



SP8782A & B

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

DS3651

Issue 2.4

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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 A DG
SP8782 B MP
DES9208901/AC/DGAZ(SMD)

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.

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.

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

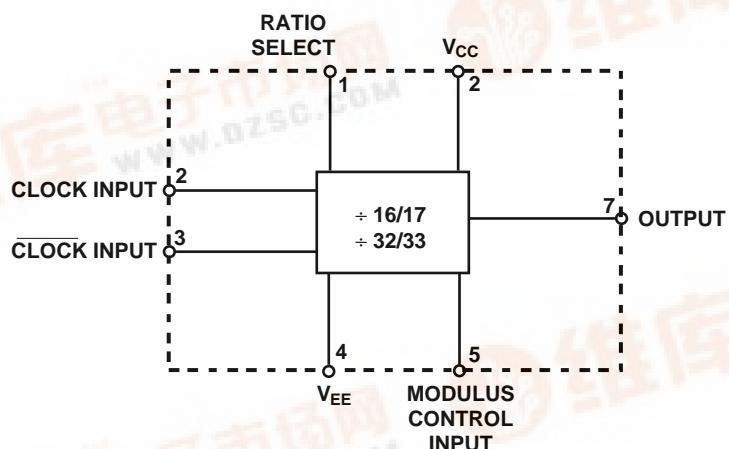


Figure 1 Functional Diagram

SP8782A & B

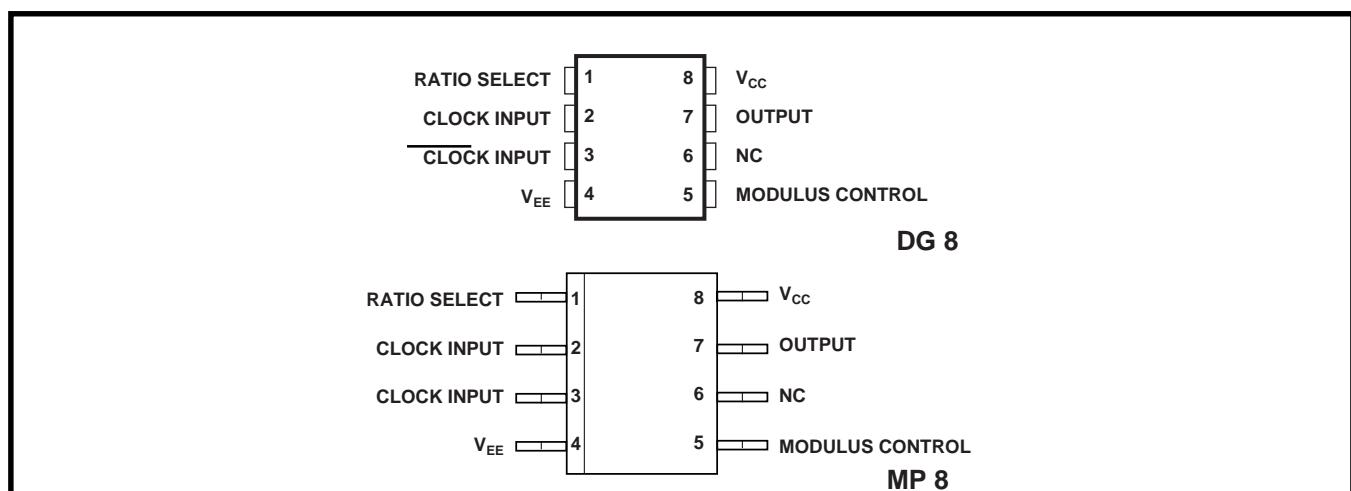


Figure 2 Typical Pin Connections

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/ μ 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 Ω resistor
Modulus control input low voltage	5	0	$0.3V_{CC}$	V	At driver end of 3k Ω resistor
Modulus control input high current	5	0.6	1.2	mA	Via 3k Ω resistor to V_{CC}
Modulus control input low current	5	-0.6	-1.2	mA	Via 3k Ω 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	μ 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 \rightarrow H transition of the modulus control input and the next L \rightarrow H output transition to ensure that the $\div 16$ (32) mode is obtained.
2. The release time t_r is defined as the minimum time that can elapse between H \rightarrow L transition of the modulus control input and the next L \rightarrow H output transition to ensure that the $\div 17$ (33) mode is obtained.

