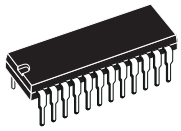
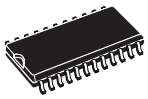
M74HC4514

4 TO 16 LINE DECODER/LATCH

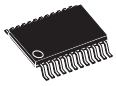
- HIGH SPEED:
  t_{PD}= 20 ns (TYP.) at V_{CC} = 6V
- LOW POWER DISSIPATION:
  I_{CC} = 4µA(MAX.) at T_A=25°C
- HIGH NOISE IMMUNITY:
  $V_{NIH} = V_{NIL}$ = 28 % V_{CC} (MIN.)
- SYMMETRICAL OUTPUT IMPEDANCE:
  $|I_{OH}| = I_{OL}$ = 4mA (MIN)
- BALANCED PROPAGATION DELAYS:
  $t_{PLH} \cong t_{PHL}$
- WIDE OPERATING VOLTAGE RANGE:
  V_{CC} (OPR) = 2V to 6V
- PIN AND FUNCTION COMPATIBLE WITH 74 SERIES 4514



DIP



SOP



TSSOP

ORDER CODES

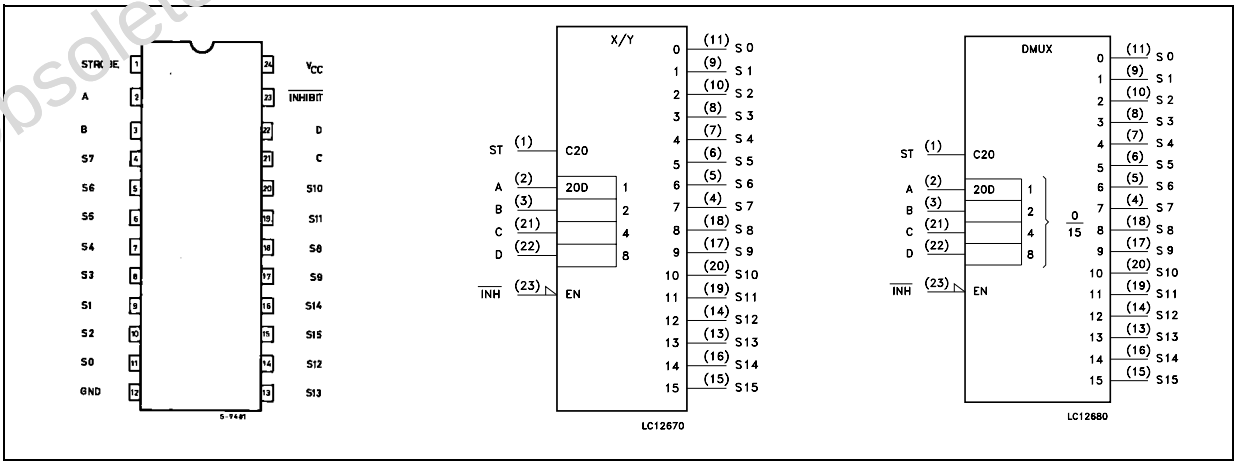
PACKAGE	TUBE	T & R
DIP	M74HC4514B1R	
SOP	M74HC4514M1R	M74HC4514RM13TR
TSSOP		M74HC4514TTR

DESCRIPTION

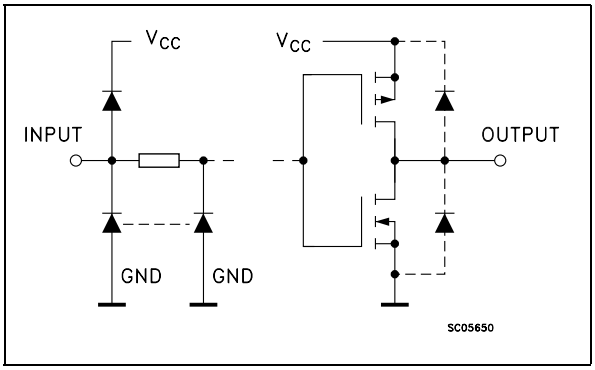
The M74HC4514 is an high speed CMOS 4 LINE TO 16 LINE SEGMENT DECODER WITH LATCHED INPUTS fabricated with silicon gate C^2MOS technology.
A binary code stored in the four input latches (A to D) provides a high level at the selected one of sixteen outputs excluding the other fifteen outputs, when the inhibit input (INHIBIT) is held low. When the inhibit input (INHIBIT) is held high, all outputs are kept low level, while the latch function is available. The data applied to the data inputs are transferred to the Q outputs of latches when the strobe input is held high. When the strobe input is taken low, the information data applied to the data inputs at a time is retained at the output of the latches.
All inputs are equipped with protection circuits against static discharge and transient excess voltage.

