
T62M0001A

Digital Sound Processor With 64K SRAM

Features

- Low Noise (-90dBV typical)
- Low Distortion (0.17% typical)
- Built –in 64 K SRAM
- Sleep Mode Function
- Two Control Modes Selection:
 - Easy Mode Using Parallel Data
 - u-COM Mode Using Serial Data
- Auto-Mute Function
- Built-in Automatic Reset Circuit
- Pin Compatible with M65831

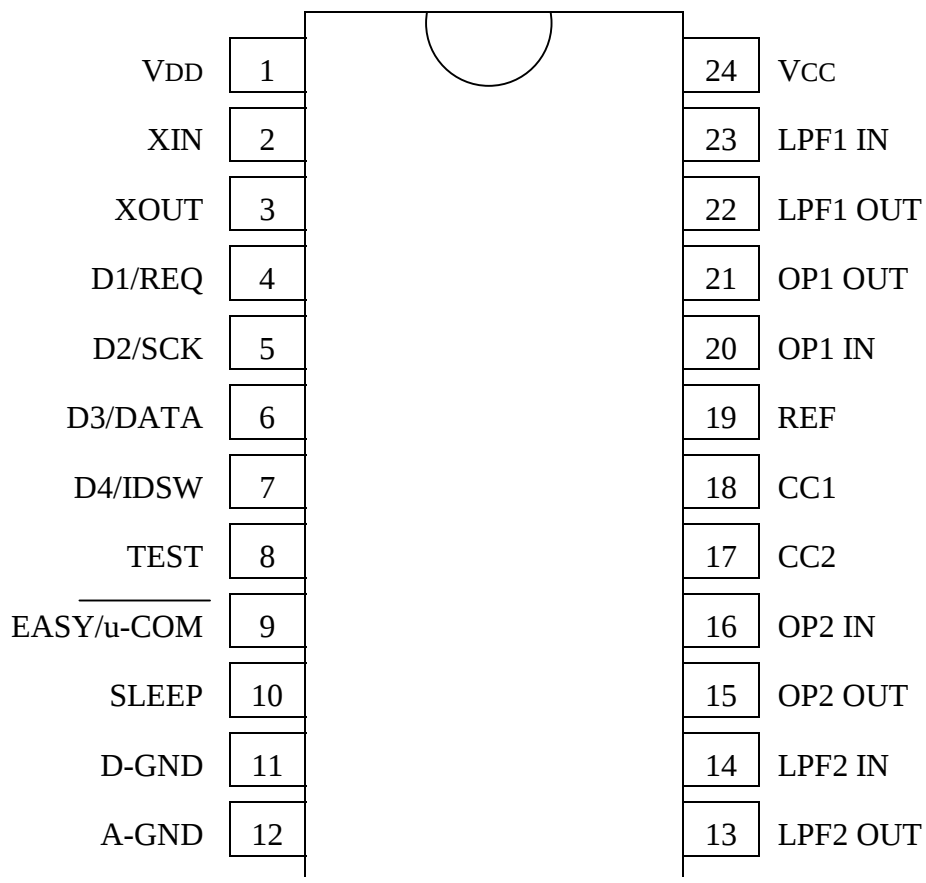
Description

T62M0001 is a digital echo/surround processor IC utilizing CMOS technology. Analog signal to T62M0001 is digitized by a built-in A/D converter and then stored in the internal memory. After an adjustable delay time, data in the memory is read and converted back to analog signal via the other D/A converter. With the built-in 64K SRAM, T62M0001 can create very high performance echo/surround sound effect and meet the application of A/V system such as CD player VCD,DVDetc.

Part Number Examples

Part NO.	Package	Description
T62M0001A-D	24-SOP	300mil-24-SOP
T62M0001A-K	24-DIP	600mil-24-DIP
T62M0001A-DG	24-SOP	300mil-24-SOP lead free
T62M0001A-KG	24-DIP	600mil-24-DIP lead free

