



# LA7286

## VCR Audio Signal Recording and Playback Processor

### Functions

- Equalizer amplifier
- Line amplifier
- Recording amplifier
- Recording bias current automatic adjustment circuit
- Ripple filter
- Mute
- ALC
- Recording/playback switch
- SP, LP, EP switch
- Tape head switch

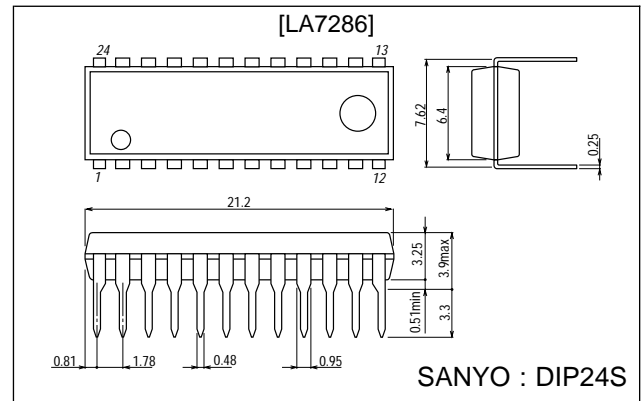
### Features

- No adjustment of recording bias current required (due to adoption of automatic adjustment circuit).
- Recording bias oscillation circuit power supply switch on chip.
- Eliminates need for choke coil for recording equalizer.
- Playback amplifier equivalent input noise voltage: 1.0  $\mu$ Vrms.

### Package Dimensions

unit : mm

#### 3067-DIP24S



- Reduced capacitance (3.3  $\mu$ F) of ALC detection capacitor.
- High withstand voltage head switch on chip.
- Supply voltage: 9 V and 12 V operation.

### Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CCmax}$		14	V
Pin 2 input voltages	$V_{IN2}$	DC	$\pm 65$	Vp-p
Pin 2 input current	$I_{IN2}$		$\pm 1.5$	mA
Allowable power dissipation	$P_{dmax}$	$T_a \leq 65\text{ }^\circ\text{C}$	500	mW
Operating temperature	$T_{opr}$		-10 to +65	$^\circ\text{C}$
Storage temperature	$T_{stg}$		-55 to +150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	$V_{CC}$		9, 12	V
Operating supply voltage range	$V_{CCop}$		8.5 to 12.5	V

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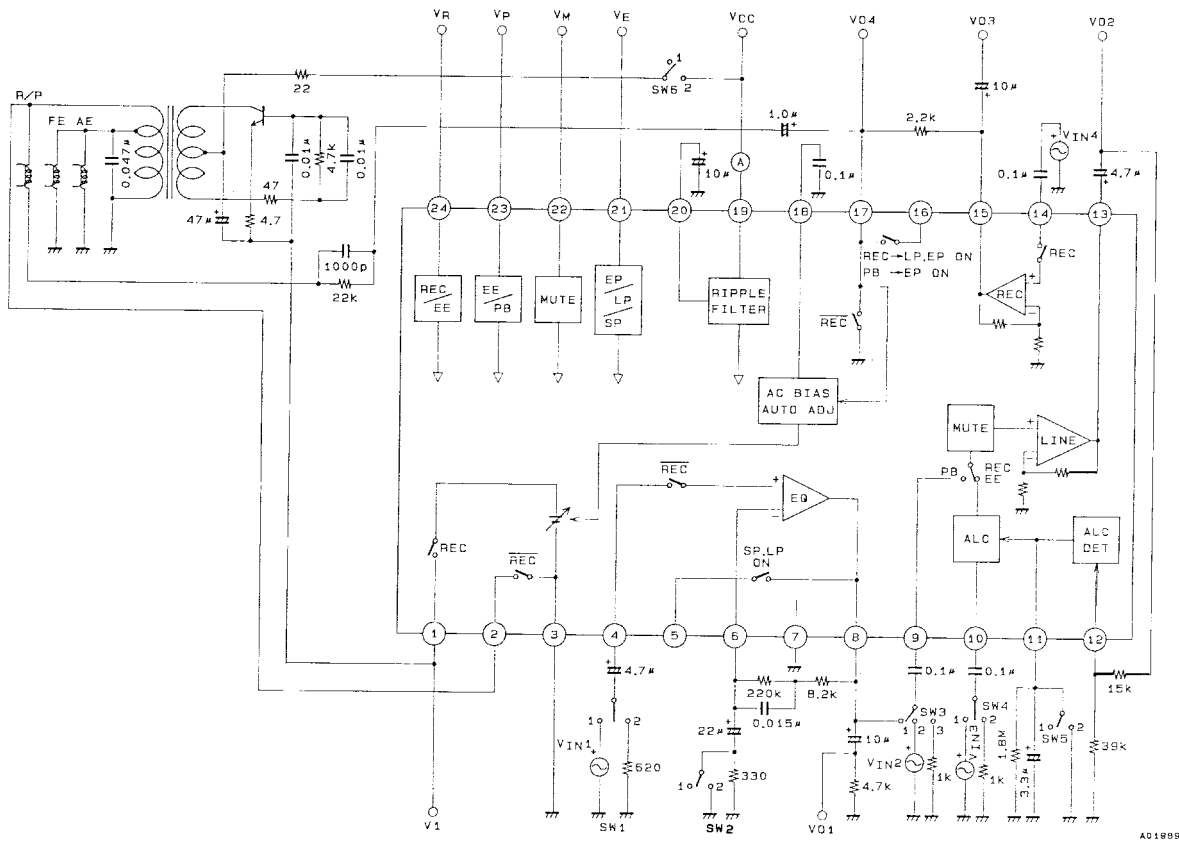




