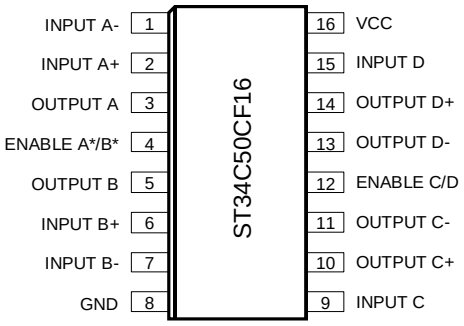
DUAL RS-422, RS-423 CMOS DIFFERENTIAL LINE RECEIVER AND DRIVER

GENERAL DESCRIPTION

The ST34C50/51 is a CMOS dual differential line receiver and driver, designed to meet the standard RS-422, RS-423 requirements and digital data transmission over balanced lines. The ST34C50/51 has an input sensitivity of 200mv over the common mode input voltage range of ± 7V. To improve noise margin and output stability for slow changing input signal, special hysteresis is built in the ST34C50/51 circuit. The ST34C50/51 is a high speed line receiver and driver, designed to operate with MFM / RLL controllers and hard disk drives as well as RS-422 and RS-423 differential applications. ST34C50/51 provides TTL compatible outputs to interface with standard 74LS and CMOS design environments. ST34C50/51 is suitable for low power 5V operation with minimum board space requirements. ST34C50/51 provides dual differential line receiver with three state control pin and dual line driver with three state control capability.

SOIC Package

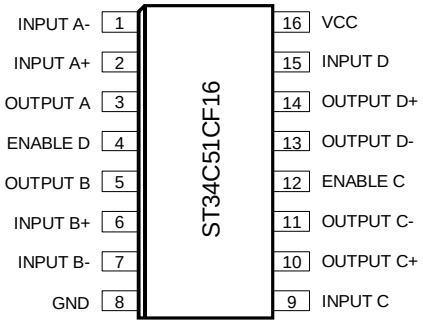


ST34C50CF

FEATURES

- Pin -to-pin compatible to Motorola MC34050 and MC34051
- Low power CMOS design
- Three-state outputs with enable pin
- Meets the EIA RS-422/423 requirements
- Low propagation delays
- High speed
- Dual line receiver with three state control
- Dual line driver with three state control

SOIC Package



ST34C51CF

ORDERING INFORMATION

Part number	Package	Operating temperature
ST34C50CP16	Plastic-DIP	0° C to + 70° C
ST34C50CF16	SOIC	0° C to + 70° C
ST34C50IP16	Plastic-DIP	-40° C to + 85° C
ST34C50IF16	SOIC	-40° C to + 85° C
ST34C51IP16	Plastic-DIP	-40° C to + 85° C
ST34C51IF16	SOIC	-40° C to + 85° C

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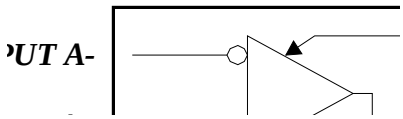
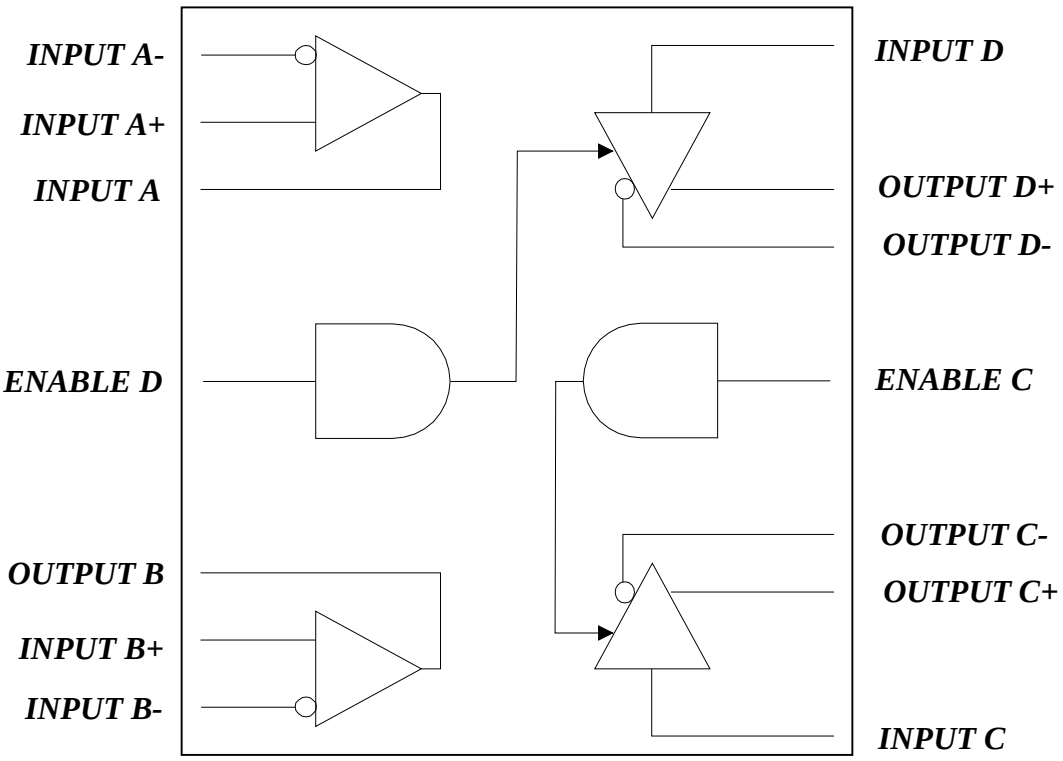
ST34C50 BLOCK DIAGRAM