Pin Configuration



24 PINS DIP/SOP

Pin Description

Symbol	I/O	Function	Pin no.
V _{DD}	P	Digital supply voltage	1
XIN	I	Oscillator input	2
XOUT	O	Oscillator output	3
D1/REQ	I	Easy mode : inputs D1 data u -COM mode : inputs request data	4
D2/SCK	I	Easy mode : inputs D2 data u -COM mode : inputs shift clock	5
D3/DATA	I	Easy mode : inputs D3 data u -COM mode : inputs serial data	6
D4/IDSW	I	Easy mode : inputs D4 data u -COM mode : controls ID code	7
TEST	I	L = normal mode	8
EASY/ u -COM	I	H = easy mode L = u -COM mode	9
SLEEP	I	H = sleep mode L = normal mode	10
D-GND	G	Digital ground	11
A-GND	G	Analog ground	12
LPF2 OUT	O	Low pass filter 2 output	13
LPF2 IN	I	Low pass filter 2 input	14
OP2 OUT	O	Integrator 2 output	15
OP2 IN	I	Integrator 2 input	16
CC2	-	Current control 2	17
CC1	-	Current control 1	18
REF	-	Analog reference voltage (= 1/2 V _{CC})	19
OP1 IN	I	Integrator 1 input	20
OP1 OUT	I	Integrator 1 output	21
LPF1 OUT	-	Low pass filter 1 output	22
LPF1 IN	O	Low pass filter 1 input	23
V _{CC}	P	Analog supply voltage	24

P : supply voltage, G : ground, I : input pin, O : output pin

Function description

1.Easy mode (parallel data input)

When the pin $\overline{EASY/\mu - COM}$ = “High”, then in the easy mode.

D4	D3	D2	D1	f _s	T _d
L	L	L	L	F _{ck} /3	12.3
L	L	L	H	F _{ck} /3	24.6
L	L	H	L	F _{ck} /3	36.9
L	L	H	H	F _{ck} /3	49.2
L	H	L	L	F _{ck} /3	61.4
L	H	L	H	F _{ck} /3	73.7
L	H	H	L	F _{ck} /3	86.0
L	H	H	H	F _{ck} /3	98.3
H	L	L	L	F _{ck} /6	110.6
H	L	L	H	F _{ck} /6	122.9
H	L	H	L	F _{ck} /6	135.2
H	L	H	H	F _{ck} /6	147.5
H	H	L	L	F _{ck} /6	159.7
H	H	L	H	F _{ck} /6	172.0
H	H	H	L	F _{ck} /6	184.3
H	H	H	H	F _{ck} /6	196.6

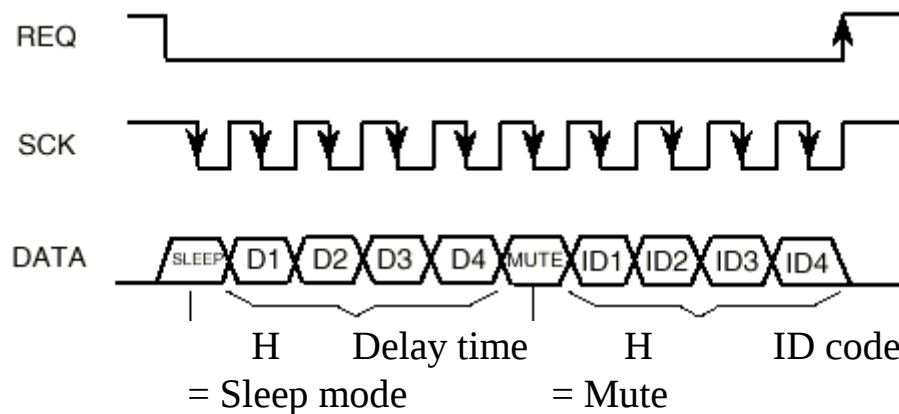
Note : f_s : sampling frequency (Hz) ; F_{ck} : oscillator frequency(example F_{ck}=2MHz)

T_d : delay time (msec)

2.u-COM mode (serial data input)

When the pin $\overline{\text{EASY}/u-COM}$ = “Low”, then in the u-COM mode.

The timing is shown as the diagram below:



