

### SP8610 1000MHz ÷ 4

### SP8611 1300/1500MHz ÷ 4

The SP8610/11 are asynchronous ECL divide by four circuits, with ECL compatible outputs which can also be used to drive 100 ohm lines. They feature input sensitivities of 600mV p-p (800mV p-p above 1300MHz).

#### FEATURES

- ECL Compatible Outputs
- AC Coupled Input (internal bias)

#### QUICK REFERENCE DATA

- Supply Voltage: -5.2V
- Power Consumption: 380mW
- Max. Input Frequency: 1500MHz (SP8611B)
- Temperature Range:

A Grade: -55°C to +110°C  
 (+125°C with suitable heatsink)  
 B Grade: 0°C to +70°C

#### ABSOLUTE MAXIMUM RATINGS

Supply voltage	-8V
Output current	15mA
Storage temperature range	-55°C to +150°C
Max. junction temperature	+175°C
Max. clock I/P voltage	2.5V p-p

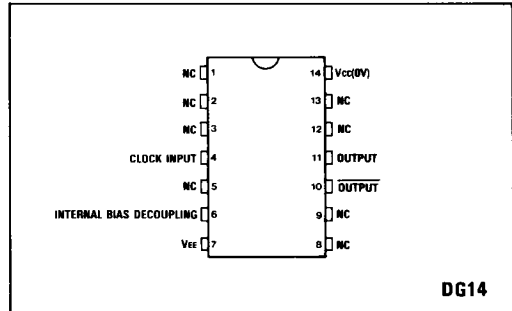


Fig.1 Pin connections - top view

#### ORDERING INFORMATION

- SP8610 A DG
- SP8610 B DG
- SP8610 AB DG
- SP8610 AA DG
- SP8611 A DG
- SP8611 B DG
- SP8611 AB DG
- SP8611 AA DG

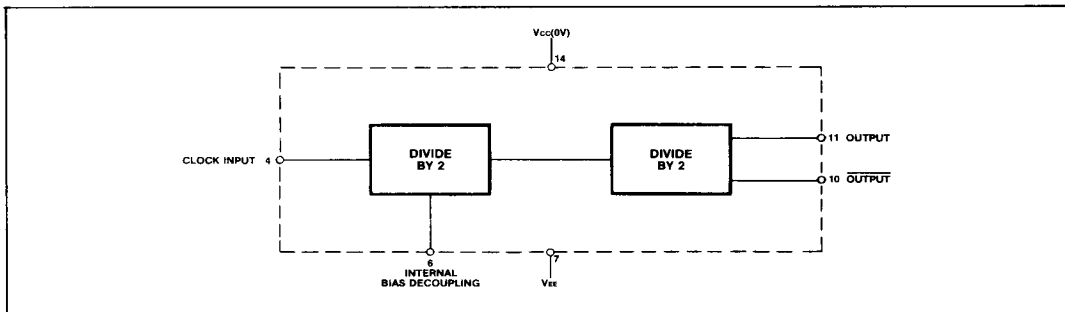


Fig.2 Functional diagram

# SP8610/11A & B

## ELECTRICAL CHARACTERISTICS

Supply voltage:  $V_{CC} = 0V$   $V_{EE} = -5.2V \pm 0.25V$   
 Temperature:  $T_{CASE}$  (A grade) =  $-55^{\circ}C$  to  $-125^{\circ}C$  (Note 2)  
 $T_{AMB}$  (B grade)  $0^{\circ}C$  to  $-70^{\circ}C$

Characteristic	Symbol	Value		Units	Grade	Conditions	Note
		Min.	Max.				
Maximum frequency	$f_{max}$	1.0		GHz	SP8610A,B	Input = 400-1200mV $V_{EE} = -5.2V$ outputs unloaded	Note 5 Note 7 Note 7
		1.3		GHz	SP8611A		
		1.5		GHz	SP8611B		
Minimum frequency	$f_{min}$		150	MHz	All	Input = 600-1200mV	Note 5
Current consumption	$I_{EE}$		100	mA	All	$V_{EE} = -5.45V$	Note 6
Output low voltage	$V_{OL}$	-1.92	-1.62	V	All	$V_{EE} = -5.2V$ outputs loaded with $430\Omega$ ( $25^{\circ}C$ )	
Output high voltage	$V_{OH}$	-0.93	-0.75	V	All	$V_{EE} = -5.2V$ outputs loaded with $430\Omega$ ( $25^{\circ}C$ )	
Minimum output swing	$V_{OUT}$	500		mV	All	$V_{EE} = -5.2V$ outputs loaded with $430\Omega$	Note 6