ST34C51 BLOCK DIAGRAM



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SYMBOL DESCRIPTION

Symbol	Pin	Signal Type	Pin Description
INPUT A-	1	I	Receiver A differential inverting input pin.
INPUT A+	2	I	Receiver A differential non-inverting input pin.
OUTPUT A	3	O	Receiver A output pin.
ENABLE A/B	4	I	Gate control (active low, ST34C50 only). This pin enables/ disables the two line receiver outputs (out A and out B of ST34C50).
ENABLE D	4*	I	Gate control (active high, ST34C51 only). This pin enables/ disables the ST34C51differential line driver D section.
OUTPUT B	5	O	Receiver B output pin.
INPUT B +	6	I	Receiver B differential non-inverting input pin.
INPUT B -	7	I	Receiver B differential inverting input pin.
GND	8	O	Signal and power ground.
INPUT C	9	I	Driver C input pin.
OUTPUT C+	10	O	Driver C differential non-inverted output pin.
OUTPUT C -	11	O	Driver C differential inverted output pin.
ENABLE C/D	12	I	Gate control (active high, ST34C50 only). This pin enables/ disables the two line driver outputs (output C and output D of ST34C50).
ENABLE C	12*	I	Gate control (active high, ST34C51 only). This pin enables/ disables the ST34C51differential line driver C section.
OUTPUT D -	13	O	Driver D differential inverted output pin.
OUTPUT D+	14	O	Driver D differential non-inverted output pin.
INPUT D	15	I	Driver D input pin.
VCC	16	I	Power supply pin.

Receiver Functional table (ST34C50 only)

Enable A/B	Output	Differential Non-Inverting Input	Differential Inverting Input
H	Z	X	X
L	L	L	H
L	H	H	L

X=Don't care
Z=Three state (high impedance)
Receive sections of the ST34C51 are enabled all the time.

Driver Functional table (ST34C50 only)

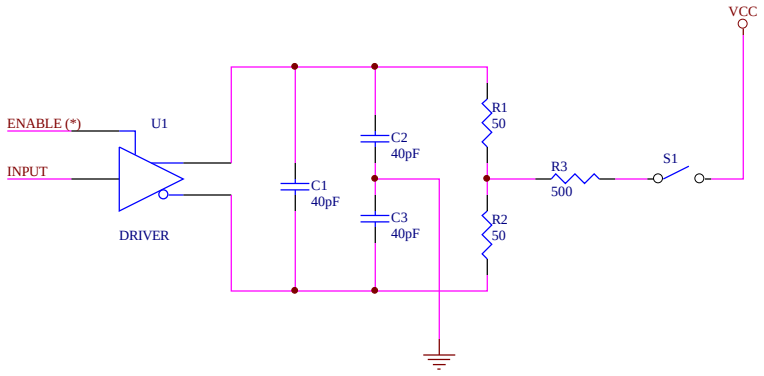
Enable C/D	Input	Differential Non-Inverted Output	Differential Inverted Output
L	X	Z	Z
H	L	L	H
H	H	H	L

X=Don't care
Z=Three state (high impedance)
* for each section of ST34C51.

*Driver Functional table (ST34C51 only)

Enable C or D	Input	Differential Non-Inverted Output	Differential Inverted Output
L	X	Z	Z
H	L	L	H
H	H	H	L

ST34C50/51 DRIVER AC TEST CIRCUIT



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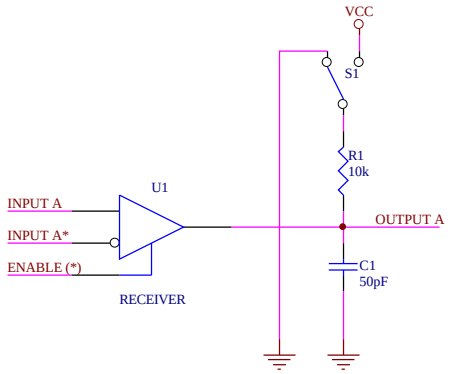
AC ELECTRICAL CHARACTERISTICS

T_A=0° - 70°C, Vcc=5.0 V ± 10% unless otherwise specified.

