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1 Pin information

Figure 1: Pin connections and IEC logic symbols

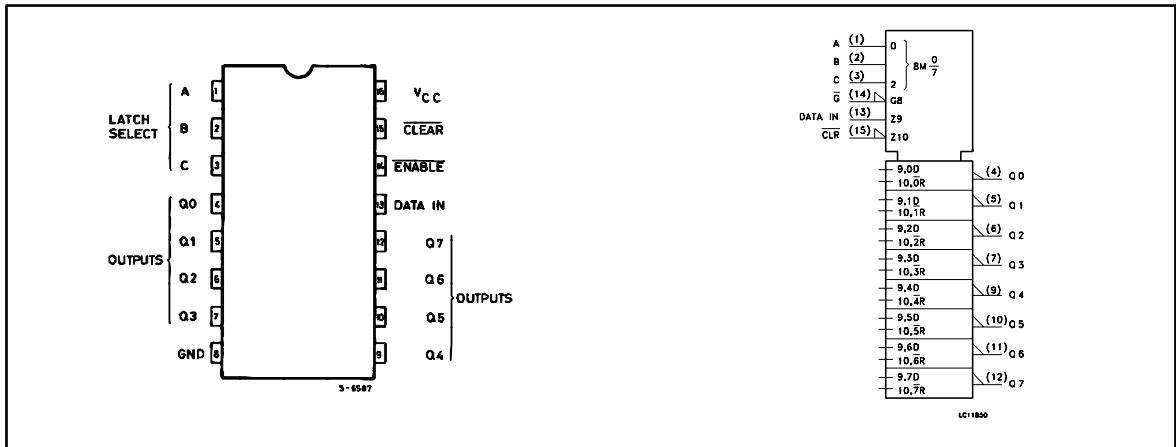


Table 2: Pin description

Pin number	Symbol	Name and function
1, 2, 3	A, B, C	Address inputs
4, 5, 6, 7, 9, 10, 11, 12	Q0 to Q7	Latch outputs
13	D	Data input
14	$\overline{\text{ENABLE}}$	Latch enable input (active low)
15	$\overline{\text{CLEAR}}$	Conditional reset input (low)
8	GND	Ground (0 V)
16	V _{CC}	Positive supply voltage

2 Functional description

Table 3: Truth table

Inputs		Outputs of addressed latch	Other output	Function
$\overline{\text{CLEAR}}$	$\overline{\text{ENABLE}}$			
H	L	D	Qi0	Addressable latch
H	H	Qi0	Qi0	Memory
L	L	D	L	8-line demultiplexer
L	H	L	L	Clear all bits to "L"

D: the level at the data input

Qi0: the level before the indicated steady state input conditions where established (i = 0, 1,, 7)

Inputs selected			Latch addressed
C	B	A	
L	L	L	Q0
L	L	H	Q1
L	H	L	Q2
L	H	H	Q3
H	L	L	Q4
H	L	H	Q5
H	H	L	Q6
H	H	H	Q7

