19-3780; Rev 1; 3/09

可提供评估板

完备的音频/视频后端方案

MAX4079

概述

MAX4079对来自电缆/卫星接收机MPEG解码器、VCR/DVD播放器或电视的视频(NTSC/PAL/DVB)及立体声音频信号进行滤波、缓冲，将其提供给外部负载。MAX4079具有灰度-色度(Y-C)及复合(CVBS)视频输入，带一个Y-C和两个CVBS输出。所有视频输入均采用交流耦合，色度输入采用内部直流偏置，有源箝位用于灰度和复合信号。

MAX4079视频重建滤波器具有6MHz截止频率，27MHz频点衰减50dB。对于标准清晰度视频信号，滤波器群延迟保持一致。视频增益固定为+6dB，以便为75Ω背向端接负载(150Ω)提供单位增益。视频输出可采用直流或交流耦合，由+5V单电源供电。

为达到最佳性能，MAX4079音频放大器采用差分输入，也可以采用具有外部偏置的单端信号源。音频通道具有+6dB固定增益，且±1.85V差分输入时提供2.6V_{RMS}输出。音频放大器工作在+9V至+12V单电源，内部偏置。片上混音器可将左、右声道信号转换为单声道输出，具有+3dB增益。

MAX4079采用24引脚TSSOP封装，工作在0°C至+70°C商业级温度范围。提供MAX4079评估板，以便加快设计进度。

应用

卫星接收机

电缆接收机

家庭影院

DVD播放器

AV接收机

电视

引脚配置在数据资料的最后给出。

特性

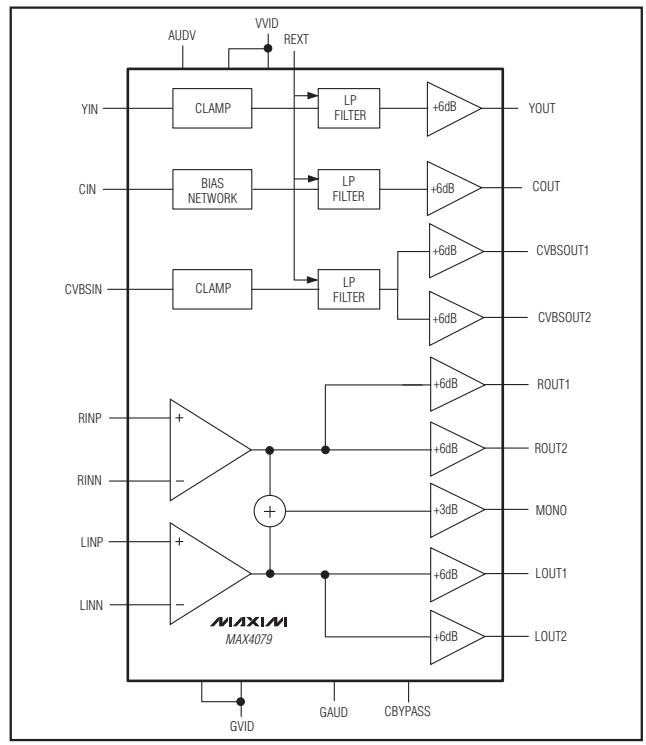
- ♦ 集成的视频重建滤波器—6MHz低通滤波器，支持NTSC、PAL或ITU-601标准DVB
- ♦ 集成视频和音频放大器
- ♦ 集成视频输入箝位和偏置
- ♦ 单声道音频和CVBS输出，驱动外部调制器
- ♦ +5V (视频)和+9V至+12V (音频)单电源供电
- ♦ 差分/单端音频输入
- ♦ 24引脚TSSOP封装

定购信息

PART	TEMP RANGE	PIN-PACKAGE
MAX4079CUG+	0°C to +70°C	24 TSSOP

+表示无铅(Pb)封装。

功能框图



ABSOLUTE MAXIMUM RATINGS

GVID to GAUD .....-0.1V to +0.1V
VVID to GVID .....-0.3V to +6V
AUDV to GAUD .....-0.3V to +14V
LINP, LINN, RINP, RINN, CBYPASS to GAUD .....-0.3V to +6V
LOUT1, LOUT2, ROUT1, ROUT2, MONO to GAUD .....-0.3V to lower of (+9V and AUDV + 0.3V)
YIN, CIN, CVBSIN, REXT to GVID .....-0.3V to (VVID + 0.3V)
YOUT, COUT, CVBSOUT1, CVBSOUT2 to GVID .....-0.3V to (VVID + 0.3V)
Video Output Short-Circuit Duration to GVID or VVID .....Continuous
Audio Output Short-Circuit Duration to GAUD or AUDV .....Continuous
Continuous Power Dissipation (T_A = +70°C)
24-Pin TSSOP (derate 12.2mW/°C above +70°C) 975.6mW
Operating Temperature Range .....0°C to +70°C
Storage Temperature Range .....-65°C to +150°C
Junction Temperature .....+150°C
Lead Temperature (soldering, 10s) .....+300°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

DC ELECTRICAL CHARACTERISTICS

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{LOAD_VID} = 150Ω to GVID, R_{REXT} = 10kΩ ±1%, $C_{CBYPASS}$ = 1µF, T_A = 0°C to +70°C, unless otherwise noted. Typical values are at T_A = +25°C.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
SUPPLIES						
Audio Supply Voltage Range	AUDV		8.5		12.6	V
Video Supply Voltage Range	VVID		4.75	5.0	5.25	V
Video Quiescent Supply Current	I_{CCV}	V_{VVID} = 5.25V, no load, all video inputs AC-coupled to ground		60	100	mA
Audio Quiescent Supply Current	I_{CCA}	V_{AUDV} = 12.6V, no load, audio inputs biased at 2.5V		8	15	mA
Thermal Shutdown	T_{SD}	Rising die temperature		+150		°C
Thermal-Shutdown Hysteresis	$T_{SD,HYS}$			25		°C
VIDEO						
Voltage Gain	$A_{V,VID}$	V_{IN} = 1V_{P-P}, all video inputs, no load	5.8	6	6.2	dB
Gain Matching	$\Delta A_{V,VID}$	V_{IN} = 1V_{P-P}, all video inputs, no load	-0.4		+0.4	dB
Input Voltage Swing	$V_{IN,VID}$	YIN, CVBSIN	0		1.2	V_{P-P}
		CIN	0		0.9	
Clamp Voltage	V_{CLMP}	CVBSOUT_ and YOUT, no signal, no load		1.0		V
Chroma Bias	V_{BIAS}	COUT, no signal, no load		2.1		V
Droop	D	(Note 2)			2	%
REXT Reference Voltage	V_{REXT}		0.85	1.00	1.15	V
Input Resistance	$R_{IN,VID}$	CVBSIN or YIN		2.3		MΩ
		CIN		10		kΩ
Input Clamping Current	I_{CLMP}	CVBSIN or YIN input, V_{IN} = 3.5V	1	2.5	4	µA
Output Voltage Swing	$V_{OUT,VID}$	CVBSOUT_, YOUT	2.4			V_{P-P}
		COUT	1.8			
Short-Circuit Current	$I_{SC,VID}$	Video output shorted to VVID or GVID		50		mA
Power-Supply Rejection Ratio	$PSRR_{VID}$	4.75V ≤ V_{VVID} ≤ 5.25V, YOUT/COUT		48		dB
		4.75V ≤ V_{VVID} ≤ 5.25V, CVBSOUT_		48		

