

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

PRODUCT DESCRIPTION

The MS7338MA integrated a bandwidth selectable video amplifier and video coaxial control decoder. The video amplifier integrates Single rail-to-rail output driver with 12dB Gain and 10th output reconstruction filter, which also can select 30MHz/45MHz -3dB bandwidth. The video coaxial control decoder integrated a high-speed processor, effective separation for mixed-signal. MS7338MA 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 35mA quiescent current, the MS7338MA is ideally suited for battery powered applications.

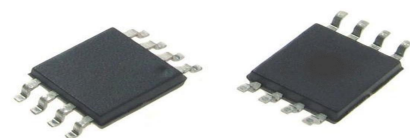
The MS7338MA has lead MSOP-8 package, and ESD (HBM) reaches over 3KV.

FEATURES

- 30MHz/45MHz -3dB selectable 10th order filter
- Transparent input clamping
- 12dB 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 35mA Supply Current
- Lead MSOP-8 package
- Through the AEC_Q100 authentication

APPLICATIONS

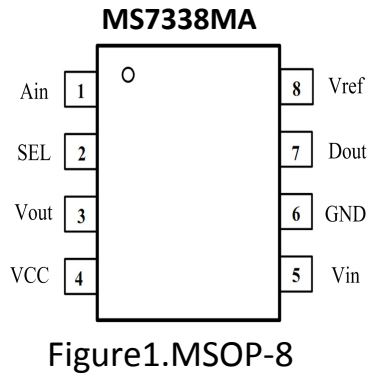
- Video On Demand (VOD)
- Communications device
- Portable and handheld product
- AHD/TVI/CVI video driver and reverse control decoder



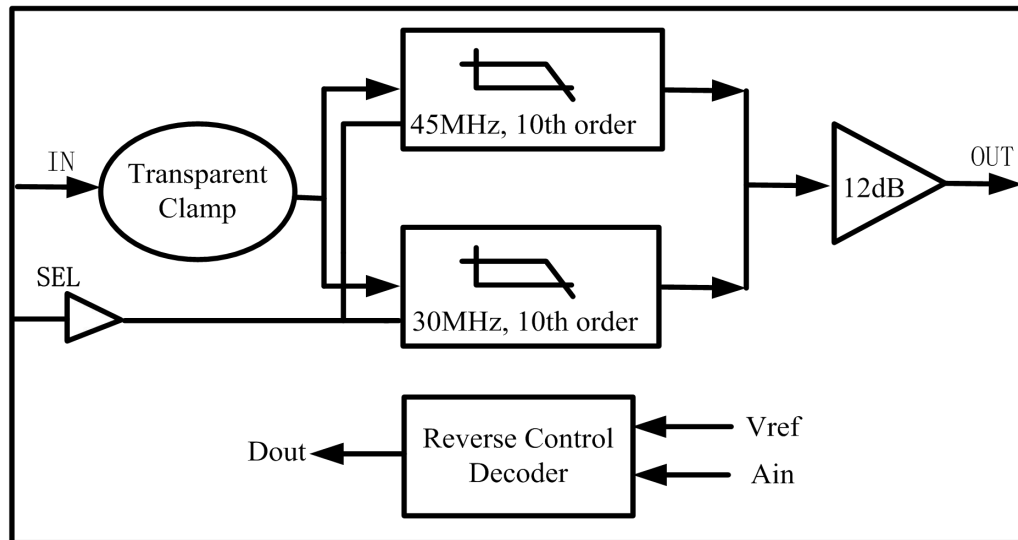
MSOP-8

PACKAGE/ORDERING INFORMATION

Part Number	Package	Marking
MS7338MA	MSOP-8	7338MA

PIN CONFIGURATIONS
Pin Description of Fig1


Pin	Name	Function Description
1	Ain	Comparator input
2	SEL	SEL is low: FHD(45MHz) SEL is high: HD(30MHz) SEL is float: HD(30MHz)
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, θ_{JA}	128℃/W
Lead Temperature Range (Soldering 10 sec)	260℃
ESD Susceptibility (HBM)	>3000V
MM	>300V

