PHS6902

Preliminary

4 to 1 Multiplexer GaAs IC for Optical Transmission

The PHS6902 is a 4 to 1 Multiplexer GaAs IC for Optical Transmission systems.

Features

- 4 to 1 Multiplexer with on-chip clock synchronization circuitry
- Clock speed 2.4 GHz
- ECL compatible I/O's
- Single Power Supply of –5.2 V
- 32 pin package containing internal decoupling capacitors.

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Absolute Maximum Ratings

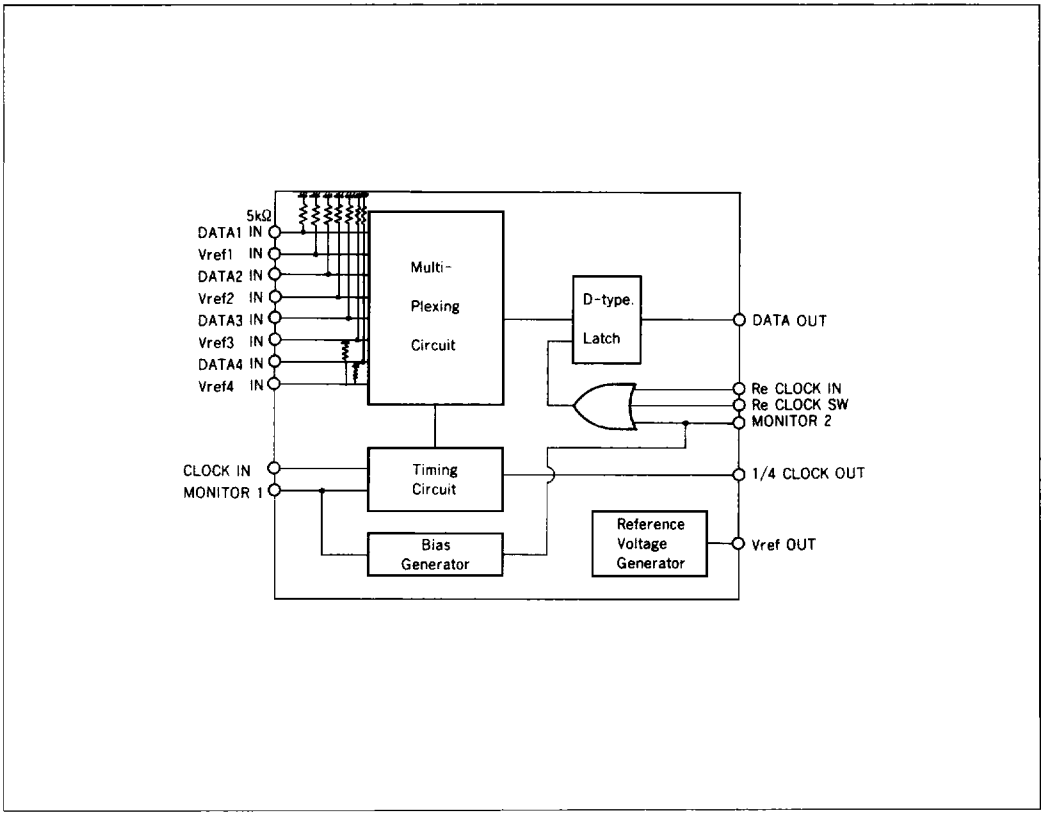
Item	Symbol	Ratings	Unit	Remarks
Supply Voltage	Vss (+)	+0.5	V	
	Vss (–)	–7.0		
Input Voltage	V_{IH}	0	V	
	V_{IL}	Vss		
Supply Current	Iss	500	mA	
Output Current	Io	50	mA	
Power Dissipation	P_D	2.5	W	
Operating Temparature	Ta	–10 to +80	°C	
Storage Temparature	Tstg	–65 to +150	°C	

The absolute maximum ratings are limiting values, to be applied individually, beyond which the device may be permanently damaged. Functional operation under any of these conditions is not guaranteed. Exposing a circuit to its absolute maximum rating for extended periods of time may affect the device's reliability.

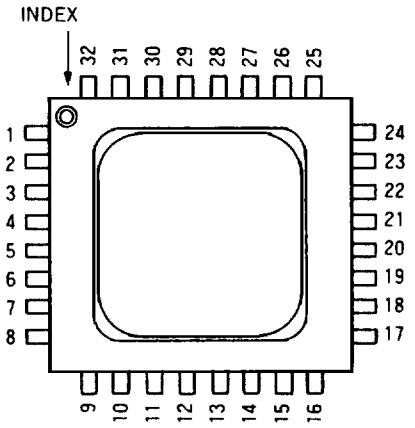
Recommended Operational Conditions

Item	Symbol	Min	Typ	Max	Unit	Remarks
Supply Voltage	Vss	–5.46	–5.20	–4.94	V	
Input Voltage	V_{IH}	–1.1		–0.8	V	
	V_{IL}	–1.8		–1.6		
Output termination Voltage	V_{TT}		–2.0		V	
Input reference Voltage	Vref	–1.386	–1.320	–1.254	V	
Input clock	CKp-p	0.6	0.8	1.2	Vp-p	
Input re-clock	RCKp-p	0.6	0.8	1.2	Vp-p	

