

GEC PLESSEY

SEMICONDUCTORS

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

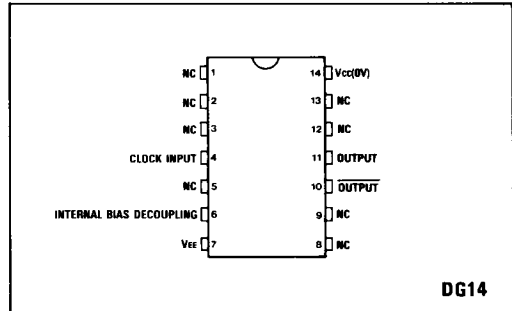


Fig.1 Pin connections - top view

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 ✓

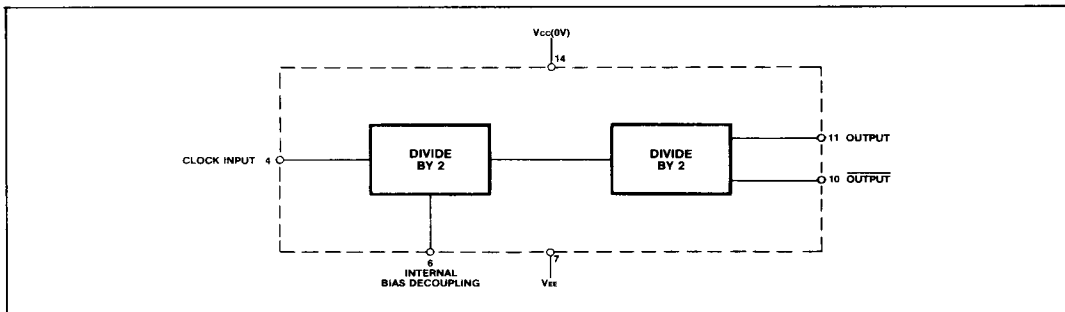


Fig.2 Functional diagram

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 430Ω ($25^{\circ}C$)	
Output high voltage	V_{OH}	-0.93	-0.75	V	All	$V_{EE} = -5.2V$ outputs loaded with 430Ω ($25^{\circ}C$)	
Minimum output swing	V_{OUT}	500		mV	All	$V_{EE} = -5.2V$ outputs loaded with 430Ω	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).

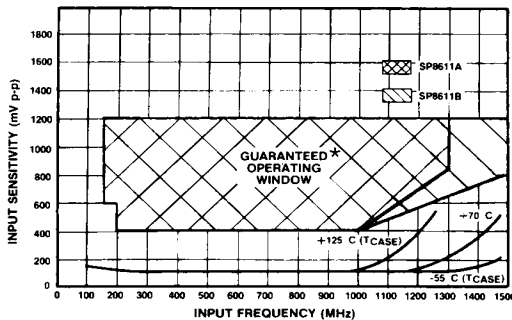


Fig.3 Typical input characteristics

* Tested as specified in table of Electrical Characteristics

THERMAL CHARACTERISTICS

θ_{JC} approximately $30^{\circ}C/W$
 θ_{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.

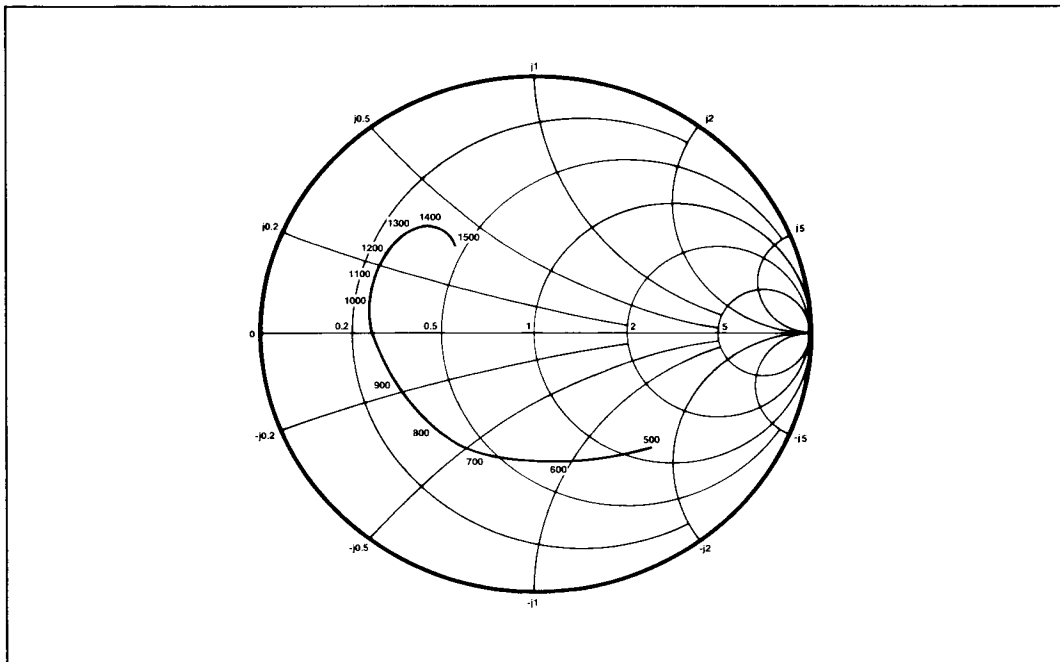


Fig.4 Typical input impedance. Test conditions: supply voltage -5.2V, ambient temperature 25°C, frequencies in MHz, impedances normalised to 50 ohms.