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=0.5V, RL=150Ω		12.4		dB
-1dB Bandwidth	HD		RL=150Ω		22		MHz
	FHD				18		
-3dB Bandwidth	HD		RL=150Ω		30		MHz
	FHD				45		
Stop-Band Rejection	HD	At	f=60MHz, RL=150Ω		32		dB
	FHD		f=100MHz, RL=150Ω		27		
Slew Rate	HD	SR	Vin=0.5V step, 20%-80%, f=100k, RL=150Ω		83		V/us
	FHD				98		
Group Delay	HD	GD	F=400kHz		29		ns
	FHD				20		
Rise Time	HD	ts	Vout=2Vp-p, 80%-20%		14.3		ns
	FHD				12.2		
Fall Time	HD				9.9		ns
	FHD				6.4		
Output Voltage Swing			Vin=3V, RL=150Ω		3.14		V
Output Short-Circuit Current		Isc	Vin=0.1V, 10Ω to VDD		147		mA
Output Level Shift Voltage			Vin=0V, no load		560		mV

video coaxial control decoding channel:

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmission Delay		F=100k,Vpp=1V,REF=1V,rising edge		30		ns
		F=100k,Vpp=1V,REF=1V,trailing edge		17.3		
		F=1M,Vpp=1V,REF=1V,rising edge		22		
		F=1M,Vpp=1V,REF=1V,trailing edge		17.8		
Dout Output High	V _{OH}	R _L =1K		3.09		V
Dout Output Low	V _{OL}	R _L =1K		6		mV
Dout Sensitivity		REF=0.5V, V _{DOUT} from 0 to 1		0.7		V
		REF=0.5V, V _{DOUT} from 1 to 0		0		
		REF=1.5V, V _{DOUT} from 0 to 1		1.5		
		REF=1.5V, V _{DOUT} from 1 to 0		1.21		
Bandwidth		No load, Vpp=1V, REF=1V duty cycle<55%		5.5		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	V _S =+2.7V to 5.5V	52	60	63	dB
Supply current	I _{SY}	No input , No load		16		mA

Electrical Characteristics(5V)

(VCC=5V, TA = 25°C, unless otherwise noted.)

Operational amplifier channel:

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Voltage Gain	Av	Vpp=0.5V, RL=150Ω		12.7		dB
-1dB Bandwidth	HD FHD	RL=150Ω		21 20		MHz
-3dB Bandwidth	HD FHD	RL=150Ω		30 43		MHz
Stop-Band Rejection	HD FHD	At f=60MHz, RL=150Ω f=100MHz, RL=150Ω		30 26		dB
Slew Rate	HD FHD	SR Vin=0.5V step, 20%-80%, f=100k, RL=150Ω		93 113		V/us
Group Delay	HD FHD	GD F=400kHz		29 20		ns
Rise Time	HD FHD	ts Vout=2Vp-p, 80%-20%		12.8 10.6		ns
Fall Time	HD FHD	ts Vout=2Vp-p, 80%-20%		10.1 6.4		ns
Output Voltage Swing		Vin=3V, RL=150Ω		4.76		V
Output Short-Circuit Current	Isc	Vin=0.1V, 10Ω to VDD		221		mA
Output Level Shift Voltage		Vin=0V, no load		650		mV

video coaxial control decoding channel:

