



SANYO Semiconductors

DATA SHEET

LA76600M — Monolithic Linear IC

Video Signal Y/C Separator IC

Overview

The LA76600M separates a video signal into Y and C components. It includes an on-chip 2H CCD delay line and achieves a significant reduction in flicker and noise by using a 3-line Y/C separation circuit.

Functions

- For Y/C Separate (Digital Clocked CCD 3Line Comb Filter).

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply rating	$V_{CC \text{ max}}$		6.0	V
Allowable power dissipation	$P_d \text{ max}$	$T_a \leq 65^\circ\text{C}$	400 (*1)	mW
Operating temperature	T_{opr}		-10 to +65	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

* Mounted on a 114.3×76.1×1.6mm glass epoxy 4-layer circuit board

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		5.0	V
Allowable operating supply voltage range	$V_{CC \text{ opg}}$		4.8 to 5.2	V

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SANYO Semiconductor Co., Ltd.

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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Electrical Characteristics at Ta = 25°C, VCC = 5.0V

Parameter	Symbol	Input	Output	Conditions	Ratings			Unit
					min	typ	max	
Analog Supply Current	I _{CC}			Measure the current at 5PIN.	25	30	35	mA
Digital Supply Current	I _{DD}			Measure the current at 6PIN.	25	30	35	mA
REG Voltage	REG		T7	Measure the output voltage.	3.8	4	4.2	V
VCO Voltage	VCO		T8	Measure the output voltage.	2.1	2.3	2.5	V
RD Voltage	RD		T12	Measure the output voltage.	9	10	11	V
PLL Voltage	PLL		T13	Measure the output voltage.	3	3.5	4	V
YIN1 Input Level	Y _{IN1}	T14A	T14	VIN = 1Vp-p, Video signal SW2:2 Measure the input level.	0.8	1	1.2	Vp-p
YIN2 Input Level	Y _{IN2}	T3A	T3	VIN = 1Vp-p, Video signal SW2:1 Measure the input level.	0.8	1	1.2	Vp-p
Chroma Input Level	C _{IN}	T1A	T1	VIN = 0.7Vp-p, Chroma signal Measure the input level.	0.5	0.7	0.9	Vp-p
FSC Input Level	FSC _{IN}	T11A	T11	VIN = 0.3Vp-p, SIN Signal Measure the input level.	0.2	0.3	0.5	Vp-p
Yout Level 1 (COMB Mode)	Y _{LVC}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the output level.	0.89	1	1.12	Vp-p
Yout Level 2 (THR Mode)	Y _{LVT}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:1 Measure the output level.	0.89	1	1.12	Vp-p
Yout f-Character (COMB Mode)	Y _{FC1}	T14A T3A	T16	VIN = 1Vp-p, 5MHz, CW signal SW1:2 Measure the Gain between the input and the output.	-3	0	3	dB
Yout f-Character (COMB Mode)	Y _{FC2}	T14A T3A	T16	VIN = 1Vp-p, 7MHz, CW signal SW1:2 Measure the Gain between the input and the output.		-20	-15	dB
Yout f-Character (THR Mode)	Y _{FT}	T14A T3A	T16	VIN = 1Vp-p, 10MHz, CW signal SW1:1 Measure the Gain between the input and the output.	-3	0	3	dB
Y Signal Delay 1 (COMB Mode)	Y _{DLYC}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the delay between the input and the output of Y signal.	200	400	600	ns
Y Signal Delay 2 (THR Mode)	Y _{DLYT}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:1 Measure the delay between the input and the output of Y signal.	0	10	50	ns
Output Clamp Level 1 (COMB Mode)	Y _{CLPC}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the clamp level of output signal.	1.5	2	2.5	V
Output Clamp Level 2 (THR Mode)	Y _{CLPT}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:1 Measure the clamp level of output signal.	1.5	2	2.5	V
Y Signal S/N ratio 1 (COMB Mode)	Y _{SNC}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the S/N ratio of Y signal.			-50	dB
Y Signal S/N ratio 2 (THR Mode)	Y _{SNT}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:1 Measure the S/N ratio of Y signal.			-50	dB
Clock Leak (COMB Mode)	Y _{CLKC}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the clock leak.			-40	dB
Clock Leak (THR Mode)	Y _{CLKT}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:1 Measure the clock leak.			-60	dB
Y_Comb Depth 1	Y _{COMB1}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at Fsc.		-35	-30	dB
Y_Comb Depth 2	Y _{COMB2}	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at (227.5-59)/227.5Fsc.		-15	-10	dB
Y_Comb Depth 3	Y _{COMB3}	T14A T3A	T16	VIN= 1Vp-p, Video signal SW1:2 Measure the comb depth at (227.5+59)/227.5Fsc.		-15	-10	dB

