



LA7138M

Monolithic Linear IC
For the DVD Player
Analog Video Signal I/F Driver

Overview

The LA7138M is a video output interface IC for DVD players. It is an ideal DVD player driver IC that generates analog video signals such as composite/S and component/RGB signals. Incorporating Y/C-MIX, the LA7138M can dispense with the composite output that would otherwise have to be provided by a DA converter.

Feature

- Video S/N ratio: -80dB.
- f characteristics: 10MHz flat.
- Y/C time difference: 2ns maximum.
- Signal dynamic range: 170 IRE.
- Supports all types of video signals including the composite/S, component, and base-band (RGB) signals; the internal input configuration is selected under microcontroller control (input capacitors to be used in common).
- Provides two channels of 75Ω driver outputs each of which can be muted on and off independently under microcontroller control.
- Internally generates clamp pulses that are necessary when receiving the component input signals.
- The amplifier gain is selectable from 8.5dB and 6dB.
- The on-chip regulator circuit provides stable DC voltages that are immune to V_{CC} fluctuations.

Function

- Clamp.
- Amplifier.
- 75Ω driver.
- Y/C-MIX.
- DC voltage output for S1 and S2.

Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		15.0	V
Allowable power dissipation	P_{dmax}	$T_a \leq 75^\circ\text{C}$, Mounted on a board*	525	mW
Operating temperature	T_{opr}		-20 to +75	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +150	$^\circ\text{C}$

*: As mounted to the glass epoxy made board of a size 114.3×76.1×1.6mm³

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Recommended Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage A	V _{CC} A	*	12.0	V
Operating supply voltage range A	V _{CCop} A		9.0 to 13.0	V
Recommended supply voltage B	V _{CC} B	*	8.0	V
Operating supply voltage range B	V _{CCop} B		7.5 to 8.5	V
Input pin voltage application range	V _{IN}	V _{CCop} A, B+0.3≤13V	-0.3 to V _{CCop} A, B+0.3	V

*:A different operation circuit is recommended for recommended supply voltages A and B. An external operation circuit with a PNP transistor for voltage drop is recommended for the recommended supply voltage A.

Electrical Characteristics at Ta = 25°C, V_{CCA} = 9.0 to 13.0V, V_{CCB} = 7.5 to 8.5V

Parameter	Symbol	Input signal	Test point	Conditions	Ratings			Unit
					min	typ	max	
Current drain (1)	I _{CC1}		9pin	Current drain of VIDEO system.	29.6	37.0	44.4	mA
(A) Pin 10 (Y signal) input when the composite/S is selected.								
AMP-GAIN (Low)	G _Y M	Sig.1	T13/15	GAIN when 996mVp-p, 100kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _Y H	Sig.1	T13/15	GAIN when 761mVp-p, 100kHz is entered.	7.38	7.6	7.81	dB
Clamp voltage	C ₁₀ H	Sig.1	T10	Potential of sink chip of T10 when 761mVp-p is entered.	3.85	4.20	4.55	V
(B) Pin 6 (chroma signal) input when the composite/S is selected.								
AMP-GAIN (Low)	G _C M	Sig.2	T17/19	GAIN when 711mVp-p, 3.58MHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _C H	Sig.2	T17/19	GAIN when 544mVp-p, 3.58MHz is entered.	7.38	7.6	7.81	dB
Chroma input DC voltage	D ₆ H	Sig.2	T6	Offset voltage of T6 when 544 mVp-p is entered.	4.4	4.75	5.1	V
(C) Pin 3 (composite signal) input when the composite is selected.								
AMP-GAIN (Low)	G _S M1	Sig.3	T21/23	GAIN when 996mVp-p, 100kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _S H1	Sig.3	T21/23	GAIN when 761mVp-p, 100kHz is entered.	7.38	7.6	7.81	dB
Clamp voltage	C ₃ H	Sig.3	T3	Potential of sink chip of T3 when 761mVp-p is entered.	4.0	4.35	4.7	V
(D) Pins 6, 10 (S signal) input when the S is selected. To select "S", insert a 5.1kΩ resistor in series with pin 2, (See the block diagram.)								
AMP-GAIN (Low)	G _S M2	Sig.1 Sig.2	T21/23	GAIN when 996mVp-p, 100kHz or 711mVp-p, 3.58MHz is entered.	4.92	5.27	5.61	dB
AMP-GAIN (High)	G _S H2	Sig.1 Sig.2	T21/23	GAIN when 761mVp-p, 100kHz or 544mVp-p, 3.58MHz is entered.	7.25	7.6	7.94	dB
(E) GAIN ratio of signals when the composite is selected.								
Y/chroma -AMP-GAIN ratio	ΔY _C	Sig.1 Sig.2	T13/15 T17/19	GAIN ratio between G _Y H of (A) and G _C H of (B).	-3	0	3	%
Y/composite-AMP-GAIN ratio	ΔY _S 1	Sig.1 Sig.3	T13/15 T21/23	GAIN ratio between G _Y H of (A) and G _S H1 of (C).	-3	0	3	%
Chroma/composite -AMP-GAIN ratio	ΔC _S 1	Sig.2 Sig.3	T17/19 T21/23	GAIN ratio between G _C H of (B) and G _S H1 of (C).	-3	0	3	%
(F) GAIN ratio of signals when the S signal is selected.								
Y/S-AMP-GAIN ratio	ΔY _S 2	Sig.1 Sig.2	T13/15 T21/23	GAIN ratio between G _Y H of (A) and G _S H2 of (D).	-4.5	0	4.5	%
Chroma/S-AMP-GAIN ratio	ΔC _S 2	Sig.1 Sig.2	T17/19 T21/23	GAIN ratio between G _C H of (B) and G _S H2 of (D).	-4.5	0	4.5	%
(G) Pin 10 (Y signal) input when the component is selected.								
AMP-GAIN (Low)	G _Y M	Sig.1	T13/15	GAIN when 996mVp-p, 100 kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _Y H	Sig.1	T13/15	GAIN when 761mVp-p, 100 kHz is entered.	7.38	7.6	7.81	dB
Y input clamp voltage	C ₁₀ H	Sig.1	T10	Potential of sink chip of T10 when 761mVp-p is entered.	3.85	4.20	4.55	V

