

# LMH1981 Evaluation Board Instruction Manual

National Semiconductor  
Application Note 1599  
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## General Description

The LMH1981 Evaluation Board can be used to evaluate the LMH1981 Multi-Format Sync Separator and as a reference for designing the PCB layout. Refer to the LMH1981 datasheet for more information on PCB layout considerations.

## Power Supply

The board should be powered with a clean supply voltage of 3.3V to 5.0V using the banana jacks  $V_{CC}$  (J2) and GND (J3). The supply should be well-regulated within  $\pm 5\%$  variation of the voltage range and should not be shared directly with other digital circuitry.

## Video Input

A high-quality DC-coupled video source should be connected to the video input BNC (J1), which is terminated on-board via a  $75\Omega$  load resistor. For AC-coupled video sources, it may be necessary to reduce the value of the input coupling capacitor (C4) as described in the datasheet; otherwise, sync loss may occur during significant changes in video average picture lev-

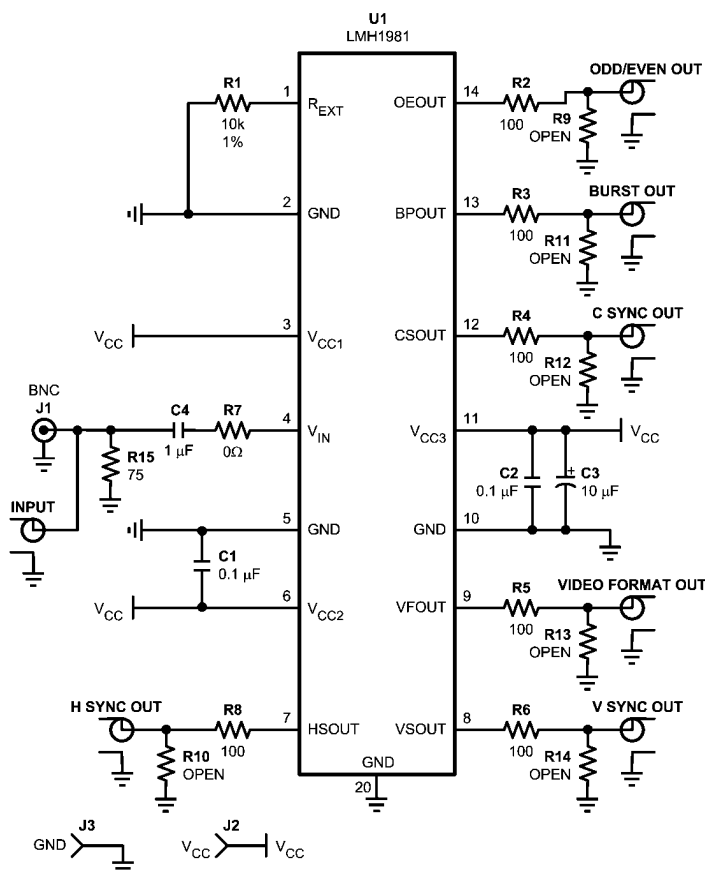
el (e.g. random white-to-black field transitions). It is recommended to drive the LMH1981 input by a professional-grade DC-coupled video reference.

Because the input can accept either SD or HD video inputs, the PCB footprints for the chroma filter components were not populated. For SD composite video inputs, it may be necessary to use a RC low-pass filter to attenuate the chroma component so it does not extend below the 50% sync level and also to improve overall signal-to-noise ratio. The RC filter cutoff frequency is typically set between 0.5 MHz and 2 MHz, which corresponds to chroma attenuation between 17 dB and 6 dB for a 3.58 MHz subcarrier (NTSC). For HD video inputs, it is suggested to bypass any composite video filtering, as it may reduce the bandwidth of the HD tri-level sync signal and thus increase timing jitter on the HSync output.

## Test Points

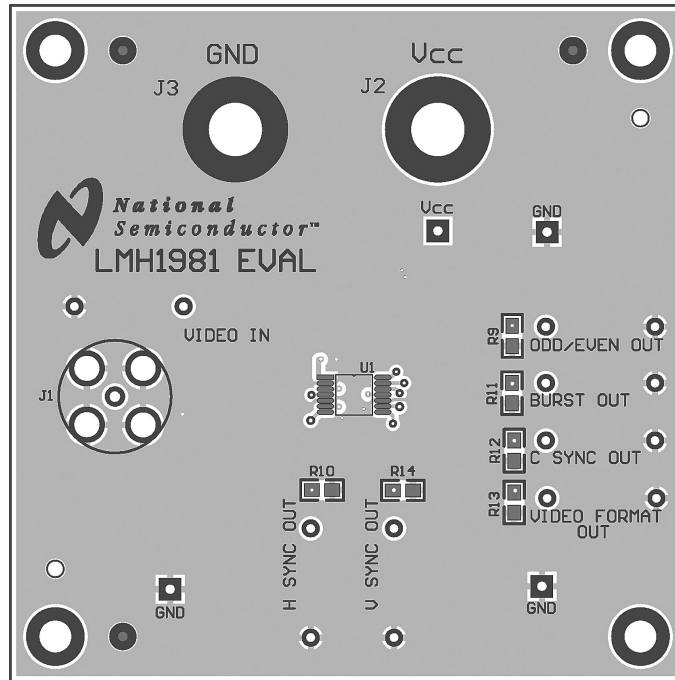
Test points are provided to probe the input and output signals using oscilloscope probes with high input impedance and low capacitance.