Obsolete Product(s) - Obsolete Product(s)

PIN CONNECTION AND IEC LOGIC SYMBOLS



INPUT AND OUTPUT EQUIVALENT CIRCUIT



PIN DESCRIPTION

PIN No	SYMBOL	NAME AND FUNCTION
1	STROBE	Strobe Input
2, 3, 21, 22	A to D	Address Inputs
11, 9, 10, 8, 7, 6, 5, 4, 18, 17, 20, 19, 14, 13, 16, 15	S0 to S15	Multiplexer Outputs (Active HIGH)
23	$\overline{\text{INHIBIT}}$	Enable Input
12	GND	Ground (0V)
24	V_{CC}	Positive Supply Voltage

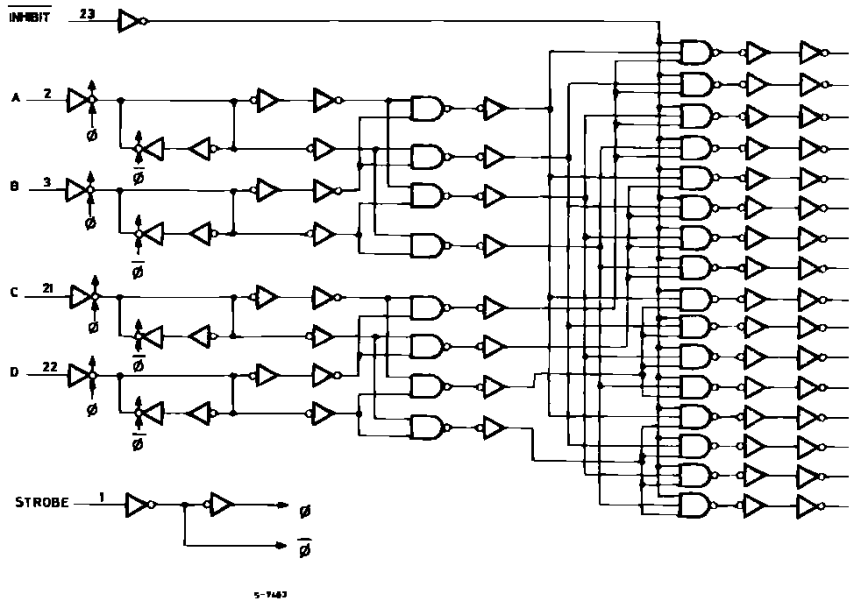
TRUTH TABLE

INPUTS					STROBE	SELECT OUTPUT
$\overline{\text{INHIBIT}}$	A	B	C	D		
L	L	L	L	L	STROBE = "H" Refer to truth table	S0
L	H	L	L	L		S1
L	L	H	L	L		S2
L	H	H	L	L	STROBE = "L" Data at the negative going transition of strobe shall be provided on the each output while strobe is held low.	S3
L	L	L	H	L		S4
L	H	L	H	L		S5
L	L	H	H	L		S6
L	H	H	H	L		S7
L	L	L	L	H		S8
L	H	L	L	H		S9
L	L	H	L	H		S10
L	H	H	L	H		S11
L	L	L	H	H		S12
L	H	L	H	H		S13
L	L	H	H	H		S14
L	H	H	H	H		S15
H	X	X	X	X		ALL OUTPUTS "L"

X : Don't Care

Obsolete Product(s) - Obsolete Product(s)

