



T-45-19-05

SP8605A & B 1000MHz ÷ 2
SP8606A & B 1300MHz ÷ 2

The SP8605 and SP8606 are emitter coupled logic dividers with ECL III compatible outputs. Specified from -55°C to +125°C (A Grade), these devices feature AC coupled inputs and 600mV p-p clock input sensitivity.

FEATURES

- ECL Compatible Outputs
- AC Coupled Inputs (Internal Bias)

QUICK REFERENCE DATA

- Supply Voltage: -5.2V
- Power Consumption: 320mW
- Max. Input Frequency: 1300MHz (SP8606)
- Temperature Range:
 - A Grade: -55°C to +110°C (125°C with suitable heat sink)
 - B Grade: 0°C to +70°C

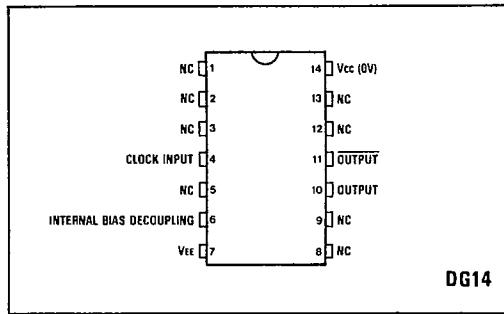


Fig.1 Pin connections - top view

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

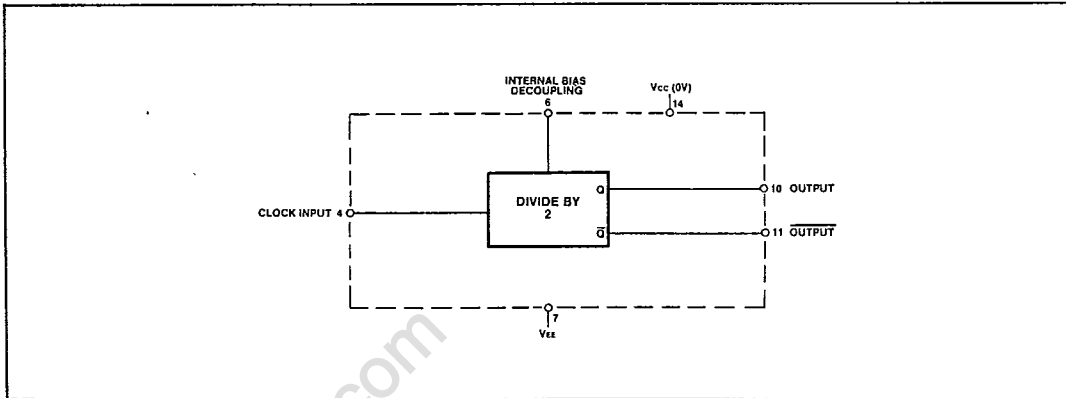


Fig.2 Functional diagram

ELECTRICAL CHARACTERISTICS

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

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Characteristics	Symbol	Value		Units	Grade	Conditions	Notes
		Min.	Max.				
Maximum frequency (sinewave input)	f_{max}	1.0		GHz	SP8605A,B	Input = 400-1200mV p-p	Note 7
		1.3		GHz	SP8606A	Input = 800-1200mV p-p	Note 7
		1.3		GHz	SP8606B	Input = 400-1200mV p-p	Note 7
Minimum frequency (sinewave input)	f_{min}		150	MHz	All	Input = 600-1200mV p-p	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 $430\Omega(25^{\circ}C)$	
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 ohms	Note 6

NOTES

1. Unless otherwise stated the electrical characteristics shown above are guaranteed over specified supply, frequency and temperature range.
2. The A grade devices must be used with a heat sink to maintain chip temperature below $+175^{\circ}C$ when operating in an ambient of $+125^{\circ}C$.
3. The temperature coefficients of $V_{OH} = +1.2mV/^{\circ}C$ and $V_{OL} = +0.24mV/^{\circ}C$ but these are not tested.
4. The test configuration for dynamic testing is shown in Fig.5.
5. Tested at $25^{\circ}C$ and $+125^{\circ}C$ only ($+70^{\circ}C$ for B grade).
6. Tested at $25^{\circ}C$ only.
7. Tested at $+125^{\circ}C$ only ($+70^{\circ}C$ for B grade).

