

ML6417

Selectable RGB HD/SD Video Filter

Y, C, Composite, and Modulator Outputs

Features

- Three channel video reconstruction filter
- YUV / RGB filters
- 2:1 Mux inputs for multiple RGB/YUV inputs
- Switchable 30MHz to 8.0MHz 6th order filters for RGB applications
- 8.0MHz 6th order Y,C filters with composite summer
- Modulator output with group delay predistortion
- Inputs are DC coupled
- All outputs can drive AC coupled 75Ω loads and provide 6dB of gain
- Dual Multiplexed Inputs
- 1% differential gain with 1° differential phase
- 36dB/octave rolloff on all channels

General Description

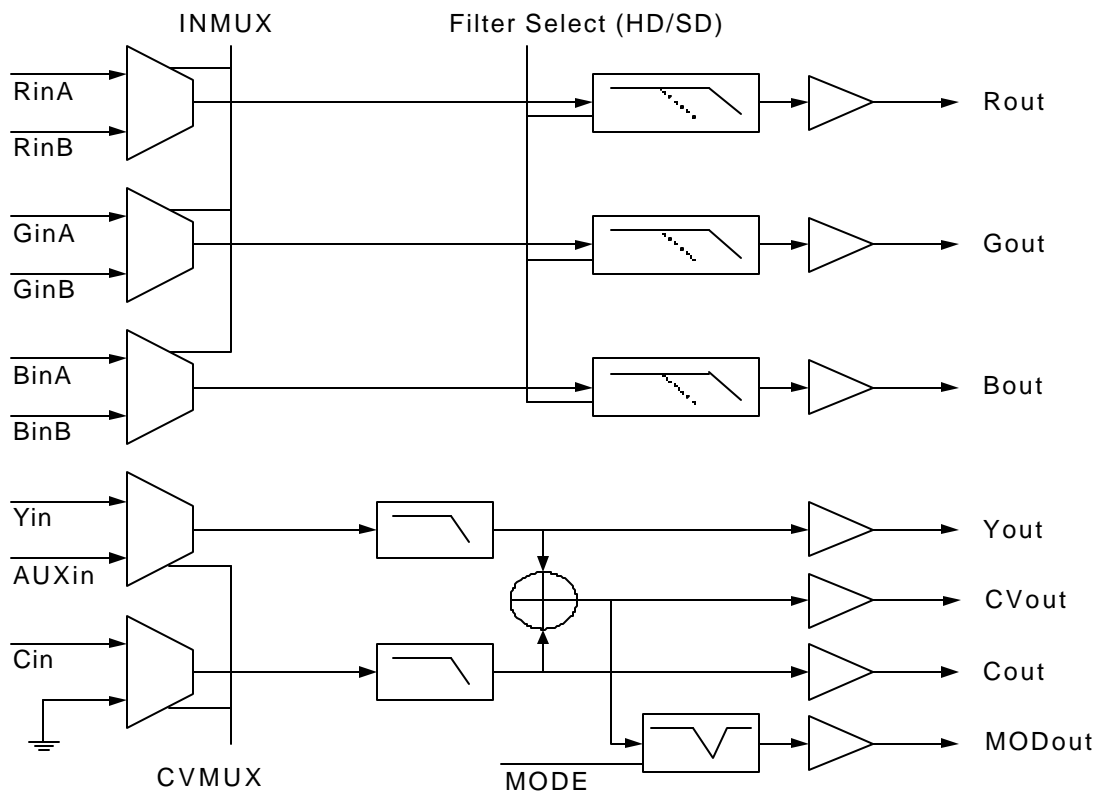
The ML6417 offers comprehensive filtering for set top box or DVD applications. This part consists of a triple 6th order filter with selectable 30MHz to 8.0MHz frequencies and a dual filter for filtering Y,C with a composite summer and a modulator channel with notch and group delay compensation. The modulator provides notching and group delay compensation for NTSC.

