

SP8904

5.0/5.5GHz ÷ 4 FIXED MODULUS DIVIDER

(Supersedes September 1993 Edition)

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
- 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-350mW (Typ.)
- Specified over the full Military Temperature Range

ABSOLUTE MAXIMUM RATINGS

Supply Voltage, V_{CC}	6.5V
Storage Temperature	-65°C to +150°C
Maximum Junction Temperature	+175°C
Prescaler Input Voltage	2.5Vp-p
Operating Temperature	KG -55°C to +125°C T_{case}
	IG -40°C to +85°C T_{case}

ORDERING INFORMATION

SP8904/KG/DG1S
SP8904/IG/DG1S
SP8904/RG/1CAC (naked die)

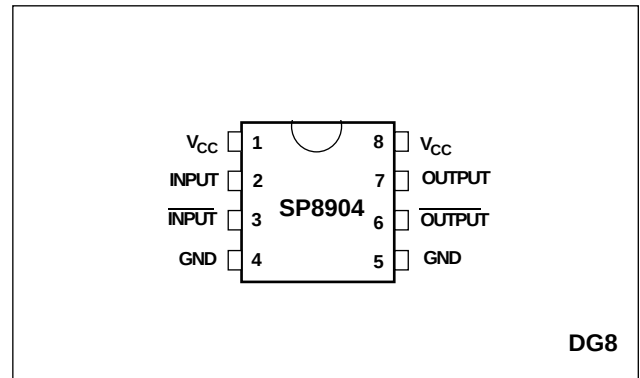


Fig.1 Pin connections - top view

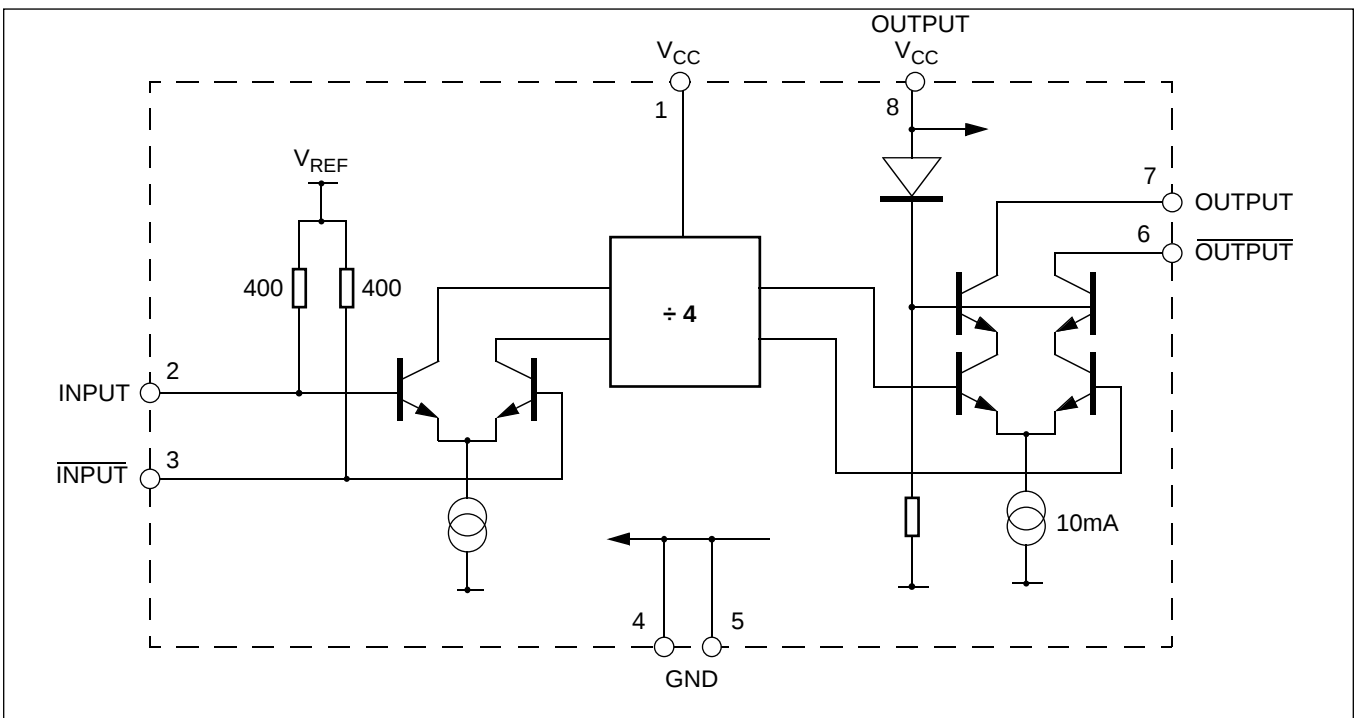


Fig.2 SP8904 block diagram

SP8904

SP8904KG ELECTRICAL CHARACTERISTICS

Guaranteed over the full specified temperature and supply voltage range

Test conditions (unless otherwise stated):

Temperature $T_{case} = -55^{\circ}\text{C}$ and $+125^{\circ}\text{C}$ using thermostream temperature control equipment.

