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PURPOSES ONLY AND IS NOT  
RECOMMENDED FOR NEW DESIGNS***



# SP8716/8/9

## 520MHz LOW CURRENT TWO-MODULUS DIVIDERS

SP8716 ÷ 40/41, SP8718 ÷ 64/65, SP8719 ÷ 80/81 are 50mW programmable dividers with a maximum specified operating frequency of 520MHz over the temperature range -40 °C to + 85 °C.

The signal (clock) inputs are biased internally and require to be capacitor coupled. The output stage is of an unusual low power design featuring dynamic pull-up, and optimised for driving CMOS. The 0 to 1 output edge should be used to give the best loop delay performance.

## FEATURES

- DC to 520MHz Operation
- -40°C to +85°C Temperature Range
- Control Inputs and Outputs are CMOS Compatible

## QUICK REFERENCE DATA

■ Supply Voltage 5.0V ± 0.25V  
■ Supply Current 10.5mA typ.

## ABSOLUTE MAXIMUM RATINGS

Supply voltage pin 2 or 8):	8V
Storage temperature range:	-55°C to +150°C
Max. Junction temperature:	+175°C
Max. clock I/P voltage:	2.5V p-p

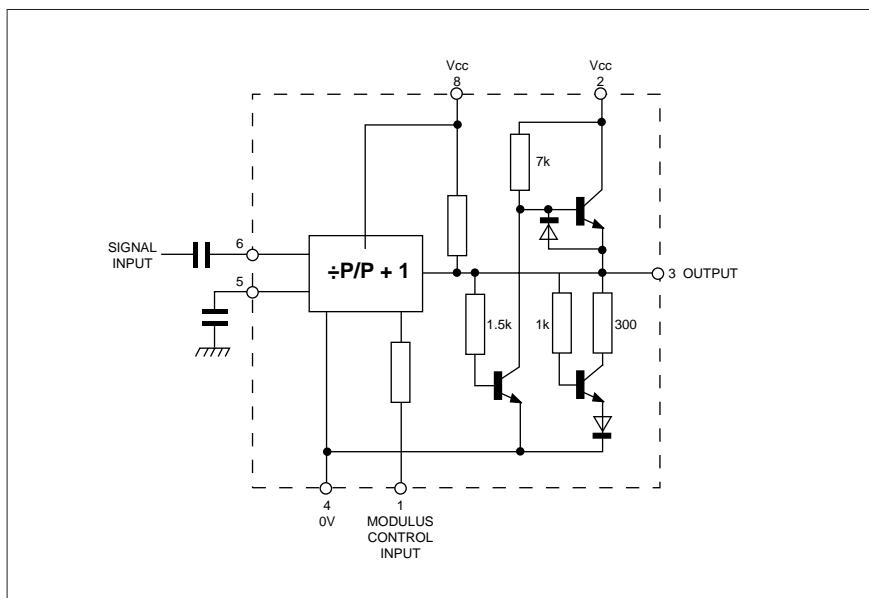


Figure 2 : Functional diagram

## ELECTRICAL CHARACTERISTICS

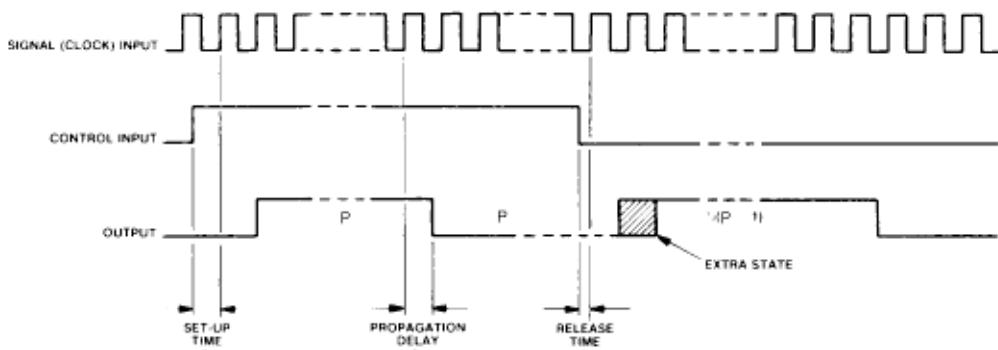
## Test conditions (unless otherwise stated):