Modulus control input	Ratio select input	
	0	1
0	$\div 17$	$\div 33$
1	$\div 16$	$\div 32$

Table 1 Truth table for control inputs

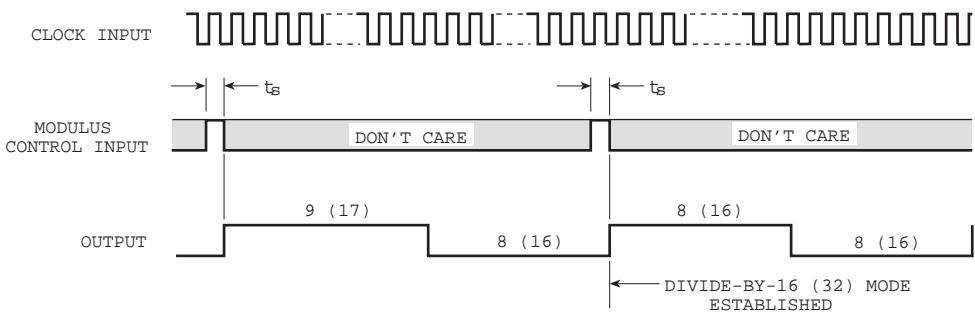


Figure 3a Setting divide - by - 16 (32 mode)

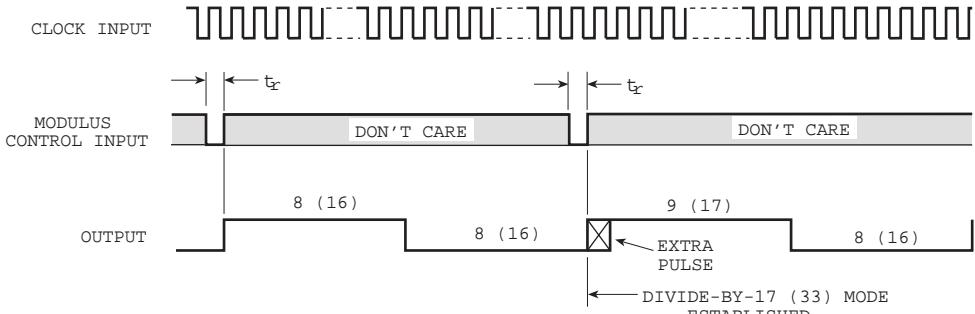


Figure 3b Setting divide - by - 17 (33 mode)

