

# COS/MOS INTEGRATED CIRCUIT



## 4 x 4 CROSSPOINT SWITCH WITH CONTROL MEMORY

- LOW ON RESISTANCE  $\approx 85\Omega$  TYP. AT  $V_{DD} = 12V$
- "BUILT-IN" CONTROL LATCHES
- LARGE ANALOG SIGNAL CAPABILITY:  $\pm V_{DD}/2$
- TRANSMITS SIGNALS UP TO 10 MHz
- MATCHED SWITCH CHARACTERISTICS  $\Delta R_{ON} = 5\Omega$  TYP. AT  $V_{DD} - V_{SS} = 12V$ .
- HIGH LINEARITY:  $-0.5\%$  DISTORTION (TYP.) AT 1 KHz,  $V_{IN} = 5V$  PEAK TO PEAK  
 $V_{DD} - V_{SS} = 10V$ ,  $R_L = 10 K\Omega$
- STANDARD COS/MOS NOISE IMMUNITY

The M22100 combines a 4 x 4 array of crosspoints (transmission gates) with a 4-line-to-16-line decoder and 16 latch circuits. Any one of the sixteen transmission gates (crosspoints) can be selected by applying the appropriate four line address. The selected transmission gate can be turned on or off by applying a logical one or zero, respectively, to the data input and strobing the strobe input to a logical one. Any number of the transmission gates can be ON simultaneously.

The device is available in 16 lead dual in-line plastic or ceramic package.

## ABSOLUTE MAXIMUM RATINGS

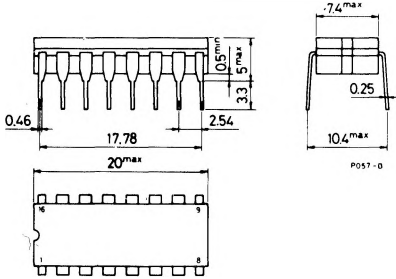
$V_{DD}^*$	Supply voltage	-0.5 to 20	V
$V_i$	Input voltage	-0.5 to $V_{DD}$ +0.5	V
$I_i$	DC input current (any one input)	$\pm 10$	mA
$P_{tot}$	Total power dissipation (per package)	200	mW
	Dissipation per output transistor for $T_{op}$ = full package-temperature range	100	mW
$T_{op}$	Operating temperature range: for ceramic	-55 to 125	$^{\circ}C$
	for plastic	-40 to 85	$^{\circ}C$
$T_{stg}$	Storage temperature range	-65 to 150	$^{\circ}C$

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

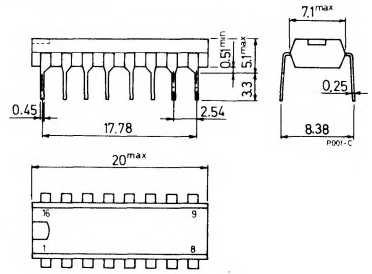
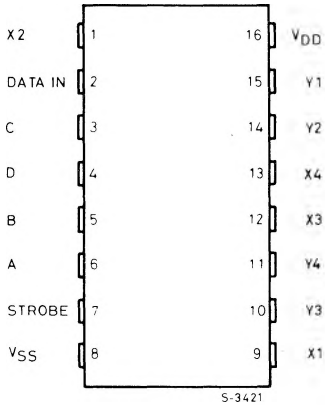
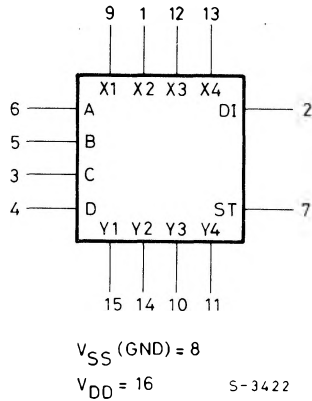
**ORDERING NUMBERS:** M22100 B1 for dual in-line plastic package  
M22100 D1 for dual in-line ceramic package frit seal

**MECHANICAL DATA** (dimension in mm)

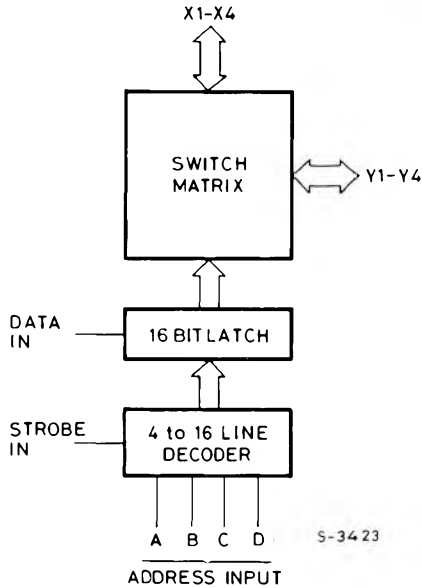
For dual in-line ceramic package, frit seal



For dual in-line plastic package


**PIN CONNECTIONS**

**FUNCTIONAL DIAGRAM and TRUTH TABLE**


Address				Select	Address				Select
A	B	C	D		A	B	C	D	
0	0	0	0	X1Y1	0	0	0	1	X1Y3
1	0	0	0	X2Y1	1	0	0	1	X2Y3
0	1	0	0	X3Y1	0	1	0	1	X3Y3
1	1	0	0	X4Y1	1	1	0	1	X4Y3
0	0	1	0	X1Y2	0	0	1	1	X1Y4
1	0	1	0	X2Y2	1	0	1	1	X2Y4
0	1	1	0	X3Y2	0	1	1	1	X3Y4
1	1	1	0	X4Y2	1	1	1	1	X4Y4

**LOGIC DIAGRAM**

**STATIC ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25°C)**

Parameter		Test conditions		Typical value	Units	
			V <sub>DD</sub> (V)			
I <sub>L</sub>	Quiescent supply current	Switches OFF or ON		12	20	nA
I <sub>L</sub>	OFF leakage current	Crosspoint	R <sub>L</sub> = 10 KΩ		100	pA
R <sub>ON</sub>	ON resistance				85	Ω
ΔR <sub>ON</sub>	ΔON resistance				5	Ω
C <sub>IO</sub>	Feedthrough capacitance				0.2	pF
C <sub>IS</sub> , C <sub>OS</sub>	Channel input or output capacitance				30	pF
C <sub>I</sub>	Input capacitance				5	pF
Sine wave response (distortion)		f <sub>is</sub> = 1 KHz R <sub>L</sub> = 10 KΩ			0.4	%
Feedthrough, crosspoints OFF		f <sub>is</sub> = 1.6 KHz R <sub>L</sub> = 1 KΩ		-95	dB	



M 22100

**DYNAMIC ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25^{\circ}C$ )

Parameter		Test conditions		Typical value	Units
		$R_L = 10\text{ k}\Omega$ $C_L = 50\text{ pF}$	$V_{DD}$ (V)		
$t_{PHL}, t_{PLH}$ Propagation delay time	address or strobe		12	200	ns
	input to outputs			20	ns
	across crosspoint	80		ns	
$t_w$ Strobe pulse width					