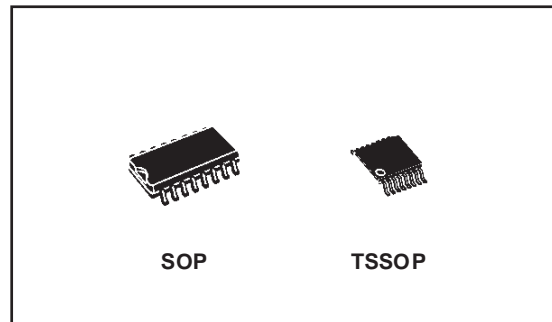




STLVDS32 STLVDS3486

HIGH SPEED DIFFERENTIAL LINE RECEIVERS

- MEETS OR EXCEEDS THE REQUIREMENTS OF ANSI TIA/EIA-644 STANDARD
- OPERATES WITH A SINGLE 3.3V SUPPLY
- DESIGNED FOR SIGNALING RATE UP TO 400Mbps
- DIFFERENTIAL INPUT THRESHOLDS $\pm 100\text{mV}$ MAX
- TYPICAL PROPAGATION DELAY TIME OF 2.5ns
- POWER DISSIPATION 60mW TYPICAL PER RECEIVER AT 200MHz
- LOW VOLATGE TTL (LVTTTL) LOGIC OUTPUT LEVELS
- PIN COMPATIBLE WITH THE AM26LS32, SN65LVD32, MC3486 AND SN65LVD3486
- OPEN CIRCUIT FAIL SAFE
- 7KV BUS PIN ESD PROTECTION
3KV ALL PINS VS GND



output state with a 3.3V supply rail. Any of the four differential receivers provides a valid logical output state with a $\pm 100\text{mV}$ differential input voltage within the input common mode voltage range. The input common mode voltage allows 1V of ground potential difference between two LVDS nodes.

The intended application of this device and signalling technique is both point-to-point and multidrop data transmission over controlled impedance media approximately 100Ω . The transmission media may be printed circuit board traces, backplanes or cables. The ultimate rate and distance of data transfer is dependent upon the attenuation characteristics of the media and noise coupling to the environment.

The STLVDS32 and STLVDS3486 "B" version are characterized for operation from -40°C to 85°C .

DESCRIPTION

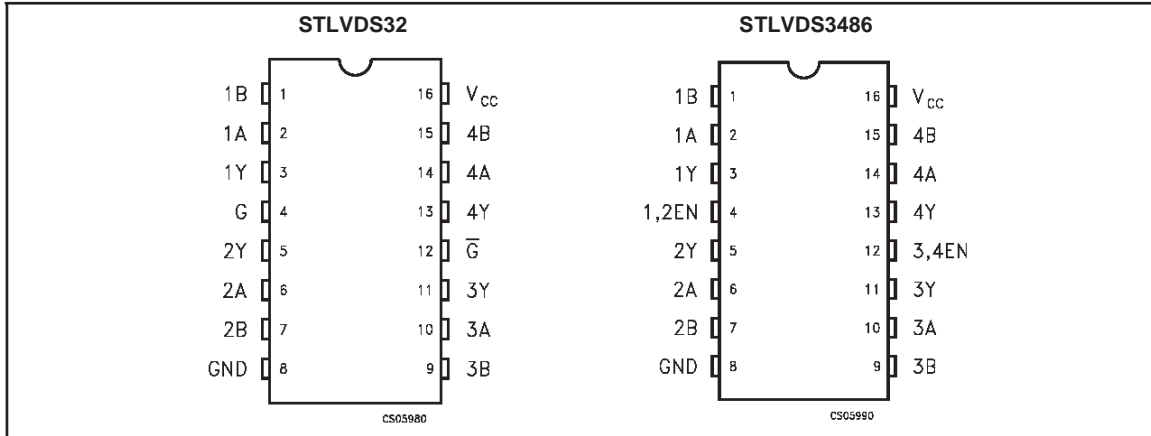
The STLVDS32 and STLVDS3486 are differential line receivers that implement the electrical characteristics of low voltage differential signaling (LVDS). This signaling technique lowers the output voltage levels of 5V differential standard levels (such as TIA/EIA-422B) to reduce the power, increase the switching speeds and allows operations with a 3.3V supply rail. Any of the four differential receivers provides a valid logical

