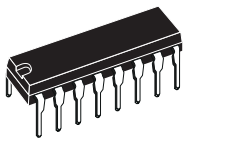
ST34C86

CMOS QUAD 3-STATE DIFFERENTIAL LINE RECEIVER

- SUPPLY VOLTAGE RANGE 4.5V TO 5.5V
- MINIMUM DIFFERENTIAL INPUT VOLTAGE ± 200mV
- TYPICAL PROPAGATION DELAYS: 19ns
- TYPICAL INPUT HYSTERESIS: 60mV
- INPUT RESISTANCE 10KΩ
- OPEN INPUT FAIL SAFE FEATURE
- OPERATING TEMPERATURE RANGE -40°C TO 85°C



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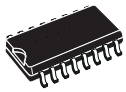


SOP

TSSOP

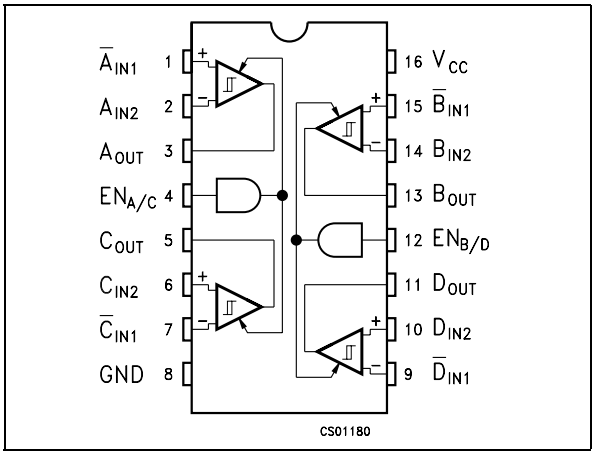
DESCRIPTION

The ST34C86 is a quad differential line receiver designed to meet the RS-422, RS-423, and Federal Standard 1020 and 1030 for balanced and unbalanced digital data transmission, while retaining the low power characteristics of CMOS. The ST34C86 has an input sensivity of 200mV over the common mode input voltage range of ±7V. Hysteresis is provided to improve noise margin and discourage output instability for slowly changing input waveforms. The ST34C86 internal pull-up and pull-down resistors. prevent output oscillation on unused channels. Separate enable pins allow independent control of receiver pairs. The 3-STATE outputs have 6mA source and sink capability.

ORDERING CODES

Type	Temperature Range	Package	Comments
ST34C86BN	-40 to 85 °C	DIP-16	25parts per tube / 40tube per box
ST34C86BD	-40 to 85 °C	SO-16 (Tube)	50parts per tube / 20tube per box
ST34C86BDR	-40 to 85 °C	SO-16 (Tape & Reel)	1000 parts per reel
ST34C86BTR	-40 to 85 °C	TSSOP-16 (Tape & Reel)	2500 parts per reel

PIN CONFIGURATION



PIN DESCRIPTION

PIN N°	SYMBOL	NAME AND FUNCTION
1	$\overline{A}_{IN1}$	Input A1
2	A_{IN2}	Input A2
3	A_{OUT}	Channel A Output
4	$EN_{A/C}$	Enable A/C
5	C_{OUT}	Channel C Output
6	C_{IN2}	Input C2
7	$\overline{C}_{IN1}$	Input C1
8	GND	Ground
9	$\overline{D}_{IN1}$	Input D1
10	D_{IN2}	Input D2
11	D_{OUT}	Channel D Output
12	$EN_{B/D}$	Enable B/D
13	B_{OUT}	Channel B Output
14	B_{IN2}	Input B2
15	$\overline{B}_{IN1}$	Input B1
16	V_{CC}	Supply Voltage

TRUTH TABLE

Enable	Input	Output
L	X	Z
H	$V_{ID} \geq V_{TH}$ (Max)	H
H	$V_{ID} \leq V_{TH}$ (Min)	L
H	Open *	H

X= Don't Care; Z=High Impedance, * Open=Not terminated

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	7	V
V_{CM}	Input Common Mode Range	± 14	V
V_{DIFF}	Differential Input Voltage	± 14	V
V_{IN}	Enable Input Voltage	7	V
I_{OUT}	Current per Output	± 25	mA
T_{stg}	Storage Temperature Range	-65 to 150	°C
T_{op}	Operating Junction Temperature Range	-40 to 85	°C
ESD	HBM (1.5KΩ 100pF)	2000	V

