



LA7160M

VHF Band RF Modulator

Overview

The LA7160M is an RF modulator which generates, from a baseband video and audio signal, PLL frequency synthesized RF TV channel signal in VHF band.

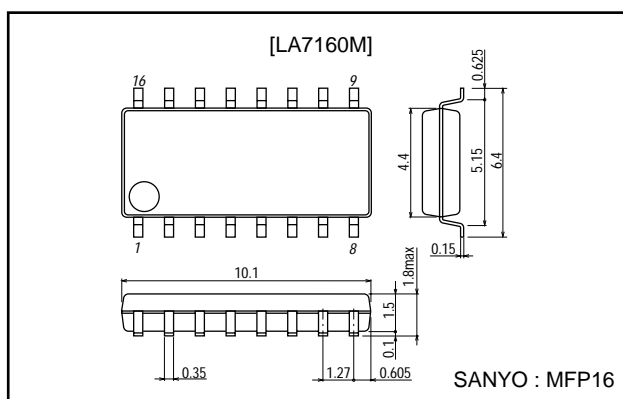
Features

- 5V operation.
- PLL synthesized RF VCO (US : 3ch, 4ch, JPN : 1ch, 2ch only), channel selection accomplished using a single pin.
- PLL synthesized and tankless audio FM.
- The 4 or 3.58MHz (color subcarrier) reference frequency for PLL can either be generated internally or input from an external source.
- Package : MFP16 (SOP16)

Package Dimensions

unit: mm

3035A-MFP16 (SOP16)



Functions

- RF VCO
- RF mixer
- RF buffer
- Video clamp
- White clip
- Audio FM
- 4V regulator
- Reference OSC

Specifications

Maximum Ratings at Ta=25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{CC} max		7	V
Allowable power dissipation	P _d max		250	mW
Operating temperature	T _{opr}		-20 to +75	°C
Storage temperature	T _{stg}		-55 to +150	°C

Operating Conditions at Ta=25°C

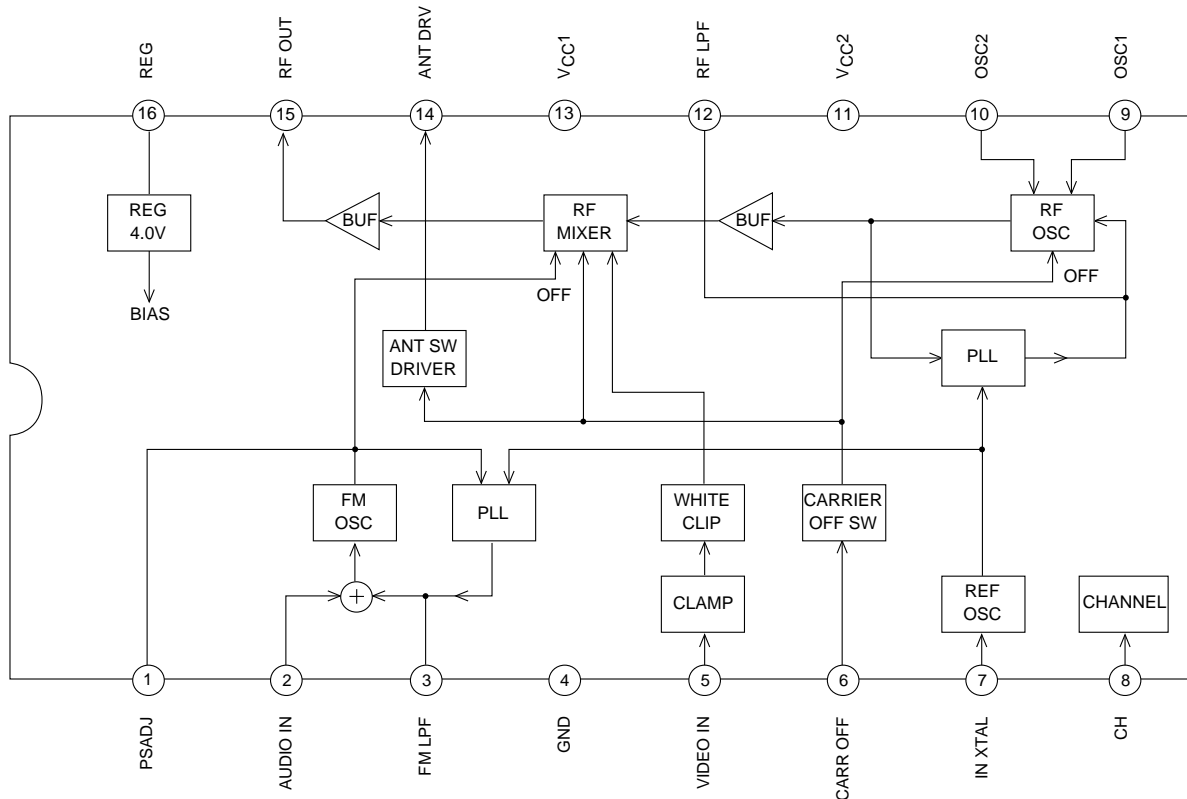
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V _{CC}		5	V
Operating voltage range	V _{CC} op		4.5 to 5.5	V