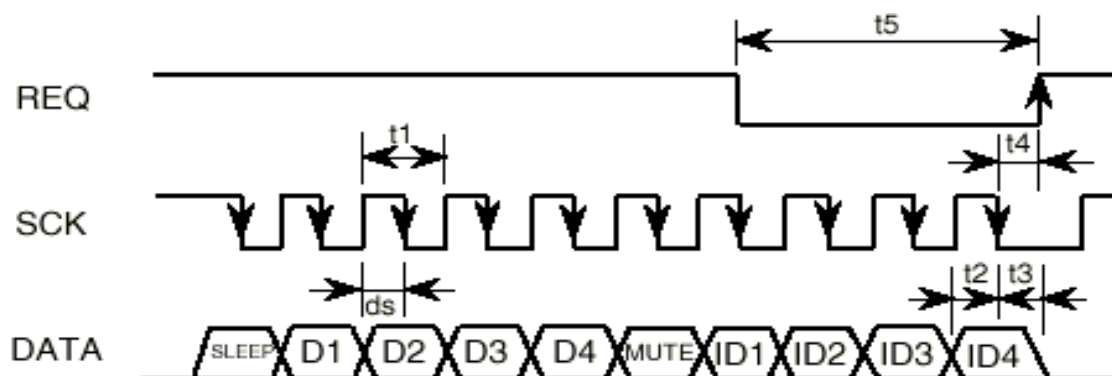
This timing chart shows that delay time is set by serial data from u-COM.

DATA signal is latched at the falling edge of SCK signal, the last ten datas are set at the rising edge of REQ signal when ID codes are satisfied.

ID1, ID3 = Low

ID2 = High

ID4 = Equal to IDSW



REQ, SCK, DATA input timing

Symbol	Parameter	Limits			Unit
		Min.	Typ.	Max.	
t_1	SCK pulse width	250	-	-	ns
ds	SCK pulse duty	-	50	-	%
t_2	DATA setup time	100	$t_1/2$	-	ns
t_3	DATA hold time	100	$t_1/2$	-	ns
t_4	REQ hold time	100	-	-	ns
t_5	REQ pulse width	250	-	-	ns

3.Mute

(1) Easy mode

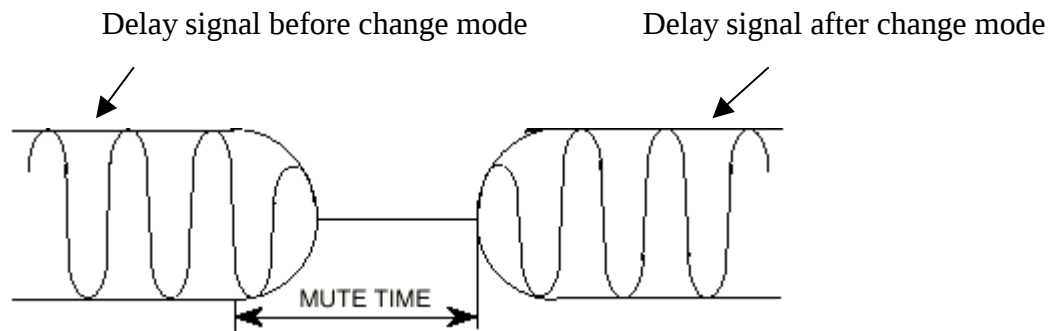
Automatic mute upon changing delay time, cancelling SLEEP mode and power on.

(2) u-COM

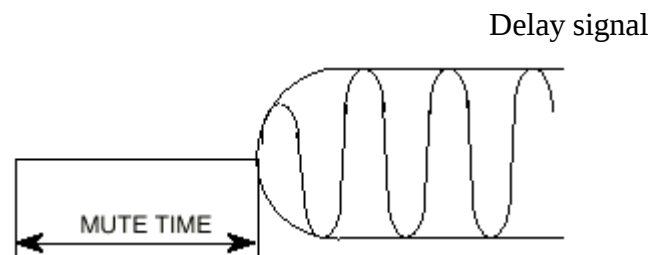
MUTE=H : mute.

MUTE=L : automatic mute.

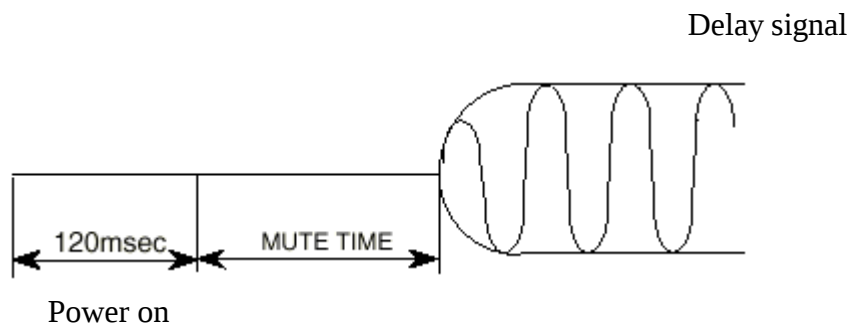
Automatic mute :



(a) Upon changing delay time



(b) Upon cancel sleep mode



(c) Upon power on

4.SLEEP mode

SLEEP data is :

H=clock and RAM stop to reduce circuit current (SLEEP mode)

L=normal operation

5.System reset

Automatically reset power-on. The reset time is about 120 m second.

