



# TEA6422

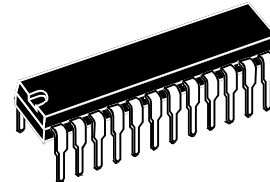
## BUS-CONTROLLED AUDIO MATRIX

- 6 Stereo Inputs
- 3 Stereo Outputs
- Gain Control 0 dB/Mute for each Output
- Cascadable (2 different addresses)
- Serial Bus Controlled
- Very Low Noise
- Very Low Distorsion
- Fully ESD Protected
- Wide Audio Dynamic Range (  $3 V_{RMS}$  )

### DESCRIPTION

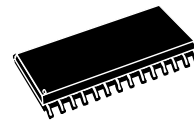
The TEA6422 switches 6 stereo audio inputs on 3 stereo outputs.

All the switching possibilities are changed through the I<sup>2</sup>C BUS.



**SHRINK DIP24**  
(Shrink Plastic Package)

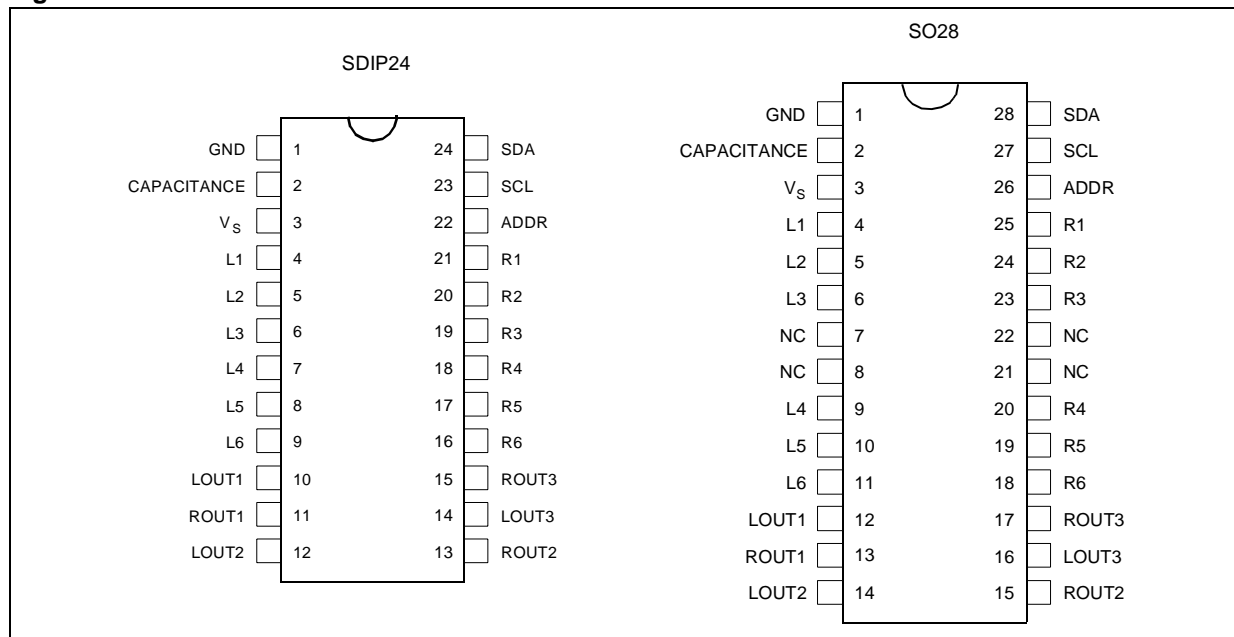
**ORDER CODE: TEA6422**



**SO28**  
(Plastic Monopackage)

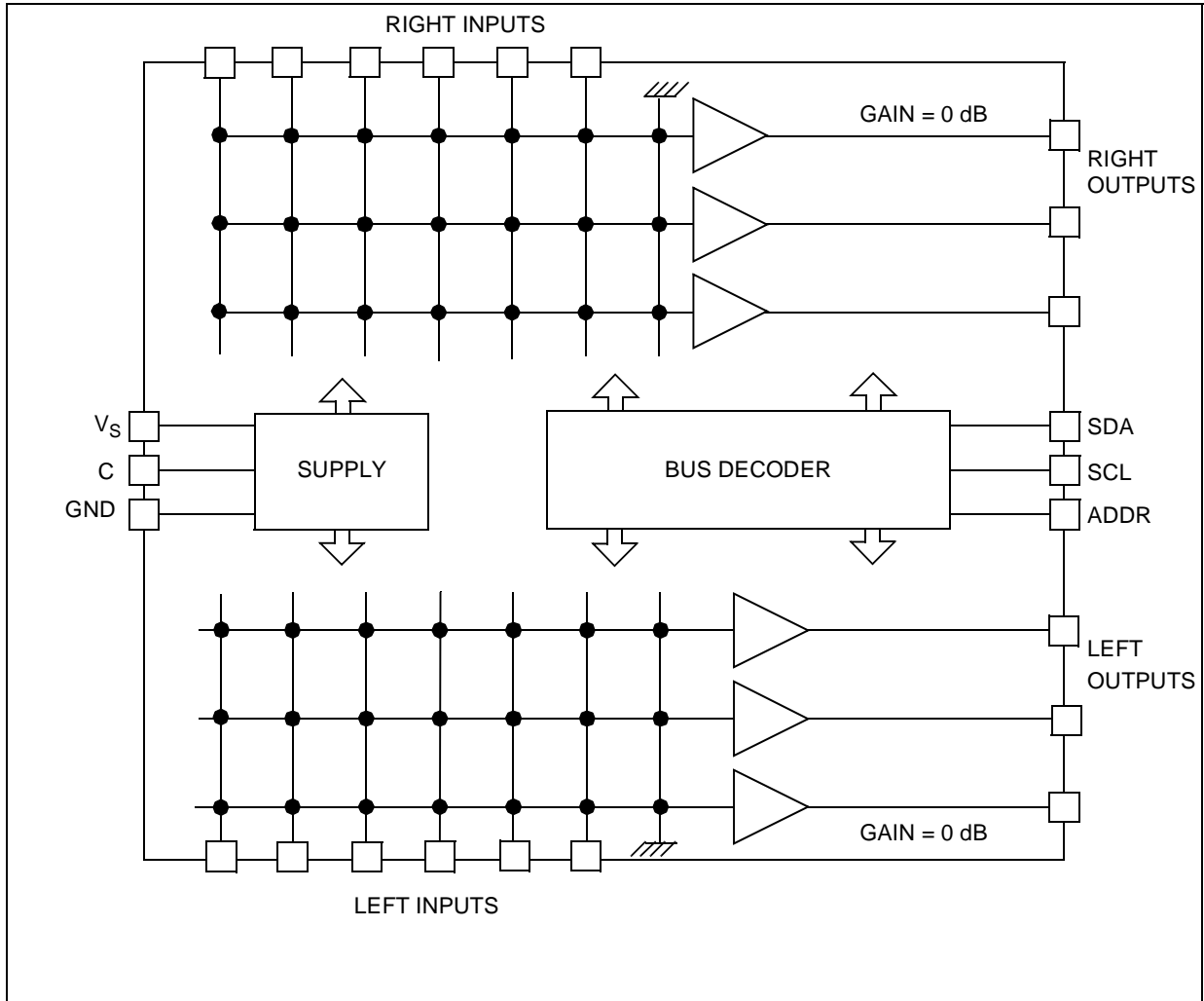
**ORDER CODE: TEA6422D**

**Figure 1. PIN CONNECTIONS**



# TEA6422

## BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	Supply Voltage	12	V
T <sub>oper</sub>	Operating Temperature	0, + 70	°C
T <sub>stg</sub>	Storage Temperature	- 20, + 150	°C

## THERMAL DATA

Symbol	Parameter	Value	Unit
R <sub>th(j-a)</sub>	Junction - ambient Thermal Resistance	SDIP24	75
		SO28	75

**ELECTRICAL CHARACTERISTICS**

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
--------	-----------	-----------------	------	------	------	------

**SUPPLY**

$V_S$	Supply Voltage		8	10	11	V
$I_S$	Supply Current			3	8	mA
SVR	Ripple Rejection	$V_{IN} = 500\text{mV}_{RMS}$ , $f = 1\text{kHz}$	70	80		dB

**MATRIX**

$V_{IN}$	Input DC Level			$V_{CC}/2$		V
$R_I$	Input Resistance		30	50	100	$\text{k}\Omega$
$C_S$	Channel Separation	$V_{IN} = 2V_{RMS}$ , $f = 1\text{kHz}$	80	90		dB

