

SANYO	No.2896	LA7220M
	3-Channel 2-Position Electronic Switch for VCR / Audio Use	

The LA7220M is a 3-channel 2-position high-performance analog switch having wide application from audio band to video band. It is also provided with 2 channels of muting function.

Features

- 3-channel 2-position switch
- Wide input dynamic range
- Low distortion
- Good frequency characteristic
- Muting available

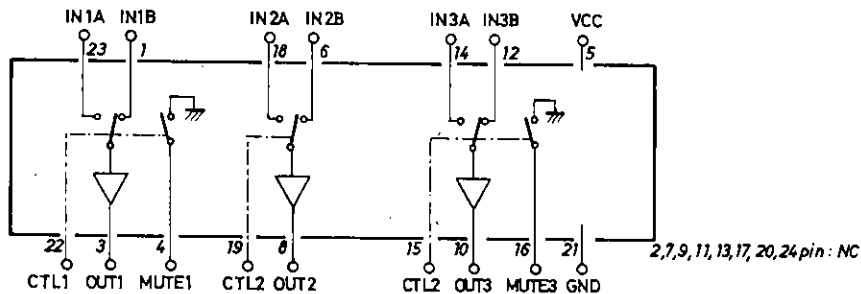
Maximum Ratings at Ta = 25°C

Maximum Supply Voltage	V _{CC} max		15	V
Allowable Power Dissipation	P _d max	Ta ≤ 65°C	500	mW
Operating Temperature	T _{op}		-20 to +65	°C
Storage Temperature	T _{stg}		-40 to +125	°C

Operating Conditions at Ta = 25°C

Recommended Supply Voltage	V _{CC}	12	V
Operating Voltage Range	V _{CC} op	9 to 13	V

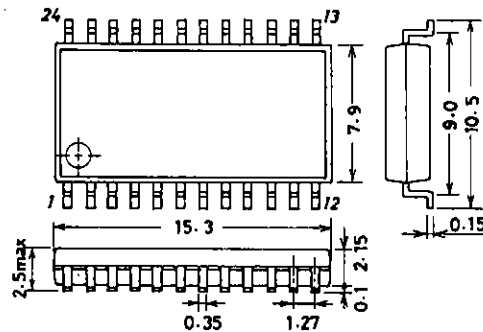
Equivalent Circuit Block Diagram



Package Dimensions

(unit : mm)

3045B



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Operating Characteristics at Ta = 25°C, VCC = 12V				min	typ	max	unit
Current Dissipation	I _{CC}				30.0	39.9	mA
Total Harmonic Distortion	THD	*1, R _g = 600Ω, 4.5V _{p-p} , f = 1kHz R _L = ∞			0.007	0.1	%
Noise Voltage	V _{NO}	*1, R _g = 600Ω, f = 20Hz to 20kHz R _L = ∞			-93	-80	dBs
Crosstalk 1ch	CR1	*2, Input 1: R _g = 50Ω, 2V _{p-p} , f = 3.58MHz, Input 2: R _g = 500Ω			-50		dB
2ch	CR2	*2, Input 1: R _g = 50Ω			-60		dB
3ch	CR3	*2, Input 1: R _g = 50Ω			-50		dB
Pedestal Level	ΔV _{ped}	*1, V _{CTL} (Pins 10, 13, 15) = 0 to 12V		-100	0	+100	mV
Maximum Input Voltage	vinmax	*1, R _g = 600Ω, f = 1kHz, R _L = ∞, THD = 1%		5.0			V _{p-p}
2nd Harmonic Voltage	H2	*1, R _g = 50Ω, 4.0V _{p-p} , f = 1MHz, R _L = ∞		-46	-55		dB
3rd Harmonic Voltage	H3	*1, "		-46	-55		dB
Switch Changeover Voltage	V _{CTLs}	*1		2.6	3.1	4.0	V
Mute Threshold Voltage	V _{ML}	*3, L Level, mute threshold voltage		1.1	1.5	1.9	V
	V _{MH}	*3, H Level, mute threshold voltage		6.6	7.3	8.0	V
Crosstalk between Channels							
1ch		*4, R _g = 500Ω, R _L = ∞, other channel input R _g = 50Ω, 2V _{p-p} , f = 3.58MHz		-50	-68		dB
2ch		*4, "		-50	-68		dB
3ch		*4, "		-50	-68		dB
Mute Compression Ratio		*3, R _g = 600Ω, 2V _{p-p} , f = 1kHz, R _L = ∞, series resistance 10kΩ			-60		dB
Control Pin Flow-in Current	I _{CTL}	*1				8	μA
Input Impedance	z _{in}	*1				10	kΩ
Output Impedance	z _{out}	*1				29	Ω
Pin Voltage	(Pin 1)	V1	V22 = 0V			7.9	V
"	(Pin 1)	V1	V22 = 12V			7.9	V
"	(Pin 3)	V3				7.2	V
"	(Pin 6)	V6	V19 = 0V			7.9	V
"	(Pin 6)	V6	V19 = 12V			7.9	V
"	(Pin 8)	V8				7.2	V
"	(Pin 10)	V10				7.2	V
"	(Pin 12)	V12	V15 = 0V			7.9	V
"	(Pin 12)	V12	V15 = 12V			7.9	V
"	(Pin 14)	V14	V15 = 0V			7.9	V
"	(Pin 14)	V14	V15 = 12V			7.9	V
"	(Pin 18)	V18	V19 = 0V			7.9	V
"	(Pin 18)	V18	V19 = 12V			7.9	V
"	(Pin 23)	V23	V22 = 0V			7.9	V
"	(Pin 23)	V23	V22 = 12V			7.9	V