LOGIC DIAGRAM



This logic diagram has not be used to estimate propagation delays

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} + 0.5	V
V_O	DC Output Voltage	-0.5 to V_{CC} + 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 V_{CC} or Ground Current	± 50	mA
P_D	Power Dissipation	500(*)	mW
T_{stg}	Storage Temperature	-65 to +150	°C
T_L	Lead Temperature (10 sec)	300	°C

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied
(*) 500mW at 65 °C; derate to 300mW by 10mW/°C from 65°C to 85°C

Obsolete Product(s) - Obsolete Product(s)

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} = 2.0V	0 to 1000	ns
		V_{CC} = 4.5V	0 to 500	ns
		V_{CC} = 6.0V	0 to 400	ns

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		0.37		0.40	
		6.0	I_O=5.2 mA		0.18	0.26		0.37		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

Obsolete Product(s) - Obsolete Product(s)

AC ELECTRICAL CHARACTERISTICS (C_L = 50 pF, Input $t_r = t_f$ = 6ns)

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.	
t_{TLH} t_{THL}	Output Transition Time	2.0			30	75		95		110	ns
		4.5			8	15		19		25	
		6.0			7	13		16		23	
t_{PLH} t_{PHL}	Propagation Delay Time (DATA - Sn)	2.0			65	175		220		230	ns
		4.5			22	35		44		56	
		6.0			19	30		37		45	
t_{PLH} t_{PHL}	Propagation Delay Time (STROBE- Sn.)	2.0			75	175		220		260	ns
		4.5			24	35		44		56	
		6.0			20	30		37		45	
t_{PLH} t_{PHL}	Propagation Delay Time ($\overline{\text{INHIBIT}}$ - Sn)	2.0			60	175		220		260	ns
		4.5			20	35		44		56	
		6.0			17	30		37		45	
$t_{W(L)}$	Minimum Pulse Width (STROBE)	2.0			14	75		95		110	ns
		4.5			6	15		19		26	
		6.0			6	13		16		23	
t_s	Minimum Set Up Time (DATA)	2.0			10	50		65		80	ns
		4.5			2	10		13		20	
		6.0			1	9		11		17	
t_h	Minimum Hold Time (DATA)	2.0				5		5		5	ns
		4.5				5		5		5	
		6.0				5		5		5	

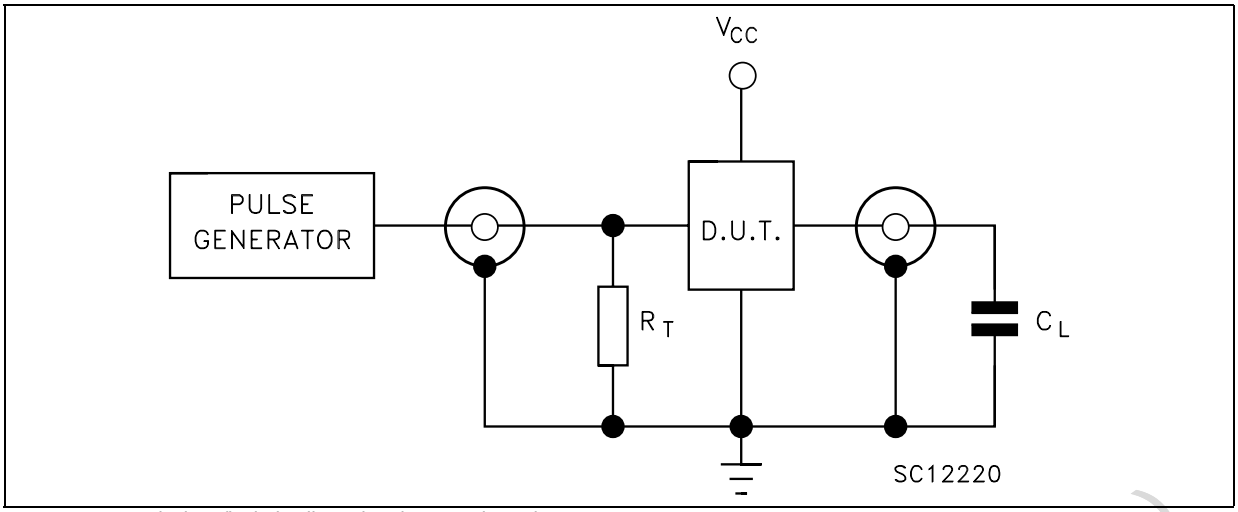
CAPACITIVE CHARACTERISTICS

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.	
C_{IN}	Input Capacitance				5	10		10		10	pF
C_{PD}	Power Dissipation Capacitance (note 1)				61						pF