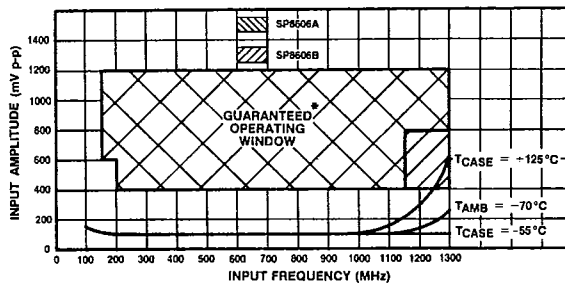


Fig.3 Typical characteristic of SP8606

*Tested as specified in table of Electrical Characteristics

THERMAL CHARACTERISTICS

θ_{IC} approximately $30^{\circ}C/W$
 θ_{JA} approximately $110^{\circ}C/W$

OPERATING NOTES

1. The clock inputs (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.
2. 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 unused input to V_{EE} (ie pin 4 to pin 7). This reduces sensitivity by approximately 100mV.
3. The input can be operated at very low frequencies but slew rate must be better than $200V/\mu s$.
4. The input impedance of the SP8605/6 is a function of frequency. See Fig. 4.
5. 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.
6. These devices may be used with split supply lines and earth referenced input using the circuit shown in Fig. 6.
7. All components should be suitable for the frequency in use.

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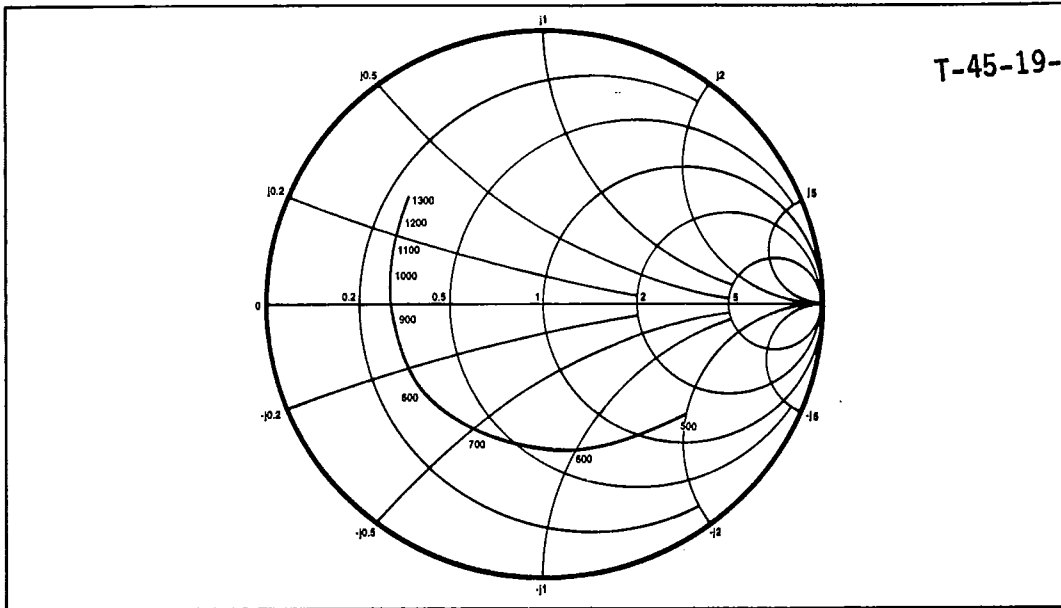


Fig.4 Typical Input impedance. Test conditions: supply voltage -5.2V, ambient temperature 25°C, frequencies in MHz, impedances normalised to 50 ohms.

