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PRELIMINARY

ANALOG FUNCTION SWITCH

■ GENERAL DESCRIPTION

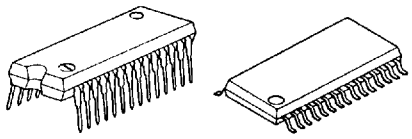
The NJU7313 is a dual 4-channel and quad 2-channel analog function switch especially suitable for input selector of audio equipments.

The high break down voltage analog switch controlled by 14-bit serial data of logic operating voltage(5V) can ON and OFF of ±15V signal.

The analog switch is realized superior linearity of on resistance in all voltage range, low distortion and wide dynamic range.

Furthermore, the both of single and dual power supply application provides easy designing.

■ PACKAGE OUTLINE

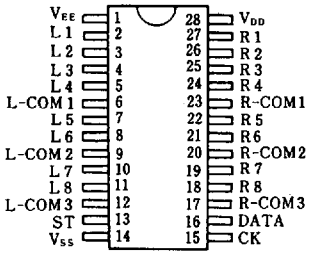


NJU7313L NJU7313M

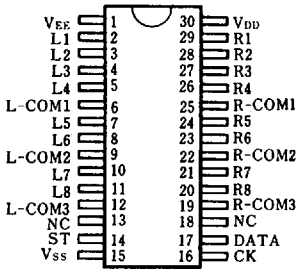
■ FEATURES

- Analog switch: dual 3 channel and quad 2 channel.
- High Break Down Voltage ------ ±15V.
- Low Distortion ------ THD: 0.002% (typ).
- Superior Linearity of ON Resistance.
- Serial Data Control.
- Package Outline SDIP 28 / DMP 30
- C-MOS Technology

■ PIN CONFIGURATION

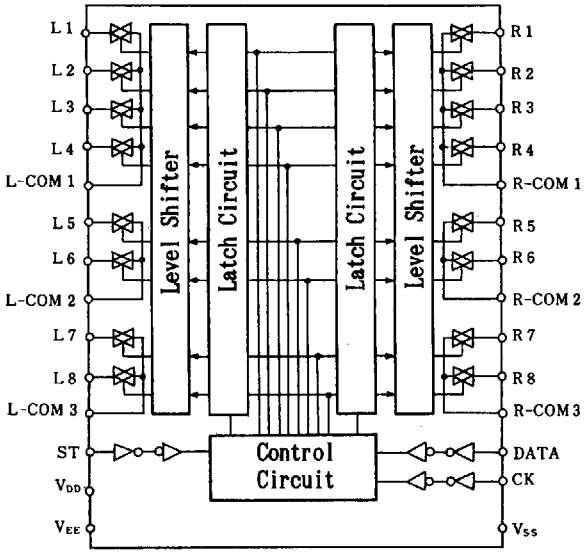


NJU7311L



NJU7311M

■ BLOCK DIAGRAM



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■ TERMINALS DESCRIPTION

NO.	SYMBOL	FUNCTIONS	NO.	SYMBOL	FUNCTIONS
1	V_{EE}	Negative voltage supply	15	CK	Clock input
2 3 4 5	L1 L2 L3 L4	Analog switch input/output	16	DATA	Data input
			17	R-COM3	R7, R8 Common
6	L-COM1	L1, L2, L3, L4 Common	18 19	R8 R7	Analog switch input/output
7 8	L5 L6	Analog switch input/output	20	R-COM2	R5, R6 Common
9	L-COM2	L5, L6 Common	21	R-COM2	Analog switch input/output
10	L7	Analog switch input	22	R5	
11	L8		23	R-COM1	R1, R2, R3, R4 Common
12	L-COM3	L7, L8 Common	24 25 26 27	R4 R3 R2 R1	Analog switch input/output
13	ST	Chip enable			
14	VSS	GND	28	VDD	Positive voltage supply

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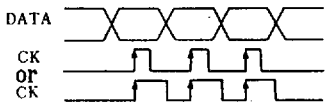
■ FUNCTIONAL DESCRIPTION

(1) Timing of DATA, CK, ST

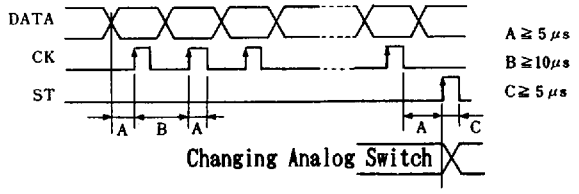
The Serial Input Data is input to internal shift registor sequently synchronized by clock signal rising edge input from CK terminal(100 kHz max.).

The Serial Input Data in the shift registor is transfered to latch circuit and renew by synchronized rising edge of Chip enable signal input from ST terminal.