**OUTPUT BUFFER**

$V_{OUT}$	Output DC Level			$V_{CC}/2$		V
$R_{OUT}$	Output Resistance			50	100	$\Omega$
$e_{NI}$	Input Noise	BW = 20 - 20kHz, flat		3		$\mu\text{V}$
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	$d = 0.3\%$ , $V_S = 10\text{ V}$	2.8	3		$V_{RMS}$
$R_L$	Output Load Resistance		2			$\text{k}\Omega$

**I<sup>2</sup>C BUS CHARACTERISTICS**

Symbol	Parameter	Test Conditions	Min.	Max.	Unit
<b>SCL</b>					
V <sub>IL</sub>	Low Level Input Voltage		- 0.3	+ 1.5	V
V <sub>IH</sub>	High Level Input Voltage		3.0	V <sub>CC</sub> + 0.5	V
I <sub>LI</sub>	Input Leakage Current	V <sub>I</sub> = 0 to V <sub>CC</sub>	- 10	+ 10	μA
f <sub>SCL</sub>	Clock Frequency		0	100	kHz
t <sub>R</sub>	Input Rise Time	1.5V to 3V		1000	ns
t <sub>F</sub>	Input Fall Time	3V to 1.5V		300	ns
C <sub>I</sub>	Input Capacitance			10	pF

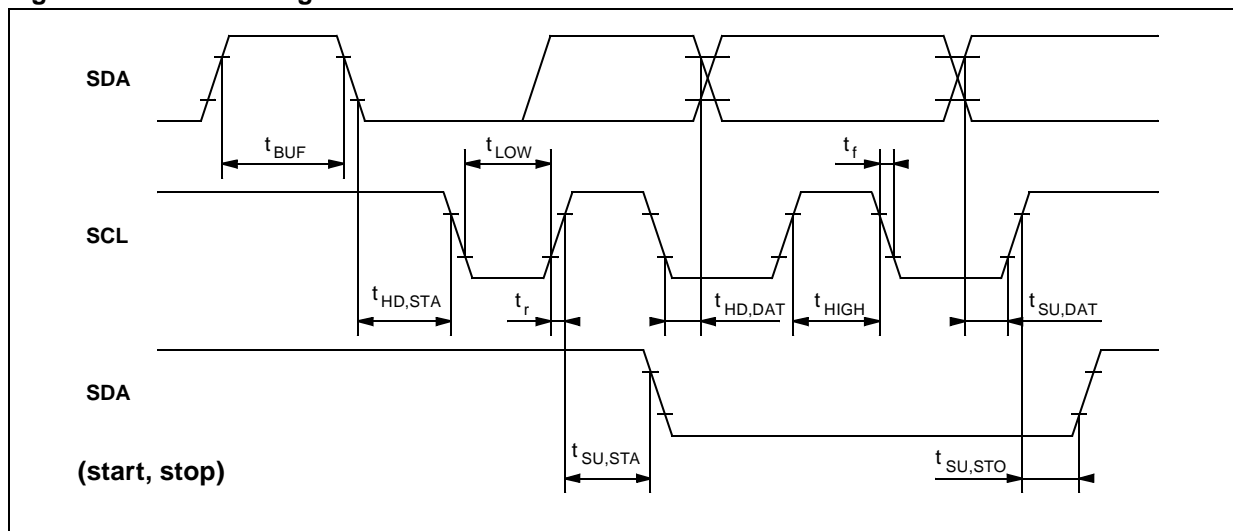
**SDA**

V <sub>IL</sub>	Low Level Input Voltage		- 0.3	+ 1.5	V
V <sub>IH</sub>	High Level Input Voltage		3.0	V <sub>CC</sub> + 0.5	V
I <sub>LI</sub>	Input Leakage Current	V <sub>I</sub> = 0 to V <sub>CC</sub>	- 10	+ 10	μA
C <sub>I</sub>	Input Capacitance			10	pF
t <sub>R</sub>	Input Rise Time	1.5V to 3V		1000	ns
t <sub>F</sub>	Input Fall Time	3V to 1.5V		300	ns
V <sub>OL</sub>	Low Level Output Voltage	I <sub>OL</sub> = 3mA		0.4	V
t <sub>F</sub>	Output Fall Time	3V to 1.5V		250	ns
C <sub>L</sub>	Load Capacitance			400	pF

