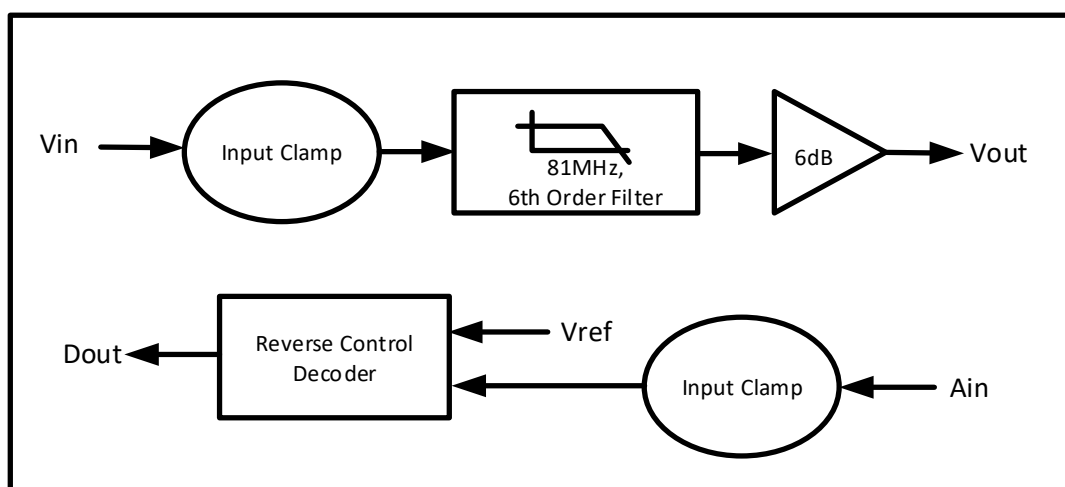
## PIN CONFIGURATION



## PIN DESCRIPTION

Pin	Name	Type	Description
1	Ain	I	Comparator Input
2	NC	-	Not Connection
3	Vout	O	Video 6dB Output
4	VCC	-	Power Supply
5	Vin	I	Video Input
6	GND	-	Ground
7	Dout	O	Reverse Control Signal Output
8	Vref	I	External Reference Input

## BLOCK DIAGRAM



**ABSOLUTE MAXIMUM RATINGS**

Any exceeding absolute maximum rating application causes permanent damage to device. Because long-time absolute operation state affects device reliability. Absolute ratings just conclude from a series of extreme tests. It doesn't represent chip can operate normally in these extreme conditions.

Parameter	Symbol	Ratings	Unit
Power Supply	VCC	6	V
Input Voltage	Vin	GND-0.3 ~ VCC+0.3	V
Storage Temperature	T <sub>stg</sub>	-65 ~ 150	°C
Junction Temperature	T <sub>j</sub>	150	°C
Operating Temperature	TA	-40 ~ +125	°C
Power Dissipation@ TA= 25°C	PD	0.8	W
Lead Temperature (Soldering 10s)	T	260	°C
ESD	HBM	3000	V
	MM	300	

## ELECTRICAL CHARACTERISTICS (5V)

VCC=5V. Unless otherwise noted, TA = 25°C ±2°C.

### Dynamic Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
-1dB Bandwidth		RL=150Ω		66		MHz
-3dB Bandwidth		RL=150Ω		81		MHz
StopBand Rejection	At	f=160MHz	26	27		dB
Voltage Gain	Av	Vpp=1V, RL=150Ω, 1MHz	5.93	6	6.11	dB
Slew Rate	SR	Vin=1V, 20%~80%, f=100k, RL=150Ω, Falling edge		180		V/us
		Vin=1V, 20%~80%, f=100k, RL=150Ω, Rising edge		193		
Differential Gain	DG	NTSC&PAL DC		0.02		%
		NTSC&PAL AC		0.3		
Differential Phase	DP	NTSC&PAL DC		0.02		
		NTSC&PAL AC		0.36		
Group Delay	GD	f=100kHz		10		ns
Group Delay Variation	D/DT	f=100kHz, 66MHz		2		ns

### Output Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output Voltage Swing		f=1MHz, RL=150Ω, VIN maximum no distortion amplitude		4.2		V
Output Bias Voltage		Vin=0V, No load, Input GND		0.57		V
Clamp Voltage		f=100kHz, 1Vpp sine wave, Input pin minimum level	160	200	240	mV
Output Short-Circuit Current	Isc	Vin=3V, Output in series with 75Ω to GND		43		mA
		Vin=0V, Output in series with 75Ω to VCC		57.8		

### Coaxial Control Decoding Channel

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Transmission Delay		RL=5.1kΩ, CL=50p		18		ns
Dout Output High	VOH	I=2mA		4.87		V
Dout Output Low	VOL	I=2mA		100		mV

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Dout Sensitivity		VREF=0.5V, VDOUT from 0 to 1		2.5		mV
		VREF=0.5V, VDOUT from 1 to 0		-150		
		VREF=1V, VDOUT from 0 to 1		12.5		
		VREF=1V, VDOUT from 1 to 0		-125		
Input Current				50		pA
Bandwidth		No Load, Vpp=2V, VREF=1V, 20%-80%, Duty cycle≤10%		11		MHz

#### Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating Voltage		Vin=1M, Vpp=0.5V, RL=150Ω	2.7		5.5	V
Operating Current		Vin=1M, Vpp=1V, VREF=0.5V, RL=150Ω	38	40	42	mA

## ELECTRICAL CHARACTERISTICS (3.3V)

VCC=3.3V. Unless otherwise noted, TA = 25°C ±2°C.