Block Diagram



Pin Description



(Top View)

Pin No	Pin Name	Function
1	Monitor 2	Gate Bias Control Pin, Normaly Open
2	GND	GND
3	DATA OUT	Data Out of Moltiplexer
4	GND	GND
5	1/4 Clock out	1/4 Clock Out of Input Clock
6	GND	GND
7	Monitor 1	Gate Bias Control Pin, Normaly Open
8	GND	GND
9	GND	GND
10	Clock In	Clock Input
11	GND	GND
12	GND	GND
13	Vss	–5.2 V Voltage Source Input
14	GND	GND
15	Vref out	Output Pin of ECL Reference Level Voltage
16	GND	GND
17	Data 1 IN	Data 1 INPUT
18	Vref 1 IN	–1.32 V Voltage Source Input
19	Data 2 IN	Data 2 INPUT
20	Vref 2 IN	–1.32 V Voltage Source Input
21	Data 3 IN	Data 3 INPUT
22	Vref 3 IN	–1.32 V Voltage Source Input
23	Data 4 IN	Data 4 INPUT
24	Vref 4 IN	–1.32 V Voltage Source Input

25	GND	GND
26	GND	GND
27	GND	GND
28	GND	GND
29	GND	GND
30	Re Clock IN	Clock input for clock sycronization to DATA OUT
31	Re Clock SW	ON/OFF switch for clock sycronization to DATA OUT
32	GND	GND