Figure 2: Input and output equivalent circuit

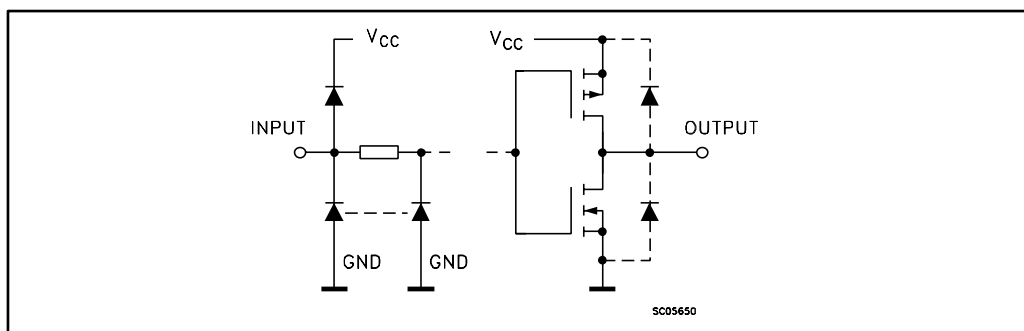
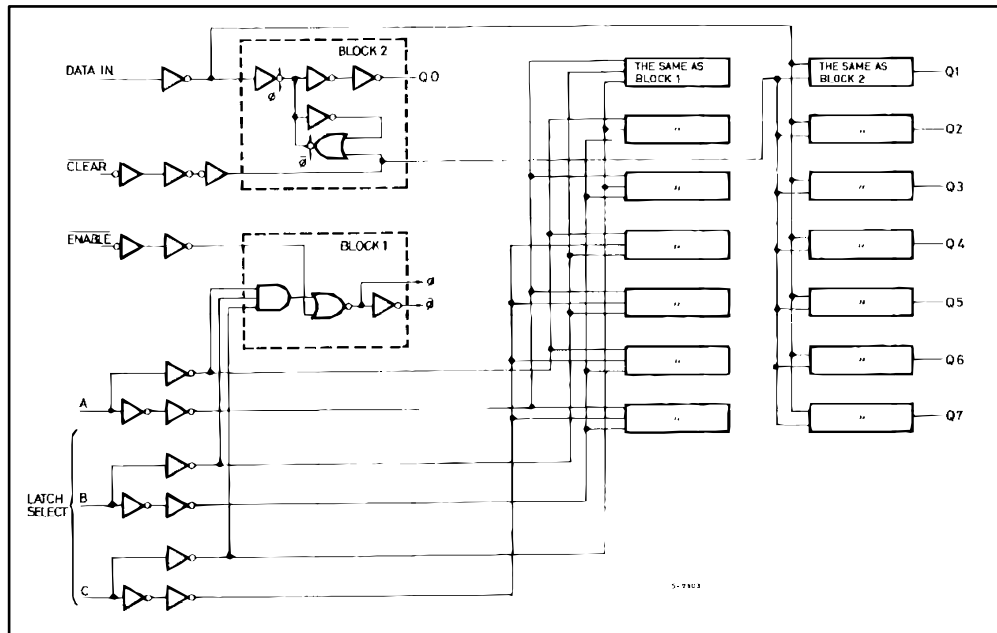


Figure 3: Logic diagram



This logic diagram has not been used to estimate propagation delays.

3 Electrical characteristics

Stressing the device above the ratings listed in the "Absolute maximum ratings" table may cause permanent damage to the device. These are stress ratings only, and operation of the device at these or any other conditions above those indicated in the operating sections of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Table 4: Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CC}	Supply voltage	-0.5 to +7	V
V _I	DC input voltage	-0.5 to V _{CC} to +0.5	V
V _O	DC output voltage	-0.5 to V _{CC} to +0.5	V
I _{IK}	DC input diode current	±20	mA
I _{OK}	DC output diode current	±20	mA
I _O	DC output current	±25	mA
I _{CC} or I _{GND}	DC VCC or ground current	±50	mA
P _D	Power dissipation	500 ⁽¹⁾	mW
T _{stg}	Storage temperature	-65 to +150	°C
T _L	Lead temperature (10 sec.)	300	°C

Notes:

⁽¹⁾500 mW at 65 °C; derate to 300 mW by 10 mW/°C from 65 °C to 85 °C

Table 5: Recommended operating conditions

Symbol	Parameter	Value	Unit	
V _{CC}	Supply voltage	2 to 6	V	
V _I	Input voltage	0 to V _{CC}	V	
V _O	Output voltage	0 to V _{CC}	V	
T _{op}	Operating temperature	-55 to 125	°C	
t _r , t _f	Input rise and fall time	V _{CC} = 2.0 V	0 to 1000	ns
		V _{CC} = 4.5 V	0 to 500	ns
		V _{CC} = 6.0 V	0 to 400	ns

