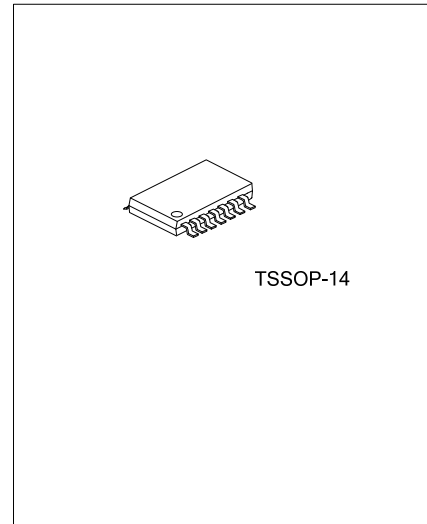




### LOW-COST SIX-CHANNEL 4TH-ORDER STANDARD- DEFINITION VIDEO FILTERS



#### DESCRIPTION

The UTC **VF8146** Low-Cost Video Filter (LCVF) offers six channels of 4th-order filters for standard-definition and drivers with a low-cost integrated device.

The UTC **VF8146** inputs feature a transparent clamp compatible with AC- coupled and DC-coupled input signals and allows DAC outputs to be directly coupled.

The outputs can drive AC- or DC-coupled single (150Ω) or dual (75Ω) loads. The input DC levels are offset approximately +280mV at the output (see Applications section for details).

The UTC **VF8146** is ideal for DAC smoothing in applications such as cable set-top boxes, satellite set-top boxes, HDTV, video on demand (VOD), DVD players, and personal video recorders.

#### FEATURES

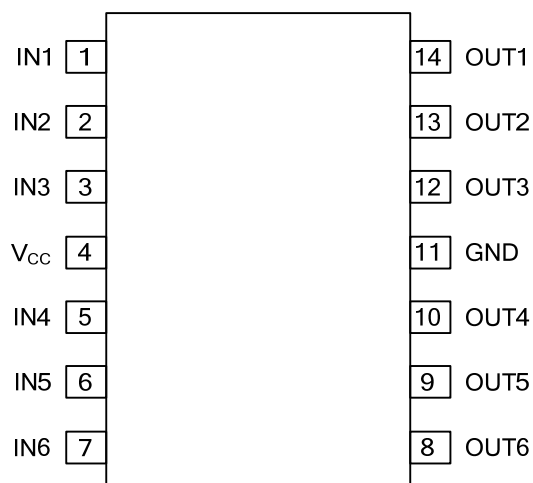
- \* Six-Channel 4th-order 8MHz filters for standard-Definition video
- \* Transparent input clamping
- \* AC-or DC-coupled inputs
- \* AC-or DC-coupled outputs
- \* Drives single, +6dB output (150Ω)
- \* Drives dual, +6dB output (75Ω)
- \* DC-coupled outputs eliminate AC-coupling capacitors
- \* Single +5V power supply

#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
VF8146L-P14-R	VF8146G-P14-R	TSSOP-14	Tape Reel
VF8146L-P14-T	VF8146G-P14-T	TSSOP-14	Tube

