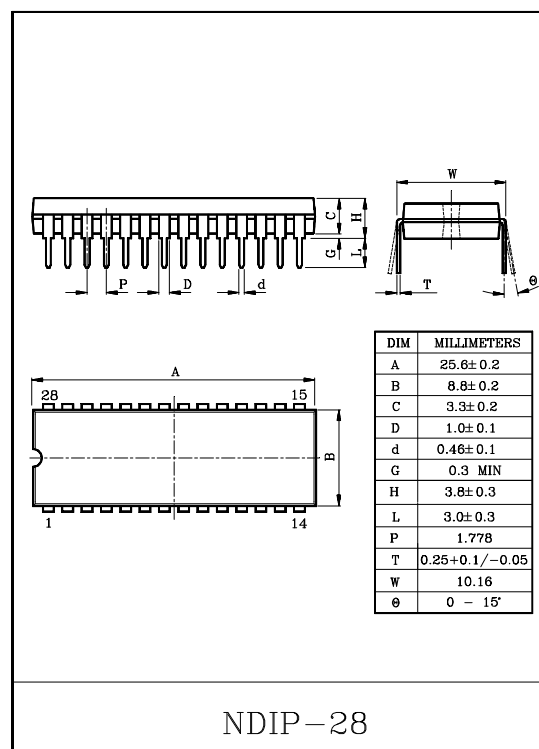


HIGH TENSION SUSTAINING ANALOG FUNCTION SWITCH

The KIC9208N, KIC9209N is a feather touch type function change-over switch incorporating a high-tension sustaining analog switches.

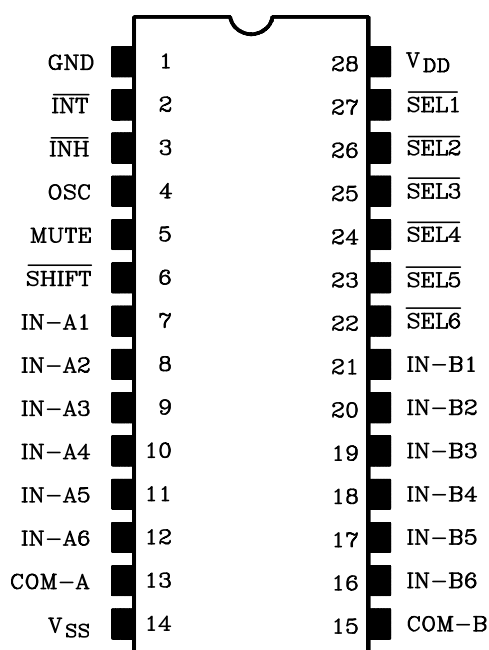
FEATURES

- The construction of the analog switches is as follows :
KIC9208N : 2 circuits 6 contacts
KIC9209N : 2 circuits 4 contacts + tape monitor
- The control system is operable by the (+) power supply and the analog system is operable by the (+) and (-) dual power supplies.
- The built-in buffer transistor enables it to directly drive the function display led, etc.
- The KIC9208N enables sequential change-over of input by the shift input in additions to direct change-over of input.
- If input is changed over when the tape monitor is in operation on the KIC9209N, the tape monitor can be released automatically (Auto monitor off).

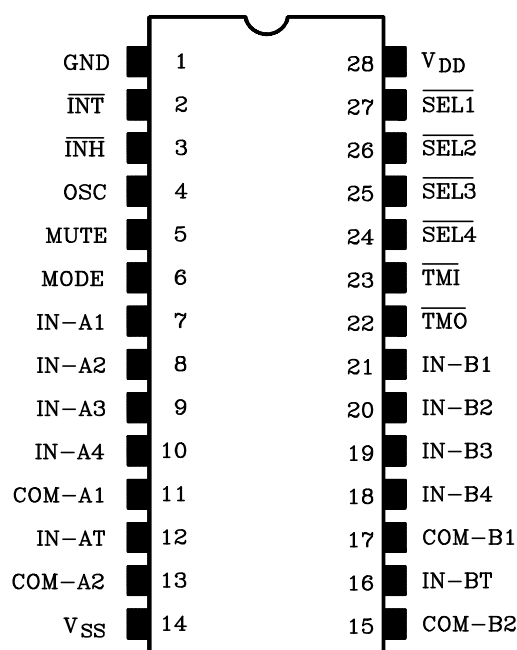


PIN CONNECTION

KIC9208N



KIC9209N



KIC9208N, KIC9209N

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage (1)	$V_{DD}-V_{SS}$	-0.3~36	V
Supply Voltage (2)	$V_{DD}-GND$	-0.3~20	V
Input Voltage	V_{IN}	$V_{SS}-0.3 \sim V_{DD}+0.3$	V
Power Dissipation	P_D	300	mW
Operating Temperature Range	T_{opr}	-40~85	℃
Storage Temperature Range	T_{stg}	-65~150	℃

