

April 2008

### Features

- Advanced Resynchronisation techniques to negate loop delay effects
- CMOS compatible output capability
- Multi-Modulus division
- Available as DESC SMD 5962-9208901MPA

### Ordering Information

SP8782/B/MP2Q	8 Pin SOP/SOIC**	Tape & Reel
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\*\*Pb Free Tin/Silver/Copper

### Description

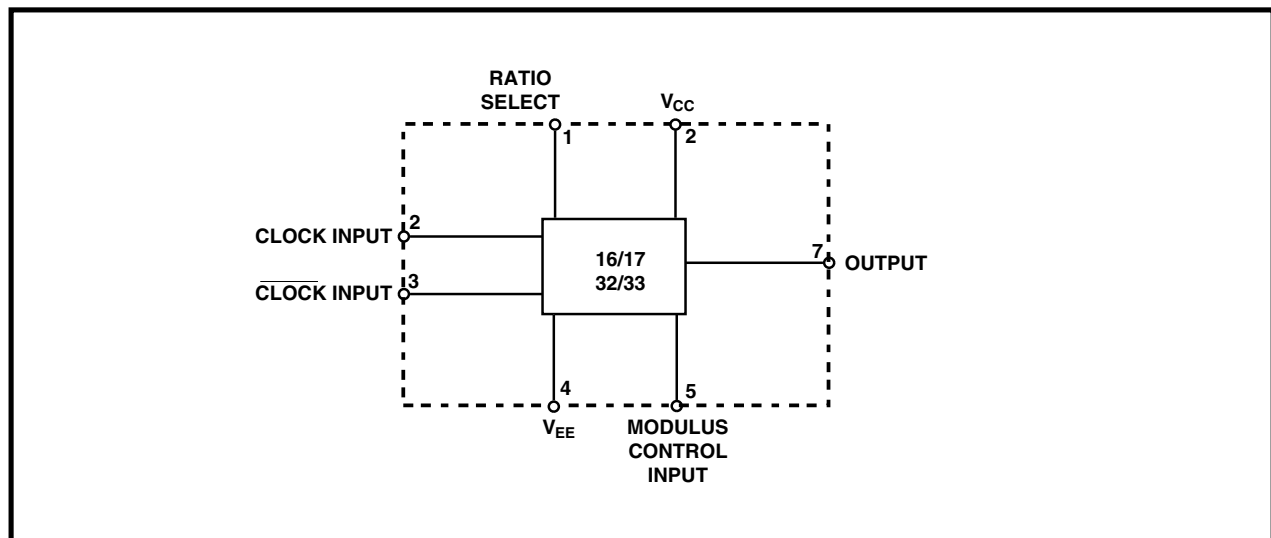
The SP8782 is a multi-modulus divider which divides by 16/17 when the Ratio Select input is low and by 32/33 when the Ratio Select input is high. When high, the modulus Control input selects the lower division ratio (16 or 32) and the higher ratio (17 or 33) when it is low.

### 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

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.



