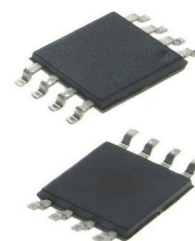


HD/FHD Selectable Video Amplifier and Video Coaxial Control Decoder

PRODUCT DESCRIPTION

The MS7336MA is a integrated single-channel selectable video amplifier and video coaxial control decoder. The video amplifier integrates rail-to-rail output driver with 6dB gain and 10th order filter, which also can select 35MHz/55MHz -3dB bandwidth. The video coaxial control decoder integrates a high-speed processor, effective separation for mixed signal. The MS7336MA provides improved image quality compared with passive LC filters and discrete drivers solution. Operating from single power supply ranging from +2.7V to +5V and sinking an ultra-low 34mA quiescent current, the MS7336MA is ideally suited for battery powered applications.

The MS7336MA has lead MSOP8 package, and ESD (HBM) reaches over 3kV.



MSOP8

FEATURES

- 35MHz/55MHz -3dB Selectable 10th Order Filter
- Transparent Input Clamping
- 6dB Gain Output Driver and Drive Dual Video Load
- Rail-to-Rail Output
- Input Voltage Range Includes Ground
- AC or DC Coupled Inputs/Outputs
- Single Power Supply Operating from 2.7V to 5V
- 34mA Supply Current at Low Power Dissipation, with 150Ω Load
- Pass the AEC_Q100 Authentication

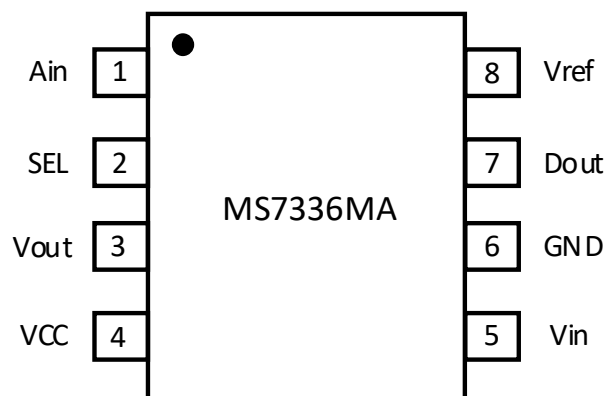
APPLICATIONS

- Video On Demand (VOD)
- Automotive Electronics
- Portable and Handheld Product
- AHD/TVI/CVI Video Driver and Reverse Control Decoder

PRODUCT SPECIFICATION

Part Number	Package	Marking
MS7336MA	MSOP8	7336MA

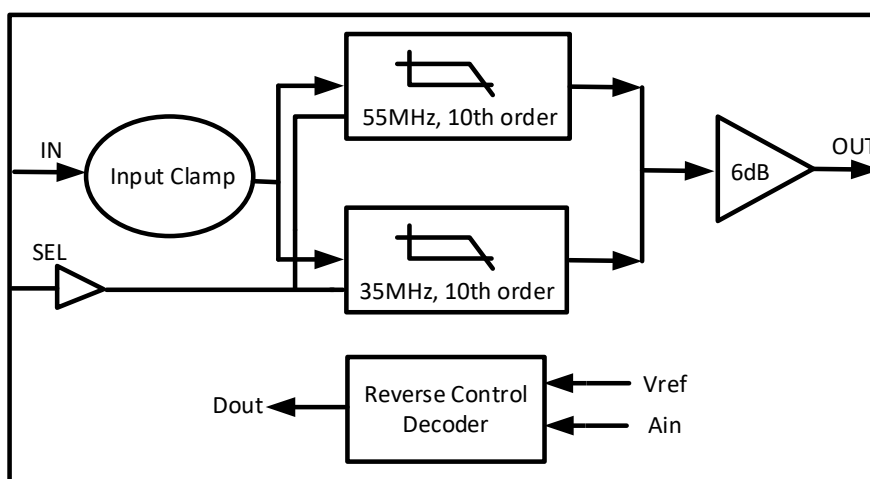
PIN CONFIGURATION



PIN DESCRIPTION

Pin	Name	Type	Description
1	Ain	I	Comparator Input
2	SEL	I	SEL is low: FHD(55MHz) SEL is high: HD(35MHz) SEL is float: HD(35MHz), Internal Default Pullup High Level
3	Vout	O	Video Output
4	VCC	-	Power Supply
5	Vin	I	Video Input
6	GND	-	Ground
7	Dout	O	Reverse Control Output
8	Vref	I	Internal Reference

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	Range	Unit
Power Supply	VCC	6	V
Input Voltage	V _{in}	GND-0.3 ~ (+VCC)+0.3	V
Operating Temperature Range	T _A	-40 ~ +125	°C
Storage Temperature Range	T _{stg}	-65 ~ 150	°C
Junction Temperature		160	°C
Power Dissipation@ T _A = 25°C	PD	0.8	W
Thermal Resistance	θ _{Ja}	128	°C/ W
Lead Temperature (Soldering 10s)		260	°C
ESD	HBM	>3000	V
	MM	>300	

Electrical CHARACTERISTICS(3.3V)

VCC=3.3V, TA = 25°C, unless otherwise noted.