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.
Unless otherwise specified, all voltage are referenced to ground.
ESD Rating:HBM Inputs ≥ 2000V, All other pins ≥ 1000V, EIAJ (0Ω, 200pF) ≥ 350V

DC ELECTRICAL CHARACTERISTICS

(V_{CC} = 5V ± 10%, T_A = -40°C to 85°C , unless otherwise specified. Typical values are referred to V_{CC}=5V, T_A = 25°C)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{TH}	Minimum Differential Driver Input Voltage	V_O =V_{OH} or V_{OL} V_{CM} = -7V to +7V	-200	35	200	mV
R_{IN}	Input Resistance	V_{IN} = -7V to +7V Other Input = GND	5	6.8	10	KΩ
I_{IN}	Input Current (under test)	V_{IN} = +10V Other Input = GND V_{IN} = -10V Other Input = GND		1.1 -2.0	2 -2.5	mA mA
V_{OH}	High Level Output Voltage	V_{CC} = Min V_{DIFF} = 1V I_O = -6mA	3.8	4.2		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min V_{DIFF} = 1V I_O = -6mA		0.2	0.3	V
V_{IH}	Minimum Enable High Input Voltage		2.0			V
V_{IL}	Minimum Enable Low Input Voltage				0.8	V
I_{OZ}	Maximum 3-STATE Output Leakage Current	V_O = V_{CC} or GND V_{EN}=V_{IL}		± 0.5	± 5	µA
I_I	Maximum Enable Input Current	V_i = V_{CC} or GND			± 1	µA
I_{CC}	Quiescent Power Supply Current	V_{CC} = Max V_{DIFF} = 1V		16	23	mA
V_{HYST}	Input Hysteresis	V_{CM} = 0V		60		mV

AC SWITCHING CHARACTERISTICS

(V_{CC} = 5V ± 10%, T_A = -40°C to 85°C, unless otherwise specified. Typical values are referred to V_{CC}=5V, T_A = 25°C) (See figure 1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{PLH} t_{PHL}	Propagation Delay Input to Output	V_{DIFF} = 2.5V V_{CM} = 0V C_L = 50pF (See Fig. 2)		19	30	ns
t_{RISE} t_{FALL}	Output Rise and Fall Time	V_{DIFF} = 2.5V V_{CM} = 0V C_L = 50pF (See Fig. 4)		4	9	ns
t_{PLZ} t_{PHZ}	Propagation Delay Enable to Output	V_{DIFF} = 2.5V R_L = 1KΩ C_L = 50pF (See Fig. 3)		13	18	ns
t_{PZL} t_{PZH}	Propagation Delay Enable to Output	V_{DIFF} = 2.5V R_L = 1KΩ C_L = 50pF (See Fig. 3)		13	21	ns

