

T.45-19-09

GEC PLESSEY
SEMICONDUCTORS

SP8655 200MHz ÷ 32
SP8657 200MHz ÷ 20
SP8659 200MHz ÷ 16

The SP8655, 57 and 59 are low power emitter coupled logic counters with open collector outputs capable of driving TTL or CMOS. They are available in two temperature ranges: -55°C to +125°C (A grade) and -30°C to +70°C (B grade). It has internally biased inputs.

FEATURES

- AC Coupled Inputs
- Low Power Consumption
- Open Collector Output CMOS and TTL Compatible

QUICK REFERENCE DATA

- Supply Voltage: 5.0V
- Power Consumption: 50mW
- Temperature Range:
 - 55°C to +125°C (A Grade)
 - 30°C to +70°C (B Grade)

ORDERING INFORMATION

See page 3-120

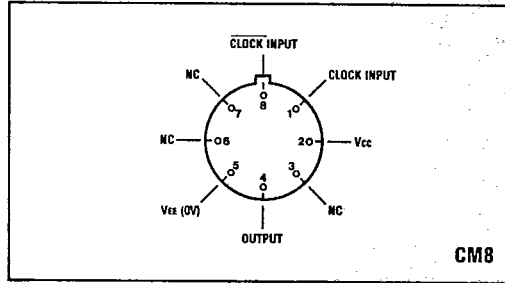


Fig.1 Pin connections - bottom view

ABSOLUTE MAXIMUM RATINGS

Supply voltage	8V
Open collector output voltage	12V
Storage temperature range	-55°C to +150°C
Max. junction temperature	+175°C
Max. clock I/P voltage	2.5V p-p
Output sink current	10mA

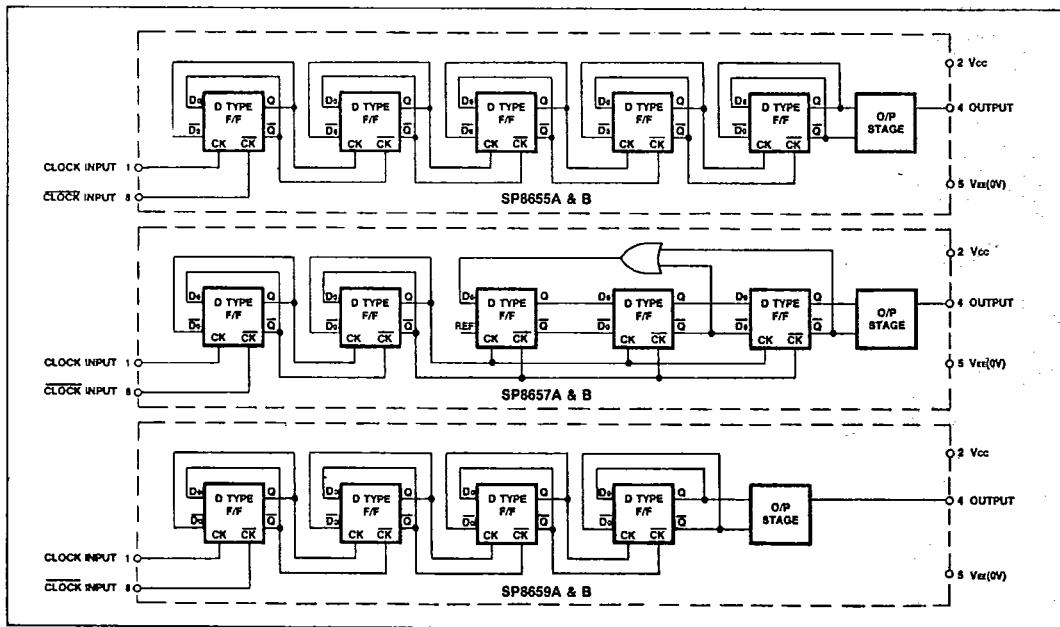


Fig.2 Functional diagram

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ELECTRICAL CHARACTERISTICS

Supply voltage: $V_{CC} = 5.0V \pm 0.25V$ $V_{EE} = 0V$
 Temperature: A grade $T_{amb} = -55^{\circ}C$ to $+125^{\circ}C$
 B grade $T_{amb} = -30^{\circ}C$ to $+70^{\circ}C$