*1 Measurements are made for each of 1ch, 2ch, 3ch using input A and input B.

Input A : V_{CTL}(pins 10, 13, 15) is 12V at the measurement mode.

Input B : V_{CTL} is 0V at the measurement mode.

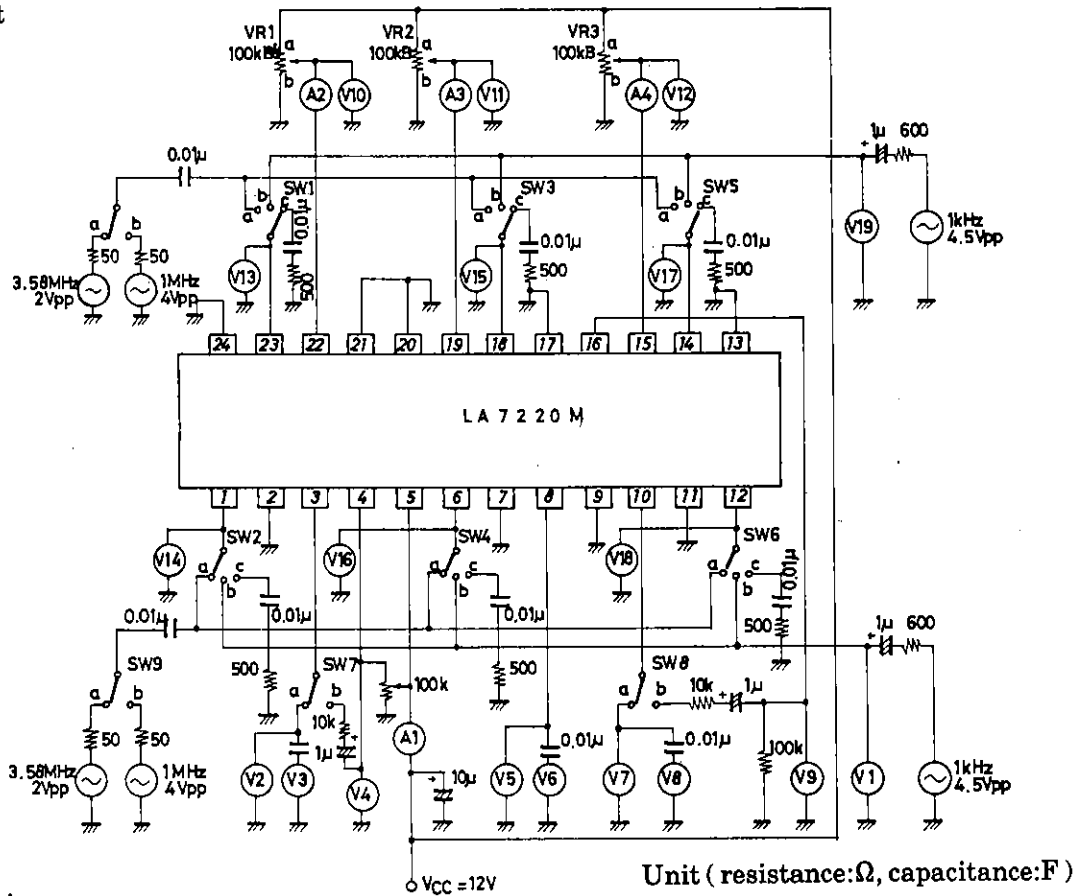
*2 Measurements are made using input A and input B.