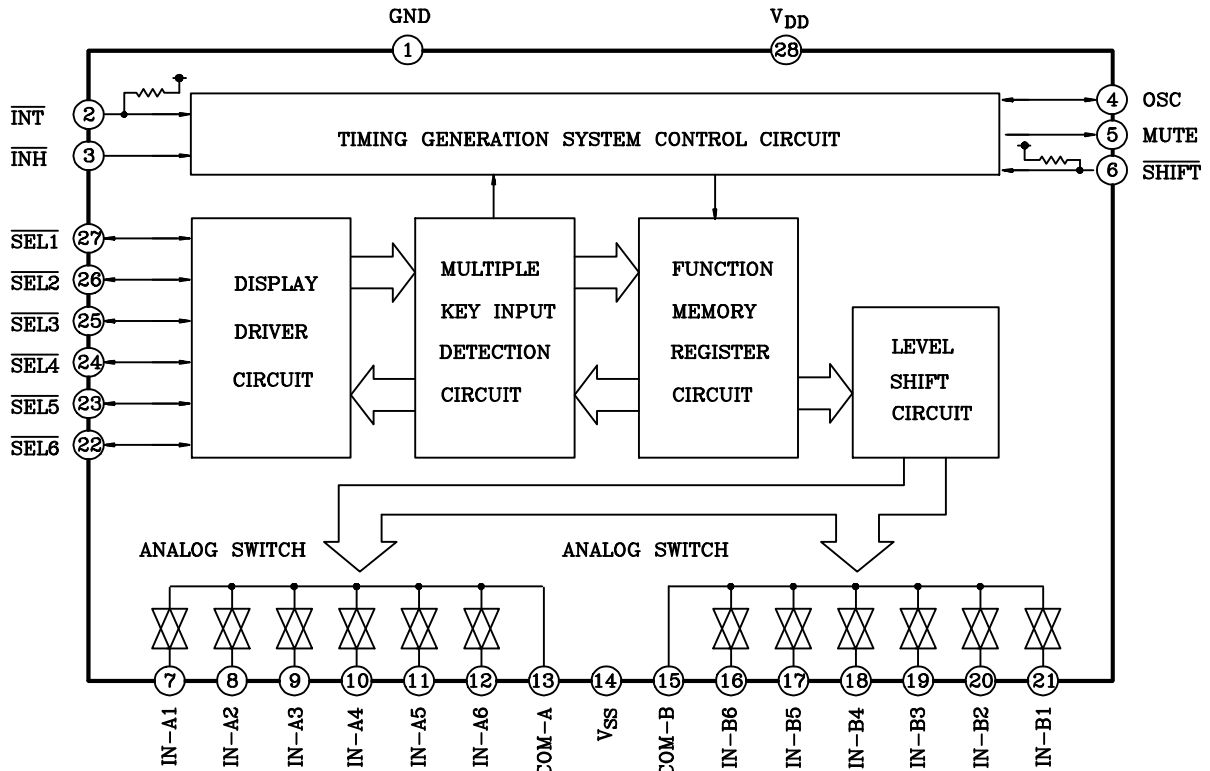
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, $V_{DD}=15V$, $V_{SS}=-15V$, $GND=0V$, $T_a=25℃$)

CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Operating Supply Voltage (1)		V _{DD} -V _{SS}	—	Dual power supplies operation		16	—	34	V
Operating Supply Voltage (2)		V _{DD} -GND	—	Single power supply operation		8	—	18	V
Operating Supply Current		I _{DD}	1	No load, No input		—	0.01	1.0	mA
Backup Voltage		V _B	1	Data holding voltage range		4.0	—	18	V
Backup Current		I _B		V _{DD} =4.0V, V _{SS} =GND=0V		—	1	10	μA
Input Voltage	"H" Level	V _{IH}	—	$\overline{SEL1 \sim 6}, \overline{(TMI)}$ $\overline{INT}, \overline{INH}, \overline{SHIFT}, \overline{(MODE)}$		V _{DD} × 0.7	—	V _{DD}	V
	"L" Level	V _{IL}				GND	—	V _{DD} × 0.3	
Input Current	"H" Level	I _{IH}	—	\overline{INH}	V _{IH} =15V	−1.0	—	1.0	μA
	"L" Level	I _{IL}		(MODE)	V _{IL} =0V	−1.0	—	1.0	
Input Pull-up Resistance		R _{IN}	—	$\overline{INT}, \overline{SHIFT}$		—	47	—	kΩ
Output Current (1)	"H" Level	I _{OH(1)}	1	$\overline{SEL1 \sim 6},$	V _{OH} =14V	—	−0.3	−0.1	mA
	"L" Level	I _{OL(1)}		$\overline{(TWO)}$	V _{OL} =5V	15.0	20.0	—	
Output Current (2)	"H" Level	I _{OH(2)}		MUTE	V _{OH} =14V	—	−0.3	−0.1	mA
	"L" Level	I _{OL(2)}			V _{OL} =5V	0.1	0.3	—	
Operating Frequency		f _{OSC}	—	R _X =47kΩ, C _X =0.47μF		—	50	—	Hz
Analog Switch On Resistance		R _{ON}	—	—		—	80	100	Ω
Analog Switch OFF Leak		I _{OFF}	—	V _{IN} =V _{SS} ~V _{DD}		—	—	±0.1	μA
Overall Harmonic Distortion Factor		THD	—	f _{IN} =1kHz V _{IN} =1V _{rms} R _g =600Ω, R _L =47kΩ BW=20Hz~20kHz		—	0.001	—	%
Crosstalk		CT				—	100	—	dB
Noise Output Voltage		V _N				—	1.0	—	μV _{rms}