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Parameter	Symbol	Input signal	Test point	Conditions	Ratings			Unit
					min	typ	max	
(H) Pin 6 (B-Y or R-Y signal) when the component is selected.								
AMP-GAIN (Low)	G _N M	Sig.4	T17/19	GAIN when 996mVp-p, 100 kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _N H	Sig.4	T17/19	GAIN when 761mVp-p, 100 kHz is entered.	7.38	7.6	7.81	dB
Input pedestal clamp voltage	P ₆ H	Sig.4	T6	Potential of pedestal of T6 when 761mVp-p is entered.	4.4	4.75	5.1	V
AMP-GAIN (Low)	G _N M	Sig.4	T21/23	GAIN when 996mVp-p, 100 kHz is entered.	5.05	5.27	5.48	dB
(I) Pin 3 (B-Y or R- Y signal) input when the component is selected.								
AMP-GAIN (High)	G _N H	Sig.4	T21/23	GAIN when 761mVp-p, 100 kHz is selected.	7.38	7.6	7.81	dB
Input pedestal clamp voltage	P ₃ H	Sig.4	T3	Potential of pedestal of T3 when 761mVp-p is entered.	4.4	4.75	5.1	V
(J) GAIN ratio of signals when the component is selected.								
Y/composite-AMP-GAIN ratio (1)	ΔY1	Sig.1 Sig.4	T13/15 T17/19	GAIN ratio between G _Y H of (E) and G _N H of (F)	-3	0	3	%
Y/composite-AMP-GAIN ratio (2)	ΔY2	Sig.1 Sig.4	T13/15 T21/23	GAIN ratio between G _Y H of (E) and G _N H of (G)	-3	0	3	%
Component-AMP-GAIN ratio	ΔN	Sig.4 Sig.4	T17/19 T21/23	GAIN ratio between G _N H of (F) and that of (G)	-3	0	3	%
(K) Pin 10 (RGB signal) input when the base band is selected.								
AMP-GAIN (Low)	G _B M	Sig.1	T13/15	GAIN when 996mVp-p, 100 kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _B H	Sig.1	T13/15	GAIN when 761mVp-p, 100 kHz is entered.	7.38	7.6	7.81	dB
Input clamp voltage	C ₁₀ H	Sig.1	T10	Potential of sink chip of T10 when 761mVp-p is entered.	3.85	4.20	4.55	V
(L) Pin 6 (RGB signal) Input when the base band is entered.								
AMP-GAIN (Low)	G _B M	Sig.1	T13/15	GAIN when 996mVp-p, 100 kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _B H	Sig.1	T13/15	GAIN when 761mVp-p, 100 kHz is entered.	7.38	7.6	7.81	dB
Input clamp voltage	C ₆ H	Sig.1	T10	Potential of sink chip of T10 when 761mVp-p is entered.	4.0	4.35	4.7	V
(M) Pin 3 (RGB signal) Input when the base band is entered.								
AMP-GAIN (Low)	G _B M	Sig.1	T13/15	GAIN when 996mVp-p, 100 kHz is entered.	5.05	5.27	5.48	dB
AMP-GAIN (High)	G _B H	Sig.1	T13/15	GAIN when 761mVp-p, 100 kHz is entered.	7.38	7.6	7.81	dB
Input clamp voltage	C ₃ H	Sig.1	T10	Potential of sink chip of T10 when 761mVp-p is entered.	4.0	4.35	4.7	V
(N) GAIN ratio of signals when the base band is selected.								
Base bank –AMP-GAIN ratio (1)	ΔB1	Sig.1 Sig.1	T13/15 T17/19	GAIN ratio between G _B H of (I) and that of (J)	-3	0	3	%
Base band –AMP-GAIN ratio (2)	ΔB2	Sig.1 Sig.1	T13/15 T21/23	GAIN ratio between G _B H of (I) and that of (K)	-3	0	3	%
Base band –AMP-GAIN ratio	ΔB3	Sig.1 Sig.1	T17/19 T21/23	GAIN ratio between G _B H of (J) and that of (K)	-3	0	3	%
(O) f characteristics of GAIN (common to all modes and input signals, however, except for Y/C-MIX).								
LPF 6MHz attenuation	F _Y 6	Sig.1	T13/15	Difference between GAIN and G _Y H when 761mVp-p, 6MHz is entered.	-0.5	0	+0.5	dB
LPF 10MHz attenuation	F _Y 10	Sig.1	T13/15	Difference between GAIN and G _Y H when 761mVp-p, 10MHz is entered.	-0.5	0	+0.5	dB
(P) DC voltage for output mute (common to all modes).								
Pin 13 voltage	V ₁₃		T13		3.7	4.05	4.4	V
Pin 15 voltage	V ₁₅		T15		3.7	4.05	4.4	V
Pin 17 voltage	V ₁₇		T17		3.9	4.25	4.6	V
Pin 19 voltage	V ₁₉		T19		3.9	4.25	4.6	V
Pin 21 voltage	V ₂₁		T21		3.9	4.25	4.6	V
Pin 23 voltage	V ₂₃		T23		3.9	4.25	4.6	V