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 Test Circuit). Average operating current can be obtained by the following equation. $I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$

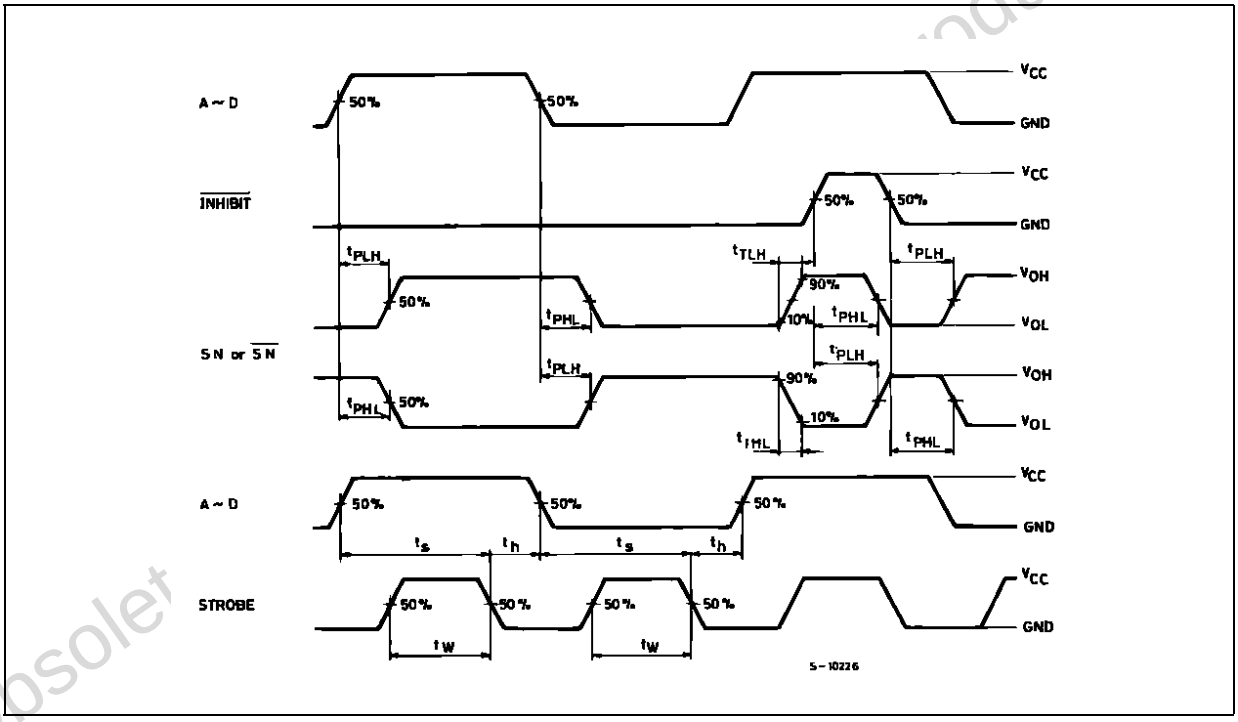
Obsolete Product(s) - Obsolete Product(s)

TEST CIRCUIT



C_L = 50pF or equivalent (includes jig and probe capacitance)
$R_T = Z_{OUT}$ of pulse generator (typically 50Ω)