DC ELECTRICAL CHARACTERISTICS (continued)

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{LOAD_VID} = 150Ω to GVID, R_{REXT} = 10kΩ ±1%, $C_{CBYPASS}$ = 1µF, T_A = 0°C to +70°C, unless otherwise noted. Typical values are at T_A = +25°C.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
AUDIO						
Voltage Gain	$A_{V,AUD}$	1.414V_{P-P} differential input	5.8	6	6.2	dB
Mono Voltage Gain	$A_{V,MONO}$	1.414V_{P-P} differential input, L_{IN} = R_{IN}	2.8	3	3.2	dB
Gain Matching Between Channels	$\Delta A_{V,AUD}$	1.414V_{P-P} differential input	-0.4		+0.4	dB
Input Voltage Range	$V_{IN,AUD}$	Inferred from CMRR test	0.3		5.2	V
Differential Input Voltage Range	$V_{IN,AUD\ DIF}$	Inferred from output voltage swing	-1.85		+1.85	V
Input Current	$I_{IN,AUD}$				2	µA
Output Voltage Swing	$V_{OUT,AUD}$	Input overdriven, 10kΩ load to 4.15V	7.4			V_{P-P}
Short-Circuit Current	$I_{SC,AUD}$			15		mA
Power-Supply Rejection Ratio	$PSRR_{AUD}$	8.5V ≤ V_{AUDV} ≤ 12.6V	70			dB
Common-Mode Rejection Ratio	$CMRR_{AUD}$	0.3V ≤ V_{CM} ≤ 5.2V	50	60		dB

AC ELECTRICAL CHARACTERISTICS

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{IN_VIDEO} = 75Ω to GVID, C_{IN_VIDEO} = 0.1µF, R_{LOAD_VID} = 150Ω to GVID, C_{OUT_AUDIO} = 10µF, R_{LOAD_AUD} = 10kΩ ±1% to GAUD, R_{REXT} = 10kΩ, $C_{CBYPASS}$ = 1µF, T_A = 0°C to +70°C, unless otherwise noted. Typical values are at T_A = +25°C.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
VIDEO							
Filter Attenuation	A_{VIDEO}	CVBSOUT1 = CVBSOUT2 = YOUT = COUT = 2V_{P-P}; R_L = 150Ω to ground, attenuation is referred to 100kHz	f = 4MHz	-0.5		+0.5	dB
			f = 7MHz		3		
			f = 27MHz	40	50		
Slew Rate	SR	V_{OUT} = 2V_{P-P}			30		V/µs
Differential Gain	DG	CVBSOUT_, YOUT, COUT, 5-step modulated staircase			0.5		%
Differential Phase	DP	CVBSOUT_, YOUT, COUT, 5-step modulated staircase			0.9		degrees
Power-Supply Rejection Ratio	$PSRR_{VID}$	f = 100kHz, 0.5V_{P-P}	YOUT/COUT		48		dB
			CVBSOUT_		44		
Peak Signal to RMS Noise	SNR_{VID}	CVBSOUT_, YOUT, COUT, V_{IN} = 1V_{P-P}			65		dB
Group Delay Deviation	GD	CVBSOUT_, YOUT, COUT, f_{IN} = 0.1MHz to 4.5MHz			25		ns
Output Impedance	$Z_{OUT,VID}$	f = 3.58MHz			0.5		Ω
Capacitive Load	$C_{L,VID}$	No sustained oscillations			35		pF
Video Crosstalk	$X_{TALK,VID}$	f = 3.58MHz, 1V_{P-P} input, between any two active inputs			-63		dB
Audio/Video Crosstalk	$X_{TALK,VD/AD}$	f = 15kHz, 1V_{P-P} input, between any two active audio or video inputs			-76		

AC ELECTRICAL CHARACTERISTICS (continued)

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{IN_VIDEO} = 75Ω to GVID, C_{IN_VIDEO} = 0.1µF, R_{LOAD_VID} = 150Ω to GVID, C_{OUT_AUDIO} = 10µF, R_{LOAD_AUD} = 10kΩ ±1% to GAUD, R_{REXT} = 10kΩ, $C_{CBYPASS}$ = 1µF, T_A = 0°C to +70°C, unless otherwise noted. Typical values are at T_A = +25°C.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
AUDIO						
Gain Flatness	ΔA_{AUD}	LOUT_, ROUT_, f_{IN} = 20Hz to 20kHz, 0.5V_{RMS} input		0.01		dB
		MONO, f_{IN} = 20Hz to 20kHz, 0.5V_{RMS} input		0.01		
Signal-to-Noise Ratio	SNR_{AUD}	f_{IN} = 1.0kHz, 0.5V_{RMS}, CCIR weighing highpass filter at 20Hz, lowpass filter at 20kHz		85		dB
Total Harmonic Distortion Plus Noise	THD+N	f_{IN} = 1.0kHz, 0.5V_{RMS}		0.005		%
		f_{IN} = 1.0kHz, 1V_{RMS}		0.003		
Output Impedance	$Z_{O,AUD}$	f = 1kHz		0.2		Ω
Power-Supply Rejection Ratio	$PSRR_{AUD,AC}$	f = 1kHz, V_{RIPPLE} = 200mV_{P-P}		60		dB
Crosstalk	$X_{TLK,AUD}$	f = 1kHz, 0.5V_{RMS} input		70		dB
Capacitive Load	$C_{L,AUD}$	No sustained oscillations		200		pF

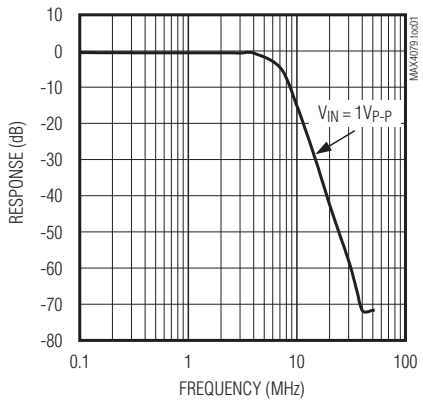
Note 1: All devices are 100% production tested at T_A = +25°C. Specifications over temperature limits are guaranteed by design.

Note 2: Droop is defined as the percentage change in the DC level from the start to the end of a video line. Inferred from input clamping current with a 0.1µF coupling capacitor.

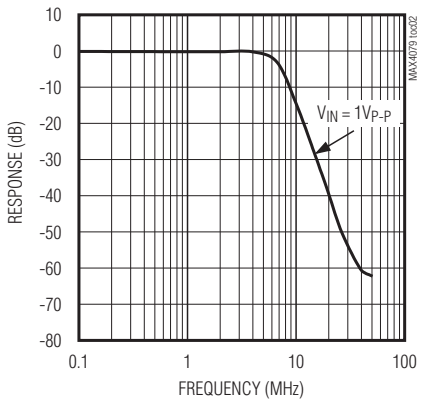
典型工作特性

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{IN_VIDEO} = 75Ω to GVID, C_{IN_VIDEO} = 0.1µF, R_{LOAD_VID} = 150Ω to GVID, C_{OUT_AUDIO} = 10µF, R_{LOAD_AUD} = 10kΩ to G_{AUD}, R_{REXT} = 10kΩ, C_{BYPASS} = 1µF, T_A = +25°C, unless otherwise noted.)

