

GEC PLESSEY**SEMICONDUCTORS**

T-45-23-33

MARCH 1992

PRELIMINARY INFORMATION

DS3173 1.3

SP8904

5.0/5.5GHz ÷ 4 FIXED MODULUS DIVIDER

The SP8904 is one of a range of very high speed low power prescalers for professional and military applications. The dividing elements are static D type flip flops and therefore allow operation down to DC if the drive signal is a pulse waveform with fast risetime. The output stage has a differential current output and provides a direct drive into a 50 ohm load.

FEATURES

- Very High Operating Speed-5.5GHz in DIL
- Operation down to DC with square wave input
- Silicon Technology for low Phase Noise
(Typically Better than -140dBc/Hz at 1KHz)
- 5V Single Supply Operation
- Low Power Dissipation-345mW (Typ)
- Specified over the full Military Temperature Range

ABSOLUTE MAXIMUM RATINGS

Supply voltage V_{cc}	6.5V
Storage temperature	-65°C to +150°C
Max. junction temperature	+175°C
Prescaler input voltage	2.5V p-p
Operating Temperature	A -55 to +125°C
	B -40 to +85°C

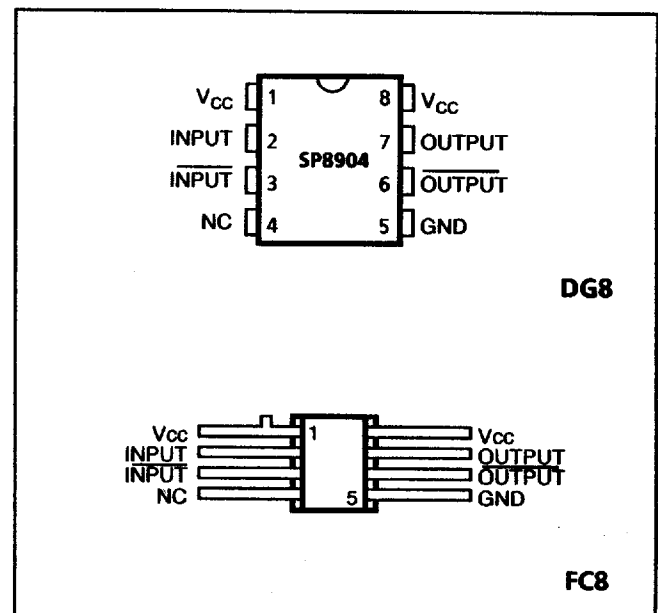


Fig.1 Pin connections - top view

ORDERING INFORMATION

SP8904 A DG SP8904 AC DG
 SP8904 B DG
 SP8904 A FC (Available soon)