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## Test Circuit

Unit (resistance:  $\Omega$ , capacitance: F)



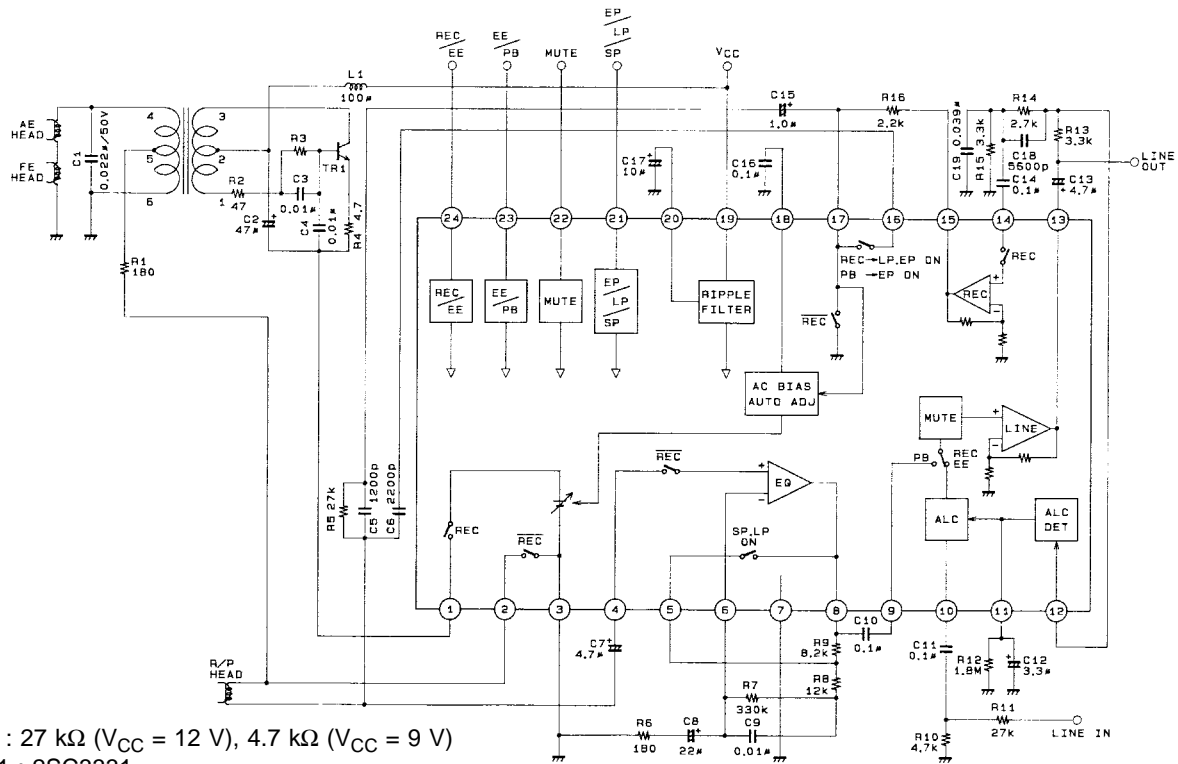
## Switch Operation Table

Test item (symbol)	SW1	SW2	SW3	SW4	SW5	SW6	$V_M$	$V_P$	$V_R$	Input	Measure:
$I_{CCE}$	2	1	3	2	2	1	GND	5 V	GND	—	$I_O$
$I_{CCP}$	2	1	3	2	2	1	GND	GND	GND	—	$I_O$
$I_{CCR}$	2	1	3	2	2	1	GND	5 V	5 V	—	$I_O$
$V_{GOE}$	1	2	3	2	2	1	GND	GND	GND	$V_{IN1}$	$V_{O1}$
$V_{INE}$	2	1	3	2	2	1	GND	GND	GND	—	$V_{O1}$
$V_{GLP}, THD_L, V_{MOL}$	2	1	2	2	2	1	GND	GND	GND	$V_{IN2}$	$V_{O2}$
$V_{GLR}$	2	1	3	1	2	1	GND	5 V	GND	$V_{IN3}$	$V_{O2}$
$V_{ONL}$	2	1	3	2	2	1	GND	5 V	GND	—	$V_{O2}$
$V_{OA}, ALC, THD_A$	2	1	3	1	1	1	GND	5 V	GND	$V_{IN3}$	$V_{O2}$
$V_{GR}, THD_R, V_{MOR}$	2	1	3	2	2	1	GND	5 V	5 V	$V_{IN4}$	$V_{O3}$
$M_P$	1	1	1	2	2	1	5 V	GND	GND	$V_{IN1}$	$V_{O2}$
$M_E$	2	1	3	1	2	1	5 V	5 V	GND	$V_{IN3}$	$V_{O2}$
$V_{BIAS}$	2	1	3	2	2	2	GND	5 V	5 V	—	$V_{O4}$
$V_{CTL}$	2	1	3	2	2	2	GND	5 V	5 V	—	$V_1$

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## Sample Application Circuit : Erase head series type

Unit (resistance:  $\Omega$ , capacitance: F)