**Figure 1 Functional Diagram**

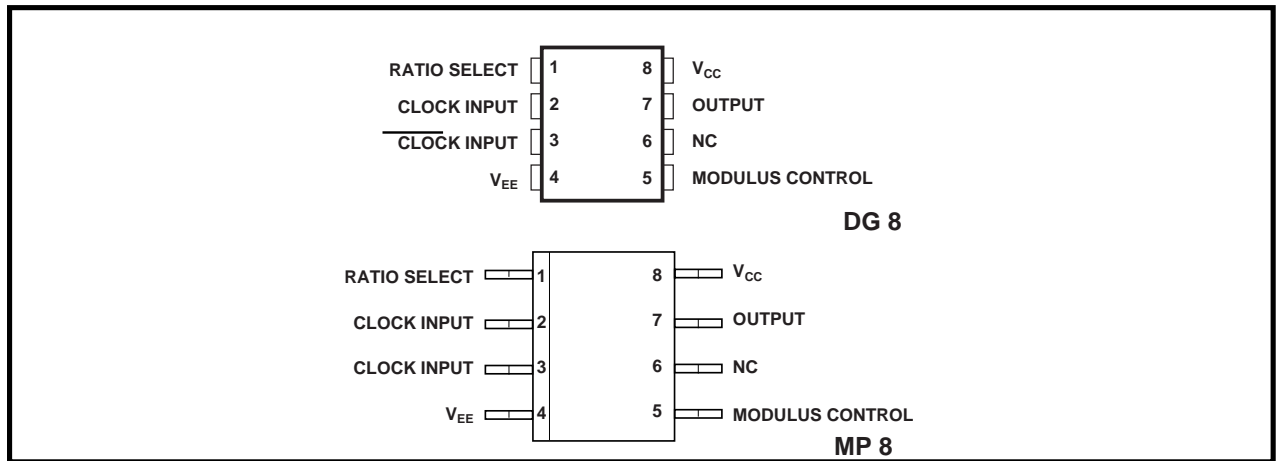


Figure 2 Typical Pin Connections

**Electrical Characteristics**

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

Supply Voltage,  $V_{CC} = +4V$  to  $+5.5V$ ,  $V_{EE} = 0V$

Temperature  $T_{amb} = -55^{\circ}C$  to  $+125^{\circ}C$ , (SP8782A),  $-40^{\circ}C$  to  $+85^{\circ}C$  (SP8782B)

Characteristic	Pin	Value		Units	Conditions
		Min	Max		
Maximum frequency (sinewave input)	2, 3	1		GHz	Input = 200-1200mVp-p
Minimum frequency	2, 3		50	MHz	Input = 400-1200mVp-p
Min Slew rate for low frequency operation	2, 3		100	V/ $\mu$ s	
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 $3k\Omega$ resistor
Modulus control input low voltage	5	0	$0.3V_{CC}$	V	At driver end of $3k\Omega$ resistor
Modulus control input high current	5	0.6	1.2	mA	Via $3k\Omega$ resistor to $V_{CC}$
Modulus control input low current	5	-0.6	-1.2	mA	Via $3k\Omega$ resistor to $V_{CC}$
Ratio select input high voltage	1	$0.6V_{CC}$	$V_{CC}$	V	
Ratio selected input low voltage	1	0	$0.4V_{CC}$	V	
Ratio select input current	1	-10	10	$\mu$ A	
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