Characteristic	Symbol	Value		Units	Conditions
		Min.	Max.		
Maximum frequency (sinewave input)	f_{max}	200		MHz	Input = 400 - 800mV
Minimum frequency (sinewave input)	f_{min}		40	MHz	Input = 400 - 800mV
Power supply current	I_{EE}		13	mA	$V_{CC} = 5.25V$
Output high voltage	V_{OH}	7.5		V	$V_{CC} = 5V$ Note 4 Pin 4 = 1.5k Ω to 10V
Output low voltage	V_{OL}		400	mV	$V_{CC} = 5V$ Pin 4 = 1.5k Ω to 10V

NOTES

1. Unless otherwise stated the electrical characteristics are guaranteed over specified supply, frequency and temperature range.
2. The dynamic test circuit is shown in Fig.5.
3. Above characteristics are not tested at 25°C (tested at low and high temperature only).
4. Open collector output not to be used above 15MHz. $C_{load} \leq 5pF$.

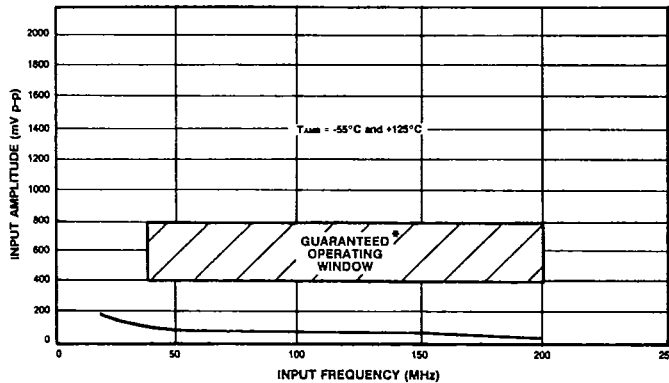


Fig.3 Typical input characteristics

* Tested as specified in table of Electrical Characteristics

OPERATING NOTES

1. The clock inputs (pin 1 and 8) should be capacitively coupled to the signal source. When driven single-ended, the input signal path is completed by connecting a capacitor from the unused input to ground.
2. In the absence of a signal the devices will self-oscillate. This can be prevented by connecting a 39k resistor from either input to ground. If the device is driven single ended, it is recommended that the pulldown resistor be connected to the decoupled unused input. There will be a loss in sensitivity of approximately 200mV.
3. The device will operate down to DC but the input slew rate must be better than 100V/ μs .
4. The open collector output will drive 3 TTL loads, and thus requires a suitable resistor to V_{CC} to maintain noise

- immunity. In order to ensure noise immunity on transitions, this resistor should not exceed 4.7k. For interfacing to CMOS, the open collector may be restored to a +10V line via a 3.3k resistor. The output sink current must not exceed 10mA, and the use of too low a value of resistor may lead to a loss of noise immunity, especially at low temperatures.
5. Input impedance is a function of frequency. See Fig. 4.
 6. The rise time of the open collector output waveform is directly proportional to the load capacitance and load resistor value. Therefore the load capacitance should be minimised and the load resistor kept to a minimum compatible with system power requirements. In the test configuration of Fig. 5, the output rise time is approximately 20ns and fall time is typically 10ns.

