

SP8690 200MHz ÷ 10/11

SP8691 200MHz ÷ 8/9

The SP8690 and SP8691 are low power ECL variable modulus dividers, with both ECL 10K and TTL/CMOS compatible outputs. They divide by the lower division ratio when either of the ECL control inputs, PE1 or PE2, is in the high state and by the higher ratio when both are low (or open circuit).

FEATURES

- ECL and TTL/CMOS Compatible Outputs
- AC-Coupled Input
- Control Inputs ECL Compatible

QUICK REFERENCE DATA

- Supply Voltage: $-5.2V \pm 0.25V$ (ECL), $5V \pm 0.25V$ (TTL)
- Power Consumption: 70mW (Typ.)
- Temperature Range:
 - 55°C to +125°C (A Grade)
 - 30°C to +70°C (B Grade)

ABSOLUTE MAXIMUM RATINGS

Supply voltage, $ V_{CC} - V_{EE} $	8V
ECL output current	10mA
Storage temperature range	-65°C to +150°C
Max. junction temperature	+175°C
TTL output voltage	+12V
Input voltage	2.5V p-p
Max. open collector current	15mA

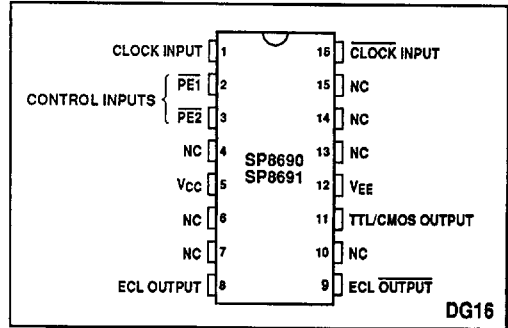


Fig. 1 Pin connections - top view

ORDERING INFORMATION

- SP8690 A DG
- SP8690 B DG
- SP8691 A DG
- 5962-87678 (SMD) (SP8690)

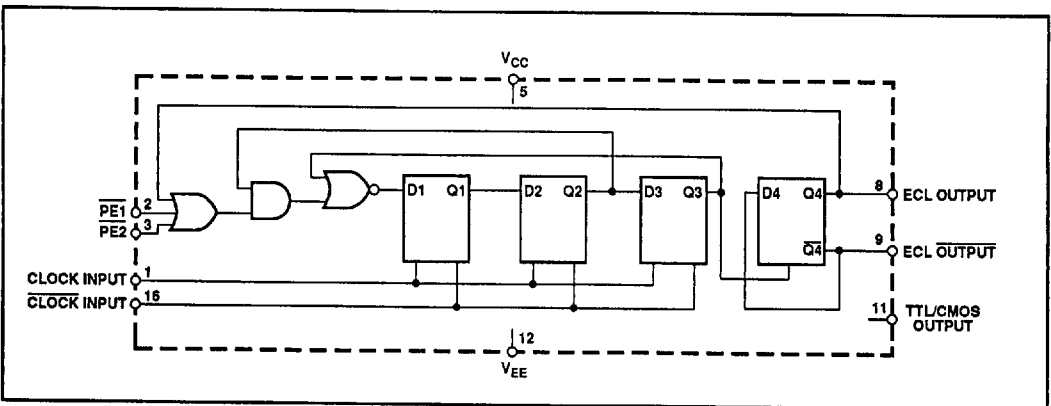


Fig. 2 Functional diagram (SP8690)

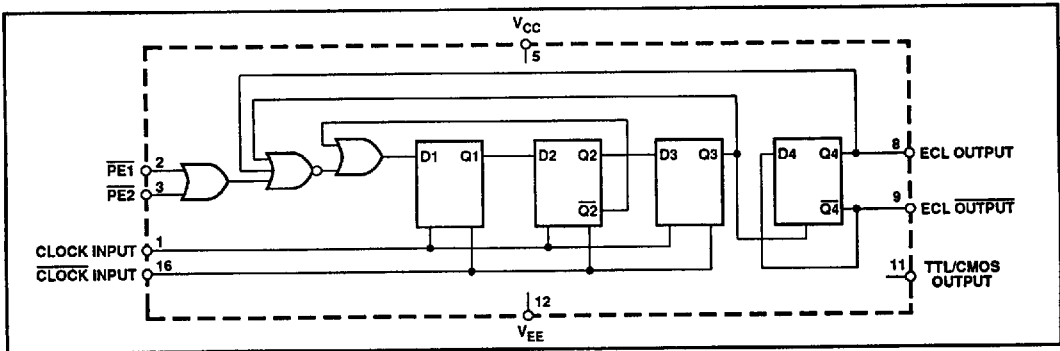


Fig. 3 Functional diagram (SP8691)