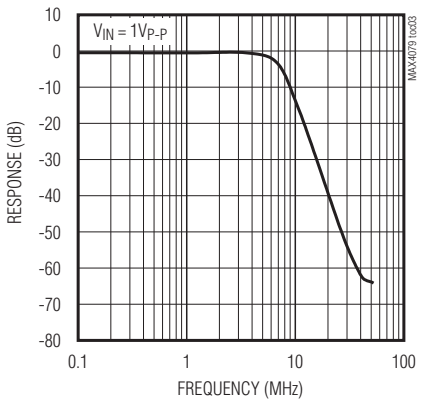
CHROMA LARGE-SIGNAL BANDWIDTH



LUMA LARGE-SIGNAL BANDWIDTH



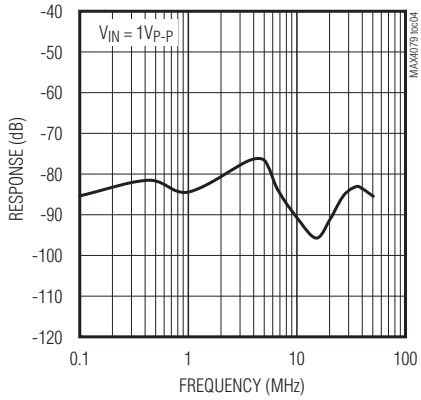
CVBSOUT_ LARGE-SIGNAL BANDWIDTH



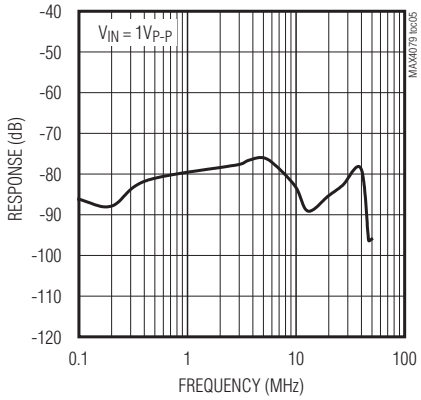
典型工作特性(续)

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{IN_VIDEO} = 75Ω to GVID, C_{IN_VIDEO} = 0.1µF, R_{LOAD_VID} = 150Ω to GVID, C_{OUT_AUDIO} = 10µF, R_{LOAD_AUD} = 10kΩ to G_{AUD}, R_{REXT} = 10kΩ, C_{BYPASS} = 1µF, T_A = +25°C, unless otherwise noted.)

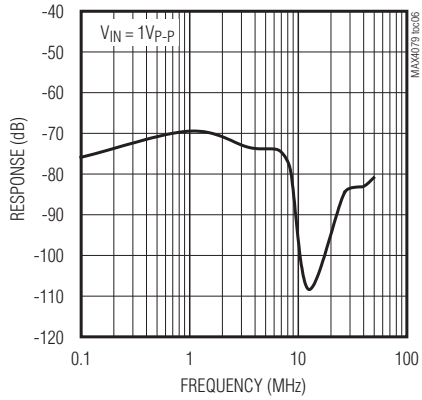
VIDEO CROSSTALK (CVBSOUT_ TO YIN)



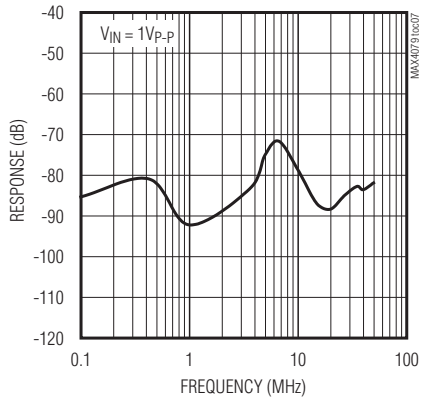
VIDEO CROSSTALK (CVBSOUT_ TO CIN)



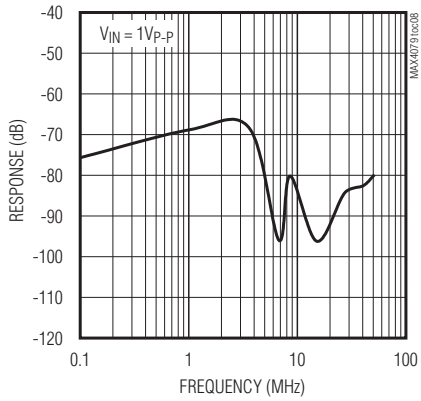
VIDEO CROSSTALK (COUT TO CVBSIN)



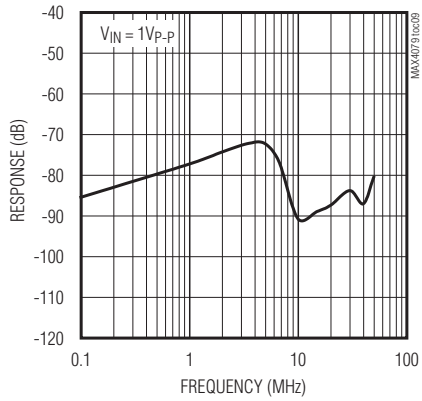
VIDEO CROSSTALK (COUT TO YIN)



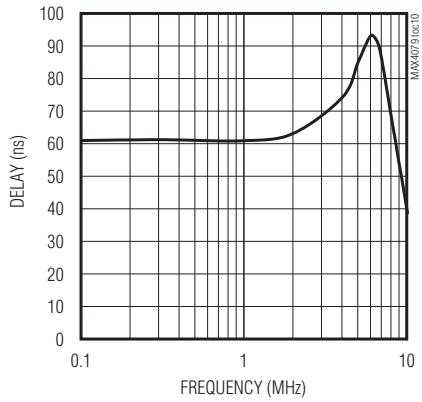
VIDEO CROSSTALK (YOUT TO CVBSIN)



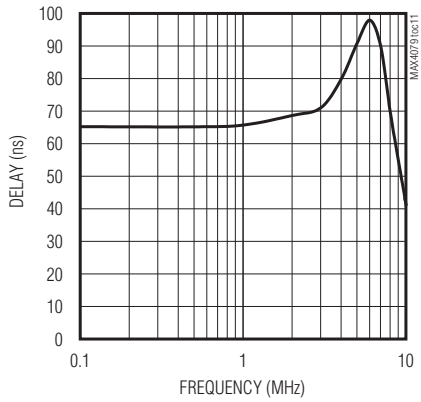
VIDEO CROSSTALK (YOUT TO CIN)



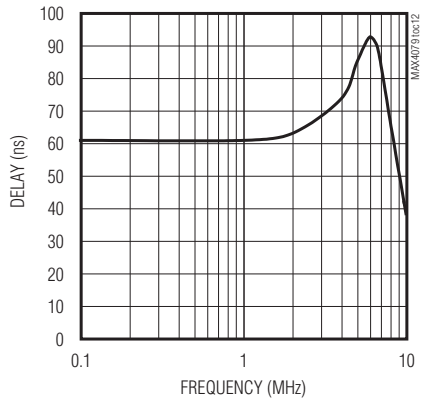
CVBSOUT_ GROUP DELAY



CHROMA GROUP DELAY



YOUT GROUP DELAY

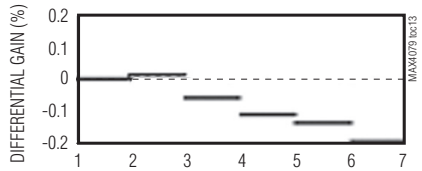


完备的音频/视频后端方案

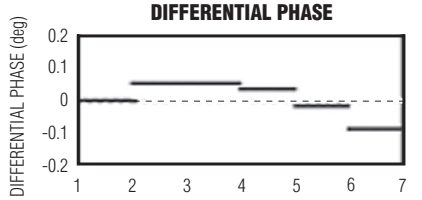
典型工作特性(续)

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{IN_VIDEO} = 75Ω to GVID, C_{IN_VIDEO} = 0.1µF, R_{LOAD_VID} = 150Ω to GVID, C_{OUT_AUDIO} = 10µF, R_{LOAD_AUD} = 10kΩ to G_{AUD}, R_{REXT} = 10kΩ, C_{BYPASS} = 1µF, T_A = +25°C, unless otherwise noted.)