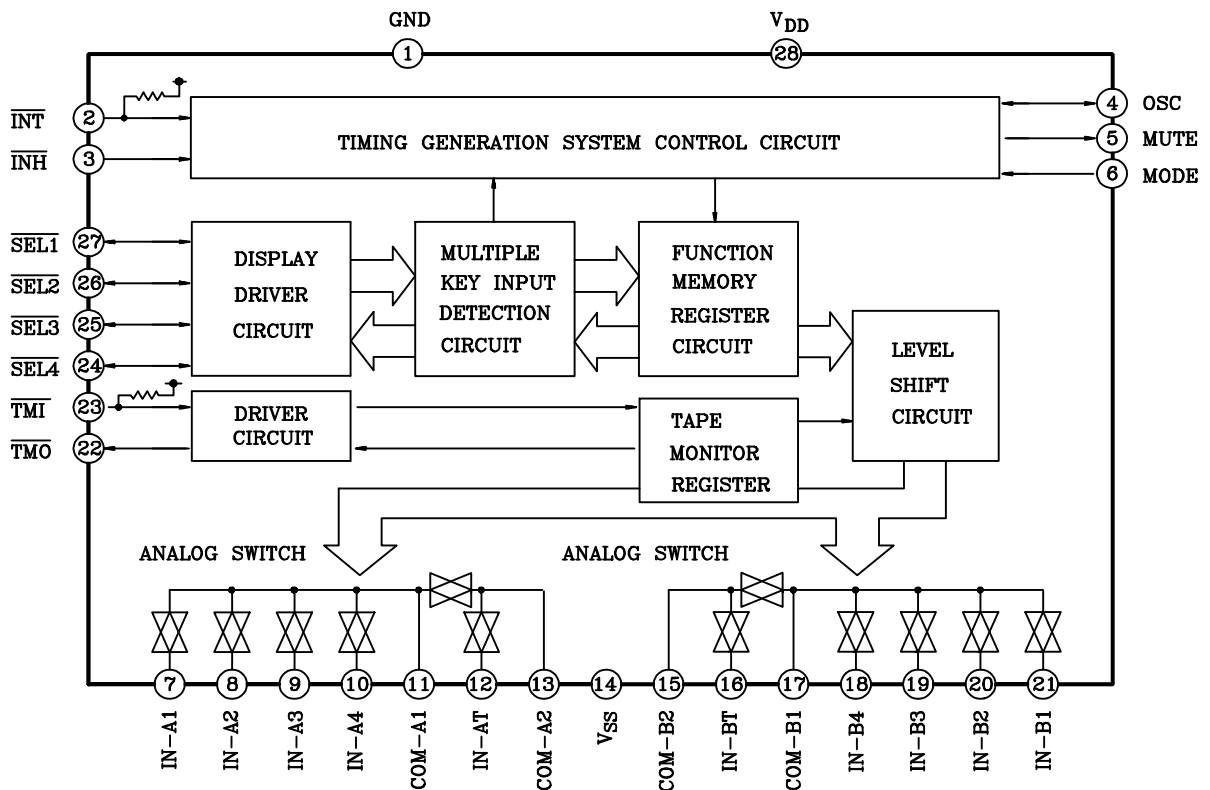
KIC9208N, KIC9209N

BLOCK DIAGRAM

KIC9208N



KIC9209N



KIC9208N, KIC9209N

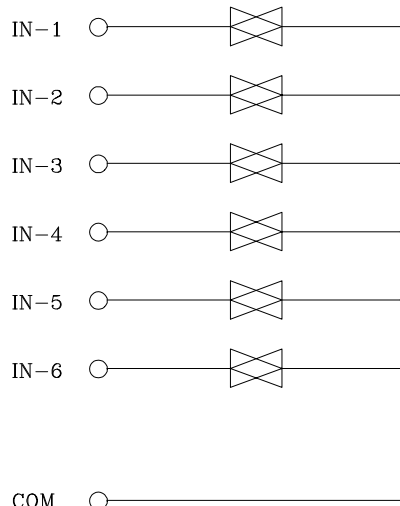
PIN FUNCTION

1. KIC9208N, KIC9209N Common Pins

PIN No.	SYMBOL	PIN NAME	FUNCTIONS AND OPERATIONS	REMARKS
1	GND	Ground pin	In case of the single power supply, use by grounding the GND and V _{SS} pins.	-
14	V _{SS}	(-) Power supply		
28	V _{DD}	(+) Power supply		
2	$\overline{\text{INT}}$	Initialize input	When "L" level signal is input, the inside is initialized. The select pin selects $\overline{\text{SEL1}}$ and the tape monitor is turned OFF on KIC9209N. When "H" level signal is input, the normal operation starts.	With a built-in pull-up resistor.
3	$\overline{\text{INH}}$	Inhibit input	When "L" level (GND level) signal in input, all inputs and outputs are inhibited and power dissipation becomes low. When "H" level signal is input, the normal operation starts.	CMOS input pin.
4	OSC	Oscillator input/output	Timings required in the IC are generated by external C and R.	-
5	MUTE	Muting output	When the analog switch is changed over by the select input pin $\overline{\text{SEL1}}$ to 5 and SHIFT pins, "H" level muting output is generated for a fixed period of time.	CMOS output pin.

