SP8782A & B

1GHz ÷16/17, ÷32/33 Multi-Modulus Divider

DS3653 - 1.2 October 1995

The SP8782 is a multi-modulus divider which divides by 16/17 when the Ratio Select input is low and by 32/33 when the Ratio Select input is high. When high, the Modulus Control input selects the lower division ratio (16 or 32) and the higher ratio (17 or 33) when it is low.

The device uses resynchronisation techniques to reduce the effects of propagation delays in frequency synthesis.

The SP8782A (ceramic DIL package) is characterised over the full military temperature range of −55°C to +125°C, the SP8782B (miniature plastic DIL package) over the industrial range of −40°C to +85°C

FEATURES

- Advanced Resynchronisation Techniques to Negate Loop Delay Effects
- CMOS Compatible Output Capability
- Multi-Modulus Division

QUICK REFERENCE DATA

- Supply Voltage Range: 4V to 5·5V
- Full Military Temperature Range:
  −55°C to +125°C (SP8782A)

ORDERING INFORMATION

SP8782 A DG
SP8782 B MP
DES9208921/AC/DG (SMD)

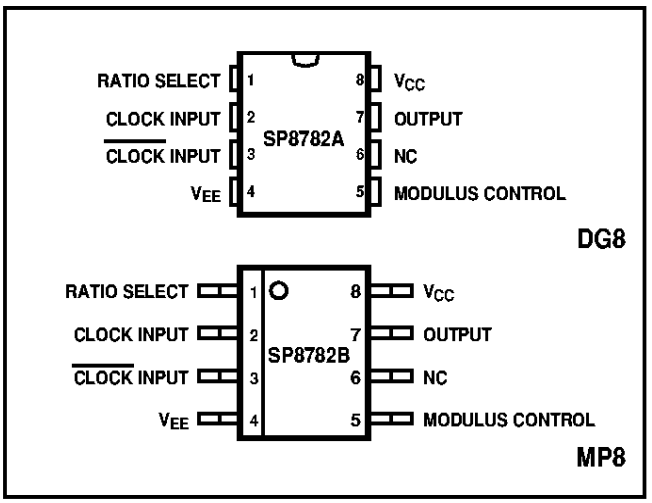


Fig. 1 Pin connections - top view (not to scale)

ABSOLUTE MAXIMUM RATINGS

Supply voltage	6V
Clock input level	2·5V p-p
Junction temperature	+175°C
Storage temperature range:	
SP8782A	−55°C to +150°C
SP8782B	−55°C to +125°C