ORDERING CODES

Type	Temperature Range	Package	Comments
STLVDS32BD	-40 to 85 °C	SO-16 (Tube)	50parts per tube / 20tube per box
STLVDS32BDR	-40 to 85 °C	SO-16 (Tape & Reel)	2500 parts per reel
STLVDS32BTR	-40 to 85 °C	TSSOP16 (Tape & Reel)	2500 parts per reel
STLVDS3487BD	-40 to 85 °C	SO-16 (Tube)	50parts per tube / 20tube per box
STLVDS3487BDR	-40 to 85 °C	SO-16 (Tape & Reel)	2500 parts per reel
STLVDS3487BTR	-40 to 85 °C	TSSOP16 (Tape & Reel)	2500 parts per reel

STLVDS32/STLVDS3486

PIN CONFIGURATION



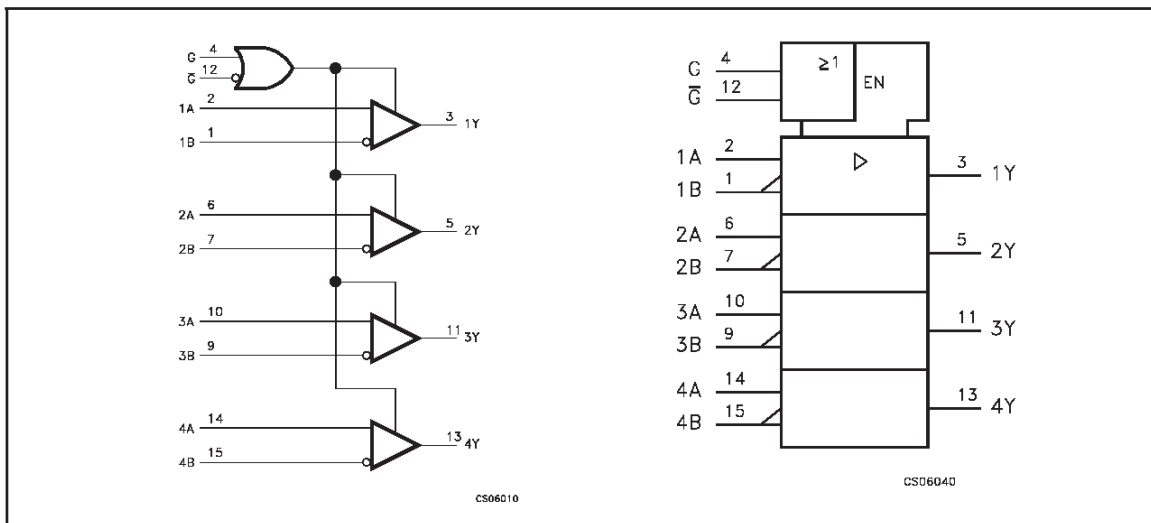
STLVDS32 PIN DESCRIPTION

PIN N°	SYMBOL	NAME AND FUNCTION
2, 6, 10, 14	1A to 4A	Receiver Inputs
1, 7, 9, 15	1B to 4B	Negated Receiver Inputs
3, 5, 11, 13	1Y to 4Y	Receiver Outputs
4	G	Enable
12	Ḡ	Enable
8	GND	Ground
16	V _{CC}	Supply Voltage