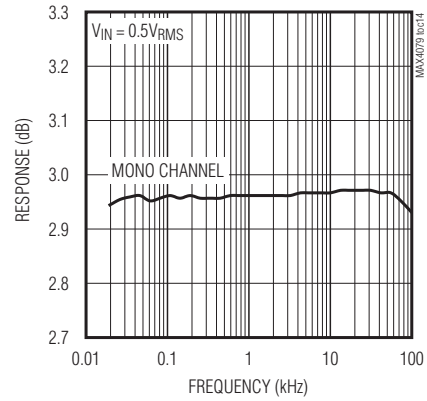
DIFFERENTIAL GAIN



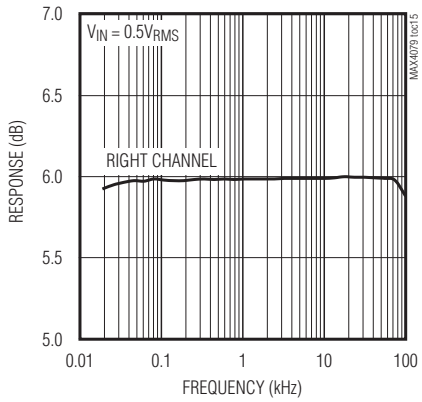
DIFFERENTIAL PHASE



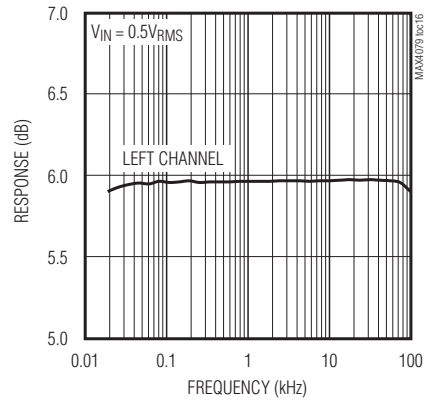
AUDIO LARGE-SIGNAL BANDWIDTH



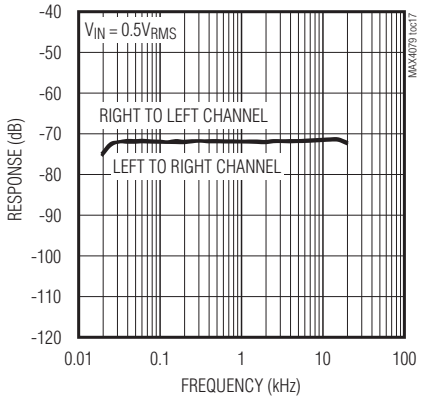
AUDIO LARGE-SIGNAL BANDWIDTH



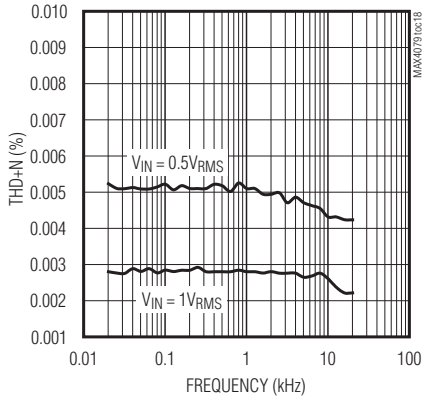
AUDIO LARGE-SIGNAL BANDWIDTH



AUDIO CROSSTALK



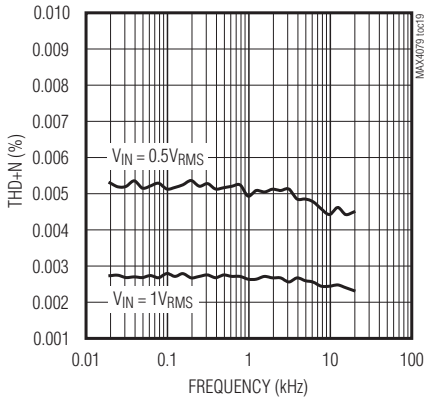
TOTAL HARMONIC DISTORTION PLUS NOISE RATIO (LEFT CHANNEL)



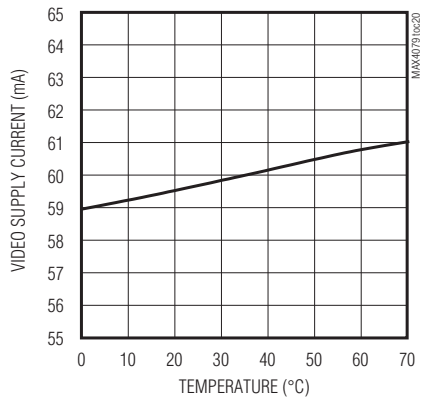
典型工作特性(续)

(V_{VVID} = +5V, V_{AUDV} = +12V, V_{GVID} = V_{GAUD} = 0V, R_{IN_VIDEO} = 75Ω to GVID, C_{IN_VIDEO} = 0.1µF, R_{LOAD_VID} = 150Ω to GVID, C_{OUT_AUDIO} = 10µF, R_{LOAD_AUD} = 10kΩ to G_{AUD}, R_{REXT} = 10kΩ, C_{BYPASS} = 1µF, T_A = +25°C, unless otherwise noted.)

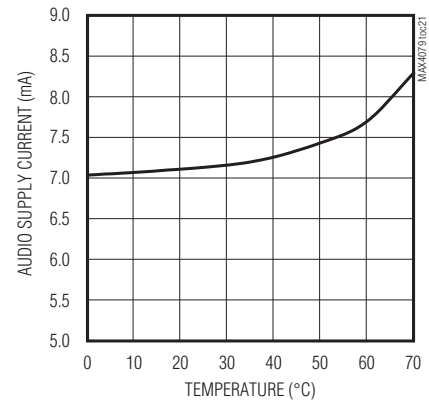
TOTAL HARMONIC DISTORTION PLUS NOISE RATIO (RIGHT CHANNEL)



