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# SP8792 225MHz ÷ 80/81

# SP8793 225MHz ÷ 40/41

## WITH ON-CHIP VOLTAGE REGULATOR

The SP8792 AND SP8793 are low power programmable  $\div 80/81$  and  $\div 40/41$  counter, temperature range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . They divide by 80(40) when control input is in the high state and by 81(41) when in the low state. An internal voltage regulator allows operation from a wide range of supply voltages.

### FEATURES

- Very Low Power
- Control Input and Output CMOS/TTL Compatible
- AC Coupled Input
- Operation up to 9.5V using Internal Regulator

### QUICK REFERENCE DATA

- Supply Voltage 5.2V or 6.8V to 9.5V
- Power consumption: 26mW Typical

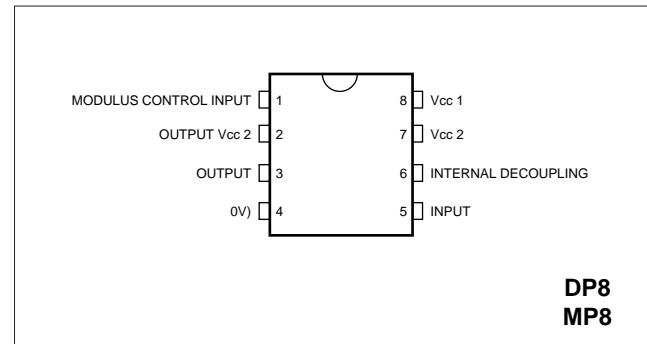


Figure 1 Pin connections - top view

### ABSOLUTE MAXIMUM RATINGS

Supply voltage	6.0V pins 7 & 8 tied
Supply voltage	13.5V pin 8, pin 7 decoupled
Storage temperature range	$-55^{\circ}\text{C}$ to $+125^{\circ}\text{C}$
Max. Junction temperature	$+175^{\circ}\text{C}$
Max. clock input voltage	2.5V p-p
Vcc2 max.	10V

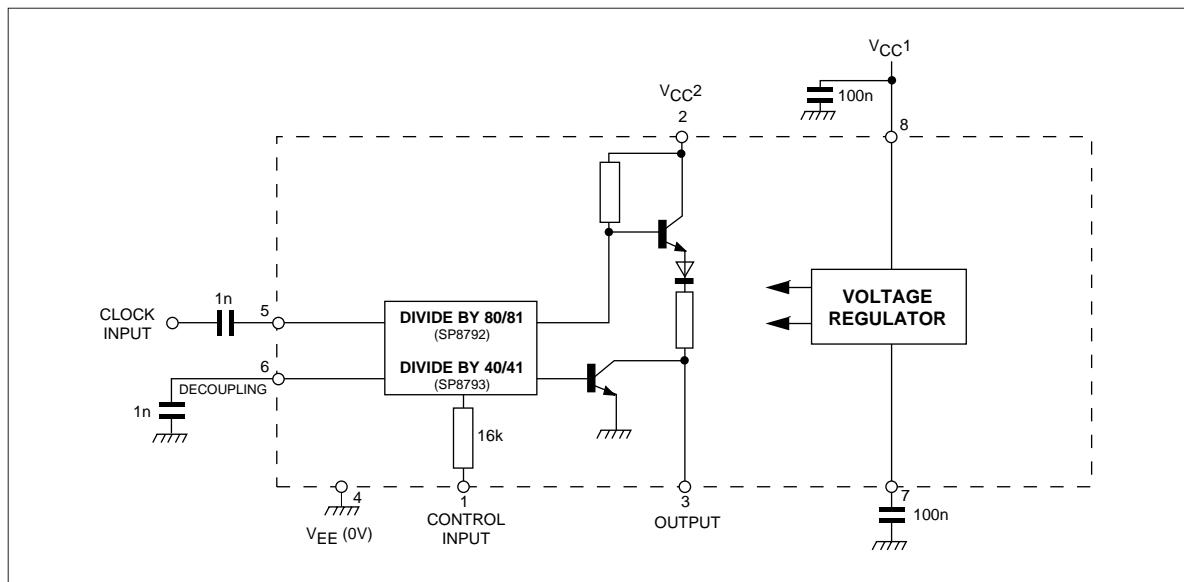


Figure 2 : Functional diagram SP8799

# SP8793

## ELECTRICAL CHARACTERISTICS

### Test conditions (unless otherwise stated):]

Supply voltage :  $V_{CC} = 5.2 \pm 0.25V$  or  $6.8V$  to  $9.5V$  (see Operating Note 6):  $V_{EE} = 0V$