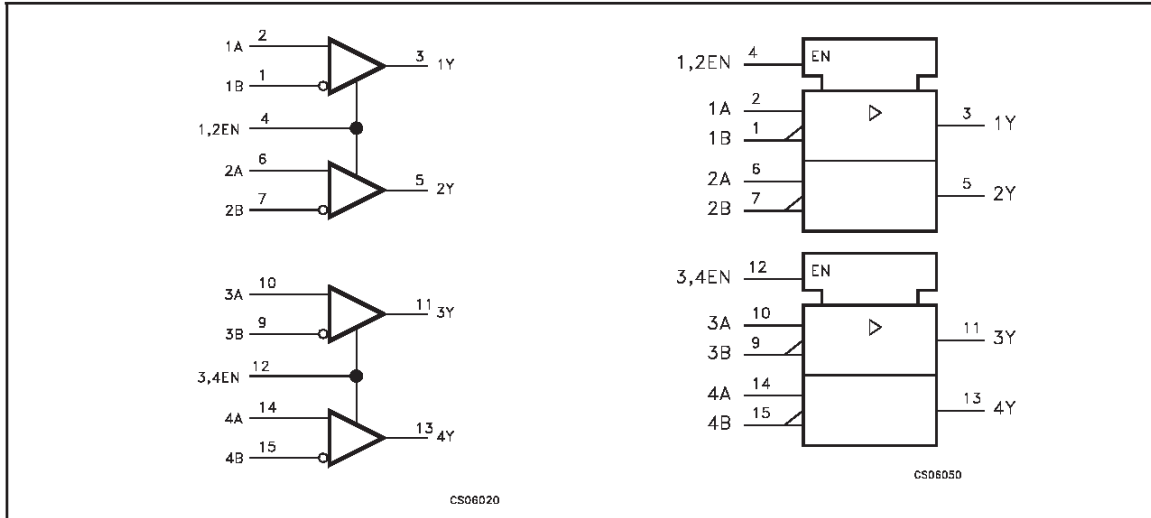
STLVDS3486 PIN DESCRIPTION

PIN N°	SYMBOL	NAME AND FUNCTION
2, 6, 10, 14	1A to 4A	Receiver Inputs
1, 7, 9, 15	1B to 4B	Negated Receiver Inputs
3, 5, 11, 13	1Y to 4Y	Receiver Outputs
4	1,2NEN	Receivers 1 and 2 Enable
12	3,4NEN	Receivers 3 and 4 Enable
8	GND	Ground
16	V _{CC}	Supply Voltage

LOGIC DIAGRAM AND LOGIC SYMBOL FOR STLVDS32



LOGIC DIAGRAM AND LOGIC SYMBOL FOR STLVDS3486



STLVDS32 TRUTH TABLE

DIFFERENTIAL INPUTS	ENABLES		OUTPUT
	G	\bar{G}	
A, B			Y
$V_{ID} \geq 100mV$	H	X	H
	X	L	H
$-100mV < V_{ID} < 100mV$	H	X	?
	X	L	?
$V_{ID} \leq -100mV$	H	X	L
	X	L	L
X	L	H	Z
OPEN/SHORT or Terminated (Full Fail-Safe)	H	X	H
	X	L	H

L=Low level, H=High Level, X=Don't care, Z= High Impedance, ?=Indeterminate

STLVDS3486 TRUTH TABLE

DIFFERENTIAL INPUTS	ENABLES	OUTPUT
A, B		Y
$V_{ID} \geq 100mV$	H	H
$-100mV < V_{ID} < 100mV$	H	?
$V_{ID} \leq -100mV$	H	L
X	L	Z
OPEN	H	H

L=Low level, H=High Level, X=Don't care, Z= High Impedance, ?=Indeterminate

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Supply Voltage (Note 1)	-0.5 to 4.6	V
V _I	Input Voltage	-0.5 to (V _{CC} + 0.5)	V
V _I	Input Voltage (A or B inputs)	-0.5 to 4.6	V
ESD	Human Body Model	BUS Terminal	7
		All Pins vs GND	3
T _{stg}	Storage Temperature Range	-65 to +150	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these condition is not implied.