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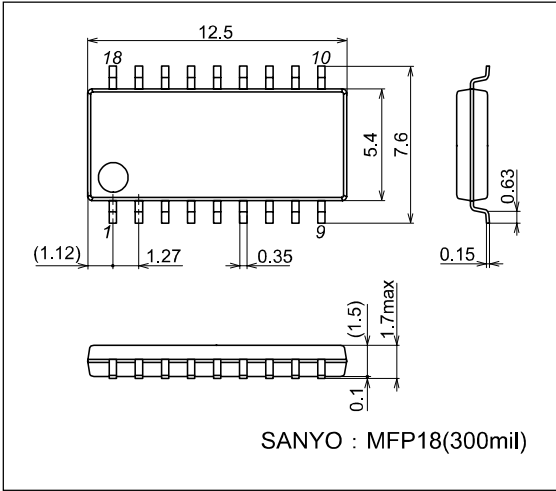
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Parameter	Symbol	Input	Output	Conditions	Ratings			Unit
					min	typ	max	
Chroma Out Level (COMB Mode)	C _{LV}	T14A T3A	T18	VIN = 0.7Vp-p, Video signal SW1:2 Measure the output level.	0.5	0.7	0.9	Vp-p
Chroma Out Level (THR Mode)	C _{LV}	T1A	T18	VIN = 0.7Vp-p, Video signal SW1:1 Measure the output level.	0.5	0.7	0.9	Vp-p
Chroma f-Character 1 (COMB Mode)	C _{FC1}	T14A T3A	T18	VIN = 1Vp-p, 1.5MHz, CW signal SW1:2 Measure the Gain between the input and the Output.	-6	-3	0	dB
Chroma f-Character 2 (COMB Mode)	C _{FC2}	T14A T3A	T18	VIN = 1Vp-p, 4.5MHz, CW signal SW1:2 Measure the Gain between the input and the Output.	-6	-3	0	dB
Chroma f-Character 3 (THR Mode)	C _{FC3}	T1A	T18	VIN = 1Vp-p, 10MHz, CW signal SW1:1 Measure the Gain between the input and the Output.	-3	0	3	dB
Chrominance Output DC Level 1 (COMB Mode)	C _{DCC}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the chrominance output DC level.	2	2.5	3	V
Chrominance Output DC Level 2 (THR Mode)	C _{DCT}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:1 Measure the chrominance output DC level.	2	2.5	3	V
C Signal S/N ratio 1 (COMB Mode)	C _{SNC}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the S/N ratio of C signal.			-50	dB
C Signal S/N ratio 2 (THR Mode)	C _{SNT}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:1 Measure the S/N ratio of C signal.			-50	dB
Clock Leak (COMB Mode)	C _{CLKC}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the clock leak.			-30	dB
Clock Leak (THR Mode)	C _{CLKT}	T14A T3A	T18	VIN = 1Vpp, Video signal SW1:1 Measure the clock leak.			-60	dB
C Signal Delay (COMB mode)	C _{DLYC}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the delay between the input and the output of C signal.	200	400	600	ns
C Signal Delay (THR Mode)	C _{DLYT}	T1A	T18	VIN = 1Vp-p, Video chroma SW1:1 Measure the delay between the input and the output of C signal.	0	10	50	ns
C_Comb Depth 1	C _{COMB1}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at Fsc.		-35	-30	dB
C_Comb Depth 2	C _{COMB2}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at (227.5-59)/227.5Fsc.		-15	-10	dB
C_Comb Depth 3	C _{COMB3}	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at (227.5+59)/227.5Fsc.		-15	-10	dB
Difference Of Delay Between Y and C	Y _{CDLY}	T14A T3A	T16 T18	VIN = 1Vp-p, Video signal SW1:2 Measure the difference of delay between the Y output and C output.	-20	0	20	ns
INPUTSEL_L (YIN1)	IN _{SELL}	T2	T2	YIN1 ON, measure the SW voltage.		0	1	V
INPUTSEL_H (YIN2)	IN _{SELH}	T2	T2	YIN2 ON, measure the SW voltage.	2.5	5		V
OUTPUTSEL_H (COMB Mode)	OUT _{SELH}	T17	T17	COMB Mode, measure the SW voltage.		0	1	V
OUTPUTSEL_L (THR Mode)	OUT _{SELL}	T17	T17	COMB Mode, measure the SW voltage.	2.5	5		V
Cross talk between Different input 1	IN _{CRS}	T14A	T16 T18	VIN = 1Vp-p, Video signal SW2:2 Measure the cross talk between different input.			-50	dB
Cross talk between Different input 2	IN _{CRS}	T3A	T16 T18	VIN = 1Vp-p, Video signal SW2:1 Measure the cross talk between different input.			-50	dB