Electrical Characteristics

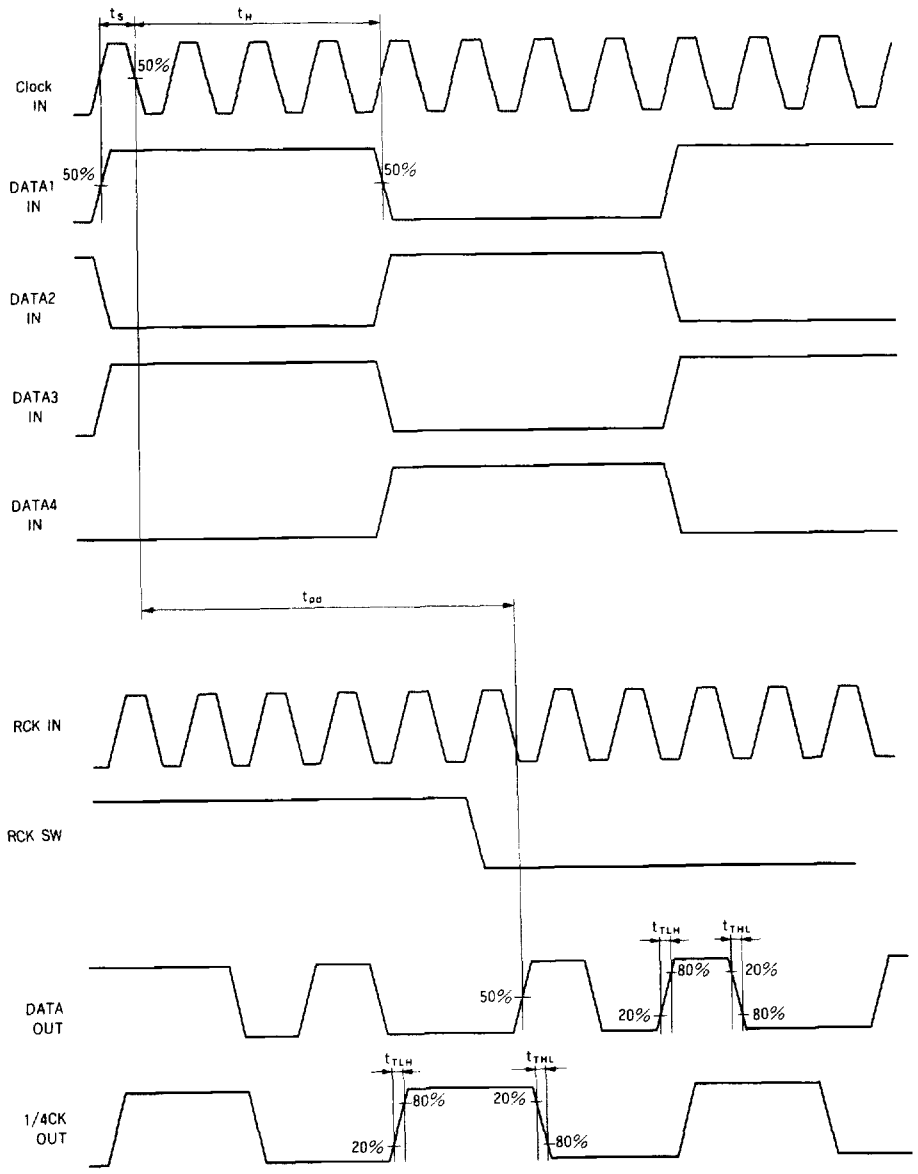
DC Characteristics

Item	Symbol	Test Conditions	Min	Typ	Max	Unit
Output Voltage	V_{OH}	$V_{IN} = V_{IH}$ max, $R_T = 50\ \Omega$	–1.1		–0.8	V
	V_{OL}	$V_{IN} = V_{IL}$ min, $V_{TT} = -2$ V	–1.8		–1.6	
Input Voltage	V_{IH}		–1.1			V
	V_{IL}				–1.5	
Input Current	I_{IH}	$V_{IN} = V_{IH}$ max		160		µA
	I_{IL}	$V_{IN} = V_{IL}$ min		360		
Output Current	I_{OH}	$R_T = 50\Omega$			24	mA
	I_{OL}	$V_{TT} = -2$ V			8	
Supply Current	Iss			300		mA

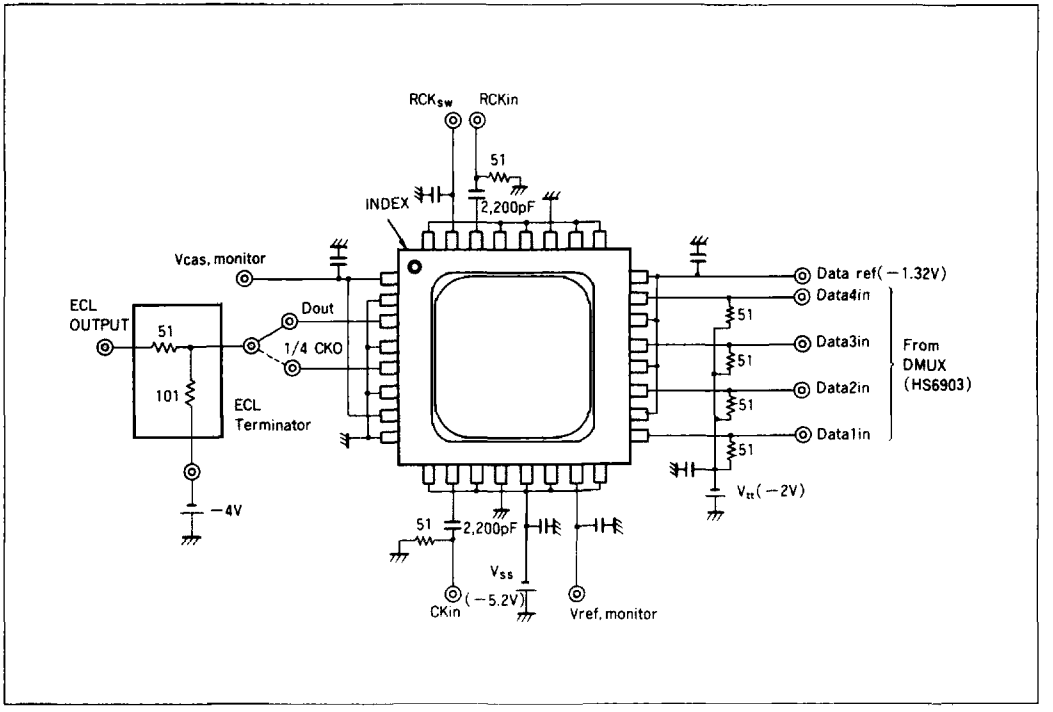
AC Characteristics

Item	Symbol	Test Conditions	Min	Typ	Max	Unit
Propagation delay between clock input and output data	tpd	50% to 50%		1.0		ns
Input data setup time	ts	50% to 50%	0.1			ns
Input data hold time	t_H	50% to 50%	0.1			ns
Clock input rate	fc max		2.4	3.0		GHz
	fe min				0.5	
Output transition time	t_{TLH}	20% to 80%, C_L= 2pF		0.15		ns
	t_{THL}	$R_T = 50\ \Omega$		0.15		

Time chart


t_S
t_H
Clock IN
50%
DATA1 IN
50%
50%
DATA2 IN
DATA3 IN
DATA4 IN
t_{pd}
RCK IN
RCK SW
t_{TLH}
t_{THL}
80%
20%
50%
20%
80%
DATA OUT
t_{TLH}
t_{THL}
80%
20%
20%
80%
1/4CK OUT

Test Circuit



Mechanical Drawings

Item	Content
Outward Form	12 x 12 x 3.35 t (mm) quad leaded chip carrier
Pin Count	32
Pin Pitch	1.27 (mm)
Characteristic Impedance of Signal Line	50 ± 5 (Ω)
Noise Decoupling Chip Capacitors	located in package
Thermal Resistance	20 (°C/W) with Fin at natural convection