

HA16856MP

Optical Communication Transmitter/Driver

The HA16856MP is a high-speed LED driver for digital data transmission via optical fiber.

Features

- Single +5 V Supply
- TTL/ECL Compatibility
- DC to 32 Mbits/s NRZ Data rate; TTL
- DC to 64 Mbits/s NRZ Data rate; ECL
- 18-pin Surface mount package

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit	Notes
Supply Voltage	V _{CC}	0 to 7	V	TTL
	V _{EE}	0 to -7	V	ECL
Input Voltage	V _{in} (TTL)	V _{CC}	V	TTLin
	V _{in} (ECL)	V _{EE}	V	ECLin/ECLin
Output Current	I _O	80	mA	V _D (-) V _D (+)
Power Dissipation	P _d	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

Electrical Characteristics

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

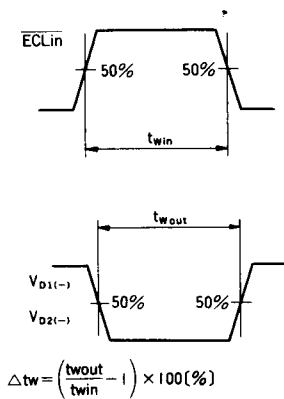
Item	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	V _{CC}	TTL mode	4.75	5.00	5.25	V
	V _{EE}	ECL mode	-5.7	-5.2	-4.7	
Power Supply	I _{CC}	V _{CC} = 5.0 V	16	—	44	mA
	I _{EE}	ECLin = -0.9 V	-42	—	-13	
Input Voltage	V _{IHT}	TTL mode	2.0	—	—	V
	V _{ILT}	TTL mode	—	—	0.8	
	V _{IHE}	ECL mode, Ref. to V _{bb}	-1.00	—	-0.88	
	V _{ILE}	ECL mode, Ref. to V _{bb}	-1.81	—	-1.60	
Input Current	I _{ILT}	V = 0.4 V	-2.0	—	0	mA
	I _{IHT}	V = 2.7 V	-300	—	40	
	I _{ILE}	V _{EE} = -5.2 V ECLin	0	—	200	μA
		V _{IL} = -1.85 V ECLin	0	—	200	
	I _{IHE}	V _{EE} = -5.2 V ECLin	0	—	270	
		V _{IH} = -0.8 V ECLin	0	—	270	
Output Current	I _{OH}	V _{CC} = D1(-)/D2(-)	-2	—	2	μA
	I _{OL}	RE = 7Ω	—	60	80	mA
ECL Reference Voltage	V _{bb}	V _{EE} = -5.2 V	-1.55	—	-1.05	V

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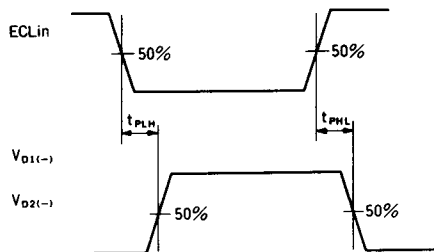
AC Characteristics [Ta = 25°C, VCC = 5 V (TTL), VEE = -5.2 V (ECL)]

Item	Symbol	Test Conditions	Min	Typ	Max	Unit	Note
Propagation Delay-Time	t_{PLHT}	$V_{CC} = 5\text{ V, TTL}$	—	10	15	ns	TTLin
	t_{PHLT}		—	10	15		
	t_{PLHE}	$V_{E/T} = 0\text{ V}$	—	—	7.0	ns	ECLin
	t_{PHLE}	ECL•ECL			7.0		ECLin
Output Pulse width fluctuation	ΔtwT	$V_{E/T} = \text{OPEN}$ $f_{TTL} = 16\text{ MHz}$	-10	—	+10	%	TTLin
	ΔtwE	$V_{E/T} = 0\text{ V}$	-10	—	+10	%	ECLin
		$f_{ECL} \text{ V } 32\text{ MHz}$					ECLin

