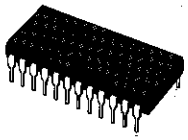
ANALOG MULTIPLEXER/DEMULTIPLEXER

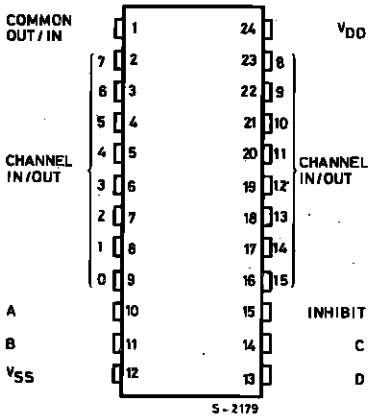
4067–SINGLE 16-CHANNEL
4097–DIFFERENTIAL 8-CHANNEL



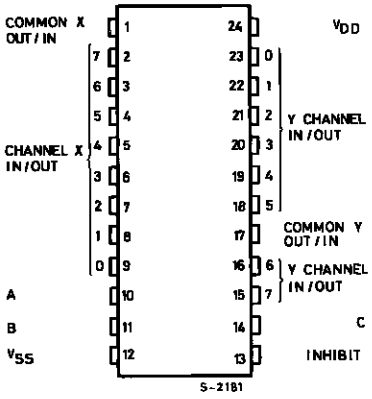
- LOW ON RESISTANCE: 125Ω (typ.) OVER 15 Vp-p SIGNAL INPUT RANGE FOR V_{DD} - V_{SS} = 15V
- HIGH OFF RESISTANCE: CHANNEL LEAKAGE OF ±10pA (typ.) @ V_{DD} - V_{SS} = 10V
- MATCHED SWITCH CHARACTERISTICS: ΔR_{ON} = 5Ω (typ.) FOR V_{DD} - V_{SS} = 15V
- VERY LOW QUIESCENT POWER DISSIPATION UNDER A DIGITAL CONTROL INPUT AND SUPPLY CONDITIONS: 0.2μW (typ.) @ V_{DD} -V_{SS} = 10V
- BINARY ADDRESS DECODING ON CHIP
- QUIESCENT CURRENT SPECIFIED TO 20V FOR HCC DEVICE
- STANDARDIZED SYMMETRICAL OUTPUT CHARACTERISTICS
- 5V, 10V AND 15V PARAMETRIC RATINGS
- INPUT CURRENT OF 100nA AT 18V AND 25°C FOR HCC DEVICE
- 100% TESTED FOR QUIESCENT CURRENT
- MEETS ALL REQUIREMENTS OF JEDEC TENTATIVE STANDARD No 13A, "STANDARD SPECIFICATIONS FOR DESCRIPTION OF B SERIE CMOS DEVICES"

PIN CONNECTIONS

4067



4097



DESCRIPTION

The **CC4067,CC4097** (extended temperature range) and **CC4067, CC4097** (intermediate temperature range) are monolithic integrated circuits available in 24-lead dual in line plastic or ceramic package.

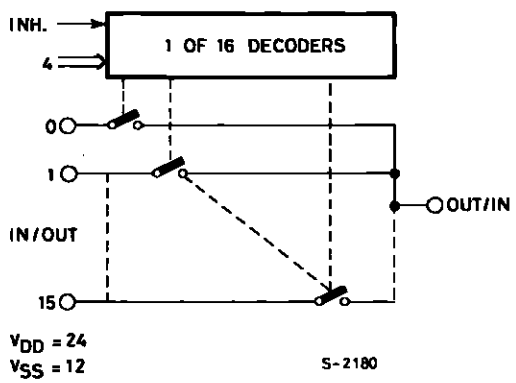
The **CC4067** and **CC4097** COS/MOS analog multiplexers/demultiplexers are digitally controlled analog switches having low ON impedance, low OFF leakage current and internal address decoding. in addition, the ON resistance is relatively constant over the full input-signal range.