### NOTES

- Unless otherwise stated the electrical characteristics shown above are guaranteed over specified supply, frequency and temperature range.
- The A grade devices must be used with a heat sink to maintain chip temperature below  $+150^{\circ}C$  when operating in an ambient of  $+125^{\circ}C$ .
- The temperature coefficients of  $V_{OH} = +1.2mV/^{\circ}C$  and  $V_{OL} = +0.24mV/^{\circ}C$  but these are not tested.
- The test configuration for dynamic testing is shown in Fig.5.
- Tested at  $25^{\circ}C$  and  $+125^{\circ}C$  only ( $+70^{\circ}C$  for B grade).
- Tested at  $25^{\circ}C$  only.
- Tested at  $+125^{\circ}C$  only ( $+70^{\circ}C$  for B grade).

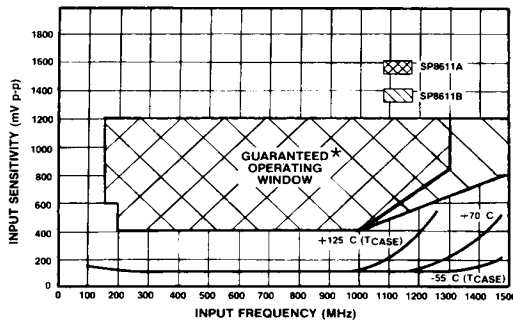


Fig.3 Typical input characteristics

\* Tested as specified in table of Electrical Characteristics

## THERMAL CHARACTERISTICS

$\theta_{JC}$  approximately  $30^{\circ}C/W$   
 $\theta_{JA}$  approximately  $110^{\circ}C/W$

## OPERATING NOTES

- The clock input (pin 4) should be capacitively coupled to the signal source. The input signal path is completed by connecting a capacitor from the internal bias decoupling, pin 6 to ground.
- If no signal is present the device will self-oscillate. If this is undesirable it may be prevented by connecting a  $10k$  resistor from the input to  $V_{EE}$  (i.e. Pin 4 to Pin 7). This reduces sensitivity by approximately  $100mV$ .
- The input can be operated at very low frequencies but

slew rate must be better than  $200V/\mu s$ .

- The input impedance of the SP8610/11 is a function of frequency. See Fig. 4.
- The emitter follower outputs require external load resistors. These should not be less than  $330$  ohms, and a value of  $430$  ohms is recommended. Interfacing to ECL  $III/10K$  is shown in Fig. 7.
- These devices may be used with split supply lines and ground referenced input by means of the circuit of Fig. 6.

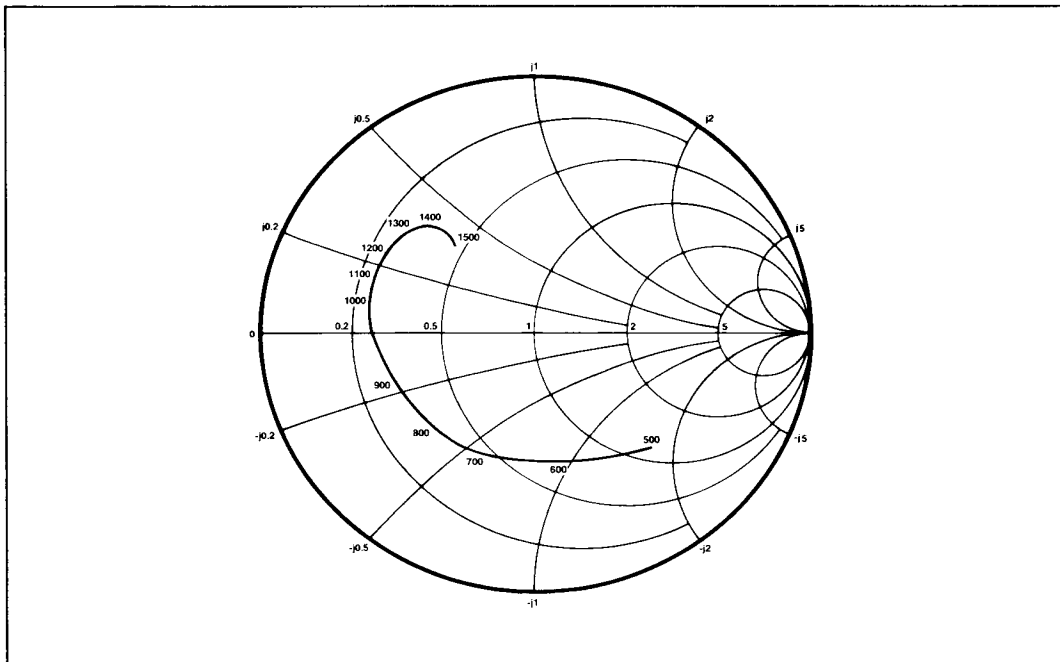


Fig.4 Typical input impedance. Test conditions: supply voltage -5.2V, ambient temperature 25°C, frequencies in MHz, impedances normalised to 50 ohms.