Operational Amplifier Channel

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Voltage Gain	Av	Vpp=1V, RL=150Ω		6		dB
-1dB Bandwidth	HD	RL=150Ω		27		MHz
	FHD			25		
-3dB Bandwidth	HD	RL=150Ω		35		MHz
	FHD			55		
Stop-band Rejection	HD	f=50MHz, RL=150Ω		40		dB
	FHD	f=100MHz, RL=150Ω		30		
Slew Rate	HD	Vin=1V step, 20%-80%, f=100k, RL=150Ω		60		V/μs
	FHD			80		
Group Delay	HD	F=400kHz		23.5		ns
	FHD			14.4		
Rise Time	HD	Vout=2Vp-p, 80%-20%		10		ns
	FHD			9.2		
Fall Time	HD			9.2		ns
	FHD			6.5		
Output Voltage Swing		Vin=3V, RL=150Ω		3.14		V
Output Short-circuit Current	Isc	Vin=0.1V, 10Ω to VDD		156		mA
Output Level Shift Voltage		Vin=0V, No load		235		mV

Video Coaxial Control Decode Channel

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmission Delay		F=100k, Vpp=1V, REF=1V, Rising edge		19		ns
		F=100k, Vpp=1V, REF=1V, Falling edge		17.3		
		F=400k, Vpp=1V, REF=1V, Rising edge		18.5		
		F=400k, Vpp=1V, REF=1V, Falling edge		17.7		
		F=1M, Vpp=1V, REF=1V, Rising edge		19		
		F=1M, Vpp=1V, REF=1V, Falling edge		17.3		
Dout Output High	VOH	RL=1K		3.087		V
Dout Output Low	VOL	RL=1K		5.4		mV
Dout Sensitivity		REF=0.5V, VDOUT from 0 to 1		0.8		V
		REF=0.5V, VDOUT from 1 to 0		0		
		REF=1.5V, VDOUT from 0 to 1		1.52		
		REF=1.5V, VDOUT from 1 to 0		1.14		
Bandwidth		No load, Vpp=1V, REF=1V, Duty cycle<55%		5.4		MHz

Supply Voltage

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Voltage		$V_{in}=1M$, $V_{pp}=0.5V$, $R_L=150\Omega$	2.5		5.5	V
Power Supply Rejection Ration	PSRR	$V_{CC}=+2.7V$ to $5.5V$	52	60	63	dB
Operating Current	I_{SY}	No input, No load	15	15.6	16	mA

ELECTRICAL CHARACTERISTICS(5V)
Operational Amplifier Channel

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Voltage Gain		Av	Vpp=1V, RL=150Ω		6		dB
-1dB Bandwidth	HD		RL=150Ω		27		MHz
	FHD				25		
-3dB Bandwidth	HD		RL=150Ω		35		MHz
	FHD				55		
Stop-Band Rejection	HD	At	f=50MHz, RL=150Ω		32		dB
	FHD		f=100MHz, RL=150Ω		30		
Slew Rate	HD	SR	Vin=1V step, 20%-80%, f=100k, RL=150Ω		65		V/μs
	FHD				80		
Group Delay	HD	GD	F=400kHz		23.5		ns
	FHD				14.4		
Rise Time	HD	ts	Vout=2Vp-p, 80%-20%		10.7		ns
	FHD				8.5		
Fall Time	HD				9		ns
	FHD				6		
Output Voltage Swing			Vin=3V, RL=150Ω		4.74		V
Output Short-Circuit Current		Isc	Vin=0.1V, 10Ω to VDD		234		mA
Output Level Shift Voltage			Vin=0V, No load		255		mV