*3 Measurements are made for 1ch, 3ch.

*4 Measurements are made for each of 1ch, 2ch, 3ch using input A and input B on other channel.

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Test Circuit



Test Conditions

Item	Symbol	SW VR Mode												Test Point	
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	VR1	VR2	VR3		
Current Dissipation	I _{CC}	c	c	c	c	c	c	c	a	a	a	b	b	b	A1
Total Harmonic Distortion	1 chA	THD	b	c	c	c	c	c	a	a	a	a	b	b	V3
	1 chB	THD	c	b	c	c	c	c	a	a	a	b	b	b	V3
	2 chA	THD	c	c	b	c	c	c	a	a	a	b	a	b	V6
	2 chB	THD	c	c	c	b	c	c	a	a	a	b	b	b	V6
	3 chA	THD	c	c	c	c	b	c	a	a	a	b	b	a	V8
	3 chB	THD	c	c	c	c	c	b	a	a	a	b	b	b	V8
Noise	1 chA	V _{N0}	c	c	c	c	c	c	a	a	a	a	b	b	V3
	1 chB	V _{N0}	c	c	c	c	c	c	a	a	a	b	b	b	V3
	2 chA	V _{N0}	c	c	c	c	c	c	a	a	a	b	a	b	V6
	2 chB	V _{N0}	c	c	c	c	c	c	a	a	a	b	b	b	V6
	3 chA	V _{N0}	c	c	c	c	c	c	a	a	a	b	b	a	V8
	3 chB	V _{N0}	c	c	c	c	c	c	a	a	a	b	b	b	V8
Crosstalk	1 chA	CR1	c	a	c	c	c	c	a	a	a	a	b	b	V3
	1 chB	CR1	a	c	c	c	c	c	a	a	a	b	b	b	V3
	2 chA	CR2	c	c	c	a	c	c	a	a	a	b	a	b	V6
	2 chB	CR2	c	c	a	c	c	c	a	a	a	b	b	b	V6
	3 chA	CR3	c	c	c	c	c	a	a	a	a	b	b	a	V8
	3 chB	CR3	c	c	c	c	a	c	a	a	a	b	b	b	V8
Pedestal	1 ch	ΔV _{PED}	c	c	c	c	c	c	a	a	a	a/b	b	b	V2
	2 ch	ΔV _{PED}	c	c	c	c	c	c	a	a	a	b	a/b	b	V5
	3 ch	ΔV _{PED}	c	c	c	c	c	c	a	a	a	b	b	a/b	V7
Maximum Input Voltage	1 chA	V _{inmax}	b	c	c	c	c	c	a	a	a	a	b	b	V19
	1 chB	V _{inmax}	c	b	c	c	c	c	a	a	a	b	b	b	V1
	2 chA	V _{inmax}	c	c	b	c	c	c	a	a	a	b	a	b	V19
	2 chB	V _{inmax}	c	c	c	b	c	c	a	a	a	b	b	b	V1
	3 chA	V _{inmax}	c	c	c	c	b	c	a	a	a	b	b	a	V19
	3 chB	V _{inmax}	c	c	c	c	c	b	a	a	a	b	b	b	V1