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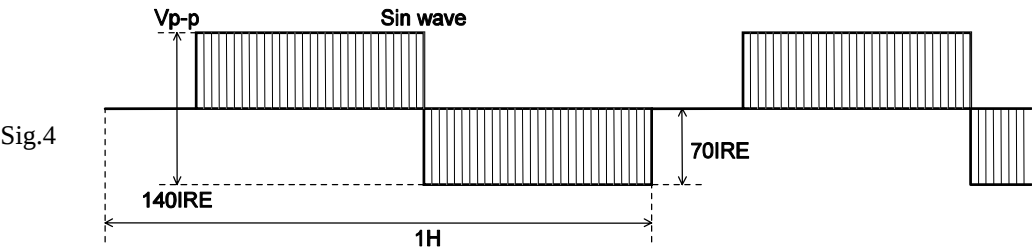
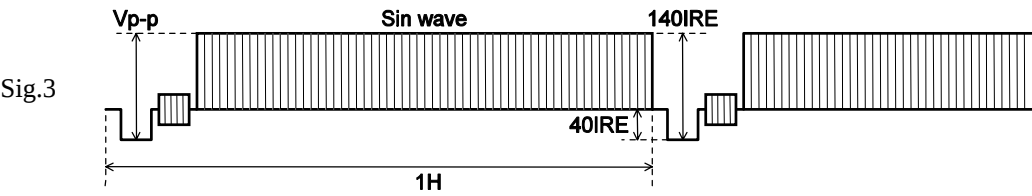
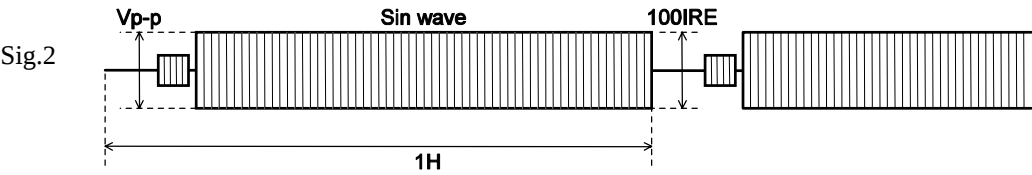
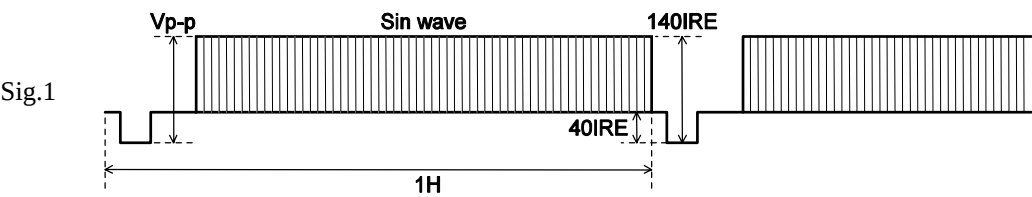
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Parameter	Symbol	Input signal	Test point	Conditions	Ratings			Unit
					min	typ	max	
* Output DC voltage characteristics at Ta = 25°C, VCCA = 9.0 to 13.0V								
Output DC for 4: 3	V43		T16	For 4:3 mode control (no load)	0	0.01	0.35	V
Output DC for Letter -Box	VLB		T16	For the Letter-Box mode control (Load current 500μA to flow out)	2.05	2.2	2.35	V
Output DC for squeeze	VSQ		T16	For squeeze mode control (Load current 500μA to flow out)	4.4	4.7	5.0	V
* Output DC voltage characteristics at Ta = 25°C, VCC B = 7.5 to 8.5V								
Output DC for 4: 3	V43		T16	For 4:3 mode control (no load)	0	0.01	0.35	V
Output DC for Letter-Box	VLB		T16	For the Letter-Box mode control (Load current 500μA to flow out)	1.90	2.15	2.40	V
Output DC for squeeze	VSQ		T16	For squeeze mode control (Load current 500μA to flow out)	4.15	4.60	5.00	V