Note 1: All voltages except differential I/O bus voltage, are with respect to the network ground terminal.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min.	Typ.	Max.	Unit
V _{CC}	Supply Voltage	3.0	3.3	3.6	V
V _{IH}	HIGH Level Input Voltage (ENABLE)	2.0			V
V _{IL}	LOW Level Input Voltage (ENABLE)			0.8	V
V _{ID}	Magnitude of Differential Input Voltage	0.1		0.6	V
V _{Ic}	Common Mode Input Voltage	0.5 V _{ID}		2.4-0.5 V _{ID}	V
				V _{CC} - 0.8	
T _A	Operating Temperature Range	-40		85	°C

ELECTRICAL CHARACTERISTICS (Over recommended operating conditions unless otherwise noted.

All typical values are at T_A = 25°C, and V_{CC} = 3.3V)

Symbol	Parameter	Test Condition s	Min.	Typ.	Max.	Unit
V _{ITH+}	Positive Going Differential Input Voltage Threshold	Fig. 1			100	mV
V _{ITH-}	Negative Going Differential Input Voltage Threshold		-100			mV
V _{OH}	High Level Output Voltage	I _{OH} = -8mA	2.4			V
		I _{OH} = -4mA	2.8			
V _{OL}	Low Level Output Voltage	I _{OH} = 8mA			0.4	V
I _{CC}	Supply Current	Enabled, No Load		9	15	mA
		Disabled		0.25	0.5	mA
I _I	Input Current (A or B inputs)	V _I = 0V	-2	-10	-20	μA
		V _I = 2.4V	-1.2	-3		
I _{I(OFF)}	Power off Input Current (A or B inputs)	V _{CC} = 0 V _I = 3.6V		10	20	μA
I _{IH}	High Level Input Current (EN, G, \bar{G} or Inputs)	V _{IH} = 2V			10	μA
I _{IL}	Low Level Input Current (EN, G, \bar{G} or Inputs)	V _{IL} = 0.8V			10	μA
I _{OZ}	High Impedance Output Current	V _O = 0 or V _{CC}			± 10	μA

SWITCHING CHARACTERISTICS (Unless otherwise noted. Typical values are referred to $T_A = 25^\circ\text{C}$ and $V_{CC} = 3.3\text{V}$)