Symbol	Parameter	Limits Min	Limits Typ	Limits Max	Units	Conditions
	Line driver section					
T_1	Propagation delay, input to output		8	10	ns	S1 open
T_2	Differential output rise and fall time		8	10	ns	S1 open
T_3	Output enable time		18	20	ns	S1 close
T_4	Output disable time		18	20	ns	S1 close
*T_5	Skew			2	ns	S1 open
	Line receiver section					
T_1	Propagation delay, input to output		8	10	ns	S1=VCC
T_2	Propagation delay, input to putput		18	20	ns	S1=GND
T_3	Output enable time		18	20	ns	V_{DIF}=2.5V
T_4	Output disable time		18	20	ns	V_{DIF}=2.5V

* Skew is defined as the difference in propagation delays between complementary outputs at the 50% point.

ST34C50/51 RECEIVER AC TEST CIRCUIT



ABSOLUTE MAXIMUM RATINGS

Operating supply range	7 Volts
Voltage at any pin	GND-0.3 V to VCC+0.3 V
Operating temperature	0° C to +70° C
Storage temperature	-40° C to +150° C
Package dissipation	500 mW

DC ELECTRICAL CHARACTERISTICS

T_A=0° - 70° C, Vcc=5.0 V ± 10% unless otherwise specified.

Symbol	Parameter	Limits Min	Typ	Max	Units	Conditions
V_{IH}	Enable high level	2.0			V	
V_{IL}	Enable low level			0.8	V	
V_{ROH}	Receiver output high level	3.8			V	
V_{ROL}	Receiver output low level			0.4	V	
V_{RID}	Receiver differential input level	-0.2		+0.2	V	R_L=100Ω
V_{RH}	Receiver input hysteresis		50		mV	
I_{RIN}	Receiver input current			±1.0	μA	
V_{RR}	Receiver input resistance	5		15	KΩ	
I_{CC}	Operating current		13		mA	
I_{OZ}	Three state output leakage		±2.0		μA	
V_{DOH}	Driver input high level	2.5			V	
V_{DOL}	Driver output low level			0.5	V	
V_{DOS}	Driver differential output level	2.0			V	R_L=100Ω
V_{DOC}	Driver Common mode output voltage			3.0	V	R_L=100Ω
V_{DOD}	Driver difference in common mode output			0.4	V	R_L=100Ω
I_{DIN}	Driver input current			±1.0	μA	