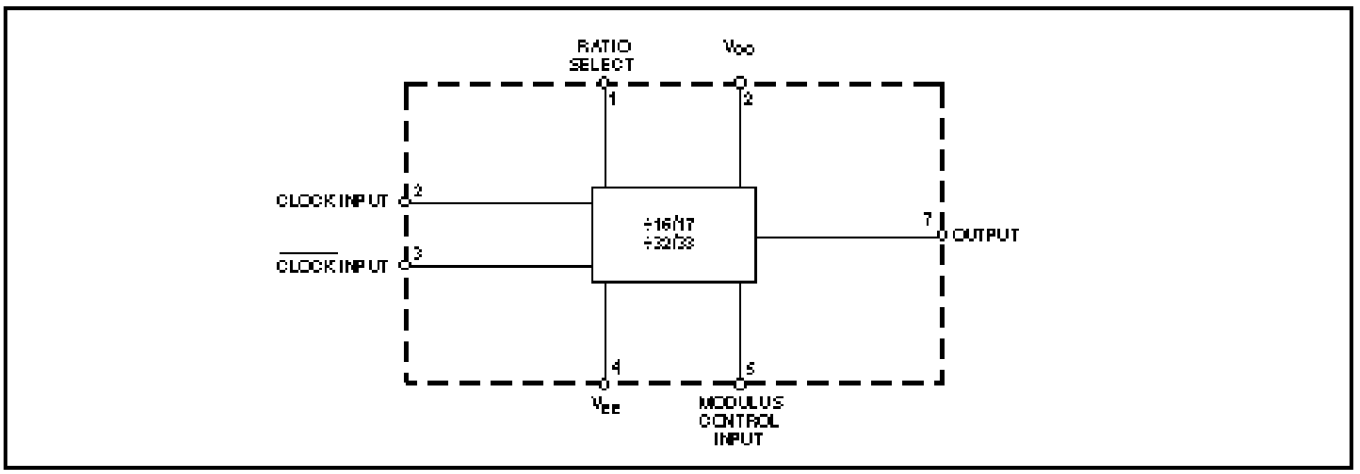


Fig. 2 Functional diagram

ELECTRICAL CHARACTERISTICS

Unless otherwise stated, the Electrical Characteristics are guaranteed over specified supply, frequency and temperature range

Supply voltage, V_{CC} = +4V to +5·5V, V_{EE} =0V

Temperature, T_{AMB} = −55°C to +125°C (SP8782A), −40°C to +85°C (SP8782B)

Characteristic	Pin	Value		Units	Conditions
		Min.	Max.		
Maximum frequency (sinewave input)	2, 3	1		GHz	Input = 200-1200mV p-p
Minimum frequency (sinewave input)	2, 3		50	MHz	Input = 400-1200mV p-p
Min slew rate for low frequency operation	2, 3		100	V/µs	
Power supply current, I_{CC}	8		60	mA	Output unloaded, V_{CC} = 5·5V
Output low voltage	7	0	1·7	V	
Output high voltage	7	V_{CC}−1·4	V_{CC}	V	
Modulus control input high voltage	5	0·7V_{CC}	V_{CC}	V	At driver end of 3kΩ resistor
Modulus control input low voltage	5	0	0·3V_{CC}	V	At driver end of 3kΩ resistor
Modulus control input high current	5	0·6	1·2	mA	Via 3kΩ resistor to V_{CC}
Modulus control input low current	5	−0·6	−1·2	mA	Via 3kΩ resistor to V_{CC}
Ratio select input high voltage	1	0·6V_{CC}	V_{CC}	V	
Ratio select input low voltage	1	0	0·4V_{CC}	V	
Ratio select input current	1	−10	10	µA	
Clock to output propagation delay	2, 3, 7		3	ns	
Set-up time, t_s	5, 7	3		ns	See note 1 and Fig. 3a
Release time, t_r	5, 7	3		ns	See note 2 and Fig. 3b

NOTES

1. The set-up time t_s is defined as the minimum time that can elapse between L→H transition of the modulus control input and the next L→H output transition to ensure that the ÷16 (32) mode is obtained.
2. The release time t_r is defined as the minimum time that can elapse between H→L transition of the modulus control input and the next L→H output transition to ensure that the ÷17 (33) mode is obtained.

