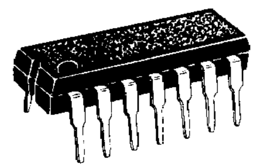
MN4066B/MN4066BS

Quad Analog Switches

Description

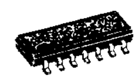
The MN4066B/S have 4 independent analog switches. A High on the enable input establishes a low impedance state (ON stage) between input and output of the switch. A Low establishes a high impedance (OFF stage).
MN4066B is pin-compatible to MN4016B. But MN4066B has low R_{ON} and better transfer characteristics. So applications are for analog/digital switching and chopper modulation and demodulation.
The MN4066B/S are equivalent to MOTOROLA MC14066B and RCA CD4066B.

P- 1



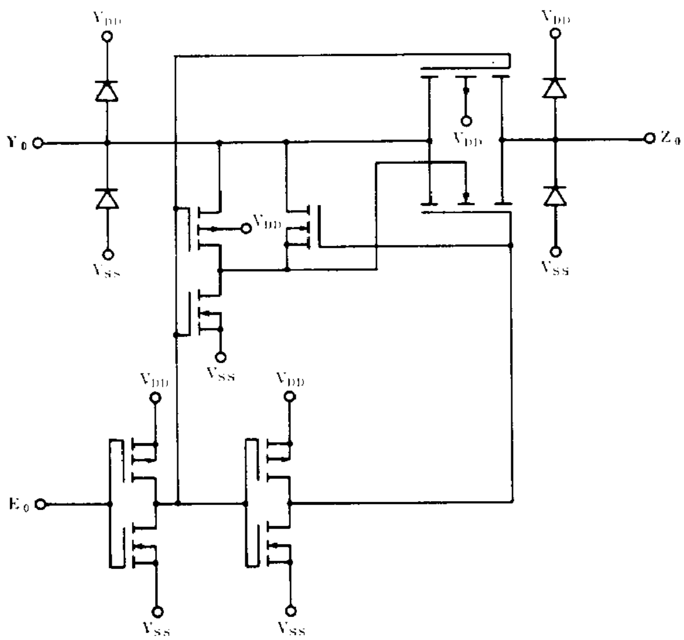
14-Pin • Plastic DIL Package

P- 2

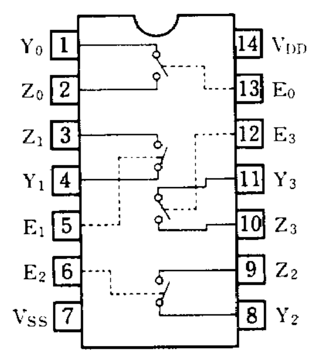


14-Pin • Panaflat Package (SO-14D)

Schematic Diagram (1/4)



Pin Configuration



Pin Explanation

$E_0 \sim E_3$: Enable input
$Y_0 \sim Y_3$: Analog input/output
$Z_0 \sim Z_3$: Analog input/output

■ Maximum Ratings (Ta=25℃)

Item		Symbol	Ratings	Unit
Supply Voltage		V_{DD}	−0.5〜+18	V
Input Voltage		V_I	−0.5〜V_{DD}+0.5*	V
Output Voltage		V_O	−0.5〜V_{DD}+0.5*	V
Peak Input · Output Current		$\pm I_I$	max. 10	mA
Power Dissipation (per package)	Ta=−40〜+60℃	P_D	max. 400	mW
	Ta=+60〜+85℃		Decrease up to 200mW rating at 8mW/°C	
Power Dissipation (per output terminal)		P_D	max. 100	mW
Operating Ambient Temperature		Topr	−40〜+85	℃
Storage Temperature		Tstg	−65〜+150	℃

* V_{DD} + 0.5V should be under 18V

■ DC Characteristics (V_{SS}=0V)

Item	V_{DD} (V)	Symbol	Conditions		Ta=−40℃ min.	Ta=−40℃ max.	Ta=25℃ min.	Ta=25℃ max.	Ta=85℃ min.	Ta=85℃ max.	Unit
Quiescent Power Supply Current	5	I_{DD}	V_I=V_{SS} or V_{DD}		—	1	—	1	—	7.5	μA
	10				—	2	—	2	—	15	
	15				—	4	—	4	—	30	
Input Voltage Low Level	5	V_{IL}	$\|I_O\|$<1μA	V_O=0.5V or 4.5V	—	1.5	—	1.5	—	1.5	V
	10			V_O=1V or 9V	—	3	—	3	—	3	
	15			V_O=1.5V or 13.5V	—	4	—	4	—	4	
Input Voltage High Level	5	V_{IH}	$\|I_O\|$<1μA	V_O=0.5V or 4.5V	3.5	—	3.5	—	3.5	—	V
	10			V_O=1V or 9V	7	—	7	—	7	—	
	15			V_O=1.5V or 13.5V	11	—	11	—	11	—	
Input Leakage Current	15	$\pm I_I$	V_I=0 or 15V		—	0.3	—	0.3	—	1	μA

■ DC Characteristics (Ta=25℃, V_{SS}=0V)