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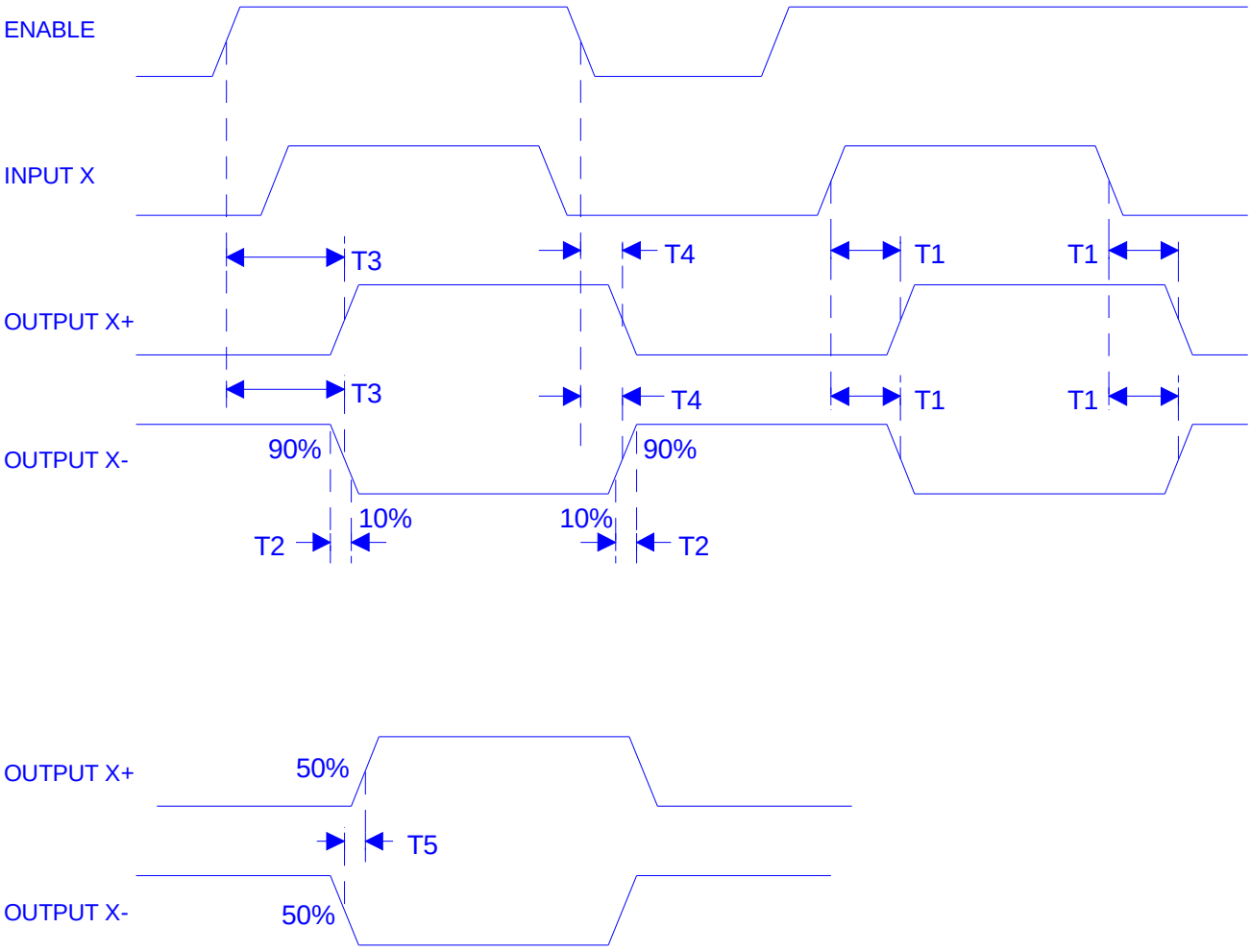
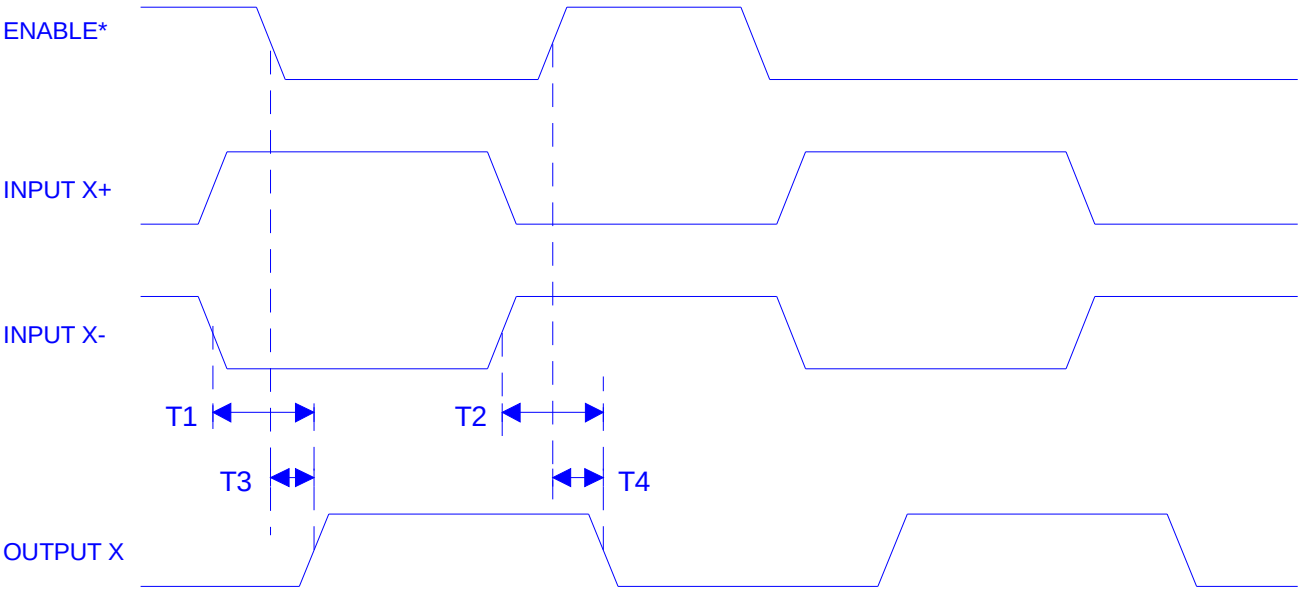
DIFFERENTIAL LINE DRIVER TIMING



3450-CK-1

DIFFERENTIAL LINE RECEIVER TIMING



3450-CK-2

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