



LA7053

Video, Audio Signal Processor for UHF Band RF Modulators

Overview

The LA7053 is a video, audio signal processor IC for UHF band RF modulators. It performs the functions of TSG (test signal generator), audio FM modulator, video clamp circuit, white clip circuit.

Features

- White clip function.
- On-chip TSG (two vertical white stripes).
- Small-sized package (9-pin SIP).

Specifications

Maximum Ratings at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\text{ max}}$	V7	12	V
Allowable power dissipation	$P_d\text{ max}$	$T_a \leq 60^\circ\text{C}$	250	mW
Operating temperature	T_{opr}		-20 to +80	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

Operating Conditions at $T_a=25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	V7	7.5	V
Operating voltage range	$V_{CC\text{ op}}$		7.0 to 8.0	V

Operating Characteristics at $T_a=25^\circ\text{C}$, $V_{CC}(V7)=7.5\text{V}$

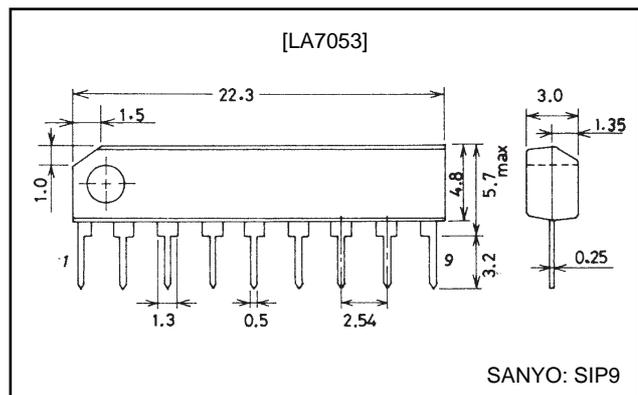
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
V_{CC7} current drain	I_{CC7}	SW5 ON	12.0	20.0	28.0	mA
Video clamp voltage	V_{VC}	SW5 ON, SW1 ON, SW2→b, SW3→a	3.7	3.9	4.1	V
Video clamp output amplitude deviation		SW→2b, SW3→a, SW5 ON at 1Vp-p stair step signal input	-5		+5	%
Audio FM sensitivity	Δf_{fm}	f_m : 1kHz, 4.5Vp-p input, f_c : 5.5MHz	870	1200	1500	Hz/mV
Audio distortion	THD	SW4 on at deviation width 100kHz		0.3	2.5	%
Audio output amplitude		f_c : 5.5MHz	0.79	1.00	1.26	Vp-p
White clip level	V_{WC}		1.16	1.19	1.22	Vp-p
TSG output amplitude	V_{TSG}		0.80	1.04	1.20	Vp-p
V/S ratio			7.2/2.8	6.5/3.5	6.0/4.0	

