HD/FHD Selectable Video Filter Driver And Video Coaxial Control Decoder

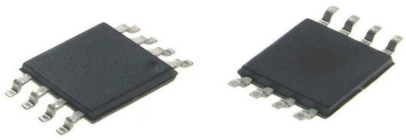
PRODUCT DESCRIPTION

The MS7336MA integrated a bandwidth selectable video amplifier and video coaxial control decoder. The video amplifier integrates Single rail-to-rail output driver with 6dB Gain and 10th output reconstruction filter, which also can select 35MHz/55MHz -3dB bandwidth. The video coaxial control decoder integrated a high-speed processor, effective separation for mixed-signal. MS7336MA provides improved image quality compared with passive LC filters and discrete drivers solution. Operating from single supplies 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 MSOP-8 package, and ESD (HBM) reaches over 3KV.

FEATURES

- 35MHz/55MHz -3dB selectable 10th order 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 34mA Supply Current
- Lead MSOP-8 package
- Through the AEC_Q100
- authentication



MSOP-8

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
MS7336MA	MSOP-8	7336MA

PIN CONFIGURATIONS

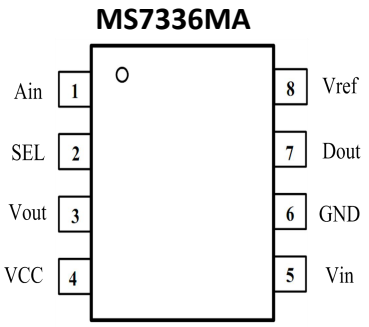
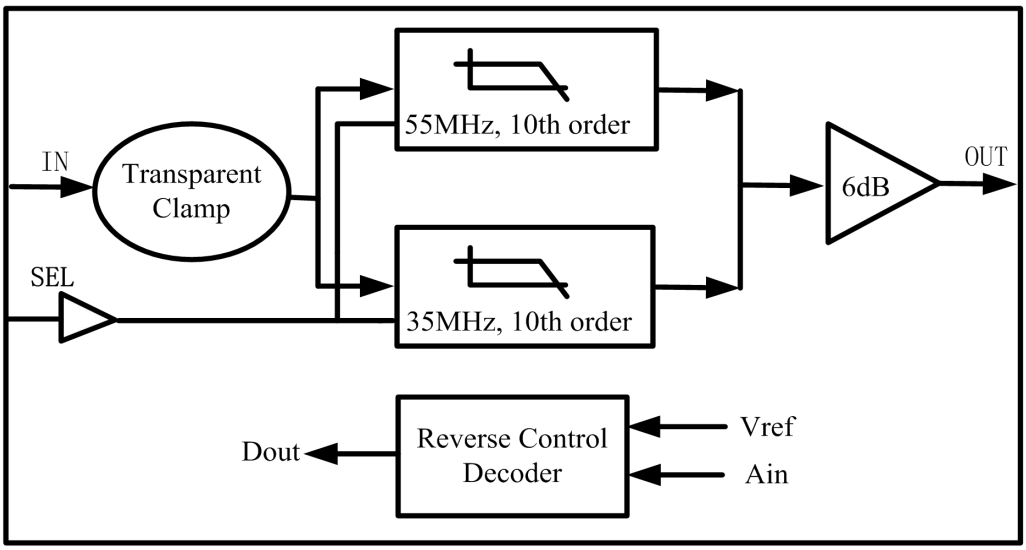


Figure1.MSOP-8

Pin Description of Fig1

Pin	Name	Function Description
1	Ain	Comparator input
2	SEL	SEL is low： FHD(55MHz) SEL is high： HD(35MHz) SEL is float: HD(35MHz)
3	Vout	Video output
4	VCC	Power supply
5	Vin	Video input
6	GND	Ground
7	Dout	Reverse control output
8	Vref	Internal reference

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Stresses below 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 below 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-	6V
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）	>3000V
MM	>300V

Electrical Characteristics(3.3V)

(VCC=3.3V, TA = 25℃, unless otherwise noted.)

