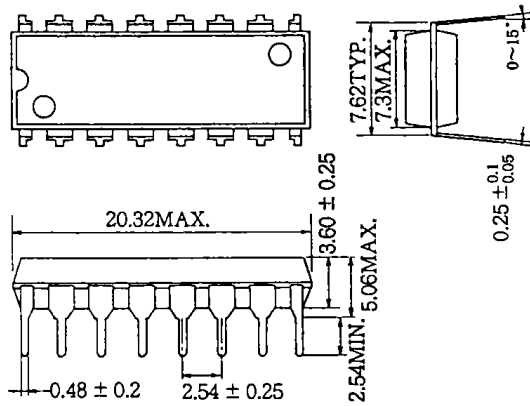


# SM1400AP

FOR GUITAR TUNER LSI

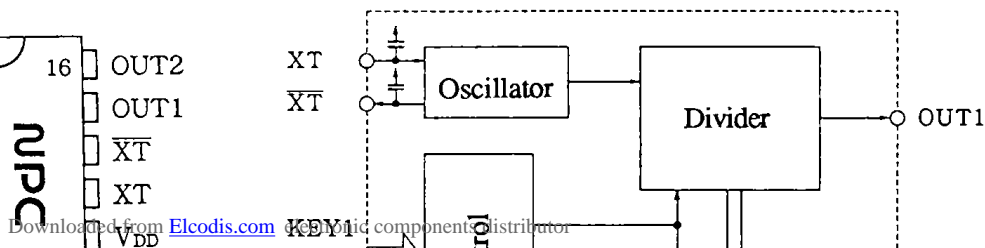
OS LSI for the guitar tuner for tuning an electric guitar, acoustic guitars.

## ■ PACKAGE DIMENSION (UNIT: mm)



## ■ BLOCK DIAGRAM

TOP VIEW



**SM1400AP**

DN

DESCRIPTION	PIN#	NAME	DESCRIPTION
Input terminal for tone tuned.	6 to 11	KEY6 to KEY1	Tone code input terminals
Generate the reference tone when REF is $V_{DD}$ level on-chip pull-down resistance.		12	$V_{DD}$
Ground	13	XT	Power-supply +5V
Testing terminals. Normally "Open"	14	$\bar{X}\bar{T}$	To connect crystal (4.25216MHz)
	15	OUT1	On-chip capacitor for oscillation
	16	OUT2	Output of reference tone
			Signal output for meter display

**MAXIMUM RATINGS**

PARAMETER	SYMBOL	LIMIT	UNIT
	$V_{DD}-V_{SS}$	-0.3 to +70	V
	$V_{IN}$	$V_{SS} \leq V_{IN} \leq V_{DD}$	V
	$T_{OPR}$	-20 to +60	°C
	$T_{STG}$	-55 to +125	°C
	$T_{SLD}$	260±5	°C
	$t_{SLD}$	10.5±0.5	Sec

**CHARACTERISTICS**

( $T_a=25^\circ\text{C}$ ,  $V_{SS}=0\text{V}$ ,  $V_{DD}=5\text{V}$   
 $f_0=4.25216\text{MHz}$  unless otherwise noted)

PARAMETER	SYMBOL	CONDITION	LIMIT			UNIT	NOTE
			MIN	TYP	MAX		
	$V_{DD}$		4.5	5.0	5.5	V	
	$I_{DD}$	Fig. 1		2	5	mA	When reference tone is out.
	$V_{IH}$		$V_{DD}-0.4$			V	T-IN, KEY1 to 6, REF
	$V_{IL}$				0.4		
	$I_{IH}$	$V_{IH}=5.0\text{V}$	50		500	µA	KEY1 to 6, REF
	$I_{IL}$	$V_{IL}=0.0\text{V}$			0.1		
	$I_{OH}$	$V_{OH}=4.5\text{V}$	1.0			mA	OUT1, OUT2
	$I_{OL}$	$V_{OL}=0.5\text{V}$	1.0				
	$T_{ON}$	for 5 correct PULSE			1	sec	
	$V_{DOB}$				4.5	V	
	$f_{VS}$	$V_{DD}=0.1\text{V}$			20	ppm	note 1

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FUNCTION

guitar and base is tuned by setting the KEY1 to KEY6 as follows:

Scale Selection table

1 = V<sub>DD</sub>, 0 = V<sub>SS</sub> or OPEN

KEY3	KEY4	KEY5	KEY6	Base guitar	* guitar
0	0	0	1	41.2Hz • 4E	82.4Hz • 6E
0	0	1	0	55.0Hz • 5A	110.0Hz • 5A
0	1	0	0	73.4Hz • 2D	146.8Hz • 4D
1	0	0	0	98.0Hz • 1G	196.0Hz • 3G
0	0	0	0	—	246.9Hz • 2B
0	0	0	0	—	329.6Hz • 1E

\* Electric guitar & Acoustic guitar

REF OUTPUT FUNCTION

output while REF is V<sub>DD</sub> which is selected by KEY1 to KEY6 as shown in reference tone is being output, tuning is not available.

1 = V<sub>DD</sub>, 0 = V<sub>SS</sub> or OPEN

KEY3	KEY4	KEY5	KEY6	Reference frequency
0	0	0	1	438 [Hz]
0	0	1	0	439
0	1	0	0	440
1	0	0	0	441
0	0	0	0	442
0	0	0	0	443

FOR METER DISPLAY FUNCTION

REF-IN terminal is compared with tone selected by KEY1 to KEY6, then output from OUT2 as follows.

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CIRCUIT (EXAMPLE)

