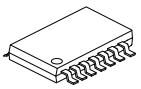
LOW-COST SIX-CHANNEL 4TH-ORDER STANDARD-DEFINITION VIDEO FILTERS



TSSOP-14

■ 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

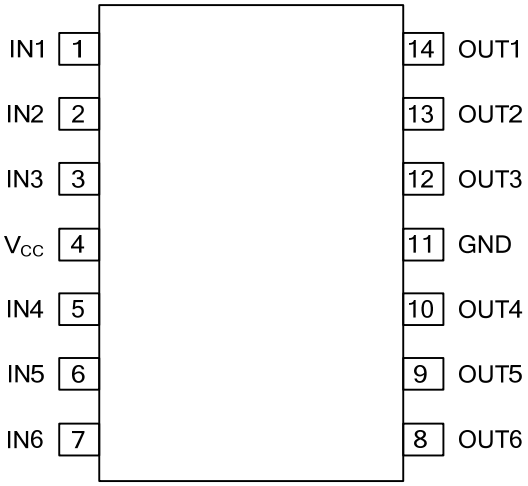
* Six-Channel 4th-order 8MHz filters for standard-Definition video
* Transparent input clamping
* AC-or DC-coupled inputs
* AC-or DC-coupled outputs
* Drives single, +6dB output (150Ω)
* Drives dual, +6dB output (75Ω)
* DC-coupled outputs eliminate AC-coupling capacitors
* Single +5V power supply

■ ORDERING INFORMATION

Ordering Number		Package Packing	
Lead Free	Halogen Free		
VF8146L-P14-R VF	8146G-P14-R	TSSOP-14	Tape Reel
VF8146L-P14-T VF	8146G-P14-T	TSSOP-14	Tube

VF8146L-P14-T (1)Packing Type (2)Package Type (3)Halogen Free	(1) T: Tube, R: Tape Reel (2) P14: TSSOP-14 (3) L: Lead Free, G: Halogen Free

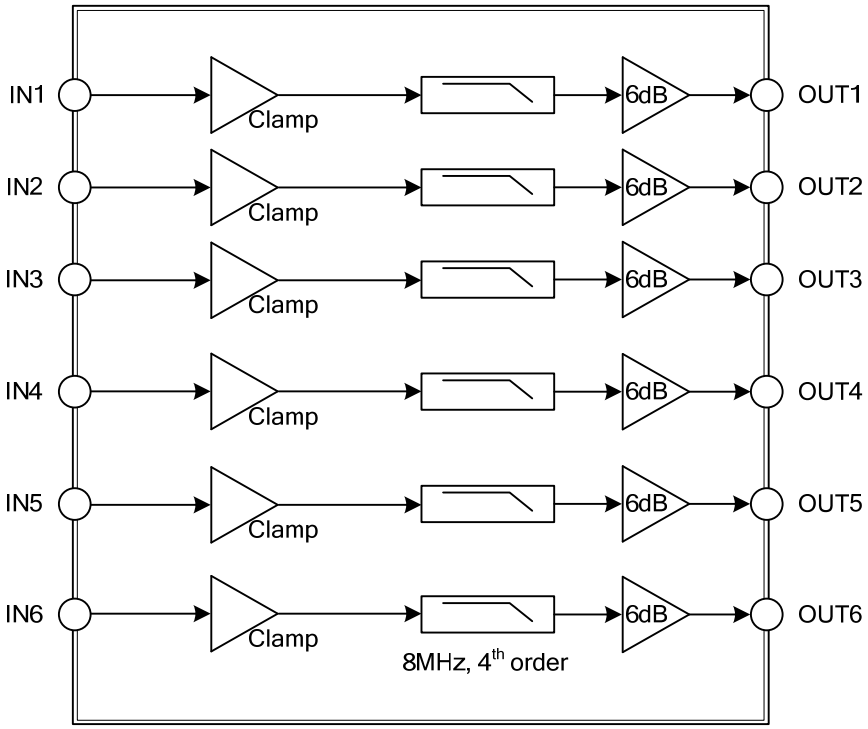
■ PIN CONFIGURATION



■ 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	CC	+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	θ_{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°C, V_{CC}=5V, R_{SOURCE}=37.5Ω, all inputs are AC coupled with 0.1μF, all outputs are AC coupled with 220μF into 150Ω 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°C.