Operational amplifier channel：

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

video coaxial control decoding 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,trailing edge		17.3		
		F=400k,Vpp=1V,REF=1V,rising edge		18.5		
		F=400k,Vpp=1V,REF=1V,trailing edge		17.7		
		F=1M,Vpp=1V,REF=1V,rising edge		19		
		F=1M,Vpp=1V,REF=1V,trailing edge		17.3		
Dout Output High	V_{OH}	R_L=1K		3.087		V
Dout Output Low	V_{OL}	R_L=1K		5.4		mV
Dout Sensitivity		REF=0.5V， V_{DOUT} from 0 to 1		0.8		V
		REF=0.5V， V_{DOUT} from 1 to 0		0		
		REF=1.5V， V_{DOUT} from 0 to 1		1.52		
		REF=1.5V， V_{DOUT} 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
Voltage operating range		Vin=1M， Vpp=0.5V， R_L=150Ω	2.5		5.5	V
Power Supply Rejection Ration	PSRR	Vs=+2.7V to 5.5V	52	60	63	dB
Supply 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， R_L=150Ω		6		dB
-1dB Bandwidth	HD		R_L=150Ω		27		MHz
	FHD				25		
-3dB Bandwidth	HD		R_L=150Ω		35		MHz
	FHD				55		
Stop-Band Rejection	HD	At	f=50MHz,R_L=150Ω		32		dB
	FHD		f=100MHz,R_L=150Ω		30		
Slew Rate	HD	SR	Vin=1V step ， 20%-80%， f=100k， R_L=150Ω		65		V/us
	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， R_L=150Ω		4.74		V
Output Short-Circuit Current		I_{SC}	Vin=0.1V， 10Ω to VDD		234		mA
Output Level Shift Voltage			Vin=0V， no load		255		mV

video coaxial control decoding 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,trailing edge		17.6		
		F=400k,Vpp=1V,REF=1V,rising edge		16		
		F=400k,Vpp=1V,REF=1V,trailing edge		17.7		
		F=1M,Vpp=1V,REF=1V,rising edge		16		
		F=1M,Vpp=1V,REF=1V,trailing edge		17.6		
Dout Output High	V_{OH}	R_L=1K		4.74		V
Dout Output Low	V_{OL}	R_L=1K		7.8		mV
Dout Sensitivity		REF=0.5V， V_{DOUT} from 0 to 1		0.84		V
		REF=0.5V， V_{DOUT} from 1 to 0		0.47		
		REF=1.5V， V_{DOUT} from 0 to 1		1.52		
		REF=1.5V， V_{DOUT} 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
Voltage operating range		Vin=1M， Vpp=0.5V， R_L=150Ω	2.5		5.5	V
Power Supply Rejection Ration	PSRR	Vs=+2.7V to 5.5V	52	60	63	dB
Supply current	I_{SY}	Vin=1M， Vpp=1V，REF=1V， R_L=150Ω		34		mA

APPLICATIONS INFORMATION

Functional Description

MS7336MA operates from a single +2.7V to +5V supply. In application, 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. MS7336MA's solution can help you save PCB size and production cost, it also improves video signal performance comparing with traditional design using discrete components. MS7336MA features a DC-coupled input buffer, 10th 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 MS7336MA also can be DC-coupled or AC-coupled.

Power-Supply Bypassing and Layout

Correct power supply bypassing is very important for optimizing video performance in design. both 0.1μF ceramic and 10μF electrolytic capacitors are always used to Bypass VCC pin of MS7336MA, 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 MS7336MA 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 MS7336MA as short as possible to minimize the parasitic stray capacitance and noise pickup.