2 to 1 multiplexers are provided on the triple filters as well as provisions for auxiliary inputs to the composite channel. The triple filters are intended for either YUV or RGB signals. All channels accept DC coupled ground-referenced 1Vp-p signals. The filters output 2Vp-p signals into AC coupled terminated loads. The low-pass filters are powered by 3.3V and the modulator and outputs by 5.0V.

Applications

- Cable Set top boxes
- Satellite Set top boxes
- DVD players
- HDTV
- Personal Video Recorders (PVRs)
- Video On Demand (VOD)

Block Diagram



Preliminary Information

General Description

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The ML6417 is a next generation filter solution from Fairchild Semiconductor, addressing the expanding filtering needs for set top boxes, and DVD players. The product provides selectable filtering from 30MHz to 8.0MHz on the RGB channels. Thus, the ML6417 addresses the requirement for a single set top box to be compatible with a variety of resolution standards. Additionally, the product provides additional filters for Y, C, CV, and modulator outputs. Multiplexers on the RGB and CV channel provide further flexibility.

For DVD applications, the product provides filtering and output drive amplification for 7 channels of outputs. These include R, G, B, Y, C, CV, and modulator outputs.

For Set top boxes, this product provides for 2 channels of video to be filtered, as well as the flexibility of selectable high order filtering for multiple resolution standards. Additional flexibility is provided by the additional Y,C filters with composite summers.

All channels provide 6dB gain, accept 1V ground referenced inputs, and drive AC coupled loads. The filters for the R, G, B, Y, C, and CV channels are powered from a 3.3V supply and the modulator channel and outputs from 5V.

The modulator channel has notch and group delay compensation set for NTSC specifications.

Pin Assignments

Pin #	Pin Name	Description
28	FSEL	Selects between (0) SD (8.0MHz) and (1) HD (30.0MHz) filters.
29	INMUX	Logic input selects between Channel <A> or of the RGB inputs. Internally pulled high.
31	RINA	Filtered analog RED video input for Channel <A>
32	RINB	Filtered analog RED video input for Channel
1	GINA	Filtered analog GREEN video input for Channel <A>
2	GINB	Filtered analog GREEN video input for Channel
3	BINA	Filtered analog BLUE video input for Channel <A>
4	BINB	Filtered analog BLUE video input for Channel
5	CVMUX	Logic input pin selects between the YIN or AUXIN inputs as well as enabling or disabling CIN
6	MODOUT	Modulator output
8	VCCOMOD	5V VCC for modulator output buffers
9	VSSOMOD	Ground for modulator output buffers
10	AUXIN	Filtered analog composite video or luma video input.
11	CIN	Chrominance (Chroma) input
12	YIN	Luminance (Luma) input
14	VCCMOD	VCC for modulator
15	VSSMOD	Ground for modulator
16	MODE	Set group delay mode for NTSC. Set to 0
17	CVOUT	Composite video output
19	COUT	Chrominance (Chroma) output
20	VCCO	5V power supply for output buffers of the RGB and CV drivers
21	YOUT	Luminance (Luma) output
22	BOUT	Analog BLUE video output from either BINA or BINB
23	GOOUT	Analog GREEN video output from either GINA or GINB
24	ROUT	Analog RED video output from either RINA or RINB
25	VSSO	Ground for output buffers
26	VCCA	VCC Analog 3.3V supply
27	VSSA	Analog ground

Absolute Maximum Ratings

Parameter	Min	Max	Units
DC Supply Voltage			V
Analog and Digital I/O			V
Output Current (Continuous)			
RGB Channels			mA
CV Channel			mA
C and Y Channels			
Junction Temperature			°C
Storage Temperature Range			°C
Lead Temperature (Soldering, 10s)			°C
Thermal Resistance(θ_{JA})			°C/W