TEST CIRCUITS AND TYPICAL CHARACTERISTICS

Figure 1 : Test Circuit for Switching Characteristics

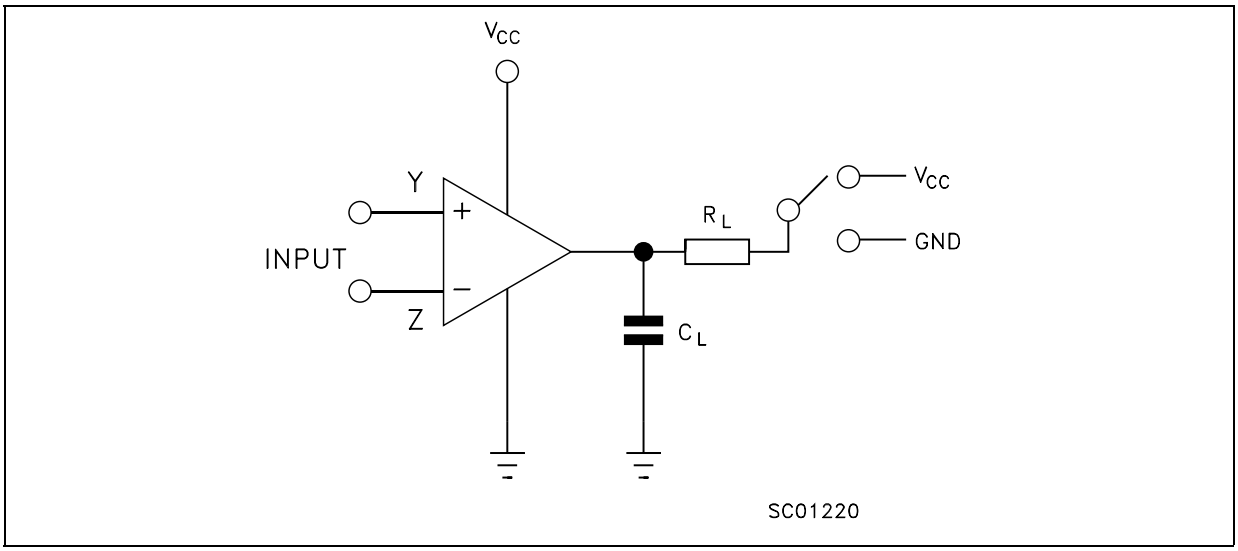


Figure 2 : Propagation Delays

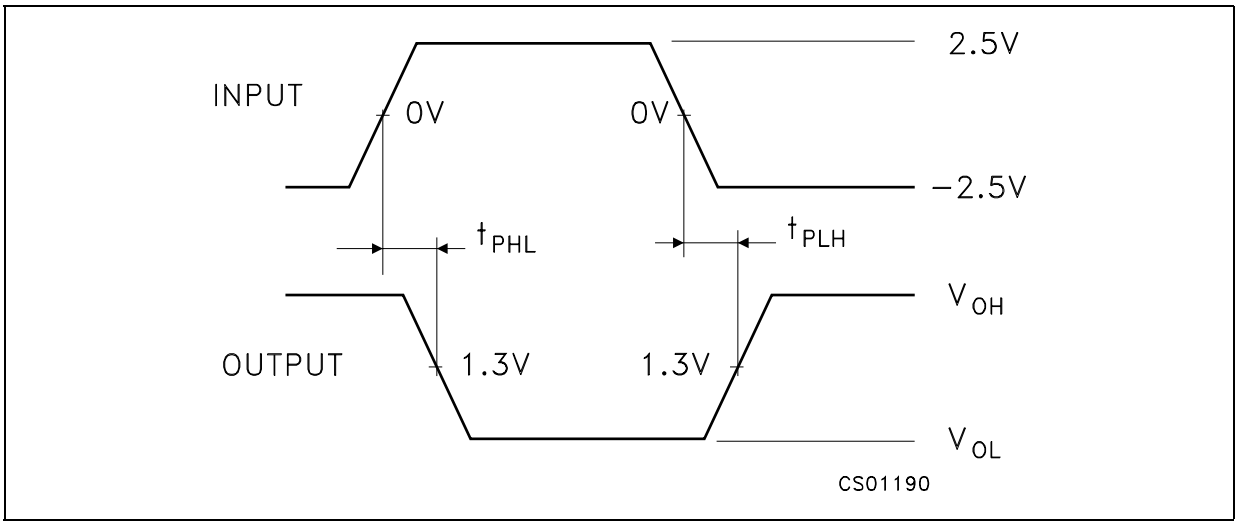


Figure 3 : Enable and Disable Propagation Delay Time