**TIMING**

t <sub>LOW</sub>	Clock Low Period		4.7		μs
t <sub>HIGH</sub>	Clock High Period		4.0		μs
t <sub>SU, DAT</sub>	Data Set-up Time		250		ns
t <sub>HD, DAT</sub>	Data Hold Time		0	340	ns
t <sub>SU, STO</sub>	Set-up Time from Clock High to Stop		4.0		μs
t <sub>BUF</sub>	Start Set-up Time following a Stop		4.7		μs
t <sub>HD, STA</sub>	Start Hold Time		4.0		μs
t <sub>SU, STA</sub>	Start Set-up Time following Clock Low-to High Transition		4.7		μs

**Figure 2. I<sup>2</sup>C Bus Timing**



**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 <sub>CC</sub>			2.5	V
		Decr. V <sub>CC</sub>			4.2	V
	End of Reset	Incr. V <sub>CC</sub>	4.5			V

**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 <sub>2</sub>	I <sub>1</sub>	I <sub>0</sub>	Output 1 Output 2 Output 3
	0	1						
	1	0						

Input select

X	Q <sub>1</sub>	Q <sub>0</sub>	X	X	0	0	0	Input 1 Input 2 Input 3 Input 4 Input 5 Input 6 Mute
					0	0	0	
					0	0	1	
					0	1	0	
					0	1	1	
					1	0	0	
					1	0	1	
					1	1	0	

X = don't care - MSB is transmitted first

**Example :** 010XX100 connects output 3 with input 5.

Figure 3. Distorsion Level versus Input Voltage

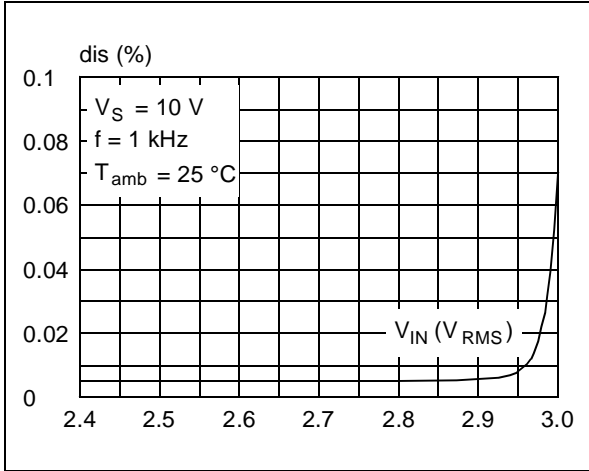


Figure 5. Clipping Level versus Supply Voltage

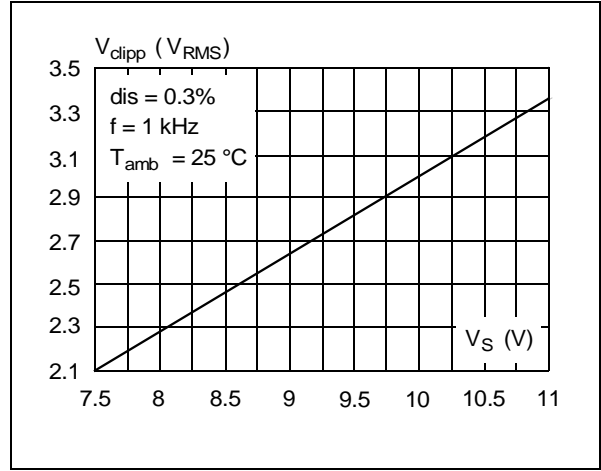
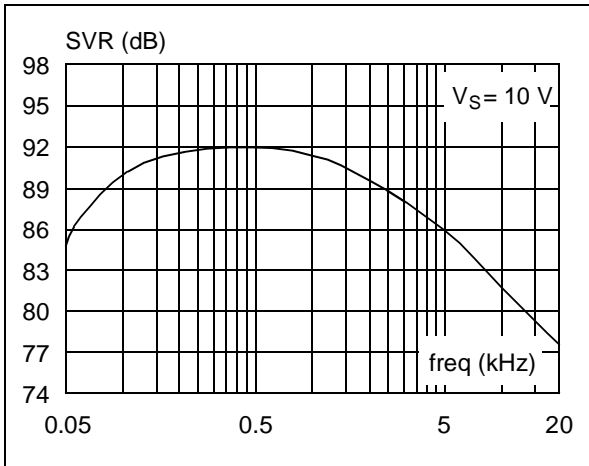
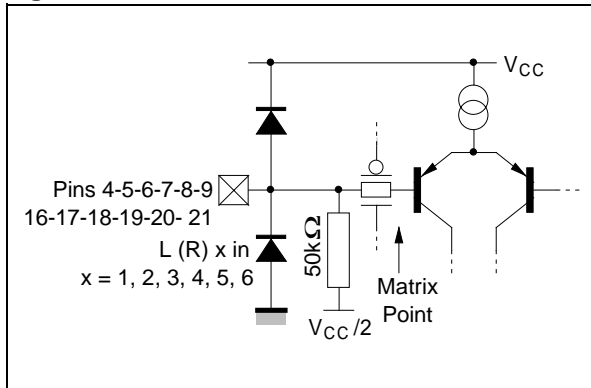