<p>VF8146L-P14-T</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Halogen Free</li> </ul>	<ul style="list-style-type: none"> <li>(1) T: Tube, R: Tape Reel</li> <li>(2) P14: TSSOP-14</li> <li>(3) L: Lead Free, G: Halogen Free</li> </ul>
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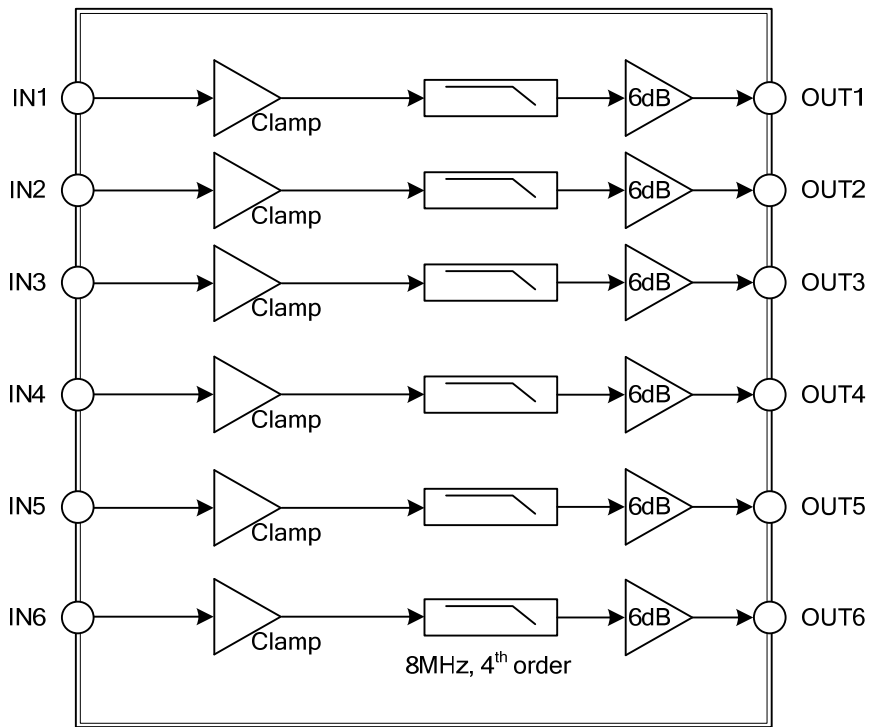
## ■ PIN CONFIGURATION



## ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	IN1	Video input, Channel 1
2	IN2	Video input, Channel 2
3	IN3	Video input, Channel 3
4	V <sub>CC</sub>	+5V Power Supply, do not float
5	IN4	Video input, Channel 4
6	IN5	Video input, Channel 5
7	IN6	Video input, Channel 6
8	OUT6	Filtered video output, Channel 6
9	OUT5	Filtered video output, Channel 5
10	OUT4	Filtered video output, Channel 4
11	GND	Ground, do not float
12	OUT3	Filtered video output, Channel 3
13	OUT2	Filtered video output, Channel 2
14	OUT1	Filtered video output, Channel 1

■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
DC Supply Voltage	$V_{CC}$	-0.3~6	V
Analog and Digital I/O		-0.3~ $V_{CC}+0.3$	V
Output Channel-Any One Channel (Do Not Exceed)		50	mA
Junction Temperature	$T_J$	+150	°C
Operating Temperature	$T_{OPR}$	-40~+85	°C
Storage Temperature	$T_{STG}$	-65~+150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance, JEDEC Standard Multi-layer Test Boards, Still Air	$\theta_{JA}$	90	°C/W

### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$V_{CC}$ Range			+4.75	+5.0	+5.25	V

### ■ DC ELECTRICAL CHARACTERISTICS

( $T_A=25^\circ\text{C}$ ,  $V_{CC}=5\text{V}$ ,  $R_{SOURCE}=37.5\Omega$ , all inputs are AC coupled with  $0.1\mu\text{F}$ , all outputs are AC coupled with  $220\mu\text{F}$  into  $150\Omega$  loads, unless otherwise noted.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Current (Note 1)	$I_{CC}$	No Load		35	55	mA
Video Input Voltage Range	$V_{IN}$	Referenced to GND if DC coupled		1.4		$V_{PP}$
Power Supply Rejection	PSRR	DC (All Channels)		-50		dB

Note: 1. 100% tested at  $25^\circ\text{C}$ .