Note) Each of AMP-GAIN and AMP-GAIN ratios is the value when the output pin part shown in the test circuit diagram is inserted.



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Design Guarantee Items at Ta = 25°C

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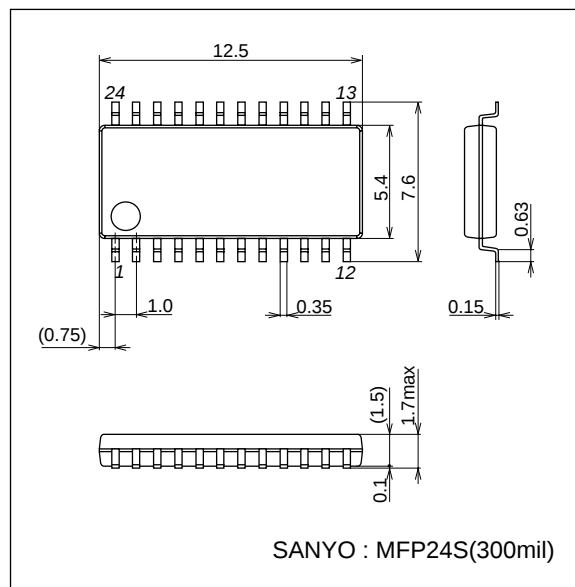
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Except for Y/C-MIX (V _{CCA} = 9.0 to 13.0V, V _{CCB} = 7.5 to 8.5V)						
Channel crosstalk	CT	The signal which becomes 1Vp-p at f = 4MHz and with the output in C connection is entered in other channels. Measure the magnitude of monitor channel output pins at 4MHz and specify the ratings as a ratio relative to the magnitude of output pin of other channels at 4MHz.		-65	-60	dB
Video S/N ratio	SN	Enter the Y signal with 100% white and apply 3.3V to pin 11. Measure S/N of the output signal. * Refer to Note 1.		-80	-78	dB
Differential gain	DG	Enter the 1Vp-p standard stair step signal (color) to obtain pin 11 = OPEN. Measure the differential gain of the output signal, with the output pin part shown in the measuring circuit diagram inserted.		0.5	2	%
Differential phase	DP	Enter the 1Vp-p standard stair step signal (color) to obtain pin 11 = OPEN. Measure the differential phase of the output signal, with the output pin part shown in the measuring circuit diagram inserted.	-1	0	1	dB
For Y/C-MIX (V _{CCB} = 7.5 to 8.5V)						
Channel crosstalk	CT	The signal which becomes 1Vp-p at f = 4MHz and with the output in C connection is entered in other channels. Measure the magnitude of monitor channel output pins at 4MHz and specify the ratings as a ratio relative to the magnitude of output pin of other channels at 4MHz.		-65	-60	dB
Video S/N ratio	SN	Enter the Y signal with 100% white and add pin 11 = 3.3V. Measure S/N of the output signal. * Refer to Note 1.		-74	-72	dB
Differential gain	DG	Enter the 761mVp-p standard stair step signal (color) to obtain pin 11 = 3.3V. Measure the differential gain of the output signal, with the output pin part shown in the measuring circuit diagram inserted.		4	5.5	%
Differential phase	DP	Enter the 761mVp-p standard stair step signal (color) to obtain pin 11 = 3.3V. Measure the differential phase of the output signal, with the output pin part shown in the measuring circuit diagram inserted.	-1	0.5	1.5	dB

* Note 1) Since the noise in IC is dependent on the stability of regulator, it is recommended to connect a 470μF capacitor when the S/N ratio of -80dB is to be secured for controls other than Y/C-MIX. To secure the S/N ratio of -74dB for Y/C-MIX, set the supply voltage to 8V (V_{CCB}) and apply 8V also to this pin. (See the test circuit B.)

