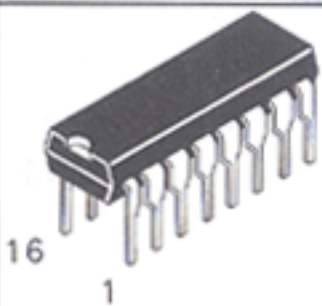


Analog Multiplexers/Demultiplexers
Single 8-Channel
Dual 4-Channel
Triple 2-Channel

DV4051B
DV4052B
DV4053B

DV4051B, DV4052B, and DV4053B multiplexer/demultiplexer analog multiplexers are digitally-controlled analog switches. They feature low ON impedance and very low OFF leakage current. Control of analog signals up to the complete supply voltage range can be achieved.

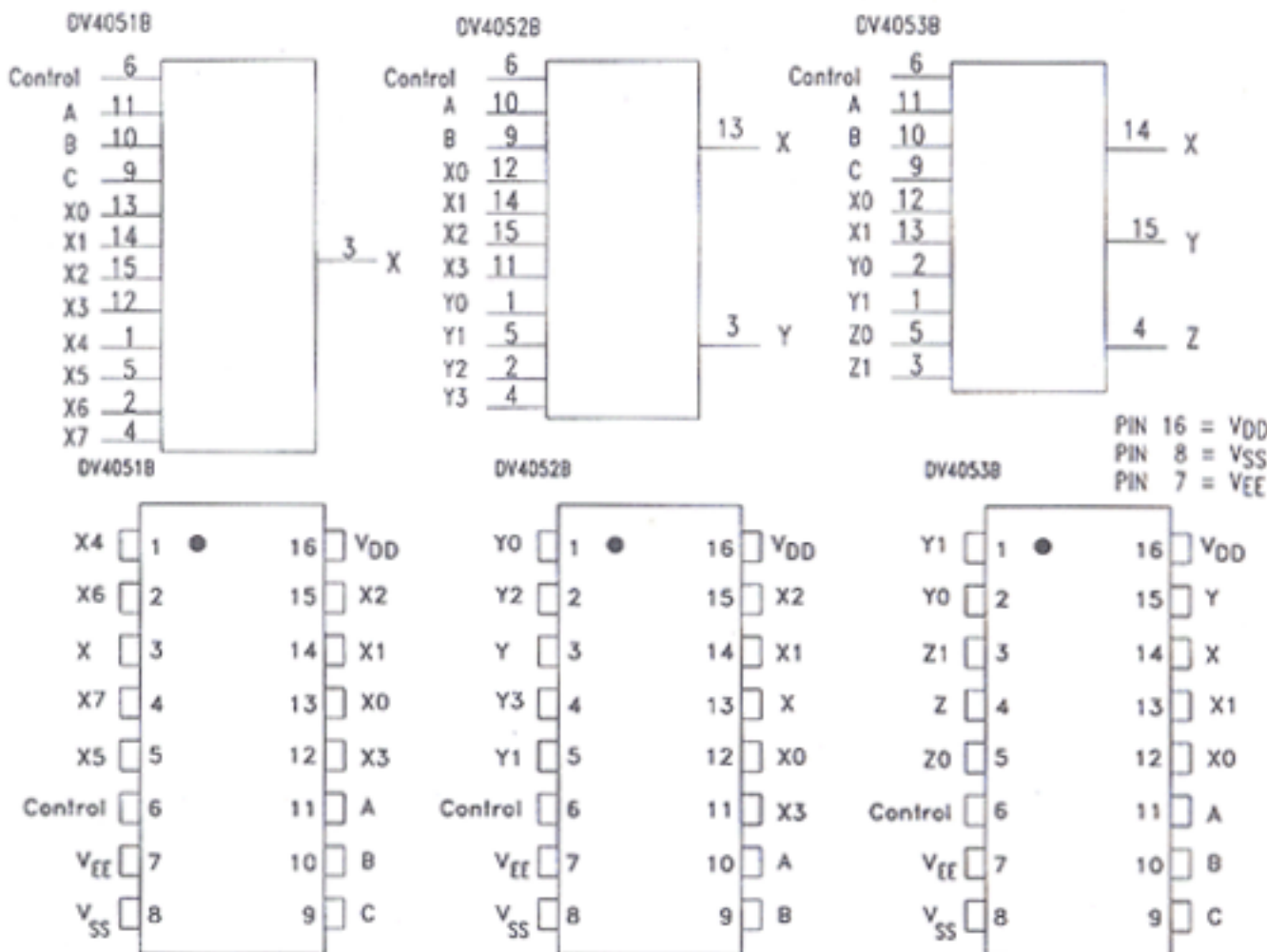
- Operating Voltage Range = 3.0 Vdc to 18 Vdc
- All Outputs Buffered
- Diode Protection on All Inputs
- Highest Noise Immunity at 12V supply