## Board Schematic



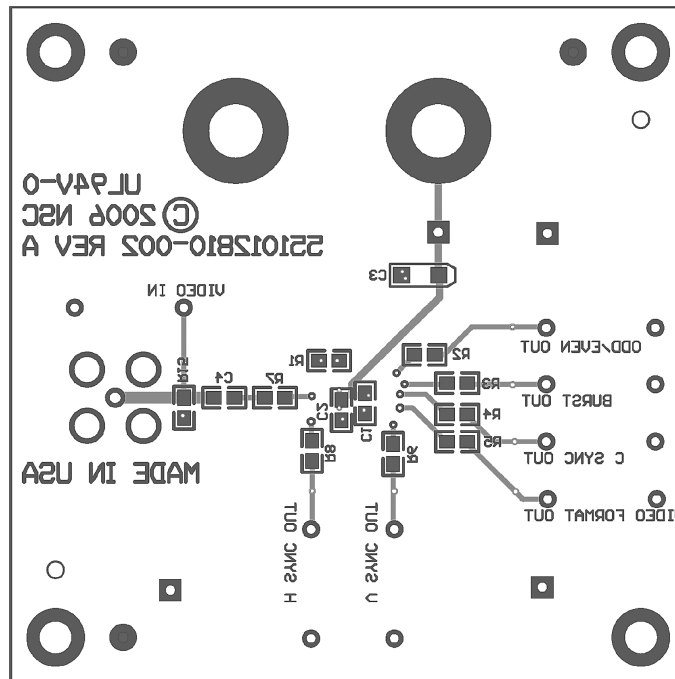
30012601

## Board Layout



Top Side

30012604



Bottom Side

30012605

## Bill of Material

Item	Mfr. Part Number	Part Description	Qty	Ref Designator	Remark
1	551012810-002A	LMH1981MTEVAL	1		
2	LMH1981MT	TSSOP-14	1	U1	
3		Cer Cap 0.1 $\mu$ F 25V X7R 0805	2	C1,C2	
4		Cer Cap 1 $\mu$ F 10V X5R 0805	1	C4	
5		Tant Cap 10 $\mu$ F 10V TANT-A (3216)	1	C3	
6		Res 10 k $\Omega$ 0.125W 1% 0805	1	R1	
7		Res 75 $\Omega$ 0.125W 1% 0805	1	R15	
8		Res 100 $\Omega$ 0.125W 1% 0805	6	R2-6,R8	
9		Res 0 $\Omega$ 0.125W 1% 0805	1	R7	
10		Res 10 k $\Omega$ 0.125W 1% 0805	6	R9-14	OPEN
11	112404	Amphenol BNC Coaxial	1	J1	
12	164-R104B-EX	Kobiconn Banana Jack Black	1	J3	
13	164-R104R-EX	Kobiconn Banana Jack Red	2	J2	

## Notes

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Interface	<a href="http://www.national.com/interface">www.national.com/interface</a>	Eval Boards	<a href="http://www.national.com/evalboards">www.national.com/evalboards</a>
LVDS	<a href="http://www.national.com/lvds">www.national.com/lvds</a>	Packaging	<a href="http://www.national.com/packaging">www.national.com/packaging</a>
Power Management	<a href="http://www.national.com/power">www.national.com/power</a>	Green Compliance	<a href="http://www.national.com/quality/green">www.national.com/quality/green</a>
Switching Regulators	<a href="http://www.national.com/switchers">www.national.com/switchers</a>	Distributors	<a href="http://www.national.com/contacts">www.national.com/contacts</a>
LDOs	<a href="http://www.national.com/ldo">www.national.com/ldo</a>	Quality and Reliability	<a href="http://www.national.com/quality">www.national.com/quality</a>
LED Lighting	<a href="http://www.national.com/led">www.national.com/led</a>	Feedback/Support	<a href="http://www.national.com/feedback">www.national.com/feedback</a>
Voltage Reference	<a href="http://www.national.com/vref">www.national.com/vref</a>	Design Made Easy	<a href="http://www.national.com/easy">www.national.com/easy</a>
PowerWise® Solutions	<a href="http://www.national.com/powerwise">www.national.com/powerwise</a>	Solutions	<a href="http://www.national.com/solutions">www.national.com/solutions</a>
Serial Digital Interface (SDI)	<a href="http://www.national.com/sdi">www.national.com/sdi</a>	Mil/Aero	<a href="http://www.national.com/milaero">www.national.com/milaero</a>
Temperature Sensors	<a href="http://www.national.com/tempsensors">www.national.com/tempsensors</a>	SolarMagic™	<a href="http://www.national.com/solarmagic">www.national.com/solarmagic</a>
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