Supply voltage:  $V_{CC} = +4.95$  to  $5.45$  V, Temperature:  $T_{amb} = -40$ °C to  $+85$ °C

Characteristics	Symbol	Value		Units	Conditions	Notes
		Min.	Max.			
Max. frequency	$f_{max}$	520		MHz	Input 100-280mV p-p	1
Min. frequency (sinewave input)	$f_{min}$		30	MHz	Input 400-800mV p-p	2
Power supply current	$I_{CC}$		11.9	mA	$CL = 3pF$ ; pins 2, 8 linked	1
Output high voltage	$V_{OH}$	$(V_{CC} - 1.2)$		V	$IL = -0.2mA$	1
Output low voltage	$V_{OL}$		1	V	$IL = 0.2mA$	1
Control input high voltage	$V_{INH}$	3.3	8	V	$\div P$	1
Control input low voltage	$V_{INL}$	0	1.7	V	$\div P + 1$	1
Control input high current	$V_{INH}$		0.41	mA	$V_{INH} = 8V$	1
Control input low current	$V_{INL}$	-0.20		mA	$V_{INL} = 0V$	1
Clock to output delay	$t_p$		28	ns	$CL = 10pF$	2
Set-up time	$t_s$	10		ns	$CL = 10pF$	2
Release time	$t_r$	10		ns	$CL = 10pF$	2

## NOTES

- Tested at 25°C only
- Guaranteed but not tested

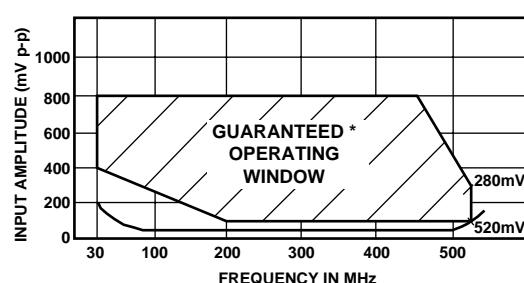


## NOTE

The set-up time  $t_s$  is defined as the minimum time that can elapse between a L  $\rightarrow$  H transition of the control input and the next L  $\rightarrow$  H clock pulse transition to ensure that the  $\div P$  mode is obtained.

The release time  $t_r$  is defined as the minimum time that can elapse between a H  $\rightarrow$  L transition of the control input and the next L  $\rightarrow$  H clock pulse transition to ensure that the  $\div(P + 1)$  mode is obtained.

Figure 3 : Timing diagram



\*Tested as specified in table of Electrical Characteristics

Figure 4 : Typical input characteristics

## OPERATING NOTES

1. The inputs are biased internally and coupled to a signal source with suitable capacitors.
2. If no signal is present the devices will self-oscillate. If this is undesirable it may be prevented by connecting a 15k resistor from one input to pin 4 (ground). This will reduce the sensitivity.
3. The circuits will operate down to DC but slew rate must be better than 100V//us.
4. The output stage is of an unusual design and is intended to interface with CMOS. External pull-up resistors or circuits must not be used.
5. This device is NOT suitable for driving TTL or its derivatives.