Temperature  $T_{amb} = -40^{\circ}C$  to  $+85^{\circ}C$

Characteristics	Symbol	Value		Units	Notes	Conditions
		Min.	Max.			
Maximum frequency (sinewave input)	$f_{max}$	225		MHz	Note 4	Input = 200-800mV p-p
Minimum frequency (sinewave input)	$f_{min}$		20	MHz	Note 4	Input = 400-800mV p-p
Power supply current	$I_{EE}$		7	mA	Note 4	
Control input high voltage	$V_{INH}$	4		V	Note 4	
Control input low voltage	$V_{INL}$		2	V	Note 4	
Output high voltage	$V_{OH}$	2.4		V	Note 4	Pins 2, 7 and 8 linked $V_{CC} = 4.95V$ $I_{OH} = 100\mu A$
Output low voltage	$V_{OL}$		0.5	V	Note 4	Pin 2 linked to 8 and 7 $I_{OL} = 1.6mA$
Set up time	$t_s$	14		ns	Note 3	25°C
Release time	$t_r$	20		ns	Note 3	25°C
Clock to output propagation time	$t_p$		45	ns	Note 3	25°C

### NOTES

- Unless otherwise stated the electrical characteristics are guaranteed over full specified supply, frequency and temperature range.
- The test configuration for dynamic testing is shown in Fig.6.
- Guaranteed but not tested.
- Tested only at 25°C



### TRUTH TABLE FOR CONTROL INPUTS

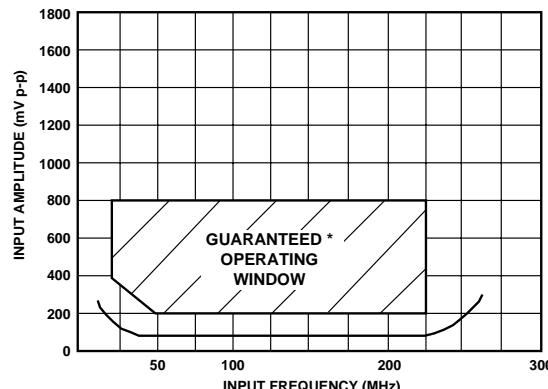
Control inputs	Division Ratio	
	SP8792	SP8793
0	81	41
1	80	40

Figure 3 : Timing diagram SP8792/3

### NOTES

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  $\div 80$  or  $40$  mode is selected.

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  $\div 81$  or  $41$  mode is selected.



\*Tested as specified  
in table of  
Electrical Characteristics

Figure 4 : Input sensitivity SP8792/SP8793

## OPERATING NOTES

1. The clock input (Pin 5) should be capacitively coupled to the signal source. The input signal path is completed by coupling a capacitor from the internal bias decoupling, Pin 6 to ground.
2. The output stage which is normally open collector (Pin 2 open circuit) can be interfaced to CMOS. The open collector can be returned to a +10V line via a 5k resistor but the output sink current should not exceed 2mA. If interfacing to TTL is required then Pins 2 and 7 should be connected together to give a fan-out = 1. This will increase supply current by approximately 2mA.
3. The circuit will operate down to DC but a slew rate of better than 20V/~s is required.
4. The mark space ratio of the output is approximately 1.2:1 at 200MHz.
5. Input impedance is a function of frequency. See Fig.5.
6. If no signal is present the device will self-oscillate. If this is undesirable it may be prevented by connecting a 150k between unused input and ground. This reduces the input sensitivity by typically 50-100mV p-p.
7. The internal regulator has its input connected to Pin 8, while the internal reference voltage appears at Pin 7 and should be decoupled. For use from a 5.2V supply, Pins 7 and 8 should be connected together, and 5.2V applied to these pins. For operation from supply voltages in the range +6.8V to +9.5V, Pins 7 and 8 should be separately decoupled, and the supply voltage applied to Pin 8.