(Timing Chart)

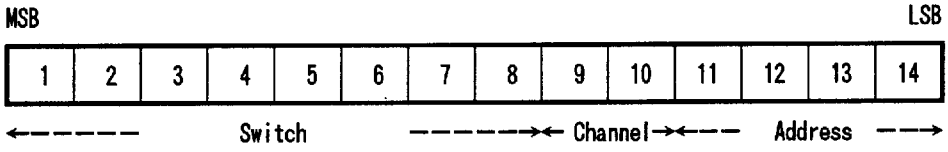


(Detailed Timing)



(2) Data Format

The 14-bit serial data strings format from MSB to LSB are 8-bit analog switch control data, 2-bit right and left channel selection data and 4-bit address data.



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(Switch)
Bit1 ~ bit7 select the analog switch ON and OFF 0: switch off
1: switch on
Bit8 is DOn't care due to no correspond analog switch.

(Channel)
Bit9 and 10 select the channel.

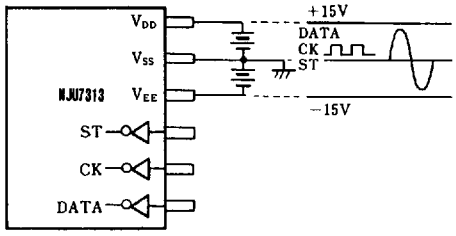
bit9	bit10	CHANNEL
1	1	L and R
1	0	R only
0	1	L only

(Address)
Bit11 to 14 select the address. This address select is used for chip selection when this LSI is connected to the common bus line.

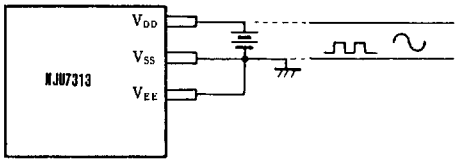
Type No.	bit11	bit12	bit13	bit14
NJU7311	0	0	0	0
NJU7312	1	0	0	0
NJU7313	0	1	0	0

(3) Supply Voltage
The power supply of NJU7313 is devided into two portion of analog switch part and control part. The analog switch part operate by dual power supply (+ and -) and control part is operate by single power supply (+) only.
The analog switch part can also operate by single power supply. In this case, the supply voltage sould be half of dual supply operation mode.
Furthermore, the CK, DATA and ST terminals can direct interface with 5V operated family, becase of its input threshold level is adjusted.

Dual Power Supply (+ and -)



Single Power Supply (+)



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■ ABSOLUTE MAXIMUM RATINGS

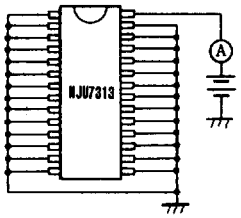
PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{DD} - V_{EE} V_{DD} - V_{SS} V_{EE} - V_{SS}	34 +17 -17	V
Input Voltage	V_{IN}	V_{SS}-0.3~V_{DD}+0.3	V
Power Dissipation	P_D	300	mW
Operating Temperature	Topr	-30 ~ +75	℃
Storage Temperature	Tstg	-40 ~ +125	℃

■ ELECTRICAL CHARACTERISTICS

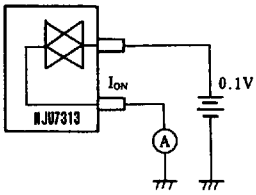
(V_{DD}=+16V, Vss=0V, V_{EE}=-16V, Ta=25℃)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{DD}-V_{SS} V_{EE}-V_{SS}		8 -16		16 -8	V
Operating Current	I_{DD}	V_{DD}=+16V, V_{EE}=-16V, V_{SS}=0V			3	mA
Back-Up Voltage	V_B		4		16	V
Back-Up Current	I_B	V_{DD}=+4V, V_{SS}=V_{EE}=0V, Circ.1			10	μA
High-Level Input Voltage	V_{IH}	CK, DATA, ST Terminals	4		16	V
Low-Level Input Voltage	V_{IL}	CK, CATA, ST Terminals	0		1	V
Min. Operating Pulse Width	t_{MIN}		5			μS
Switch ON Resistance	R_{ON}	Circ.2		100	200	Ω
Total Harmonic Distortion	THD	f_{IN}=20~20kHz, V_{IN}=1Vrms Circ.3		0.002	0.005	%

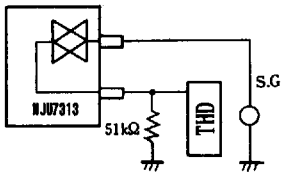
■ MEASUREMENT CIRCUIT DIAGRAMS



(Circ.1)



(Circ.2)



(Circ.3)

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