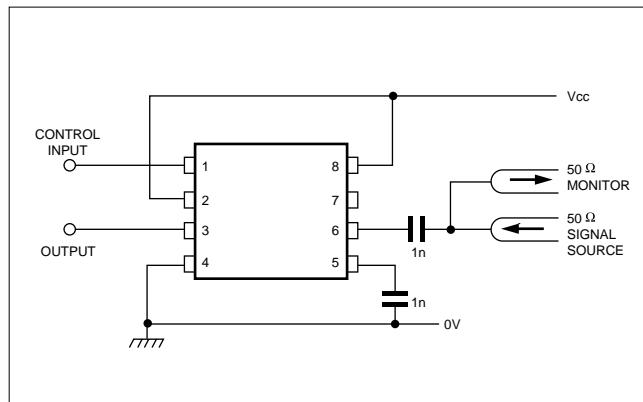


Figure 5: Toggle frequency test circuit

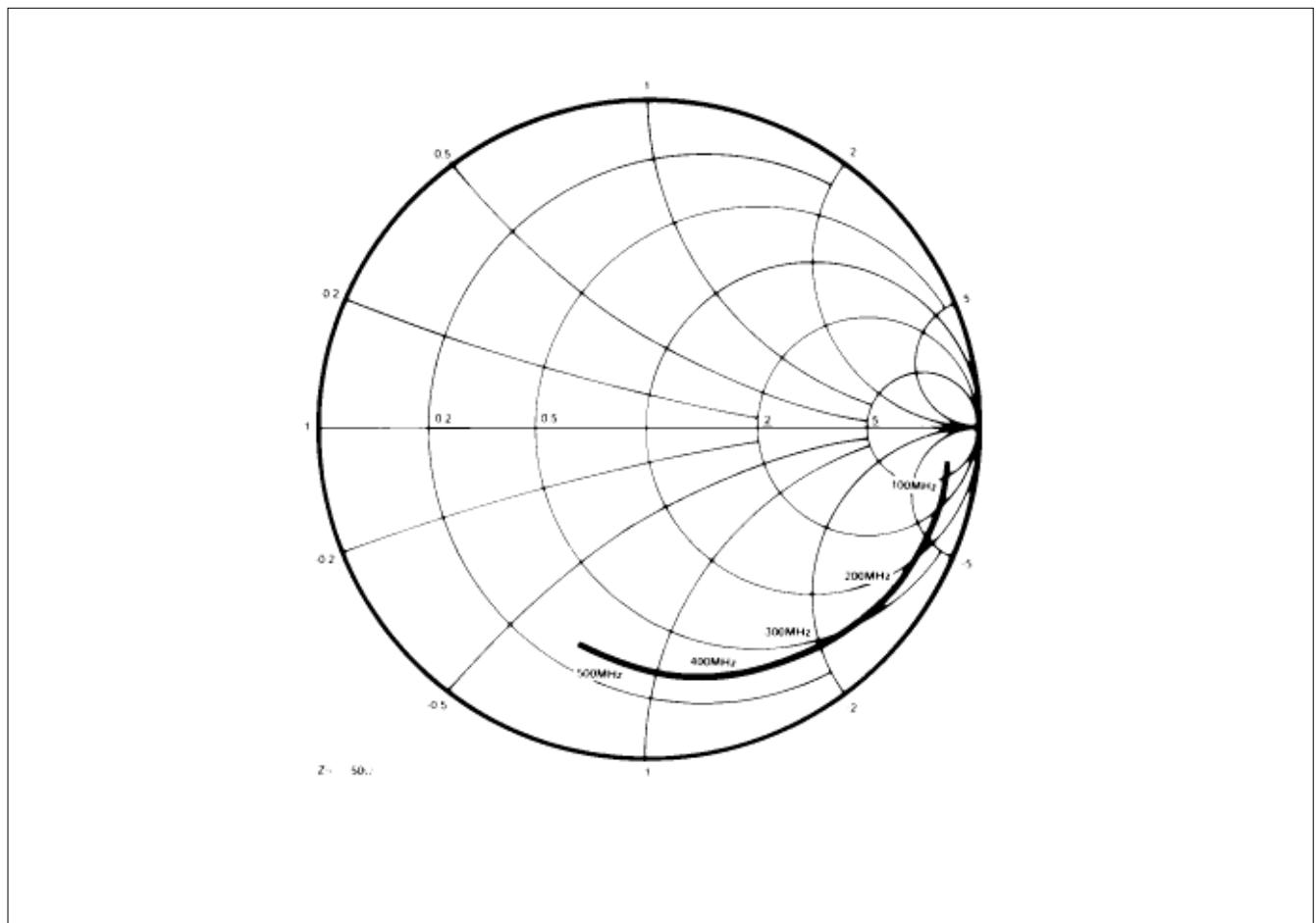


Figure 6 : Typical input impedance



<http://www.zarlink.com>

**World Headquarters - Canada**

Tel: +1 (613) 592 0200

Fax: +1 (613) 592 1010

**North America - West Coast**

Tel: (858) 675-3400

Fax: (858) 675-3450

**North America - East Coast**

Tel: (978) 322-4800

Fax: (978) 322-4888

**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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