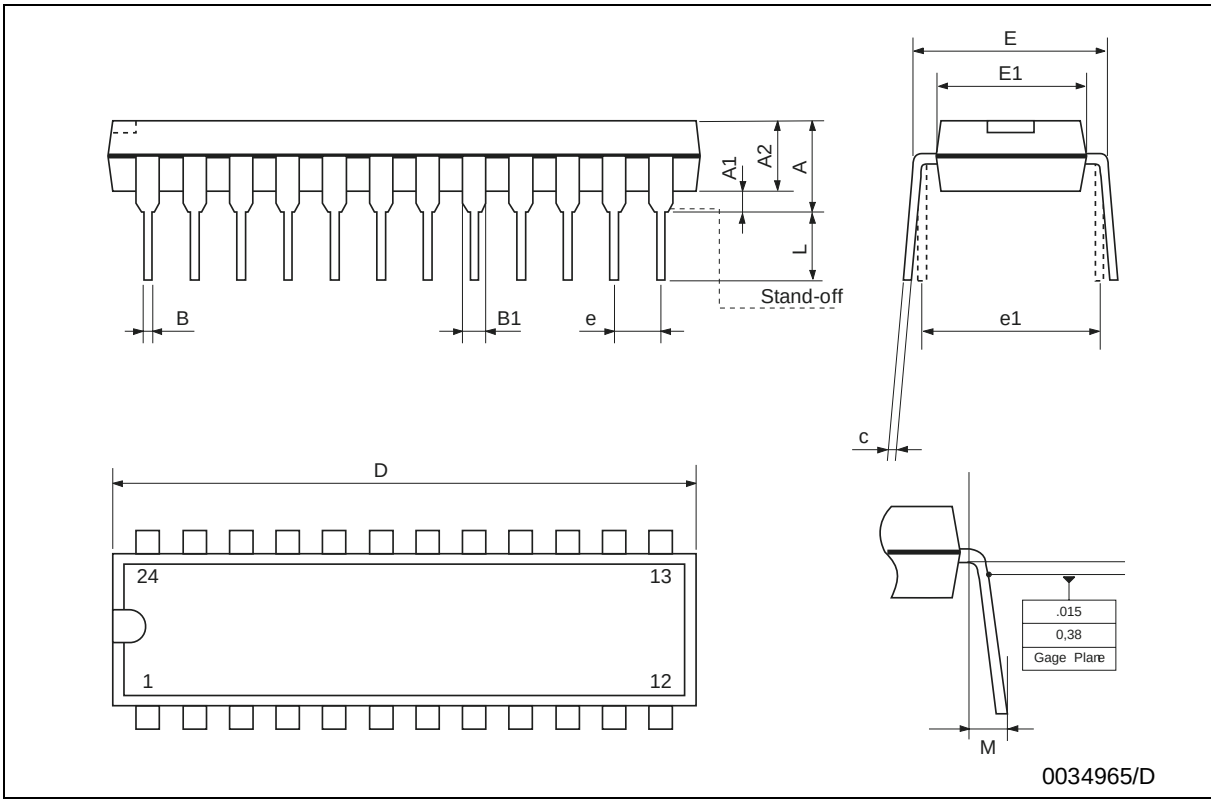
SWITCHING CHARACTERISTICS TEST WAVEFORM (f=1MHz; 50% duty cycle)