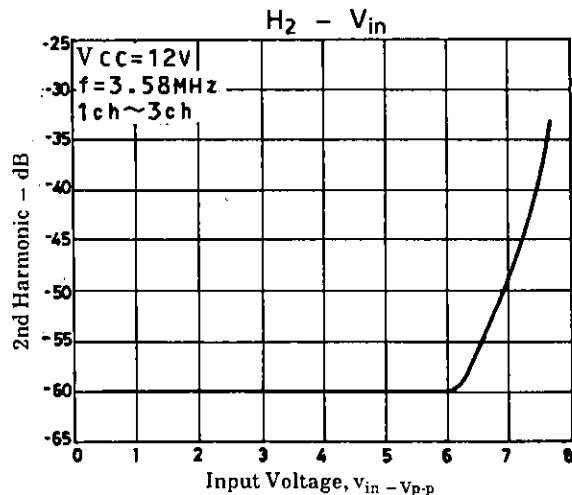
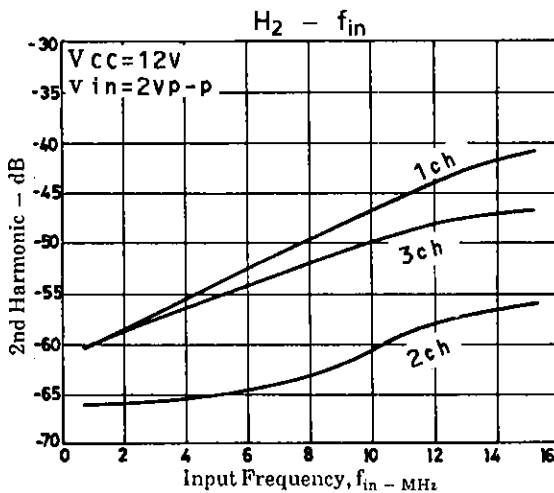
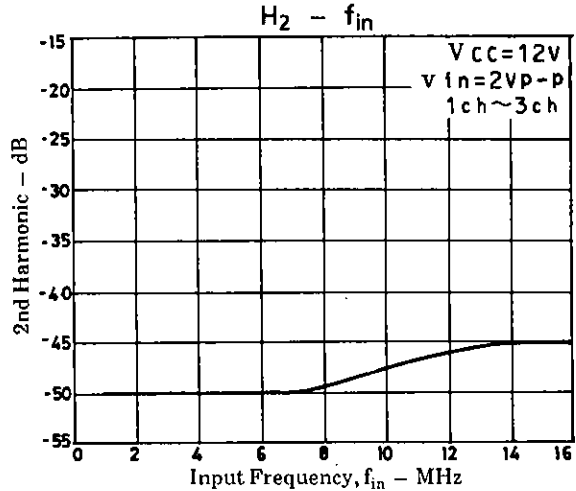
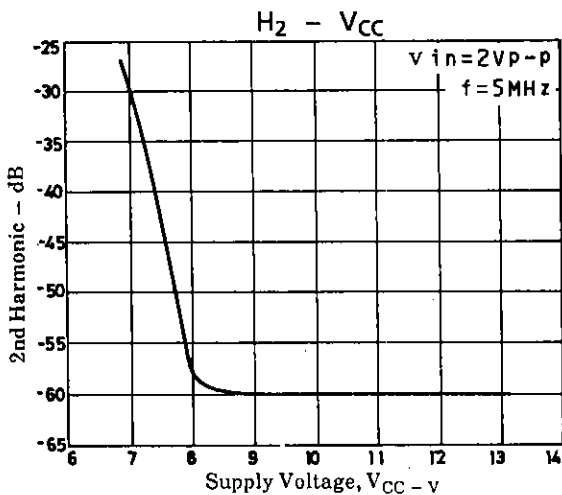
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Item	Symbol	SW VR Mode												Test	
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	VR1	VR2	VR3	Point	
2nd Harmonic	1 chA	H2-1	a	c	c	c	c	c	a	a	b	a	b	b	V3
	1 chB	H2-1	c	a	c	c	c	c	a	a	b	b	b	b	V3
	2 chA	H2-2	c	c	a	c	c	c	a	a	b	b	a	b	V6
	2 chB	H2-2	c	c	c	a	c	c	a	a	b	b	b	b	V6
	3 chA	H2-3	c	c	c	c	a	c	a	a	b	b	b	a	V8
	3 chB	H2-3	c	c	c	c	c	a	a	a	b	b	b	b	V8
3rd Harmonic	1 chA	H3-1	a	c	c	c	c	c	a	a	b	a	b	b	V3
	1 chB	H3-1	c	a	c	c	c	c	a	a	b	b	b	b	V3
	2 chA	H3-2	c	c	a	c	c	c	a	a	b	b	a	b	V6
	2 chB	H3-2	c	c	c	a	c	c	a	a	b	b	b	b	V6
	3 chA	H3-3	c	c	c	c	a	c	a	a	b	b	b	a	V8
	3 chB	H3-3	c	c	c	c	c	a	a	a	b	b	b	b	V8
Switch Changeover Voltage	1 ch	VCTLS	a	a	c	c	c	c	a	a	a	Var*	b	b	V10
	2 ch	VCTLS	c	c	a	a	c	c	a	a	a	b	Var*	b	V11
	3 ch	VCTLS	c	c	c	c	a	a	a	a	a	b	b	Var*	V12
Mute Threshold	1 ch	VML	b	b	c	c	c	c	b	a	a	Var*	b	b	V10
	1 ch	VMH	b	b	c	c	c	c	b	a	a	Var*	b	b	V10
	3 ch	VML	c	c	c	c	b	b	a	b	a	b	b	Var*	V12
	3 ch	VMH	c	c	c	c	b	b	a	b	a	b	b	Var*	V12
Crosstalk between Channels	1 ch		c	c	c	c	a	c	a	a	a	a	a	a	V3
	1 ch		c	c	c	c	c	a	a	a	a	a	a	b	V3
	1 ch		c	c	c	c	a	c	a	a	a	a	b	a	V3
	1 ch		c	c	c	c	c	a	a	a	a	a	b	a	V3
	1 ch		c	c	a	c	c	c	a	a	a	b	a	b	V3
	1 ch		c	c	c	a	c	c	a	a	a	b	b	a	V3
	1 ch		c	c	c	a	c	c	a	a	a	b	b	b	V3
	1 ch		c	c	c	a	c	c	a	a	a	b	b	b	V3
	2 ch		c	c	c	c	a	c	a	a	a	a	a	a	V6
	2 ch		c	c	c	c	c	a	a	a	a	a	a	b	V6
	2 ch		c	c	c	c	a	c	a	a	a	b	a	a	V6
	2 ch		c	c	c	c	c	a	a	a	a	a	b	a	V6
	2 ch		a	c	c	c	c	c	a	a	a	a	b	a	V6
	2 ch		a	c	c	c	c	c	a	a	a	a	b	b	V6