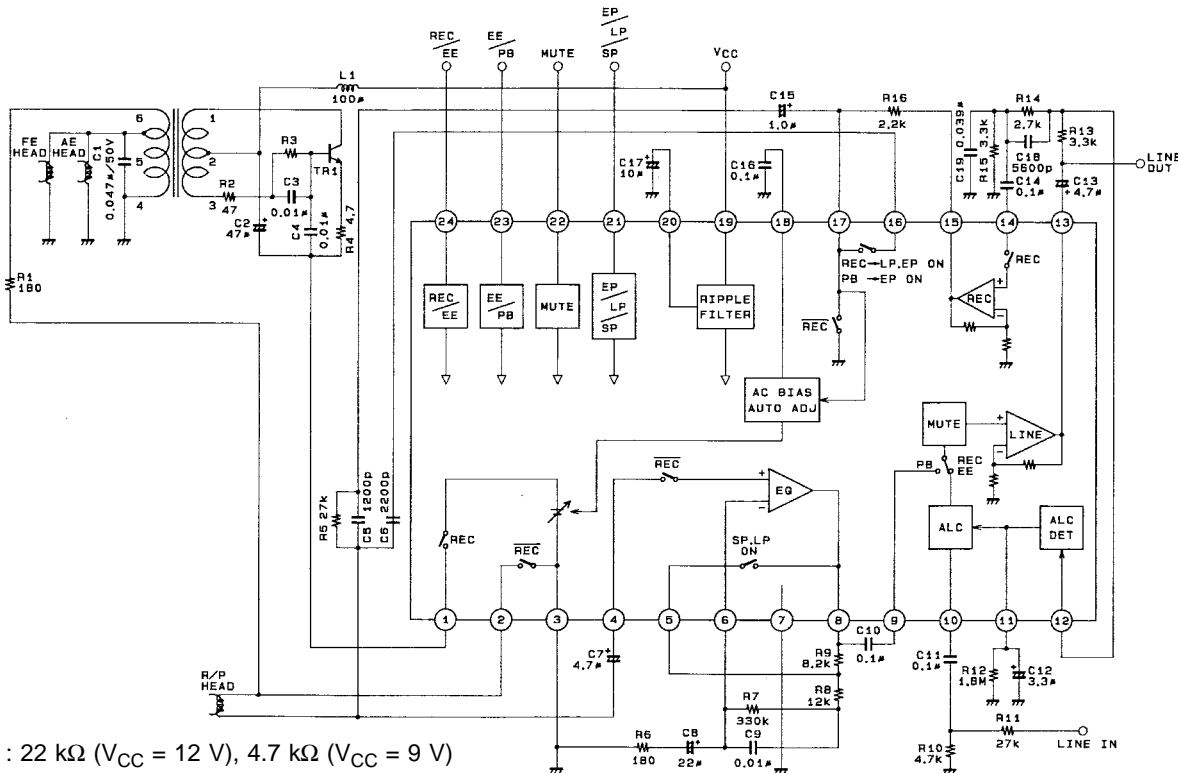


- \* R3 : 27 k $\Omega$  ( $V_{CC} = 12 V$ ), 4.7 k $\Omega$  ( $V_{CC} = 9 V$ )
- \* TR1 : 2SC3331

A01990

## Sample Application Circuit : Erase head parallel type

Unit (resistance:  $\Omega$ , capacitance: F)



- \* R3 : 22 k $\Omega$  ( $V_{CC} = 12 V$ ), 4.7 k $\Omega$  ( $V_{CC} = 9 V$ )
- \* TR1 : 2SC3331

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## Pin Functions

Unit (resistance:  $\Omega$ )

Pin No.	Function name	Internal circuit for pin	Description of function
1	Recording bias automatic control output		EE, PB $\rightarrow$ off REC $\rightarrow$ control voltage
2	Head switch (high withstand voltage)		EE, PB $\rightarrow$ on REC $\rightarrow$ off On resistance $\rightarrow$ 10 $\Omega$ (typ) Withstand voltage when off $\rightarrow$ $\pm$ 45 V (f = 80 kHz)
3	GND		GND for pin 2 head switch and Equalizer Amplifier only
4	EQ AMP input		Input impedance for playback signal input from head $\rightarrow$ 120 k $\Omega$ (typ)
5	EQ switch 1		Switches the Playback Equalizer Amplifier high-region frequency voltage gain. LP, SP $\rightarrow$ on EP $\rightarrow$ off On resistance $\rightarrow$ 20 $\Omega$ (typ)
6	EQ AMP NFB		Equalizer Amplifier negative feedback pin
7	GND		GND for all circuit blocks except the pin 2 head switch and Equalizer Amplifier

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Unit (resistance:  $\Omega$ )

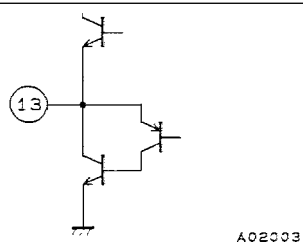