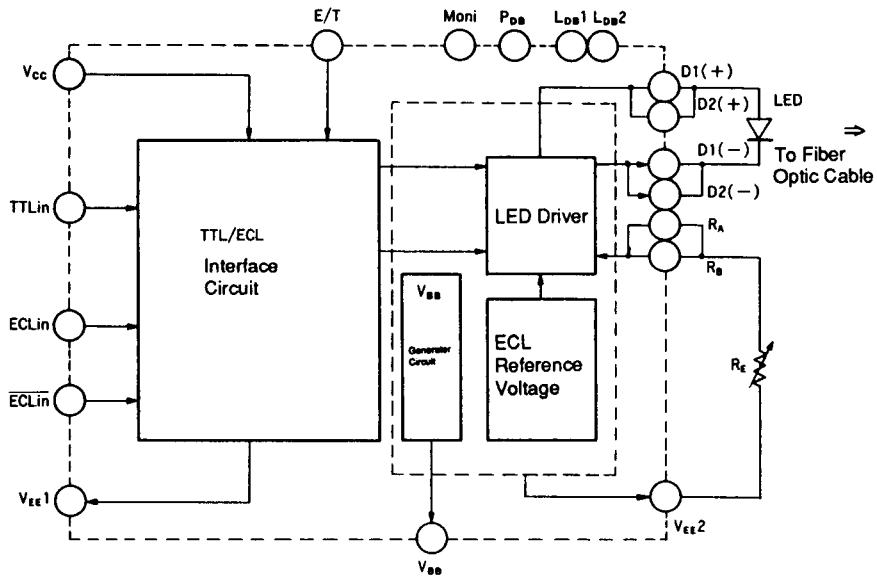
Output Pulse Width Fluctuation



Propagation Delay Time Waveforms

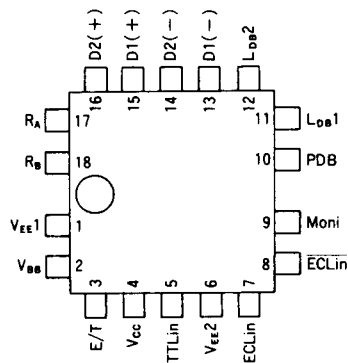


Block Diagram



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Pin Arrangement



(Top View)

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Pin Description

Pin No	Pin Name	Function Description	
		TTL	ECL
1	VEE1	Ground pin	-5 V Voltage source Input
2	VBB	Open	Reference Voltage output for ECL
3	E/T	Open	to Ground
TTL or ECL switch pin			
4	VCC	+5 V Voltage Source Input	Ground pin
5	TTLin	TTL level digital input	Open
6	VEE2	Ground pin	-5 V Voltage Source Input
7	ECLin	Open	ECL level Invert Digital Input
8	ECLin	Open	ECL level Invert Digital Input
9	Moni	Open	
10	PDB	Open	
11	LDD1	Open	
12	LDD2		
13	D1(-)	Connected to LED Cathode Pin	
14	D2(-)		
15	D1(+)	Connected to LED Anode pin	
16	D2(+)		
17	RA	LED drive current adjust, connected resistanse this terminal and VEE.	
18	RB		