Table 6: DC specifications

Symbol	Parameter	Test condition		Value						Unit	
		V _{CC} (V)		T _A = 25°C			-40 to 85°C		-55 to 125°C		
				Min.	Typ.	Max.	Min.	Max.	Min.		Max.
V _{IH}	High-level input voltage	2.0		1.5			1.5		1.5		V
		4.5		3.15			3.15		3.15		
		6.0		4.2			4.2		4.2		
V _{IL}	Low-level input voltage	2.0				0.5		0.5		0.5	V
		4.5				1.35		1.35		1.35	
		6.0				1.8		1.8		1.8	
V _{OH}	High-level output voltage	2.0	I _O = -20 μA	1.9	2.0		1.9		1.9		V
		4.5	I _O = -20 μA	4.4	4.5		4.4		4.4		
		6.0	I _O = -20 μA	5.9	6.0		5.9		5.9		
		4.5	I _O = -4.0 mA	4.18	4.31		4.13		4.10		
		6.0	I _O = -5.2 mA	5.68	5.8		5.63		5.60		
V _{OL}	Low-level output voltage	2.0	I _O = 20 μA		0.0	0.1		0.1		0.1	V
		4.5	I _O = 20 μA		0.0	0.1		0.1		0.1	
		6.0	I _O = 20 μA		0.0	0.1		0.1		0.1	
		4.5	I _O = 4.0 mA		0.17	0.26		0.33		0.40	
		6.0	I _O = 5.2 mA		0.18	0.26		0.33		0.40	
I _I	Input leakage current	6.0	V _I = V _{CC} or GND			±0.1		±1		±1	μA
I _{CC}	Quiescent supply current	6.0	V _I = V _{CC} or GND			4		40		80	μA

Table 7: AC electrical characteristics ($C_L = 50$ pF, input $t_r = t_f = 6$ ns)

Symbol	Parameter	Test condition	Value						Unit	
			$T_A = 25^\circ\text{C}$			-40 to 85°C		-55 to 125°C		
		V_{CC} (V)	Min.	Typ.	Max.	Min.	Max.	Min.		Max.
t_{TLH} t_{THL}	Output transition time	2.0		30	75		95		110	ns
		4.5		8	15		19		22	
		6.0		7	13		16		19	
t_{PLH} t_{PHL}	Propagation delay time (DATA – Q)	2.0		56	140		175		210	ns
		4.5		18	28		35		42	
		6.0		15	24		30		36	
t_{PLH} t_{PHL}	Propagation delay time (A, B, C – Q)	2.0		76	190		240		285	ns
		4.5		24	38		48		57	
		6.0		20	32		41		48	
t_{PLH} t_{PHL}	Propagation delay time (G – Q)	2.0		57	150		190		225	ns
		4.5		19	30		38		45	
		6.0		16	26		32		38	
t_{PLH} t_{PHL}	Propagation delay time ($\overline{\text{CLEAR}}$ – Q)	2.0		45	115		145		175	ns
		4.5		15	23		29		35	
		6.0		13	20		25		30	
$t_{W(L)}$	Minimum pulse width ($\overline{\text{ENABLE}}$)	2.0		28	75		90		115	ns
		4.5		7	15		19		23	
		6.0		6	13		16		20	
$t_{W(L)}$	Minimum pulse width ($\overline{\text{CLEAR}}$)	2.0		24	75		90		115	ns
		4.5		6	15		19		23	
		6.0		5	13		16		20	
t_s	Minimum setup time (DATA)	2.0		12	50		60		75	ns
		4.5		3	10		12		15	
		6.0		3	9		11		13	
t_s	Minimum setup time (A, B, C)	2.0			25		30		40	ns
		4.5			5		6		8	
		6.0			5		5		7	
t_h	Minimum hold time (DATA)	2.0			5		5		5	ns
		4.5			5		5		5	
		6.0			5		5		5	
t_h	Minimum hold time (A, B, C)	2.0			0		0		0	ns
		4.5			0		0		0	
		6.0			0		0		0	

