

T-45-19-05

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

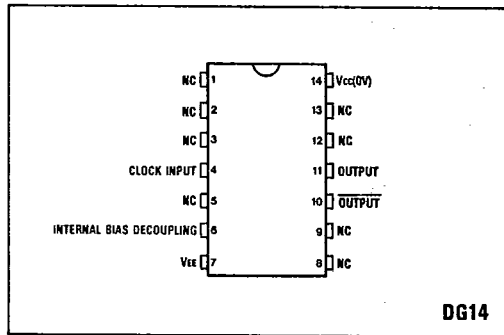


Fig.1 Pin connections - top view

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

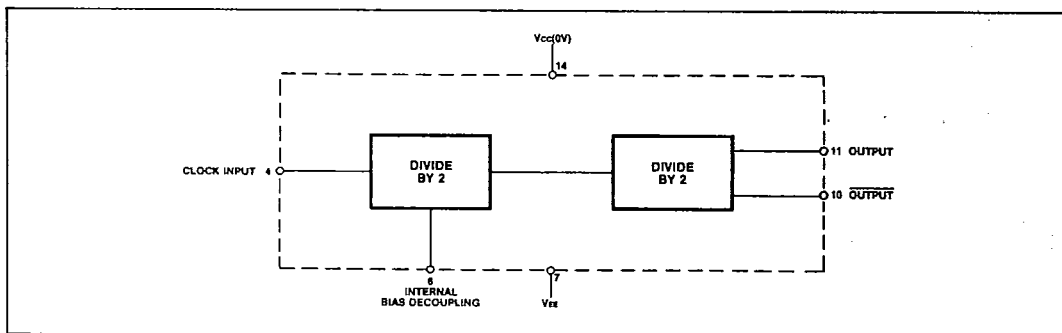


Fig.2 Functional diagram

SP8610/11A & B

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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	Note 5
		1.3		GHz	SP8611A	Input = 800-1200mV	Note 7
		1.5		GHz	SP8611B	Input = 800-1200mV	Note 7
Minimum frequency	f_{min}		150	MHz	All	Input = 600-1200mV	Note 5
Current consumption	I_{EE}		100	mA	All	$V_{EE} = -5.45V$ Outputs unloaded	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).

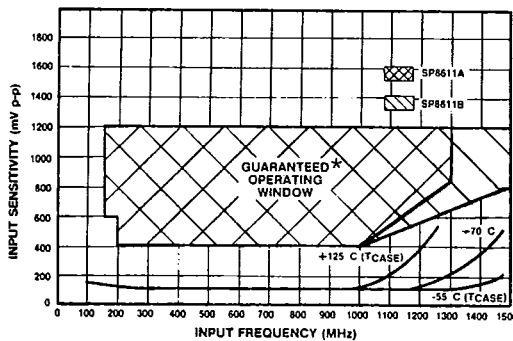


Fig.3 Typical input characteristics

*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.

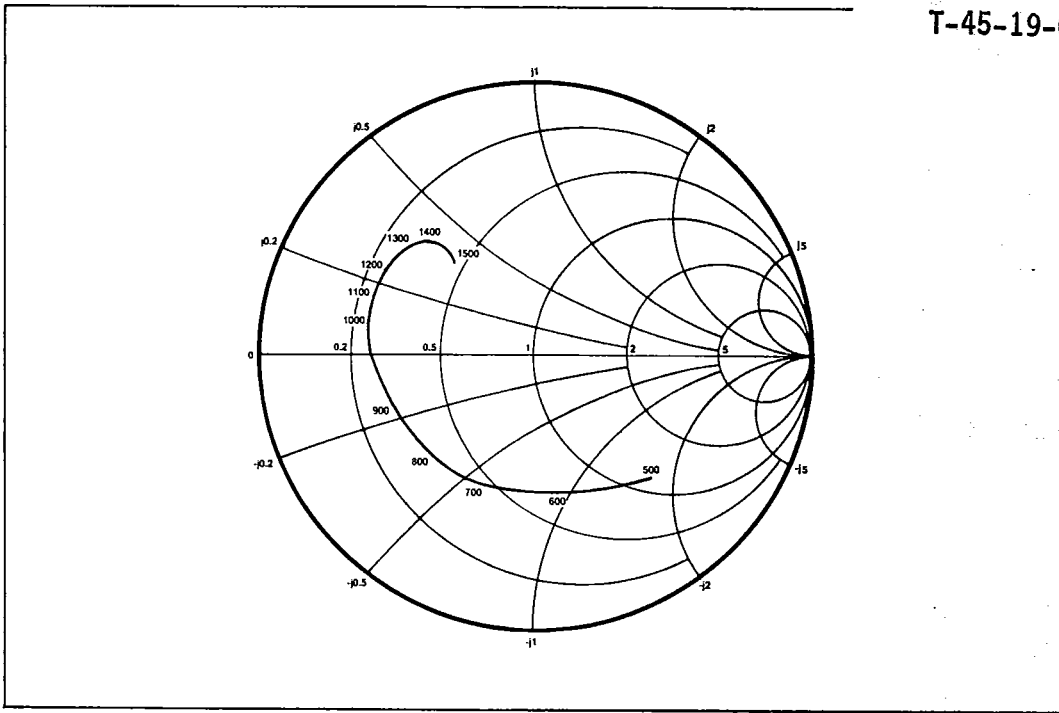


Fig.4 Typical input impedance. Test conditions: supply voltage -5.2V, ambient temperature 25°C, frequencies in MHz, impedances normalised to 50 ohms.

