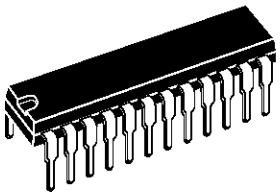
SGS-THOMSON MICROELECTRONICS

TEA6422

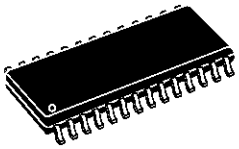
BUS-CONTROLLED AUDIO MATRIX

- 6 STEREO INPUTS
- 3 STEREO OUPUTS
- GAIN CONTROL 0dB/MUTE FOR EACH OUTPUT
- CASCADABLE (2 DIFFERENT ADDRESSES)
- SERIAL BUS CONTROLLED
- VERY LOW NOISE
- VERY LOW DISTORSION
- FULLY ESD PROTECTED



SHRINK 24
(Plastic Package)

ORDER CODE : TEA6422



SO28
(Plastic Micropackage)

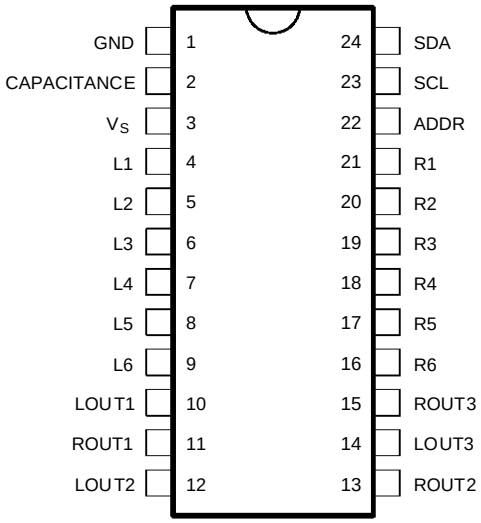
ORDER CODE : TEA6422D

DESCRIPTION

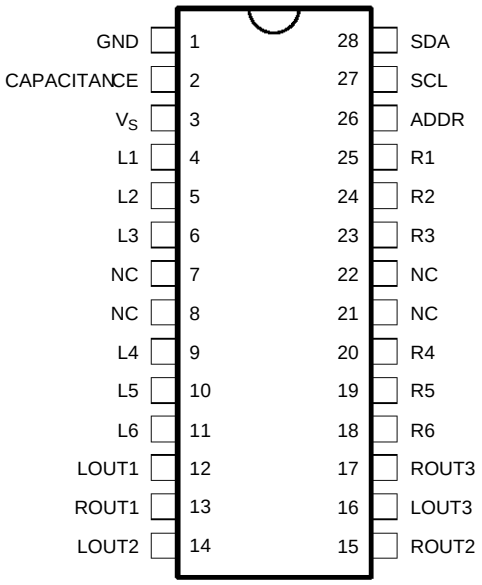
The TEA6422 switches 6 stereo audio inputs on 3 stereo outputs.
All the switching possibilities are changed through the I^2C BUS.