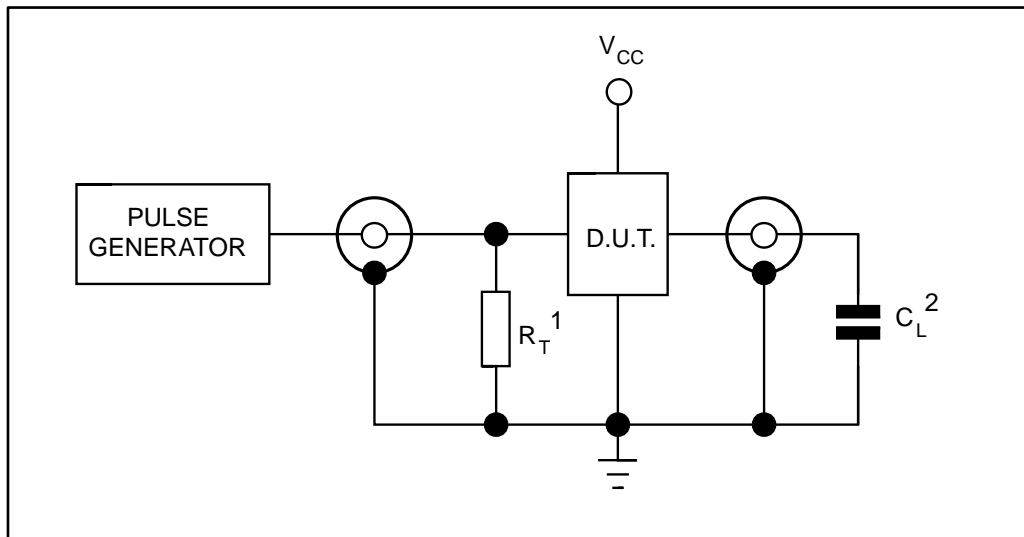
Table 8: Capacitive characteristics

Symbol	Parameter	Test condition	Value						Unit	
			T _A = 25°C			-40 to 85°C		-55 to 125°C		
			V _{CC} (V)	Min.	Typ.	Max.	Min.	Max.		Min.
C _{IN}	Input capacitance	5.0		5	10		10		10	pF
C _{PD}	Power dissipation capacitance ⁽¹⁾	5.0		66						pF

Notes:

⁽¹⁾C_{PD} is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load (refer to the test circuit). The average operating current can be obtained by the following equation: $I_{CC(oper)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$

Figure 4: Test circuit



1. R_T = Z_{OUT} of pulse generator (typically 50 ohm)
2. C_L = 50 pF or equivalent (includes jig and probe capacitance)

Figure 5: Waveform 1: propagation delay time (f = 1 MHz; 50% duty cycle)