Obsolet

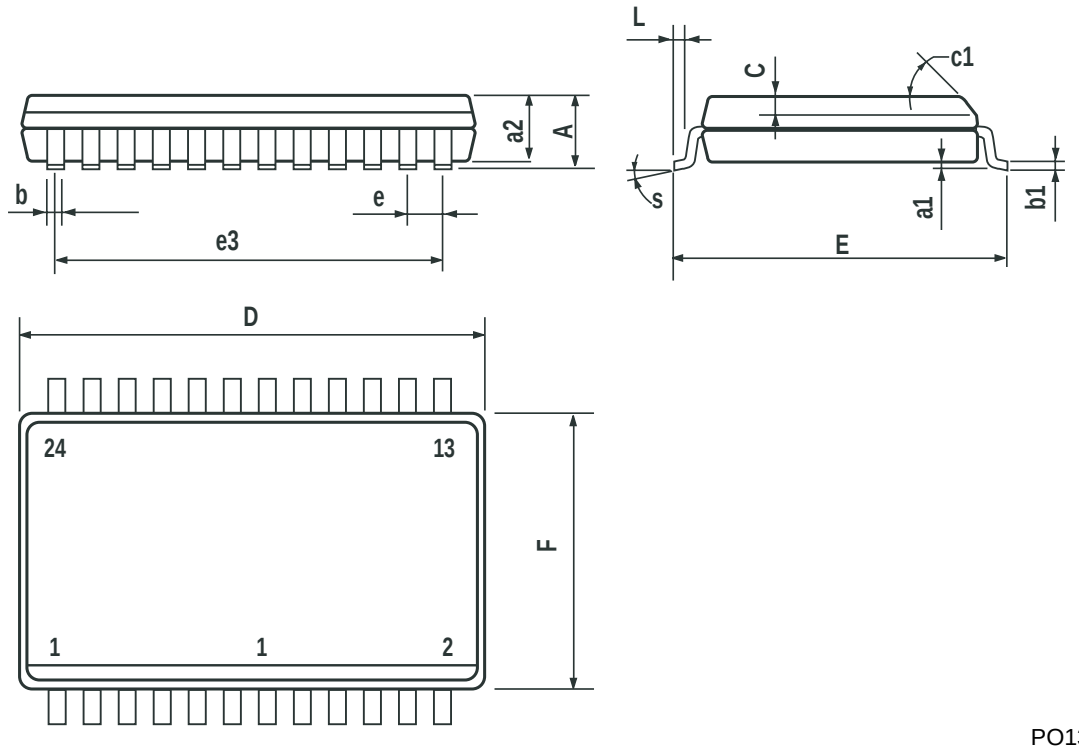
Plastic DIP-24 (0.25) MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			4.32			0.170
A1	0.38			0.015		
A2		3.3			0.130	
B	0.41	0.46	0.51	0.016	0.018	0.020
B1	1.40	1.52	1.65	0.055	0.060	0.065
c	0.20	0.25	0.30	0.008	0.010	0.012
D	31.62	31.75	31.88	1.245	1.250	1.255
E	7.62		8.26	0.300		0.325
E1	6.35	6.60	6.86	0.250	0.260	0.270
e		2.54			0.100	
E1		7.62			0.300	
L	3.18		3.43	0.125		0.135
M	0˚		15˚	0˚		15˚



SO-24 MECHANICAL DATA

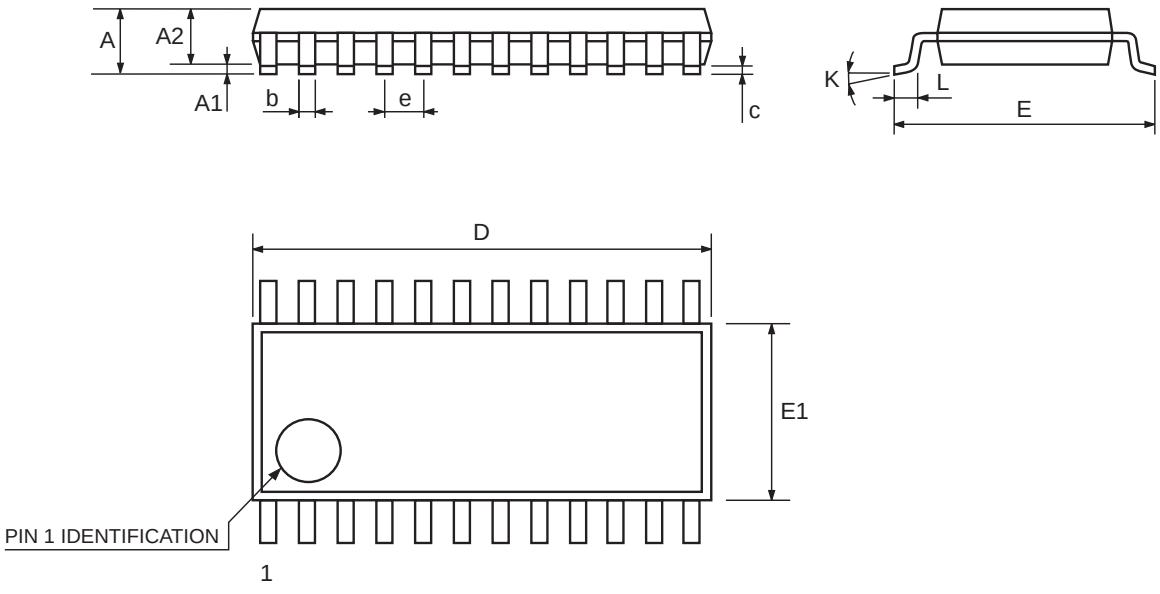
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			2.65			0.104
a1	0.1		0.2	0.004		0.008
a2			2.45			0.096
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.012
C		0.5			0.020	
c1	45° (typ.)					
D	15.20		15.60	0.598		0.614
E	10.00		10.65	0.393		0.419
e		1.27			0.050	
e3		13.97			0.550	
F	7.40		7.60	0.291		0.300
L	0.50		1.27	0.020		0.050
S	8° (max.)					



