

### 1 FEATURES

- HIGH PERFORMANCE, STABLE 57KHz FILTER
- HIGH SELECTIVITY
- FLAT GROUP DELAY
- HIGH PERFORMANCE LIMITER
- VERY FEW EXTERNAL COMPONENTS
- 4.332MHz CLOCK OSCILLATOR (8.664MHz OPTIONAL)

### 2 DESCRIPTION

The TDA7332 is an RDS filter, realized in switched capacitor technique.

The 4 biquad stage architecture is working with 4.332MHz clock.

Figure 1. Package

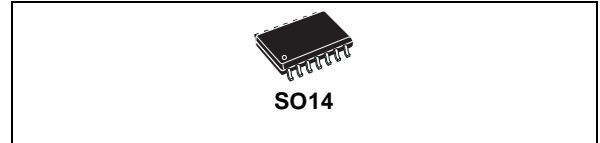


Table 1. Order Codes

Part Number	Package
TDA7332D	SO14
TDA7332D013TR	Tape & Reel
TDA7332DIE1	Chip on water

Optionally a 8.664MHz crystal can be used.

The filter has a center frequency of 57KHz and a bandwidth of 3KHz. Input 2nd order antialiasing filter and output smoothing filter are provided.

#### Block Diagram

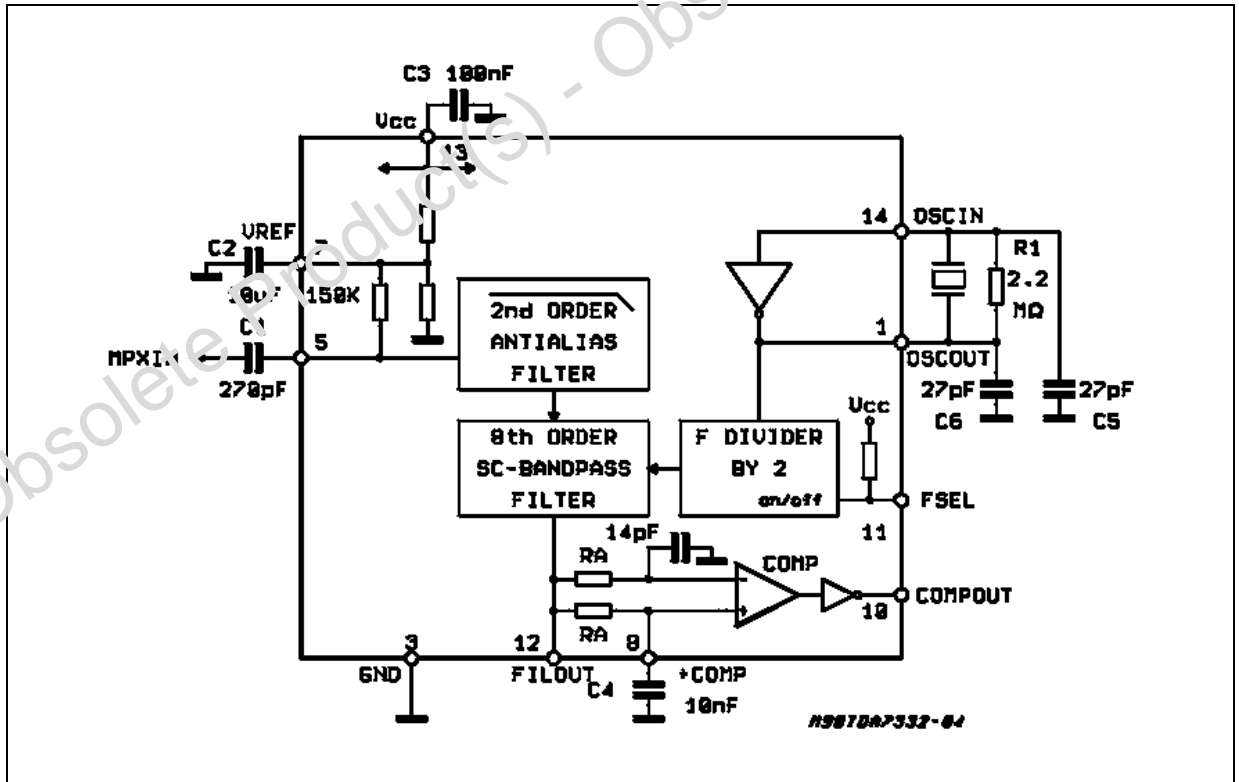


Figure 2. Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
$V_S$	Supply Voltage	7	V
$T_{op}$	Operating Temperature Range	-40 to 85	°C
$T_{stg}$	Storage Temperature	-40 to 150	°C