The **CC4067** ia a 16-channel multiplexer with four binary control inputs A, B, C, D, and an inhibit input, arranged so that any combination of the inputs selects one switch.

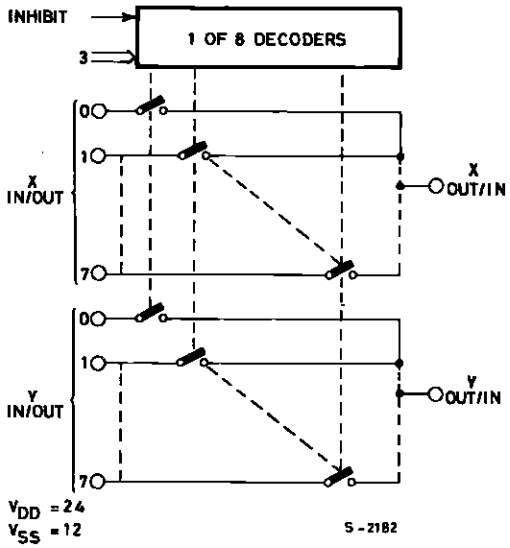
The **CC4097** is a differential 8-channel multiplexer having three binary control inputs A, B, C, and an inhibit input. The inputs permit selection of one

FUNCTIONAL DIAGRAM

For **4067B**

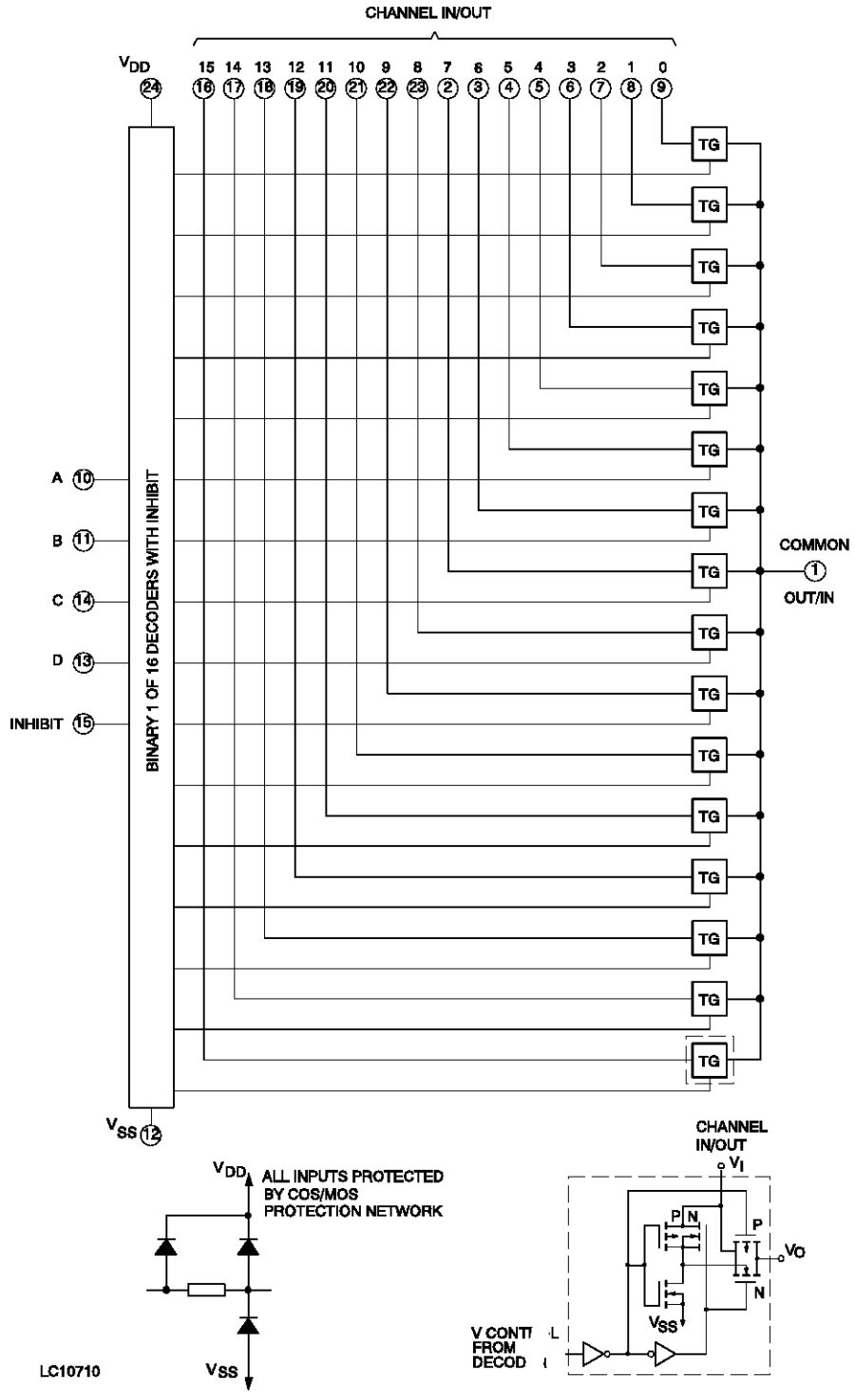


For **4097B**



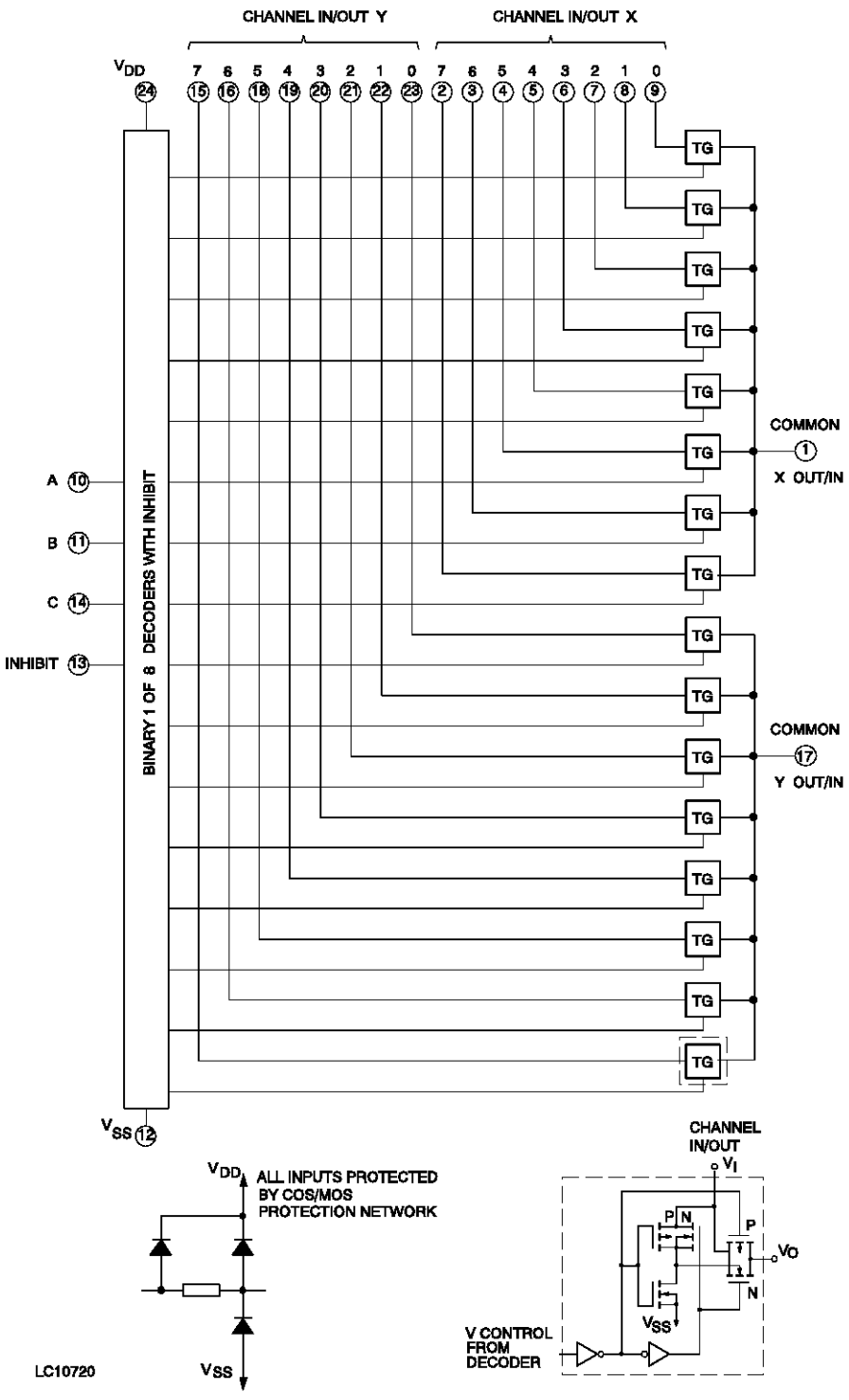
LOGIC DIAGRAM

For **4067B**



LOGIC DIAGRAM

For **4097B**



TRUTH TABLES FOR CC4067