Video Coaxial Control Decode Channel

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmission Delay		F=100k, Vpp=1V, REF=1V, Rising edge		16		ns
		F=100k, Vpp=1V, REF=1V, Falling edge		17.6		
		F=400k, Vpp=1V, REF=1V, Rising edge		16		
		F=400k, Vpp=1V, REF=1V, Falling edge		17.7		
		F=1M, Vpp=1V, REF=1V, Rising edge		16		
		F=1M, Vpp=1V, REF=1V, Falling edge		17.6		
Dout Output High	VOH	RL=1K		4.74		V
Dout Output Low	VOL	RL=1K		7.8		mV
Dout Sensitivity		REF=0.5V, VDOUT from 0 to 1		0.84		V
		REF=0.5V, VDOUT from 1 to 0		0.47		
		REF=1.5V, VDOUT from 0 to 1		1.52		
		REF=1.5V, VDOUT from 1 to 0		1.12		
Bandwidth		No load, Vpp=1V, REF=1V, Duty cycle<55%		4.8		MHz

Supply Voltage

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Operating Voltage		Vin=1M, Vpp=0.5V, RL=150Ω	2.5		5.5	V
Power Supply Rejection Ration	PSRR	VCC=+2.7V to 5.5V	52	60	63	dB
Operating Current	ISY	Vin=1M, Vpp=1V, REF=1V, RL=150Ω		34		mA

APPLICATIONS INFORMATION

Functional Description

The MS7336MA operates from a single +2.7V to +5V power supply. In application, the MS7336MA is a fully integrated solution for filtering and buffering HDTV signals in front of video decoder or behind video encoder, and reverse control decoder. The MS7336MA's solution can save PCB size, reduce production cost, and improve video signal performance compared with traditional design using discrete components.

The MS7336MA features a DC-coupled input buffer, a video encoder to eliminate out-of-band noise, a gain of +6dB amplifier to drive 75Ω load, and a video coaxial control decoder. The AC or DC-coupled input buffer eliminates sync crush, droop and field tilt. The output of the MS7336MA also can be DC-coupled or AC-coupled.

Power-Supply Bypassing and Layout

In design, correcting power supply bypassing is very important for optimizing video performance. Both a 0.1μF ceramic and 22μF capacitors are always used to bypass power pin of the MS7336MA. And please place these two capacitors as close to the MS7336MA 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 the MS7336MA as possible to avoid performance degradation.

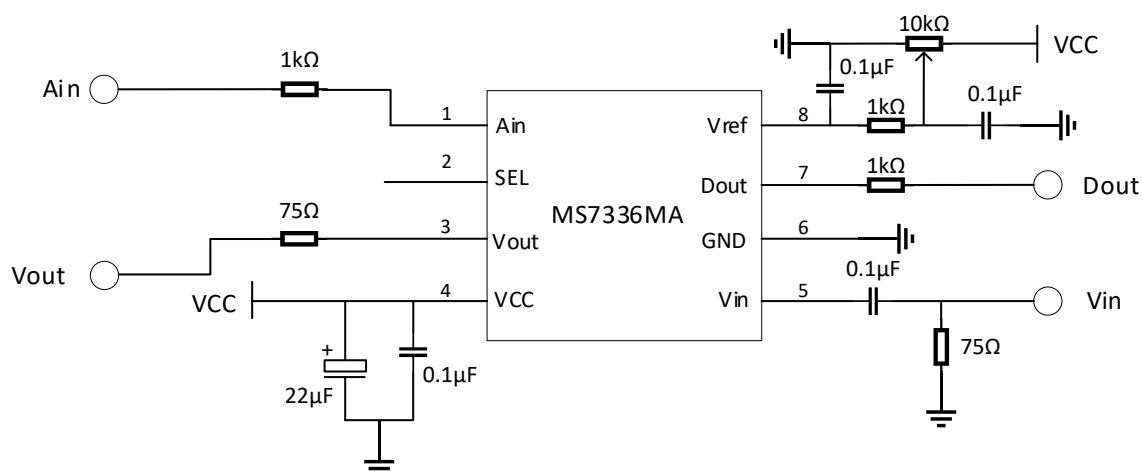
The PCB traces at the output terminal should have 75Ω resistance to match the 75Ω characteristic impedance. In design, please keep the board traces at the input and output of the MS7336MA as short as possible to minimize the parasitic stray capacitance and noise.

