

Low-Cost, Single-Channel,10th-Order Video Filter Driver

-----MS2631

PRODUCT DESCRIPTION

The MS2631 is a Video Filter Driver which integrates Single rail-to-rail output driver with 6dB Gain and 10th output reconstruction filter, it has 55MHz -3dB bandwidth. MS2631 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 25mA quiescent current, the MS2631 is ideally suited for battery powered applications.

The MS2631 has lead SOT23-6 package, and ESD (HBM) reaches over 3KV.

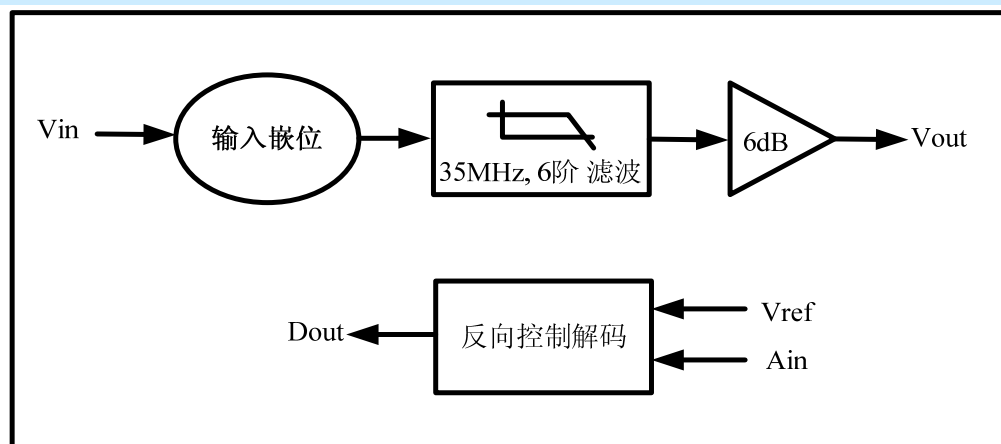
FEATURES

- Tenth-order 55MHz (FHD) 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 25mA Supply Current
- Lead SOT23-6 package

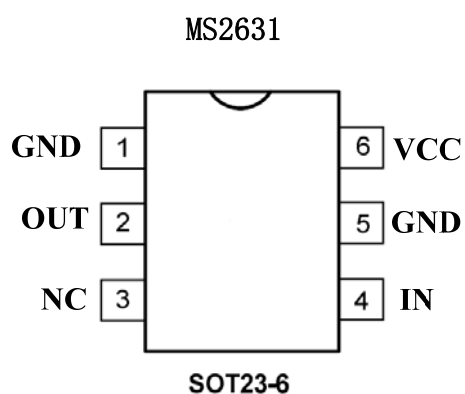
APPLICATIONS

- Video On Demand (VOD)
- Communications device
- Portable and handheld product
- Cable and Satellite Set-top Boxes
- DVD Players
- HDTV and Projector
- Personal Video Recorders (PVR)

BLOCK DIAGRAM



PIN CONFIGURATIONS



Pin Description of Figure

Pin	Name	Function Description
1	GND	Ground
2	OUT	Video output
3	NC	Unused
4	IN	Video input
5	GND	Ground
6	VCC	Power supply

PACKAGE/ORDERING INFORMATION

Part Number	Package	Marking
MS2631	SOT23-6	2631

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-	7.5V
Input Voltage	GND-0.3V to (+VS)+0.3V
Storage Temperature Range	-65°C to +150°C
Junction Temperature	160°C
Operating Temperature Range	-40°C to +125°C
Power Dissipation, PD @ TA = 25°C	0.8W
Package Thermal Resistance, θ_{JA}	128°C/W
Lead Temperature Range (Soldering 10 sec)	260°C
ESD Susceptibility (HBM)	>3000V
MM	>300V

ELECTRICAL CHARACTERISTICS

(At $R_L = 150\Omega$ connected to GND, $V_{in}=1V_{pp}$, and $C_{IN} = 0.1\mu F$, all outputs AC coupled with $220\mu F$, unless otherwise noted).

PARAMETER	CONDITION	TYP	MIN	MAX	UNITS
DYNAMIC PERFORMANCE: Amplifier channel					
-1dB Bandwidth	$R_L=150\Omega$	46			MHz
-3dB Bandwidth	$R_L=150\Omega$	55			MHz
Gain		6			dB
Slew Rate	$V_{in}=1V$ step, 20%--80%	90			V/us
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 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%	4.5			ns
Fall Time	2.0V step, 80%--20%	5.3			ns
Control decoding channel					
Propagation Delay	$R_L = 5.1k\Omega, C_L = 50p$			40	ns
Output Swing High	$I=2mA$	$V_{DD}-0.1$			V
Output Swing Low	$I=2mA$	100			mV
Input Offset Current				50	pA
INPUT CHARACTERISTICS: Amplifier channel					
Output Level Shift Voltage (VOLS)	$V_{in}=0V$, no load	235	230	370	mv
Input Voltage Clamp (VCLAMP)	$I_{in} = -1mA$	-4.5	-4	-22	mV
Clamp Charge Current	$V_{in}=V_{clp}-100mV$	-5		-7.2	mA
Voltage Gain (A_v)	$R_L=150$	2	1.90	2.1	V/V
OUTPUT CHARACTERISTICS: Amplifier channel					

Output Voltage High Swing	Vin=3V, RL=150 Ω	4.5	4.2	4.5	V
Output Short-Circuit Current (ISC)	Vin=0.1V, out short to VDD through 10 Ω	37		45	mA
POWER SUPPLY					
Operating Voltage Range			2.7	5	V
Quiescent Current	no load	13		15	mA
Operating Current	Vin=500mV	25		27	mA

CAUTION

This integrated circuit can be damaged by Static electricity 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.

