

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

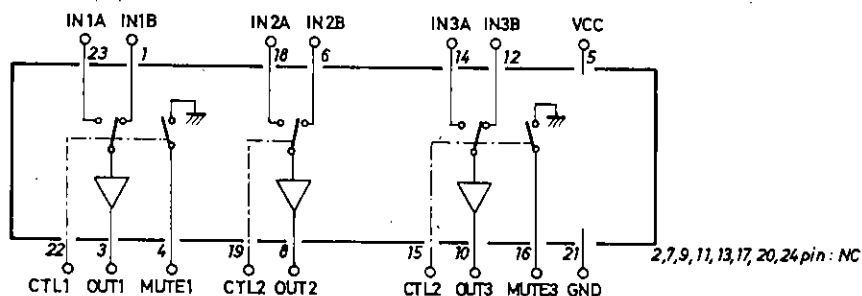
- 3-channel 2-position switch
- Wide input dynamic range
- Low distortion
- Good frequency characteristic
- Muting available

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

Maximum Supply Voltage	V_{CC} max	15	V
Allowable Power Dissipation	P_d max	500	mW
Operating Temperature	T_{opr}	-20 to +65	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 to +125	$^\circ\text{C}$

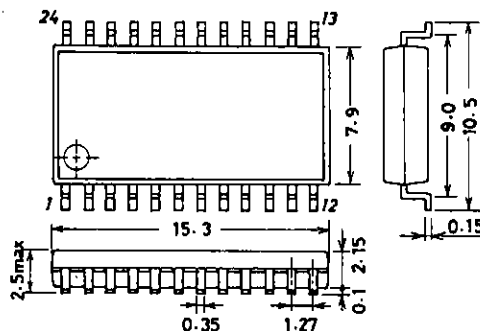
 $T_a \leq 65^\circ\text{C}$ **Operating Conditions at $T_a = 25^\circ\text{C}$**

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



SANYO : MFP24

SANYO Electric Co., Ltd. Semiconductor Business Headquarters
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110 JAPAN