PIN CONNECTIONS

SDIP24

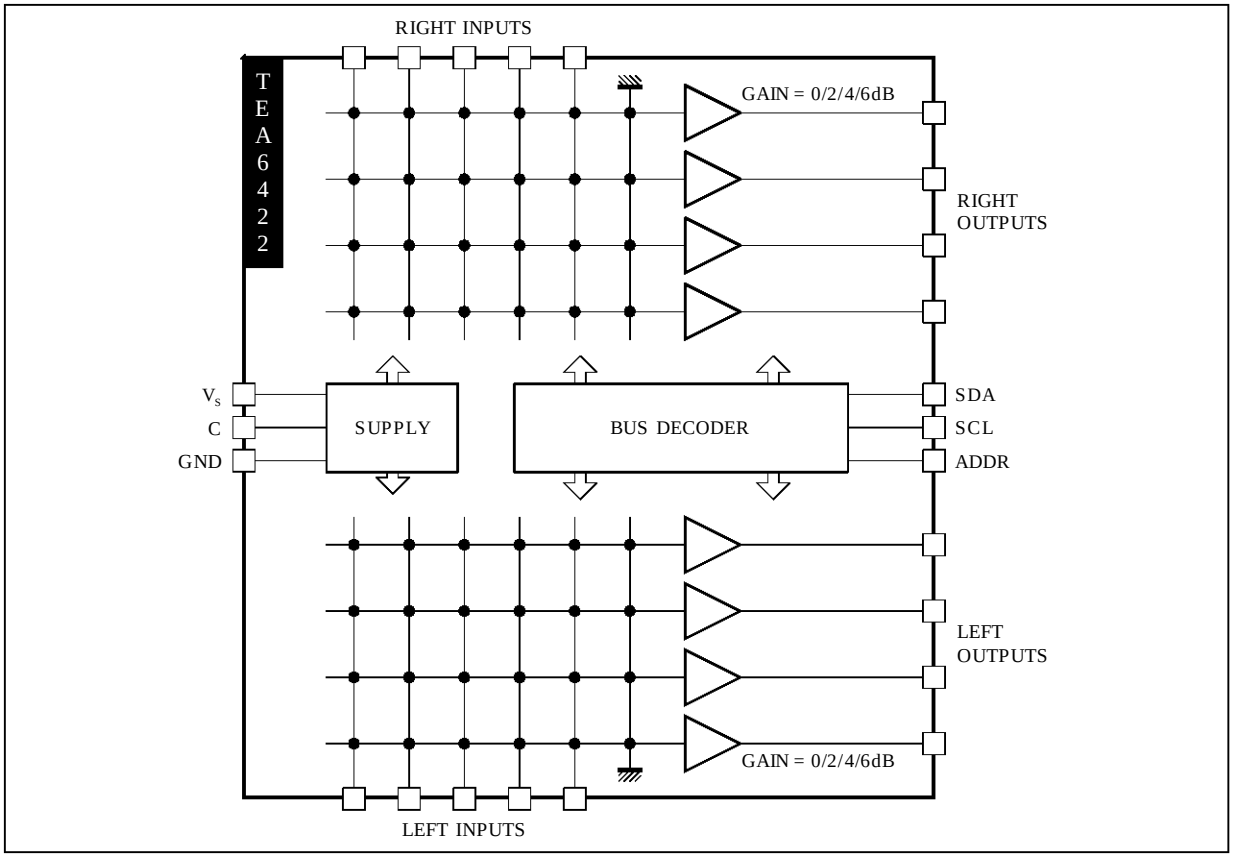


SO28



6422-01.EPS / 6422-02.EPS

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	Supply Voltage	12	V
T_{oper}	Operating Temperature	0, + 70	^oC
T_{stg}	Storage Temperature	- 20, + 150	^oC

6422-01.TBL

THERMAL DATA

Symbol	Parameter		Value	Unit
$R_{th(j-a)}$	Junction - ambient Thermal Resistance	SDIP24 SO28	75 75	$^oC/W$ $^oC/W$

6422-02.TBL

ELECTRICAL CHARACTERISTICS

$T_A = 25^oC$, $V_S = 9V$, $R_L = 10k\Omega$, $R_G = 600\Omega$, f = 1kHz (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
SUPPLY						
V_S	Supply Voltage		8	9	10.2	V
I_S	Supply Current			3	8	mA
SVR	Ripple Rejection	$V_{IN} = 500mV_{RMS}$, f = 1kHz	70	80		dB
MATRIX						
V_{IN}	Input DC Level			4.5		V
R_I	Input Resistance		30	50	100	kΩ
C_S	Channel Separation	$V_{IN} = 2V_{RMS}$, f = 1kHz	80	90		dB
OUTPUT BUFFER						
V_{OUT}	Output DC Level		4.2	4.5	4.8	V
R_{OUT}	Output Resistance			50	100	Ω
e_{NI}	Input Noise	BW = 20 - 20kHz, flat		3		μV
S/N	Signal to Noise Ratio	$V_{IN} = V_{OUT} = 1V_{RMS}$		110		dB
G	Gain		-1	0	+ 1	dB
d	Distortion	$V_{IN} = V_{OUT} = 1V_{RMS}$		0.01	0.05	%
V_{CL}	Clipping Level	d = 0.3%	2	2.5		V_{RMS}
R_L	Output Load Resistance		2			kΩ