Delay time is set at 147.5 m second.

Absolute maximum rating (Ta=25°C,unless otherwise noted)

symbol	paramatic	ratings	unit
Vcc	Supply voltage	6	V
Icc	Circuit current	100	mA
Pd	Power dissipation	1.7	W
Topr	Operating temperature	-20~75	°C
Tstg	Storage temperature	-25~125	°C

Recommended operating conditions

symbol	parameter	rating			unit
		Min.	Typ.	Max.	
VCC	Supply voltage	4.5	5	5.5	V
VDD	Supply voltage	4.5	5	5.5	V
VCC-VDD	Difference voltage	-0.3	0	0.3	V
fck	Clock frequency	1	2	3	MHz
V _{IH}	“H” input voltage	0.7V _{DD}	-	-	V
V _{IL}	“L” input voltage	-	-	0.3V _{DD}	V

Electrical characteristics

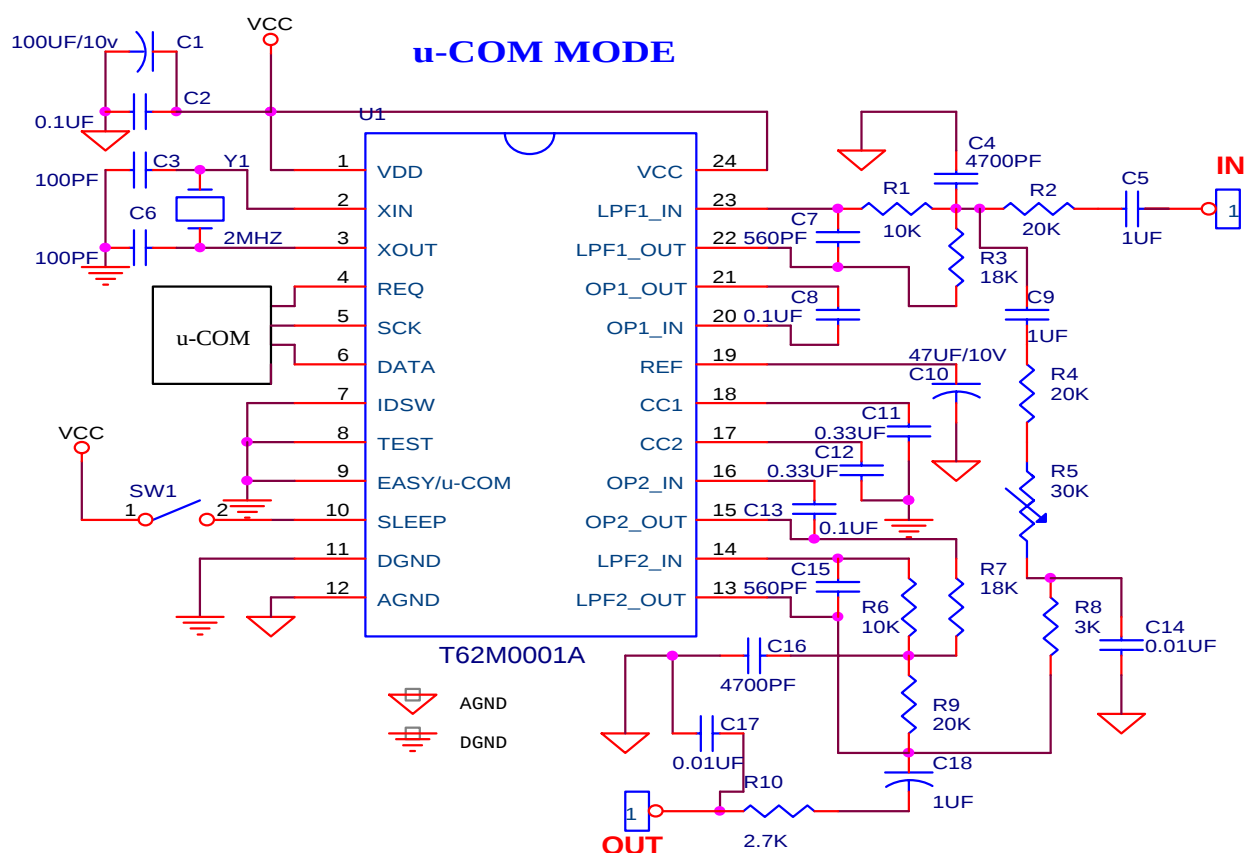
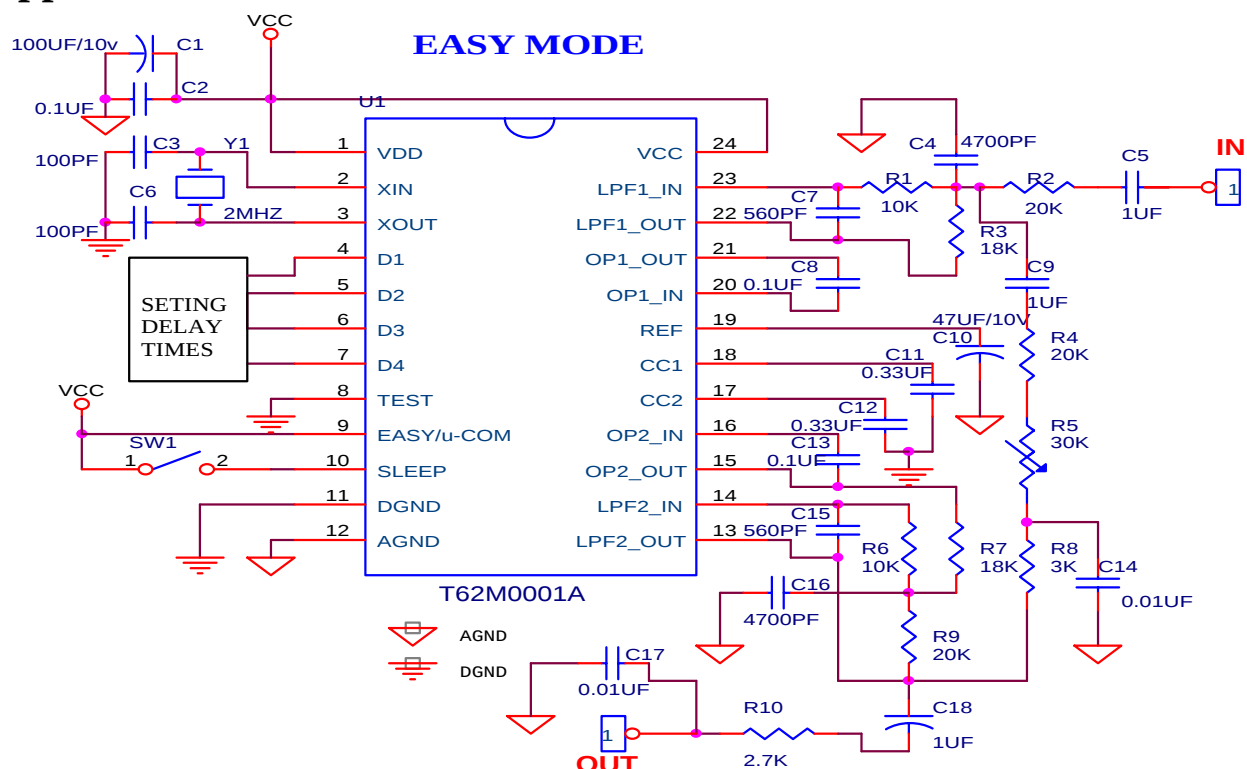
(V_{CC}=5.0V, f_{in}=1KHz, V_i=100mV_{rms}, f_{ck}=2MHz, T_a=25°C, unless otherwise noted)