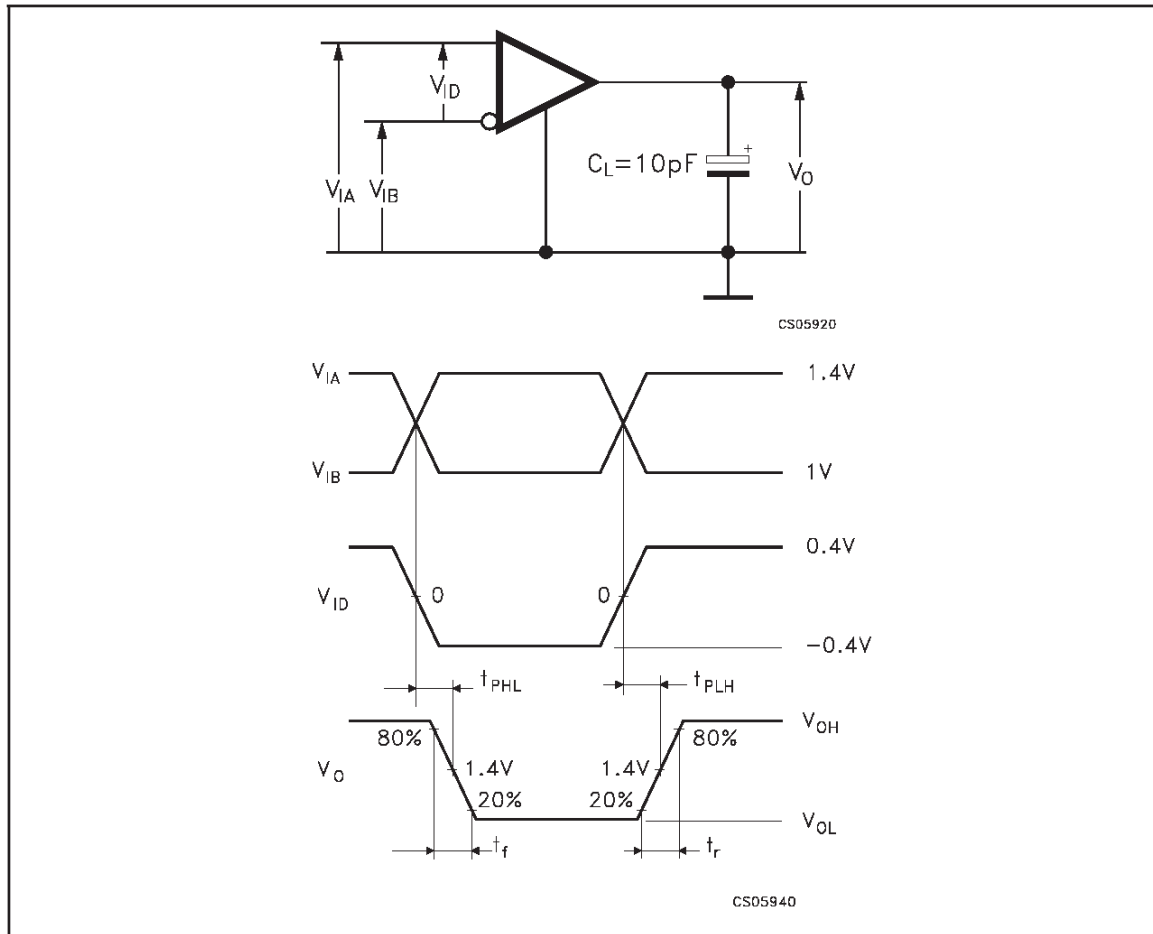
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{PLH}	Propagation Delay Time, Low to High Output	$C_L = 10\text{pF}$ Fig. 1	2.1	2.5	3.3	ns
t_{PHL}	Propagation Delay Time, High to Low Output		2.1	2.5	3.3	ns
t_r	Differential Output Signal Rise Time			0.35		ns
t_f	Differential Output Signal Fall Time			0.35		ns
$t_{sk(O)}$	Channel to Channel Output Skew (note1)				0.3	ns
$t_{sk(P)}$	Pulse Skew ($ t_{PHL} - t_{PLH} $) (note2)			0.2	0.4	ns
$t_{sk(PP)}$	Part to Part Skew (note3)				0.1	ns
t_{PZH}	Propagation Delay Time, High Impedance to High Level Output	Fig. 2		3	10	ns
t_{PZL}	Propagation Delay Time, High Impedance to Low Level Output			5	10	ns
t_{PHZ}	Propagation Delay Time, High Level to High Impedance Output			4	10	ns
t_{PLZ}	Propagation Delay Time, Low Level to High Impedance Output			4	10	ns

Note 1: $t_{sk(O)}$ is the skew between specified outputs of a single device with all driving inputs connected together and the outputs switching in the same direction while driving identical specified loads.

Note 2: $t_{sk(P)}$ is the magnitude of the time between the high to low and low to high propagation delay times at an outputs.