Package Dimensions

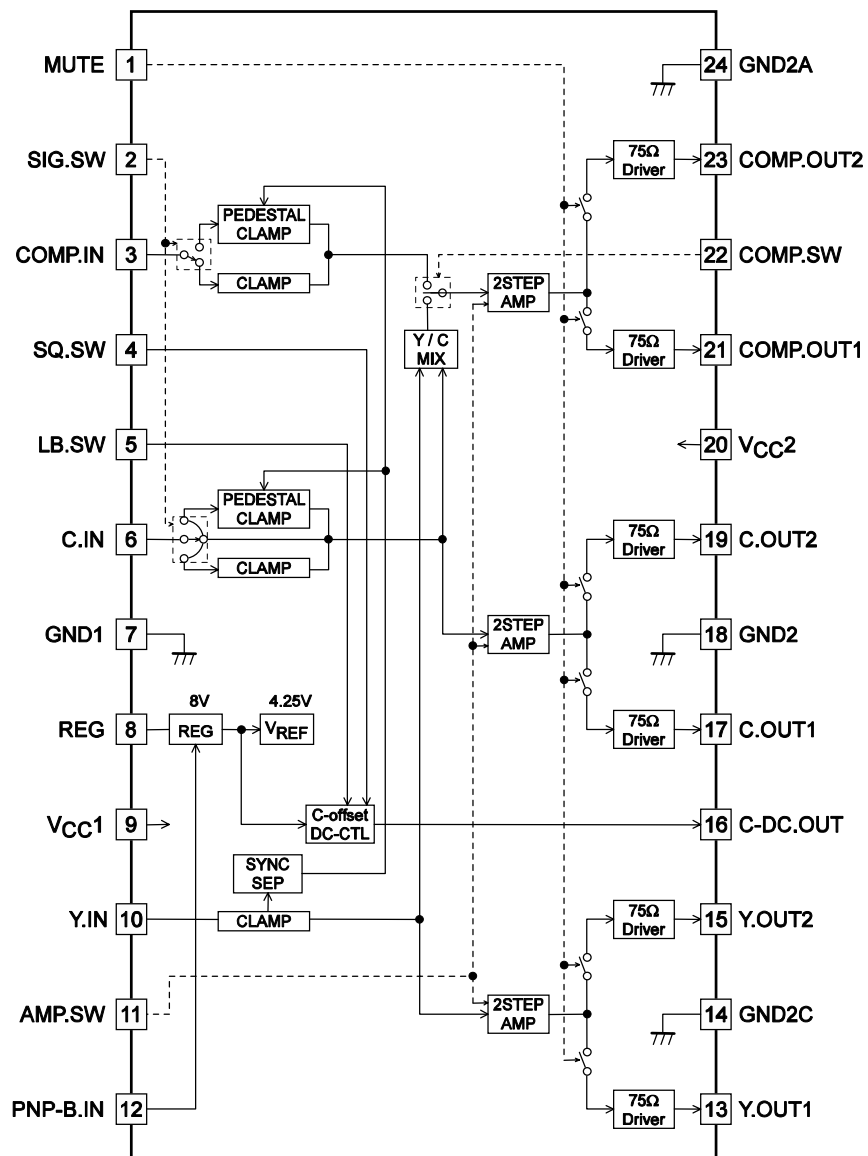
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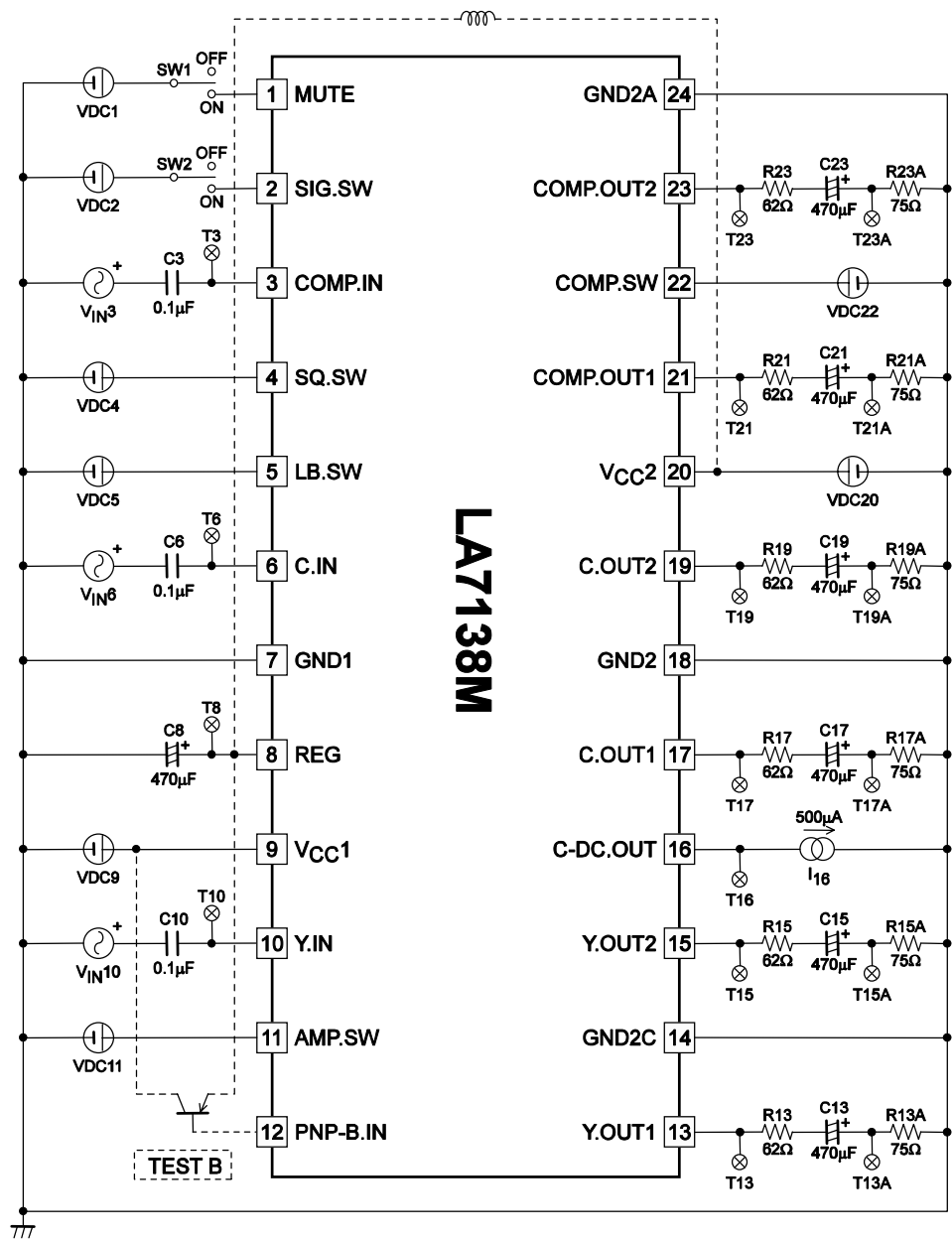
Block Diagram