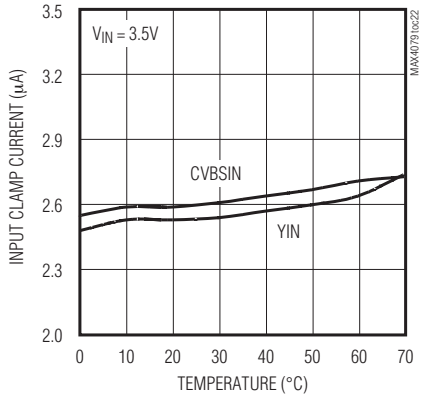
VIDEO SUPPLY CURRENT vs. TEMPERATURE



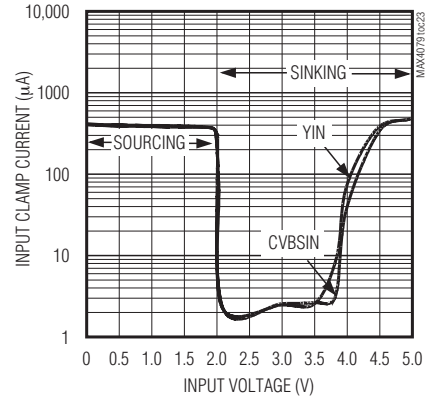
AUDIO SUPPLY CURRENT vs. TEMPERATURE



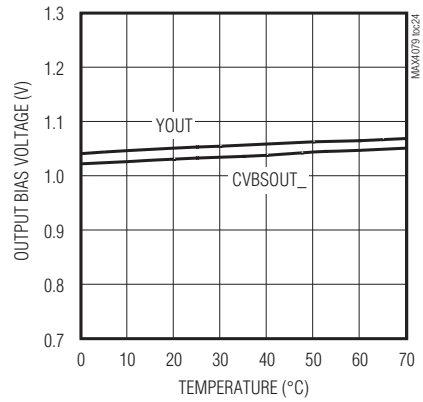
INPUT CLAMP CURRENT vs. TEMPERATURE



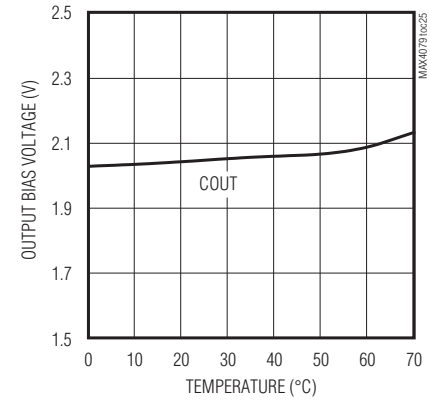
INPUT CLAMP CURRENT vs. INPUT VOLTAGE



OUTPUT BIAS VOLTAGE vs. TEMPERATURE



OUTPUT BIAS VOLTAGE vs. TEMPERATURE



引脚说明

引脚	名称	功能
1	REXT	外部滤波电阻。通过一个10kΩ ±1%电阻和0.1µF电容旁路至GVID。
2, 24	VVID	视频电源输入。
3	CVBSIN	复合视频输入。
4, 21	GVID	视频地。
5	YIN	灰度信号输入。
6	CBYPASS	音频LDO稳压器旁路电容。使用一个1µF电容旁路至GAUD。
7	CIN	色度输入。
8	AUDV	音频电源输入。
9	LINP	左声道音频同相输入。
10	LINN	左声道音频反相输入。
11	RINN	右声道音频反相输入。
12	RINP	右声道音频同相输入。
13	ROUT2	右声道音频输出2。
14	ROUT1	右声道音频输出1。
15	GAUD	音频地。
16	MONO	单声道音频输出。
17	LOUT2	左声道音频输出2。
18	LOUT1	左声道音频输出1。
19	COUT	色度视频输出。
20	YOUT	灰度视频输出。
22	CVBSOUT1	复合视频输出1。
23	CVBSOUT2	复合视频输出2。

详细说明

MAX4079对来自电缆/卫星接收机MPEG解码器、VCR/DVD播放器或电视的视频(NTSC/PAL/DVB)及立体声音频信号进行滤波、缓冲，将其提供给外部负载。MAX4079具有灰度-色度(Y-C)及复合(CVBS)视频输入，带一个Y-C和两个CVBS输出。所有视频输入均采用交流耦合，色度输入采用内部直流偏置，有源箝位用于灰度和复合信号。

MAX4079视频重建滤波器具有6MHz截止频率，27MHz频点衰减50dB。对于标准清晰度视频信号，滤波器群延迟保持一致。视频增益固定为+6dB，以便为75Ω背向端接负载(150Ω)提供单位增益。视频输出可采用直流或交流耦合，由+5V单电源供电。

为达到最佳性能，MAX4079音频放大器采用差分输入。但也可以采用具有外部偏置的单端信号源。音频通道具有+6dB固定增益，且±1.85V差分输入时提供2.6V_{RMS}输出。音频放大器工作在+9V至+12V单电源，内部偏置。片上混音器可将左、右声道的信号转换为单声道输出，具有+3dB增益。

视频

MAX4079的视频部分可对Y-C和CVBS输入信号进行直流恢复/偏置、放大和重建滤波。所有视频输入都采用交流耦合。对于灰度和复合视频通道，利用同步头箝位实现直流恢复。色度的直流电平输入被偏置在信号的中间电平。

所有视频通道具有+6dB固定增益。视频输出直流电平受控，无需耦合电容。

所有复合和灰度视频输出可向150Ω对地电阻提供2.4V_{P-P}驱动信号，色度输出可提供1.8V_{P-P}驱动。高达35pF的负载电容容限保证每路视频输出不存在稳定性和摆率问题。

所有视频输入在高达150Ω的信号源阻抗下保持稳定。对信号源阻抗更高的应用，请参考Maxim的应用笔记。

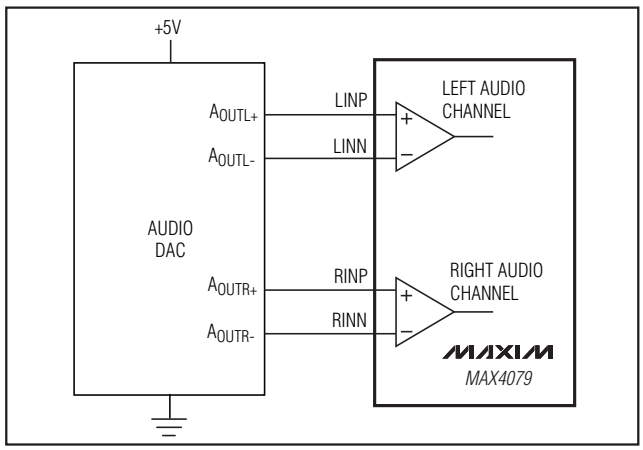


图1. 差分音频输入

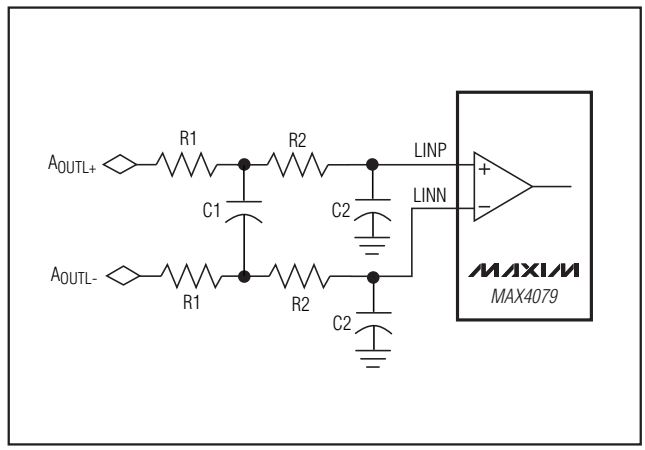


图2. 差分音频输入滤波

视频重建滤波器

MAX4079重建滤波器为4阶巴特沃思滤波器，具有6MHz的截止频率和高达4.5MHz的平坦群延迟。阻带在13.5MHz频点具有26dB的衰减，在27MHz具有50dB衰减。