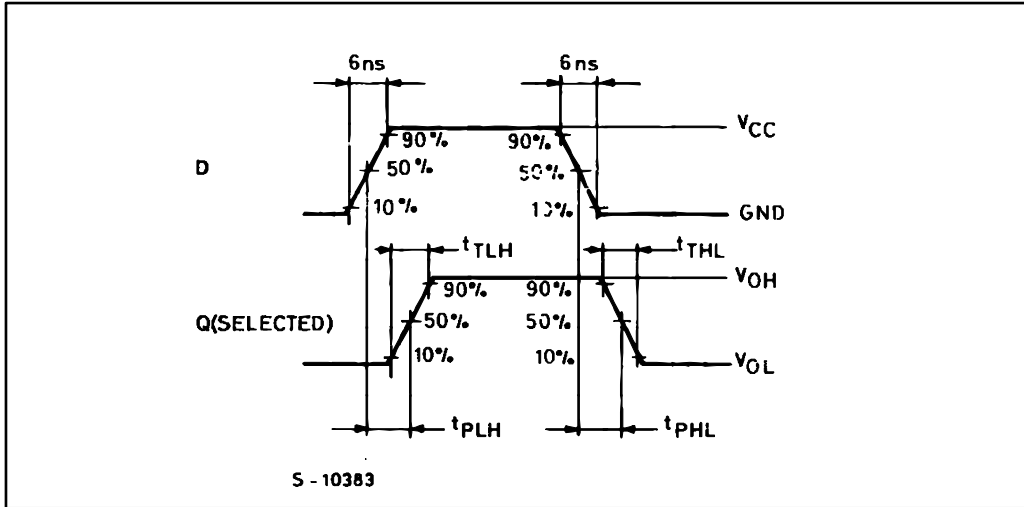


Figure 6: Waveform 2: propagation delay time (f = 1 MHz; 50% duty cycle)

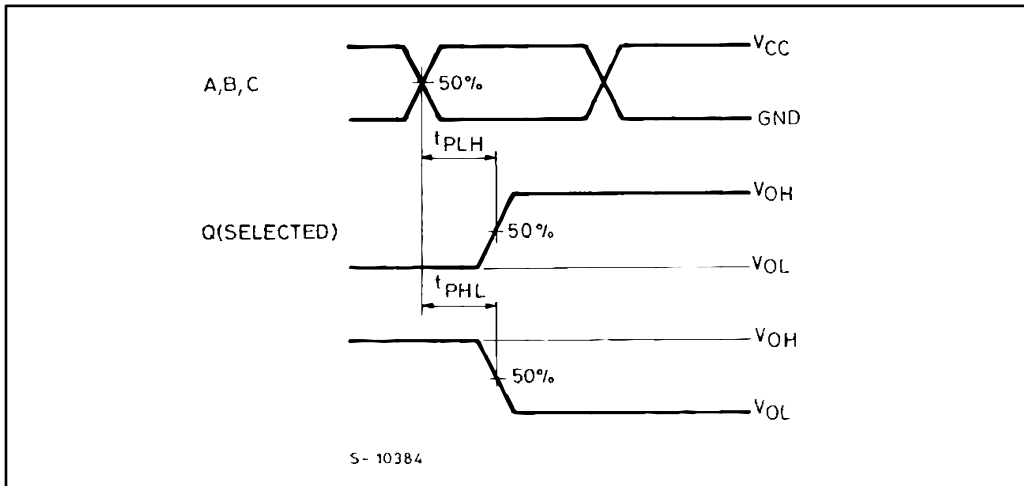


Figure 7: Waveform 3: minimum pulse width (G), setup and hold time (D to G) ($f = 1\text{ MHz}$; 50% duty cycle)

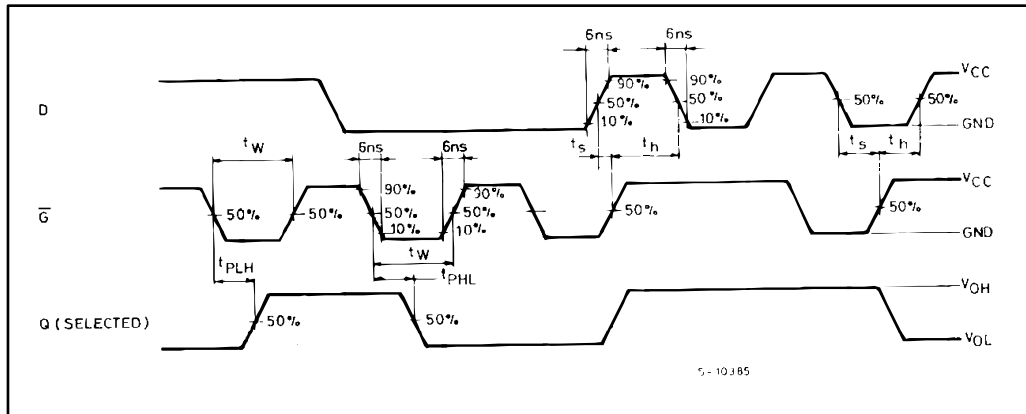


Figure 8: Waveform 4: minimum pulse width (CLR) ($f = 1\text{ MHz}$; 50% duty cycle)