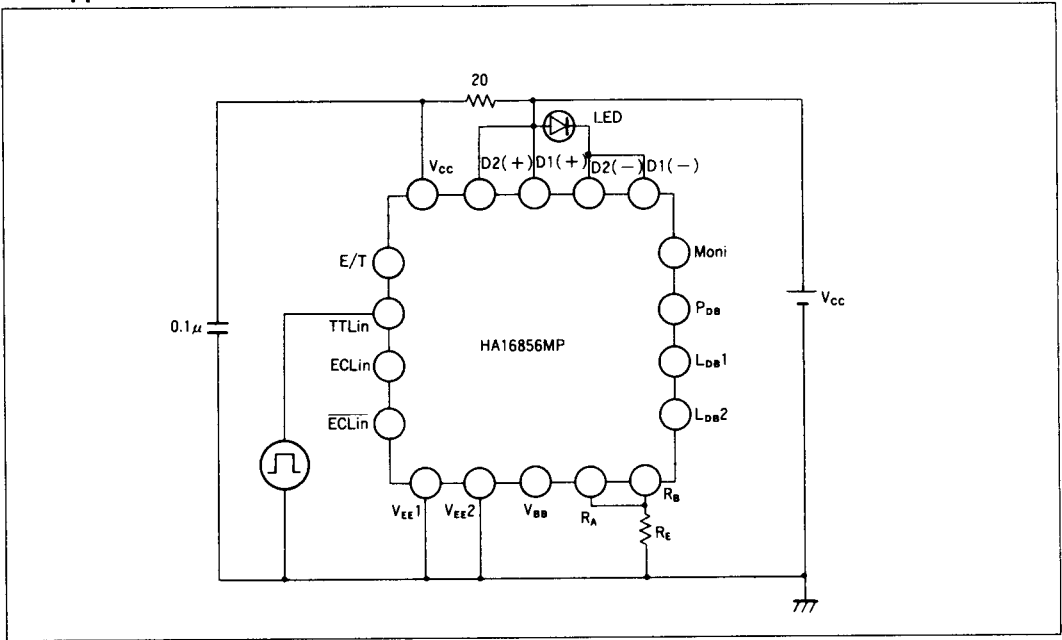
Packaging Information

Part No.	Package
HA16856MP	MP-18

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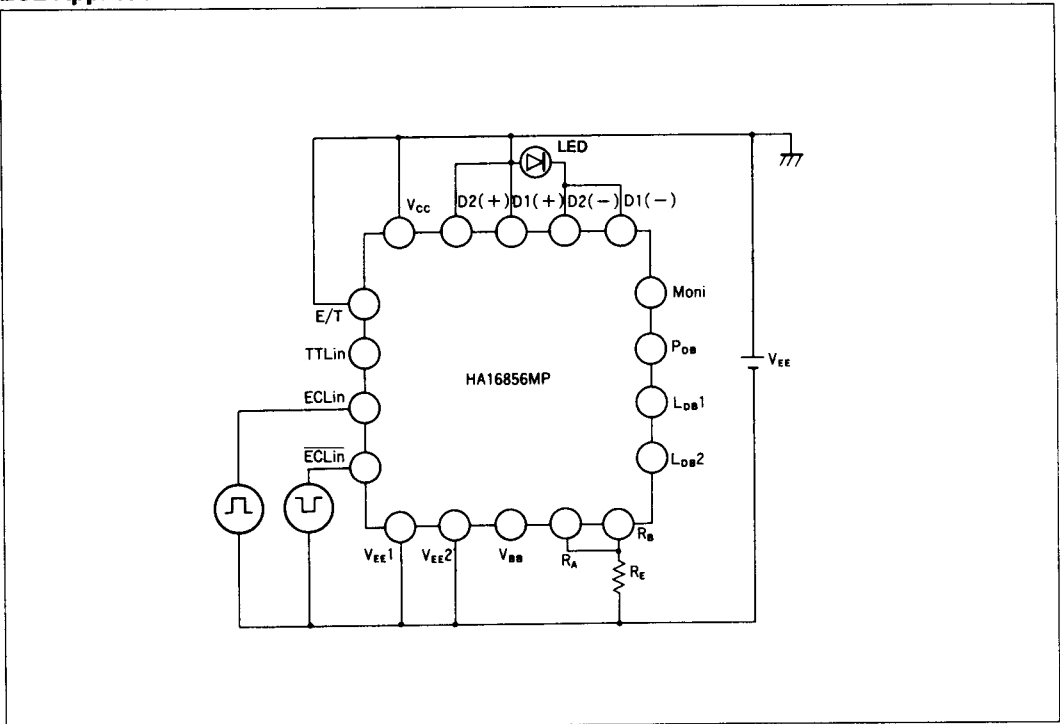
Applications Information

TTL Application



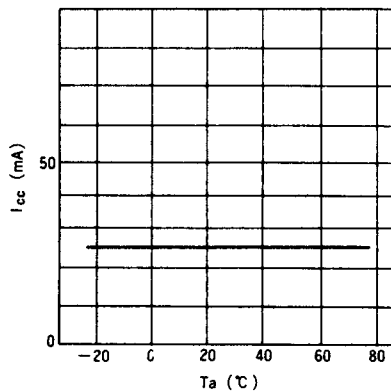
ECL Application

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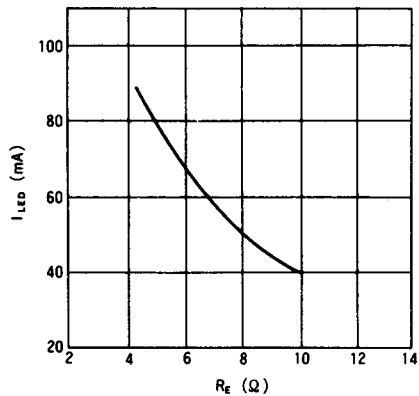


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Supply Current vs. Temperature



Output Current vs. R_E



Output Current vs. Temperature