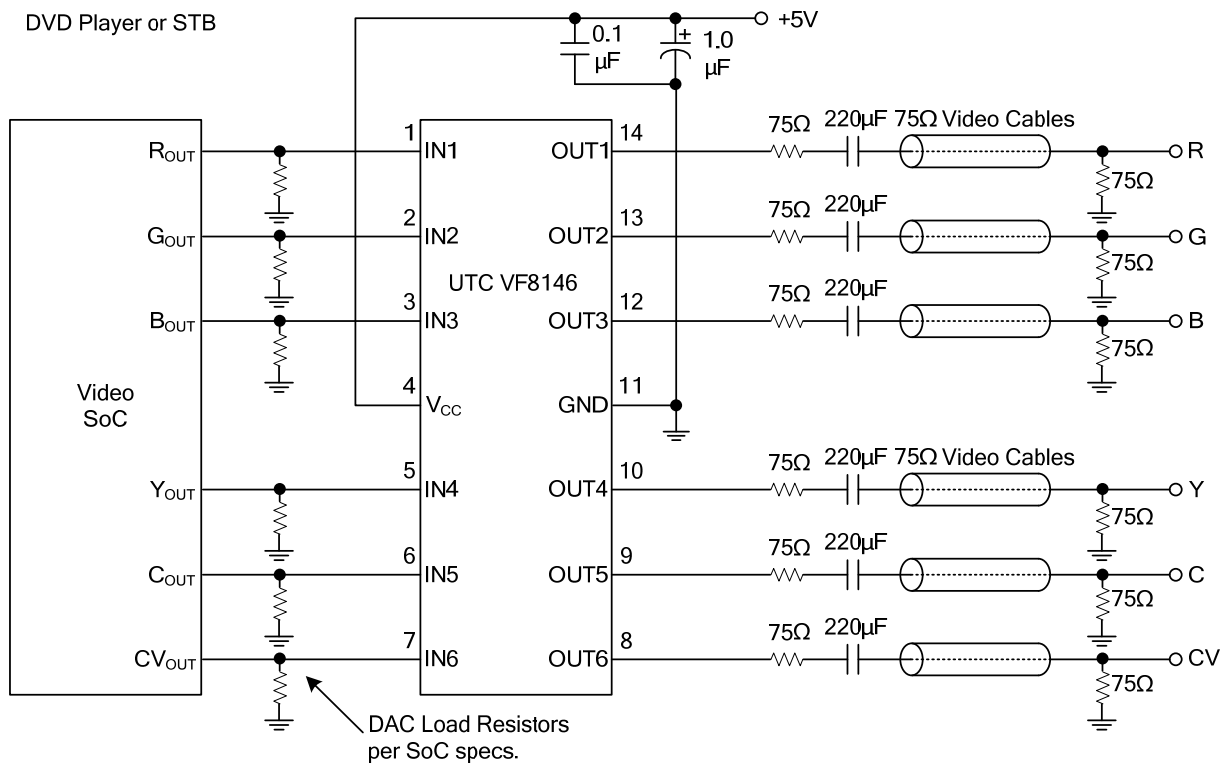
### ■ AC ELECTRICAL CHARACTERISTICS

( $T_A=25^\circ\text{C}$ ,  $V_{IN}=1V_{PP}$ ,  $V_{CC}=5\text{V}$ ,  $R_{SOURCE}=37.5\Omega$ , all inputs are AC coupled with  $0.1\mu\text{F}$ , all outputs are AC coupled with  $220\mu\text{F}$  into  $150\Omega$  loads, unless otherwise noted.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Channel Gain (Note 1)	AV	All Channels	6.0	6.2	6.4	dB
-1dB Bandwidth (Note 1)	$f_{1dB}$	All Channels	4.5	6.8		MHz
-3dB Bandwidth	$f_c$	All Channels		7.8		MHz
Attenuation (Stopband Reject)	$f_{SB}$	All Channels at $f=27\text{MHz}$		48		dB
Differential Gain	dG	All Channels		0.3		%
Differential Phase	d $\Phi$	All Channels		0.6		°
Output Distortion (All Channels)	THD	$V_{OUT}=1.8V_{PP}$ , 1MHz		0.4		%
Crosstalk (Channel-to-Channel)	$X_{TALK}$	at 1MHz		-60		dB
Signal-to-Noise Ratio	SNR	All Channels NTC-7 Weighting: 100kHz~4.2MHz		75		dB
Propagation Delay	$t_{pd}$	Delay from Input-to-Output, 4.5MHz		59		ns

Note: 1. 100% tested at  $25^\circ\text{C}$ .

■ TYPICAL APPLICATION CIRCUIT



The circuit may be used for direct DC-coupled drive by DACs with an output voltage range of 0V~1.4V. AC-coupled or DC-coupled outputs may be used with AC-coupled outputs, offering slightly lower power dissipation.

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