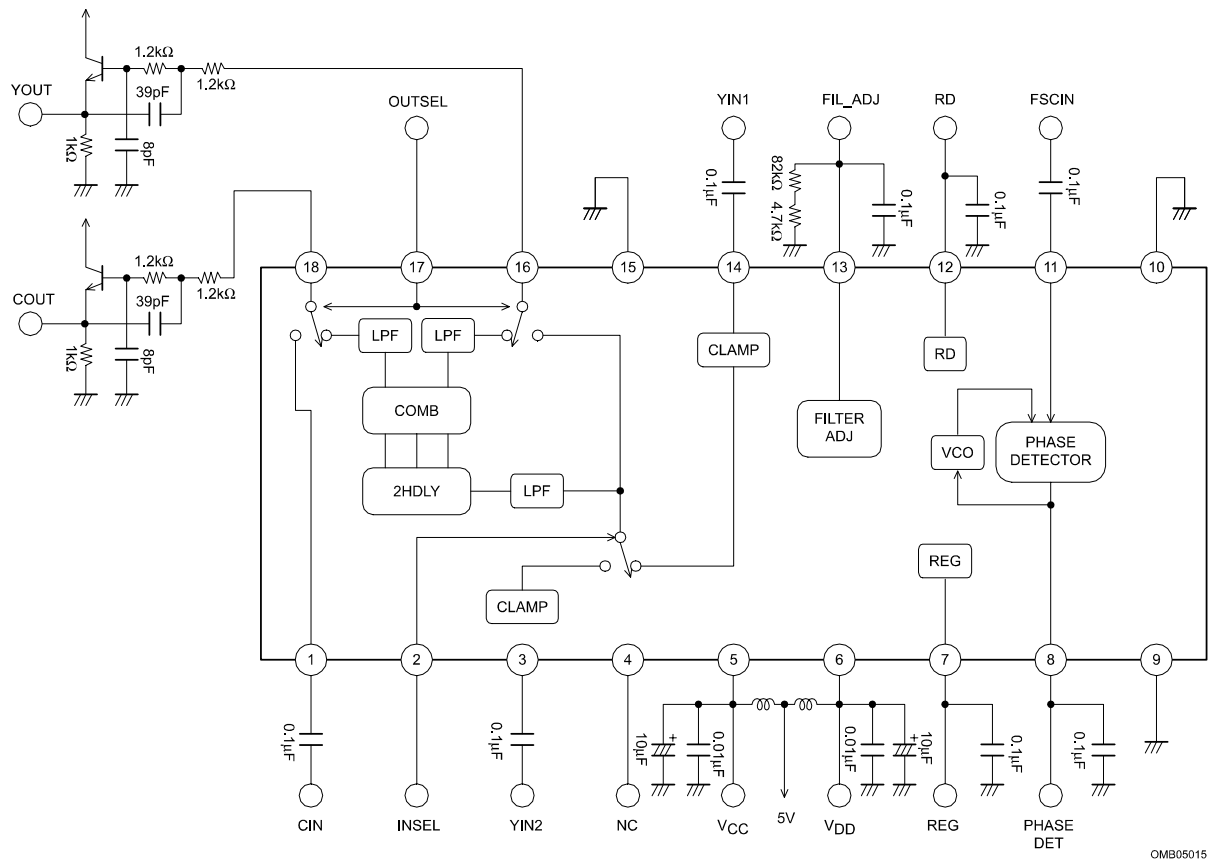
Package Dimensions

unit: mm

3095A

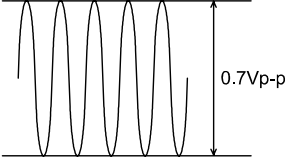
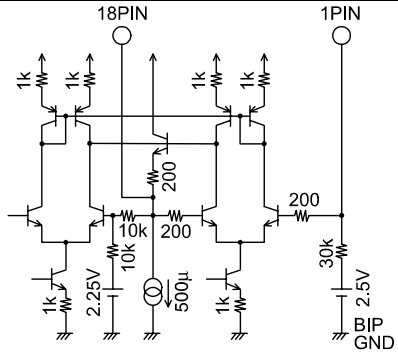
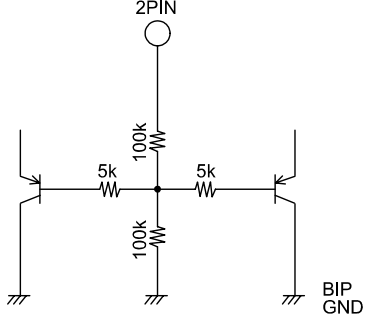
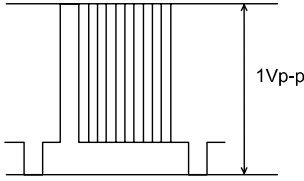
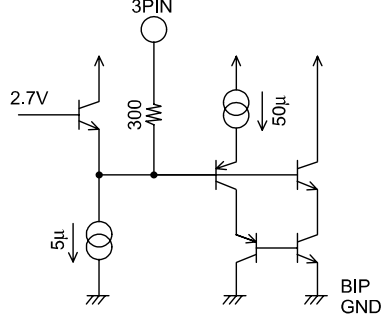
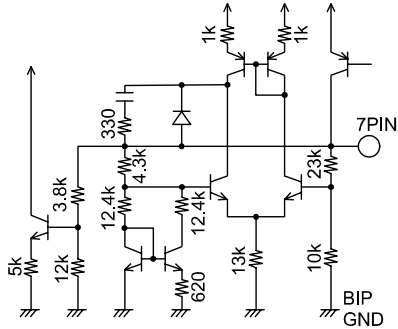


Block Diagram



Pin Function

(unit: Ω)

Pin No.	Pin name	DC voltage	Signal waveform	Input/Output form
1	CIN	2.5V	CHROMA-SIGNAL 	
2	INSEL		GND: YIN2 V_{CC}: YIN1	
3	YIN2	2.5V	VIDEO-SIGNAL 	
5	BIP-V _{CC}	5V	DC	
6	CCD-V _{CC}	5V	DC	