Figure 4. Supply Voltage Rejection versus Frequency ( $V_{IN} = 500\text{ mV}_{RMS}$ )

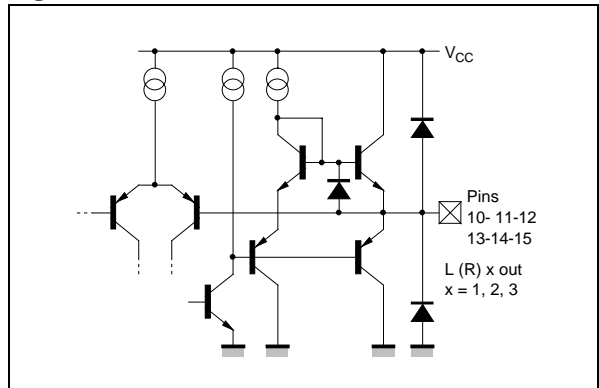


**PIN CONFIGURATIONS (SDIP24 Package)**

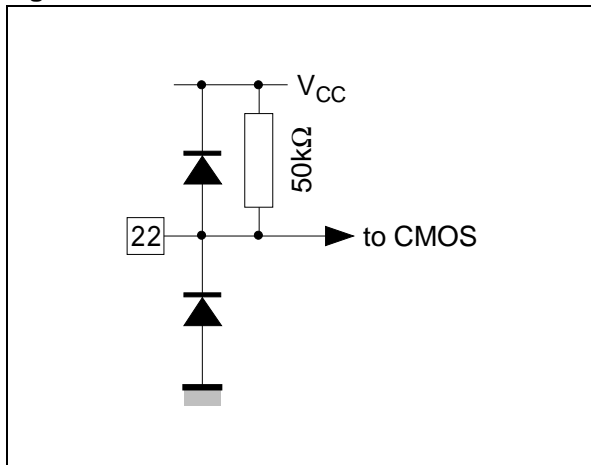
**Figure 6. Audio IN**



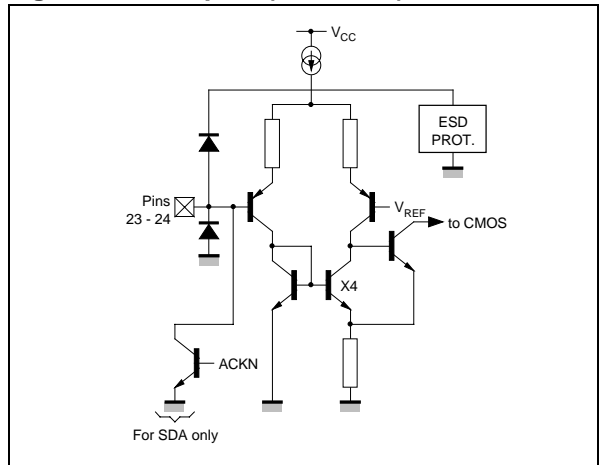
**Figure 8. Audio OUT**



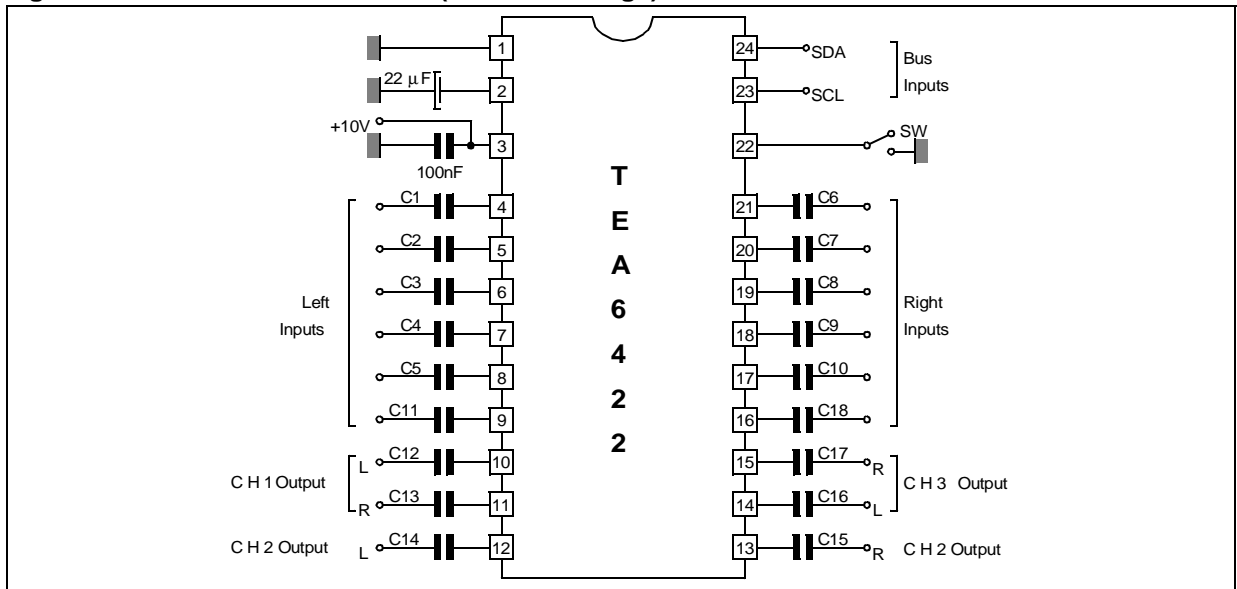
**Figure 7. ADDR**



**Figure 9. Bus Inputs (SDA, SCL)**



**Figure 