A	B	C	D	INH	SELECTED CHANNEL
X	X	X	X	1	None
0	0	0	0	0	0
1	0	0	0	0	1
0	1	0	0	0	2
1	1	0	0	0	3
0	0	1	0	0	4
1	0	1	0	0	5
0	1	1	0	0	6
1	1	1	0	0	7
0	0	0	1	0	8
1	0	0	1	0	9
0	1	0	1	0	10
1	1	0	1	0	11
0	0	1	1	0	12
1	0	1	1	0	13
0	1	1	1	0	14
1	1	1	1	0	15

TRUTH TABLE FOR CC4097

A	B	C	INH	SELECTED CHANNEL
X	X	X	1	None
0	0	0	0	0X 0Y
1	0	0	0	1X 1Y
0	1	0	0	2X 2Y
1	1	0	0	3X 3Y
0	0	1	0	4X 4Y
1	0	1	0	5X 5Y
0	1	1	0	6X 6Y
1	1	1	0	7X 7Y

ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V_{DD} *	Supply Voltage:	-0.5 to +20	V
V_i	Input Voltage	-0.5 to V_{DD} + 0.5	V
I_I	DC Input Current (any one input)	± 10	mA
P_{tot}	Total Power Dissipation (per package) Dissipation per Output Transistor for Top = Full Package Temperature Range	200 100	mW mW
T_{op}	Operating Temperature:	-55 to +125	^oC
T_{stg}	Storage Temperature	-65 to +150	^oC

Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for external periods may affect device reliability.

* All voltage values are referred to V_{SS} pin voltage.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Value	Unit
V_{DD}	Supply Voltage: **HCC** Types	3 to 18	V
V_I	Input Voltage	0 to V_{DD}	V
T_{op}	Operating Temperature:		^oC

STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

Symbol	Parameter		Test Conditios				Value							Unit
			V_{IS} (V)	V_{EE} (V)	V_{SS} (V)	V_{DD} (V)	T_{LOW} * Min.	T_{LOW} * Max.	25 °C Min.	25 °C Typ.	25 °C Max.	T_{HIGH} * Min.	T_{HIGH} * Max.	
I_L	Quiescent Supply Current					5		5		0.04	5		150	µA
						10		10		0.04	10		300	
						15		20		0.04	20		600	
						18		100		0.08	100		3000	
SWITCH														
R_{ON}	On Resistance	HCC types	$0 \le V_I \le V_{DD}$	0	0	5		800		470	1050		1300	Ω
						10		310		180	400		580	
						15		200		125	240		320	
ΔON	Resistance ΔR_{ON} (Between any two channels)			0	0	5				10				Ω
						10				10				
						15				5				
OFF (•) Channel Leakage Current	Any Channel OFF			0	0	18		100		±0.1	100		1000	µA
	All Channel OFF (common OUT/IN)			0	0	18		100		±0.1	100		1000	
C	Capacitance Input Output for 4067 Output for 4097 Feedthrough				-5	5				5 55 35 0.2				pF
CONTROL														
V_{IL}	Input Low Voltage		= V_{DD} thru 1KΩ	$V_{EE}=V_{SS}$ R_L =1KΩ to V_{SS} I_{IS} < 2µA (on all OFF channels)		5		1.5			1.5		1.5	V
						10		3			3		3	
						15		4			4		4	
V_{IH}	Input High Voltage					5	3.5		3.5			3.5		V
						10	7		7			7		
						15	11		11			11		
I_{IH} I_{IL}	Input Leackage Current		V_I = 0/18V			18		±0.1		$±10^{-3}$	±0.1		±1	µA
C_I	Input Capacitance		Any Address or Inhibit Input							5	7.5			pF

• Determined by minimum feasible leakage measurement for automatic testing
* T_{LOW} = -55 °C for **HCC** device: -40 °C for **HCF** device.
* T_{HIGH} = +125 °C for **HCC** device: +85 °C for **HCF** device.
The Noise Margin for both "1" and "0" level is: 1V min. with V_{DD} = 5 V, 2 V min. with V_{DD} = 10 V, 2.5 V min. with V_{DD} = 15 V

DYNAMIC ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, C_L = 50 pF, R_L = 200 KΩ, typical temperature coefficent for all V_{DD} values is 03 %/°C, all input rise and fall times= 20 ns)

Symbol	Parameter	Test Conditions								Value		Unit
		V_C (V)	R_L (KΩ)	f_i (KHz)	V_I (V)	V_{SS} (V)	V_{DD} (V)			Typ.	Max.	
SWITCH												
t_{pd}	Propagation Delay Time (Signal Input to Output)	= V_{DD}	200		⎍	0	5			30	60	ns
							10			15	30	
							15			11	20	
	Frequency Response Channel "ON" (Sine Wave Input) at $20\ Log \frac{V_O}{V_I} = -3\ dB$	= V_{DD}	1		5 (•)	0	10	V_O at Common OUT/IN	4067B	14		ns
									4097B	20		
								V_O at Any Channel		60		
	Feedthrough (All Channels OFF) at $20\ Log \frac{V_O}{V_I} = -40\ dB$	= V_{SS}	1		5 (•)	0	10	V_O at Common OUT/IN	4067B	20		MHz
									4097B	12		
								V_O at Any Channel		8		
	Frequency Signal Crosstalk at $20Log \frac{V_{O(B)}}{V_{I(A)}} = -40dB$	$V_{C(A)}$=V_{DD} $V_{C(B)}$=V_{SS}	1		5 (•)	0	10	Between Any two (A and B) Channels		1		MHz
								Between Sections (A and B) 4097B only	Measured on common	10		
									Measured on Any Channel	18		
t_W	Sine Wave Distortion (f_{is} = 1KHz sine wave)	5	10	1	2 (•)	0	5			0.3		%
		10	10	1	3 (•)	0	10			0.2		
		15	10	1	5 (•)	0	15			0.12		
CONTROL (address or Inhibit)												
t_{PLH} t_{PHL}	Propagation Delay Time: Address or Inhibit to Signal OUT (Channel Turning ON)		1			0	5			325	650	ns
						0	10			135	270	
						0	15			95	190	
t_{PLH} t_{PHL}	Propagation Delay Time: Address or Inhibit to Signal OUT (Channel Turning OFF)		0.3			0	5			220	440	ns
						0	10			90	180	
						0	15			65	130	
	Address or Inhibit to Signal Crosstalk		10*			0	10			75		mV peak

(•) Peak to peak voltage symmetrical about $\frac{V_{DD} - V_{SS}}{2}$

(*) Both ends of channel