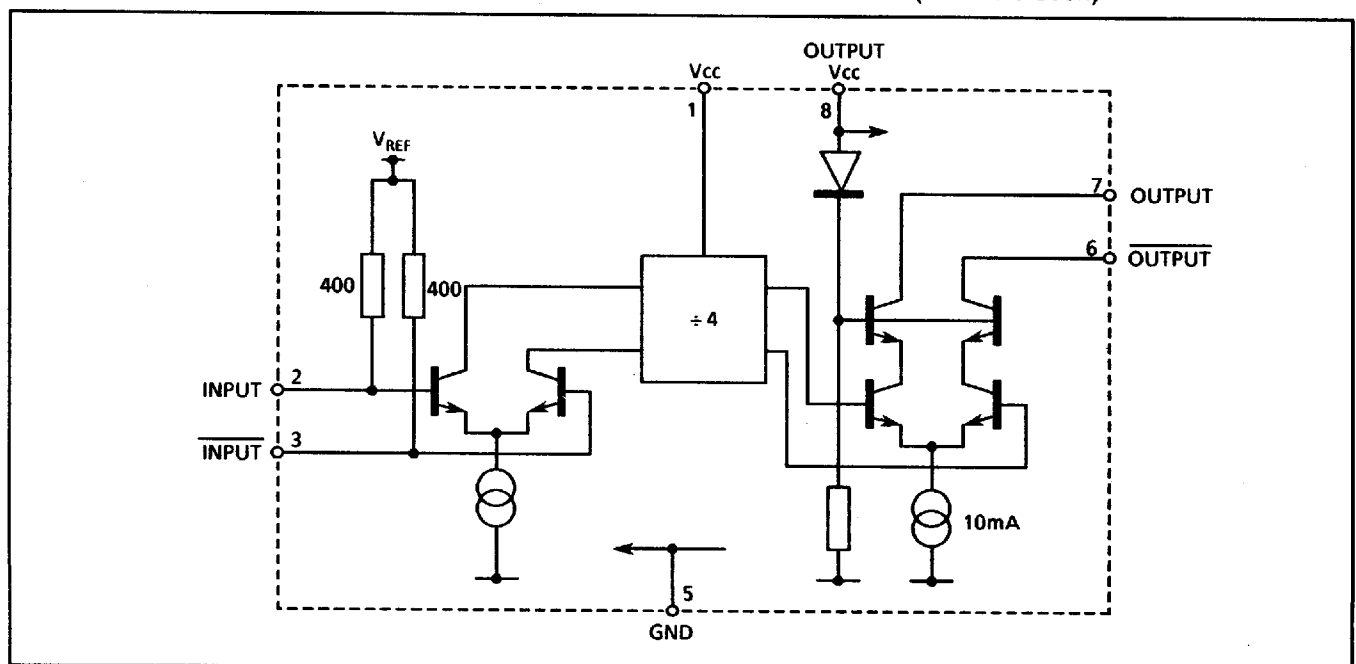


Fig.2 SP8904 Block diagram

SP8904

SP8904A ELECTRICAL CHARACTERISTICS (DG Package Only)

Guaranteed over the full specified temperature and supply voltage range

Test conditions (unless otherwise stated)Temperature $T_{amb} = -55^{\circ}\text{C}$ and $+125^{\circ}\text{C}$ Supply Voltage: $V_{CC} = 4.75\text{V}$ and 5.25V

Characteristic	Pin	Value			Units	Conditions
		Min	Typ	Max		
Supply current	1, 8	45	69	93	mA	
Input frequency	2, 3	1.0		5.0	GHz	RMS sinewave
Input frequency	2, 3	1.0		5.5	GHz	RMS sinewave, $T_{amb} = -55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$
Input sensitivity	2, 3			180	mVrms	$f_{in} = 1$ to 4.2GHz
Input sensitivity	2, 3			570	mVrms	$f_{in} = 5\text{GHz}$
Input sensitivity	2, 3			570	mVrms	$f_{in} = 5.5\text{GHz}$ $T_{amb} = -55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$
Input overload	2, 3	440			mVrms	$f_{in} = 1$ to 3.8GHz
Input overload	2, 3	700			mVrms	$f_{in} = 3.8$ to 5GHz
Input overload	2, 3	700			mVrms	$f_{in} = 5$ to 5.5GHz $T_{amb} = -55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$
Output voltage	6, 7		0.5		V p/p	Into 50 Ω pull up resistor
Output power	6, 7	-9.0	-4.5	0.0	dBm	$f_{in} = 1$ to 5GHz (see note 1)

NOTE 1.

Measured into 50 Ω measuring instrument in parallel with 50 Ω pull up resistor. See fig. 4.

SP8904B ELECTRICAL CHARACTERISTICS (DG Package Only)

Guaranteed across the B grade temperature range of -40°C to $+85^{\circ}\text{C}$, but tested at $T_{amb} = 25^{\circ}\text{C}$ With supply Voltage: $V_{CC} = 4.75\text{V}$ and 5.25V

Characteristic	Pin	Value			Units	Conditions
		Min	Typ	Max		
Supply current	1, 8	45	69	93	mA	
Input frequency	2, 3	1.0		5.0	GHz	RMS sinewave
Input sensitivity	2, 3			180	mVrms	$f_{in} = 1$ to 4.2GHz
Input sensitivity	2, 3			570	mVrms	$f_{in} = 5\text{GHz}$
Input overload	2, 3	440			mVrms	$f_{in} = 1$ to 3.8GHz
Input overload	2, 3	700			mVrms	$f_{in} = 3.8$ to 5GHz
Output voltage	6, 7		0.5		V p/p	Into 50 Ω pull up resistor
Output power	6, 7	-9.0	-4.5	0.0	dBm	$f_{in} = 1$ to 5GHz (see note 1)

NOTE 1.