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Test Circuit

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Input/Output form Diagram

Pin No.	Pin name	I/O	Pin voltage	Input/ Output impedance	Function	Equivalent circuit
1	MUTE	I	1.7V	21k Ω	Mute control pin for video signal outputs (Pins 13, 15, 17, 19 and 21). Control can be made with a microcontroller operating on 3.3 to 5.0V power supply.	
2	SIG.SW	I	1.7V	21k Ω	Pin to select the input form of pins 3 and 6 according to the type of input signal (composite/s/component/ base band). Control can be made with a microcontroller operating on 3.3 to 5.0V power supply. Add a 5.1k Ω resistor in series externally.	
3	COMP.IN	I	4.5V	Clamp form	Video signal input pin. Enter the composite signal for input of the composite/S signal. Enter the B-Y or R-Y signal for input of the component signal. For input of the base band, enter any of RGB signals that have a sync signal. (This pin is connected to GND when the S signal is entered.)	
4	SQ.SW	I	2.4V	9.0G Ω	Pin to enter the squeeze information. Control can be made with a microcontroller that operates on 3.3 to 5.0V power supply.	
5	LB.SW	I	2.43V	8.1G Ω	Pin to enter the Letter-Box information. Control can be made with a microcontroller that operates on 3.3 to 5.0V power supply.	
22	COMP.SW	I	2.4V	9.0G Ω	Y/C-MIX ON/OFF control pin. Be sure to set this pin HIGH in cases other than composite/S control of pin 2. Control is possible with a microcontroller operating on 3.3 to 5.0V power supply or through selection of V _{CC} /GND on the substrate.	