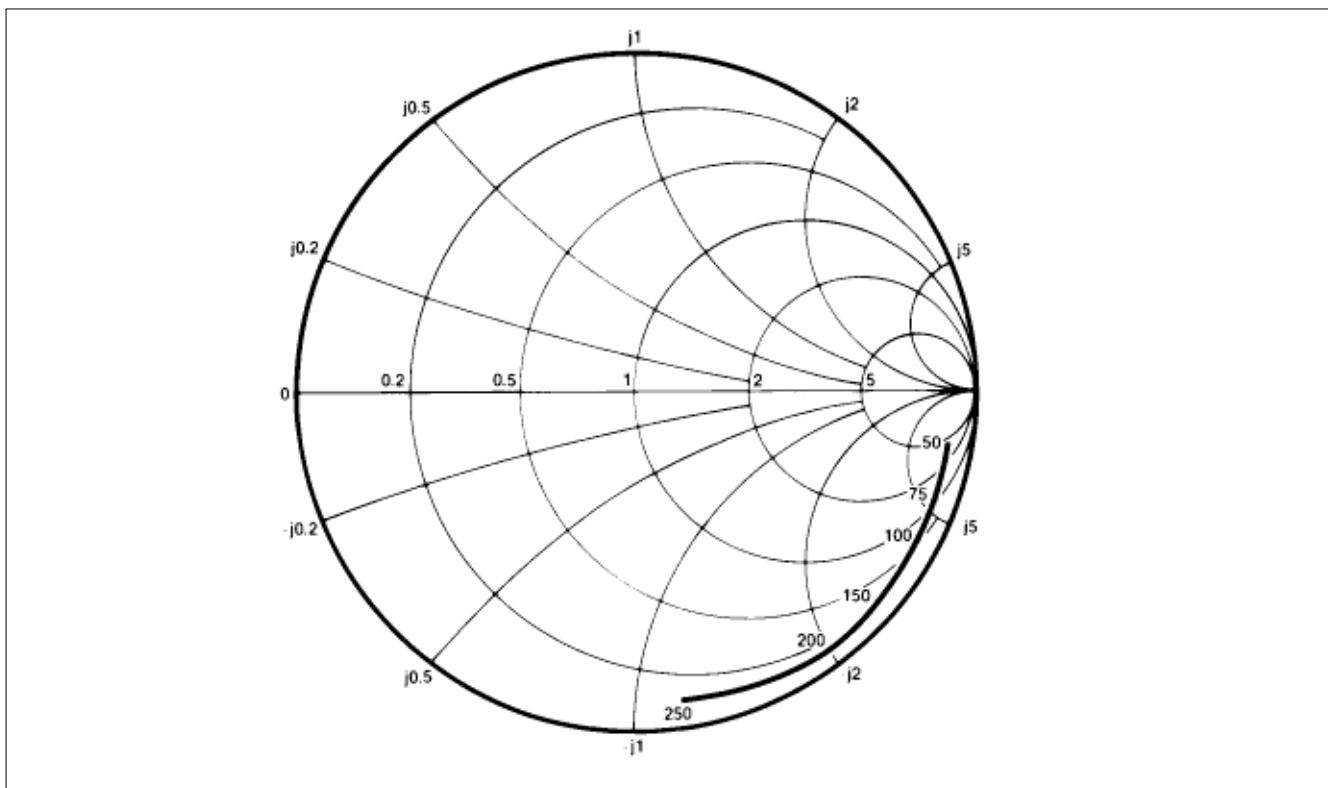


Figure 5 : Typical impedance. Test conditions: supply voltage 5.2V, ambient temperature 25°C, frequencies in MHz, impedance normalised to 50 ohms.

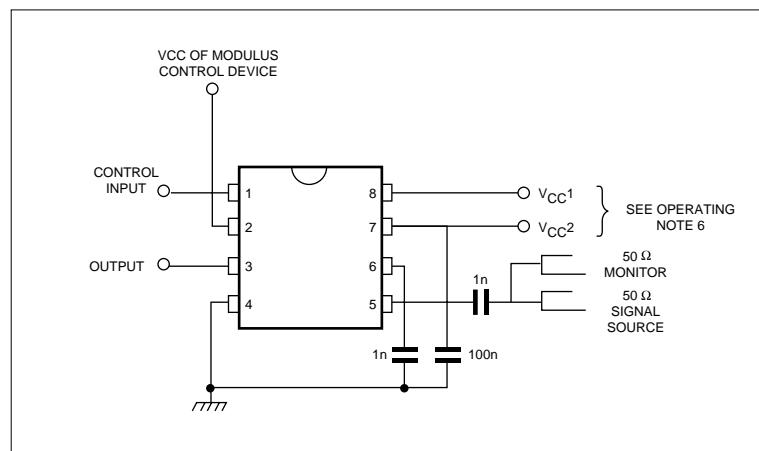


Figure 6 : Toggle frequency test circuit



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