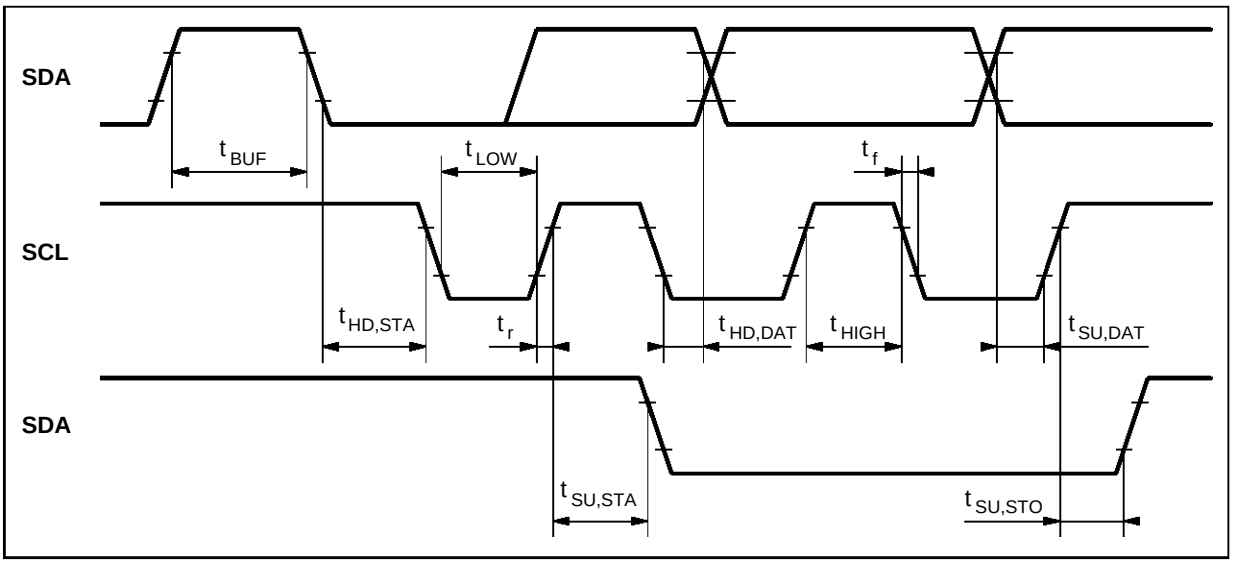
6422-03.TBL

I²C BUS CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Max.	Unit
SCL					
V_{IL}	Low Level Input Voltage		- 0.3	+ 1.5	V
V_{IH}	High Level Input Voltage		3.0	V_{CC} + 0.5	V
I_{LI}	Input Leakage Current	V_I = 0 to V_{CC}	- 10	+ 10	µA
f_{SCL}	Clock Frequency		0	100	kHz
t_R	Input Rise Time	1.5V to 3V		1000	ns
t_F	Input Fall Time	1.5V to 3V		300	ns
C_I	Input Capacitance			10	pF
SDA					
V_{IL}	Low Level Input Voltage		- 0.3	+ 1.5	V
V_{IH}	High Level Input Voltage		3.0	V_{CC} + 0.5	V
I_{LI}	Input Leakage Current	V_I = 0 to V_{CC}	- 10	+ 10	µA
C_I	Input Capacitance			10	pF
t_R	Input Rise Time	1.5V to 3V		1000	ns
t_F	Input Fall Time	1.5V to 3V		300	ns
V_{OL}	Low Level Output Voltage	I_{OL} = 3mA		0.4	V
t_F	Output Fall Time	3V to 1.5V		250	ns
C_L	Load Capacitance			400	pF
TIMING					
t_{LOW}	Clock Low Period		4.7		µs
t_{HIGH}	Clock High Period		4.0		µs
$t_{SU, DAT}$	Data Set-up Time		250		ns
$t_{HD, DAT}$	Data Hold Time		0	340	ns
$t_{SU, STO}$	Set-up Time from Clock High to Stop		4.0		µs
t_{BUF}	Start Set-up Time following a Stop		4.7		µs
$t_{HD, STA}$	Start Hold Time		4.0		µs
$t_{SU, STA}$	Start Set-up Time following Clock Low-to High Transition		4.7		µs

