

***THIS DOCUMENT IS FOR MAINTENANCE  
PURPOSES ONLY AND IS NOT  
RECOMMENDED FOR NEW DESIGNS***

SL1640 IS FOR MAINTENANCE PURPOSES ONLY AND IS NOT RECOMMENDED FOR NEW DESIGNS

# SL1640

## DOUBLE BALANCED MODULATORS

The SL1640 is a double balanced modulator intended for use in radio systems at frequencies up to 75MHz. The SL1640 has an integral output load resistor (Pin 5) together with an emitter follower output (Pin 6).

### FEATURES

- No External Bias Networks Needed
- Easy Interfacing
- Choice of Voltage or Current Outputs

### APPLICATIONS

- Mixers In Radio Transceivers
- Phase Comparators
- Modulators

### QUICK REFERENCE DATA

- Supply Voltage: 6V
- Conversion Gain: 0dB
- Maximum Inputs: 200mV rms

### ABSOLUTE MAXIMUM RATINGS

Supply voltage:	9V
Storage temperature:	-55°C to +150°C
Operating temperature range:	0°C to +70°C
Chip operating temperature:	+150°C
Thermal resistance	
Chip-to-ambient	111°C/W
Chip-to-case	71°C/W

### ORDERING INFORMATION

SL1640 C DP

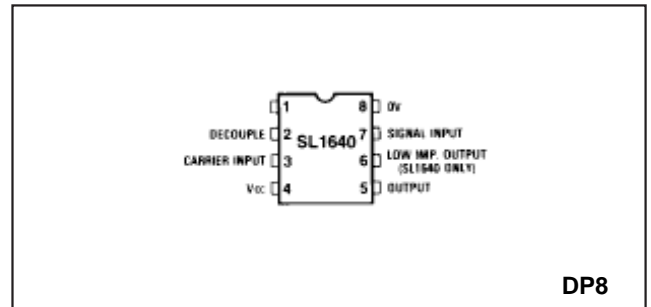


Fig.1 Pin connections (top view)

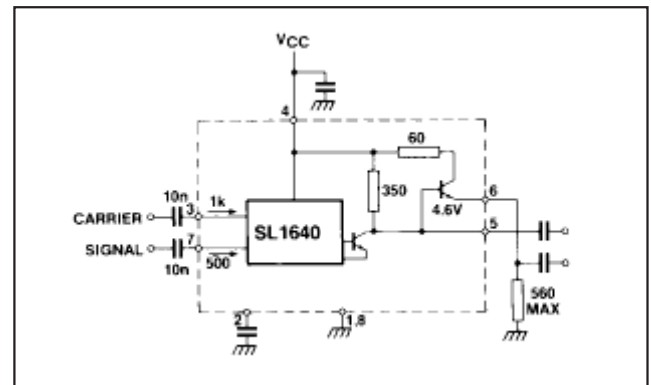


Fig.2 Block diagram (SL1640)

# SL1640

## ELECTRICAL CHARACTERISTICS

These characteristics are guaranteed over the following conditions (unless otherwise stated)

Supply voltage  $V_{cc}$ : 6V

Ambient temperature:  $22^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Characteristics	Circuit	Value			Units	Conditions
		Min.	Typ.	Max.		
Supply current	SL1640		12	17	mA	{ Signal: 70mVrms, 1.75MHz Carrier: 100mV rms, 28.25MHz Output: 30MHz { Signal: 70mVrms, 30MHz Carrier: 100mV rms, 28.25MHz Output: 1.75MHz { Signal 1: 42.5mVrms, 1.75MHz Signal 2: 42.5mV rms, 2MHz Carrier: 100mV rms, 28.25MHz Output: 29.75MHz
Conversion gain	SL1640	-3	0	+3	dB	
Noise figure			10		dB	
Carrier input impedance			1		$\text{K}\Omega$	
Signal input impedance	SL1640		500		$\Omega$	
			210		$\text{K}\Omega$	
Maximum input voltage	SL1640				mV rms	
Signal leak	SL1640		-30		dB	
Signal leak	SL1640		-18		dB	
Intermodulation products	SL1640		-45		dB	