Modulus control input	Ratio select input	
	0	1
0	÷17	÷33
1	÷16	÷32

Table 1 Truth table for control inputs

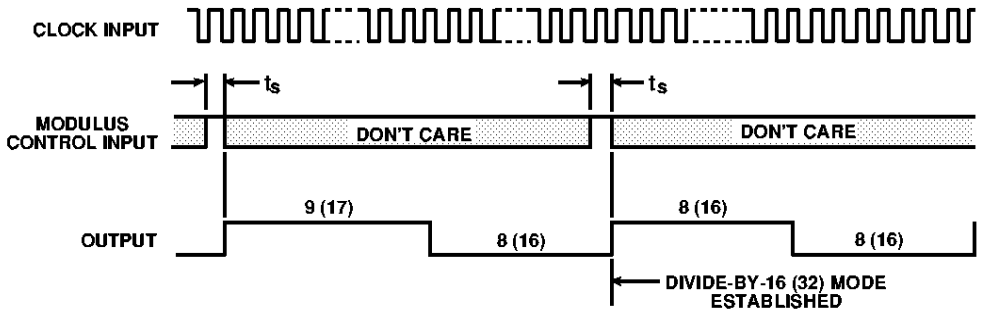


Fig. 3a Setting divide-by-16 (32) mode

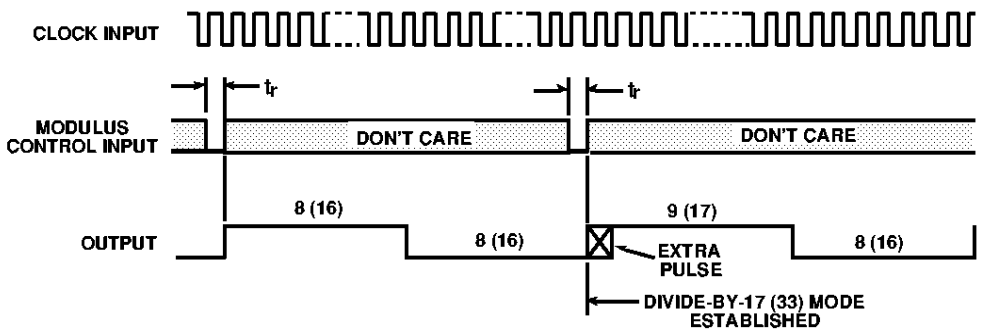


Fig. 3b Setting divide-by-17 (33) mode