7	REG	4V	DC	

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(unit: Ω)

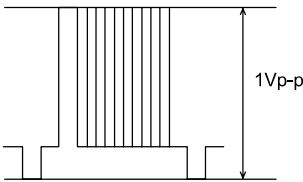
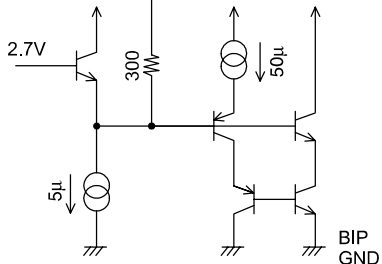
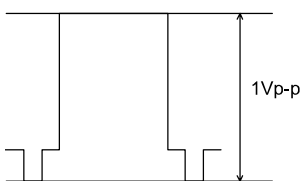
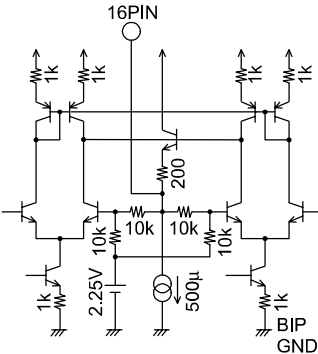
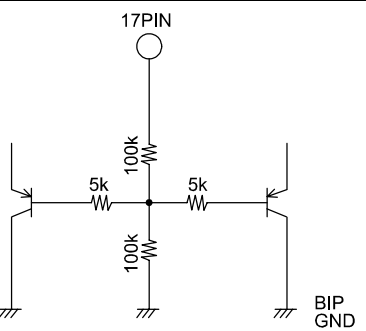
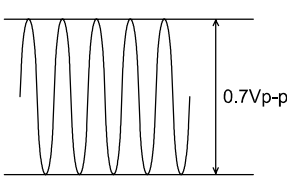
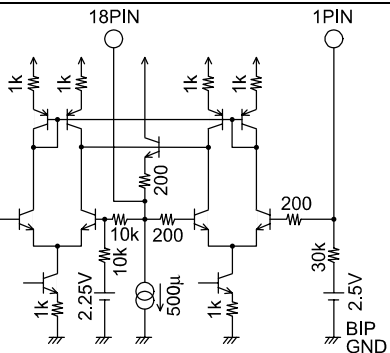
Pin No.	Pin name	DC voltage	Signal waveform	Input/Output form
8	PHASEDET	2.3V	DC	
9	CCD-GND	GND		
10	CCD-GND	GND		
11	FSC_IN	0.8V	SIN-WAVE:3.58MHz	
12	RD	10V	DC	
13	AFC	3.5V	DC	