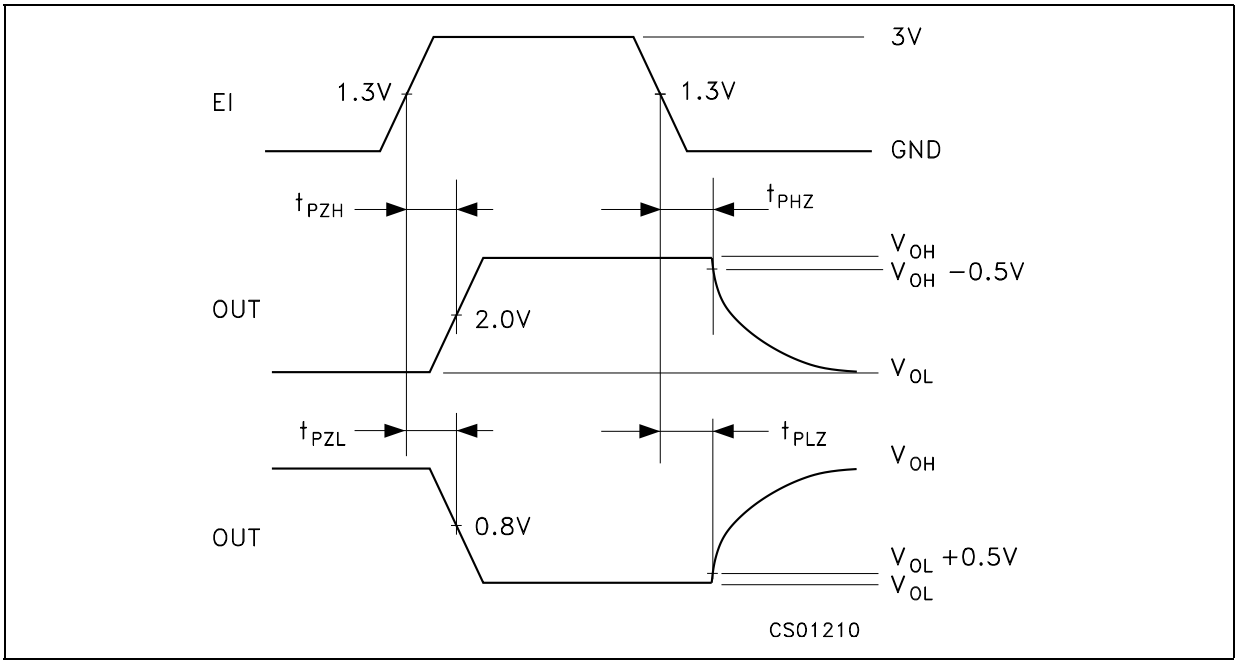


Figure 4 : Differential Rise and Fall Time

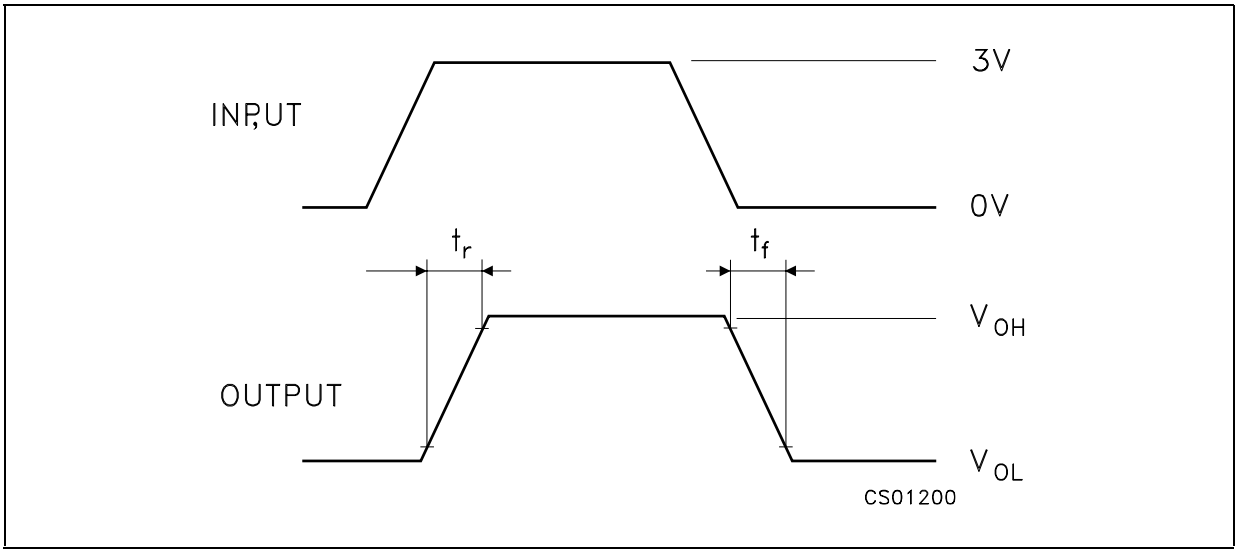


Figure 5 : Output Current vs Output Low Voltage

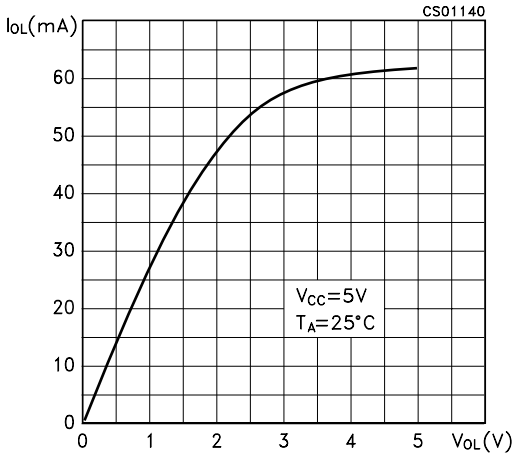