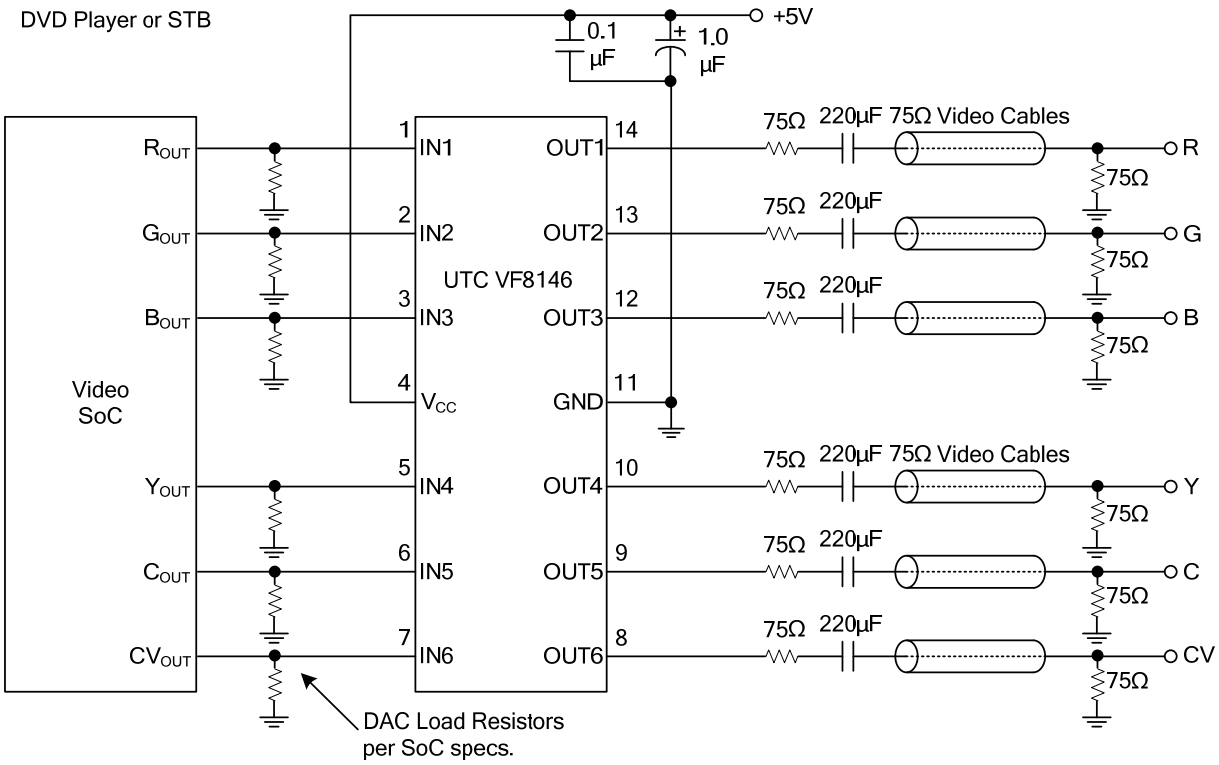
■ AC ELECTRICAL CHARACTERISTICS

(T_A=25°C, V_{IN}=1V_{PP}, V_{CC}=5V, R_{SOURCE}=37.5Ω, all inputs are AC coupled with 0.1μF, all outputs are AC coupled with 220μF into 150Ω 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=27MHz		48		dB
Differential Gain	dG	All Channels		0.3		%
Differential Phase	dΦ 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°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.