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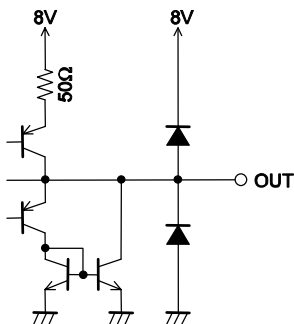
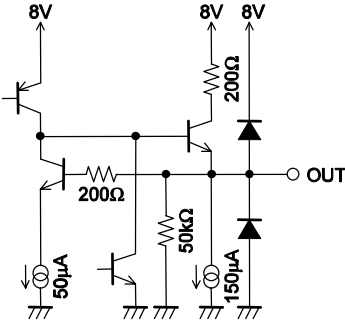
Pin No.	Pin name	I/O	Pin voltage	Input/ Output impedance	Function	Equivalent circuit
6	C.IN	I	4.8V	10kΩ	Video signal input pin. Enter the chroma signal for input of composite/S signal. Enter the B-Y or R-Y signal for input of the component signal input. For input of the base band signal, enter any of RGB signals that have a sync signal.	
8	REG	O	8V	1.5kΩ	Pin for the regulator that generates an 8V supply voltage in IC. To use the supply voltage of 12V, connect a collector of the external PNP transistor (see the test circuit A). Since the noise in IC is dependent on the stability of regulator, it is recommended to connect a 470μF capacitor when the S/N ratio of -80dB is to be secured for controls other than Y/C-MIX. To secure the S/N ratio of -74dB for Y/C-MIX, set the supply voltage to 8V (V _{CCB}) and apply 8V also to this pin. (See the test circuit B.)	
10	Y.IN	I	4.2V	Clamp form	Video signal input pin. Enter the Y signal for input of composite/S and component signal. For input of the base band signal, enter any of RGB signals that have a sync signal.	
11	AMP.SW	I	2.4V	9.0GΩ	Control pin to select the AMP gain according to the input signal amplitude. Control is possible with a microcontroller that operates on 3.3 to 5.0V power supply as well as through selection of V _{CC} /GND on a substrate.	
12	PNP-B-IN	O	3.4V	4.0GΩ	Base input pin of the external PNP transistor for the 8V regulator. Connect to the transistor in case of the supply voltage of 12V (see the test circuit A). To use the supply voltage of 8V, keep this pin open (see the test circuit B).	

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Pin No.	Pin name	I/O	Pin voltage	Input/ Output impedance	Function	Equivalent circuit
13	Y.OUT1	O	2.7V	11.6Ω	Video signal output pin. Drives the video signal entered in pin 10 by 75Ω. Mute possible with pin 1.	
15	Y.OUT2	O	2.7V	11.6Ω		
17	C.OUT1	O	3.9V	11.6Ω	Video signal output pin. Drives the video signal entered in pin 6 by 75Ω. Mute possible with pin 1.	
19	C.OUT2	O	3.9V	11.6Ω		
21	COMP.OUT1	O	3.57V	11.6Ω	Video signal output pin. Drives the video signal entered in pin 3 by 75Ω. Mute possible with pin 1.	
23	COMP.OUT2	O	3.57V	11.6Ω		
16	C-DC.OUT	O	4.7V	4.1Ω	S1/S2 DC voltage output pin. Outputs 0V for the 4: 3 mode, 2.2V for the Letter-Box mode, and 5V for the squeeze mode. Connect with a 10kΩ resistor after capacitive coupling of chroma signal output.	
9	V _{CC} 1	P	12V OR 8.0V		V _{CC} for a signal processing circuit. To use the supply voltage of 12V, connect an emitter of external PNP transistor (see the test circuit A). Insert a capacitor of around 47μF between this V _{CC} and pin 7.	
20	V _{CC} 2	P	8V		V _{CC} for the 75Ω drive circuit. Insert a capacitor of around 47μF between this V _{CC} and GND of the 75Ω drive circuit. Pay due attention to the layout because the output signal has a substantial amplitude.	
7	GND1	P	0V		GND for the signal processing circuit.	
14	GND2	P	0V		GND of the 75Ω drive circuit (pins 13 and 15). Pay due attention on the layout because the output signal has a substantial amplitude.	
18	GND2B	P	0V		GND of the 75Ω drive circuit (pins 17 and 19). Pay due attention to the layout because the output signal has a substantial amplitude.	
24	GND2A	P	0V		GND of the 75Ω drive circuit (pins 21 and 23). Pay due attention on the layout because the output signal has a substantial amplitude.	

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Control Pin Function Table

Pin No.	Pin condition	LOW	OPEN	HIGH
Pin 1	Pin voltage	0 to 0.6V	1.55 to 1.75V	2.7 to 5V
	Mute of 75Ω driver	13,17,21 mute	No mute	15,19,23 mute
Pin 2 (Y point)	Pin voltage	0 to 0.6V	1.55 to 1.75V	2.7 to 5V
	Signal input mode select	Composite/S	Base band	Component
Pin 11	Pin voltage	0 to 1V		2.7 to 8V (Note)
	AMP-GAIN select	6dB		8.5dB
Pin 22	Pin voltage	0 to 1V		2.7 to 8V (Note)
	Y/C-MIX Control	Y/C-MIX		Composite

Note: Do not apply to pins 11 and 22 a voltage higher than the REG & V_{CC2} voltages of pins 8 and 20.

* Do not use Y/C-MIX for cases other than composite/S.

* For composite, the chroma signal is entered with pin 6 in C connection, the composite signal is entered with pin 3 clamped, and the Y signal is entered with pin 9 clamped. However, for S, Pin 3 has no input.

For component, the B-Y/R-Y signal is entered with pins 3 and 6 clamped to pedestal and the Y signal is entered with pin 10 clamped.

For base band, the RGB signal is entered with pins 3, 6, and 10 clamped.

Do not use Pins 11 and 22 in the OPEN state.