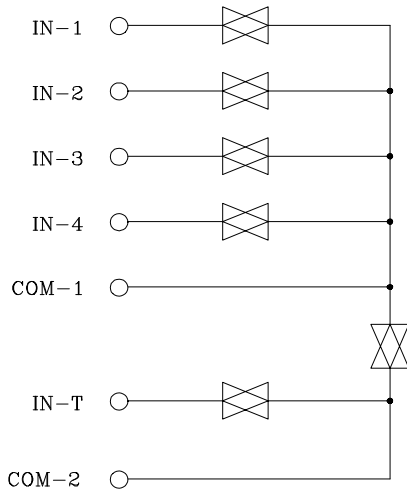
KIC9208N, KIC9209N

1. KIC9208N Pins

PIN NO.	SYMBOL	PIN NAME	FUNCTIONS AND OPERATIONS	REMARKS
6	$\overline{\text{SHIFT}}$	Shift select input pin	Whenever this pin is set at "L" level, the shift by one to the upward direction is made from the current $\overline{\text{SEL}}$ position. $\overline{\text{SEL1}} \rightarrow \overline{\text{SEL2}} \rightarrow \overline{\text{SEL3}} \rightarrow \overline{\text{SEL4}} \rightarrow \overline{\text{SEL5}} \rightarrow \overline{\text{SEL6}} \rightarrow \overline{\text{SEL1}} \dots$	With a built-in pull-down resistor.
7	IN-A1	Signal input-1	<p>The analog switch circuit of 2-circuit and 6-contact type.</p> <p>Compatible with $\overline{\text{SEL-N}} = \text{IN-N}$</p> 	-
21	IN-B1			
8	IN-A2	Signal input-2		
20	IN-B2			
9	IN-A3	Signal input-3		
19	IN-B3			
10	IN-A4	Signal input-4		
18	IN-B4			
11	IN-A5	Signal input-5		
17	IN-B5			
12	IN-A6	Signal input-6		
16	IN-B6			
13	COM-A	Signal output pin		
15	COM-B			
27	$\overline{\text{SEL1}}$	Analog switch select input/output	<p>When "L" level signal is input, the selected analog switches are turned ON.</p> <p>As the $\overline{\text{SEL}}$ pins serve as <u>the</u> input/output ports, the selected $\overline{\text{SEL}}$ pin is fixed at "L" level even when the input key is turned OFF.</p>	With a built-in driver transistor and pull-down resistor.
26	$\overline{\text{SEL2}}$			
25	$\overline{\text{SEL3}}$			
24	$\overline{\text{SEL4}}$			
23	$\overline{\text{SEL5}}$			
22	$\overline{\text{SEL6}}$			

KIC9208N, KIC9209N

1. KIC9209N Pins

PIN NO.	SYMBOL	PIN NAME	FUNCTIONS AND OPERATIONS	REMARKS
6	MODE	Tape monitor mode change-over input	The normal operation at "L" level. When this pin is set at "H" level, the tape monitor is automatically turned OFF ($\overline{\text{TMO}}$)= "L" level) if the $\overline{\text{SEL}}$ input is changed over during the tape monitoring ($\overline{\text{TMO}}$)= "H" level) (Auto Monitor OFF Mode)	CMOS input pin.
7	IN-A1	Signal input-1	<p>The analog switch circuit is of 2-circuit and 4-contact type+tape monitor circuit. Compatible with $\overline{\text{SEL-N}}=1\text{N-N}$.</p> 	-
21	IN-B1			
8	IN-A2	Signal input-2		
20	IN-B2			
9	IN-A3	Signal input-3		
19	IN-A4			
10	IN-B4	Signal input-4		
18	IN-B4			
11	COM-A1	Recording output pin		
17	COM-B1			
12	IN-AT	Tape monitoring input pin		
16	IN-BT			
13	COM-A2	Signal output pin		
15	COM-B2			
27	$\overline{\text{SEL1}}$	Analog switch select input/output	The operation is the same as that of the KIC9208N.	With a built-in driver transistor and a pull-down resistor.
26	$\overline{\text{SEL2}}$			
25	$\overline{\text{SEL3}}$			
24	$\overline{\text{SEL4}}$			
23	$\overline{\text{TMI}}$	Tape monitor change-over input	Whenever "L" level signal is input, the tape monitor switch is turned ON/OFF repeatedly. When the tape monitor switch is ON, the $\overline{\text{TMO}}$ pin becomes "L" level output.	With a built-in pull-down resistor.
22	$\overline{\text{TMO}}$	Tape monitor display output	The $\overline{\text{TMO}}$ pin houses the a driver equivalent to that of the $\overline{\text{SEL}}$ pin, LED, etc. can be directly driven.	With a built-in driver transistor.

