

Optical Communication Receiver/Amplifier

The HA16852MP is a receiving amplifier-IC for digital data receiver via optical fiber.

The circuit includes a main Amplifier, comparator, TTL output and ECL output stage, in a mini-square Package.

The HA16852MP is advisable to use simultaneously photo-Diode and pre-Amplifier as well

Features

- Single 5 V Supply
- TTL/ECL Compatibility
- TTL; 0.5 M to 32 Mbits/s NRZ Data rate
- ECL; 0.5 M to 64 Mbits/s NRZ Data rate
- Internal Automatic Threshold Control
- 18-pins surface mount package

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit	Notes
Supply Voltage	V _{CC}	0 to 7	V	TTL application
	V _{EE}	-7 to 0	V	ECL application
Input Current	I _{inp}	-0.4 to 1	mA	Pin
	I _{inm}	-1 to 1	mA	Min
Output Current	I _{pout}	-0.2 to 0	mA	Pout
	I _{ECLout}	-1 to 0	mA	ECLout/ECLout
	I _{TTLout}	-2 to 7	mA	TTLout
Power Dissipation	Pr	500	mW	
Operating Temperature	T _{opr}	-20 to +75	°C	
Storage Temperature	T _{stg}	-55 to +125	°C	

Notes: TTL application; V_{EE} = 0 V = Ground
ECL application; V_{CC} = 0 V = Ground

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Electrical Characteristics

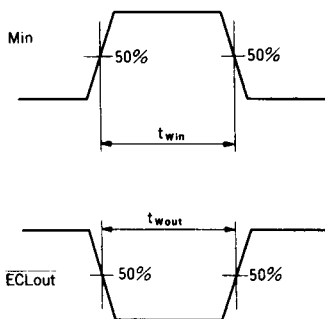
DC characteristics [Ta = 25°C, V_{CC} = 5 V (TTL), V_{EE} = -5.2 V (ECL)]

Item	Symbol	Test Conditions	Min	Typ	Max	Unit	Notes
Supply Voltage	V _{CC}	TTL mode	4.75	5.00	5.25	V	
	V _{EE}	ECL mode	-5.7	-5.2	-4.7	V	
Supply Current	I _{CC}	V _{CC} = V _{OS} = 5 V	23	32	42	mA	
	I _{EE}	V _{OS} = 0V, V _{cfl} = -5 V	23	35	47	mA	
Output Voltage	V _{OLT}	V _{cfl} = 0 V, I _{OLT} = 4 mA	0	—	0.4	V	TTLout
	V _{OHT}	V _{Min} = 0 V, I _{OLT} = -400 μA	2.7	—	4.6	V	
	V _{OLE}	V _{EE} = -5.2 V V _{cfl} = -5 V	-1.85	-1.74	-1.65	V	ECLout
	V _{OHE}	V _{ET} = 0V V _{min} = -5V	-0.96	-0.93	-0.81	V	ECLout

AC Characteristics [Ta = 25°C, VCC = 5 V (TTL), VEE = -5.2 V (ECL)]

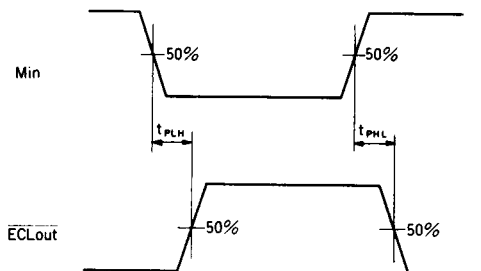
Item	Symbol	Test Conditions	Min	Typ	Max	Unit	Notes
Propagation Delay-Time	t_{PLH}	$V_{CC} = 5\text{ V}, R = 2\text{ k}\Omega$	—	—	50	ns	TTLout
	t_{PHL}		—	—	50	ns	
	t_{PLH}	$V_{EE} = -5.2\text{ V}, V_{E/T} = 0\text{ V}$	—	—	40	ns	ECLout
	t_{PHL}	$R = 510\Omega$	—	—	40	ns	
Output Pulse Width Fluctuation	Δtw	$V_{CC} = 5\text{ V}, R = 2\text{ k}\Omega$ $f = 16\text{ MHz}$	-10	—	+10	%	TTLout
	Δtwe	$V_{CC} = -5.2\text{ V}, V_{E/T} = 0\text{ V}$ $f = 32\text{ MHz}, R = 510\Omega$	-10	—	+10	%	ECLout