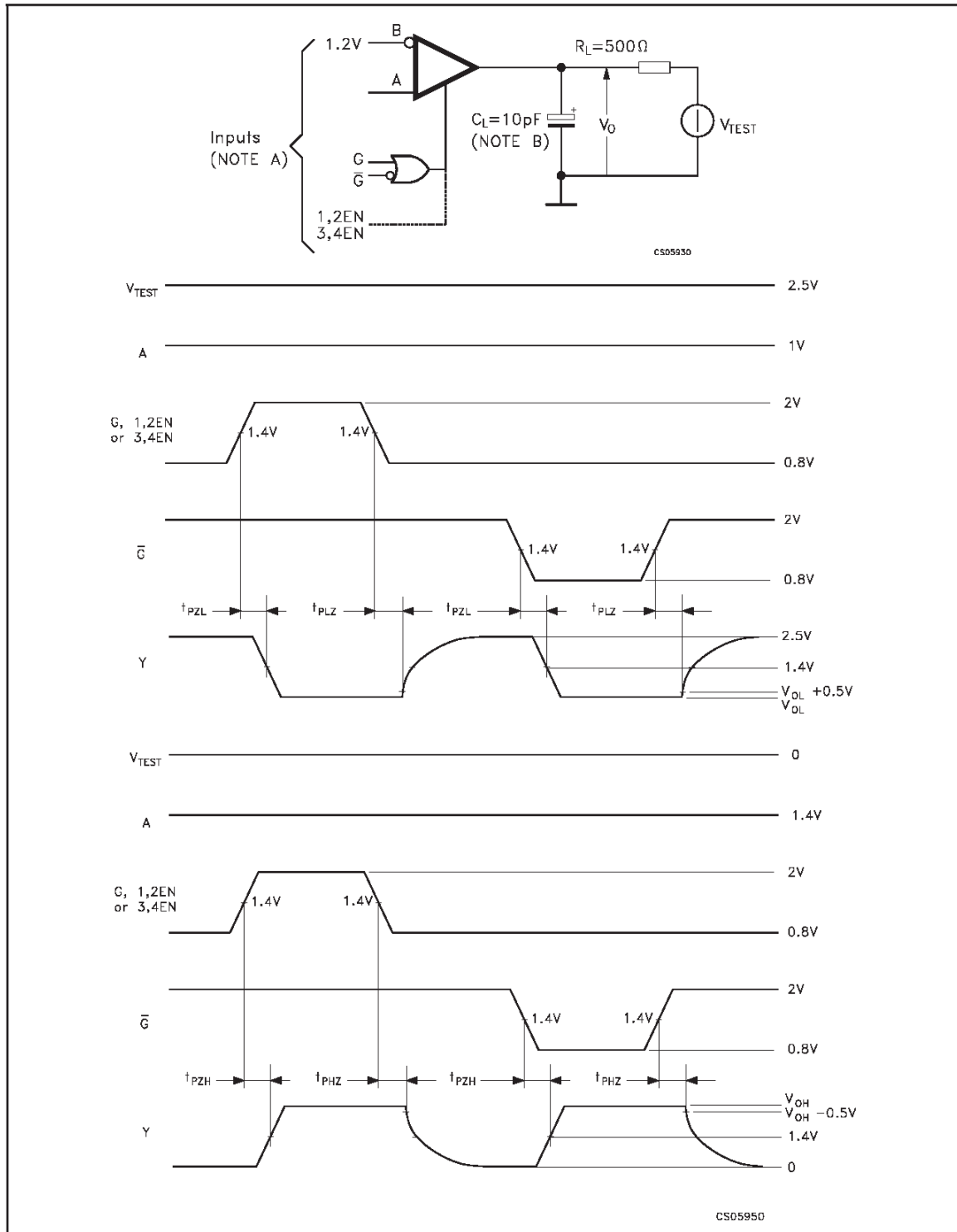
Note 3: $t_{sk(PP)}$ is the magnitude of the different in propagation delay times between any specified terminals of two devices when both devices operate with the same supply voltage, same temperature and have identical packages and test circuits.

Figure 1 : Timing Test Circuit, Timing And Waveforms



Note A: All input pulse are supplied by a generator having the following characteristics: t_r or $t_f \leq 1\text{ns}$, pulse repetition rate (PRR) = 50Mpps, pulse width = $10 \pm 0.2\text{ns}$.
 Note B: C_L includes instrumentation and fixture capacitance within 6mm of the D.U.T.