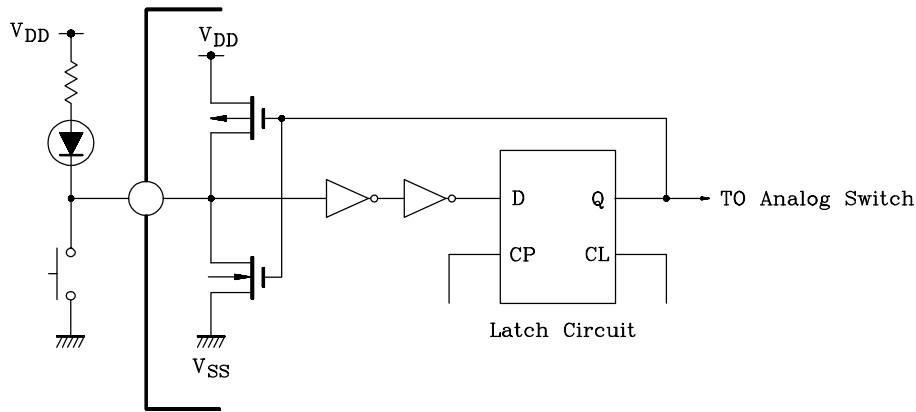
KIC9208N, KIC9209N

DESCRIPTION OF OPERATION

1. SEL Pins

These pins are the analog switch select input and LED driver output I/O pins.

When "L" level signal is input, the driver is turned ON by the internal latch circuit and the pins are fixed at "L" level even when the input key is turned OFF.

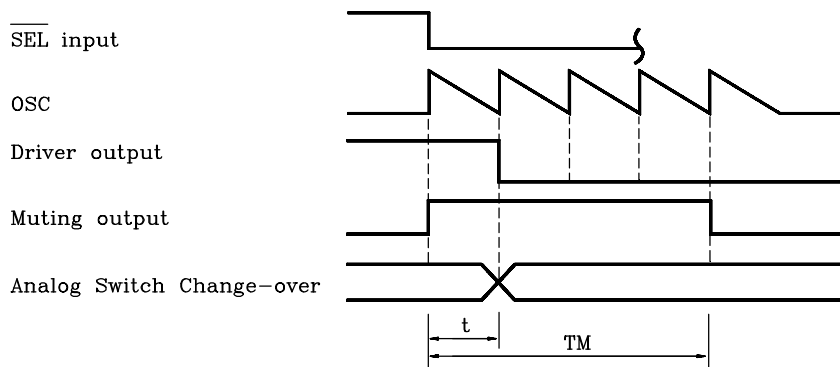


As SEL1 through SEL6 are mutually reset on the KIC9208N and SEL1 through SEL4 are mutually reset on the KIC9209N, all pins except the input pin are kept OFF.

2. Switch change-over timing and muting output

To prevent abnormal sounds such as pop sound generated when the analog switch is changed over, muting signal is output.

This muting signal output time and SEL pin (TMI pin and SHIFT pin) chattering prevention time are decided by oscillation frequency of the OSC pin.



※ $f_{osc}=50\text{Hz}$

t : Chattering prevention time = $(1 / f_{osc}) \approx 20\text{mS}$

TM : Muting time = $(1 / f_{osc}) \times 4 \approx 80\text{mS}$

- At time of SHIFT input of KIC9208N and TMI input of KIC9209N, the IC operates at the above timings.
- As the multiple input inhibit circuit is built in the SEL input pins, if more than 2 SEL pins are selected simultaneously, all the analog switches are kept in the OFF state and the muting signal is successively output during the period of that multiple inputs.

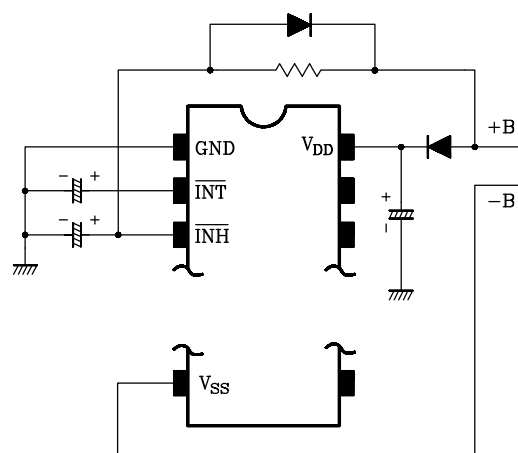
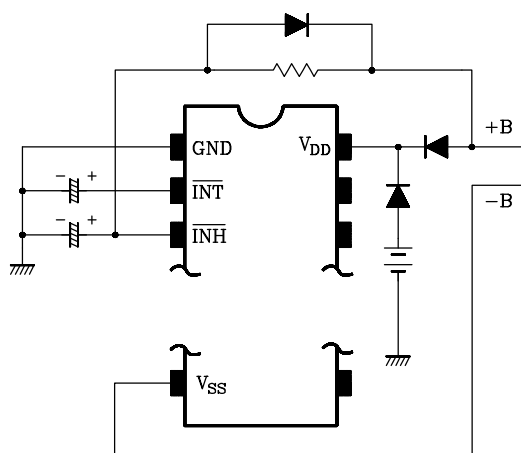
Further, if multiple inputs are released, the last input is accepted.