Operating Conditions

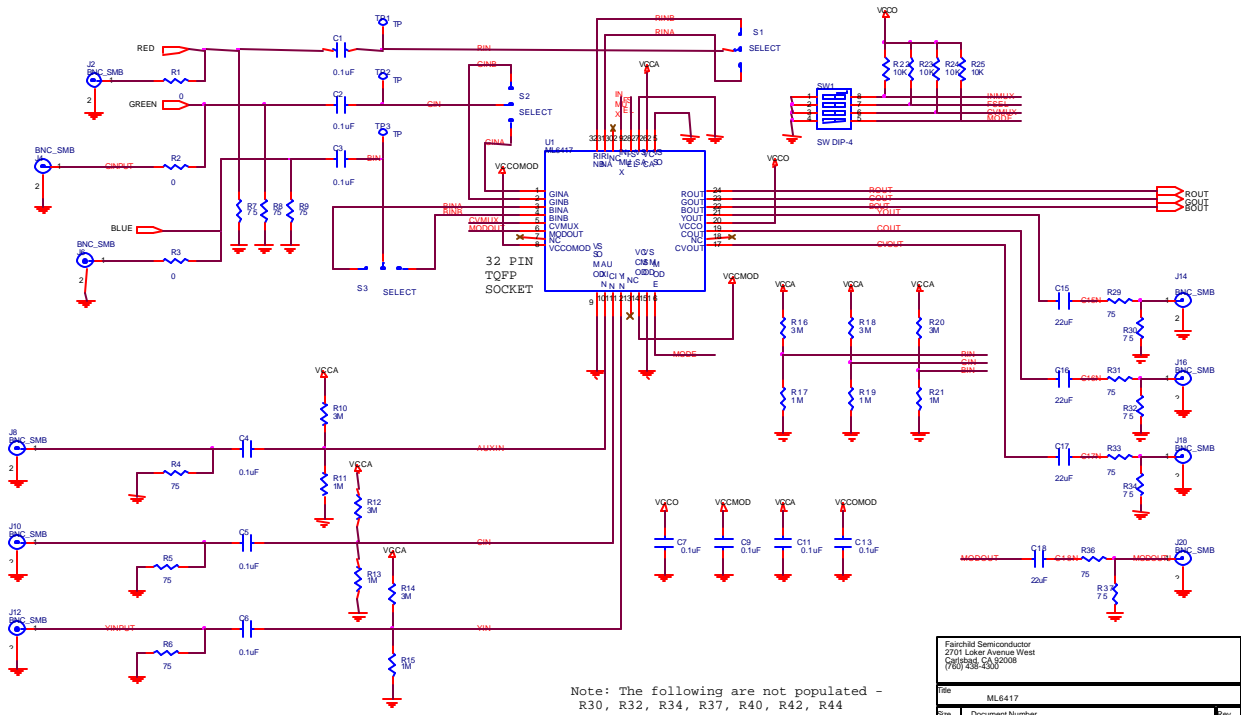
Parameter	Min	Max	Units
Temperature Range	0	70	°C
VCCO Range	4.5	5.5	V
VCCA Range	3.0	3.6	V
VCCMOD Range	4.5	5.5	V
VCCOMOD Range	4.5	5.5	V