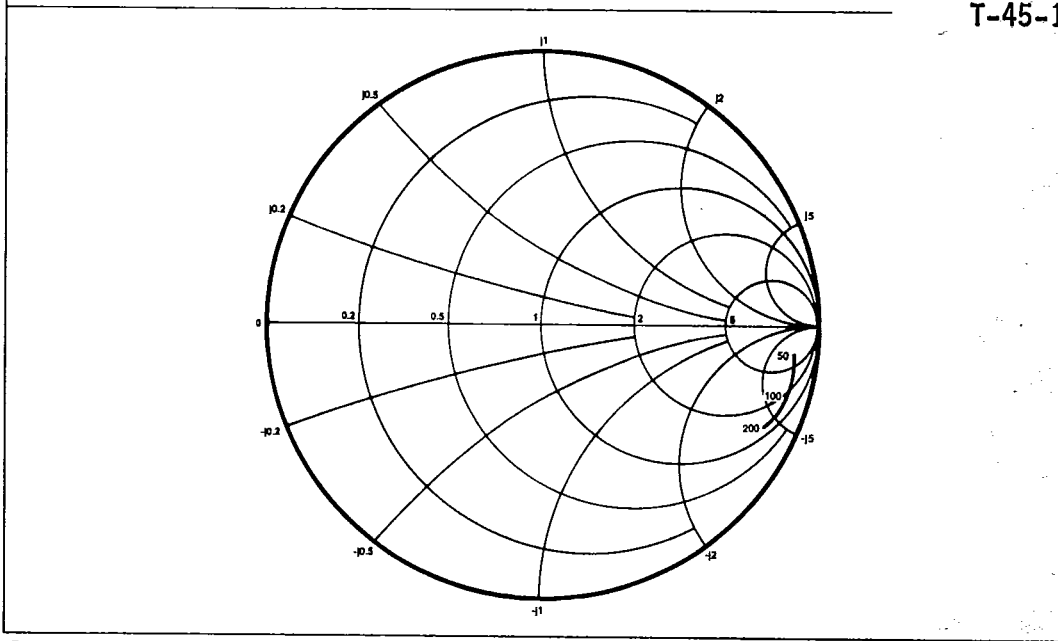


Fig.4 Typical input impedance. Test conditions: supply voltage 5.0V, ambient temperature 25° C, frequencies in MHz, impedances normalised to 50 ohms.

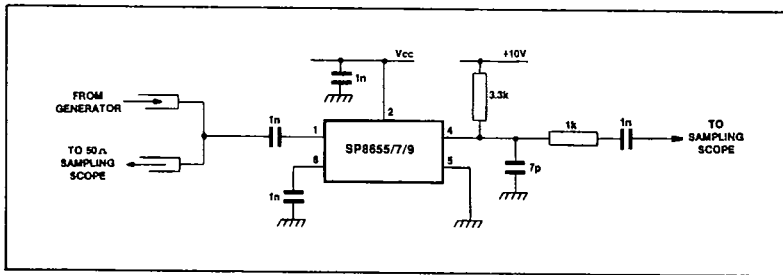


Fig.5 Test circuit

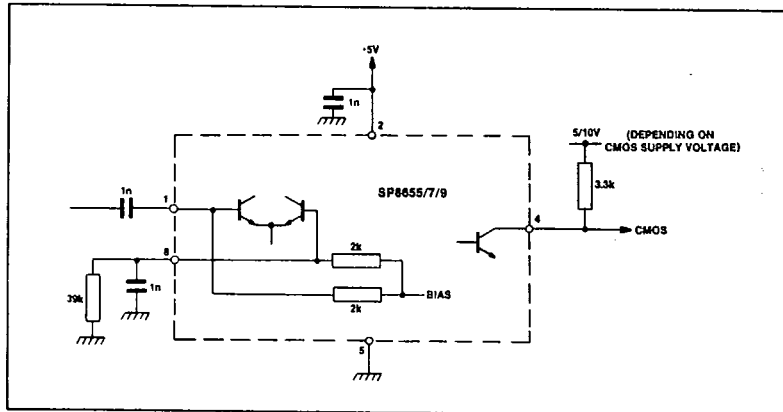


Fig.6 Typical application showing interfacing

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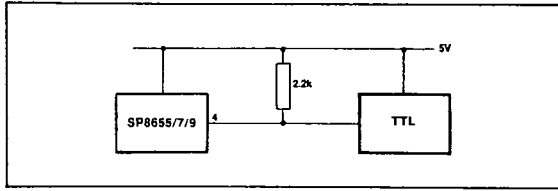


Fig.7 Interfacing to TTL. Load not to exceed 3 TTL unit loads.

ORDERING INFORMATION

SP8655 A CM
SP8655 B CM
SP8655 AB CM
SP8655 AC CM
SP8655 ABSS2 CM
SP8657 A CM
SP8657 B CM

SP8657 AB CM
SP8657 AC CM
SP8659 A CM
SP8659 B CM
SP8659 AB CM
SP8659 AC CM
SP8659 ABSS2 CM