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Package Dimensions

unit: mm

3017C-SIP9

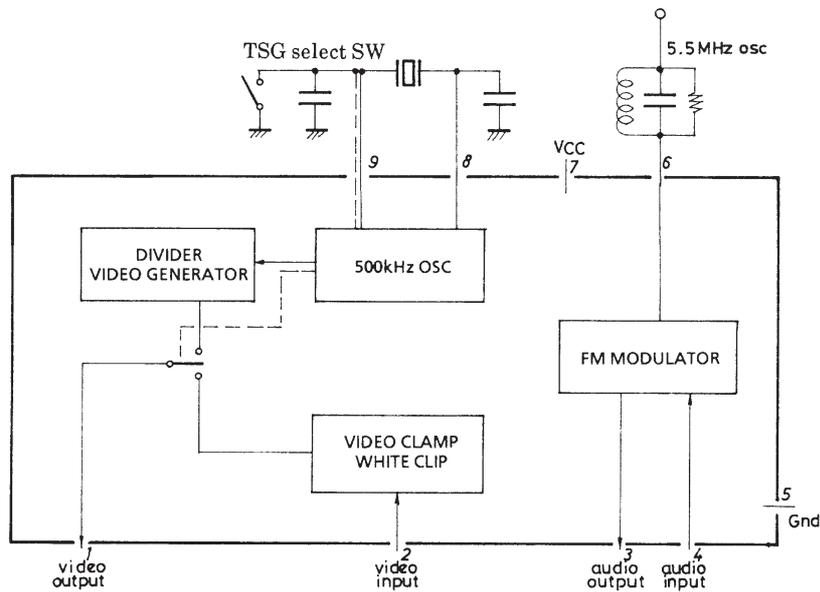


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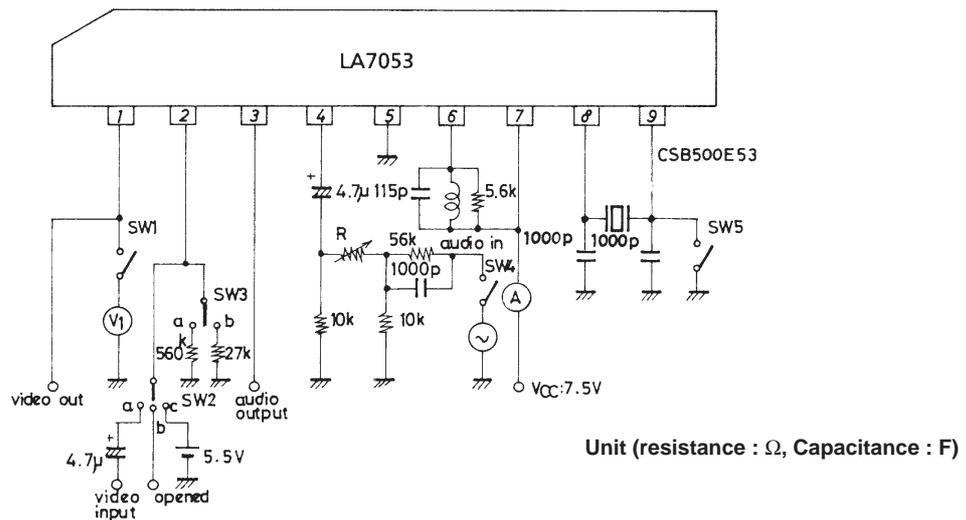
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Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Horizontal sync frequency variation	f_s		-5		+5	%
Horizontal sync signal width variation	H_s		3.6	1.0	4.4	μs
White signal width variation	H_v		3.6	4.0	4.4	μs
Sync 1st white signal rise time	t_{v1}		22	24	26	μs
Sync 2nd white signal rise time	t_{v2}		22	24	26	μs

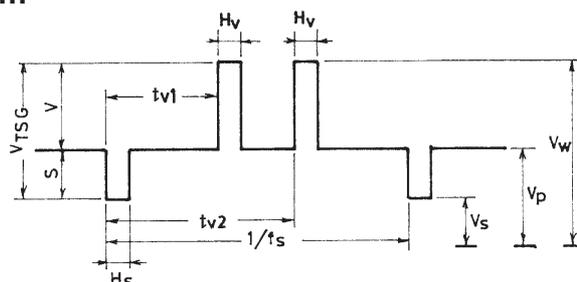
Equivalent Circuit Block Diagram



Test Circuit

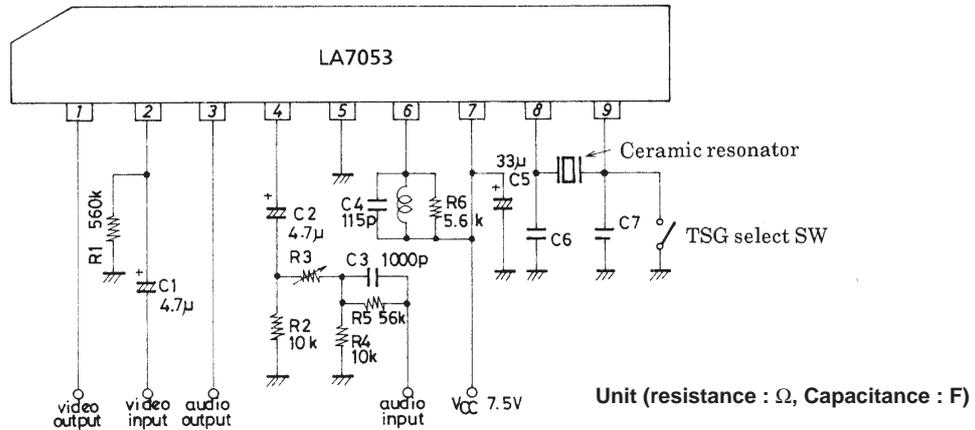


TSG Output Waveform



LA7053

Sample Application Circuit



Ceramic resonator	C6	C7
CSB500E53 (Murata)	1000pF	1000pF
DCRK500 (Toko)	680pF	330pF

Test Conditions

Parameter	Symbol	SW Mode					Test point	Remarks
		SW1	SW2	SW3	SW4	SW5		
V _{CC7} current drain	I _{CC7}	OFF	b	a	OFF	ON	Pin 7	
Video clamp voltage	V _{VC}	ON	b	a	OFF	ON	Pin 1	
Video clamp output amplitude deviation		OFF	a	a	OFF	ON	Pin 1	
Audio FM sensitivity	Δf _{fm}	OFF	b	a	ON	ON	Pin 3	
Audio distortion	THD	OFF	b	a	ON	ON	pin 3	
Audio output amplitude		OFF	b	a	OFF	ON	Pin 3	
White clip level	V _{WC1}	ON	c	a	OFF	ON	Pin 1	V _{WC} =V _{WC1} -V _{WC2}
	V _{WC2}	ON	b	b	OFF	ON	Pin 1	
TSG output amplitude	V _{TSG}	OFF	b	a	OFF	OFF	Pin 1	
V/S ratio		OFF	b	a	OFF	OFF	Pin 1	
Horizontal sync frequency variation	f _S	OFF	b	a	OFF	OFF	Pin 1	
Horizontal sync signal width variation	H _S	OFF	b	a	OFF	OFF	Pin 1	
White signal width variation	H _V	OFF	b	a	OFF	OFF	Pin 1	
Sync 1st white signal rise time	t _{v1}	OFF	b	a	OFF	OFF	Pin 1	
Sync 2nd white signal rise time	t _{v2}	OFF	b	a	OFF	OFF	Pin 1	

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