10. TYPICAL APPLICATION (SDIP24 Package)**

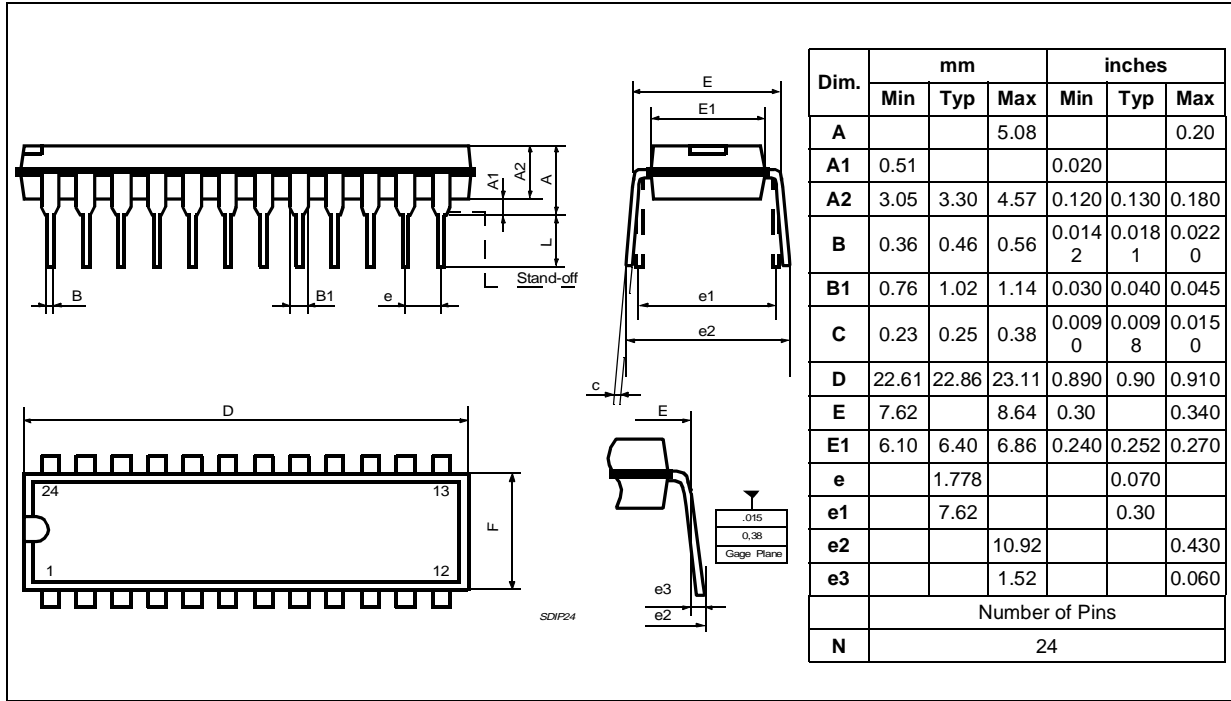


**TEA6422**

**PACKAGE MECHANICAL DATA**

24 PINS - PLASTIC SHRINK

**Figure 11. 24-Pin Shrink Plastic Dual In Line Package**

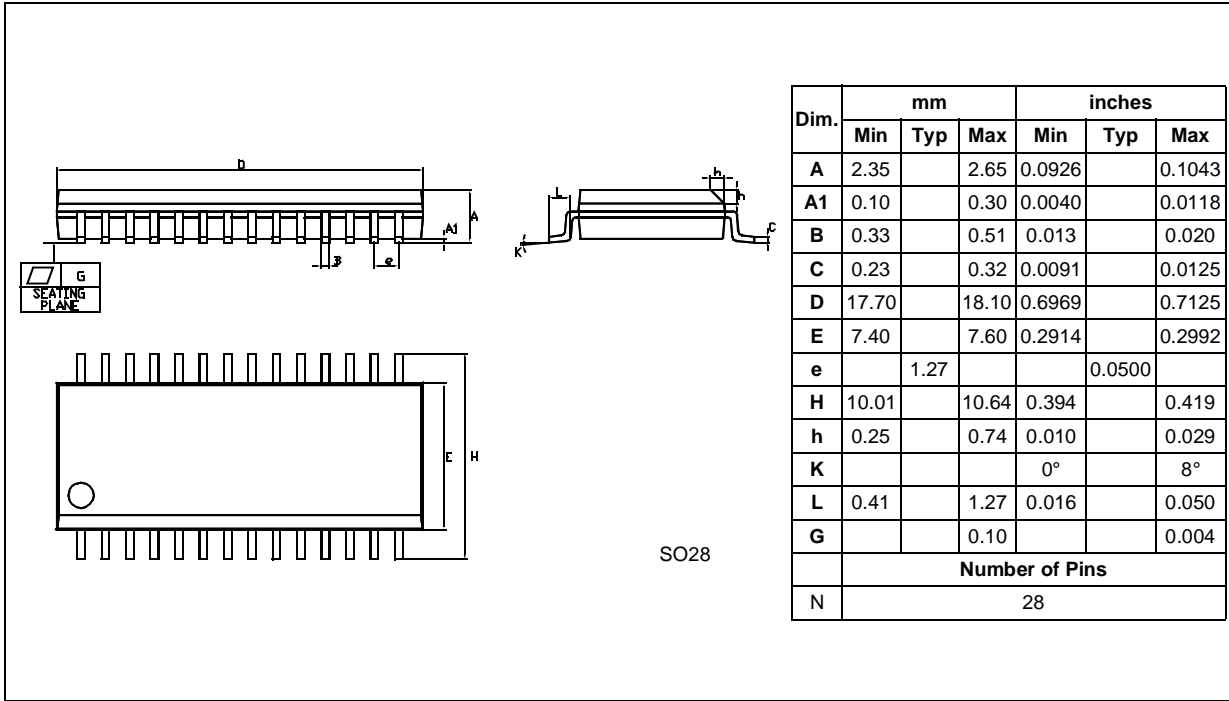




**PACKAGE MECHANICAL DATA**

28 PINS - PLASTIC MICROPACKAGE

**Figure 12. 28-Pin Plastic Small Outline Package, 300-mil Width**



Dim.	mm			inches		
	Min	Typ	Max	Min	Typ	Max
A	2.35		2.65	0.0926		0.1043
A1	0.10		0.30	0.0040		0.0118
B	0.33		0.51	0.013		0.020
C	0.23		0.32	0.0091		0.0125
D	17.70		18.10	0.6969		0.7125
E	7.40		7.60	0.2914		0.2992
e		1.27		0.0500		
H	10.01		10.64	0.394		0.419
h	0.25		0.74	0.010		0.029
K				0°		8°
L	0.41		1.27	0.016		0.050
G			0.10			0.004
<b>Number of Pins</b>						
N	28					

SO28

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