PO13T

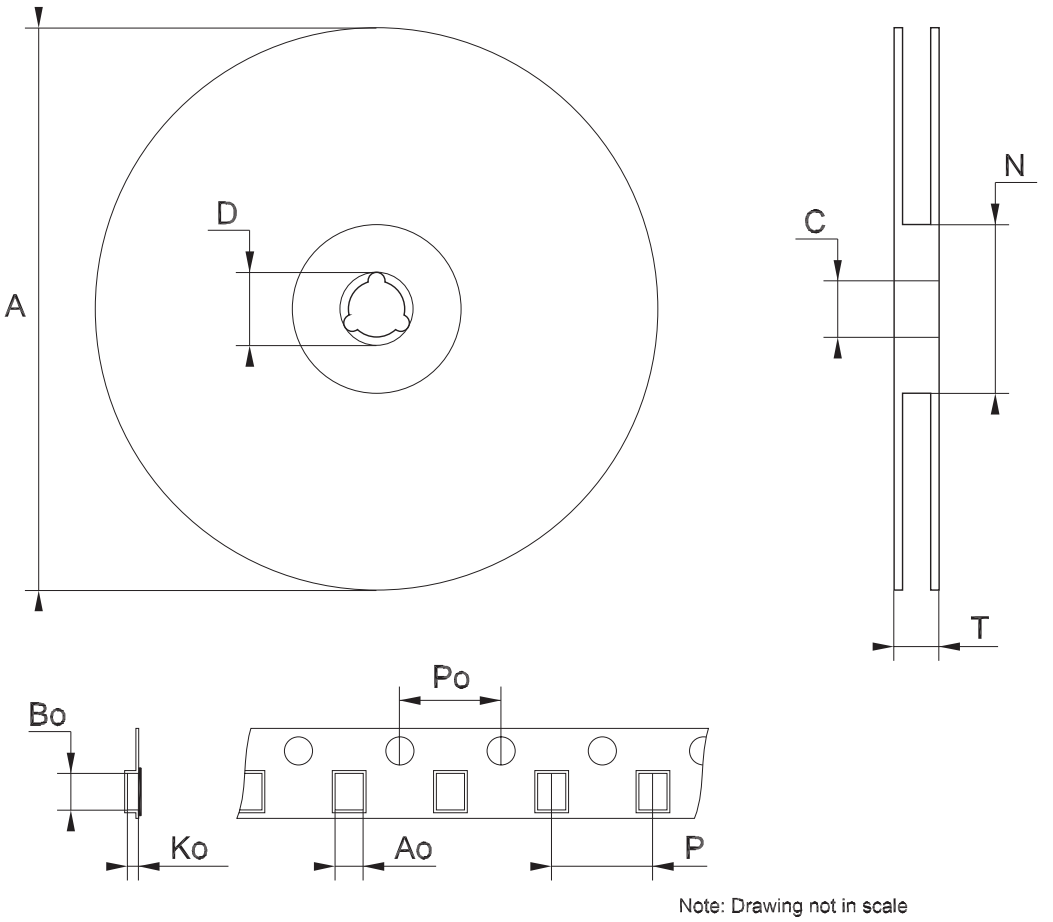
TSSOP24 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			1.1			0.043
A1	0.05		0.15	0.002		0.006
A2		0.9			0.035	
b	0.19		0.30	0.0075		0.0118
c	0.09		0.20	0.0035		0.0079
D	7.7		7.9	0.303		0.311
E	6.25		6.5	0.246		0.256
E1	4.3		4.5	0.169		0.177
e		0.65 BSC			0.0256 BSC	
K	0°		8°	0°		8°
L	0.50		0.70	0.020		0.028