Fig. 3 Timing diagrams

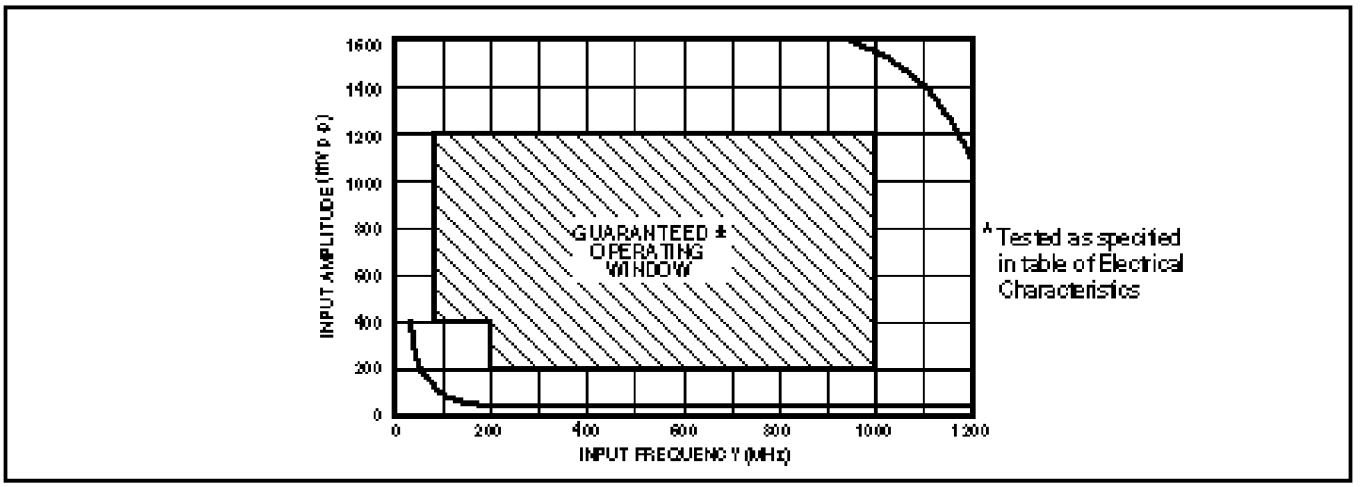


Fig. 4 Typical input characteristics

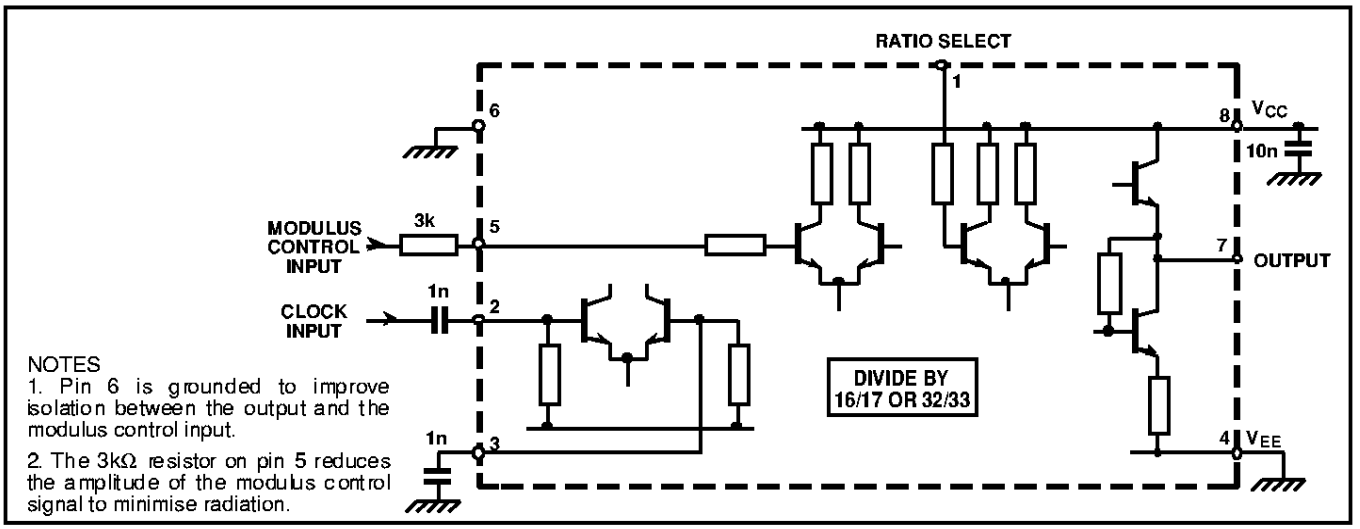


Fig. 5 Typical application showing interfacing

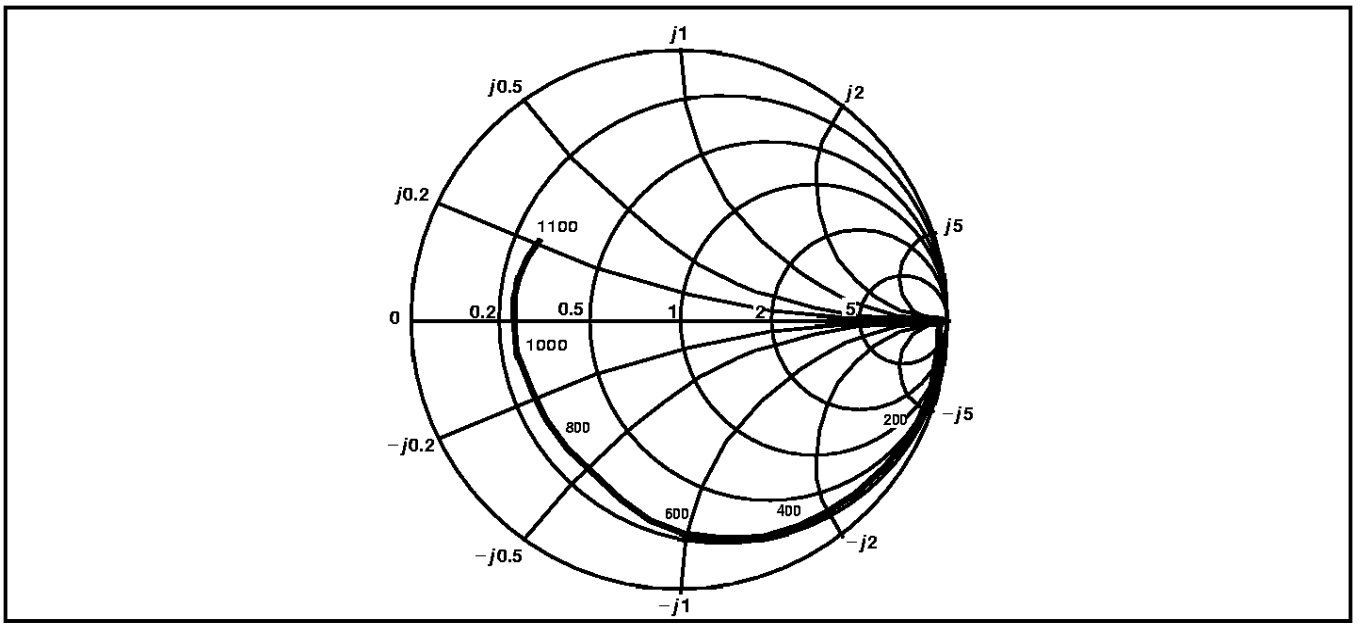
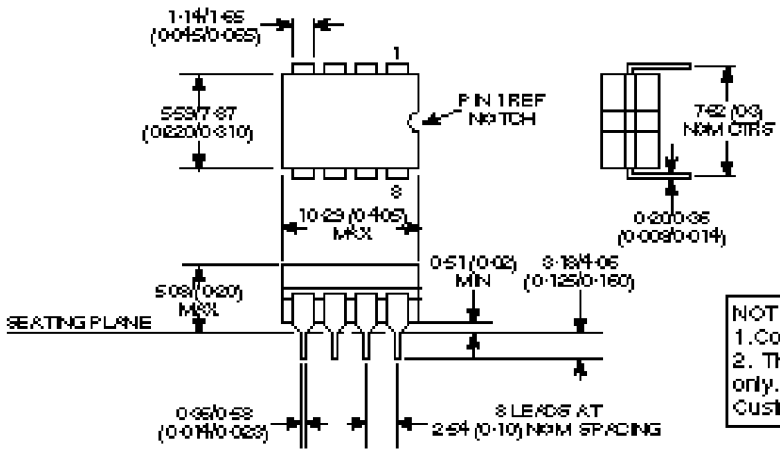