Figure 3 Timing diagrams

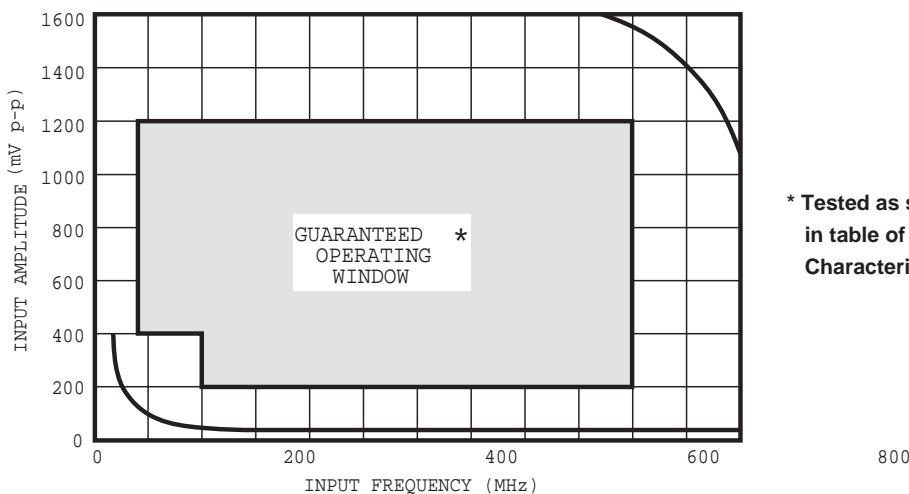


Figure 4 Typical input characteristics

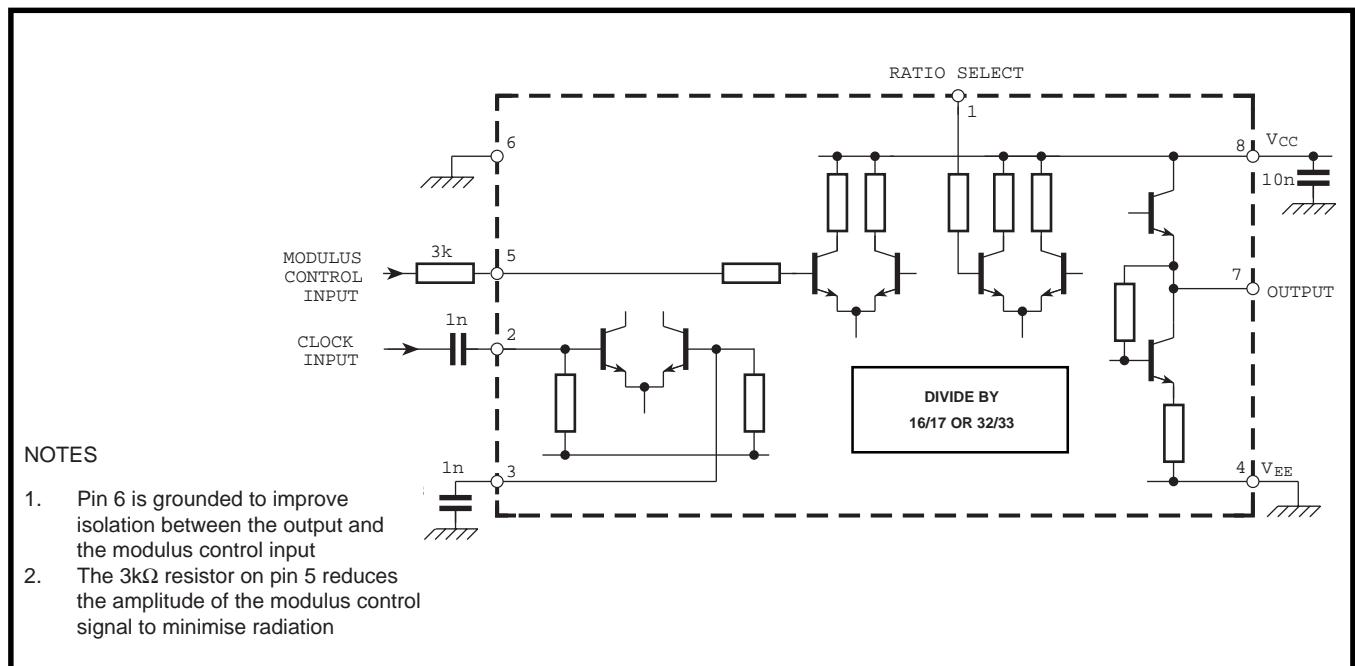


Figure 5 Typical application showing interfacing

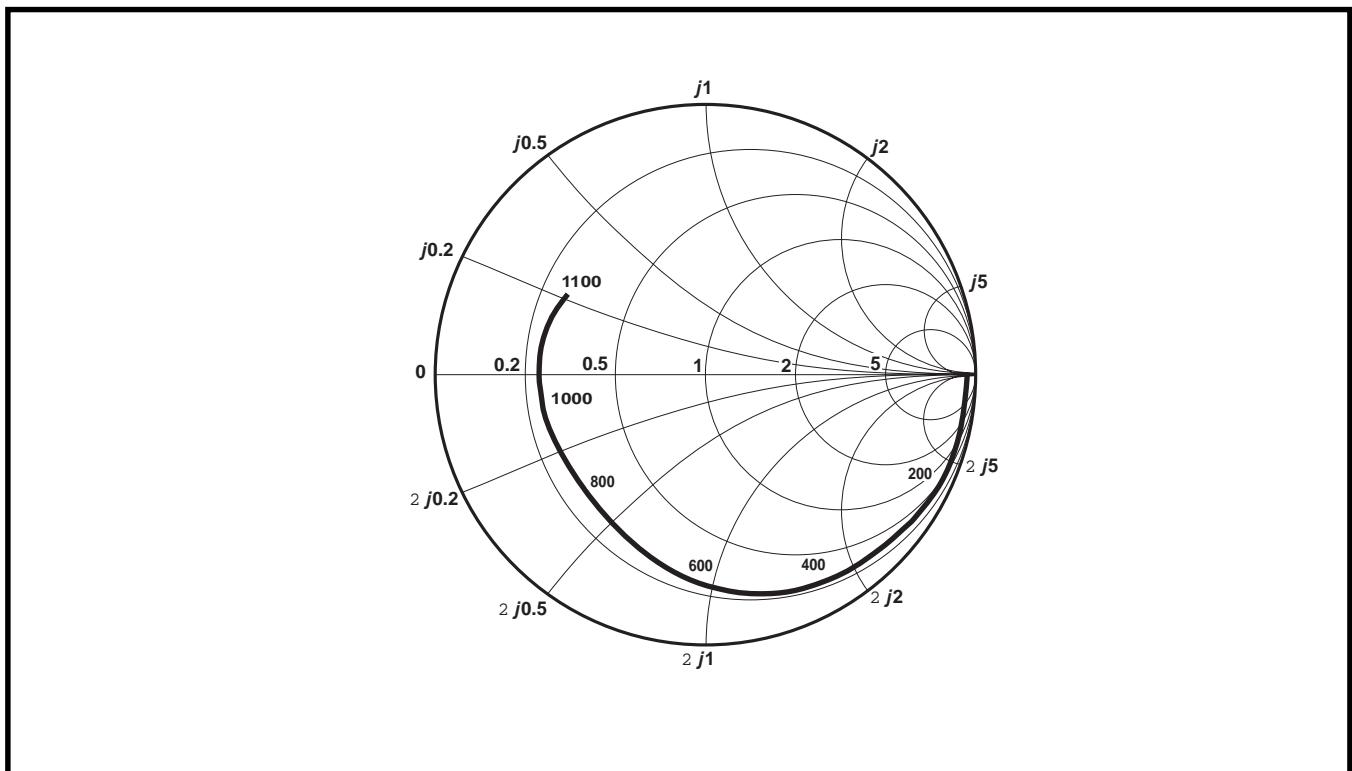
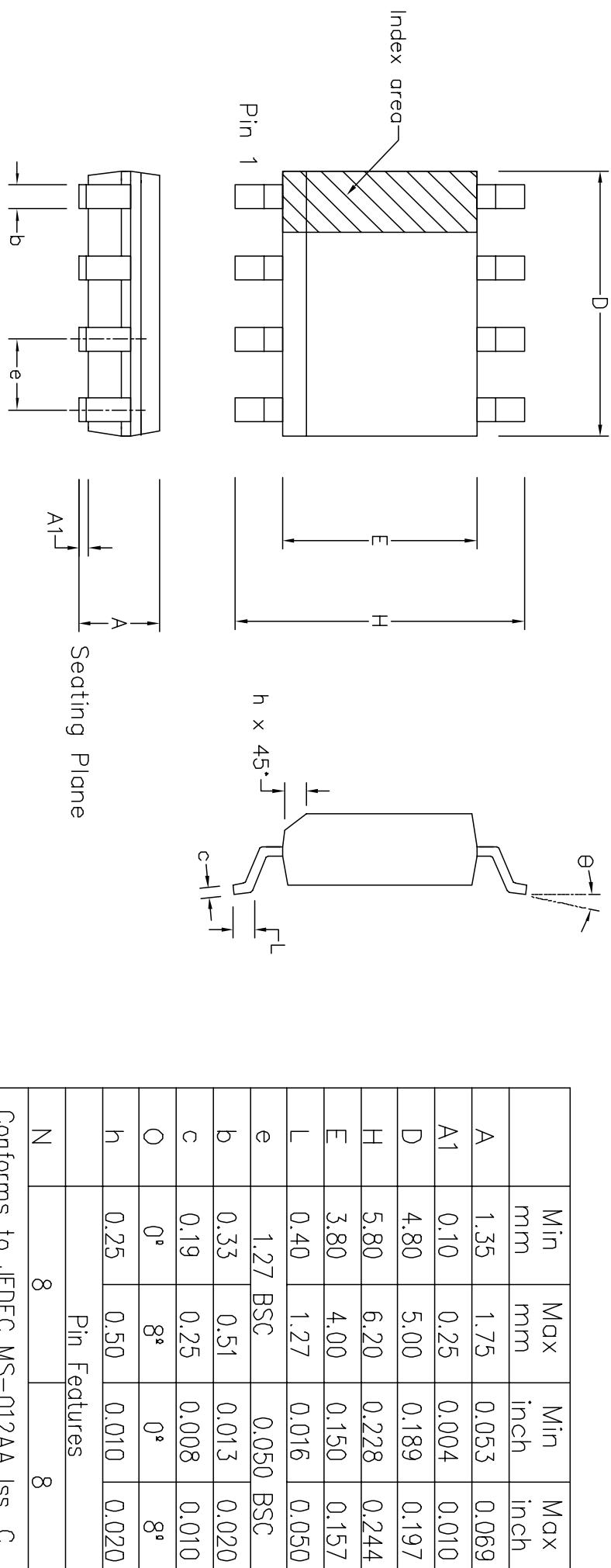


Figure 6 Typical input impedance. Test conditions: supply voltage =5V, ambient temperature =25°C, frequencies in MHz, impedances normalised to 50Ω



Notes:

1. The chamfer on the body is optional. If it not present, a visual index feature, e.g. a dot, must be located within the cross-hatched area.
2. Controlling dimension are in inches.
3. Dimension D do not include mould flash, protrusion or gate burrs. These shall not exceed 0.006" per side.
4. Dimension E1 do not include inter-lead flash or protrusion. These shall not exceed 0.010" per side.
5. Dimension b does not include dambar protrusion/intrusion. Allowable dambar protrusion shall be 0.004" total in excess of b dimension.

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MITEL SEMICONDUCTOR

Title: Package Outline Drawing for
8 lds SOIC(N)-0.150" Body Width (M)
Drawing Number GPD00010



<http://www.mitelsemi.com>

World Headquarters - Canada

Tel: +1 (613) 592 2122
Fax: +1 (613) 592 6909

North America

Tel: +1 (770) 486 0194
Fax: +1 (770) 631 8213

Asia/Pacific

Tel: +65 333 6193
Fax: +65 333 6192

**Europe, Middle East,
and Africa (EMEA)**

Tel: +44 (0) 1793 518528
Fax: +44 (0) 1793 518581

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