



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	$V_{CC\ max}$		6.0	V
Allowable power dissipation	$P_d\ max$	$T_a \leq 65^\circ\text{C}$	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	$V_{CC\ opg}$		4.8 to 5.2	V

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# LA76600M

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

Parameter	Symbol	Input	Output	Conditions	Ratings			Unit
					min	typ	max	
Analog Supply Current	I <sub>CC</sub>			Measure the current at 5PIN.	25	30	35	mA
Digital Supply Current	I <sub>DD</sub>			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 <sub>IN1</sub>	T14A	T14	VIN = 1Vp-p, Video signal SW2:2 Measure the input level.	0.8	1	1.2	Vp-p
YIN2 Input Level	Y <sub>IN2</sub>	T3A	T3	VIN = 1Vp-p, Video signal SW2:1 Measure the input level.	0.8	1	1.2	Vp-p
Chroma Input Level	C <sub>IN</sub>	T1A	T1	VIN = 0.7Vp-p, Chroma signal Measure the input level.	0.5	0.7	0.9	Vp-p
FSC Input Level	FSC <sub>IN</sub>	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 <sub>LVC</sub>	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 <sub>LVT</sub>	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 <sub>FC1</sub>	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 <sub>FC2</sub>	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 <sub>FT</sub>	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 <sub>DLYC</sub>	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 <sub>DLYT</sub>	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 <sub>CLPC</sub>	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 <sub>CLPT</sub>	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 <sub>SNC</sub>	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 <sub>SNT</sub>	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 <sub>CLKC</sub>	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the clock leak.			-40	dB
Clock Leak (THR Mode)	Y <sub>CLKT</sub>	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:1 Measure the clock leak.			-60	dB
Y_Comb Depth 1	Y <sub>COMB1</sub>	T14A T3A	T16	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at Fsc.		-35	-30	dB
Y_Comb Depth 2	Y <sub>COMB2</sub>	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 <sub>COMB3</sub>	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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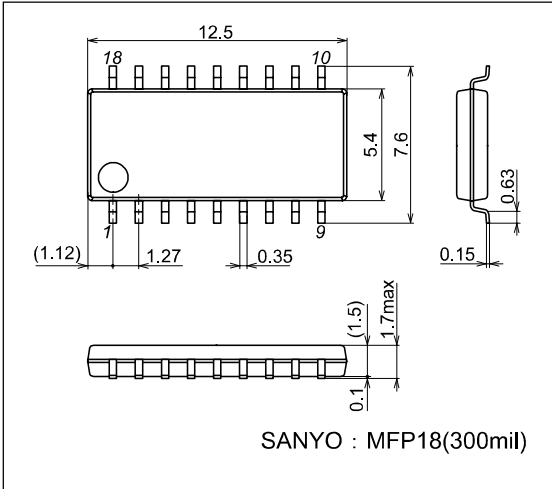
Parameter	Symbol	Input	Output	Conditions	Ratings			Unit
					min	typ	max	
Chroma Out Level (COMB Mode)	C <sub>LV</sub>	T14A T3A	T18	VIN = 0.7Vp-p, Video signal SW1:2 Measure the output level.	0.5	0.7	0.9	Vp-p
Chroma Out Level (THR Mode)	C <sub>LV</sub>	T1A	T18	VIN = 0.7Vp-p, Video signal SW1:1 Measure the output level.	0.5	0.7	0.9	Vp-p
Chroma f-Character 1 (COMB Mode)	C <sub>FC1</sub>	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 <sub>FC2</sub>	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 <sub>FC3</sub>	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 <sub>DCC</sub>	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 <sub>DCT</sub>	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 <sub>SNC</sub>	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 <sub>SNT</sub>	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 <sub>CLKC</sub>	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the clock leak.			-30	dB
Clock Leak (THR Mode)	C <sub>CLKT</sub>	T14A T3A	T18	VIN = 1Vpp, Video signal SW1:1 Measure the clock leak.			-60	dB
C Signal Delay (COMB mode)	C <sub>DLYC</sub>	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 <sub>DLYT</sub>	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 <sub>COMB1</sub>	T14A T3A	T18	VIN = 1Vp-p, Video signal SW1:2 Measure the comb depth at Fsc.		-35	-30	dB
C_Comb Depth 2	C <sub>COMB2</sub>	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 <sub>COMB3</sub>	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 <sub>CDLY</sub>	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 <sub>SELL</sub>	T2	T2	YIN1 ON, measure the SW voltage.		0	1	V
INPUTSEL_H (YIN2)	IN <sub>SELH</sub>	T2	T2	YIN2 ON, measure the SW voltage.	2.5	5		V
OUTPUTSEL_H (COMB Mode)	OUT <sub>SELH</sub>	T17	T17	COMB Mode, measure the SW voltage.		0	1	V
OUTPUTSEL_L (THR Mode)	OUT <sub>SELL</sub>	T17	T17	COMB Mode, measure the SW voltage.	2.5	5		V
Cross talk between Different input 1	IN <sub>CRS</sub>	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 <sub>CRS</sub>	T3A	T16 T18	VIN = 1Vp-p, Video signal SW2:1 Measure the cross talk between different input.			-50	dB