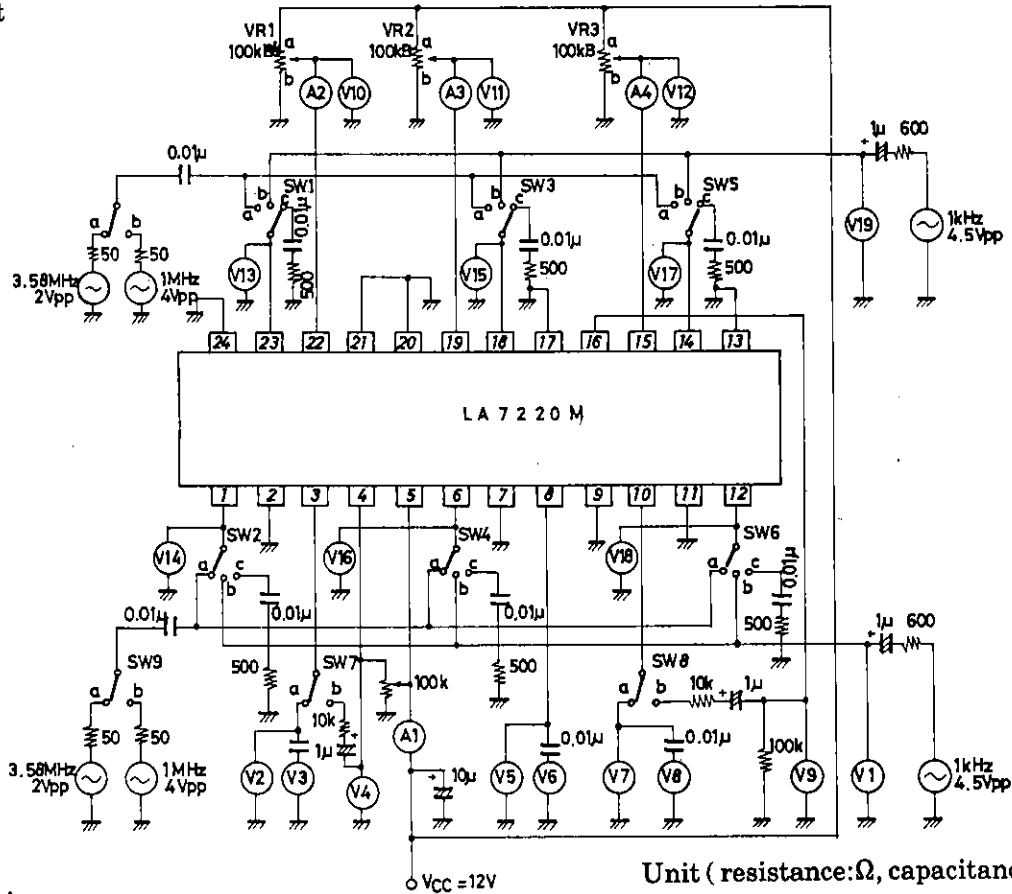
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Operating Characteristics at Ta = 25°C, VCC = 12V				min	typ	max	unit
Current Dissipation	ICC				30.0	39.9	mA
Total Harmonic Distortion	THD	*1, Rg = 600Ω, 4.5Vp-p, f = 1kHz RL = ∞			0.007	0.1	%
Noise Voltage	VNO	*1, Rg = 600Ω, f = 20Hz to 20kHz RL = ∞			-93	-80	dBs
Crosstalk 1ch CR1		*2, Input 1: Rg = 50Ω, 2Vp-p, f = 3.58MHz, Input 2: Rg = 500Ω			-50		dB
2ch CR2		*2, Input 1: Rg = 50Ω			-60		dB
3ch CR3		*2, Input 1: Rg = 50Ω			-50		dB
Pedestal Level	ΔVped	*1, VCTL (Pins 10, 13, 15) = 0 to 12V		-100	0	+100	mV
Maximum Input Voltage	vinmax	*1, Rg = 600Ω, f = 1kHz, RL = ∞, THD = 1%		5.0			Vp-p
2nd Harmonic Voltage	H2	*1, Rg = 50Ω, 4.0Vp-p, f = 1MHz, RL = ∞		-46	-55		dB
3rd Harmonic Voltage	H3	*1, "		-46	-55		dB
Switch Changeover Voltage	VCTLs	*1		2.6	3.1	4.0	V
Mute Threshold Voltage	VML	*3, L Level, mute threshold voltage		1.1	1.5	1.9	V
	VMH	*3, H Level, mute threshold voltage		6.6	7.3	8.0	V
Crosstalk between Channels 1ch		*4, Rg = 500Ω, RL = ∞, other channel input Rg = 50Ω, 2Vp-p, f = 3.58MHz		-50	-68		dB
2ch		*4, "		-50	-68		dB
3ch		*4, "		-50	-68		dB
Mute Compression Ratio		*3, Rg = 600Ω, 2Vp-p, f = 1kHz, RL = ∞, series resistance 10kΩ			-60		dB
Control Pin Flow-in Current	ICTL	*1				8	μA
Input Impedance	zin	*1				10	kΩ
Output Impedance	zout	*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 : VCTL (pins 10, 13, 15) is 12V at the measurement mode.
Input B : VCTL 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	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