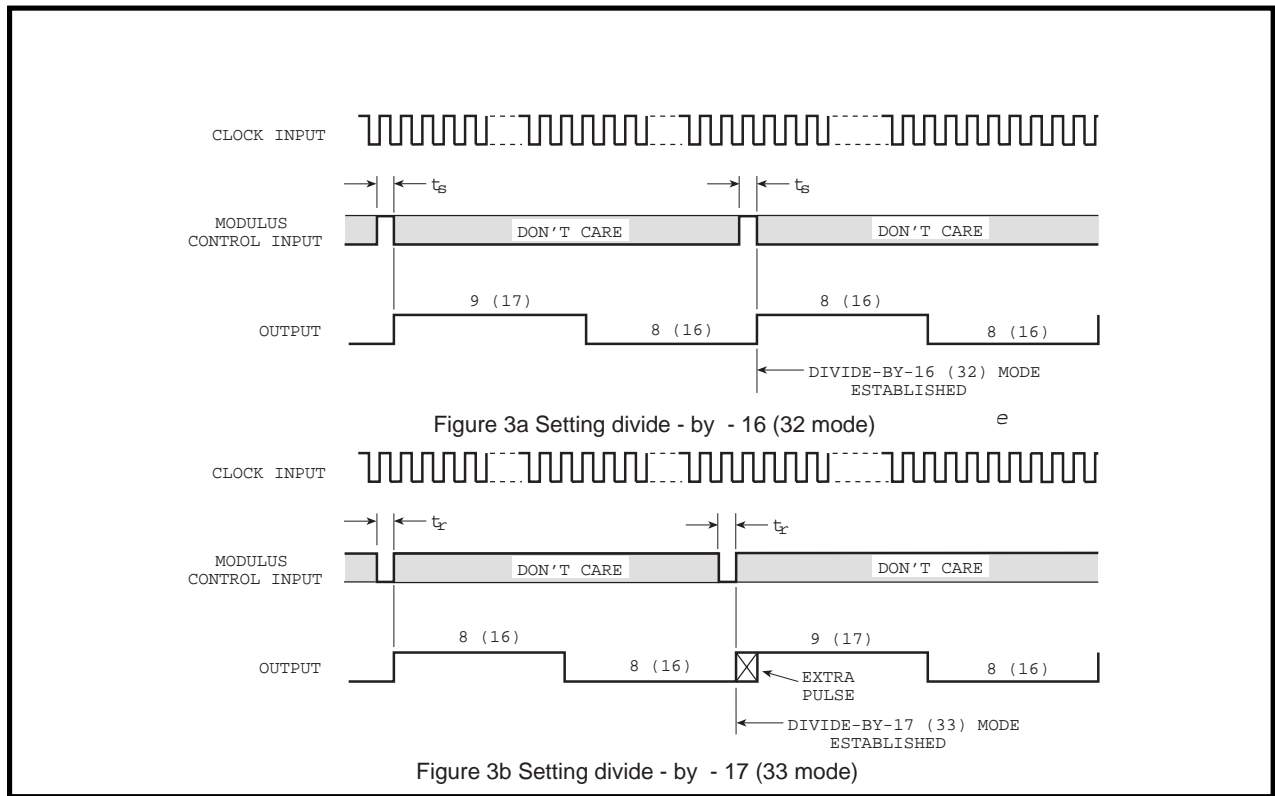


Figure 3 Timing diagrams

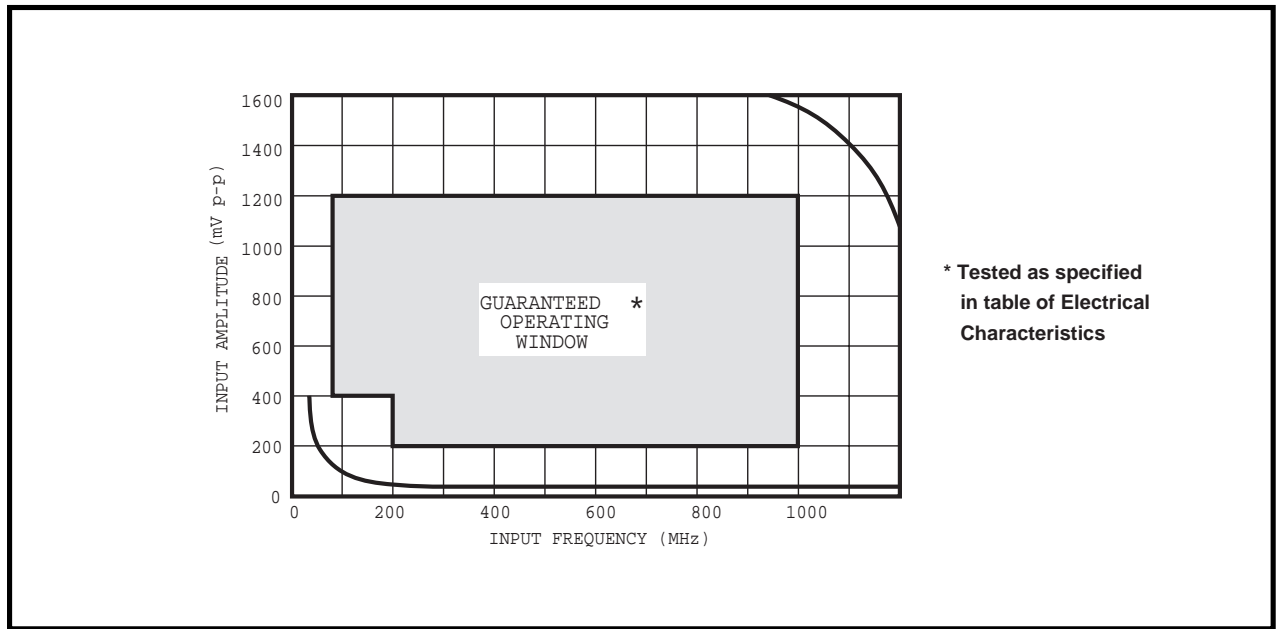


Figure 4 Typical input characteristics

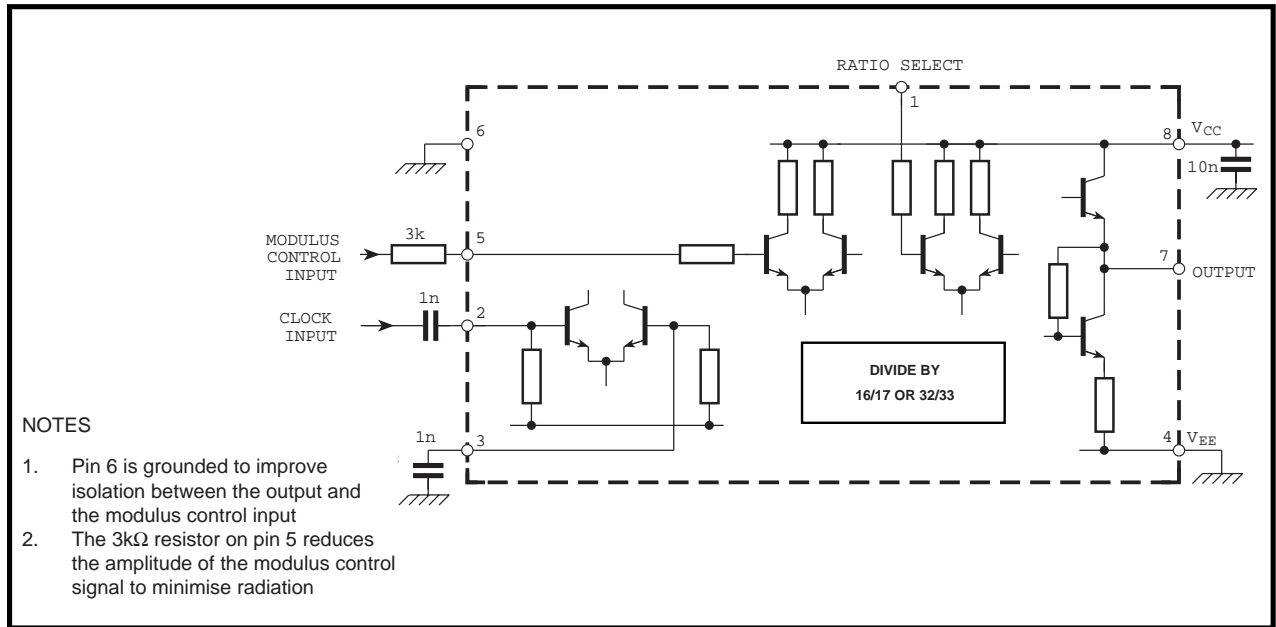