Measured into 50 Ω measuring instrument in parallel with 50 Ω pull up resistor. See fig. 4.

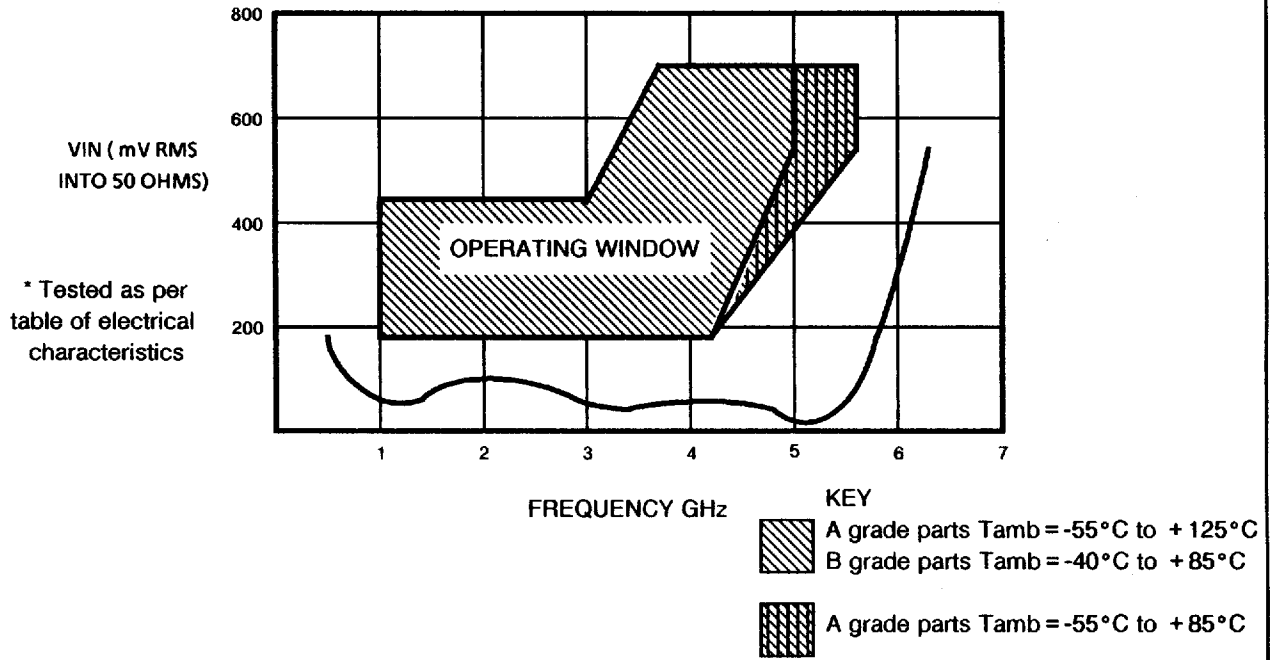


Fig.3 Typical input sensitivity (DIL package sine wave drive)