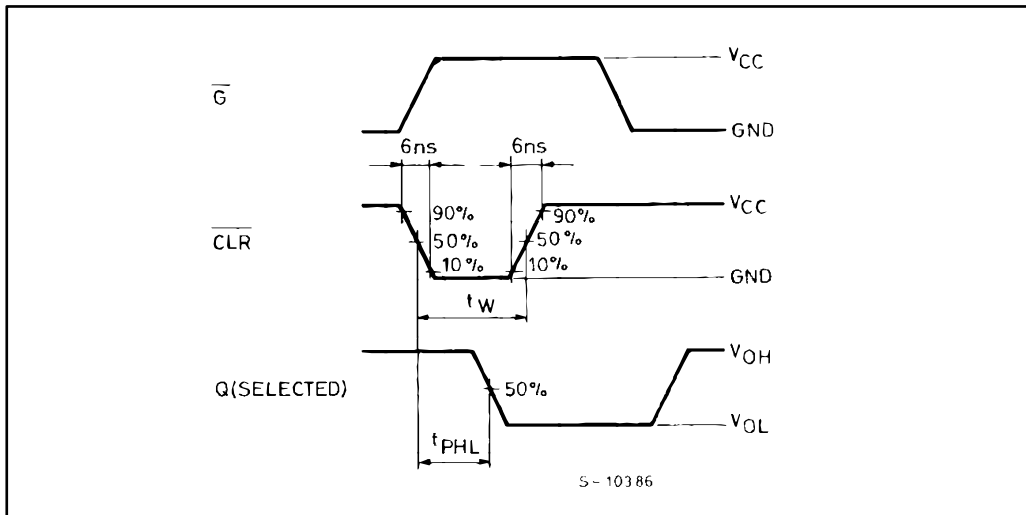


Figure 9: Waveform 5: setup and hold time (f = 1 MHz; 50% duty cycle)

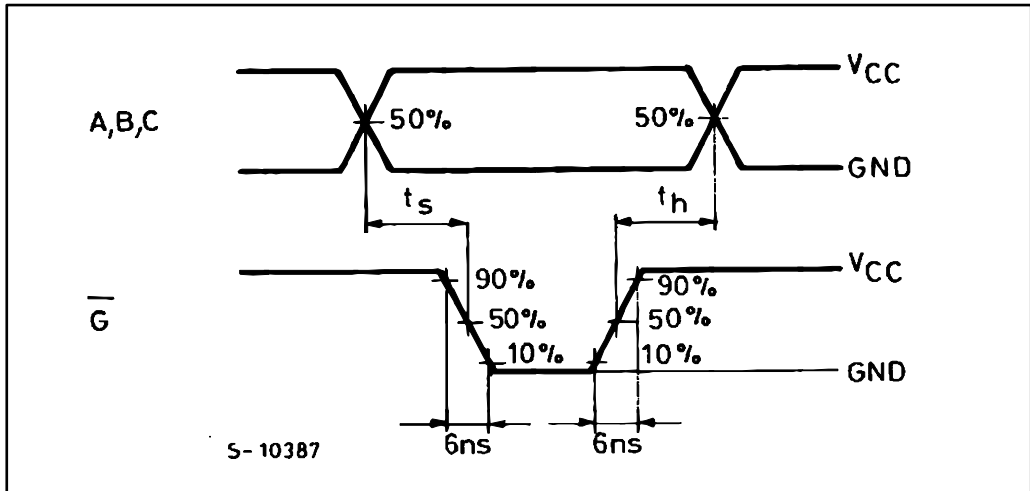
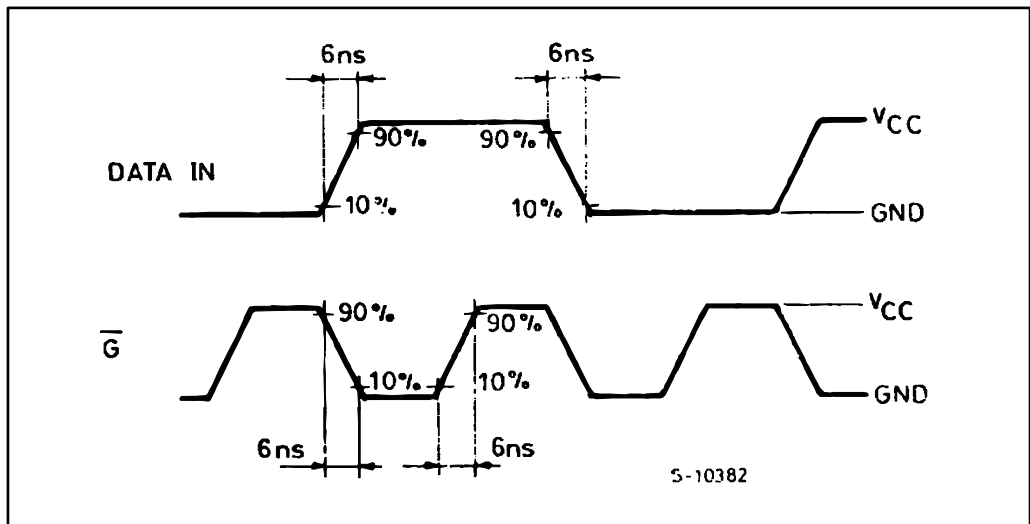