Supply Voltage: $V_{CC} = 4.75\text{V}$ and 5.25V

Characteristic	Pin	Value			Units	Conditions
		Min.	Typ.	Max.		
Supply current	1, 8	-	70	95	mA	
Input frequency	2, 3	1.0	-	5.0	GHz	RMS sinewave
Input frequency	2, 3	1.0	-	5.5	GHz	RMS sinewave, $T_{case} = -55^{\circ}\text{C}$ & $+85^{\circ}\text{C}$
Input sensitivity	2, 3	-	-	180	mVrms	$f_{in} = 1$ & 4.2GHz
Input sensitivity	2, 3	-	-	570	mVrms	$f_{in} = 5\text{GHz}$
Input sensitivity	2, 3	-	-	570	mVrms	$f_{in} = 5.5\text{GHz}$, $T_{case} = -55^{\circ}\text{C}$ & $+85^{\circ}\text{C}$
Input overload	2, 3	440	-	-	mVrms	$f_{in} = 1$ & 3GHz
Input overload	2, 3	700	-	-	mVrms	$f_{in} = 3.8$ & 5GHz
Input overload	2, 3	700	-	-	mVrms	$f_{in} = 5.5\text{GHz}$, $T_{case} = -55^{\circ}\text{C}$ & $+85^{\circ}\text{C}$
Output voltage	6, 7	-	0.5	-	Vp/p	Into 50W pull up resistor
Output power	6, 7	-10.0	0	+2.0	dBm	$f_{in} = 1, 3, 4.2, 5\text{GHz}$ (see note 1)

NOTE 1.

Measured into 50W measuring instrument in parallel with 50W pull up resistor. See Fig.5.

SP8904IG ELECTRICAL CHARACTERISTICS

Guaranteed across the temperature range of $T_{case} = -40^{\circ}\text{C}$ 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	-	70	95	mA	
Input frequency	2, 3	1.0	-	5.0	GHz	RMS sinewave
Input sensitivity	2, 3	-	-	180	mVrms	$f_{in} = 1$ & 4.2GHz
Input sensitivity	2, 3	-	-	570	mVrms	$f_{in} = 5\text{GHz}$
Input overload	2, 3	440	-	-	mVrms	$f_{in} = 1$ & 3.0GHz

The thermal resistances of the DG package are given for guidance only, $q_{JA} = 150^{\circ}\text{C/W}$ and $q_{JC} = 30^{\circ}\text{C/W}$, to assist the decision on the heat sink requirements for the port