音频

MAX4079的音频部分是一个立体声放大器，为每个通道(左声道和右声道)提供一个差分输入和两个单端输出。单声道输出通过叠加两通道立体声信号得到。立体声通道具有+6dB的典型增益，而单声道增益则为+3dB。

音频输入可以采用直流耦合，省去了大尺寸耦合电容。五路输出都可交流耦合至10kΩ负载，提供2.6V_{RMS}驱动信号。

应用信息

音频DAC接口

差分音频DAC

MAX4079可接收差分音频信号。图1给出器件与差分输出音频DAC的典型连接电路。图2给出了用于差分音频输入的重建滤波器。须谨慎选择电阻和电容，用于衰减带外噪声，使其对增益的影响最小。这些信号的共模电压通常为2.5V。

单端音频DAC

MAX4079也可以配置为单端输入。图3给出了单端输出音频DAC与MAX4079的连接。图4给出了重建滤波器在单端音频输入中的应用。适当选择元件值，使其对增益的影响最小。

如果单端音频DAC输出不含共模电压，可通过匹配电阻提供一个偏置点，并将音频信号耦合到差分输入正端(参见图5)。偏置点可以使用电阻分压网络对视频电源分压产生。注意，电阻误差将影响共模和电源抑制比。小的电阻误差有助于改善CMRR和PSRR性能，例如1%电阻所得到的CMRR和PSRR低于40dB，而0.1%的电阻则可将结果提高到60dB。

电源和旁路

MAX4079工作在+5V (视频)和+12V (音频)电源，无需负电压。将VVID引脚连到一起，并通过0.01µF、0.1µF和4.7µF并联电容旁路至GVID。将AUDV通过0.1µF、1µF和47µF并联电容旁路至GAUD。将CBYPASS通过一个1µF的电容旁路至GAUD (*参考典型工作电路*)。

完备的音频/视频后端方案

布局和接地

为了得到最佳性能，在较窄的相邻信号线之间插入接地过孔，以降低串扰。视频引线应避免与高速数据线平行。

MAX4079对于视频和音频电源具有独立的接地端。为了得到最佳性能，每个地回路使用独立的地平面，并且将每个地平面单点相连。MAX4079评估板提供了一个经过验证的电路板布局。