Figure 2 : Enable And Disable Time Test Circuit And Waveform



Note A: All input pulse are supplied by a generator having the following characteristics: t_r or $t_f \leq 1\text{ns}$, pulse repetition rate (PRR) = 50Mpps, pulse width = $500 \pm 10\text{ns}$.

Note B: C_L includes instrumentation and fixture capacitance within 6mm of the D.U.T.

TYPICAL PERFORMANCE CHARACTERISTICS (unless otherwise specified $T_j = 25^\circ\text{C}$)

Figure 3 : Output Current vs Output Voltage

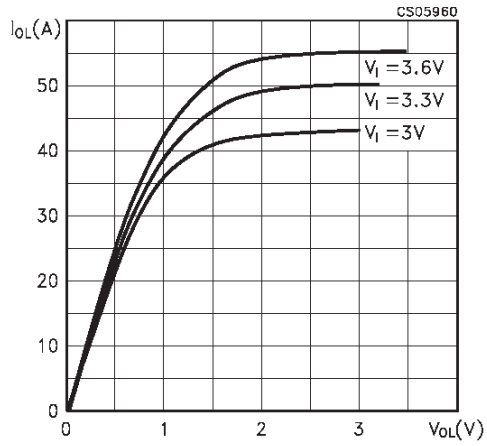
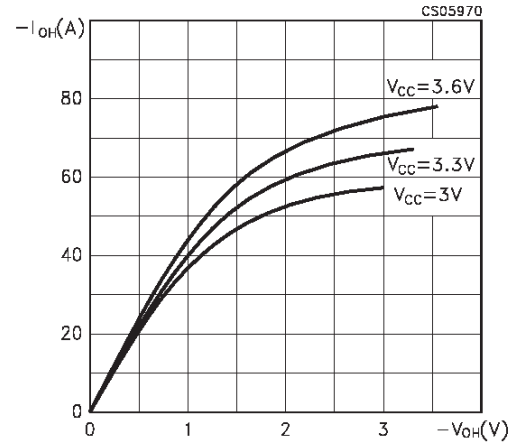
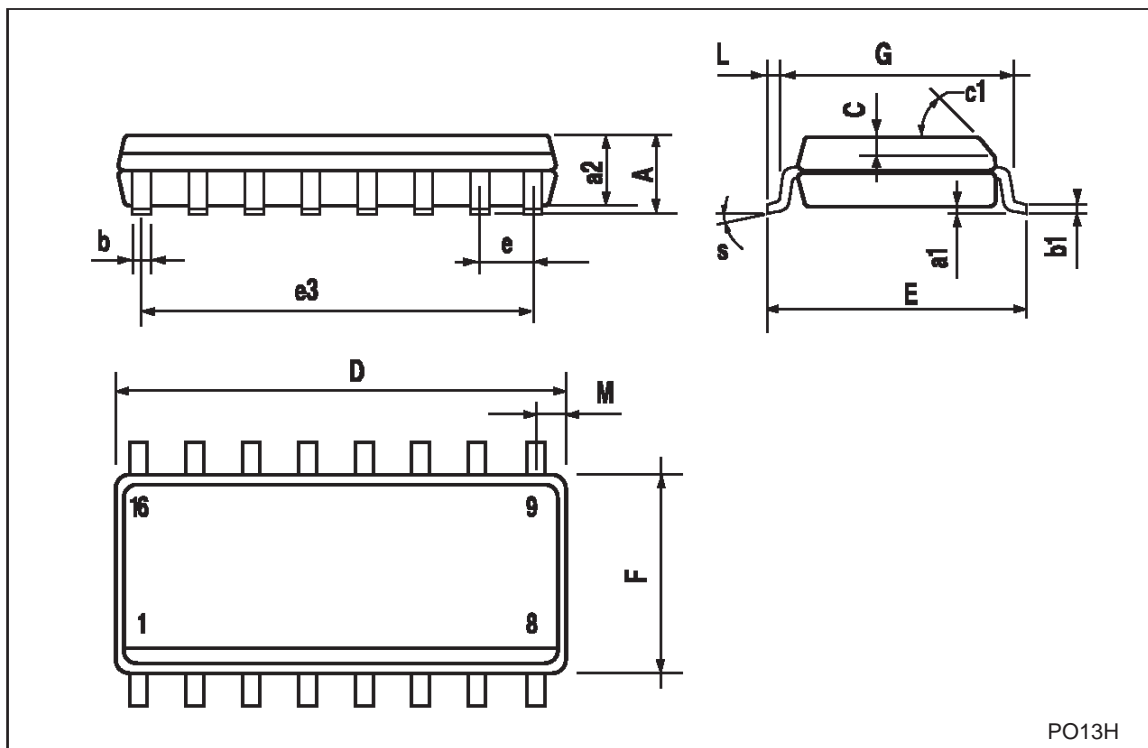


