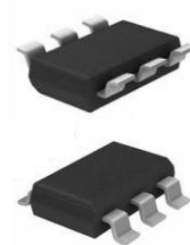


Single Channel Video Operational Amplifier

PRODUCT DESCRIPTION

The MS1637 is a single-channel video amplifier. Video amplifier integrates rail-to-rail output driver with 6dB gain and 6th order filter. The -3dB bandwidth is up to 80MHz.

The single power supply ranges from +2.7V to +5.5V and operating current is 36mA, which is ideally suited for battery-powered applications.



SOT23-6

FEATURES

- Single Channel, 80MHz, 6th Order (FHD) Filter
- 6dB Gain Output Driver and Drive Dual Video Load
- Rail-to-Rail Output
- Input Voltage Range Includes Ground
- AC or DC Coupled Input
- AC or DC Coupled Outputs
- Single Power Supply: 2.7V to 5.5V
- SOT23-6 Package
- Low Power Dissipation, Operating Current: 36mA

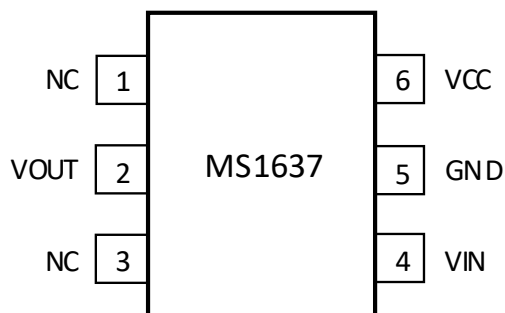
APPLICATIONS

- Consumer Video
- Portable and Handheld Products
- AHD/TVI/CVI Analog HD Video Driver

PRODUCT SPECIFICATION

Part Number	Package	Marking
MS1637	SOT23-6	1637

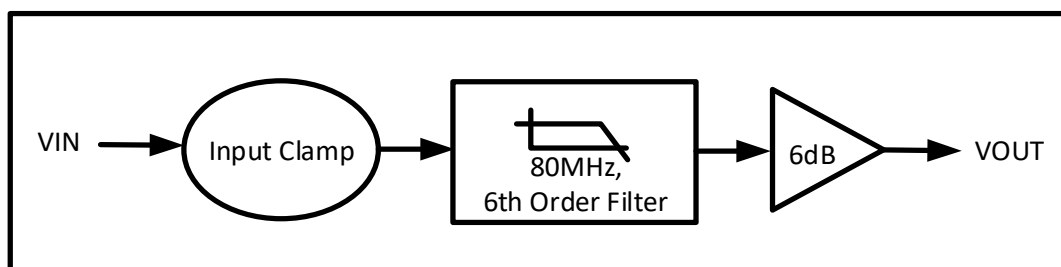
PIN CONFIGURATION



PIN DESCRIPTION

Pin	Name	Type	Description
1	NC	-	Not Connection
2	VOUT	O	Video 6dB Output
3	NC	-	Not Connection
4	VIN	I	Video Input
5	GND	-	Ground
6	VCC	-	Power Supply

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	Ratings	Unit
Power Supply	V_{CC}	6	V
Input Voltage	V_{IN}	GND-0.3 ~ $V_{CC}+0.3$	V
Operating Temperature	T_A	-40 ~ +125	°C
Maximum Power Dissipation for SOT23-6 Package, $T_A=25^{\circ}\text{C}$	P_D	0.34	W
Maximum Junction Temperature	T_{JMAX}	150	°C
Storage Temperature	T_{STG}	-65 ~ +150	°C
Lead Temperature (Soldering 10s)		260	°C
ESD (HBM)	V_{ESD}	±8000	V

ELECTRICAL CHARACTERISTICS (5V)

$V_{CC}=5V$. Unless otherwise noted, $T_A=25^{\circ}C \pm 2^{\circ}C$.

Dynamic Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
-1dB Bandwidth		$R_L=150\Omega$		60		MHz
-3dB Bandwidth		$R_L=150\Omega$		80		MHz
StopBand Rejection	A_T	$f=160MHz$		-28		dB
Voltage Gain	A_v	$V_{pp}=0.5V, R_L=150\Omega$		6.4		dB
Slew Rate	SR	$V_{pp}=0.5V, 20\%-80\%, f=100k$ $R_L=150\Omega$, Falling edge		180		V/ μs
		$V_{pp}=0.5V, 20\%-80\%, f=100k$ $R_L=150\Omega$, Rising edge		193		
Group Delay	GD	$f=400kHz$		6.6		ns
Group Delay Variation	D/DT	$f=400kHz \sim 78MHz$		2.5		ns

Output Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Maximum Output Swing		$V_{IN}=3V, R_L=150\Omega$		4.78		V
Output Bias Voltage		$V_{IN}=0V$, No load, Input GND		0.52		V
Output Short-Circuit Current	I_{SC}	$V_{IN}=0V$, Output in series with 10Ω to VCC		72		mA

Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating Voltage		Input 1M, $V_{pp}=0.5V, R_L=150\Omega$	2.7		5.5	V
Operating Current		Input 1M, $V_{pp}=0.5V, REF=0.5V, R_L=150\Omega$		36		mA

ELECTRICAL CHARACTERISTICS (3.3V)

$V_{CC}=3.3V$. Unless otherwise noted, $T_A=25^{\circ}C \pm 2^{\circ}C$.