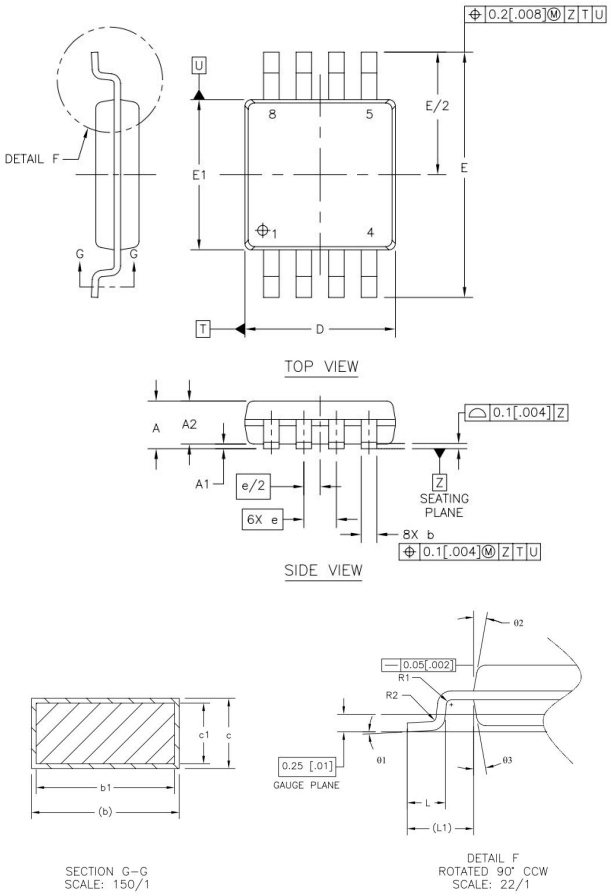
0.1uF capacitor is used to stabilize Vref pin of MS7336MA.

Different Bandwidth To Choose

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

PACKAGE OUTLINE DIMENSIONS

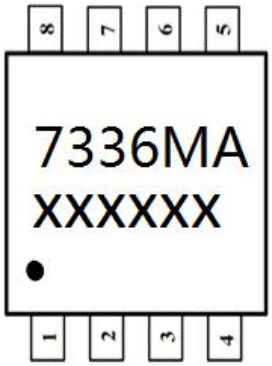
MSOP8:



DESCRIPTION		Symbol	Dimensions In Millimeters			Dimensions in Inches		
			MIN	NOM	MAX	MIN	NOM	MAX
TOTAL THICKNESS		A	0.86		1.04	0.034		0.041
STAND OFF		A1	0.05		0.13	0.002		0.005
MOLD THICKNESS		A2	0.81		0.91	0.032		0.036
LEAD WIDTH(PLATING)		b	0.28		0.38	0.011		0.015
LEAD WIDTH		b1	0.25		0.33	0.010		0.013
L/F THICKNESS(PLATING)		c	0.13		0.2	0.005		0.008
L/F THICKNESS		c1	0.08		0.18	0.003		0.007
BODY SIZE	X	D	2.9	3	3.1	0.114	0.118	0.122
	Y	E1	2.9	3	3.1	0.114	0.118	0.122
		E	4.8	4.9	5	0.189	0.193	0.197
LAED PITCH		e		0.65 BSC			0.026 BSC	
		L	0.445	0.546	0.648	0.017	0.021	0.026
FOOTPRINT		L1		0.95 REF			0.037 REF	
		θ1	0°		6°	0°		6°
		θ2	5°		15°	5°		15°
		θ3	5°		15°	5°		15°
		R1	0.07		----	0.003		----
		R2	0.07		----	0.003		----

Marking and Packaging Specifications

1、Marking drawing description



7336MA：product name

XXXXXX：Product code

2、Marking drawing pattern

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

3、Packaging Specifications

Device	Package	piece/reel	reel/box	piece /box	box/carton	piece/carton
MS7336MA	MSOP8	3000	1	3000	8	24000

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 be used conductor packaging or antistatic materials packaging or transportation.

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