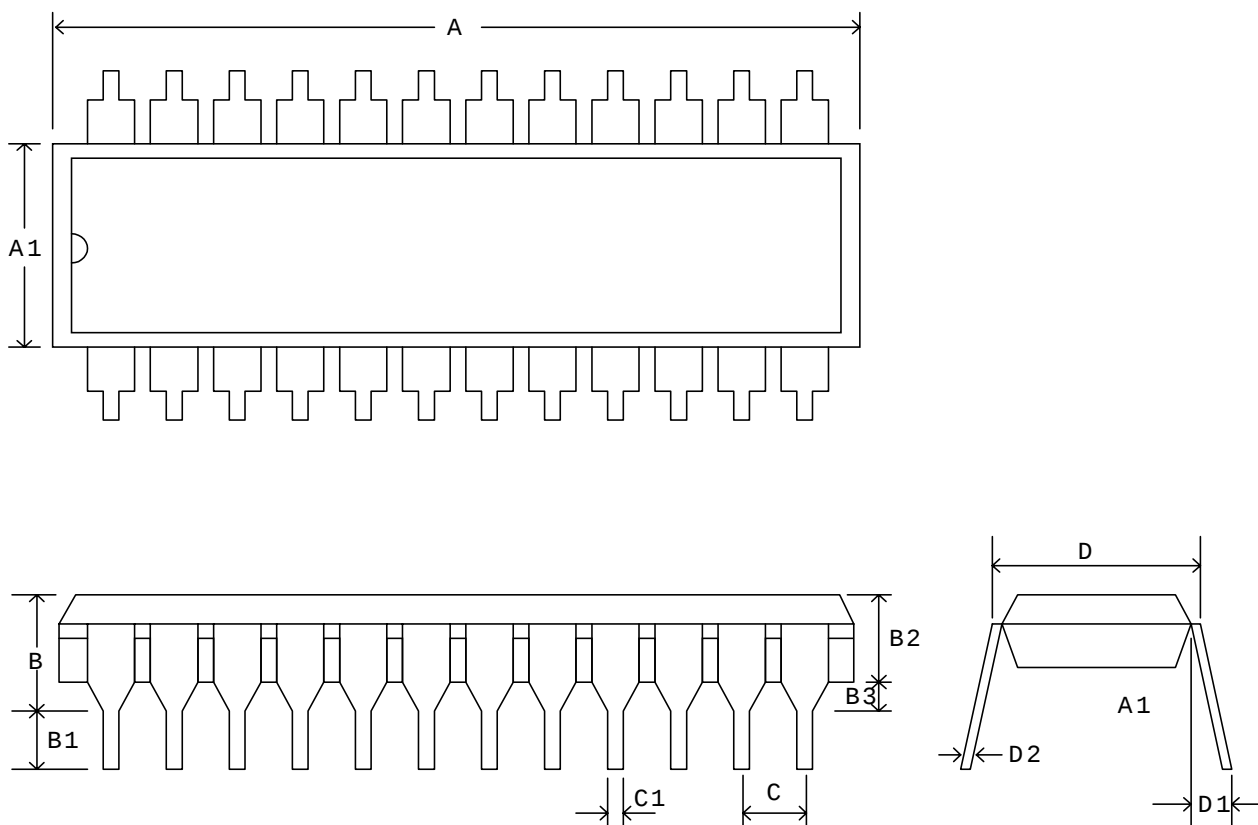
symbol	Parameter	Test condition		Min.	Typ.	Max.	unit
I _{CC}	Circuit current	No signal		-	13	20	mA
G _v	Voltage gain	R _L =47KΩ		-	-0.5	2.5	dB
I _{CCS}	Circuit current (Sleep Mode)	Sleep Mode		-	7	10	mA
V _{OMAX}	Max. output voltage	THD=10%		1.3	1.6	-	V _{rms}
THD	Output distorton	30KHz L.P.F.	f _s =666KHz	-	0.17	0.6	%
			f _s =333KHz	-	0.4	1.0	%
T _{MUTE}	Mute time	Upon changing delay time		508	528	548	ms
		Upon canceling sleep mode		508	528	548	ms
No	Output noise voltage	DIN-AUDIO(f _s =666KHz)		-	-90	-80	dBV