Dynamic Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
-1dB Bandwidth		$R_L=150\Omega$		62		MHz
-3dB Bandwidth		$R_L=150\Omega$		80		MHz
StopBand Rejection	At	$f=160MHz$		-29		dB
Voltage Gain	A_v	$V_{pp}=0.5V, R_L=150\Omega$		6.4		dB
Slew Rate	SR	$V_{pp}=0.5V, 20\%-80\%, f=100k$ $R_L=150\Omega$, Falling edge		180		V/ μs
		$V_{pp}=0.5V, 20\%-80\%, f=100k$ $R_L=150\Omega$, Rising edge		136		
Group Delay	GD	$f=400kHz$		7.8		ns
Group Delay Variation	D/DT	$f=400kHz \sim 78MHz$		2		ns

Output Characteristics (Operational Amplifier Channel)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Maximum Output Swing		$V_{IN}=3V, R_L=150\Omega$		3.17		V
Output Bias Voltage		$V_{IN}=0V$, No load, Input GND		0.5		V
Output Short-Circuit Current	I_{SC}	$V_{IN}=0V$, Output in series with 10Ω to VCC		65		mA

Power Supply

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Operating Current		No input GND, No load		26		mA

FUNCTIONAL DESCRIPTION

Functional Description

The MS1637 operates from a single +2.7V to +5.5V power supply. In application, the MS1637 is a fully integrated solution for filtering and buffering HD video signals.

The MS1637 integrates a DC-coupled input buffer, a gain of +6dB OPA driver to drive 75Ω load. The AC or DC-coupled input buffer can eliminate sync crush, droop and field tilt. The output of the MS1637 can also be DC-coupled or AC-coupled.

Power Supply Bypass and Layout

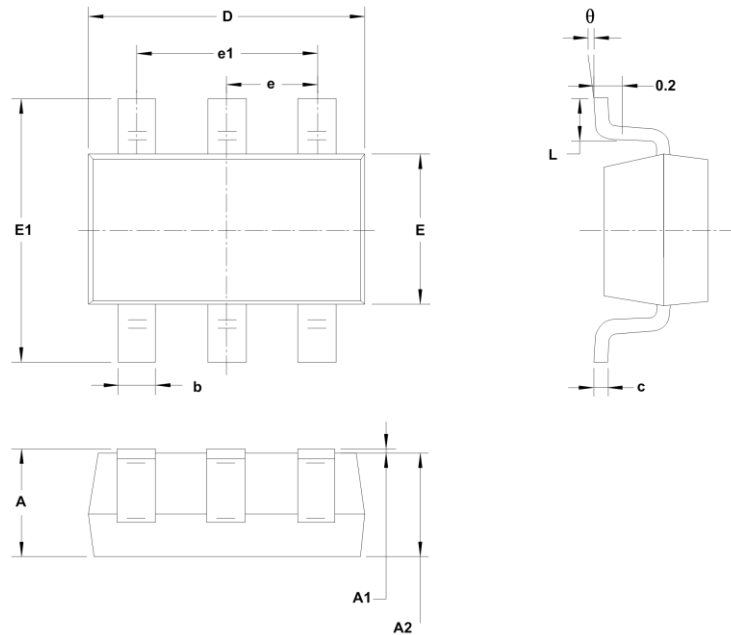
Appropriate power supply bypassing is very important for optimizing video performance in design. Both a 0.1μF and a 22μF capacitor are always used to bypass VCC pin of the MS1637. Please place these two capacitors as close to the output pin of the MS1637 as possible. A large ground plane is also needed to ensure optimum performance. The input and output termination resistors should be placed as close to the related pin of the MS1637 as possible in order to avoid performance degradation.

The PCB traces at the output terminal has 75Ω resistance in order to match 75Ω characteristic impedance cable. In design, please keep the board traces at the input and output of the MS1637 as short as possible to minimize the parasitic stray capacitance and noise.

A 0.1μF capacitor is used to stabilize reference voltage to reduce external interference.

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 and PACKAGING SPECIFICATIONS**1. Marking Drawing Description**

Product Name : 1637

Product Code: XXXXX

2. Marking Drawing Demand

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

3. Packaging Specifications

Device	Package	Piece/Reel	Reel/Box	Piece/Box	Box/Carton	Piece/Carton
MS1637	SOT23-6	3000	10	30000	4	120000

STATEMENT

- All Revision Rights of Datasheets Reserved for Ruimeng. Don't release additional notice.
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- When using Ruimeng products to design and produce, purchaser has the responsibility to observe safety standard and adopt corresponding precautions, in order to avoid personal injury and property loss caused by potential failure risk.
- 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.



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