Electrical Characteristics 1 Vp-p signal at room temperature

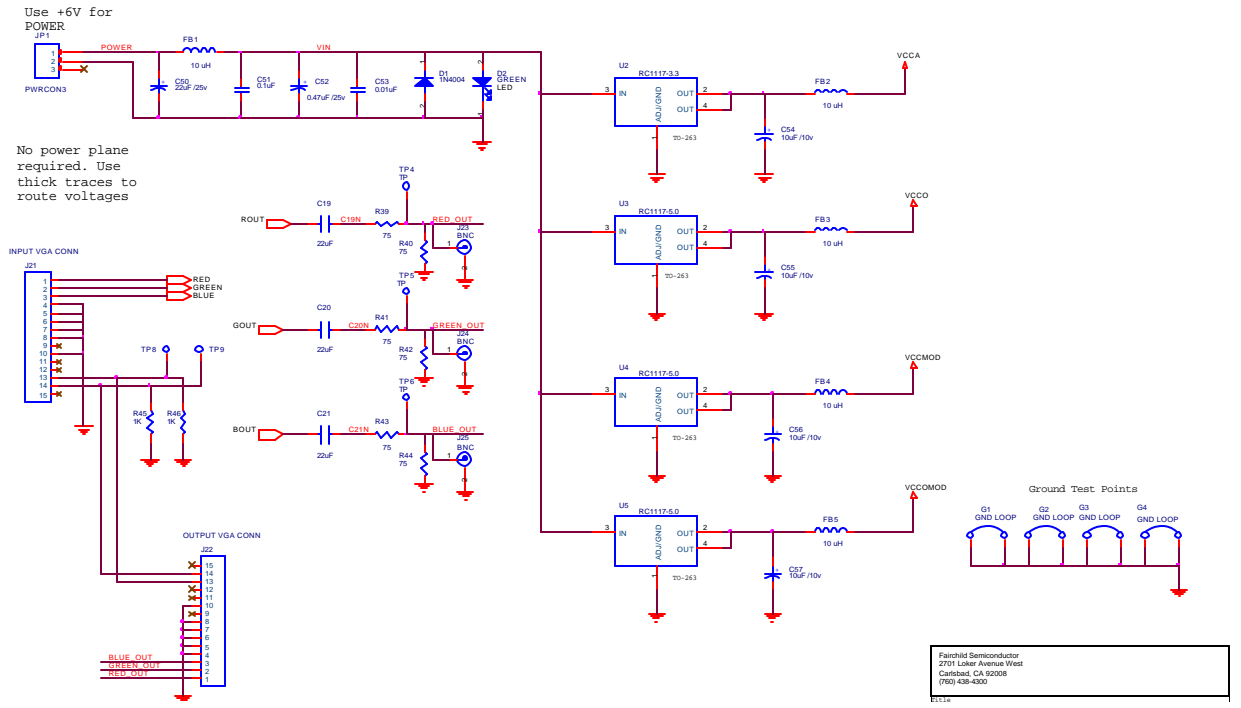
Symbol	Parameter	Condition Vcca=3.3V+/- 10%, VccO=5.0V+/-10%	Min	Typ	Max	Units
ICCA	Supply Current	VCCA				mA
ICCO	Supply Current	VCCO No load				mA
ICCMOD	Supply Current	VCCMOD				mA
ICCOMOD	Supply Current	VCCOMOD				mA
AV	Gain	All Channels		6		dB
AVMOD	Mod Gain	Modulator Channel				dB
fC	3dB bandwidth	Filter select =1, RGB Channels		36		MHz
	Attenuation	Filter select =1 f=74MHz, RGB Channels		-30		dB
fC	3dB bandwidth	Filter select =1, Y,C,CV Channels		8		MHz
fC	3dB bandwidth	Filter select =0, R,G,B,Y,C,CV Channels		8		MHz
	Attenuation	Filter select =0, R,G,B,Y,C,CV Channels at f=27MHz		-40		dB
SNR	SNR	Filter select =0, R,G,B,Y,C channels, unified weighting, 300kHz high pass enabled				dB
SNR	SNR	Filter select =0, CV channels, unified weighting, 300kHz high pass enabled				dB
Tpd	Modulator Group Delay	Mode select = 0, from 400kHz to 3.58MHz	-230	-170	-130	nsec
Vi	Input voltage range	Referenced to ground		1.0		V
	Output voltage	During Sync, CV Channel		1		V
	Output voltage	During Sync, RGB Channel		2		V
	Output voltage	During Sync, Modulator Channel		1		V
dG	Differential Gain	Filter Select = 0, R,G,B,Y,C,CV channels		1		%
dp	Differential Phase	Filter Select = 0, R,G,B,Y,C,CV channels		1		°
XTALK	Crosstalk	Yin to Cout or Cin to Yout				dB
XTALK	Crosstalk	R1 to Rout, R2 enabled				dB
XTALK	Crosstalk	B1 to Bout, B2 enabled				dB
XTALK	Crosstalk	G1 to Gout, G2 enabled				dB
dp	Differential Phase	Modulator Channel		1.5		°
MCF	Modulator Channel Flatness		-0.75		+0.75	dB
AV	Notch Attenuation	At 4.40MHz			-14	dB

