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

---------MS2681

PRODUCT DESCRIPTION

The MS2681 is a Video Filter Driver which integrates Single rail-to-rail output driver with 6dB Gain and 10th output reconstruction filter, it has 35MHz -3dB bandwidth. MS2681 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 MS2681 is ideally suited for battery powered applications.

The MS2681 has lead SOT23-6 package, and ESD (HBM) reaches over 3KV.

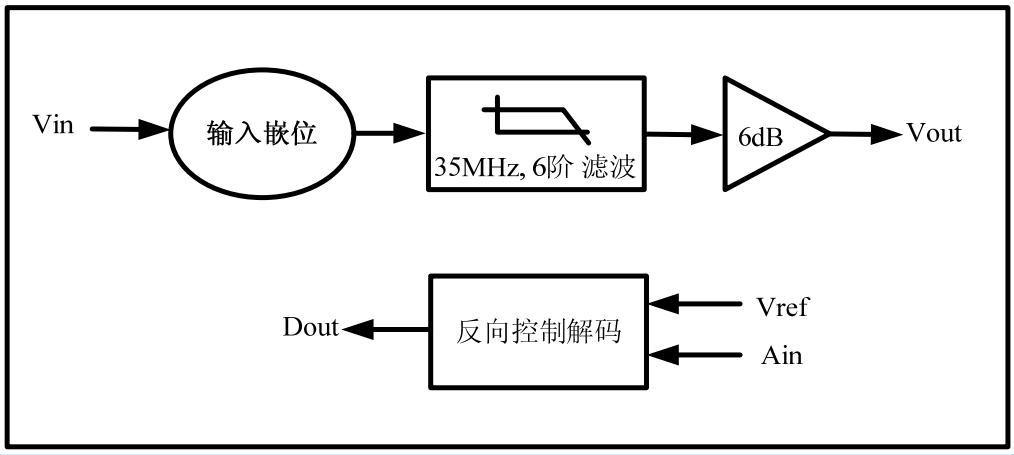
FEATURES

- Tenth-order 35MHz (HD) 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

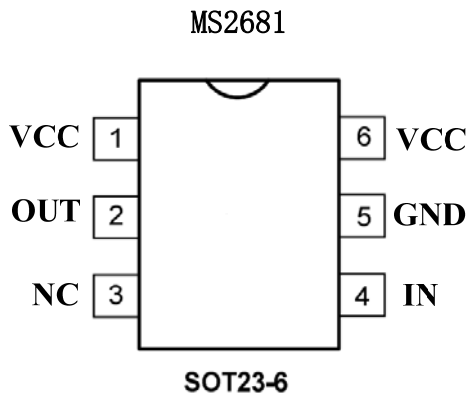
APPLICATIONS

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

BLOCK DIAGRAM



PIN CONFIGURATIONS



Pin Description of Figure

Pin	Name	Function Description
1	VCC	Power supply
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
MS2681	SOT23-6	2681

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℃ 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

(At RL = 150Ω connected to GND, Vin=1Vpp，and CIN = 0.1μF, all outputs AC coupled with 220μF，unless otherwise noted).

PARAMETER	CONDITION	TYP	MIN	MAX	UNITS
DYNAMIC PERFORMANCE：Amplifier channel					
-1dB Bandwidth	Rl=150Ω	29			MHz
-3dB Bandwidth	Rl=150Ω	35			MHz
Gain		6			dB
Slew Rate	Vin=1V step，20%--80%	90			V/us
Differential Gain (DG)	NTSC & PAL DC NTSC & PAL AC	0.02 0.3			% %
Differential Phase (DP)	NTSC & PAL DC NTSC & PAL AC	0.02 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%	8.5			ns
Fall Time	2.0V step，80%--20%	8.7			ns
Control decoding channel					
Propagation Delay	RL = 5.1kΩ，CL = 50p			40	ns
Output Swing High	I=2mA	VDD-0.1			V
Output Swing Low	I=2mA	100			mV
Input Offset Current				50	pA
INPUT CHARACTERISTICS: Amplifier channel					
Output Level Shift Voltage (VOLS)	Vin=0V，no load	235	230	370	mv
Input Voltage Clamp (VCLAMP)	Iin= -1mA	-4.5	-4	-22	mV
Clamp Charge Current	Vin=Vclp-100mV	-5		-7.2	mA
Voltage Gain（Av）	RL=150	2	1.90	2.1	V/V
OUTPUT CHARACTERISTICS：Amplifier channel					