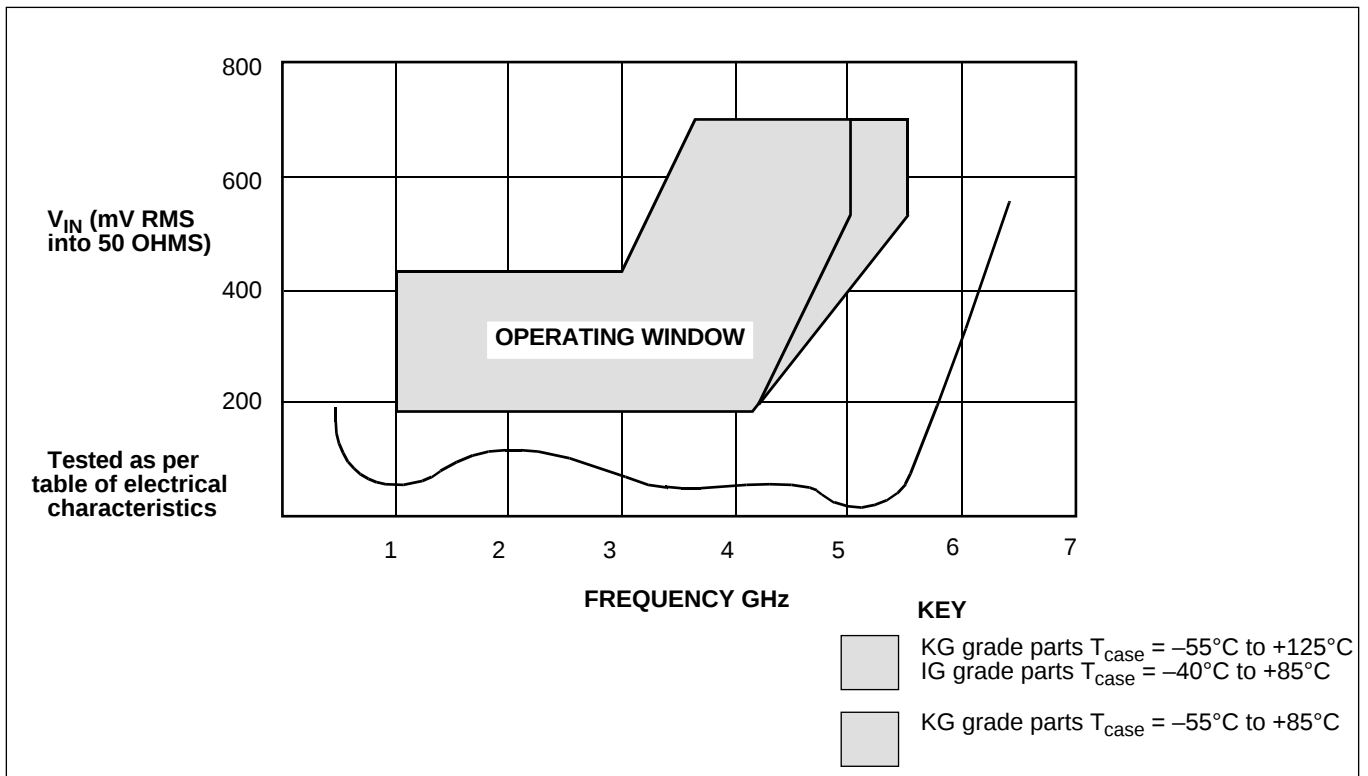


Fig.3 Typical input sensitivity (sine wave drive)