Propagation Delay-Time

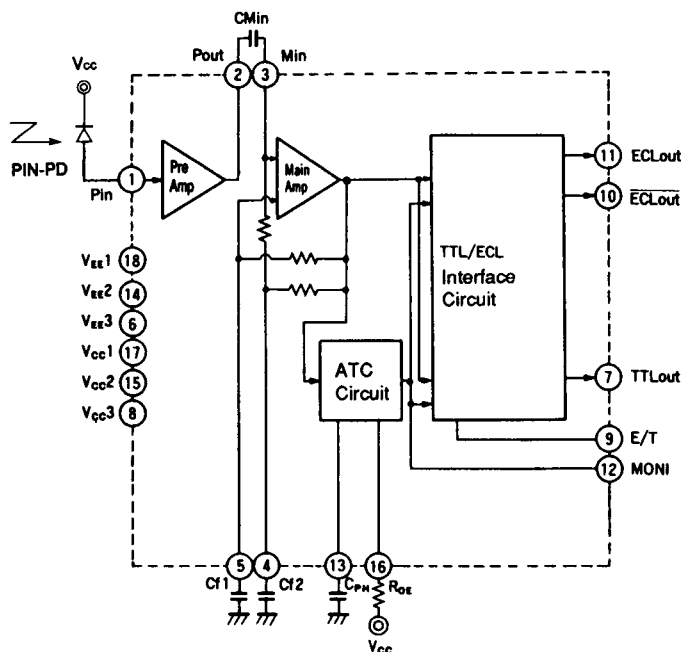


$$\Delta tw = \left(\frac{t_{wout}}{t_{win}} - 1 \right) \times 100 (\%)$$

Output Pulse Width Fluctuation

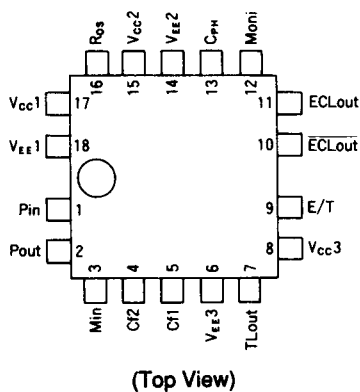


Block Diagram



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Pin Arrangement



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Pin Description

Pin No	Pin name	Function description	
		TTL application	ECL application
1	Pin	Pre-Amplifier input (use a input signal within 10 Mbits/s)	
2	Pout	Pre-Amplifier output	
3	Min	Main-Amplifier input. DC cut capacitor connected to external pre-Amp. output.	
4	Cf2	Bias terminal for main-Amp. Connected to V _{EE} terminal through the capacitor.	
5	Cf1	Bias terminal for main-Amp. Connected to V _{EE} terminal through the capacitor.	
6	V _{EE} 3	Ground pin	–5.2 V Voltage Source input
7	TTLout	TTL level digital output	Open
8	V _{cc} 3	+5 V Voltage Source input	Ground pin
9	E/T	Open	to Ground
10	ECLout	Open	ECL level Inverting digital output
11	ECLout	Open	ECL level Non Inverting digital output
12	Moni	Check terminal for ATC level	
13	CPH	Connected to Ground through the Capacitor for peak Hold of ATC.	
14	V _{EE} 2	Ground pin	–5.2 V Voltage Source input
15	V _{cc} 2	+5 V Voltage Source input	Ground pin
16	Ros	Connected to V _{cc} terminal through the resistor for threshold level adjustment of comparator.	
17	V _{cc} 1	+5 V Voltage Source input	Ground pin
18	V _{EE} 1	Ground pin	–5.2 V Voltage Source input

Packaging Information

Part No.	Package
HA16852MP	MP-18