### Dynamic Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
-1dB Bandwidth		RL=150Ω		66		MHz
-3dB Bandwidth		RL=150Ω		81		MHz
StopBand Rejection	At	f=160MHz, RL=150Ω	26	27		dB
Voltage Gain	Av	Vpp=1V, RL=150Ω, 1MHz	5.93	6	6.02	dB
Slew Rate	SR	Vin=1V, 20%~80%, f=100k, RL=150Ω, Falling edge		180		V/us
		Vin=1V, 20%~80%, f=100k, RL=150Ω, Rising edge		136		
Differential Gain	DG	NTSC&PAL DC		0.02		%
		NTSC&PAL AC		0.3		
Differential Phase	DP	NTSC&PAL DC		0.02		
		NTSC&PAL AC		0.36		
Group Delay	GD	f=100kHz		10		ns
Group Delay Variation	D/DT	f=100kHz, 66MHz		2		ns

### Output Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Output Voltage Swing		f=1MHz, RL=150Ω, VIN maximum no distortion amplitude		2.7		V
Output Bias Voltage		Vin=0V, No load, Input GND		0.5		V
Clamp Voltage		f=100kHz, 1Vpp sine wave, Input pin minimum level	160	180	200	mV
Output Short-Circuit Current	Isc	Vin=3V, Output in series with 75Ω to GND		33		mA
		Vin=0V, Output in series with 75Ω to VCC		36		

### Coaxial Control Decoding Channel

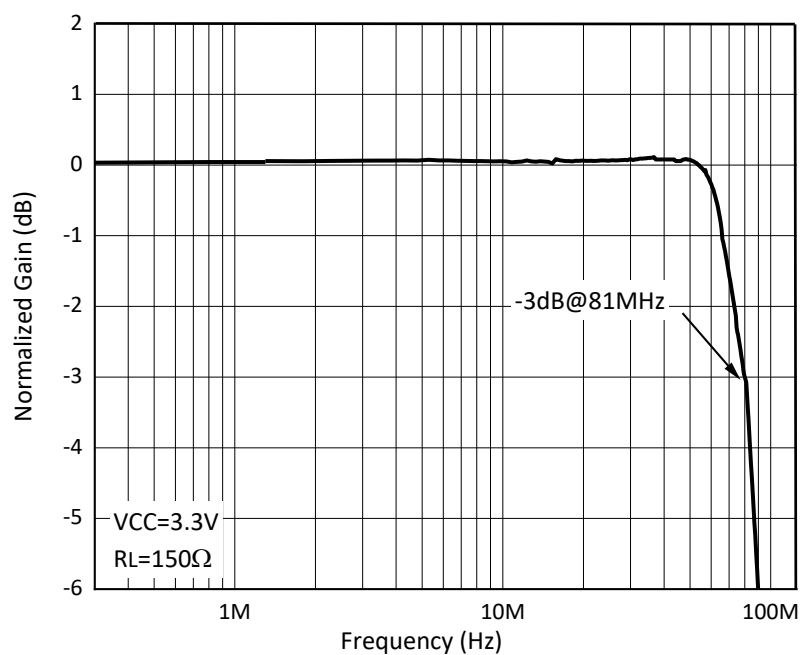
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Transmission Delay		RL=5.1kΩ, CL=50p		18		ns
Dout Output High	VOH	I=2mA		3.15		V
Dout Output Low	VOL	I=2mA		100		mV

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Dout Sensitivity		VREF=0.5V, VDOUT from 0 to 1		0		mV
		VREF=0.5V, VDOUT from 1 to 0		-90		
		VREF=1V, VDOUT from 0 to 1		12.5		
		VREF=1V, VDOUT from 1 to 0		-65		
Input Current				50		pA
Bandwidth		No Load, Vpp=1V, VREF=1V, Duty cycle≤45%, Output amplitude = -3dB	10	11		MHz

#### Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating Current		Vin=1M, Vpp=1V, VREF=0.5V, RL=150Ω	34	36	38	mA
		No input GND, No load	26	27	28	

## TYPICAL CHARACTERISTICS CURVE



## FUNCTIONAL DESCRIPTION

The MS7337M operates from a single +2.7V to +5.5V power supply. In application, the MS7337M is a fully integrated solution for filtering and buffering HD video signals and reverse control decoder. The MS7337M's solution can save PCB size and cost, and it can also improve video signal performance compared with traditional design using discrete components.

The MS7337M integrates a DC-coupled input buffer, a video encoder to eliminate out-of-band noise, a gain of +6dB OPA driver to drive 75Ω load and a coaxial video control decoder. The AC or DC-coupled input buffer can eliminate sync crush, droop and field tilt. The output of the MS7337M can also be DC-coupled or AC-coupled.