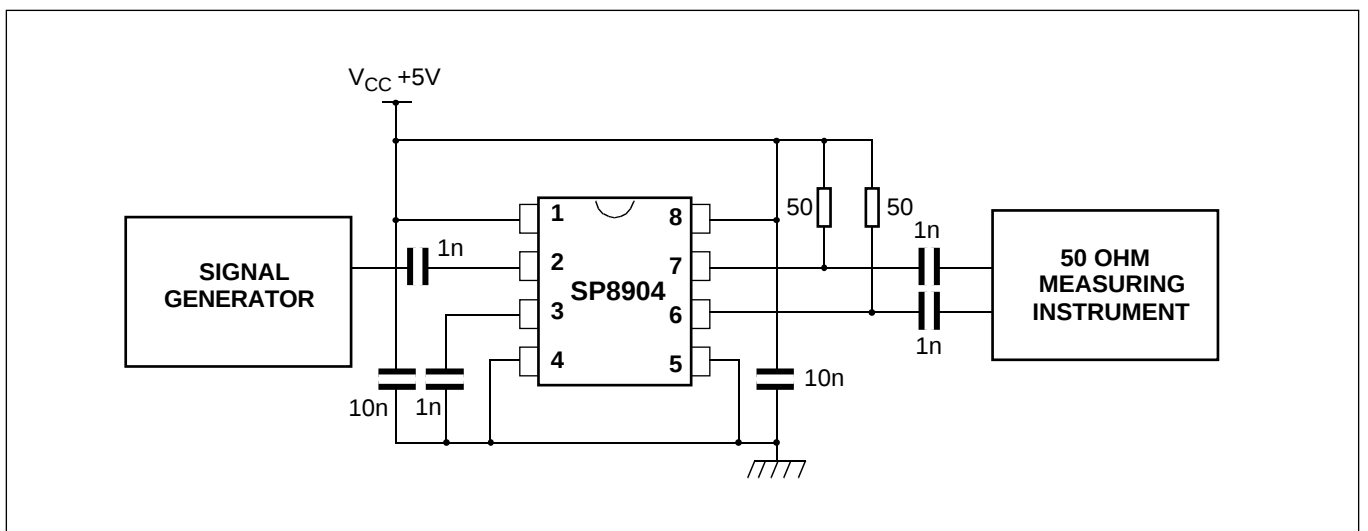


Fig.4 Typical application and test circuit

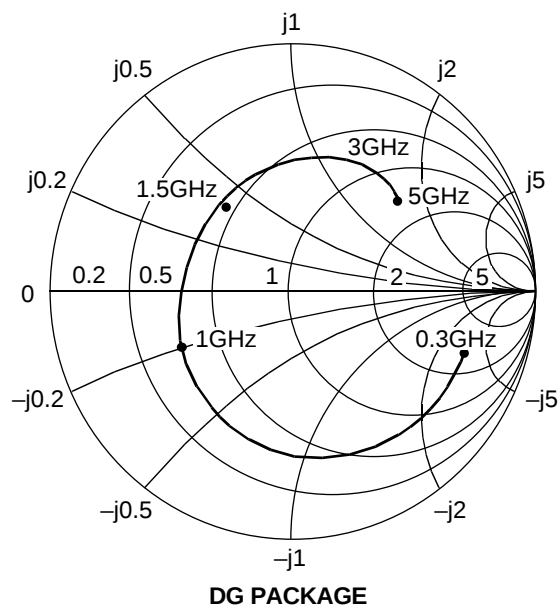
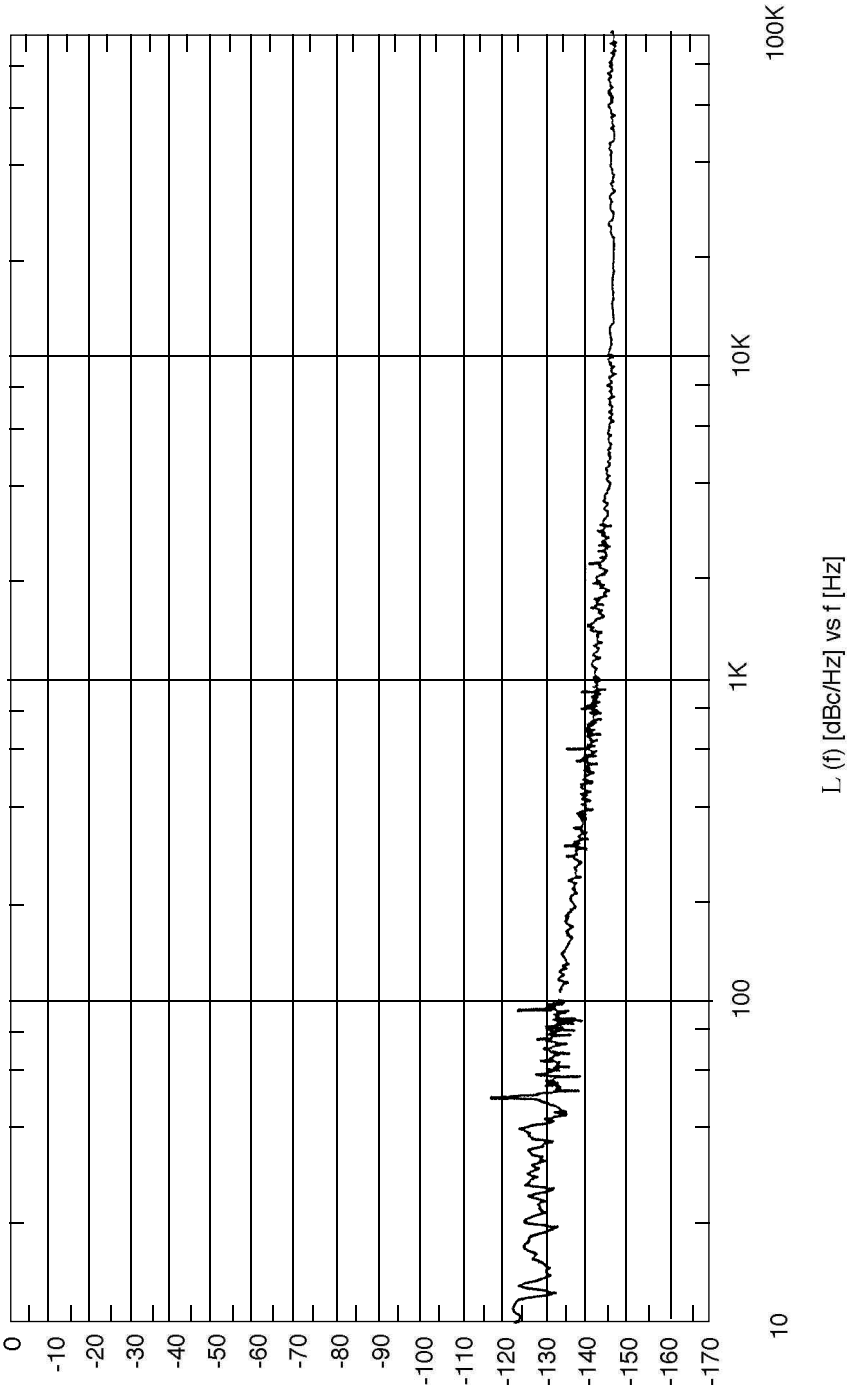