Figure 10: Waveform 6: input waveforms (f = 1 MHz; 50% duty cycle)



4 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

4.1 SO16 package information

Figure 11: Plastic SO16 package mechanical outline

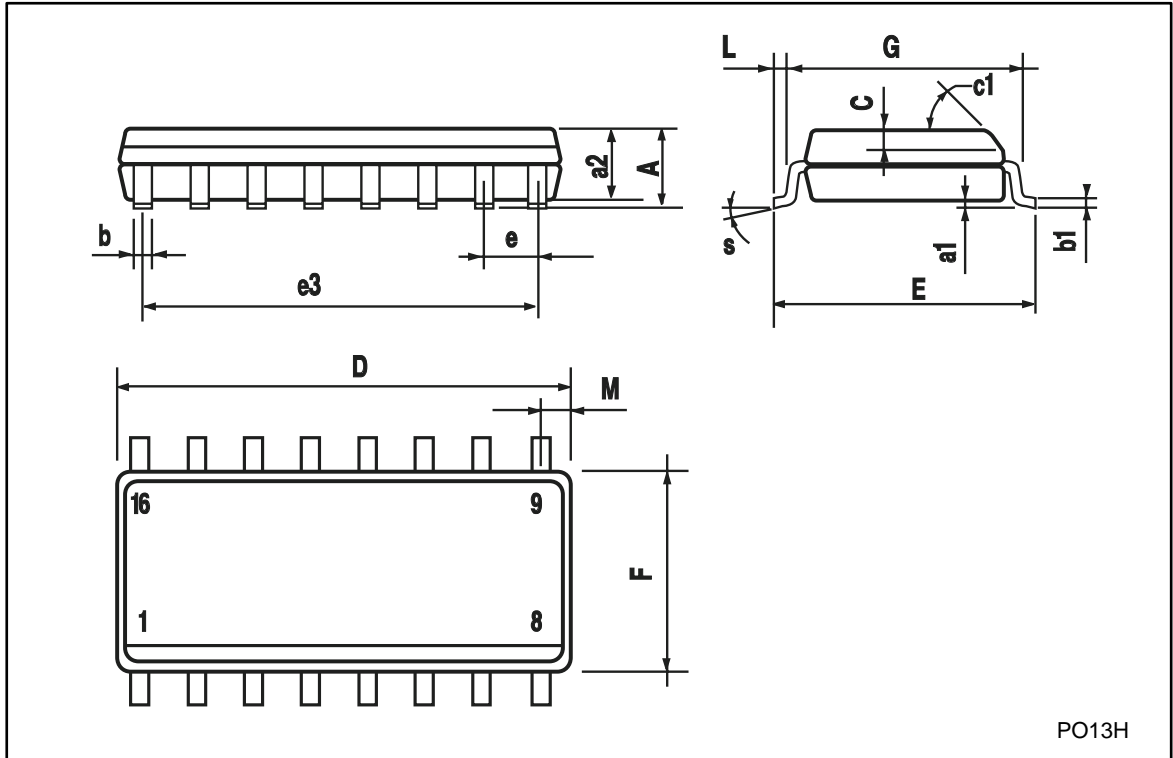


Table 9: Plastic SO16 package mechanical data

Dimensions	mm.			inches		
	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.)					

4.3 TSSOP16 package information

Figure 12: TSSOP16 package mechanical outline

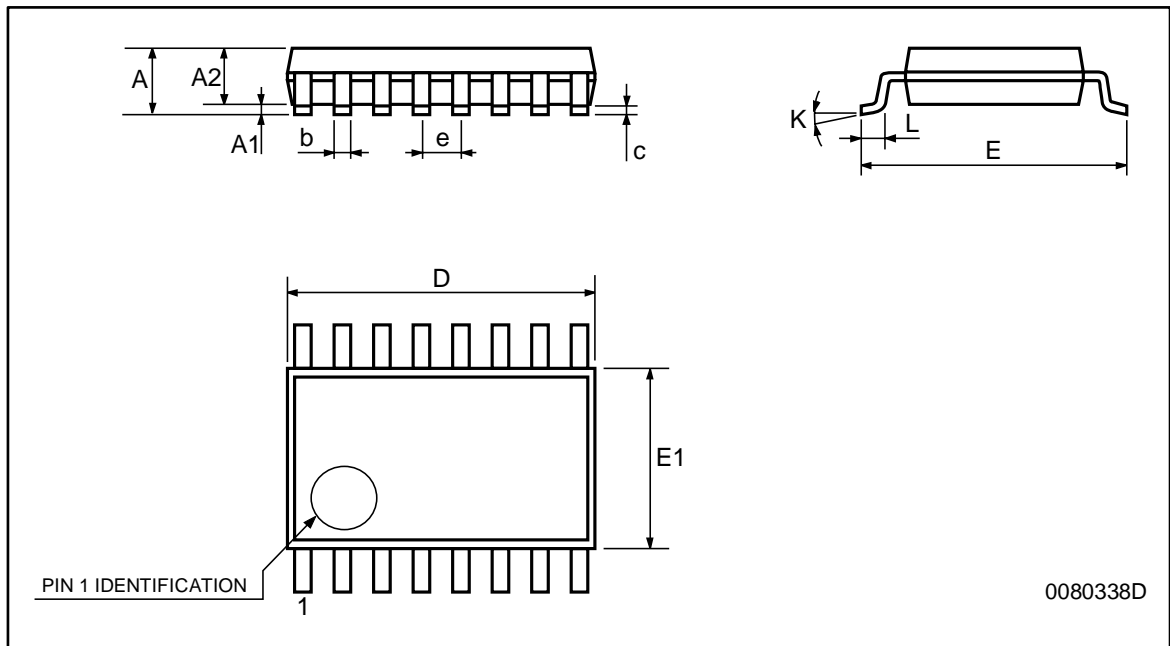


Table 10: TSSOP16 package mechanical data

Dimensions	mm.			inches		
	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

5 Revision history

Table 11: Document revision history

Date	Version	Change
Jul-2001	1	Initial release
01-Nov-2013	2	Added ESD performance to Section "Features" Added automotive grade order codes, temperature ranges and marking information to Table 1: "Device summary" Removed DIP16 package option Revised document presentation, minor textual updates

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