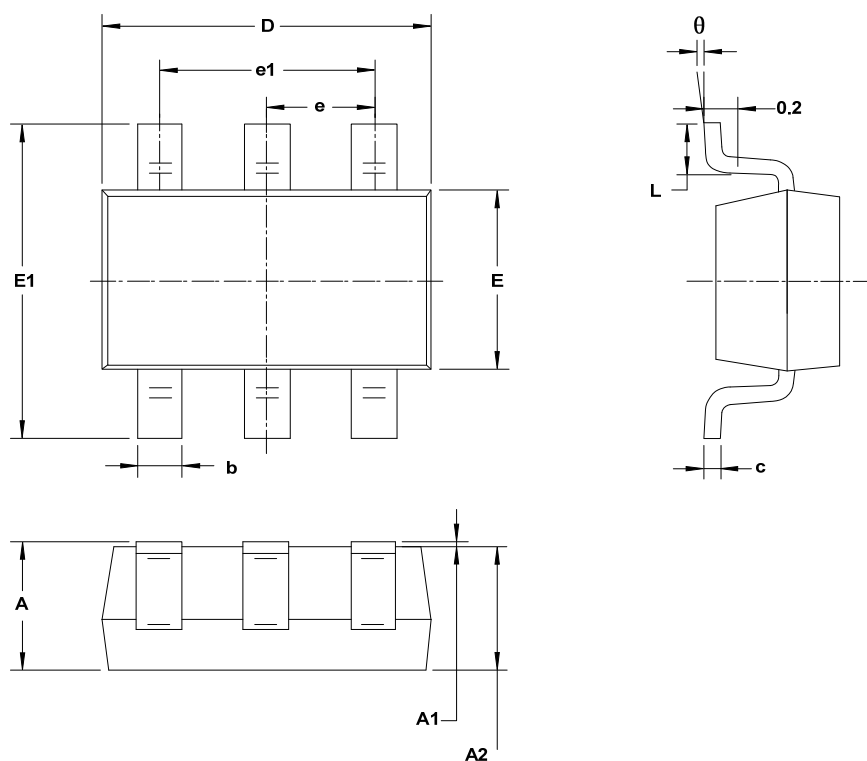
APPLICATIONS INFORMATION

Functional Description

MS2631 operates from a single +2.7V to +5V supply. In application, MS2631 is a fully integrated solution for filtering and buffering HDTV signals. MS2631's solution can help you save PCB size and production cost, it also improves video signal performance comparing with traditional design using discrete components. MS2631 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 MS2631 also can be DC-coupled or AC-coupled.

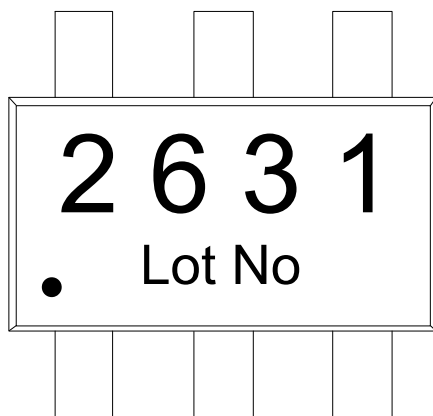
Power-Supply Bypassing and Layout

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 MS2631, please place these two capacitors as close to the MS2631 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 MS2631 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 MS2631 as short as possible to minimize the parasitic stray capacitance and noise pickup.

PACKAGE OUTLINE DIMENSIONS
SOT23-6


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 BSC		0.037 BSC	
e1	1.900 BSC		0.075 BSC	
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

Marking drawing criterion and pack illustrate

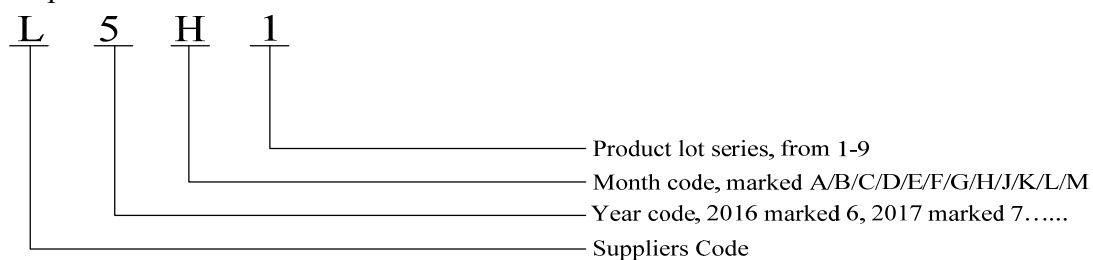


1. Marking drawing criterion

2631: product name

Lot No:

Example: L5H1



2. Marking drawing pattern

Laser printing, contents in the middle, font type Arial

3. Pack illustrate

Type	piece/roll	roll/box	roll/carton	piece/carton
MS2631	3000	10	4	120000