

## PRELIMINARY DATA

### 16 STAGE COUNTER

- LOW QUIESCENT POWER DISSIPATION
- WIDE SUPPLY VOLTAGE RANGE: 3 to 17V
- FULLY PROTECTED INPUTS
- INVERTER AVAILABILITY FOR CRYSTAL OSCILLATOR TIMING APPLICATION
- ADJUSTABLE FREQUENCY DIVIDER IN 127 STEPS
- TEST OUTPUT AVAILABEL
- MOTOR DRIVE BRIDGE CONFIGURATION OUTPUT

The M752 (standard temperature range) is a 16 stage binary counter in COS/MOS technology in a single monolithic chip. An inverter is available for crystal oscillator application in which the function of the trimmer capacitor has been taken over by the variable frequency divider comprised in the IC and used to set the correct output frequency. For this purpose seven adjustment terminals are provided on the M752: they are used to set the divider ratio to the required value with an accuracy of  $10^{-6}$ . With an oscillator frequency of 4.194812 MHz the bridge configuration outputs supply two symmetrical square wave signals whose frequency is 64 Hz; duty cycle is 50% and their relative delay is of half period. The adjustable frequency divider has been designed in such a way that the maximum output frequency is set when all adjustment terminals are either open-circuit or connected to pin 16. If one or more adjustment terminals are grounded (taken to pin 14), the output frequency decreases. If all adjustment terminals are grounded, the output frequency is reduced by 242 ppm. The by-four-divided oscillator frequency may be checked at a separate test output (pin 9) non-reactive with respect to the oscillator. Based on this check the output frequency and consequently the accuracy of the clock may be adjustable at the terminals 2 . . . 8 by means of the variable frequency divider. The device is available in 16 lead dual in-line plastic or ceramic package.

### ABSOLUTE MAXIMUM RATINGS\*

$V_{DD}$ **	Supply voltage	-0.3 to +17	V
$I_{12}, I_{13}$	Output current	30	mA
$P_{tot}$	Power dissipation at $T_{amb} = 25^{\circ}C$	200	mW
$T_{op}$	Operating temperature range	-40 to +85	$^{\circ}C$
$T_{stg}$	Storage temperature range	-55 to +125	$^{\circ}C$

\* 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 extended periods may affect device reliability.

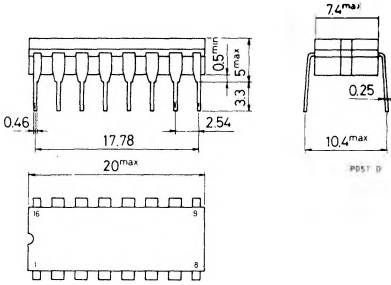
\*\* All voltages are referred to  $V_{SS}$  pin voltage.

**ORDERING NUMBERS:** M752 B1 for dual in-line plastic package  
M752 D1 for dual in-line ceramic package, frit seal

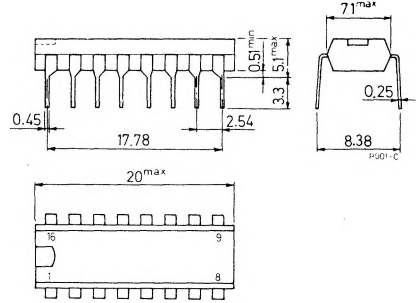


## MECHANICAL DATA (dimension in mm)

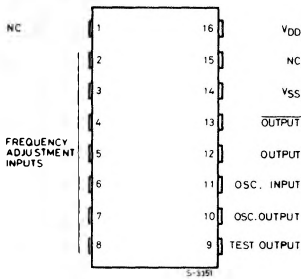
For dual in-line ceramic package, frit seal



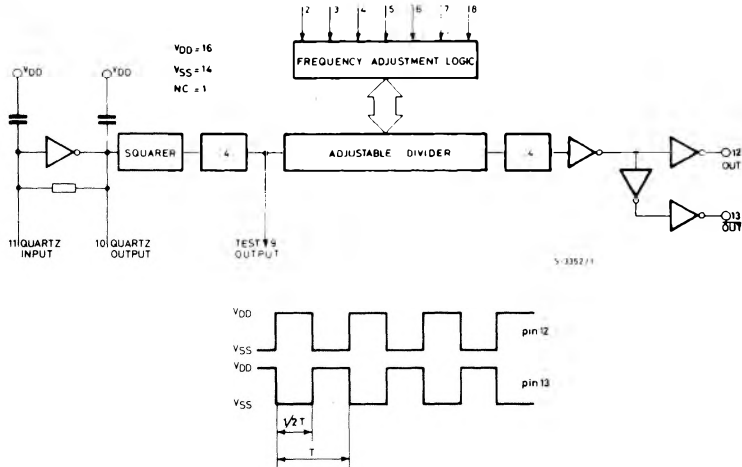
For dual in-line plastic package



## PIN CONNECTIONS



## BLOCK DIAGRAM and OUTPUT WAVEFORM



## RECOMMENDED OPERATING CONDITIONS

$V_{DD}$	Supply voltage: for general applications	3 to 16.5	V
$V_{DD}$	for oscillator starting	6 to 16.5	V
$V_i$	Input voltage	$V_{DD}$ to $V_{SS}$	V
$R_L$	Output load resistance between pins 12 and 13	1	$K\Omega$
$T_{op}$	Operating temperature	-40 to +85	$^{\circ}C$



### STATIC ELECTRICAL CHARACTERISTICS (over recommended operating conditions)

Parameter	Test conditions		Values									Unit
			-40°C			25°C			85°C			
	V <sub>O</sub> (V)	V <sub>DD</sub> (V)	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
V <sub>OH</sub> Output high voltage	I <sub>OH</sub> = 0	6	5.99			5.99	6		5.95			V
		12	11.99			11.99	12		11.95			
V <sub>OL</sub> Output low voltage	I <sub>OL</sub> = 0	6			0.01		0	0.01			0.05	V
		12			0.01		0	0.01			0.05	
I <sub>DN</sub> Output drive current N-channel	pin 12-13	2	6	10.5			10	12.5		6.5		mA
		2	12	17			16.5	20		6.5		
I <sub>DP</sub> Output drive current P-channel	pin 12-13	4	6	-10.5			-10	-12.5		-6.5		mA
		10	12	-17			-16.5	-20		-6.5		
I <sub>ON</sub> Current consumption	I <sub>O</sub> = 0*		12				3					mA

\* At quartz frequency of 4.194.812 Hz.

### DYNAMIC ELECTRICAL CHARACTERISTICS (T<sub>amb</sub> = 25°C, quartz frequency 4.194.812 Hz)

Parameter	Test conditions		Values						Unit	
			V <sub>DD</sub> (V)	M752 D1			M752 B1			
	Min.	Typ.		Max.	Min.	Typ.	Max.			
f <sub>T</sub> Frequency test output			12	1.048703			1.048703			Hz
f <sub>o</sub> ** Output frequency			12		64			64		Hz
$\frac{\Delta f_o}{f_o}$ Range output frequency adjustment			12		± 121			± 121		ppm
R <sub>o</sub> Total bridge output resistance	R <sub>L</sub> = 300Ω		6			300			300	Ω

\*\* At the centre position of the variable divider.

**APPLICATION CIRCUIT**