Figure 6 : Output Current vs Output High Voltage

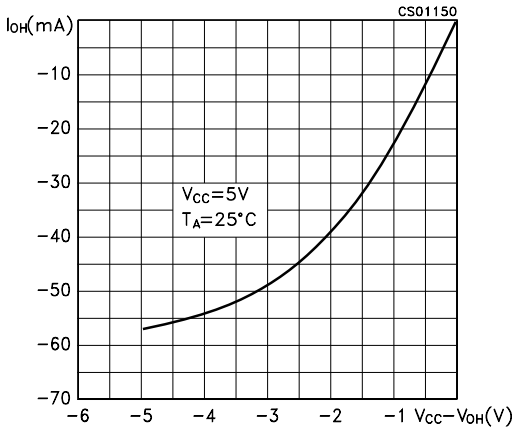


Figure 7 : EnableThreshold vs Supply Voltage

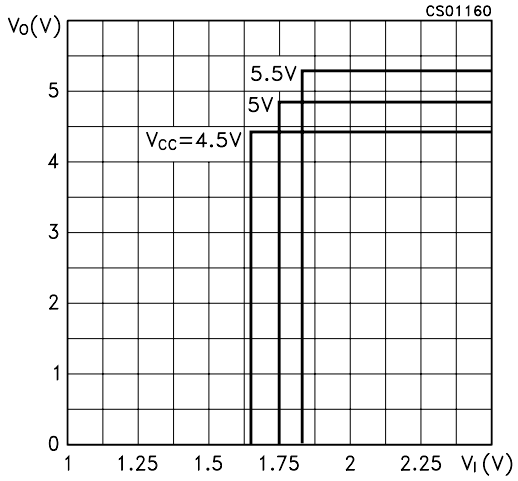
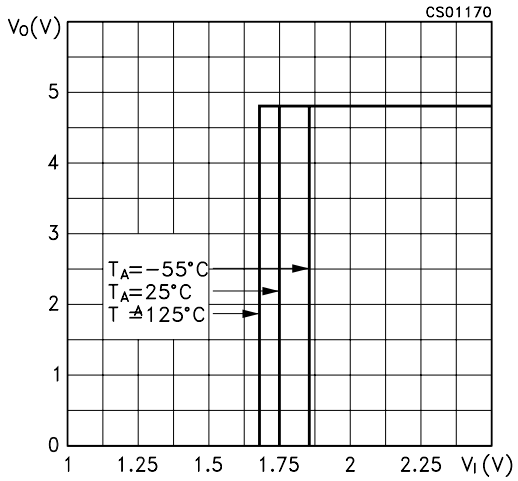
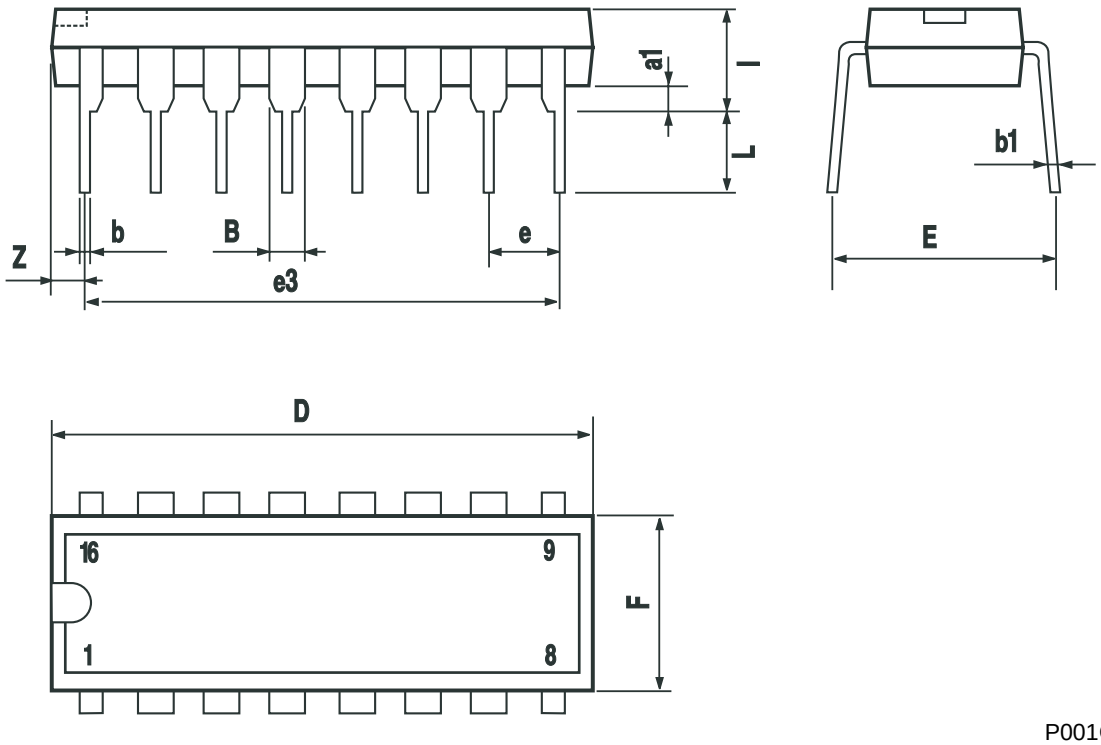