- Oscillation frequency of the OSC pin may vary depending upon fluctuation of IC and supply voltage. (See the attached graph.)

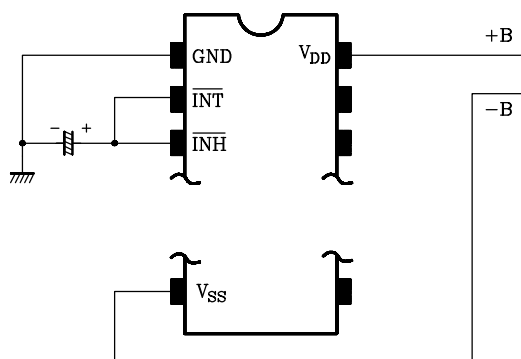
KIC9208N, KIC9209N

3. Initialization and Backup of Switches

- When the $\overline{\text{INT}}$ pin is set at "L" level, the switches are initialized.
KIC9208N : $\overline{\text{SEL1}}$ (IN-1→COM)
KIC9209N : $\overline{\text{SEL1}}$ (IN-1→COM1), Tape Monitor OFF
- When the $\overline{\text{INH}}$ pin is set at "L" level, all the inputs and outputs are cut off and the IC is placed in the inhibit status. Under this status, the internal circuit scarcely consume current and therefore, the backup for a long time becomes possible. During the backup, it becomes possible to lower V_{DD} to 4.0V
- Backup by Battery, etc.
- Backup by Capacitor



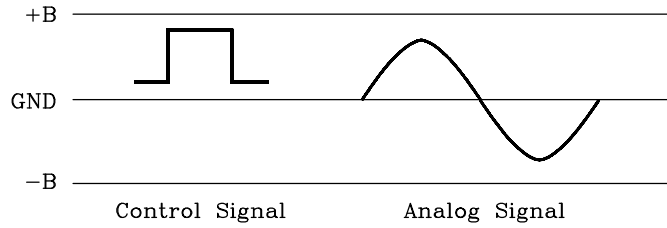
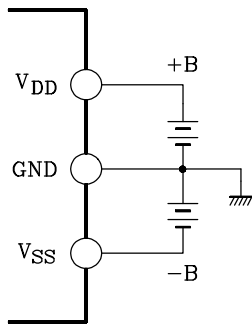
- When no backup is required



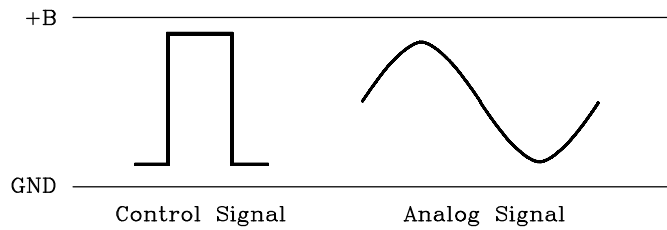
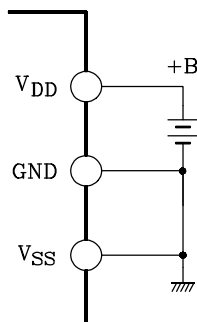
4. Power Supply

The separate power supply system is provided for the analog switches and the control unit.
The (+) and (-) dual power supplies are used for the analog switches while a single supply is used for the control unit.