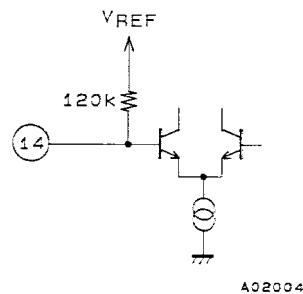
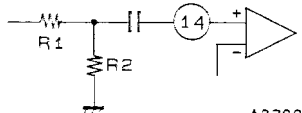
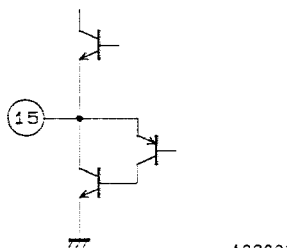
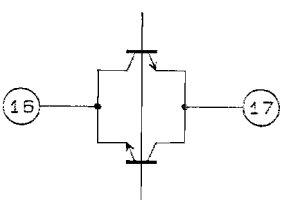
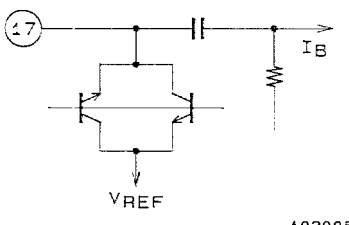
Pin No.	Function name	Internal circuit for pin	Description of function
8	EQ AMP output	<p style="text-align: right;">A01995</p>	Output impedance $\rightarrow$ 50 $\Omega$ (typ)
9	LINE AMP PB input	<p style="text-align: right;">A01997</p>	Inputs the playback signal from the Equalizer Amplifier. Because the input impedance is as high as 120 k $\Omega$ , a 0.1 $\mu$ F ceramic capacitor can be used for the coupling capacitor on pin 9.
10	LINE AMP LINE input	<p style="text-align: right;">A01998</p>	Inputs EE and REC signals. <p style="text-align: right;">A01999</p> <p>The reference input is set by resistors R1 and R2. The amplifier gain is fixed at 21.5 dB. In addition, because the input impedance is as high as 120 k<math>\Omega</math>, a 0.1 <math>\mu</math>F ceramic capacitor can be used for the coupling capacitor on pin 10.</p>
11	ALC FILTER	<p style="text-align: right;">A02000</p>	Wave detection is performed when connected to GND through a capacitor. In addition, the attack and recovery time is set by the C and R time constants.
12	ALC input wave detection	<p style="text-align: right;">A02001</p>	<p style="text-align: right;">A02002</p> <p>Inputs the Line Amplifier output signal. The ALC level is set by the resistors R1 and R2.</p>