Preliminary Information

Applications

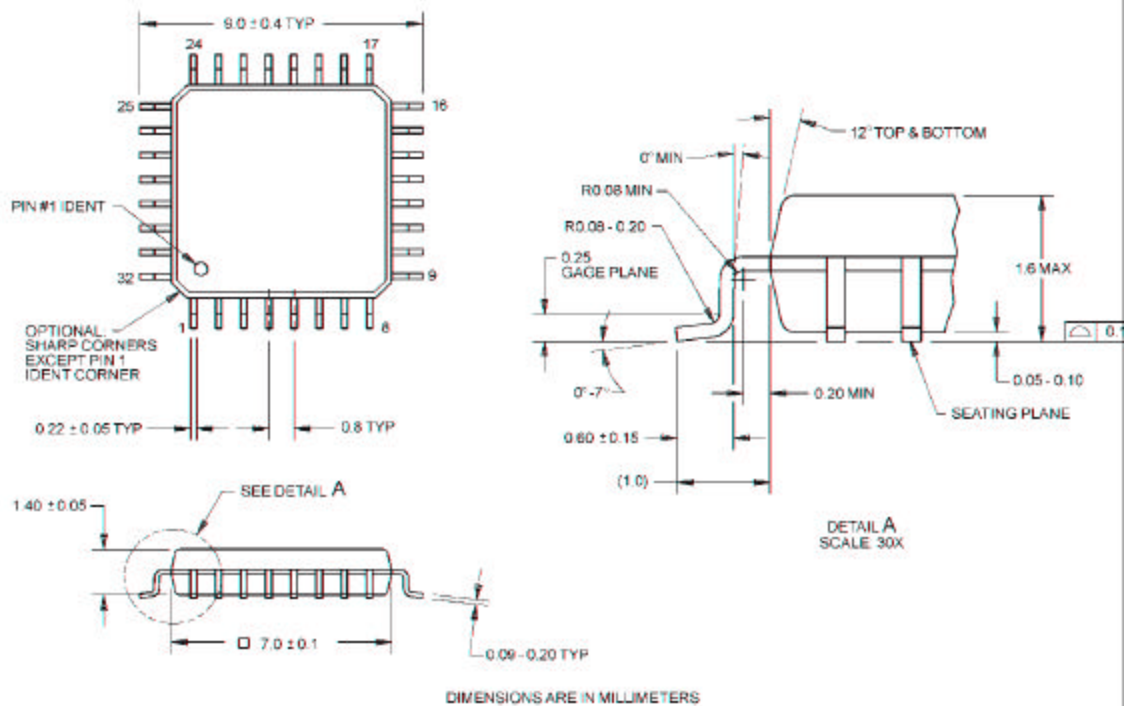
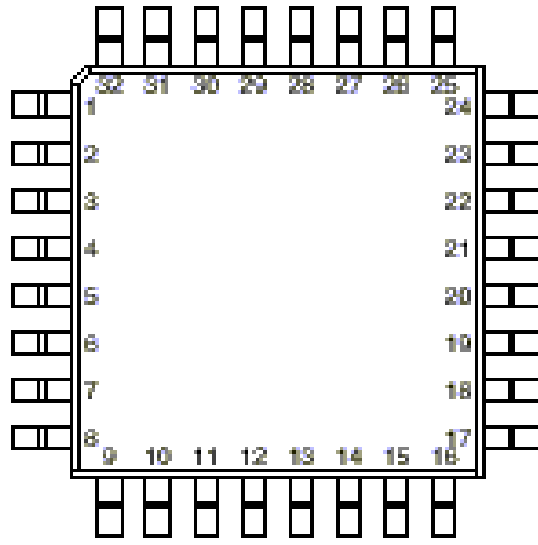


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32 Lead LQFP



32-Lead Thin Quad Flat Package (TQFP), JEDEC MO-135, 7mm Square Package Number VBE032

Ordering Information

Part Number	Temperature Range	Package
ML6417CH	0° to 70°	32 pin LQFP

Preliminary Information

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