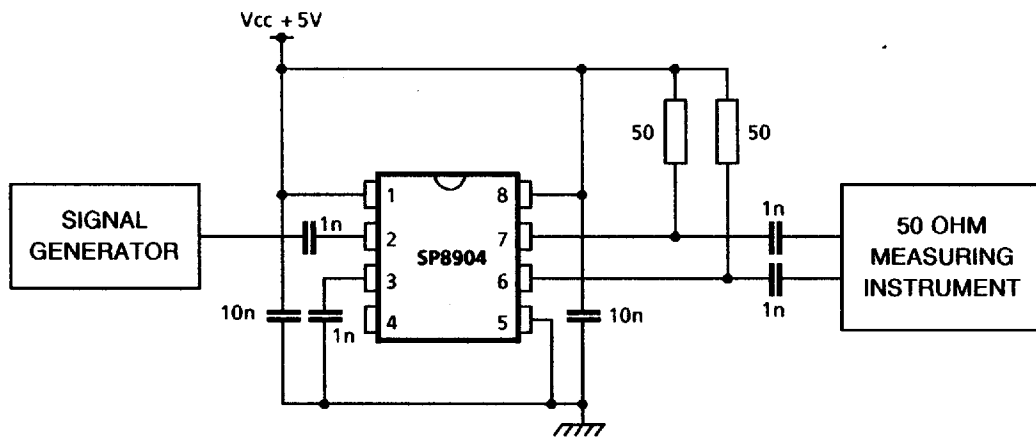
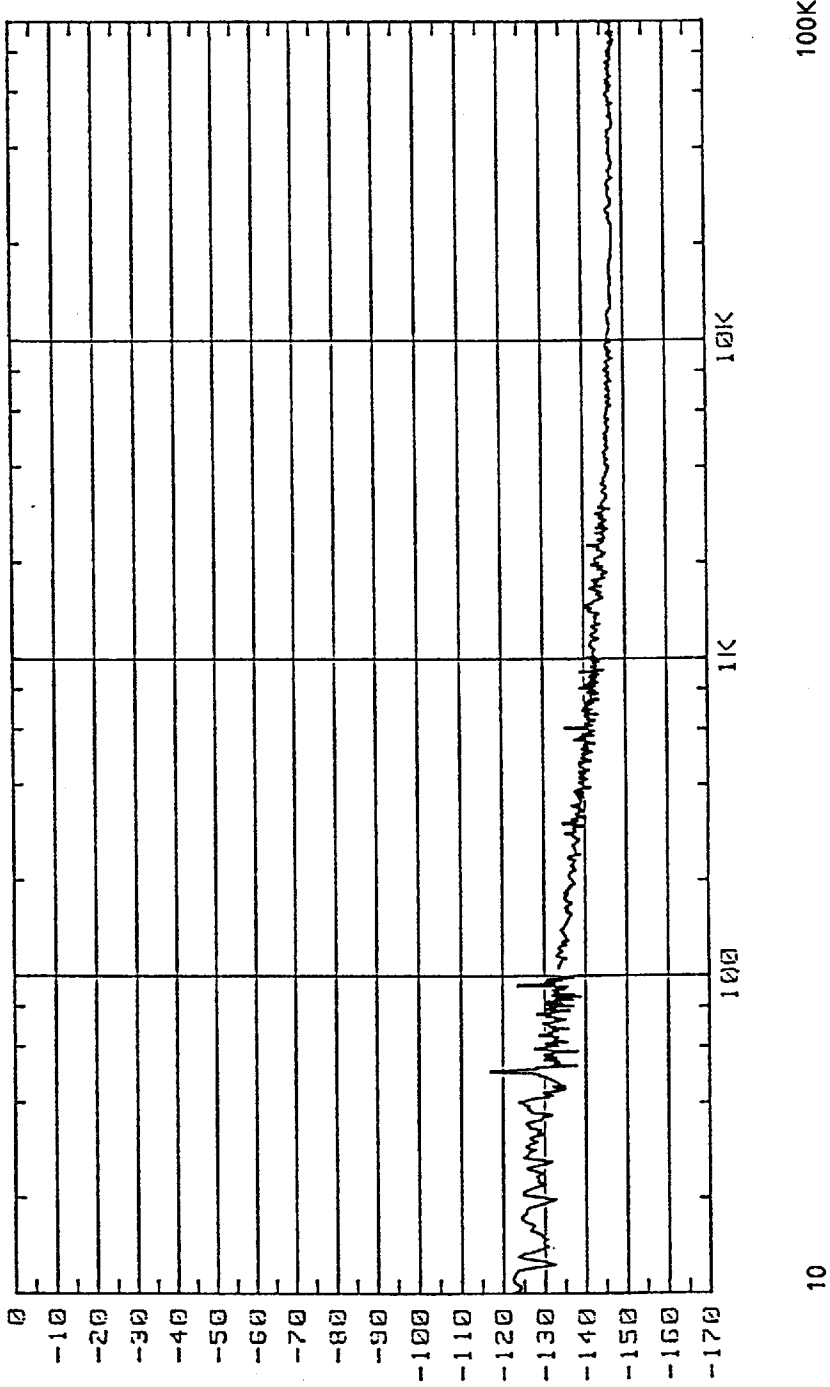