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Transmission Delay		F=100k,Vpp=1V,REF=1V,rising edge		18.7		ns
		F=100k,Vpp=1V,REF=1V,trailing edge		17.5		
		F=1M,Vpp=1V,REF=1V,rising edge		19		
		F=1M,Vpp=1V,REF=1V,trailing edge		17.5		
Dout Output High	V _{OH}	R _L =1K		4.73		V
Dout Output Low	V _{OL}	R _L =1K		8		mV
Dout Sensitivity		REF=0.5V, V _{DOUT} from 0 to 1		0.9		V
		REF=0.5V, V _{DOUT} from 1 to 0		0.43		
		REF=1.5V, V _{DOUT} from 0 to 1		1.52		
		REF=1.5V, V _{DOUT} from 1 to 0		1.23		
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	V _S =+2.7V to 5.5V	52	60	63	dB
Supply current	I _{SV}	Vin=1M, Vpp=0.5V, REF=0.5V, R _L =150Ω		35		mA

APPLICATIONS INFORMATION

Functional Description

MS7338MA operates from a single +2.7V to +5V supply. In application, MS7338MA is a fully integrated solution for filtering and buffering HDTV signals in front of video decoder or behind video encoder, and reverse control decoder. MS7338MA's solution can help you save PCB size and production cost, it also improves video signal performance comparing with traditional design using discrete components. MS7338MA features a DC-coupled input buffer, 10th low-pass filter to eliminate out-of-band noise of video encoder, and a gain of +12dB 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 MS7338MA also can be DC-coupled or AC-coupled.

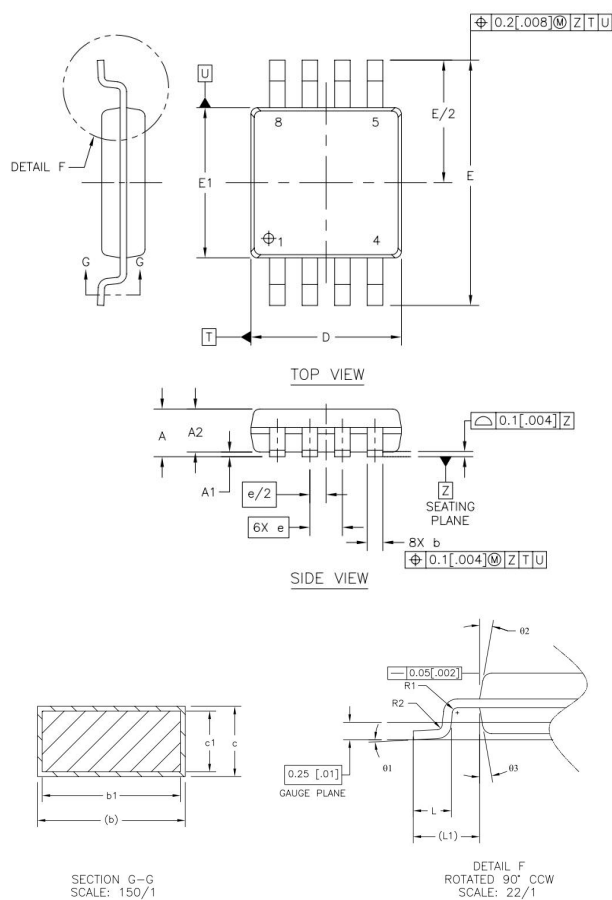
Power-Supply Bypassing and Layout

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 MS7338MA, please place these two capacitors as close to the MS7338MA 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 MS7338MA 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 MS7338MA as short as possible to minimize the parasitic stray capacitance and noise pickup.

0.1uF capacitor is used to stabilize Vref pin of MS7338MA.

Different Bandwidth To Choose

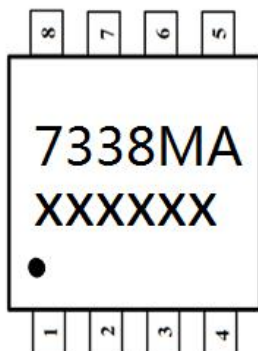
The SEL pin of MS7338MA can select 30MHz/45MHz -3dB bandwidth. SEL is high select 30MHz, SEL is low select 45MHz.

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



7338MA: 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
MS7338MA	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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