N Suffix
Plastic DIP
AVG-003 Case

D Suffix
Plastic SOP
AVG-004 Case

4051B, 4052B, 4053B



TRUTH TABLE

Control Inputs				ON Switches		
Control	Select			4051B	4052B	4053B
	C*	B	A			
0	0	0	0	X0	Y0	X0
0	0	0	1	X1	Y1	X1
0	0	1	0	X2	Y2	X2
0	0	1	1	X3	Y3	X3
0	1	0	0	X4		Z1
0	1	0	1	X5		Z1
0	1	1	0	X6		Z1
0	1	1	1	X7		Z1
1	X	X	X	Switch OFF	Switches OFF	Switches OFF

*Not Used on DV4052B

X=Don't Care

Control Input is referenced to VSS, analog terminals are referenced to VEE.

VEE must be ≤ VSS

ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V_{DD}	DC Supply Voltage (Referenced to V_{EE} , $V_{SS} \geq V_{EE}$)	-0.5 to 18.0	V
V_{IN} , V_{OUT}	Input or Output Voltage (DC or Transient) (Referenced to V_{SS} for Control Inputs and V_{EE} for Switch I/O)	-0.5 to $V_{DD} + 0.5$	V
I_{IN}	Input Current (DC or Transient), per Control Pin	± 10	mA
I_{SW}	Current Through Switch	± 25	mA
P_D	Power Dissipation in Still Air, Per Package Derating: -12mW/°C from 65°C to 85°C	500	mW
T_{STG}	Storage Temperature Range	-65 to +150	°C
TL	Lead Temperature, 8 Second Soldering	260	°C

ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{DD}	Guaranteed Limits							Unit
				-40°C		25°C			85°C		
				Min	Max	Min	Typ	Max	Min	Max	
Supply Requirements (Voltages referenced to V _{EE})											
V _{DD}	Power Supply Voltage Range	V _{DD} -3.0≥V _{SS} ≥V _{EE}	-	3.0	18	3.0	-	18	3.0	18	V
I _{DD}	Quiescent Current, Per Package	Control Inputs: V _{IN} =V _{SS} or V _{DD} Switch I/O: V _{EE} ≤V _{IO} ≤V _{DD} , and ΔV _{Switch} ≤500mV*	5.0 10 15	- - -	20 40 80	- - -	0.005 0.010 0.015	20 40 80	- - -	150 300 600	μA
Control Inputs – INHIBIT, A, B, C (Voltages referenced to V _{SS})											
V _{IL}	Low-Level Input Voltage	R _{ON} =Per Spec I _{OFF} =Per Spec	5.0 10 15	- - -	1.5 3.0 4.0	- - -	2.25 4.50 6.75	1.5 3.0 4.0	- - -	1.5 3.0 4.0	V
V _{IH}	High- Level Input Voltage	R _{ON} =Per Spec I _{OFF} =Per Spec	5.0 10 15	3.5 7.0 11	- - -	3.5 7.0 11	2.75 5.50 8.25	- - -	3.5 7.0 11	- - -	V
I _{IN}	Input Leakage Current	V _{IN} = 0 or V _{DD}	15		± 0.3	-	±0.00001	± 0.3	-	±1.0	μA
C _{IN}	Input Capacitance		-	-	-	-	5.0	7.5	-	-	pF
Switches IN/OUT and Commons OUT/IN – X, Y, Z (Voltages Referenced to V _{EE})											
V _{IO}	Recommended Peak-to-Peak Voltage Into or Out of the Switch	Channel On or Off	-	0	V _{DD}	0	-	V _{DD}	0	V _{DD}	V _{PP}
ΔV _{Switch}	Recommended Static or Dynamic Voltage Across the Switch*	Channel On	-	0	600	0	-	600	0	300	mV
V _{OO}	Output Offset Voltage	V _{IN} =0V, No Load	-	-	-	-	10	-	-	-	μV
R _{ON}	On Resistance	ΔV _{Switch} ≤500mV* V _{IN} =V _{IL} or V _{IH} (Control), V _{IN} =0 to V _{DD} (Switch)	5.0 10 15	- - -	880 450 250	- - -	250 120 80	1050 500 280	- - -	1200 520 300	Ω
ΔR _{ON}	Δ On Resistance between any two Channels in the same package			Inh=Pin 6 A=Pin 11 B=Pin 10 C= Pin 5	70 50 45 300	- - - -	25 10 10 ±0.05	70 50 45 ±300	- - - -	135 95 65 ±1000	Ω nA
I _{OFF}	Off-Channel Leakage Current (Control)	V _{IN} =V _{IL} or V _{IH} Channel to Channel or Any One Channel									
C _{IO}	Capacitance, Switch I/O	Inhibit=V _{DD}	-	-	-	-	10	-	-	-	pF
C _{O/I}	Capacitance, Common O/I Inhibit=V _{DD}	DV4051B DV4052B DV4053B	- - -	- - -	- - -	- - -	60 32 17	- - -	- - -	- - -	pF
C _{IO}	Capacitance, Feedthrough (Channel Off)	Pins Not Adjacent Pins Adjacent	- -	- -	- -	- -	0.15 0.47	- -	- -	- -	pF