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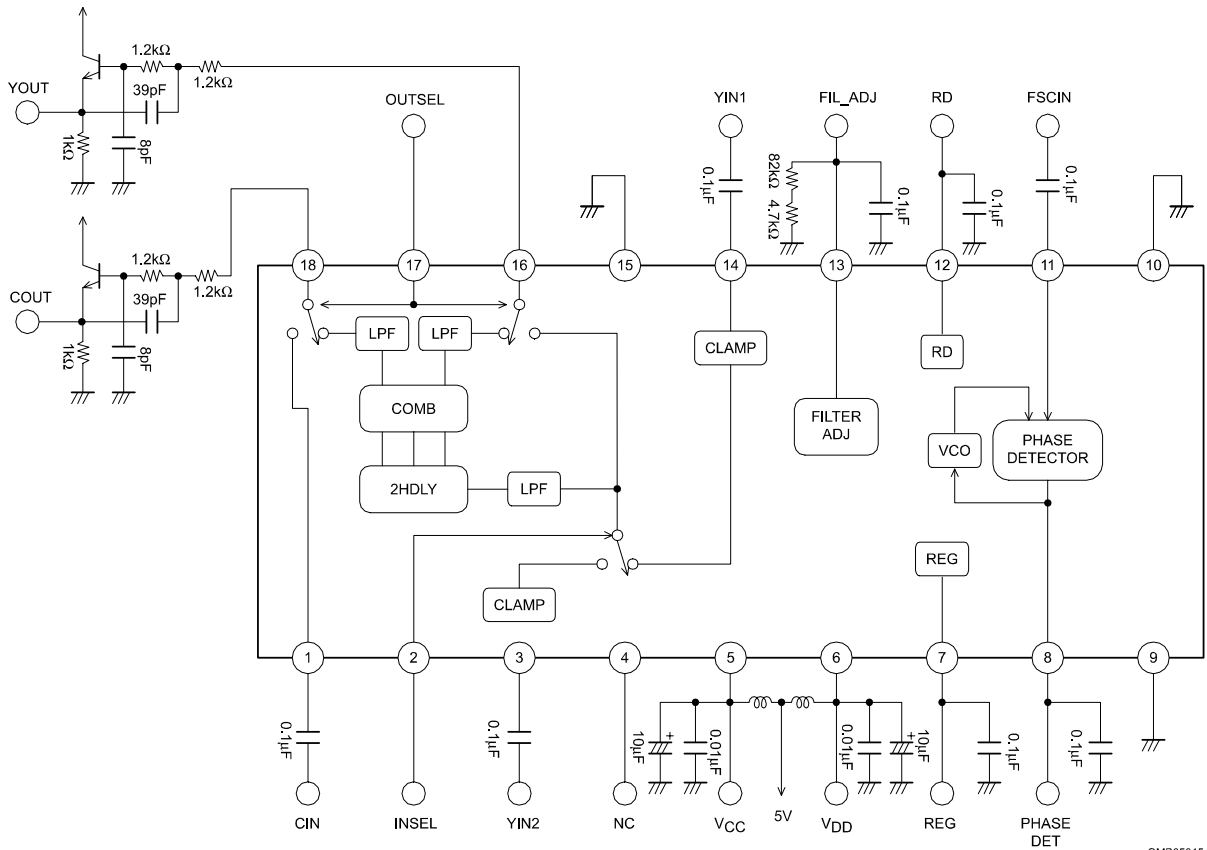
## Package Dimensions