6422-04.TBL

Figure 1 : I²C Bus Timing



6422-04.EPS

POWER ON RESET

After power-on reset all outputs are in mute mode

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Reset	Start of Reset	Incr. V_{CC}			2.5	V
		Decr. V_{CC}			4.2	V
	End of Reset	Incr. V_{CC}	4.5			V

6422-05.TBL

SOFTWARE SPECIFICATION

1. Chip address

Address	HEX	ADDR
1001 1000	98	0
1001 1010	9A	1

2. Data bytes

Output select

X	0	0	X	X	I_2	I_1	I_0	Output 1
	0	1						Output 2
	1	0						Output 3

Input select

X	Q_1	Q0	X	X	0	0	0	Input 1
					0	0	1	Input 2
					0	1	0	Input 3
					0	1	1	Input 4
					1	0	0	Input 5
					1	0	1	Input 6
					1	1	0	Mute

6422-06.TBL

X = don't care - MSB is transmitted first
Example : 0 10 XX 100 connects outputs 3 with input 5.

Figure 2 : Distorsion Level versus Input Voltage

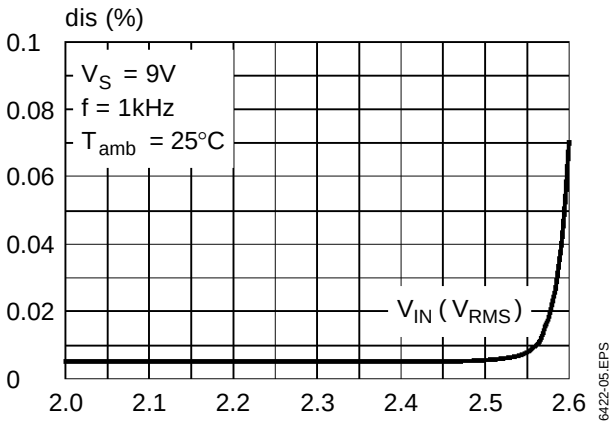


Figure 3 : Clipping Level versus Supply Voltage

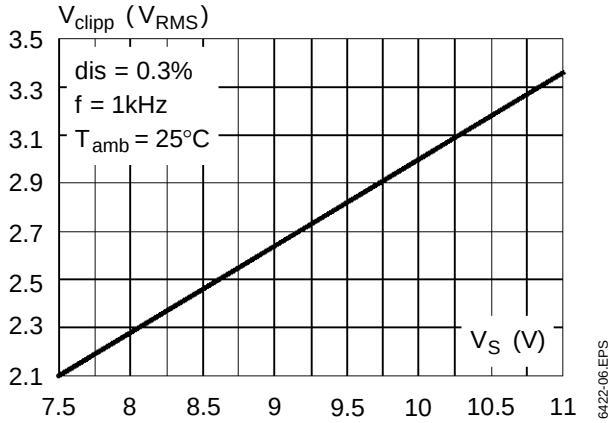
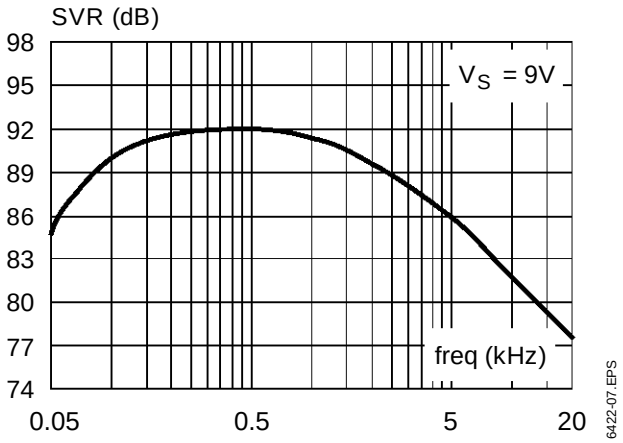