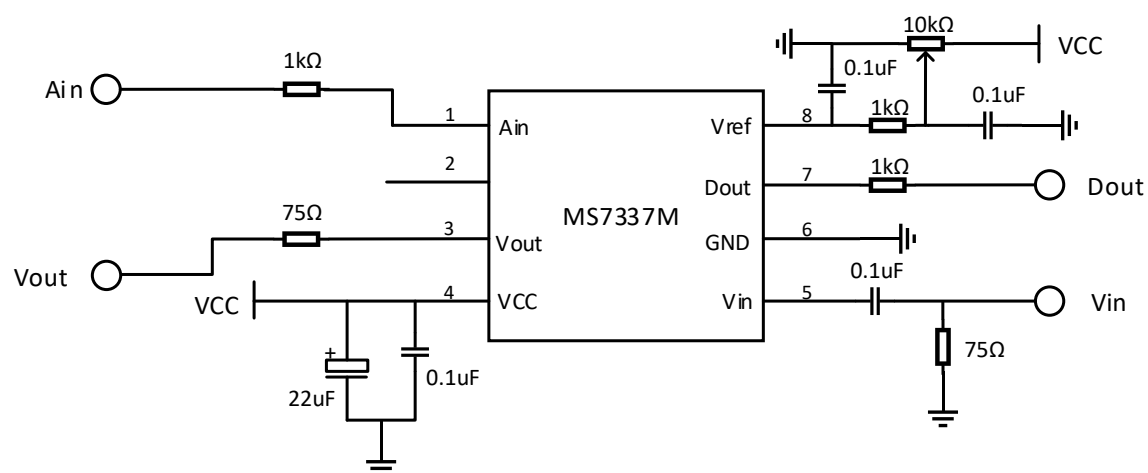
### Power Supply Bypass and Layout

Appropriate power supply bypassing is very important for optimizing video performance in design. Both a 0.1μF and a 22μF capacitor are always used to bypass VCC pin of the MS7337M. Please place these two capacitors as close to the output pin of the MS7337M 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 the MS7337M as possible in order to avoid performance degradation.

The PCB traces at the output terminal has 75Ω resistance in order to match 75Ω characteristic impedance cable. In design, please keep the board traces at the input and output of the MS7337M as short as possible to minimize the parasitic stray capacitance and noise.

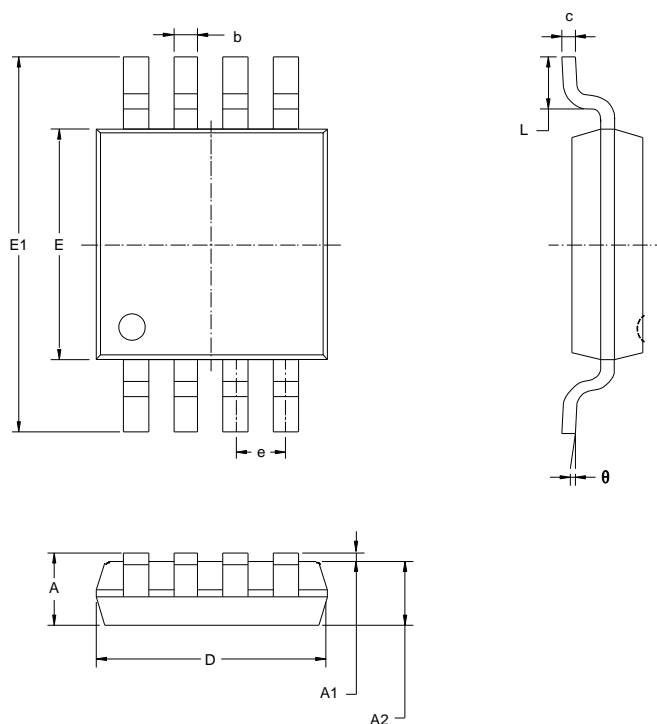
A 0.1μF capacitor is used to stabilize reference voltage to reduce external interference.

TYPICAL APPLICATION DIAGRAM



# PACKAGE OUTLINE DIMENSIONS

## MSOP8



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°

## MARKING and PACKAGING SPECIFICATION

### 1. Marking Drawing Description



Product Name : MS7337M

Product Code: XXXXXXXX

### 2. Marking Drawing Demand

Laser printing, contents in the middle, font type Arial.

### 3. Packaging Specification

Device	Package	Piece/Reel	Reel/Box	Piece/Box	Box/Carton	Piece/Carton
MS7337M	MSOP8	3000	1	3000	8	24000

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- The process of improving product is endless. And our company would sincerely provide more excellent product for customer.



#### MOS CIRCUIT OPERATION PRECAUTIONS

Static electricity can be generated in many places. The following precautions can be taken to effectively prevent the damage of MOS circuit caused by electrostatic discharge:

1. The operator shall ground through the anti-static wristband.
2. The equipment shell must be grounded.
3. The tools used in the assembly process must be grounded.
4. Must use conductor packaging or anti-static materials packaging or transportation.



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