unit: mm

3095A



## Block Diagram

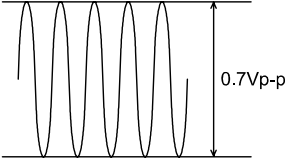
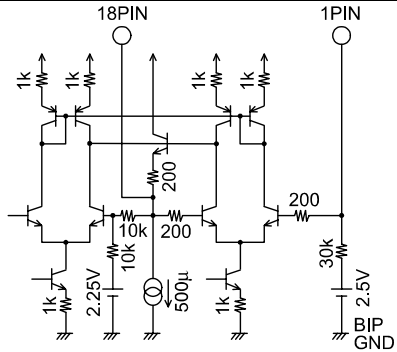
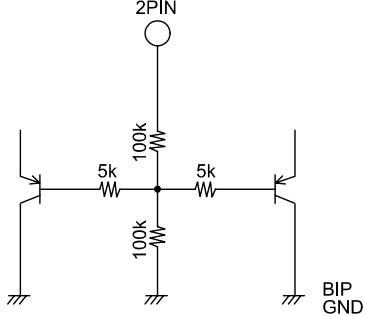
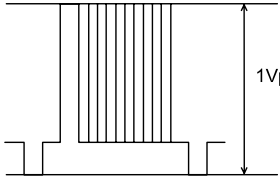
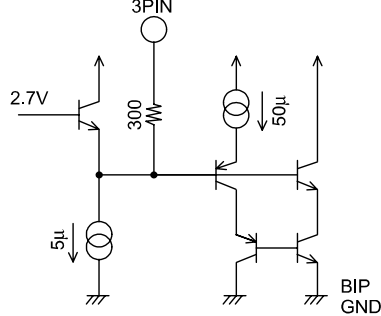
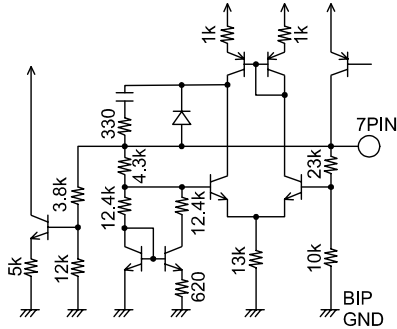


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## Pin Function

(unit:  $\Omega$ )

Pin No.	Pin name	DC voltage	Signal waveform	Input/Output form
1	CIN	2.5V	<p>CHROMA-SIGNAL</p> 	
2	INSEL		<p>GND: YIN2 VCC: YIN1</p>	
3	YIN2	2.5V	<p>VIDEO-SIGNAL</p> 	
5	BIP-V <sub>CC</sub>	5V	DC	
6	CCD-V <sub>CC</sub>	5V	DC	
7	REG	4V	DC	

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(unit:  $\Omega$ )

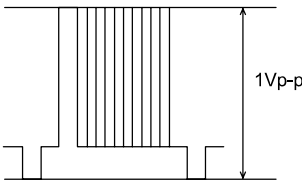
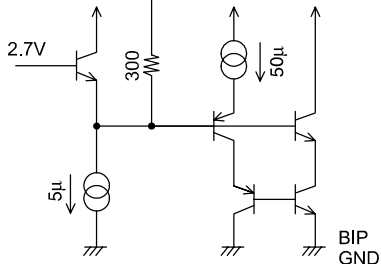
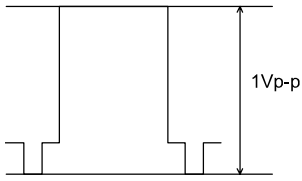
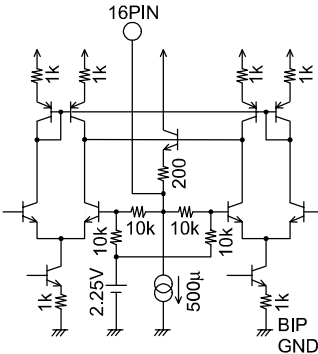
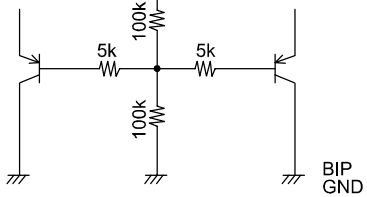
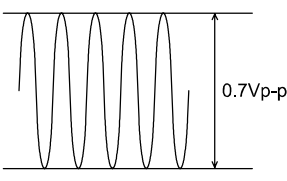
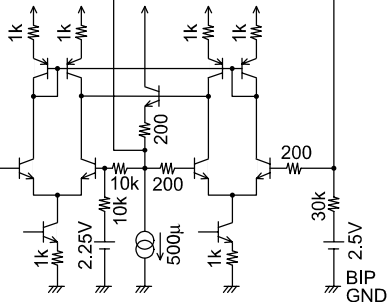
Pin No.	Pin name	DC voltage	Signal waveform	Input/Output form
8	PHASEDET	2.3V	DC	
9	CCD-GND	GND		
10	CCD-GND	GND		
11	FSC_IN	0.8V	<p>SIN-WAVE:3.58MHz</p>	
12	RD	10V	DC	
13	AFC	3.5V	DC	