LA7160M

Operating Characteristics at $T_a=25^\circ\text{C}$, $V_{CC}=5\text{V}$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Supply current 1	I_{CC1}	No signal, pin 6, high	20	28	36	mA
Supply current 2	I_{CC2}	No signal, pin 6, low	13	18	23	mA
ANT SW driver	ANT	Pin 6, high	3.2	3.5	3.8	V
RF output US	P_{US}	No signal	89	92	95	dB μ
RF output JP	P_{JP}	No signal	89	92	95	dB μ
P/S ratio	P/S	S : $f_p+4.5\text{MHz}$	13.5	16	18.5	dB
4.5MHz 2nd harmonics	P/S2	S2 : $f_p+2\times 4.5\text{MHz}$	50	65		dB
4.5MHz 3rd harmonics	P/S3	S3 : $f_p+3\times 4.5\text{MHz}$	45	55		dB
920kHz beat	P/CB	$V_{IN}=3.58\text{MHz}$, 0.6Vp-p CB : $f_p+920\text{kHz}$	65	72		dB
Video harmonics	P/V2	$V_{IN}=1\text{MHz}$, 1Vp-p $V2 : f_p+2\text{MHz}$	45	65		dB
Video modulation	M_p	$V_{IN}=\text{Stair step}$, 1Vp-p	75	80	85	%
White clip level	WCL	$V_{IN}=\text{Stair step}$, 1.5Vp-p	88	93	98	%
Differential gain	DG	$V_{IN}=\text{Stair step}$, 1Vp-p	-5		+5	%
Differential phase	DP	$V_{IN}=\text{Stair step}$, 1Vp-p	-5		+5	Deg
Audio modulation	M_S	$A_{IN}=1\text{kHz}$, 1Vp-p	90	100	110	%
Maximum audio modulation	$M_S \text{ max}$	THD<3%	400			%
Audio THD	THD	$A_{IN}=1\text{kHz}$, 1Vp-p		0.4	2	%
Audio S/N	S/N	$A_{IN}=1\text{kHz}$, 1Vp-p $V_{IN}=\text{Color bar}$, 1Vp-p	45	51		dB

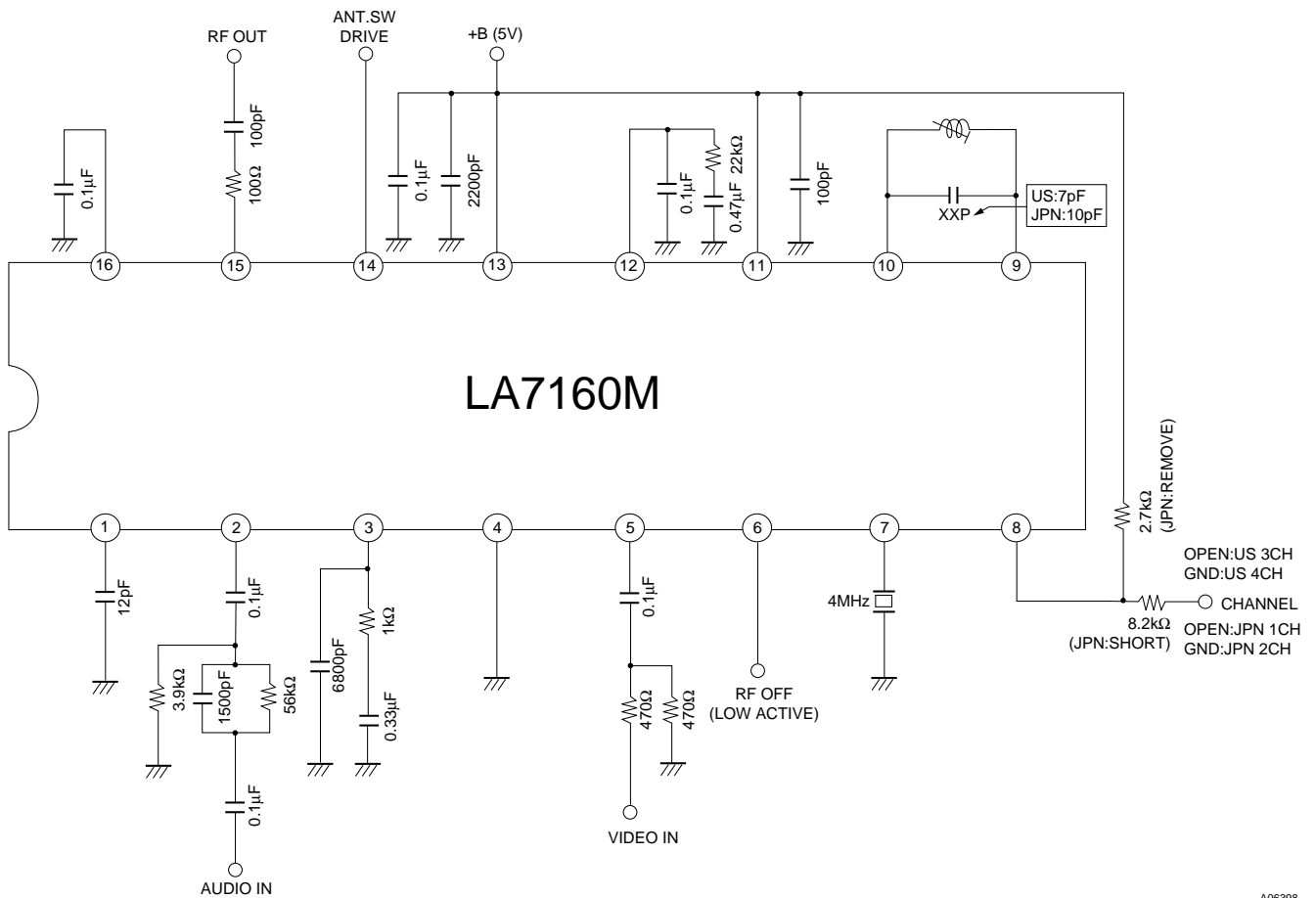
Equivalent Circuit Block Diagram



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LA7160M

Test Circuit



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