Figure 4 : Supply Voltage Rejection versus frequency (V_{IN} = 500mV_{RMS})



PIN CONFIGURATIONS (SDIP24 Package)

Figure 5 : Audio IN

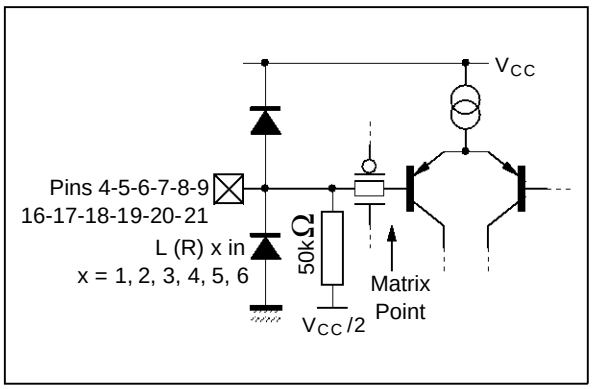


Figure 6 : Audio OUT

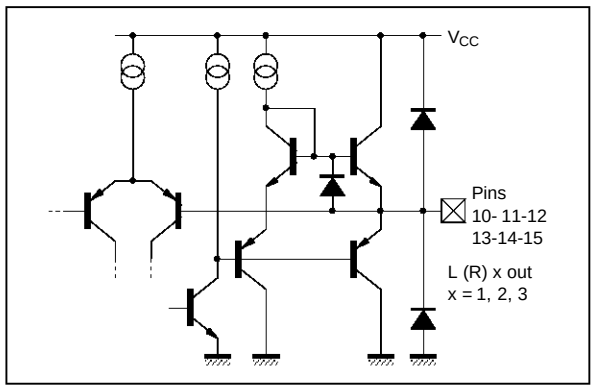


Figure 7 : ADDR

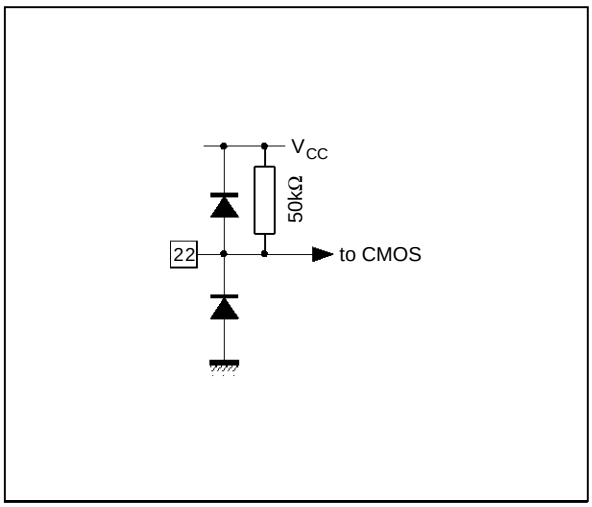
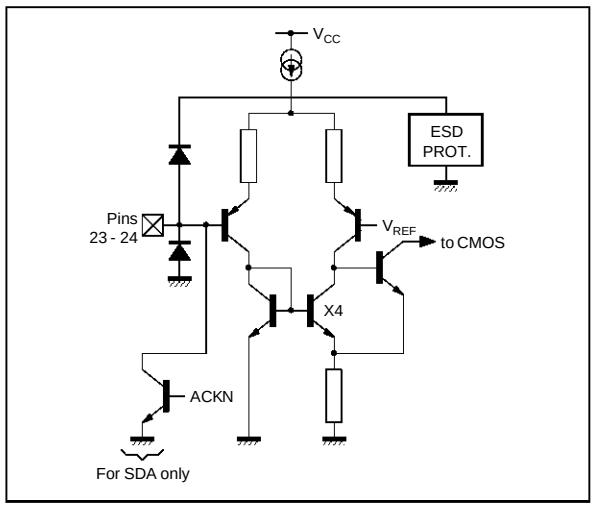
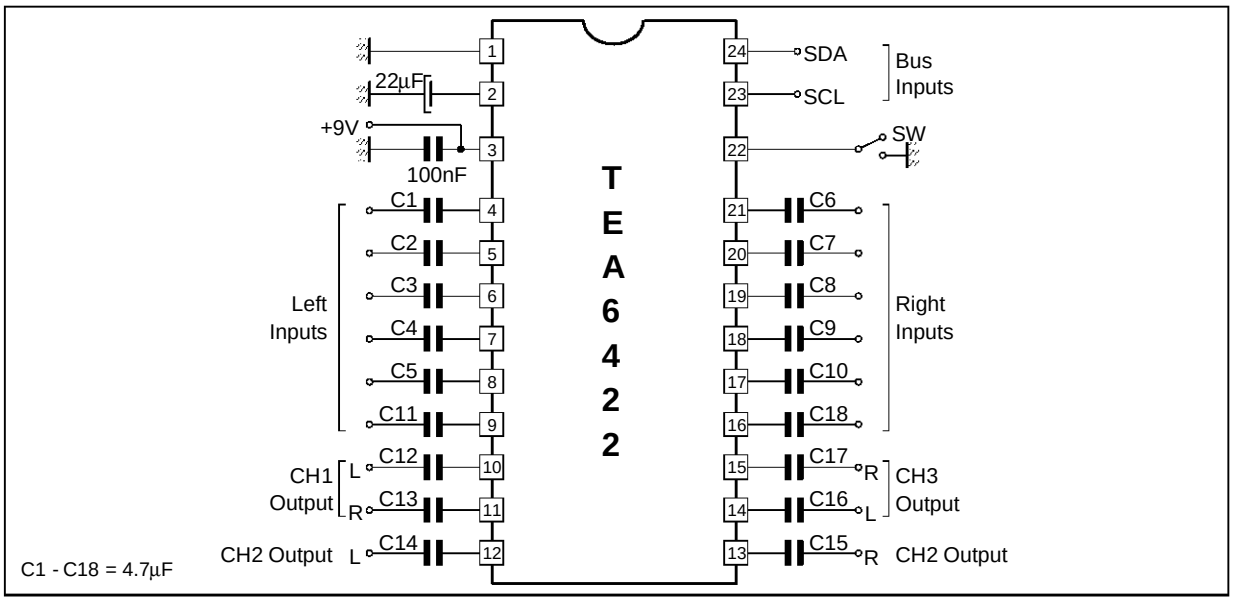


Figure 8 : Bus Inputs (SDA, SCL)