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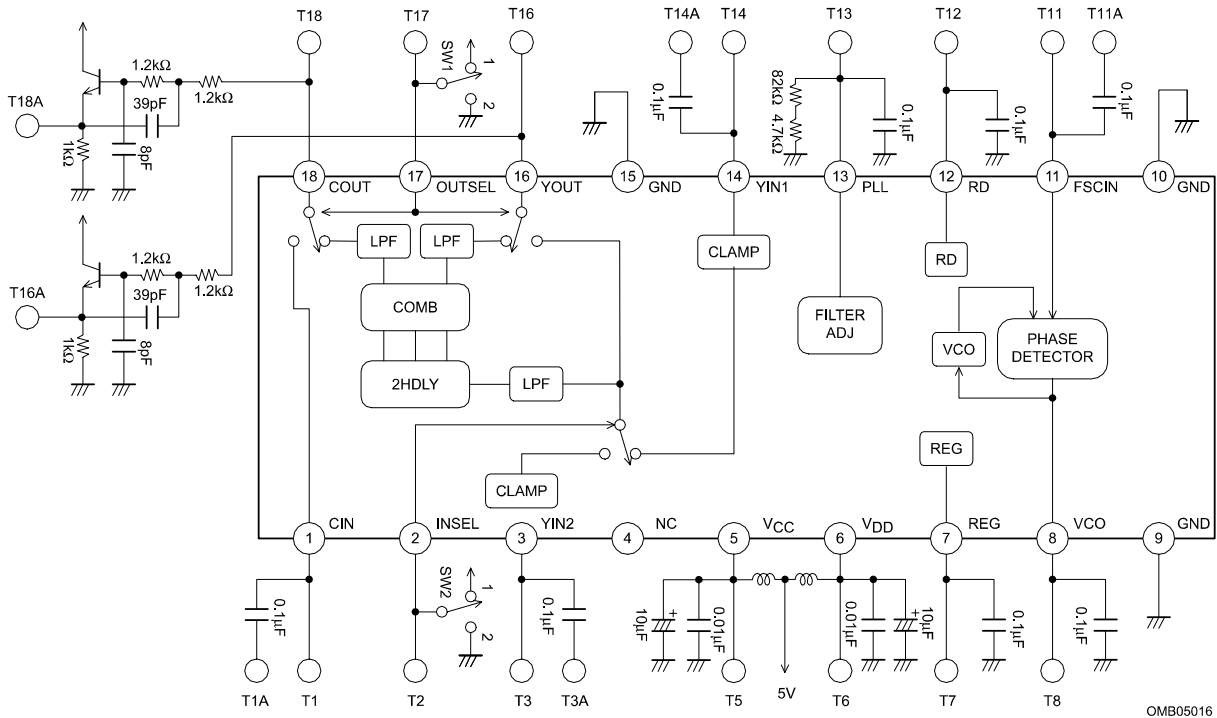
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(unit:  $\Omega$ )

Pin No.	Pin name	DC voltage	Signal waveform	Input/Output form
14	YIN1		<p style="text-align: center;">VIDEO-SIGNAL</p>  <p style="text-align: right;">1Vp-p</p>	<p style="text-align: center;">14PIN</p>  <p style="text-align: right;">BIP GND</p>
15	BIP-GND	GND		
16	YOUT	2.5V	<p style="text-align: center;">Y-SIGNAL</p>  <p style="text-align: right;">1Vp-p</p>	<p style="text-align: center;">16PIN</p>  <p style="text-align: right;">BIP GND</p>
17	OUTSEL		<p>GND: COMB V<sub>CC</sub>: THROUGH</p>	<p style="text-align: center;">17PIN</p>  <p style="text-align: right;">BIP GND</p>
18	COUT	2.5V	<p style="text-align: center;">CHROMA-SIGNAL</p>  <p style="text-align: right;">0.7Vp-p</p>	<p style="text-align: center;">18PIN</p>  <p style="text-align: right;">BIP GND</p>

Test Circuit



OMB05016

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