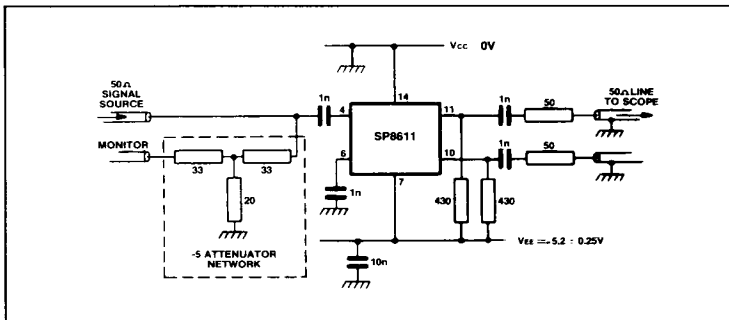


Fig.5 Toggle frequency test circuit

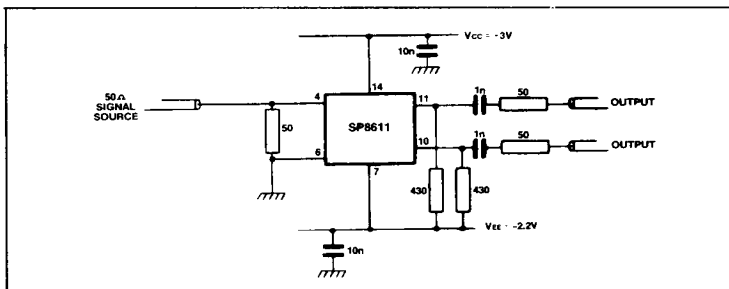
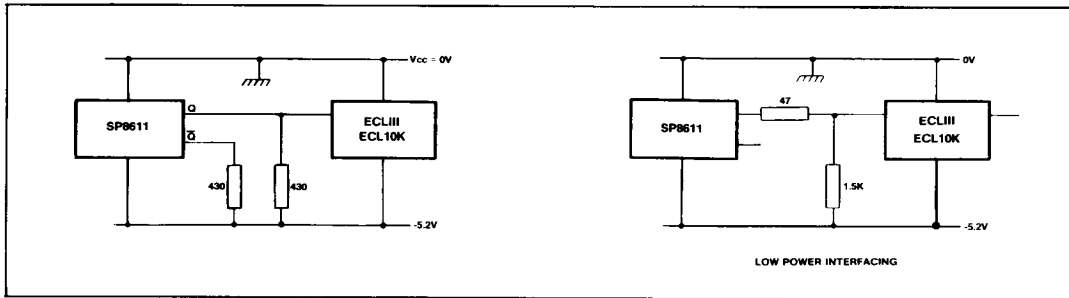
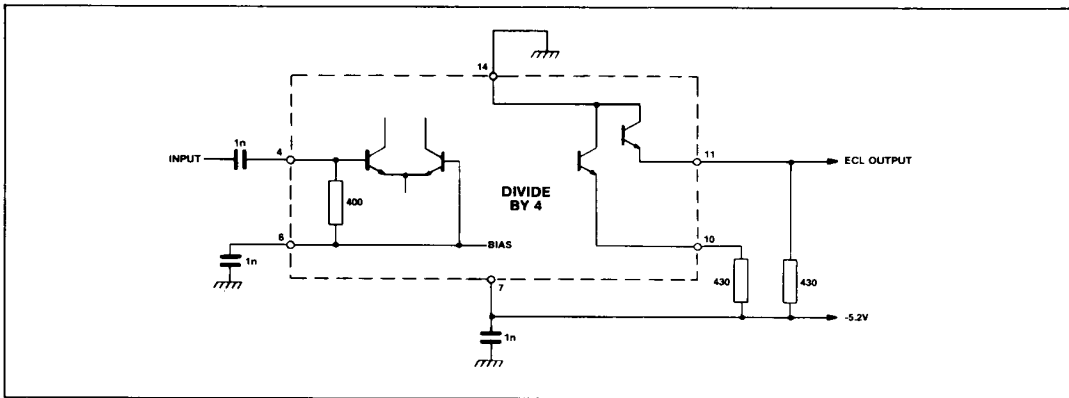


Fig.6 Circuit for using the input signal about earth potential

**SP8610/11**



*Fig.7 Interfacing SP8611 series to ECL 10K and ECL III*



*Fig.8 Typical application showing interfacing*