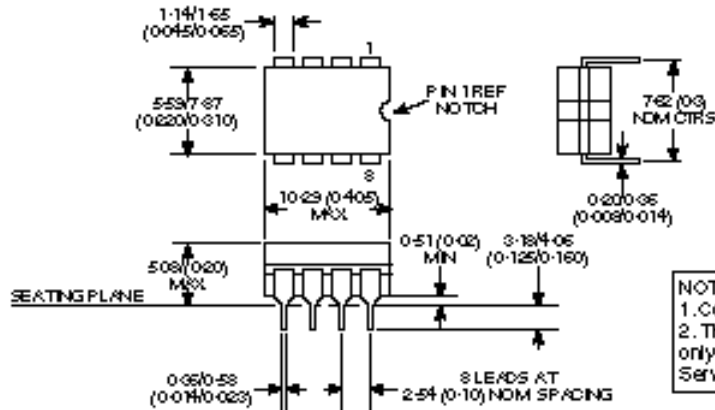
Fig.5 Typical input impedance



SP8904

PACKAGE DETAILS

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



8 LEAD CERAMIC DIL DG8 COMPLIES WITH MIL STD 1835



HEADQUARTERS OPERATIONS
GEC PLESSEY SEMICONDUCTORS
Cheney Manor, Swindon,
Wiltshire, United Kingdom. SN2 2QW
Tel: (01793) 518000
Fax: (01793) 518411

GEC PLESSEY SEMICONDUCTORS
P.O. Box 660017,
1500 Green Hills Road,
Scotts Valley, California 95067-0017,
United States of America.
Tel (408) 438 2900
Fax: (408) 438 5576

CUSTOMER SERVICE CENTRES

- **FRANCE & BENELUX** Les Ulis Cedex Tel: (1) 69 18 90 00 Fax: (1) 64 46 06 07
- **GERMANY** Munich Tel: (089) 3609 06-0 Fax: (089) 3609 06-55
- **ITALY** Milan Tel: (02) 66040867 Fax: (02) 66040993
- **JAPAN** Tokyo Tel: (03) 5276-5501 Fax: (03) 5276-5510
- **NORTH AMERICA** Scotts Valley, USA Tel: (408) 438 2900 Fax: (408) 438 7023
- **SOUTH EAST ASIA** Singapore Tel: (65) 3827708 Fax: (65) 3828872
- **SWEDEN** Stockholm Tel: 46 8 702 97 70 Fax: 46 8 640 47 36
- **TAIWAN, ROC** Taipei Tel: 886 2 5461260 Fax: 886 2 7190260
- **UK, EIRE, DENMARK, FINLAND & NORWAY**
Swindon Tel: (01793) 518527/518566 Fax: (01793) 518582

These are supported by Agents and Distributors in major countries worldwide.

© GEC Plessey Semiconductors 1995 Publication No. DS3173 Issue No.3.2 Oct. 1995

TECHNICAL DOCUMENTATION - NOT FOR RESALE. PRINTED IN UNITED KINGDOM

This publication is issued to provide information only which (unless agreed by the Company in writing) may not be used, applied or reproduced for any purpose nor form part of any order or contract nor to be regarded as a representation relating to the products or services concerned. No warranty or guarantee express or implied is made regarding the capability, performance or suitability of any product or service. The Company reserves the right to alter without prior notice the specification, design or price of any product or service. Information concerning possible methods of use is provided as a guide only and does not constitute any guarantee that such methods of use will be satisfactory in a specific piece of equipment. It is the user's responsibility to fully determine the performance and suitability of any equipment using such information and to ensure that any publication or data used is up to date and has not been superseded. These products are not suitable for use in any medical products whose failure to perform may result in significant injury or death to the user. All products and materials are sold and services provided subject to the Company's conditions of sale, which are available on request.