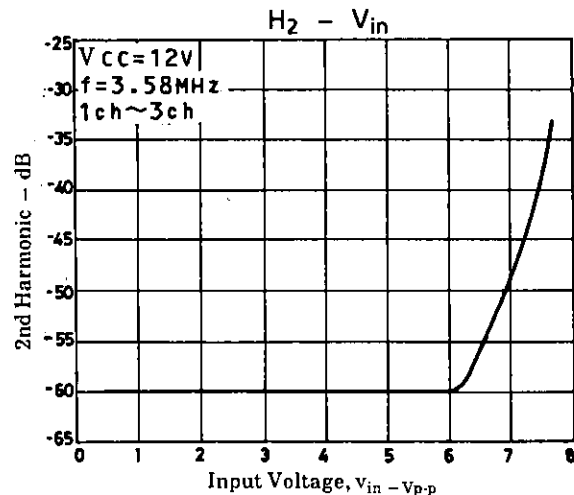
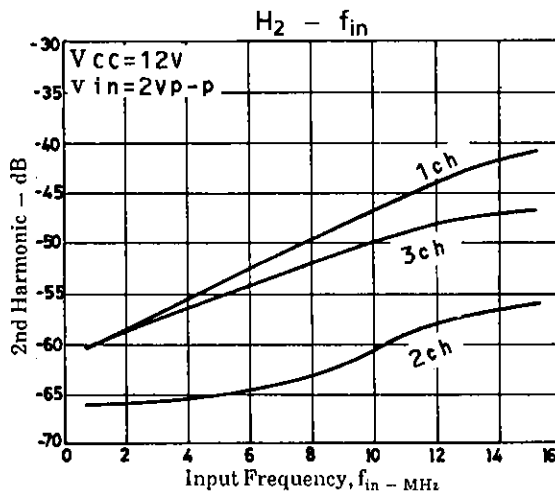
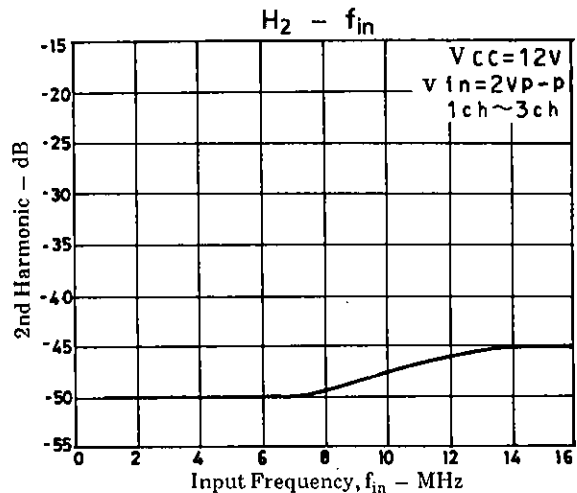
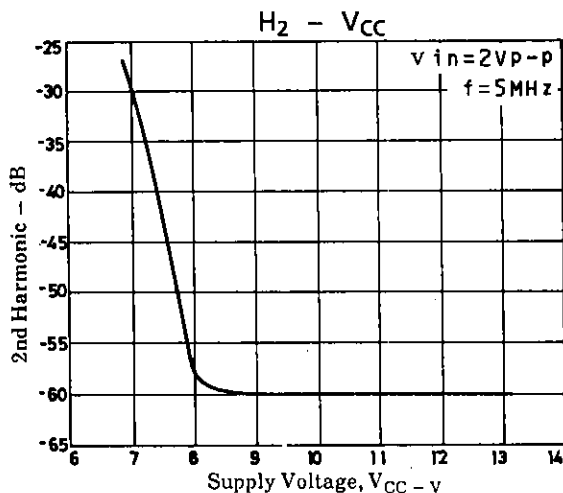
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Item	Symbol	SW VR Mode													Test-Point
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	VR1	VR2	VR3		
2nd Harmonic	1 chA	H2-1	a	c	c	c	c	c	a	a	b	a	b	b	V3
	1 chB	H2-1	c	a	c	c	c	c	a	a	b	b	b	b	V3
	2 chA	H2-2	c	c	a	c	c	c	a	a	b	b	a	b	V6
	2 chB	H2-2	c	c	c	a	c	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	b	V3
	1 ch		c	c	a	c	c	c	a	a	a	b	a	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
	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	b	a	b	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	a	c	c	c	a	a	a	b	a	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		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

Item	Symbol	SW VR Mode												Test Point
		SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8	SW9	VR1	VR2	VR3	
(Pin 12)	V12	c	c	c	c	c	c	a	a	a	b	b	b	V18
(Pin 12)	V12	c	c	c	c	c	c	a	a	a	b	b	a	V18
(Pin 14)	V14	c	c	c	c	c	c	a	a	a	b	b	b	V17
(Pin 14)	V14	c	c	c	c	c	c	a	a	a	b	b	a	V17
(Pin 18)	V18	c	c	c	c	c	c	a	a	a	b	b	b	V15
(Pin 18)	V18	c	c	c	c	c	c	a	a	a	b	a	b	V15
(Pin 23)	V23	c	c	c	c	c	c	a	a	a	b	b	b	V13
(Pin 23)	V23	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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