DC electrical characteristics

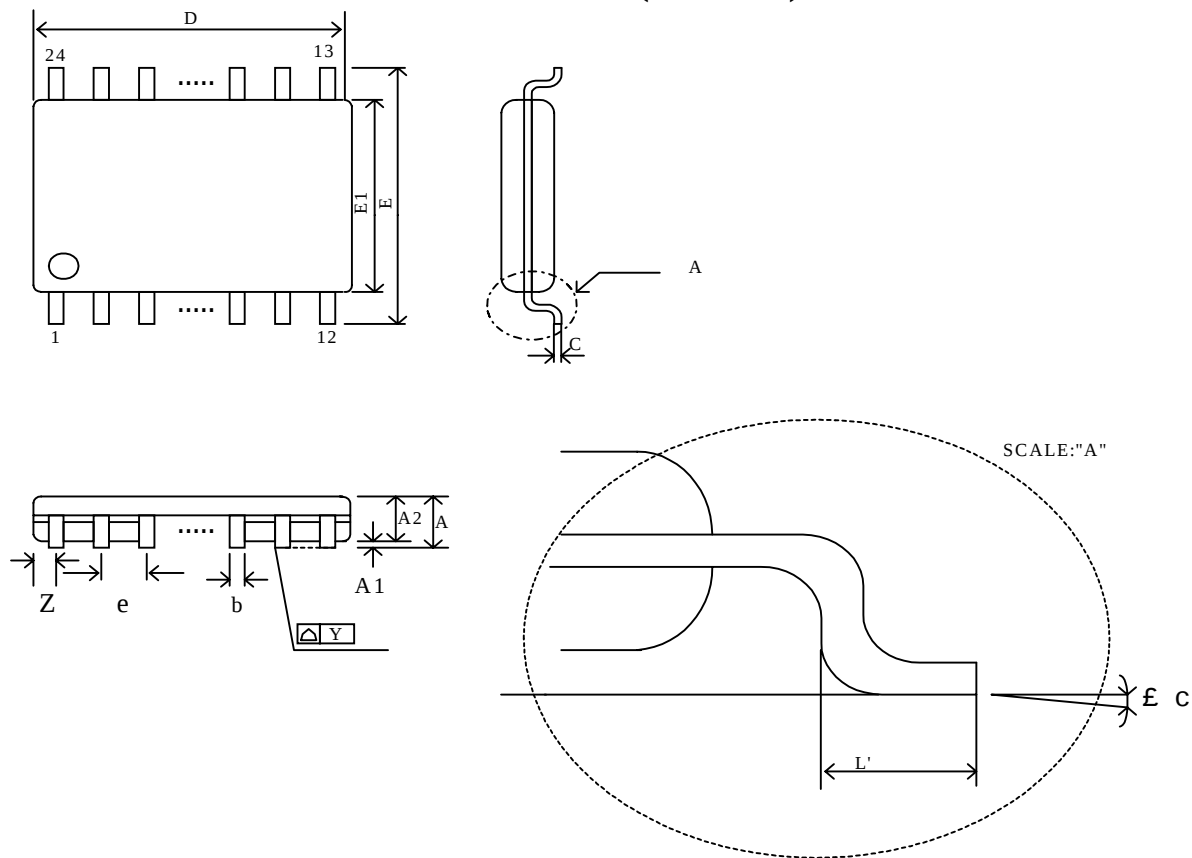
symbol	parameter	limits			unit
		Min.	Typ.	Max.	
V _{CC}	Supply voltage	4.5	5	5.5	V
I _{CC}	Circuit current	-	13	20	mA
V _{IH}	“H” input voltage	0.7V _{DD}	-	-	V
V _{IL}	“L” input voltage	-	-	0.3V _{DD}	V

Application circuit



IC package
T62M0001A(24-DIP)


Symbol	Dimension in mm			Dimension in inch		
	min.	typ.	max	min.	typ.	max.
A	-	32.26	-	-	1.270	-
A1	13.21	-	14.22	0.520	-	0.560
B	-	-	5.08	-	-	0.20
B1	3.18	-	-	0.125	-	-
B2	-	-	4.57	-	-	0.180
B3	0.51	-	-	0.020	-	-
C	2.24	2.54	2.84	0.088	0.100	0.112
C1	4.06	4.57	5.08	0.16	0.18	0.20
D	14.99	-	15.49	0.59	-	0.61
D1	-	0~15°	-	-	0~15°	-
D2	-	0.25	-	-	0.01	-

T62M0001A(24-SOP)


Symbol	Dimension in mm			Dimension in inch		
	min.	typ.	max	min.	typ.	max.
A	2.36	2.49	2.64	0.093	0.098	0.104
A1	0.1	--	0.30	0.004	--	0.012
A2	--	2.34	--	--	0.092	--
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.23	0.25	0.30	0.009	0.010	0.020
D	15.19	15.39	15.49	0.598	0.606	0.610
E	10.01	10.31	10.64	0.394	0.406	0.419
E1	7.39	7.49	7.59	0.291	0.295	0.299
e	--	1.27	--	--	0.05	--
L	0.38	0.81	1.27	0.015	0.032	0.050
Y	--	--	0.076	--	--	0.003
θ	0°	-	8°	0°	-	8°