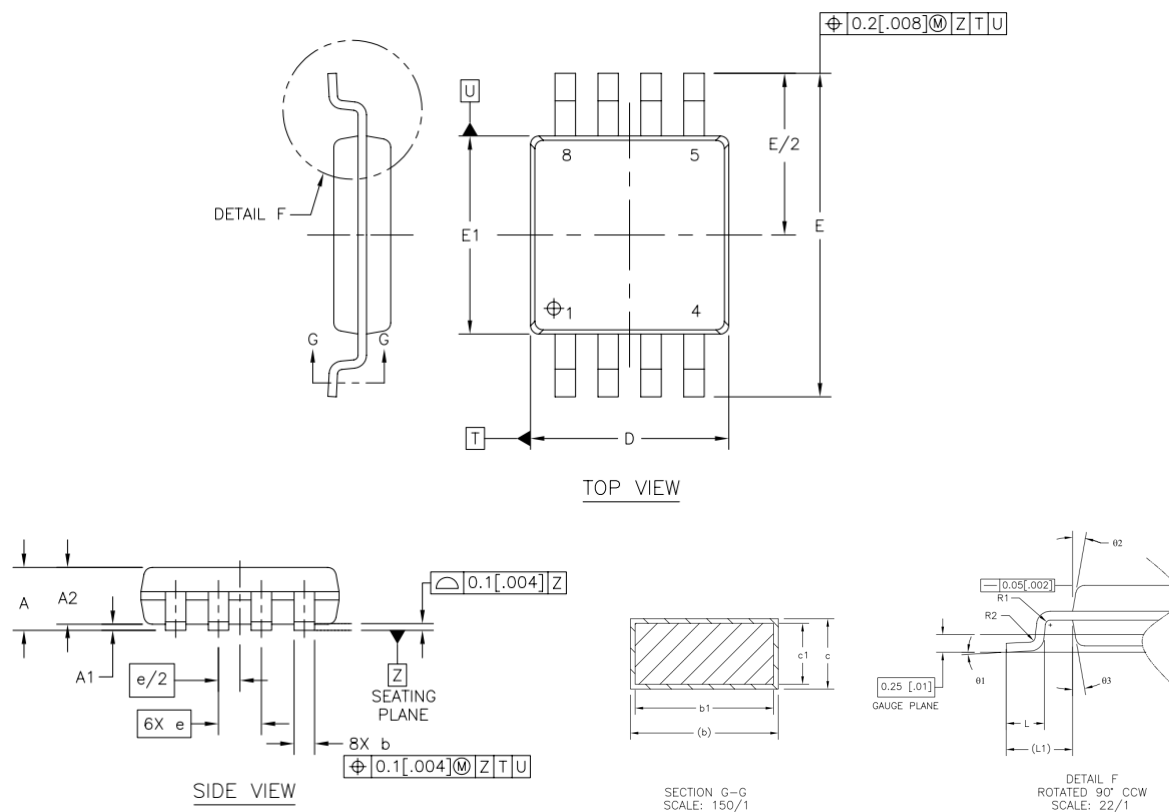
A 0.1μF capacitor is used to stabilize reference voltage of the MS7336MA, reducing external interference.

Different Bandwidth Selection

The SEL pin of the MS7336MA can select 35MHz/55MHz -3dB bandwidth. When SEL is high, select 35MHz; When SEL is low, select 55MHz.

TYPICAL APPLICATION DIAGRAM

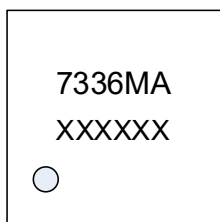


PACKAGE OUTLINE DIMENSIONS
MSOP8


Symbol	Dimensions in Millimeters			Dimensions in Inches		
	Min	Typ	Max	Min	Typ	Max
A	0.86		1.04	0.034		0.041
A1	0.05		0.13	0.002		0.005
A2	0.81		0.91	0.032		0.036
b	0.28		0.38	0.011		0.015
b1	0.25		0.33	0.010		0.013
c	0.13		0.2	0.005		0.008
c1	0.08		0.18	0.003		0.007
D	2.9	3	3.1	0.114	0.118	0.122
E1	2.9	3	3.1	0.114	0.118	0.122
E	4.8	4.9	5	0.189	0.193	0.197
e	0.65 BSC			0.026 BSC		
L	0.445	0.546	0.648	0.017	0.021	0.026
L1	0.95 REF			0.037 REF		
θ1	0°		6°	0°		6°
θ2	5°		15°	5°		15°

MARKING and PACKAGING SPECIFICATION

1. Marking Drawing Description



Product Name: 7336MA

Product Code : XXXXXX

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
MS7336MA	MSOP8	3000	1	3000	8	24000

STATEMENT

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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.



+86-571-89966911



Rm701, No.9 Building, No. 1 WeiYe Road, Puyan Street, Binjiang District, Hangzhou, Zhejiang



[http:// www.relmon.com](http://www.relmon.com)