Figure 8 : Enable Threshold vs Temperature



Plastic DIP-16 (0.25) MECHANICAL DATA

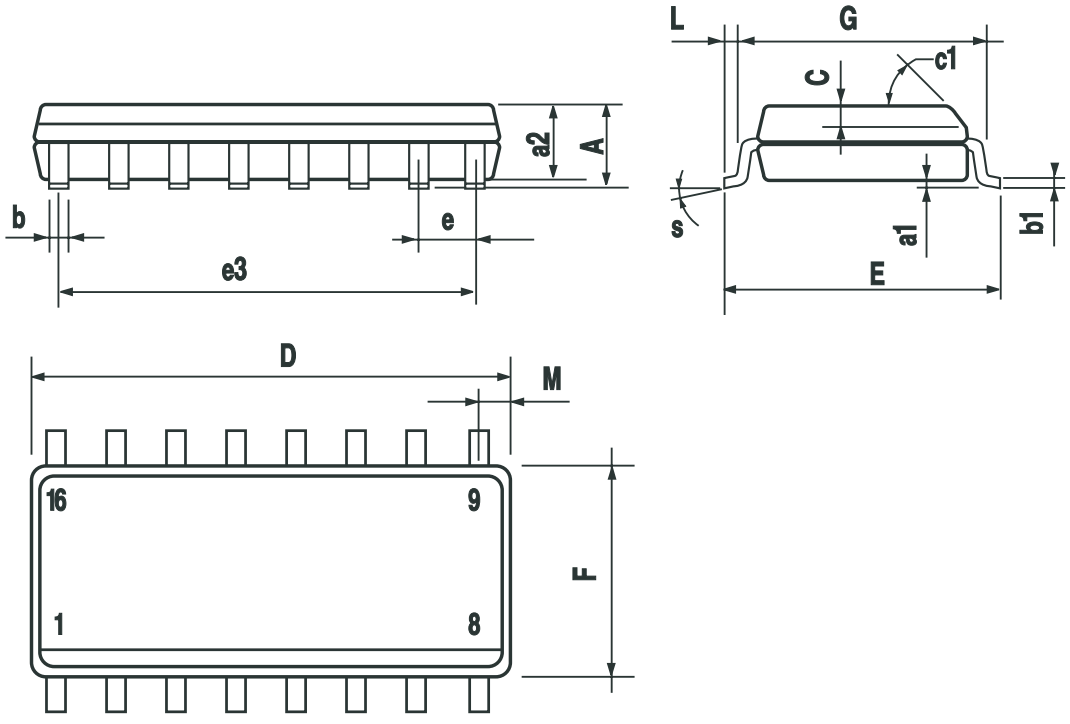
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



P001C

SO-16 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.003		0.007
a2			1.65			0.064
b	0.35		0.46	0.013		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.019	
c1	45° (typ.)					
D	9.8		10	0.385		0.393
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		8.89			0.350	
F	3.8		4.0	0.149		0.157
G	4.6		5.3	0.181		0.208
L	0.5		1.27	0.019		0.050
M			0.62			0.024
S	8° (max.)					



PO13H

TSSOP16 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.2			0.047
A1	0.05		0.15	0.002	0.004	0.006
A2	0.8	1	1.05	0.031	0.039	0.041
b	0.19		0.30	0.007		0.012
c	0.09		0.20	0.004		0.0089
D	4.9	5	5.1	0.193	0.197	0.201
E	6.2	6.4	6.6	0.244	0.252	0.260
E1	4.3	4.4	4.48	0.169	0.173	0.176
e		0.65 BSC			0.0256 BSC	
K	0°		8°	0°		8°
L	0.45	0.60	0.75	0.018	0.024	0.030