## APPLICATION NOTES

The SL1640 requires input and output coupling capacitors which normally should be chosen to present a low reactance compared with the input and output impedances (see Electrical Characteristics). However, for minimum carrier leak at high frequencies the signal input should be driven from a low impedance source, in which case the signal input capacitor reactance should be comparable with the source impedance. Pin 2 must be decoupled to earth via a capacitor which presents the lowest possible impedance at both carrier and signal frequencies. The presence of these frequencies at Pin 2 would give rise to poor rejection figures and to distortion

There are two outputs from the SL1640: one is a voltage source of output impedance 350 ohms and 8pF and the other is the emitter of an emitter follower connected to the first output. The output on pin 6 requires a discrete load resistor of not less than 1500 ohms to ground. The emitter follower output should not be used to drive capacitive loads as emitter followers act as detectors under such circumstances with resultant distortion and harmonic generation. Frequency shaping components may be connected to the voltage output and the shaped signal taken from the emitter follower.

Signal and carrier leak may be reduced by altering the bias on the carrier and signal input pins, as shown in Fig.3. With carrier but no signal R1 is adjusted for minimum carrier leak. A similar network is connected to the carrier input and with signal and carrier present, signal leak is minimised by means of R2.

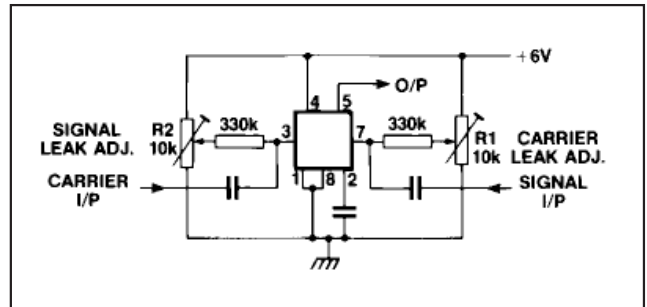


Fig.3 Signal and carrier leak adjustment





HEADQUARTERS OPERATIONS  
**GEC PLESSEY SEMICONDUCTORS**  
Cheney Manor, Swindon,  
Wiltshire SN2 2QW, United Kingdom.  
Tel: (0793) 518000  
Fax: (0793) 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) 64 46 23 45 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
- **UK, EIRE, DENMARK, FINLAND & NORWAY**  
Swindon Tel: (0793) 518510 Fax : (0793) 518582

These are supported by Agents and Distributors in major countries world-wide.

© GEC Plessey Semiconductors 1994

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 knowledge 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.



**For more information about all Zarlink products  
visit our Web Site at  
[www.zarlink.com](http://www.zarlink.com)**

Information relating to products and services furnished herein by Zarlink Semiconductor Inc. trading as Zarlink Semiconductor or its subsidiaries (collectively "Zarlink") is believed to be reliable. However, Zarlink assumes no liability for errors that may appear in this publication, or for liability otherwise arising from the application or use of any such information, product or service or for any infringement of patents or other intellectual property rights owned by third parties which may result from such application or use. Neither the supply of such information or purchase of product or service conveys any license, either express or implied, under patents or other intellectual property rights owned by Zarlink or licensed from third parties by Zarlink, whatsoever. Purchasers of products are also hereby notified that the use of product in certain ways or in combination with Zarlink, or non-Zarlink furnished goods or services may infringe patents or other intellectual property rights owned by Zarlink.

This publication is issued to provide information only and (unless agreed by Zarlink 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. The products, their specifications, services and other information appearing in this publication are subject to change by Zarlink without notice. No warranty or guarantee express or implied is made regarding the capability, performance or suitability 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. Manufacturing does not necessarily include testing of all functions or parameters. 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 Zarlink's conditions of sale which are available on request.

Purchase of Zarlink's I<sup>2</sup>C components conveys a licence under the Philips I<sup>2</sup>C Patent rights to use these components in and I<sup>2</sup>C System, provided that the system conforms to the I<sup>2</sup>C Standard Specification as defined by Philips.

Zarlink and the Zarlink Semiconductor logo are trademarks of Zarlink Semiconductor Inc.

Copyright 2001, Zarlink Semiconductor Inc. All Rights Reserved.

**TECHNICAL DOCUMENTATION - NOT FOR RESALE**

---