Output Voltage High Swing	Vin=3V，RL=150Ω	4.5	4.2	4.5	V
Output Short-Circuit Current (ISC)	Vin=0.1V, out short to VDD through 10Ω	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

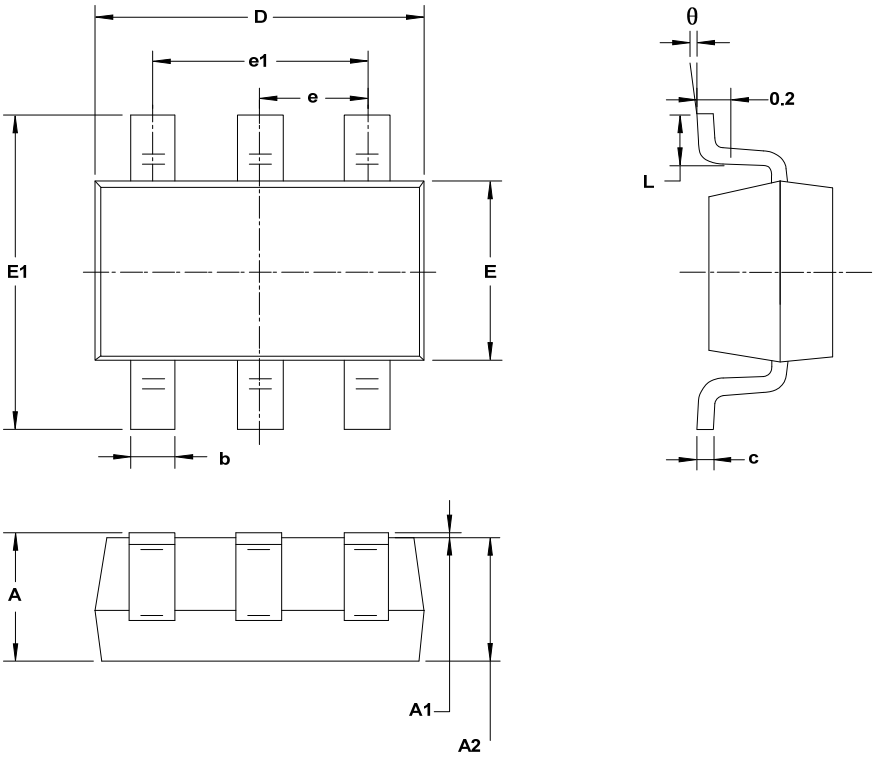
MS2681 operates from a single +2.7V to +5V supply. In application, MS2681 is a fully integrated solution for filtering and buffering HDTV signals. MS2681's solution can help you save PCB size and production cost, it also improves video signal performance comparing with traditional design using discrete components. MS2681 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 MS2681 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 MS2681, please place these two capacitors as close to the MS2681 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 MS2681 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 MS2681 as short as possible to minimize the parasitic stray capacitance and noise pickup.

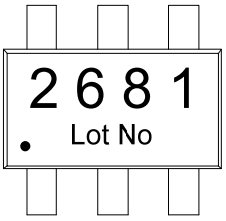
PACKAGE OUTLINE DIMENSIONS

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

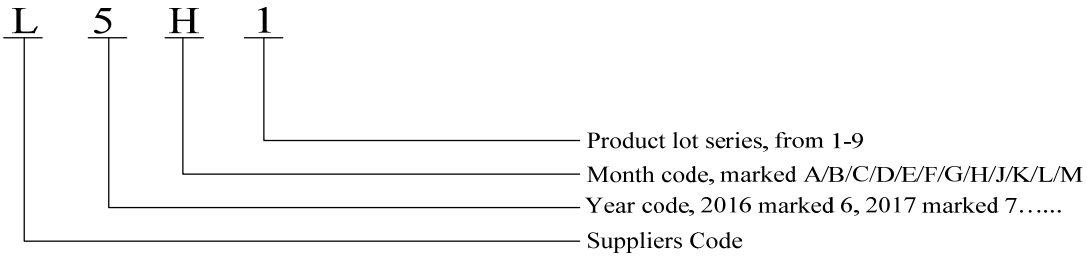


1. Marking drawing criterion

2681: 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
MS2681	3000	10	4	120000