Pin 4	Pin 5	Pin 16 output DC
0 to 1V	0 to 1V	LOW (0V) → 4:3Mode
0 to 1V	2.6 to 5V	MIDDLE (2.5V) → Letter-Box mode
2.6 to 5V	0 to 1V	HIGH (5V) → Squeeze mode
2.6 to 5V	2.6 to 5V	Not allowed

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Switch conditions

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Symbol	Control voltage (Unit: V)						Switch conditions	
	VDC1	VDC2	VDC4	VDC5	VDC11	VDC22	SW1	SW2
I _{CC1}	0	0	3.3	0	3.3	3.3	ON	ON
I _{CC2}	0	0	3.3	0	3.3	3.3	ON	ON
(A) Pin 10 (Y signal) input when the composite/S is selected.								
G _Y M	0/3.3	0	*	*	0	3.3	ON/OFF	ON
G _Y H	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
C ₁₀ H	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
(B) Pin 6 (chroma signal) input when the composite/S is selected.								
G _C M	0/3.3	0	*	*	0	3.3	ON/OFF	ON
G _C H	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
C ₆ H	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
(C) Pin 3 (composite signal) input when the composite is selected.								
G _S M1	0/3.3	0	*	*	0	3.3	ON/OFF	ON
G _S H1	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
C ₃ H	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
(D) GAIN ratio of signals when the composite/S is selected.								
G _S M2	0/3.3	0	*	*	0	0	ON/OFF	ON
G _S H2	0/3.3	0	*	*	3.3	0	ON/OFF	ON
(E) GAIN ratio of signals when the composite is selected.								
ΔY _C	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
ΔY _{S1}	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
ΔC _{S1}	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
(F) GAIN ratio of signals when the S is selected.								
ΔY _{S2}	0/3.3	0	*	*	3.3	0	ON/OFF	ON
ΔC _{S2}	0/3.3	0	*	*	3.3	0	ON/OFF	ON
(G) Pin 10 (Y signal) input when the component is selected.								
G _Y M	0/3.3	3.3	*	*	0	3.3	ON/OFF	ON
G _Y H	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
C ₁₀ H	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
(H) Pin 6 (B-Y or R-Y signal) input when the component is selected.								
G _N M	0/3.3	3.3	*	*	0	3.3	ON/OFF	ON
G _N H	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
P ₆ H	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
(I) Pin 3 (B-Y or R-Y signal) input when the component is selected.								
G _N M	0/3.3	3.3	*	*	0	3.3	ON/OFF	ON
G _N H	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
P ₃ H	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
(J) GAIN ratio of signals when the component is selected.								
ΔY1	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
ΔY2	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
ΔN	0/3.3	3.3	*	*	3.3	3.3	ON/OFF	ON
(K) Pin 10 (RGB signal) input when the base band is selected.								
G _B M	0/3.3	*	*	*	0	3.3	ON/OFF	OFF
G _B H	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
C ₁₀ H	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
(L) Pin 6 (RGB signal) input when the base band is selected.								
G _B M	0/3.3	*	*	*	0	3.3	ON/OFF	OFF
G _B H	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
C ₆ H	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
(M) Pin 3 (RGB signal) input when the base band is selected.								
G _B M	0/3.3	*	*	*	0	3.3	ON/OFF	OFF
G _B H	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
C ₃ H	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF

*: Any condition

Continued on next page.

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Symbol	Control voltage (Unit: V)						Switch conditions	
	VDC1	VDC2	VDC4	VDC5	VDC11	VDC22	SW1	SW2
(N) GAIN ratio of signals when the base band is selected								
$\Delta B1$	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
$\Delta B2$	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
$\Delta B3$	0/3.3	*	*	*	3.3	3.3	ON/OFF	OFF
(O) f characteristics of GAIN (common to all modes and input signals, however, except for Y/C-MIX)								
F _{Y6}	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
F _{Y10}	0/3.3	0	*	*	3.3	3.3	ON/OFF	ON
(P) DC voltage for output mute (common to all modes)								
V ₁₃	0	*	*	*	0/3.3	0/3.3	ON	*
V ₁₅	3.3	*	*	*	0/3.3	0/3.3	ON	*
V ₁₇	0	*	*	*	0/3.3	0/3.3	ON	*
V ₁₉	3.3	*	*	*	0/3.3	0/3.3	ON	*
V ₂₁	0	*	*	*	0/3.3	0/3.3	ON	*
V ₂₃	3.3	*	*	*	0/3.3	0/3.3	ON	*
(Q) Output DC voltage characteristics								
V ₄₃	*	*	0	0	0/3.3	0/3.3	*	*
V _{LB}	*	*	0	3.3	0/3.3	0/3.3	*	*
V _{SO}	*	*	3.3	0	0/3.3	0/3.3	*	*

*: Any condition

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