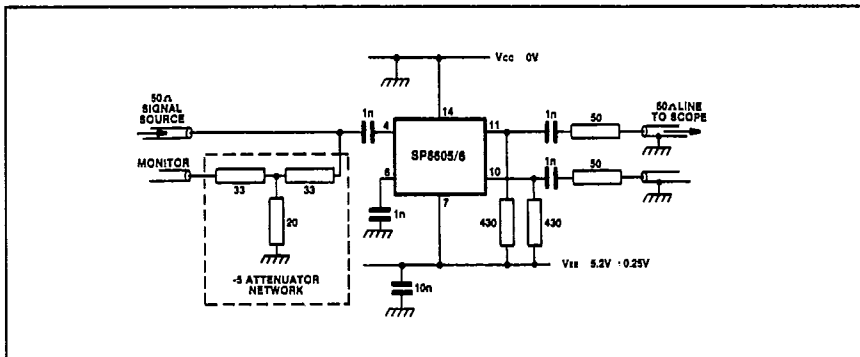


Fig.5 Toggle frequency test circuit

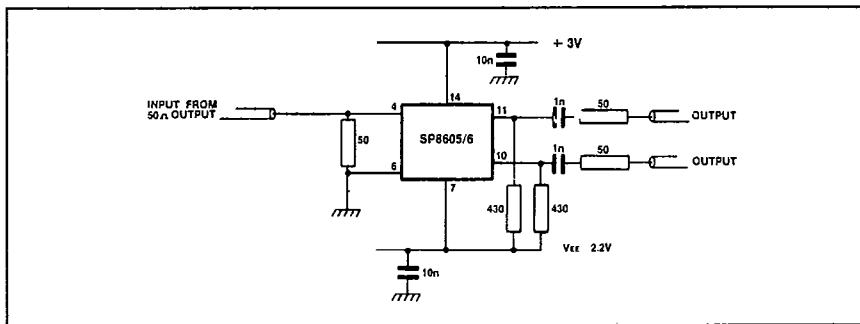


Fig.6 Circuit for using the input signal about ground potential

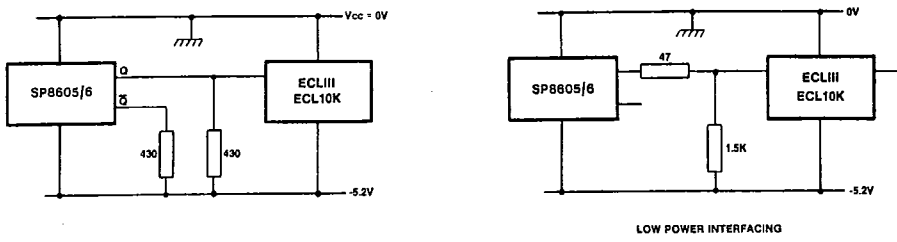


Fig.7 Interfacing SP8605/6 to ECL 10K and ECL III

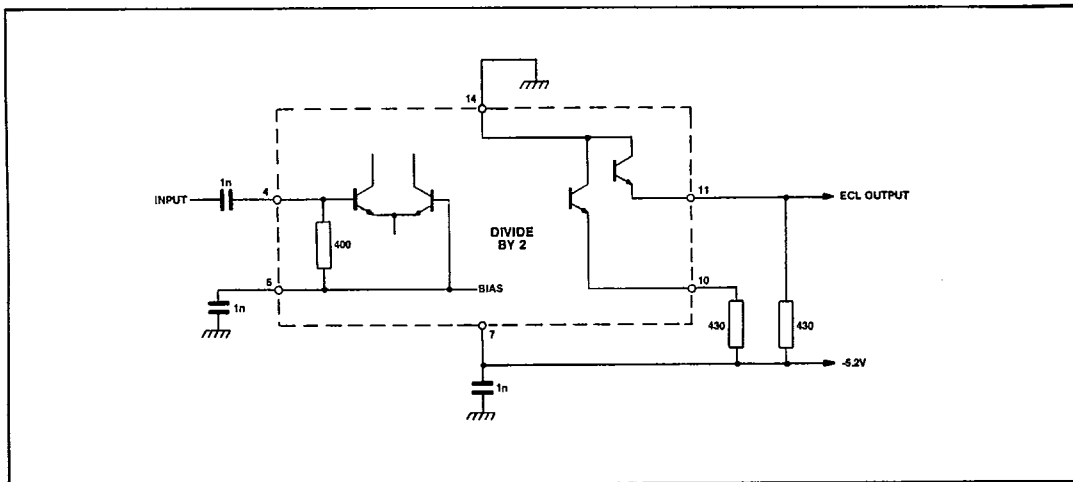


Fig.8 Typical application showing interfacing