ELECTRICAL CHARACTERISTICS

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

ECL OPERATION

Supply voltage, $V_{CC} = 0V$, $V_{EE} = -5.2V \pm 0.25V$
 Temperature, $T_{AMB} = -55^{\circ}C$ to $+125^{\circ}C$ (A Grade), $-30^{\circ}C$ to $+70^{\circ}C$ (B Grade)

Characteristic	Symbol	Value		Units	Conditions	Notes
		Min.	Max.			
Maximum frequency (sinewave input)	f_{MAX}	200		MHz	Input = 400-800mV p-p	5
Minimum frequency (sinewave input)	f_{MIN}		40	MHz	Input = 400-800mV p-p	5
Power supply current	I_{EE}		21	mA	$V_{EE} = -5.0V$	5
ECL output high voltage	V_{OH}	-0.85	-0.7	V	$V_{EE} = -5.2V$ (25°C)	
ECL output low voltage	V_{OL}	-1.8	-1.5	V	$V_{EE} = -5.2V$ (25°C)	
PE input high voltage	V_{INH}	-0.93		V	$V_{EE} = -5.2V$ (25°C)	
PE input low voltage	V_{INL}		-1.62	V	$V_{EE} = -5.2V$ (25°C)	
Clock to ECL output delay	t_D		9	ns		6
Set-up time	t_s	3		ns		3, 6
Release time	t_r	8		ns		4, 6

TTL OPERATION

Supply voltage, $V_{CC} = 5V \pm 0.25V$, $V_{EE} = 0V$
 Temperature, $T_{AMB} = -55^{\circ}C$ to $+125^{\circ}C$ (A Grade), $-30^{\circ}C$ to $+70^{\circ}C$ (B Grade)

Characteristic	Symbol	Value		Units	Conditions	Notes
		Min.	Max.			
Maximum frequency (sinewave input)	f_{MAX}	200		MHz	Input = 400-800mV p-p	5
Minimum frequency (sinewave input)	f_{MIN}		40	MHz	Input = 400-800mV p-p	5
Power supply current	I_{EE}		21	mA	$V_{CC} = 5.0V$	5
TTL output low voltage	V_{OL}		0.5	V	$V_{CC} = 5V$, $R_L = 560\Omega$	5, 7
TTL output high voltage	V_{OH}	3.75		V	$R_L = 560\Omega$	5, 7
Clock to TTL output high delay, +ve going	t_{PLH}		32	ns	$R_L = 560\Omega$	6
Clock to TTL output low delay, -ve going	t_{PHL}		18	ns	$R_L = 560\Omega$	6
Set-up time	t_s	3		ns		3, 6
Release time	t_r	8		ns		4, 6

NOTES

- The temperature coefficients of $V_{OH} = +1.63mV/^{\circ}C$, $V_{OL} = +0.94mV/^{\circ}C$ and of $V_{IN} = +1.22mV/^{\circ}C$.
- The test configuration for dynamic testing is shown in Fig.8
- The set-up time t_s is defined as the minimum time that can elapse between L→H transition of control input and the next L→H clock pulse transition to ensure that division by the lower modulus is obtained.
- The release time t_r is defined as the minimum time that can elapse between H→L transition of control input and the next L→H clock pulse transition to ensure that division by the higher modulus is obtained.
- SP8690/1B tested at 25°C only.
- Guaranteed but not tested.
- The open collector output is not recommended for use at output frequencies above 15MHz. $C_{LOAD} \leq 5pF$.