Figure 4 : Output Current vs Output Voltage



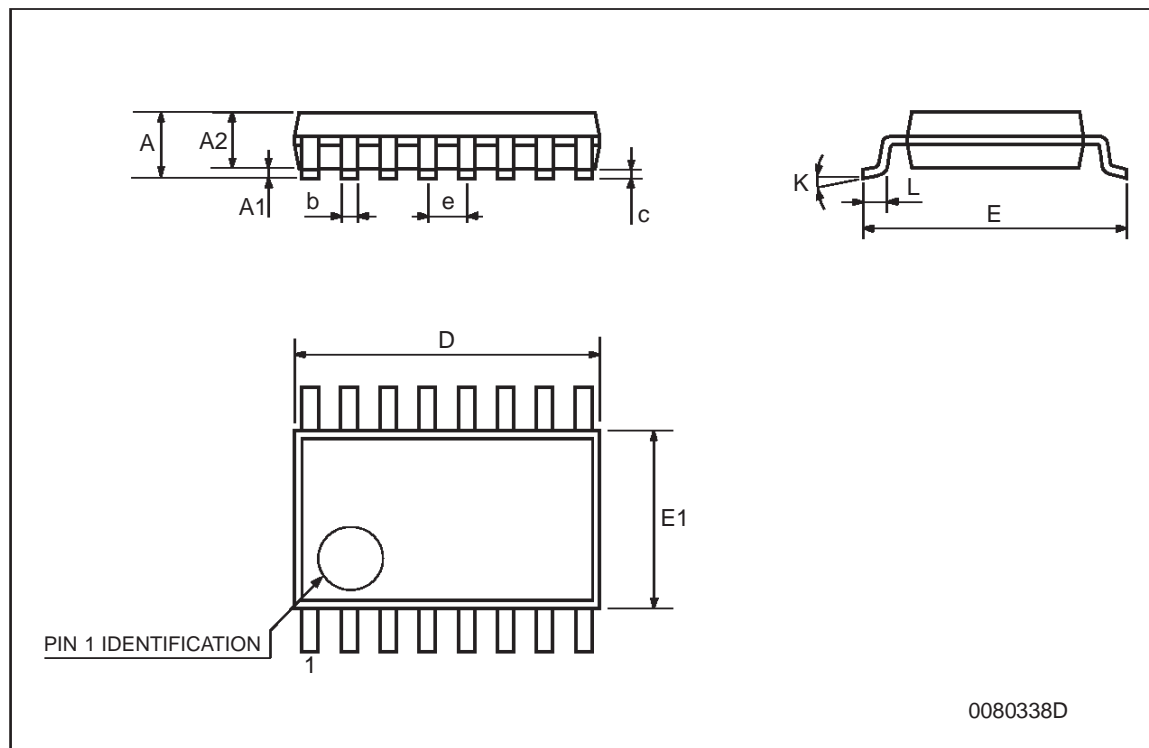
SO-16 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.2	0.004		0.008
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.)		



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		0.0079
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



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