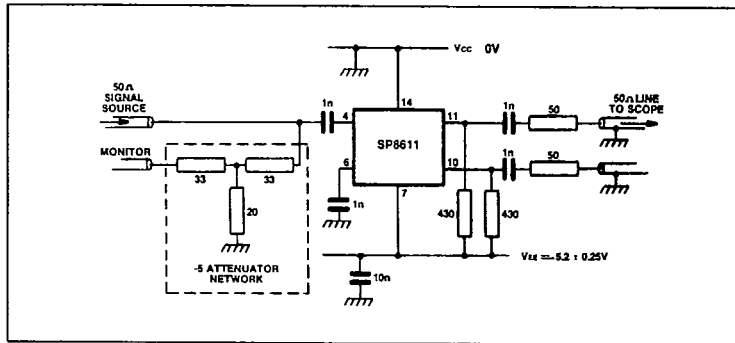


Fig.5 Toggle frequency test circuit

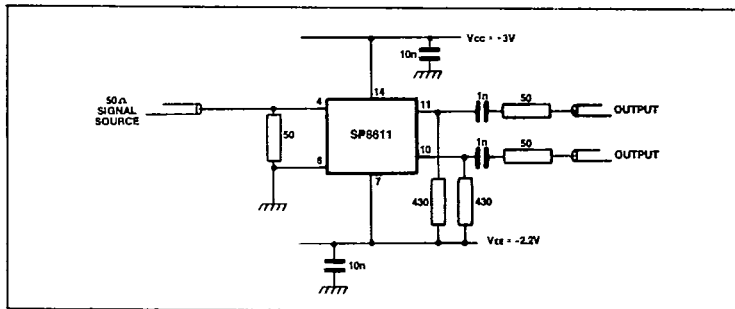


Fig.6 Circuit for using the input signal about earth potential

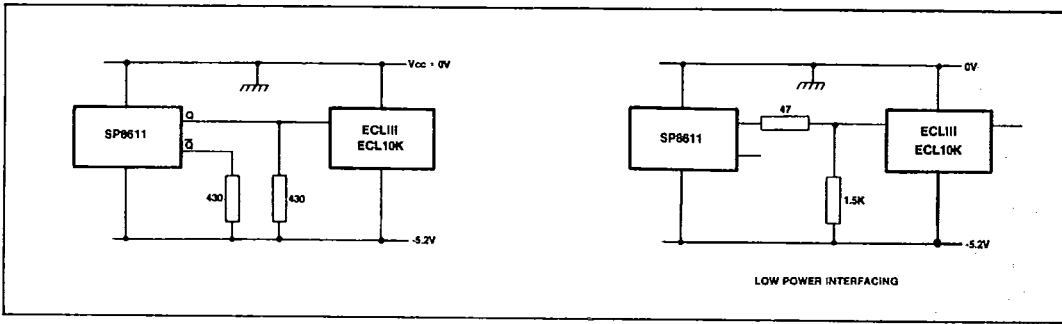


Fig.7 Interfacing SP8611 series to ECL 10K and ECL III

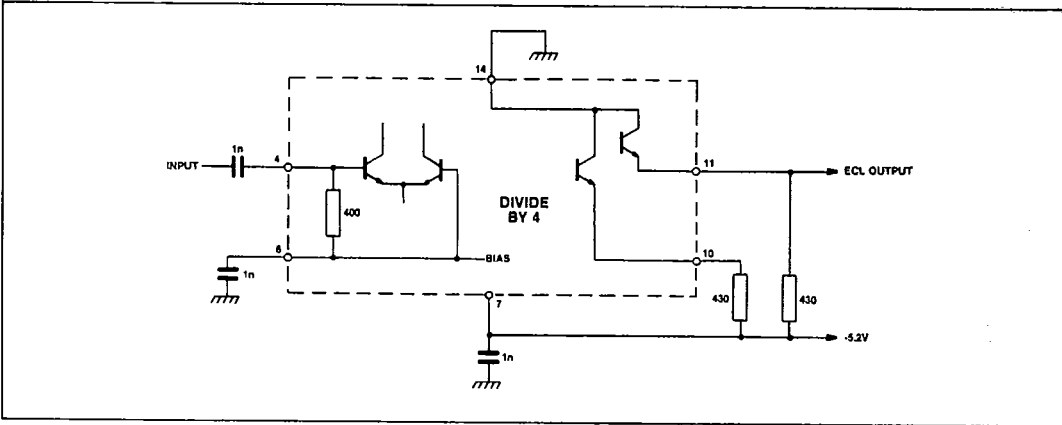


Fig.8 Typical application showing interfacing