Dual power supplies used



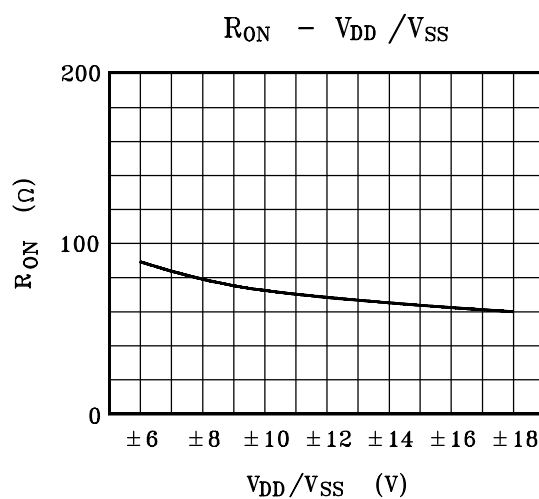
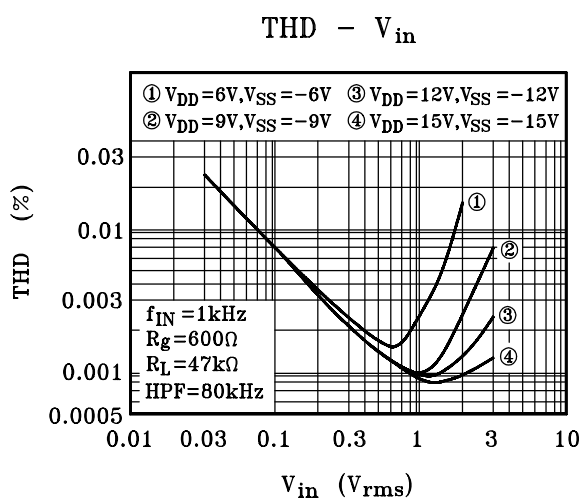
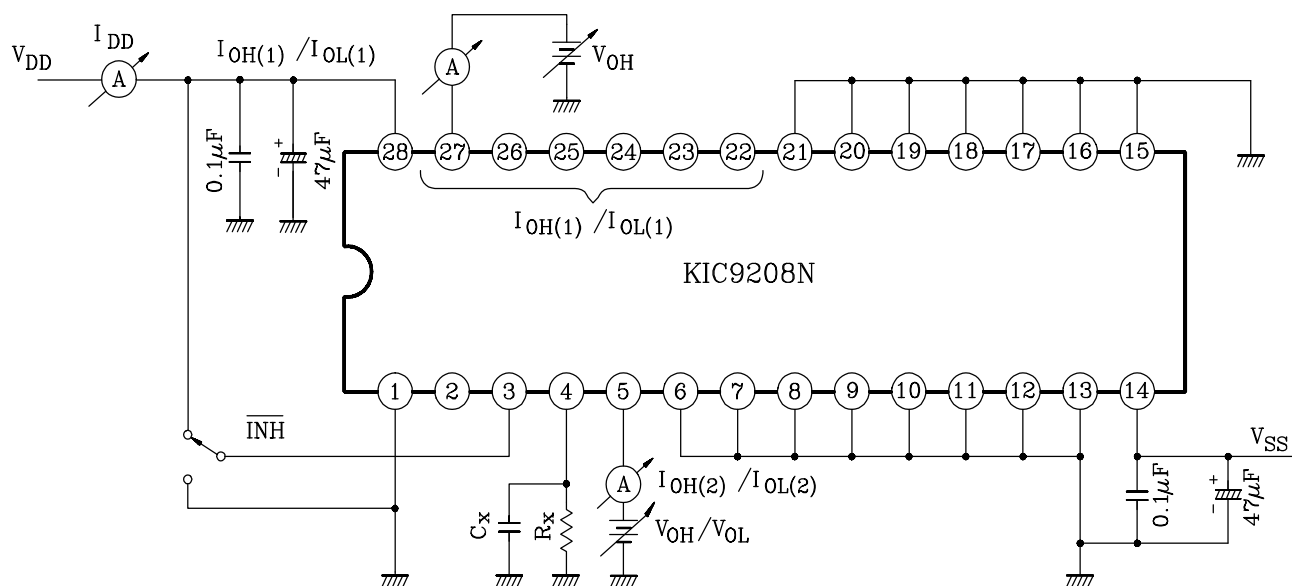
Single power supplies used



(Caution) When a single power supply is used by using the V_{SS} and GND pins commonly, only 1/2 voltage of dual power supplies can be applied as withstanding voltage between V_{DD} and GND is a half of that between V_{DD} and V_{SS} . ($V_{DD}-GND \leq 18V$)

KIC9208N, KIC9209N

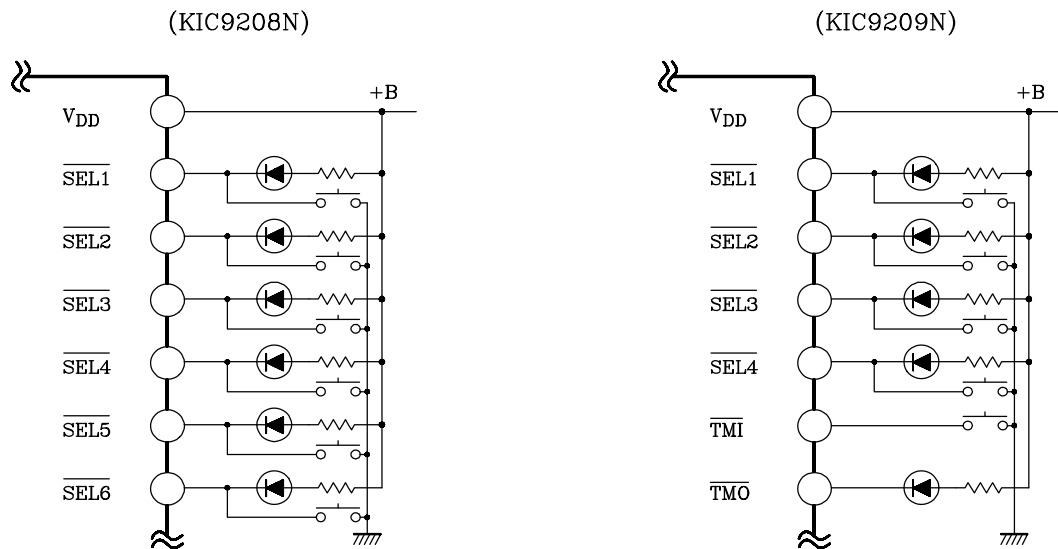
TEST CIRCUIT-1 (I_{DD} , I_B , I_{OH}/I_{OL})