Table 2. Thermal Data

Symbol	Parameter	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case	200	°C

Figure 3. Pin Connection (Top view)

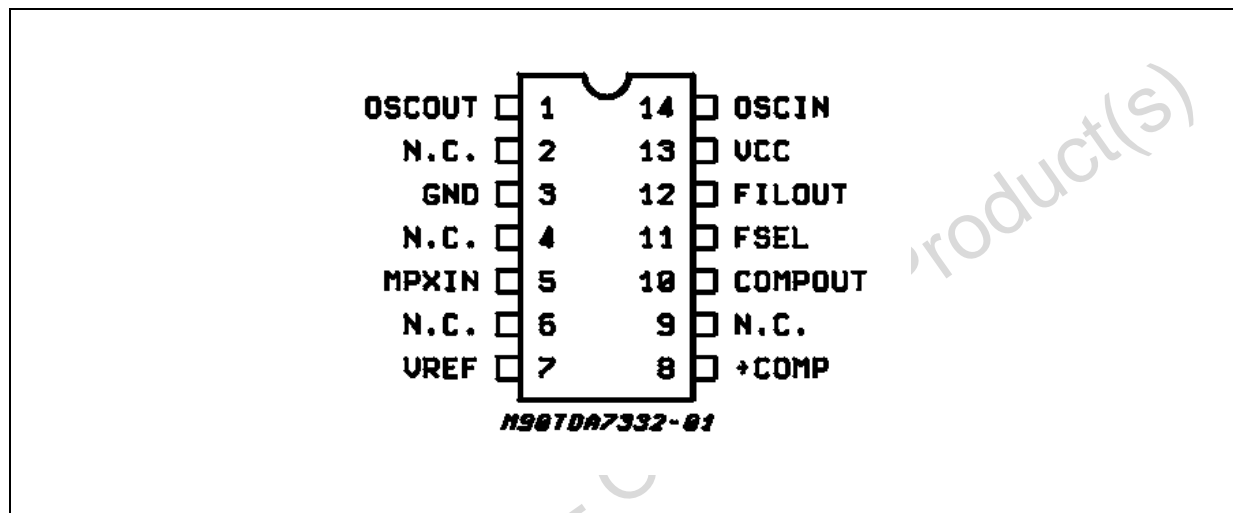


Figure 4. Bonding Pad Locations (Top view)