Tape & Reel SO-24 MECHANICAL DATA

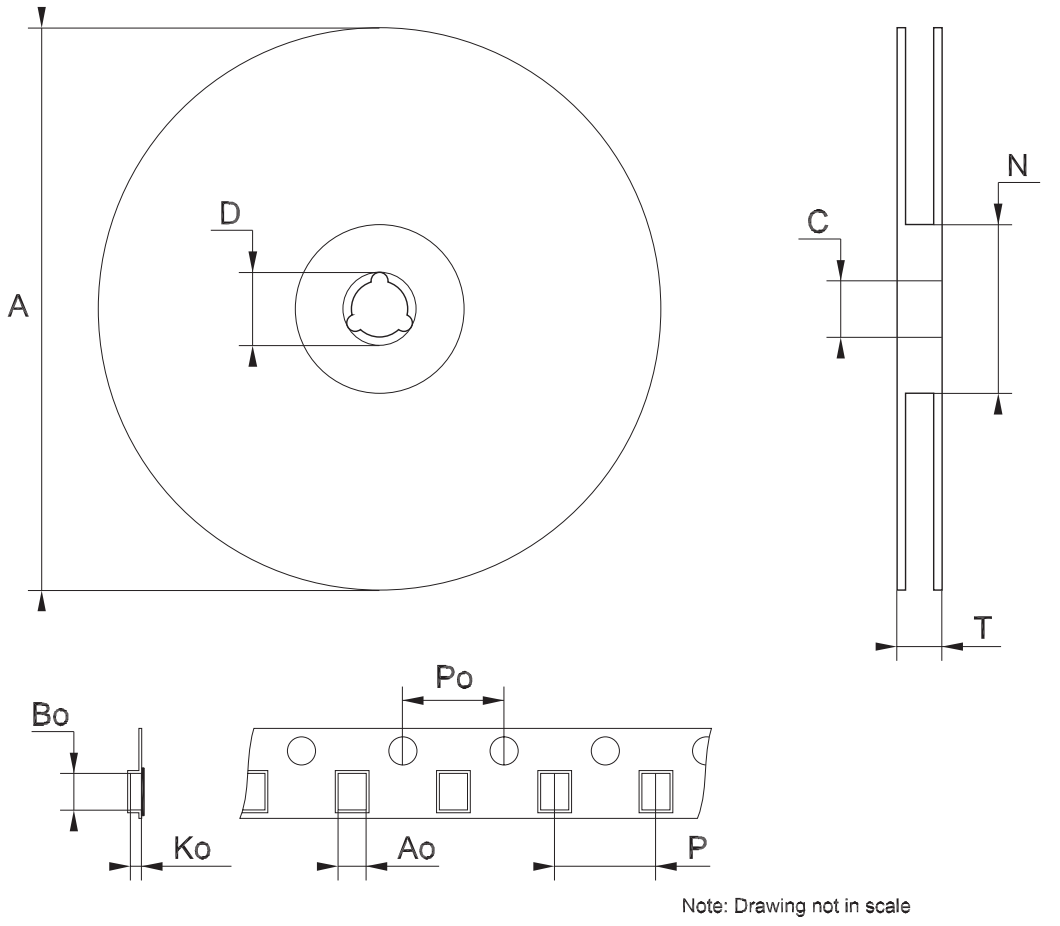
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			30.4			1.197
Ao	10.8		11.0	0.425		0.433
Bo	15.7		15.9	0.618		0.626
Ko	2.9		3.1	0.114		0.122
Po	3.9		4.1	0.153		0.161
P	11.9		12.1	0.468		0.476



Note: Drawing not in scale

Tape & Reel TSSOP24 MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	6.8		7	0.268		0.276
Bo	8.2		8.4	0.323		0.331
Ko	1.7		1.9	0.067		0.075
Po	3.9		4.1	0.153		0.161
P	11.9		12.1	0.468		0.476



Note: Drawing not in scale

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