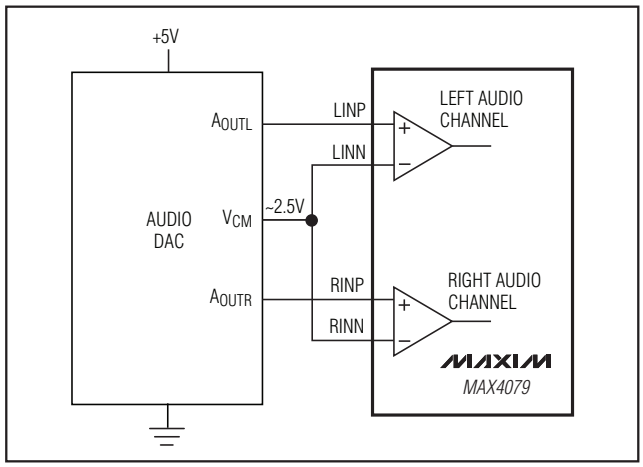


图3. 单端音频输入

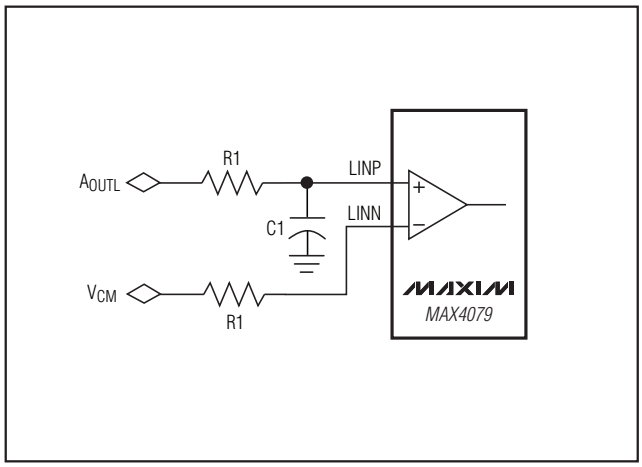


图4. 单端音频输入滤波

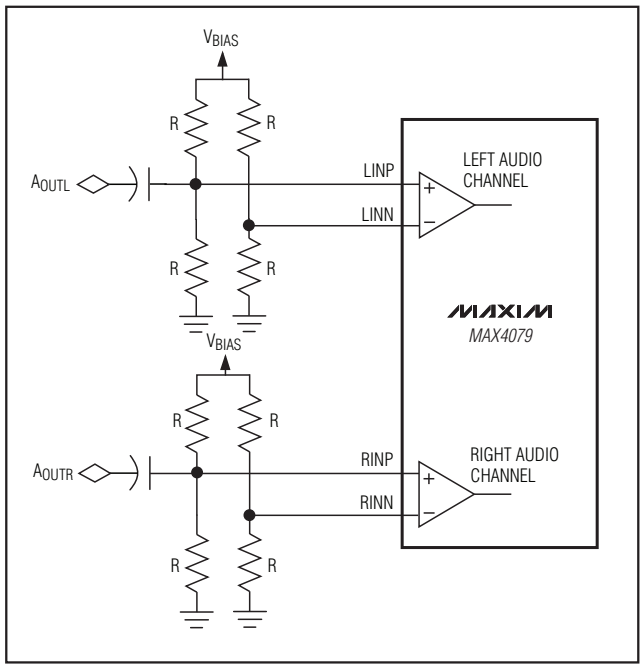


图5. 单端音频输入偏置

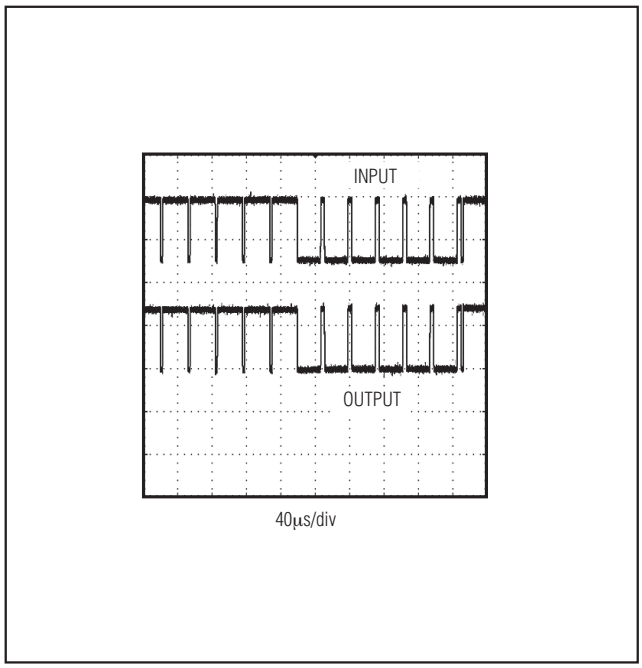
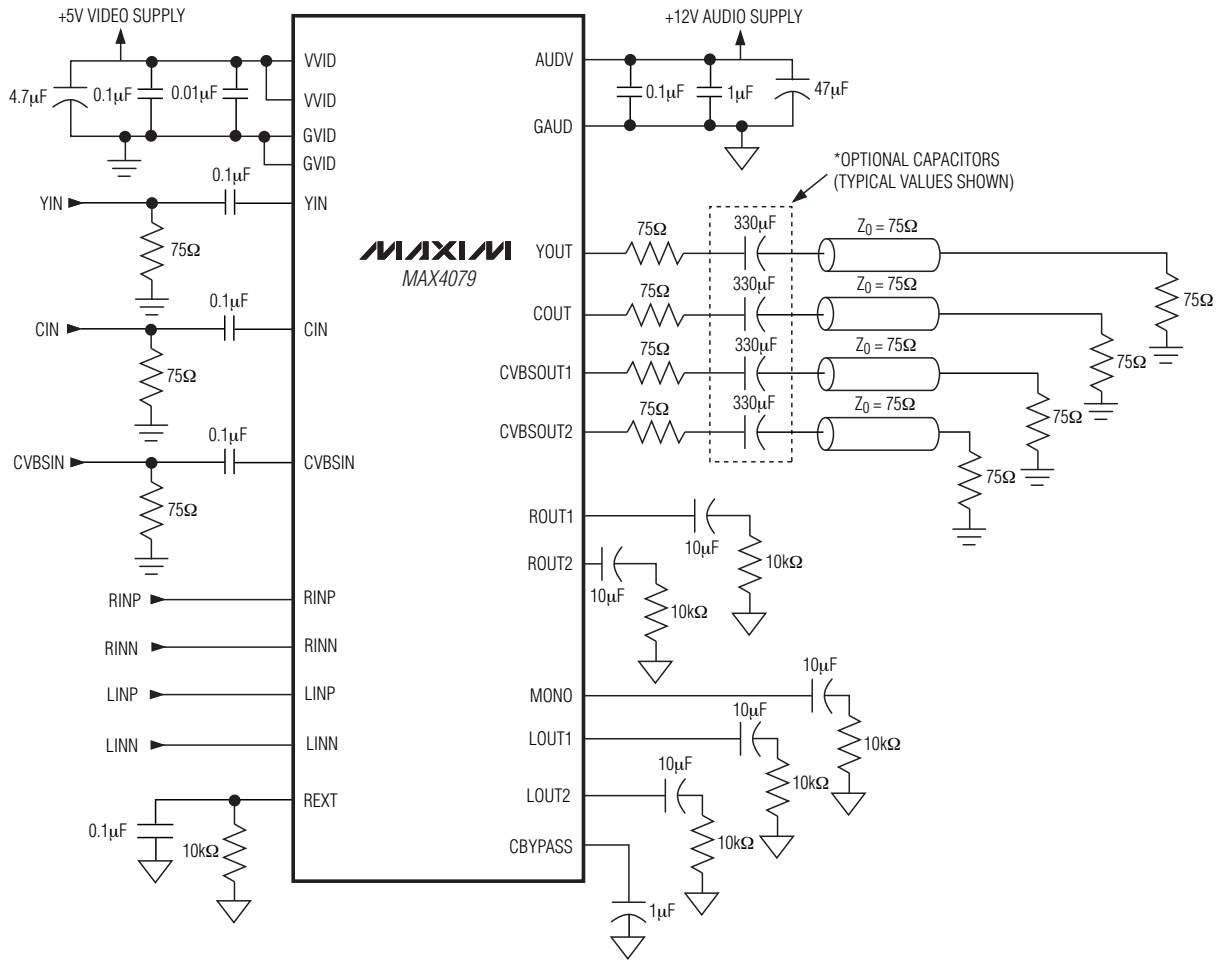


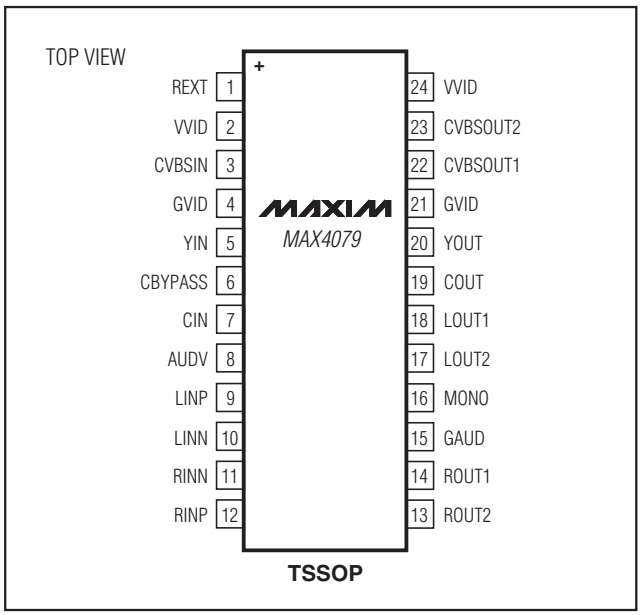
图6. 场同步间隔

典型工作电路


+5V VIDEO SUPPLY
+12V AUDIO SUPPLY
VVID
VVID
GVID
GVID
YIN
CIN
CVBSIN
RINP
RINN
LINP
LINN
REXT
AUDV
GAUD
YOUT
COUT
CVBSOUT1
CVBSOUT2
ROUT1
ROUT2
MONO
LOUT1
LOUT2
CBYPASS
MAXIM
MAX4079
4.7µF
0.1µF
0.01µF
47µF
1µF
10µF
330µF
75Ω
10kΩ
*OPTIONAL CAPACITORS
(TYPICAL VALUES SHOWN)
Z0 = 75Ω