* For voltage drops across the switch > 600 mV (> 300 mV at high temperature), excessive V_{DD} current may be drawn; i.e. the current out of the switch may contain both V_{DD} and switch input components. The reliability of the device will be unaffected unless the Maximum Ratings are exceeded.

ELECTRICAL CHARACTERISTICS ($C_L=50\text{pF}$, $T_A=25^\circ\text{C}$) ($V_{EE} \leq V_{SS}$ unless otherwise indicated)

Symbol	Characteristic	$V_{DD}-V_{EE}$	Typ	Max	Unit
t_{PLH} , t_{PHL}	Propagation Delay Times Switch Input to Switch Output ($R_L = 10\text{k}\Omega$)				
	DV4051B	5.0 10 15	35 15 12	90 40 30	ns
	DV4052B	5.0 10 15	30 12 10	75 30 25	ns
	DV4053B	5.0 1.0 15	25 8.0 6.0	60 20 15	ns
t_{PHZ} , t_{PLZ} , t_{PZH} , t_{PZL}	Inhibit to Output ($R_L = 10\text{k}\Omega$, $V_{EE} = V_{SS}$) Output "1" or "0" to High Impedance, or High Impedance to "1" or "0" Level				
	DV4051B	5.0 10 15	350 170 140	700 340 280	ns
	DV4052B	5.0 10 15	300 155 125	600 310 250	ns
	DV4053B	5.0 10 15	275 140 110	550 280 220	ns
t_{PLH} , t_{PHL}	Control Input to Output ($R_L = 10\text{k}\Omega$, $V_{EE} = V_{SS}$)				
	DV4051B	5.0 10 15	360 160 120	720 320 240	ns
	DV4052B	5.0 10 15	325 130 90	650 260 180	ns
	DV4053B	5.0 10 15	300 120 80	600 240 160	ns
-	Second Harmonic Distortion ($R_L = 10\text{k}\Omega$, $f = 1\text{kHz}$) $V_{IN} = 5\text{VPP}$	10	0.07	-	%
BW	Bandwidth ($R_L = 1\text{k}\Omega$, $V_{IN} = 1/2 (V_{DD}-V_{EE})$ p-p, $C_L = 50\text{pF}$ $20 \text{ Log } (V_{OUT}/V_{IN}) = -3\text{ dB}$	10	17	-	MHz
-	Off Channel Feedthrough Attenuation ($R_L = 1\text{k}\Omega$, $V_{IN} = 1/2 (V_{DD}-V_{EE})$ p-p DV4051B: $f_{in} = 4.5\text{ MHz}$, DV4052B: $f_{in} = 30\text{ MHz}$	10	-50	-	dB
-	Channel Separation ($R_L = 1\text{k}\Omega$, $V_{IN} = 1/2 (V_{DD}-V_{EE})$ p-p $f_{in} = 3.0\text{ MHz}$	10	-50	-	dB
-	Crosstalk, Control Input to Common O/I ($R_1 = 1\text{k}\Omega$, $R_L = 10\text{k}\Omega$ Control $t_{TLH} = t_{THL} = 20\text{ ns}$, Inhibit = V_{SS})	10	75		mV

SWITCHING WAVEFORMS