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Unit (resistance:  $\Omega$ )

Pin No.	Function name	Internal circuit for pin	Description of function												
13	LINE AMP output	 <p style="text-align: right; font-size: small;">A02003</p>	Output impedance $\rightarrow$ 50 $\Omega$ (typ)												
14	REC AMP input	 <p style="text-align: right; font-size: small;">A02004</p>	<p>Inputs the recording signal from Line Amplifier.</p>  <p style="text-align: right; font-size: small;">A02005</p> <p>The recording current is set by the resistors R1 and R2. In addition, because the input impedance is as high as 120 k<math>\Omega</math>, a 0.1 <math>\mu</math>F ceramic capacitor can be used for the coupling capacitor on pin 14.</p>												
15	REC AMP output	 <p style="text-align: right; font-size: small;">A02005</p>	Output impedance $\rightarrow$ 50 $\Omega$ (typ)												
16	EQ switch 2	 <p style="text-align: right; font-size: small;">A02007</p>	<p>Switches the high-region peaking frequency during recording and playback.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>REC</th> <th>PB</th> </tr> </thead> <tbody> <tr> <td>EP</td> <td>On</td> <td>On</td> </tr> <tr> <td>LP</td> <td>On</td> <td>Off</td> </tr> <tr> <td>SP</td> <td>Off</td> <td>Off</td> </tr> </tbody> </table> <p>On resistance <math>\rightarrow</math> 30 <math>\Omega</math> (typ)</p>		REC	PB	EP	On	On	LP	On	Off	SP	Off	Off
	REC	PB													
EP	On	On													
LP	On	Off													
SP	Off	Off													
17	Recording bias automatic control input and PB switch.	 <p style="text-align: right; font-size: small;">A02008</p>	<p>EE, PB <math>\rightarrow</math> on            REC <math>\rightarrow</math> off            On resistance <math>\rightarrow</math> 20 <math>\Omega</math> (typ)</p>												