	2 ch		c	a	c	c	c	c	a	a	a	b	b	a	V6
	2 ch		c	a	c	c	c	c	a	a	a	b	b	b	V6
	3 ch		c	c	a	c	c	c	a	a	a	a	a	a	V8
	3 ch		c	c	c	a	c	c	a	a	a	a	b	a	V8
	3 ch		c	c	c	a	c	c	a	a	a	b	b	a	V8
	3 ch		a	c	c	c	c	c	a	a	a	a	a	b	V8
3 ch		a	c	c	c	c	c	a	a	a	b	a	b	V8	
3 ch		c	a	c	c	c	c	a	a	a	b	a	b	V8	
3 ch		c	a	c	c	c	c	a	a	a	b	b	b	V8	
Mute Compression Ratio	1 ch		b	b	c	c	c	c	b	a	a	Var*	b	b	V4
	3 ch		c	c	c	c	b	b	a	b	a	b	b	Var*	V9
Control Pin Flow-in Current	1 ch	I CTL1	c	c	c	c	c	c	a	a	a	a	b	b	A2
	2 ch	I CTL2	c	c	c	c	c	c	a	a	a	b	a	b	A3
	3 ch	I CTL3	c	c	c	c	c	c	a	a	a	b	b	a	A4
Pin Voltage	(Pin 1)	V1	c	c	c	c	c	c	a	a	a	b	b	b	V14
	(Pin 1)	V1	c	c	c	c	c	c	a	a	a	a	b	b	V14
	(Pin 3)	V3	c	c	c	c	c	c	a	a	a	b	b	b	V2
	(Pin 6)	V6	c	c	c	c	c	c	a	a	a	b	b	b	V16
	(Pin 6)	V6	c	c	c	c	c	c	a	a	a	b	a	b	V16
	(Pin 8)	V8	c	c	c	c	c	c	a	a	a	b	b	b	V5
	(Pin 10)	V10	c	c	c	c	c	c	a	a	a	b	b	b	V7

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Item	Symbol	SW VR Mode												Test Point
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	VR1	VR2	VR3	
(Pin 12)	V 12	c	c	c	c	c	c	a	a	a	b	b	b	V18
(Pin 12)	V 12	c	c	c	c	c	c	a	a	a	b	b	a	V18
(Pin 14)	V 14	c	c	c	c	c	c	a	a	a	b	b	b	V17
(Pin 14)	V 14	c	c	c	c	c	c	a	a	a	b	b	a	V17
(Pin 18)	V 18	c	c	c	c	c	c	a	a	a	b	b	b	V15
(Pin 18)	V 18	c	c	c	c	c	c	a	a	a	b	a	b	V15
(Pin 23)	V 23	c	c	c	c	c	c	a	a	a	b	b	b	V13
(Pin 23)	V 23	c	c	c	c	c	c	a	a	a	a	b	b	V13

(Note) Var* : While monitoring pins 3, 8, 10, adjust so that the minimum output is obtained.
 Mute Threshold : While monitoring pins 4, 16, measure the minimum and maximum values of V15, V18 when the minimum output is obtained.



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