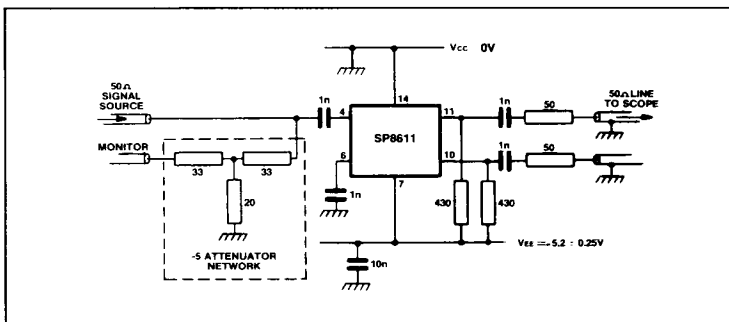


Fig.5 Toggle frequency test circuit

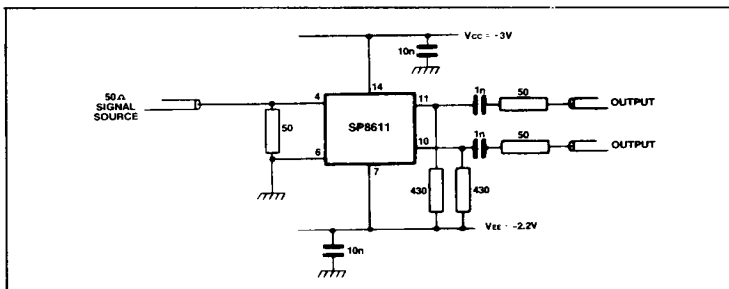


Fig.6 Circuit for using the input signal about earth potential

SP8610/11

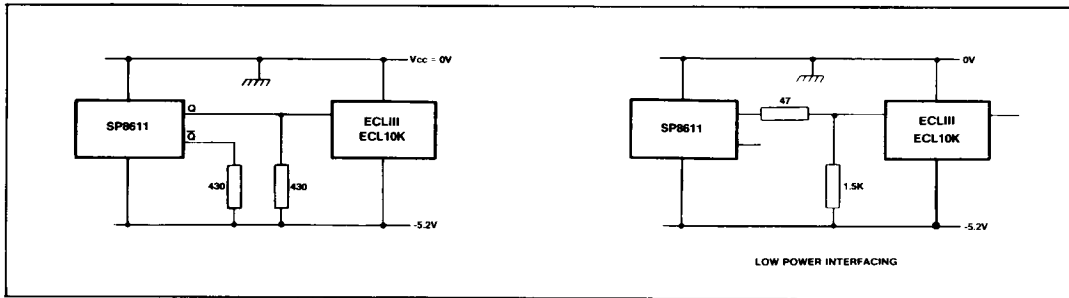


Fig.7 Interfacing SP8611 series to ECL 10K and ECL III

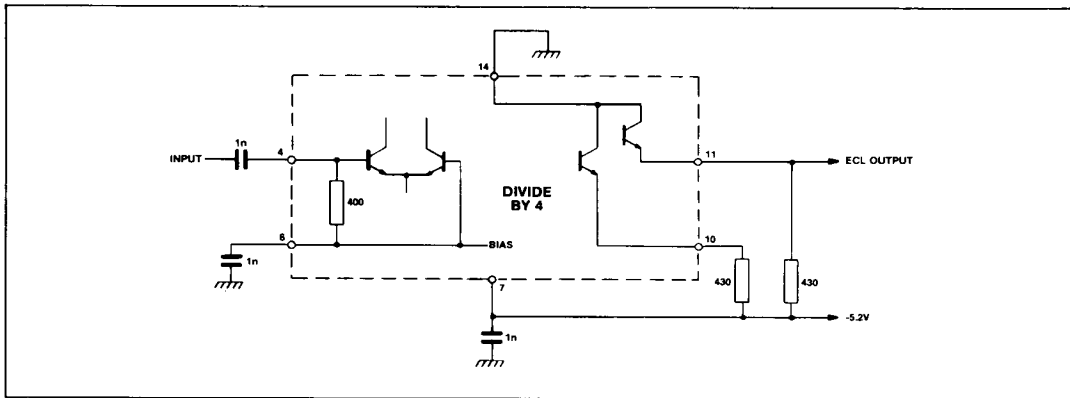


Fig.8 Typical application showing interfacing