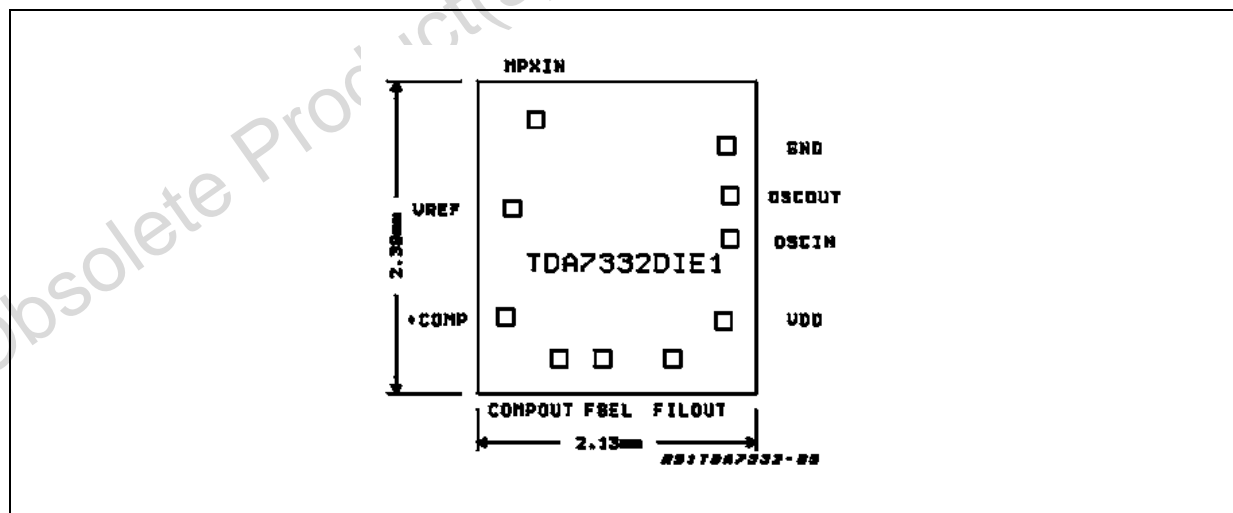


Table 3. Electrical Characteristics ( $V_{CC} = 5V$ ,  $T_{amb} = 25^\circ C$ ;  $f_{osc} = 4.332MHz$ ;  $V_{IN} = 20mV_{rms}$  unless

otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>SUPPLY SECTION</b>						
V <sub>CC</sub>	Supply Voltage		4.5	5	5.5	V
I <sub>S</sub>	Supply Current		6	9	14	mA
<b>FILTER</b>						
F <sub>C</sub>	Center Frequency		56.5	57	57.5	KHz
BW	3dB Bandwidth		2.5	3	3.5	KHz
G	Gain	f = 57KHz	18	20	22	dB
A	Attenuation	Δf = ±4KHz	18	22		dB
		f = 38KHz; V <sub>i</sub> = 500mVrms	50	80		dB
		f = 67KHz; V <sub>i</sub> = 250mVrms	35	50		dB
ΔPh	Phase non linearity	A (see note1)		0.5	5	DEG
		B (see note1)		1	7.5	DEG
		C (see note1)		2	10	DEG
R <sub>i</sub>	Input Impedance		100	160	200	KΩ
S/N	Signal to Noise Ratio	V <sub>i</sub> = 3mVrms	30	40		dB
V <sub>i</sub>	Input Signal	f = 19KHz; T <sub>3</sub> < -40dB (see note2)			1	Vrms
		f = 57KHz (RDS + ARI)			50	mVrms
R <sub>L</sub>	Load Impedance	Pin 12	100			KΩ
<b>LIMITER</b>						
RA	Resistance pin 8-12		15	21	28	KΩ
V <sub>OL</sub>	Comp. Output LOW	I <sub>O</sub> = +0.5mA			1	V
V <sub>OH</sub>	Comp. Output HIGH	I <sub>O</sub> = -0.5mA	4			V
	Duty Cycle	V <sub>i</sub> = 1mVrms		50		%
<b>OSCILLATOR</b>						
F <sub>OSC</sub>	Oscillator Frequency	F <sub>SEL</sub> = Open		4.332		MHz
		F <sub>SEL</sub> = Closed to Ground		8.664		MHz
	Output Amplitude			4.5		V <sub>PP</sub>
V <sub>CLL</sub>	Clock Input Level LOW				1	V
V <sub>OLH</sub>	Clock Input Level HIGH		4			V

CRYSTAL TYPE = EURO QUARTZ

Note (1):

The phase non linearity is defined as:  $DPh = | -2 ff2 + ff1 + ff3 |$   
 where ffx is the input-output phase difference at the frequency fx (x = 1,2,3)

Table 4.

Measure	f1 (KHz)	f2 (KHz)	f3 (KHz)	ΔPh max
A	56.5	57	57.5	<5°
B	56	57	58	<7.5°
C	55.5	57	58.5	<10°

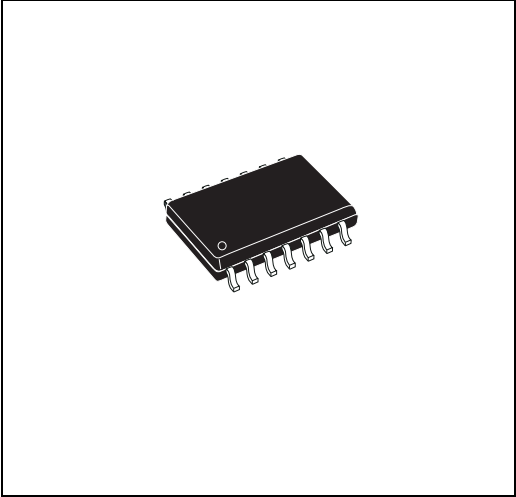
Note (2): The 3th harmonic (57KHz) at the output (pin12) must be less than -40dB in respect to the input signal plus gain.