Figure 5 Typical application showing interfacing

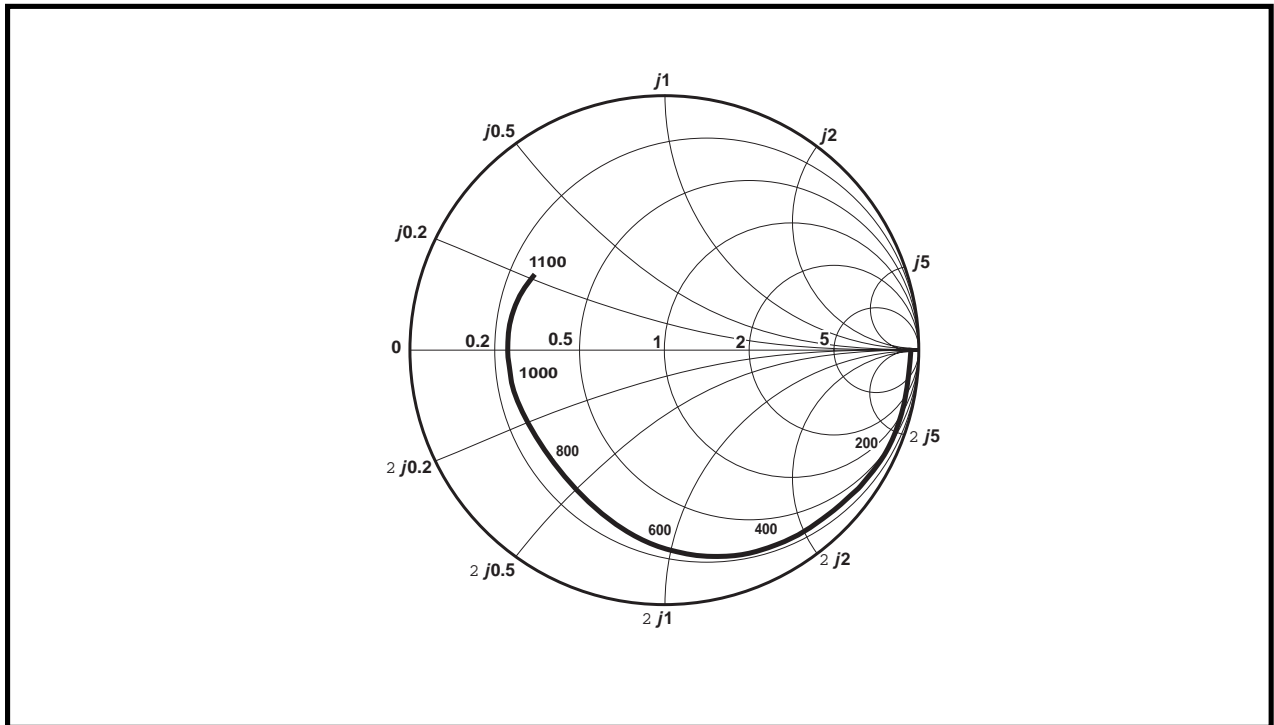


Figure 6 Typical input impedance. Test conditions: supply voltage =5V, ambient temperature =25°C, frequencies in MHz, impedances normalised to 50Ω