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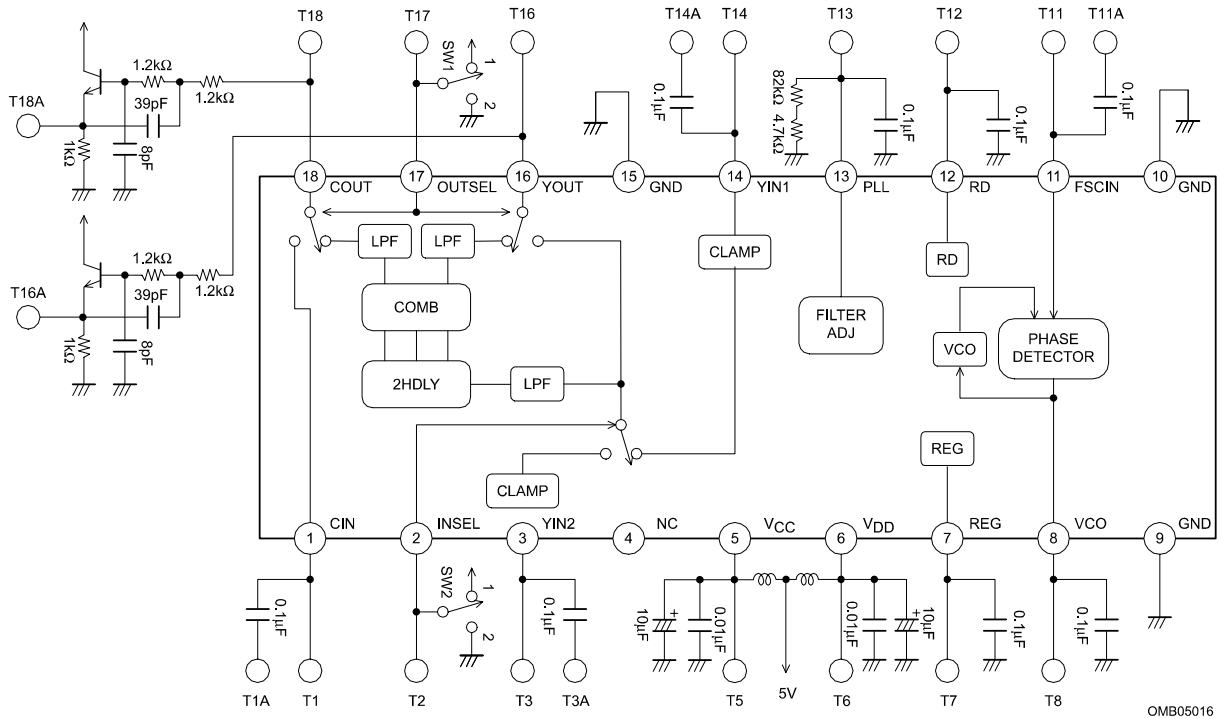
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(unit: Ω)

Pin No.	Pin name	DC voltage	Signal waveform	Input/Output form
14	YIN1		VIDEO-SIGNAL 	
15	BIP-GND	GND		
16	YOUT	2.5V	Y-SIGNAL 	
17	OUTSEL		GND: COMB V_{CC}: THROUGH	
18	COUT	2.5V	CHROMA-SIGNAL 	

Test Circuit



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