Figure 5. SO14 Mechanical Data & Package Dimensions

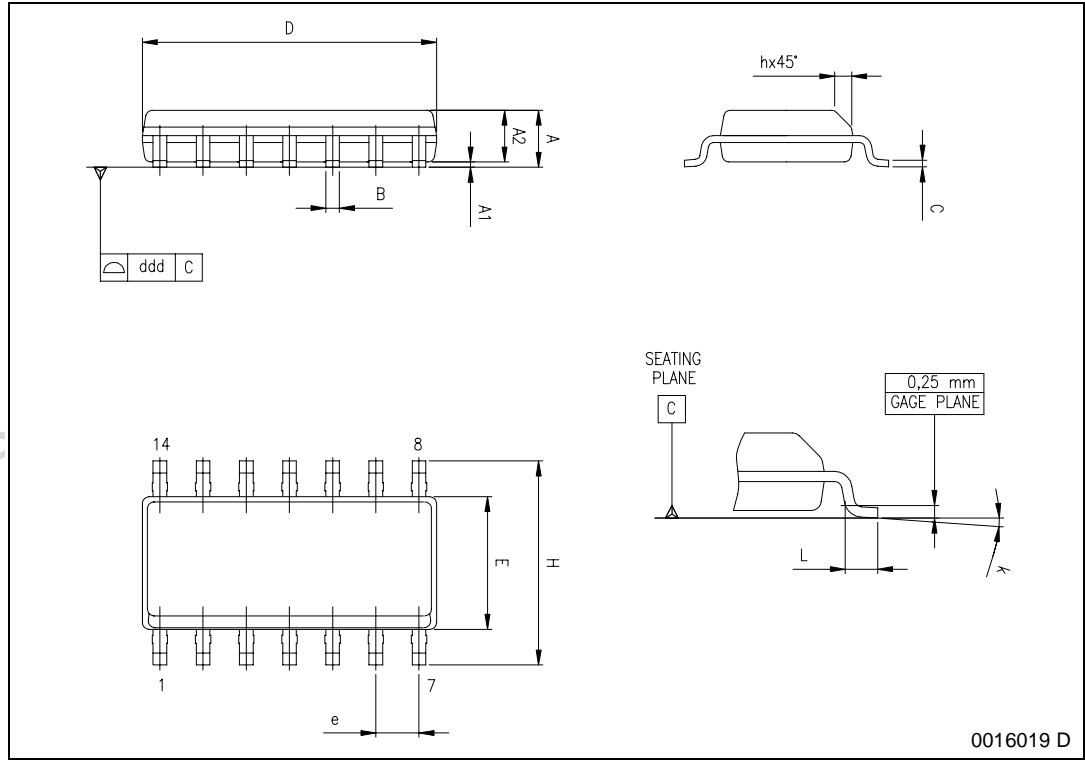
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.35		1.75	0.053		0.069
A1	0.10		0.30	0.004		0.012
A2	1.10		1.65	0.043		0.065
B	0.33		0.51	0.013		0.020
C	0.19		0.25	0.007		0.01
D (1)	8.55		8.75	0.337		0.344
E	3.80		4.0	0.150		0.157
e		1.27			0.050	
H	5.8		6.20	0.228		0.244
h	0.25		0.50	0.01		0.02
L	0.40		1.27	0.016		0.050
k	0° (min.), 8° (max.)					
ddd			0.10			0.004

(1) "D" dimension does not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.15mm per side.

**OUTLINE AND MECHANICAL DATA**



**SO14**



0016019 D

**Table 5. Revision History**

Date	Revision	Description of Changes
September 2003	1	First Issue
September 2004	2	Deleted DIP 14 package and part number TDA7332. Aligned the graphic style to be compliant with the new "Corporate Technical Publications Design Guide"

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