Fig.4 Typical application and test circuit



$L(f)$ [dBc/Hz] vs f [Hz]

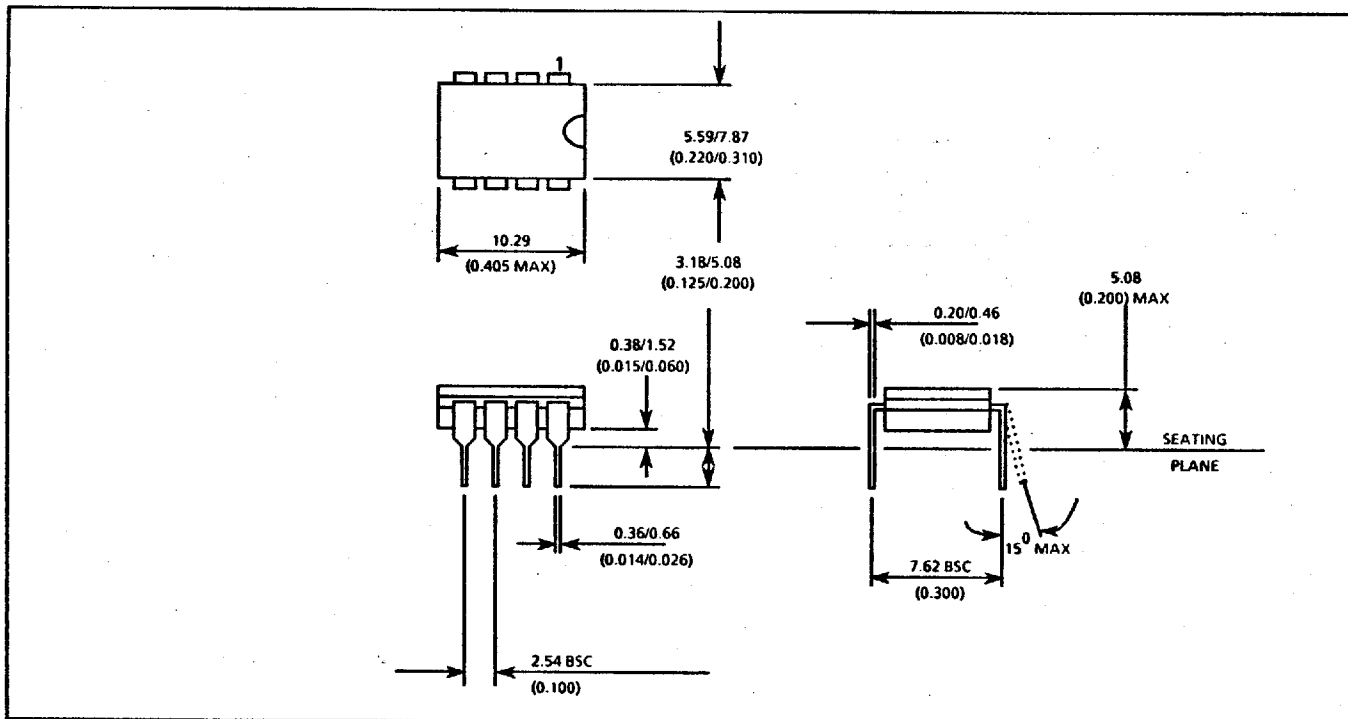
Fig 5 Typical phase noise of SP8904 Input frequency = 3GHz

NOTE.

The phase noise of the SP8904 varies with carrier frequency, a reduction of a half in carrier frequency will result in a phase noise reduction of approximately 6dB at 1KHz offset.

PACKAGE DETAILS

Dimensions are shown thus: mm (in). For further package information please contact your local Customer Service Centre.



8 LEAD CERAMIC DIP DG8 COMPLIES WITH MIL STD 1835

GEC PLESSEY

SEMICONDUCTORS

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