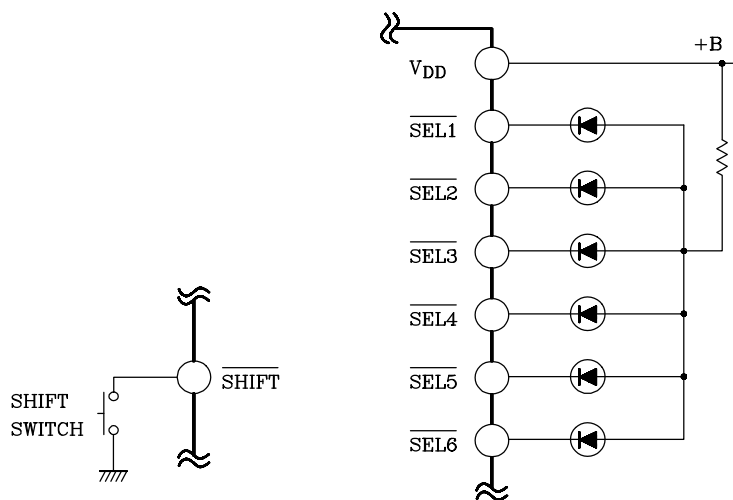
KIC9208N, KIC9209N

APPLICATION CIRCUIT

1. Example of Direct Select Application Circuit

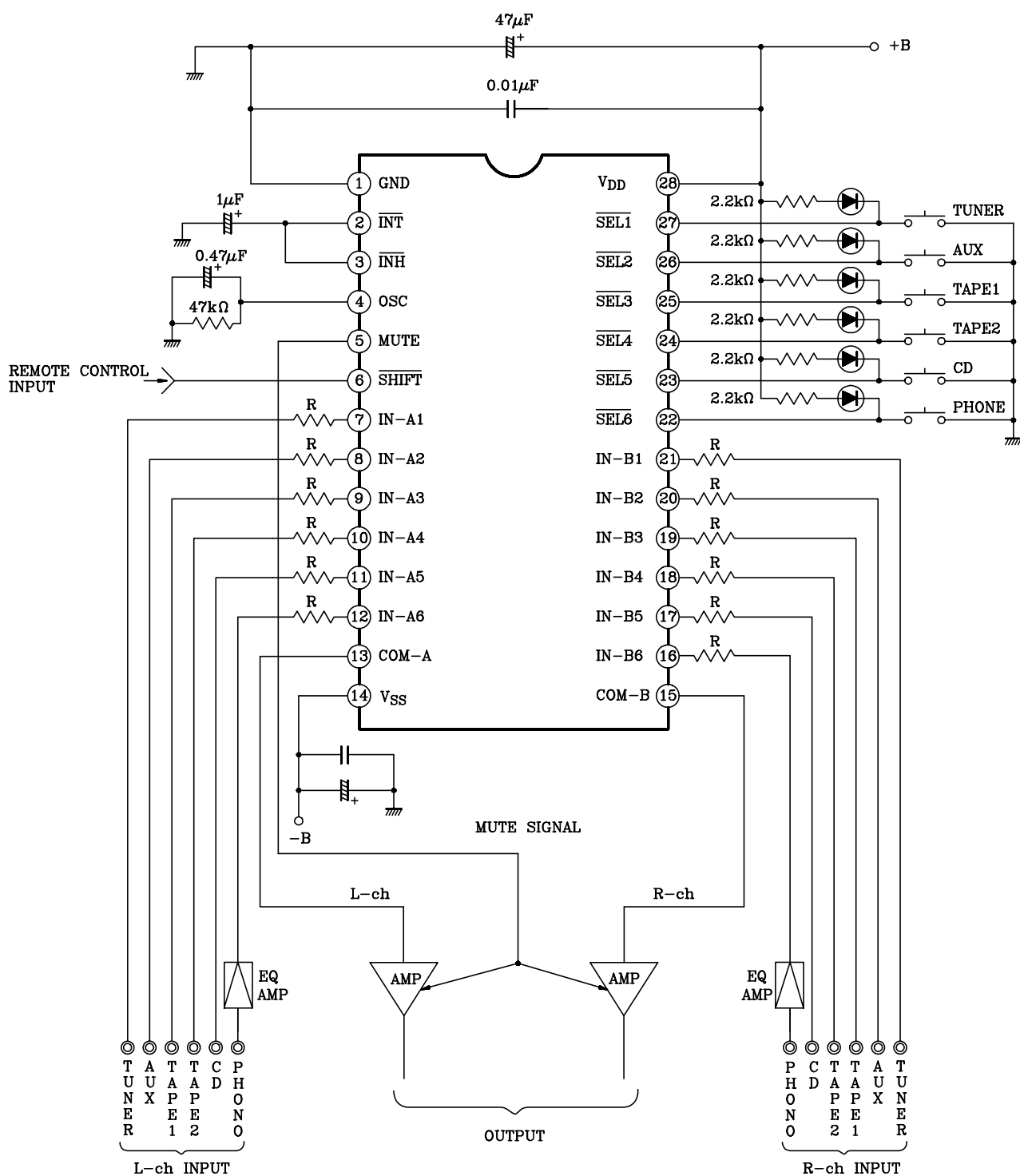


2. Example of Application Circuit by SHIFT input (KIC9208N)



KIC9208N, KIC9209N

APPLICATION CIRCUIT KIC9208N (Not back up mode)



※ This resistor protect IC from over current.
R=1.2~4.7kΩ