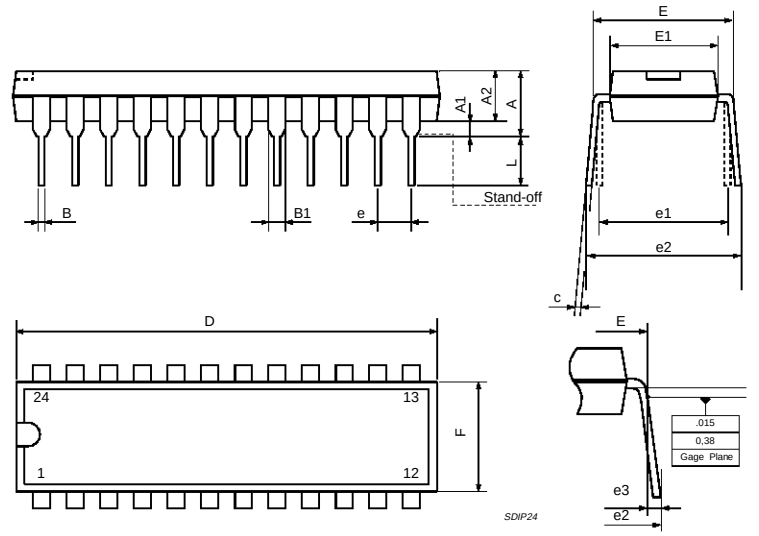


TYPICAL APPLICATION (SDIP24 Package)



PACKAGE MECHANICAL DATA

24 PINS - PLASTIC SHRINK



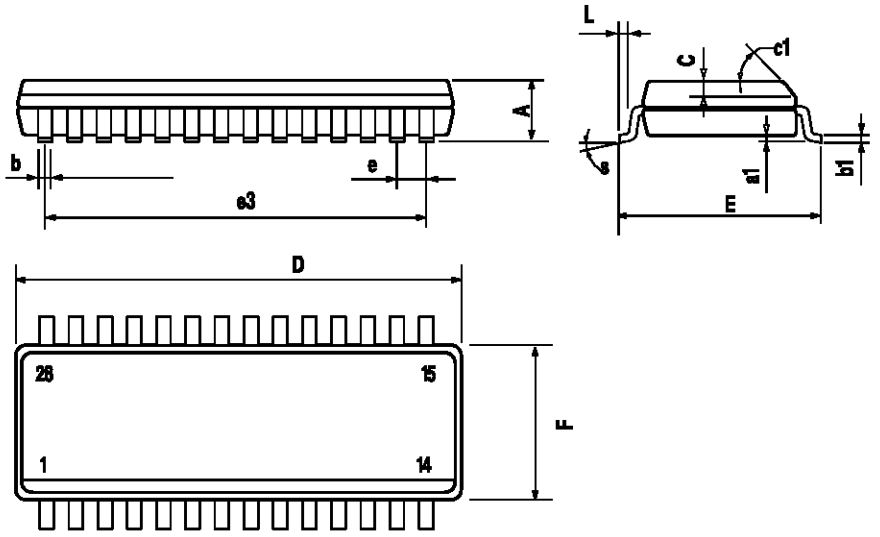
PMSDIP24.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			5.08			0.20
A1	0.51			0.020		
A2	3.05	3.30	4.57	0.120	0.130	0.180
B	0.36	0.46	0.56	0.0142	0.0181	0.0220
B1	0.76	1.02	1.14	0.030	0.040	0.045
C	0.23	0.25	0.38	0.0090	0.0098	0.0150
D	22.61	22.86	23.11	0.890	0.90	0.910
E	7.62		8.64	0.30		0.340
E1	6.10	6.40	6.86	0.240	0.252	0270
e		1.778			0.070	
e1		7.62			0.30	
e2			10.92			0.430
e3			1.52			0.060
L	2.54	3.30	3.81	0.10	0.130	0.150

SDIP24.TBL

PACKAGE MECHANICAL DATA

28 PINS - PLASTIC MICROPACKAGE (SO)



PM-SO28.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			2.65			0.104
a1	0.1		0.3	0.004		0.012
b	0.35		0.49	0.014		0.019
b1	0.23		0.32	0.009		0.013
C		0.5			0.020	
c1	45° (Typ.)					
D	17.7		18.1	0.697		0.713
E	10		10.65	0.394		0.419
e		1.27			0.050	
e3		16.51			0.65	
F	7.4		7.6	0.291		0.299
L	0.4		1.27	0.016		0.050
S	8° (Max.)					

SO28.TBL