Fig. 6 Typical input impedance. Test conditions: supply voltage = 5V, ambient temperature = 25°C, frequencies in MHz, Impedances normalised to 50Ω

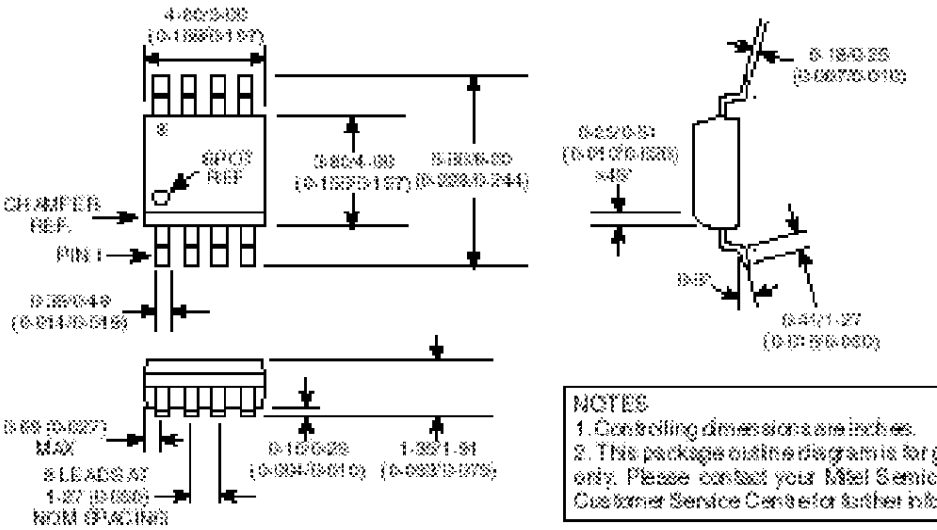
PACKAGE DETAILS

Dimensions are shown thus: mm (in).



NOTES
1. Controlling dimensions are inches.
2. This package outline diagram is for guidance only. Please contact your Mitel Semiconductor Customer Service Centre for further information.

8-LEAD CERAMIC DIL – DG8



NOTES
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8-LEAD MINIATURE PLASTIC DIL - MP8

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