完备的音频/视频后端方案

引脚配置



芯片信息

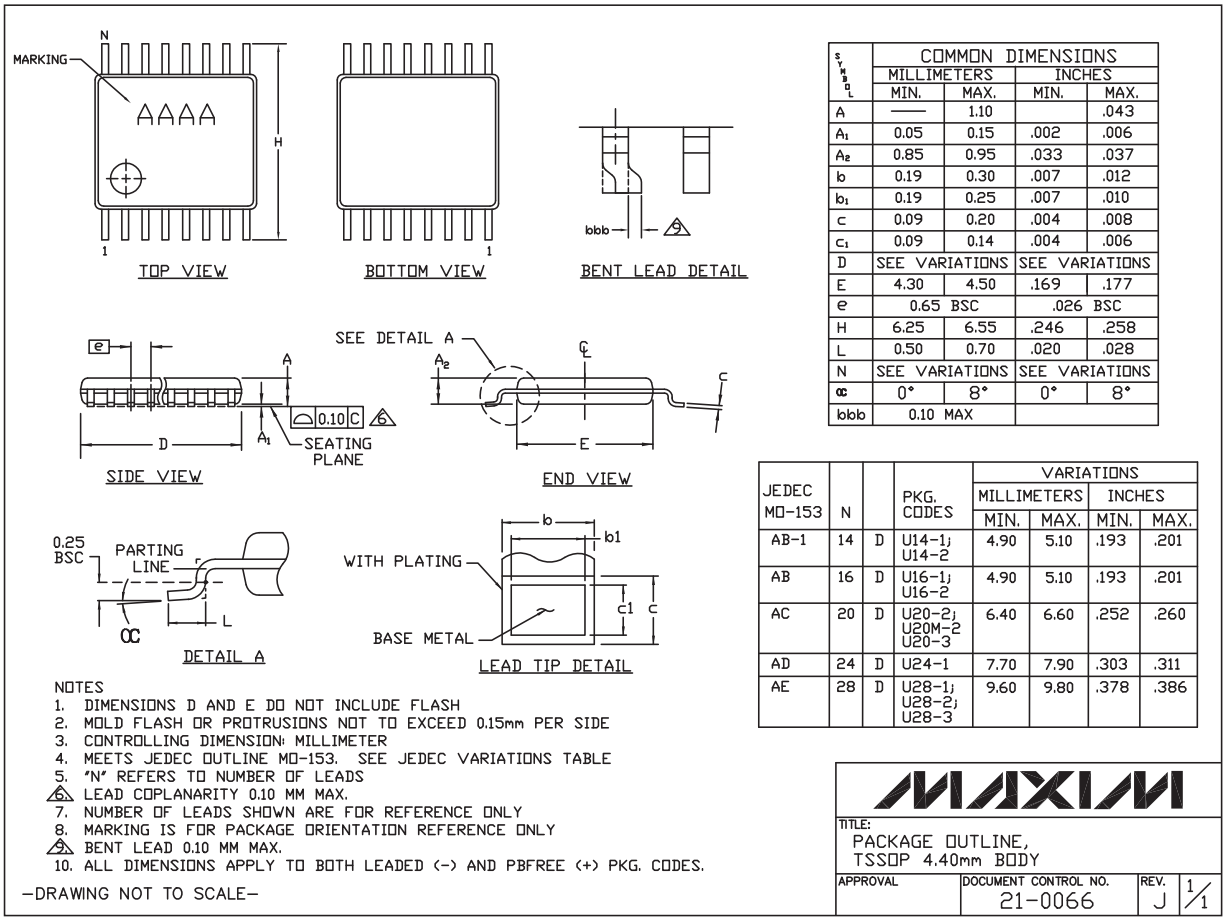
PROCESS: BiCMOS

封装信息

如需最近的封装外形信息和焊盘布局，请查询 **www.maxim-ic.com.cn/packages**。

封装类型	封装编码	文档编号
24 TSSOP	U24+1	**21-0066**

TSSOP4.40mm.EPS



SYMBOL	COMMON DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	——	1.10		.043
A_1	0.05	0.15	.002	.006
A_2	0.85	0.95	.033	.037
b	0.19	0.30	.007	.012
b_1	0.19	0.25	.007	.010
c	0.09	0.20	.004	.008
c_1	0.09	0.14	.004	.006
D	SEE VARIATIONS		SEE VARIATIONS	
E	4.30	4.50	.169	.177
e	0.65 BSC		.026 BSC	
H	6.25	6.55	.246	.258
L	0.50	0.70	.020	.028
N	SEE VARIATIONS		SEE VARIATIONS	
α	0°	8°	0°	8°
bbb	0.10 MAX			

JEDEC MO-153	N		PKG. CODES	VARIATIONS			
				MILLIMETERS		INCHES	
				MIN.	MAX.	MIN.	MAX.
AB-1	14	D	U14-1; U14-2	4.90	5.10	.193	.201
AB	16	D	U16-1; U16-2	4.90	5.10	.193	.201
AC	20	D	U20-2; U20M-2 U20-3	6.40	6.60	.252	.260
AD	24	D	U24-1	7.70	7.90	.303	.311
AE	28	D	U28-1; U28-2; U28-3	9.60	9.80	.378	.386

NOTES
1. DIMENSIONS D AND E DO NOT INCLUDE FLASH
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED 0.15mm PER SIDE
3. CONTROLLING DIMENSION: MILLIMETER
4. MEETS JEDEC OUTLINE MO-153. SEE JEDEC VARIATIONS TABLE
5. "N" REFERS TO NUMBER OF LEADS
6. LEAD COPLANARITY 0.10 MM MAX.
7. NUMBER OF LEADS SHOWN ARE FOR REFERENCE ONLY
8. MARKING IS FOR PACKAGE ORIENTATION REFERENCE ONLY
9. BENT LEAD 0.10 MM MAX.
10. ALL DIMENSIONS APPLY TO BOTH LEADED (-) AND PBFREE (+) PKG. CODES.

—DRAWING NOT TO SCALE—

MAXIM

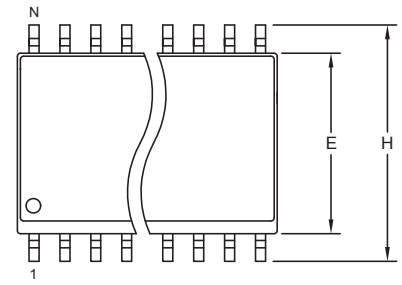
TITLE:
PACKAGE OUTLINE,
TSSOP 4.40mm BODY

APPROVAL	DOCUMENT CONTROL NO.	REV.	
	21-0066	J	1/1

封装信息(续)

如需最近的封装外形信息和焊盘布局，请查询 **www.maxim-ic.com.cn/packages**。

SOICW.EPS

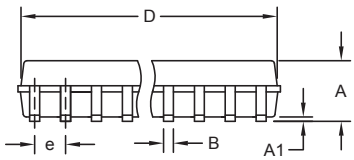


TOP VIEW

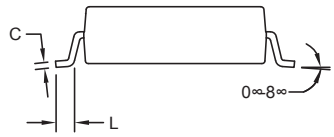
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.093	0.104	2.35	2.65
A1	0.004	0.012	0.10	0.30
B	0.014	0.019	0.35	0.49
C	0.009	0.013	0.23	0.32
e	0.050		1.27	
E	0.291	0.299	7.40	7.60
H	0.394	0.419	10.00	10.65
L	0.016	0.050	0.40	1.27

VARIATIONS:

DIM	INCHES		MILLIMETERS		N	MS013
	MIN	MAX	MIN	MAX		
D	0.398	0.413	10.10	10.50	16	AA
D	0.447	0.463	11.35	11.75	18	AB
D	0.496	0.512	12.60	13.00	20	AC
D	0.598	0.614	15.20	15.60	24	AD
D	0.697	0.713	17.70	18.10	28	AE



FRONT VIEW



SIDE VIEW

NOTES:
1. D&E DO NOT INCLUDE MOLD FLASH.
2. MOLD FLASH OR PROTRUSIONS NOT TO EXCEED 0.15mm (.006").
3. LEADS TO BE COPLANAR WITHIN 0.10mm (.004").
4. CONTROLLING DIMENSION: MILLIMETERS.
5. MEETS JEDEC MS013.
6. N = NUMBER OF PINS.

DALLAS SEMICONDUCTOR MAXIM

PROPRIETARY INFORMATION

TITLE: PACKAGE OUTLINE, .300" SOIC

APPROVAL	DOCUMENT CONTROL NO.	REV.	
	21-0042	B	1/1

修订历史

修订次数	修订日期	说明	修改页
0	8/05	最初版本。	—
1	3/09	删除了SO封装，并做了一些格式上的修改。	1–7, 12, 13, 14

Maxim北京办事处

北京 8328信箱 邮政编码 100083

免费电话：800 810 0310

电话：010-6211 5199

传真：010-6211 5299