Item	V_{DD}(V)	Symbol	Conditions	min.	typ.	max.	Unit
On Resistance	5	R_{ON}	V_{SS}=0V, V_I=5V	—	150	450	Ω
			V_{SS}=0V, V_I=2.5V	—	380	1140	
			V_{SS}=0V, V_I=0.25V	—	150	450	
	10	R_{ON}	V_{SS}=0V, V_I=10V	—	80	250	Ω
			V_{SS}=0V, V_I=5V	—	100	300	
			V_{SS}=0V, V_I=0.25V	—	100	300	
	15	R_{ON}	V_{SS}=0V, V_I=15V	—	60	180	Ω
			V_{SS}=0V, V_I=7.5V	—	70	210	
			V_{SS}=0V, V_I=0.25V	—	60	180	
	5	R_{ON}	V_{SS}=−5V, V_I=5V	—	100	300	Ω
			V_{SS}=−5V, V_I=±0.25V	—	100	300	
			V_{SS}=−5V, V_I=−5V	—	100	300	
	7.5	R_{ON}	V_{SS}=−7.5V, V_I=7.5V	—	70	210	Ω
			V_{SS}=−7.5V, V_I=±0.25V	—	70	210	
			V_{SS}=−7.5V, V_I=−7.5V	—	70	210	
Input Output of Leakage Current	10	I_{OFF}	V_I=10V, V_O=0V	—	30	125	nA
			V_I=0V, V_O=10V	—	30	125	
	15		V_I=15V, V_O=0V	—	60	250	nA
			V_I=0V, V_O=15V	—	60	250	

■ Switching Characteristics (Ta=25℃, V_{SS}=0V)

Item	V_{DD} (V)	Symbol	Conditions	min.	typ.	max.	Unit
Propagation Delay Time (Fig. 1) Vis→V_{OS}	5	t_{PHL}	R_L=10kΩ, C_L=50pF, En=V_{DD}	—	10	30	ns
	10			—	5	15	
	15			—	5	15	
Propagation Delay Time (Fig. 1) Vis→V_{OS}	5	t_{PLH}		—	10	30	ns
	10			—	5	15	
	15			—	5	15	
Propagation Delay Time (Fig. 1) En→V_{OS}	5	t_{PHZ}	R_L=10kΩ, C_L=50pF, Vis=V_{DD}, R_L→V_{SS}	—	80	240	ns
	10			—	65	195	
	15			—	60	180	
Propagation Delay Time (Fig. 1) En→V_{OS}	5	t_{PLZ}	R_L=10kΩ, C_L=50pF, Vis=V_{SS}, R_L→V_{DD}	—	80	240	ns
	10			—	70	210	
	15			—	70	210	
Propagation Delay Time (Fig. 1) En→V_{OS}	5	t_{PZH}	R_L=10kΩ, C_L=50pF, Vis=V_{DD}, R_L→V_{SS}	—	40	120	ns
	10			—	20	60	
	15			—	15	45	
Propagation Delay Time (Fig. 1) En→V_{OS}	5	t_{PZL}	R_L=10kΩ, C_L=50pF, Vis=V_{SS}, R_L→V_{DD}	—	45	135	ns
	10			—	20	60	
	15			—	15	45	
Sine Wave Distortion (Fig. 2)	5		R_L=10kΩ, C_L=50pF, En=V_{DD}, f=1 kHz, Vis=$\frac{1}{2}V_{DD(P\text{-}P)}$	—	—	—	%
	10			—	0.1	—	
	15			—	0.1	—	
Crosstalk (Fig. 3) (Between 2 Channels)	5		R_L=1kΩ, Vis=$\frac{1}{2}V_{DD(P\text{-}P)}$	—	—	—	MHz
	10			—	1	—	
	15			—	—	—	
Crosstalk (Fig. 1) En→V_{SS}	5		R_L=1kΩ, C_L=15pF, En=V_{DD}	—	—	—	mV
	10			—	80	—	
	15			—	—	—	
Feedthrough (Fig. 2)(Note) (OFF)	5		R_L=1kΩ, C_L=50pF, En=V_{SS}, Vis=$\frac{1}{2}V_{DD(P\text{-}P)}$	—	—	—	kHz
	10			—	700	—	
	15			—	—	—	
Input Capacitance		C_I		—	—	7.5	pF

Fig. 1 Propagation Delay Time, Crosstalk Test Circuit

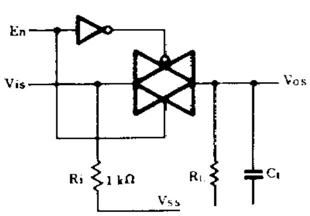
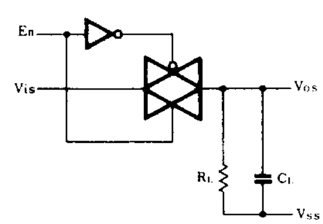
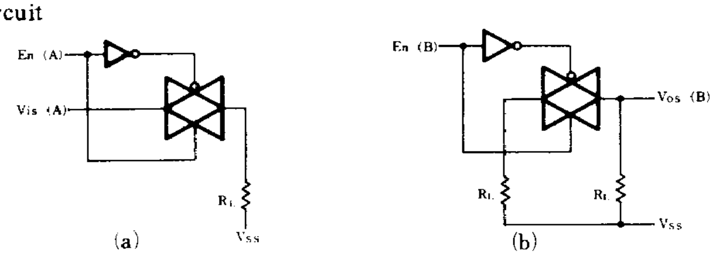


Fig. 2 Sine Wave Distortion, Feedthrough Test Circuit



(Note) $20\log\frac{V_{OS}}{V_{IS}} = -50\text{dB}$

Fig. 3 Crosstalk Test Circuit



$20\log\frac{V_{OS}\ (B)}{V_{IS}\ (A)} = -50\text{dB}$

Panasonic