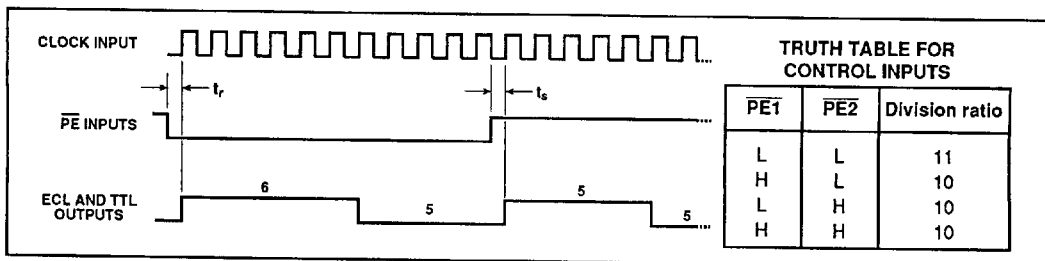


Fig. 4 Timing diagram, SP8690

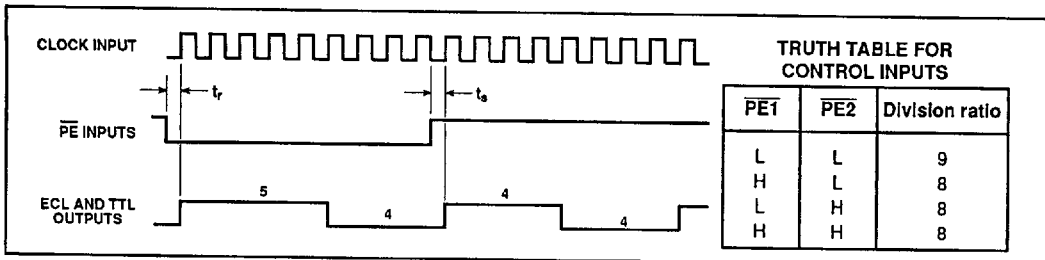


Fig. 5 Timing diagram, SP8691

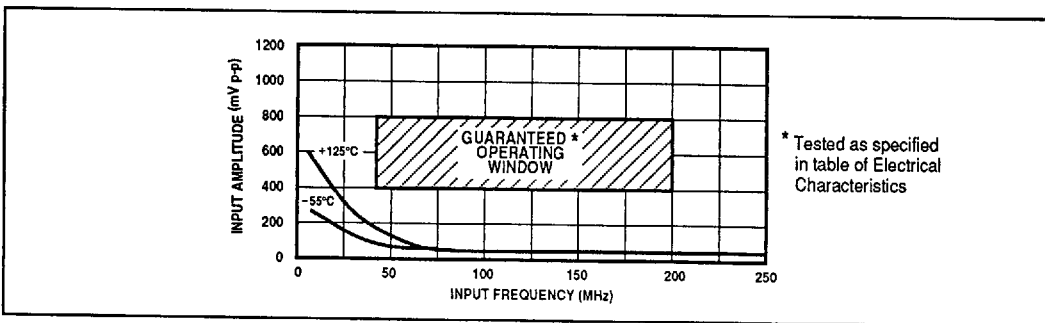


Fig. 6 Typical input characteristics, SP8690/1

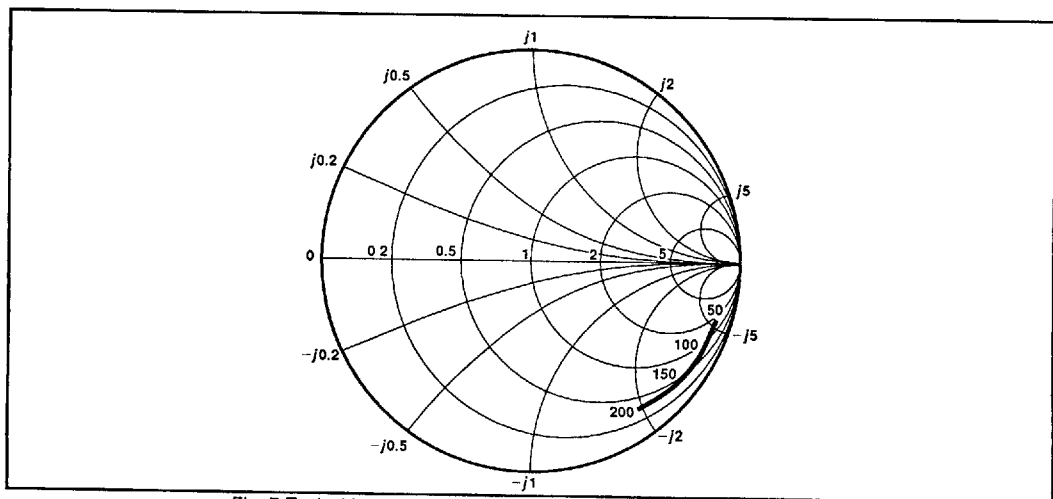


Fig. 7 Typical input impedance. Test conditions: Supply Voltage = 5.0V, Ambient Temperature = 25°C. Frequencies in MHz, impedances normalised to 50Ω.