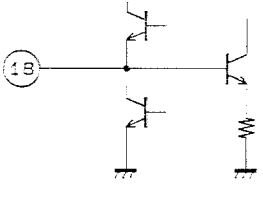
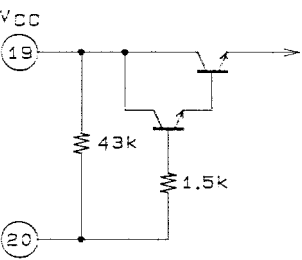
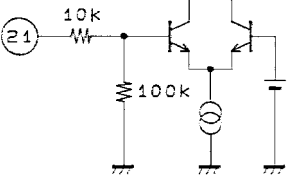
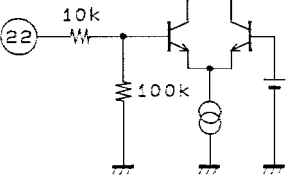
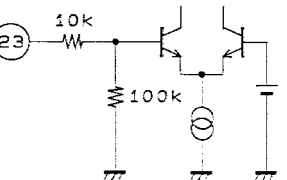
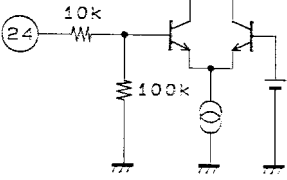
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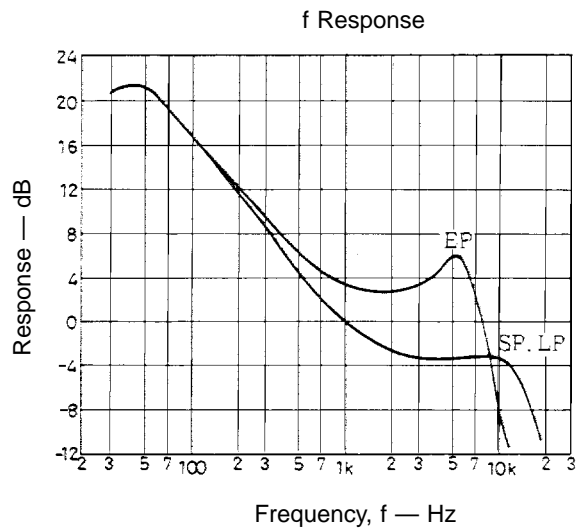
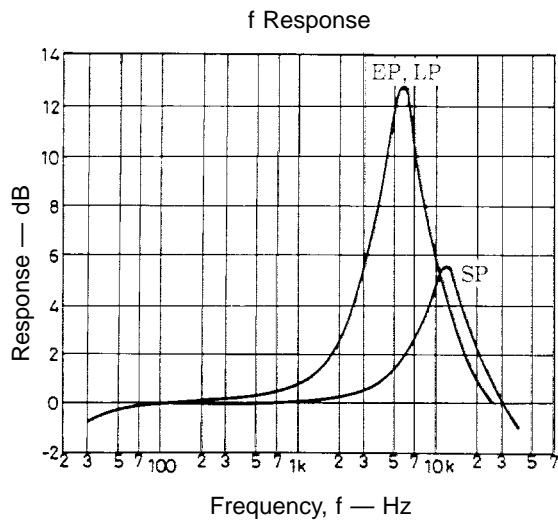


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Unit (resistance:  $\Omega$ )

Pin No.	Function name	Internal circuit for pin	Description of function												
18	Recording bias automatic control filter	 <p style="text-align: right;">A02009</p>	Wave detection is performed when connected to GND through a capacitor.												
19	Supply voltage ( $V_{CC}$ )		$V_{CC}$ max = 14 V $V_{CC}$ = 8.5 V to 12.5 V												
20	Ripple filter	 <p style="text-align: right;">A02010</p>	Ripple rejection is performed when connected to GND through an electrolytic capacitor for the filter.												
21	EP/LP/SP Control	 <p style="text-align: right;">A02011</p>	<p>When the voltage on pin 21 is 3.6 V to 6.0 V: EP; when 1.8 V to 2.6 V: LP; when 0 V to 1.0 V: SP</p> <p>Switch On Pin Number</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>REC</th> <th>PB</th> </tr> </thead> <tbody> <tr> <td>EP</td> <td>16</td> <td>16</td> </tr> <tr> <td>LP</td> <td>16, 5</td> <td>5</td> </tr> <tr> <td>SP</td> <td>5</td> <td>5</td> </tr> </tbody> </table>		REC	PB	EP	16	16	LP	16, 5	5	SP	5	5
	REC	PB													
EP	16	16													
LP	16, 5	5													
SP	5	5													
22	MUTE Control	 <p style="text-align: right;">A02012</p>	<p>When the voltage on pin 22 is 2.5 V to 6.0 V: MUTE on; when 0 V to 1.5 V: MUTE off</p>												
23	EE/PB Control	 <p style="text-align: right;">A02013</p>	<p>When the voltage on pin 23 is 3.0 V to 6.0 V: EE; when 0 V to 1.0 V: PB</p>												
24	REC/EE Control	 <p style="text-align: right;">A02014</p>	<p>When the voltage on pin 24 is 3.0 V to 6.0 V: REC; when 0V to 1.0 V: EE</p> <p>However, REC mode is entered only when the voltage on pin 23 is 3.0 V to 6.0 V.</p>												



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