

24-Bit Stereo Audio D/A Converter

Features

- Single power supply voltage: 3V~5V
- Low power consumption
- Low distortion
- Low clock jitter sensitivity
- High SNR ratio and dynamic range
- Low harmonic distortion
- Wide temperature range
- Control feature for click and Pops
- On-chip digital de-emphasis for 32, 44.1 and 48kHz
- 16-pin NSOP package

Applications

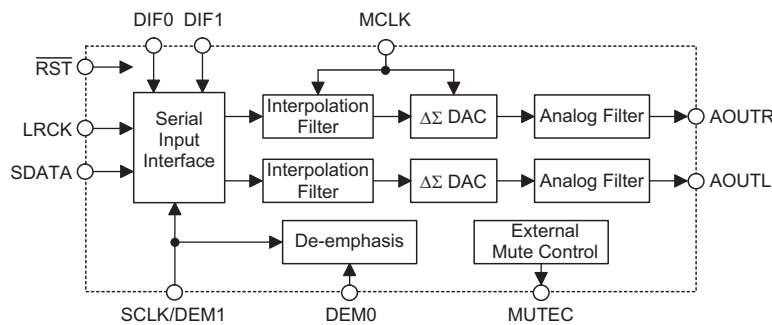
- DVD players
- Home theater systems
- Digital TV
- Digital set top boxes
- MP3 players
- CD players
- Automotive systems

General Description

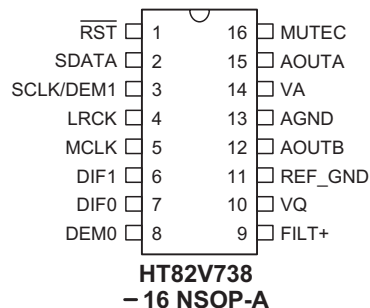
The HT82V738 is a high performance audio DAC converter. It provides digital de-emphasis (32, 44.1 and 48kHz), external mute control and adjustment for serial data and clock. The HT82V738 accepts data at audio rates up to 96kHz. It performs within a wide dynamic

range, high SNR ratio and has low clock jitter sensitivity. HT82V738 is an ideal DAC for DVD players, MP3 players and set-top box systems. It is also pin-compatible with CS4340.

Block Diagram



Pin Assignment



Pin Description

Pin No.	Pin Name	I/O	Description																																																				
1	RST	I	Reset																																																				
2	SDATA	I	Serial data																																																				
3	SCLK/DEM1	I	Serial clock/de-emphasis																																																				
4	LRCK	I	Left/right clock																																																				
5	MCLK	I	Master clock																																																				
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9	FILT+	I	Positive voltage reference																																																				
10	VQ	I	Quiescent voltage																																																				
11	REF_GND	I	Reference ground																																																				
12	AOUTB	O	Analog output B																																																				
13	AGND	I	Analog ground																																																				
14	VA	I	Analog power																																																				
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16	MUTEC	O	Mute control																																																				

Absolute Maximum Ratings

Supply Voltage	$V_{SS}-0.3V$ to $V_{SS}+6.0V$	Storage Temperature	$-50^{\circ}C$ to $125^{\circ}C$
Input Voltage	$V_{SS}-0.3V$ to $V_{DD}+0.3V$	Operating Temperature	$-10^{\circ}C$ to $70^{\circ}C$

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Electrical Characteristics

Analog Characteristics

 $T_a = -10^{\circ}C$ to $70^{\circ}C$

Symbol	Parameter	Test Conditions		Base-rate Mode			High-rate Mode			Unit
		V_{DD}	Conditions	Min.	Typ.	Max.	Min.	Typ.	Max.	
Dynamic Performance										
	Dynamic Range (18~24-bit)	5V	Unweighted	—	93	—	—	92	—	dB
			A-weighted	—	95	—	—	95	—	
	Dynamic Range (16-bit)		Unweighted	—	91	—	—	88	—	
			A-weighted	—	94	—	—	94	—	
THD+N	Total Harmonic Distortion+Noise (18~24-bit)	5V	—	—	-88	—	—	-88	—	dB
	Total Harmonic Distortion+Noise (16-bit)		—	—	-86	—	—	-86	—	
	Interchannel Isolation	5V	—	—	90	—	—	90	—	dB
Dynamic Performance										
	Dynamic Range (18~24-bit)	3V	Unweighted	—	91	—	—	90	—	dB
			A-weighted	—	94	—	—	91	—	
	Dynamic Range (16-bit)		Unweighted	—	90	—	—	88	—	
			A-weighted	—	92	—	—	90	—	
THD+N	Total Harmonic Distortion+Noise (18~24-bit)	3V	—	—	-88	—	—	-88	—	dB
	Total Harmonic Distortion+Noise (16-bit)		—	—	-86	—	—	-86	—	
	Interchannel Isolation	3V	—	—	90	—	—	90	—	dB

Analog Characteristics

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V_{DD}	Conditions				
Analog Output							
	Full Scale Output Voltage	—	—	—	0.7VA	—	V_{PP}
V_Q	Quiescent Voltage	—	—	—	0.5VA	—	VDC
	Interchannel Gain Mismatch	—	—	—	0.1	—	dB
	Gain Drift	—	—	—	100	—	ppm/ $^{\circ}C$
R_L	AC-load Resistance	—	—	3	—	—	k Ω
C_L	Load Capacitance	—	—	—	—	100	pF

Digital Characteristics

Ta=-10°C to 70°C

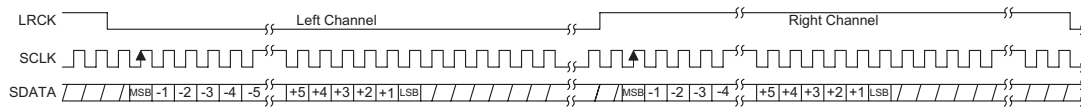
Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Unit
		V _{DD}	Conditions				
V _{IH}	High-level Input Voltage	5V	—	2.0	—	—	V
		3V	—	2.0	—	—	V
V _{IL}	Low-level Input Voltage	5V	—	—	—	0.8	V
		3V	—	—	—	—	V
I _{IN}	Input Leakage Current	—	—	—	—	±10	μA
	Input Capacitance	—	—	—	8	—	pF
Power Ratio							
V _A	DC Power Supply	—	—	2.7	5.0	5.5	V
V _{IND}	Digital Input Voltage	—	—	-0.3	—	V _A +0.4	mA

Power Characteristics

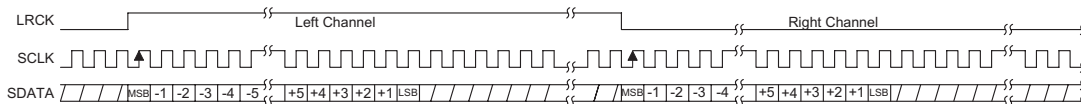
Symbol	Parameter	Test Conditions		Base-rate Mode			High-rate Mode			Unit
		V _{DD}	Conditions	Min.	Typ.	Max.	Min.	Typ.	Max.	
I _A	Power Supply Current	3V	Normal	—	10	—	—	10	—	mA
			Power-down	—	30	—	—	30	—	μA
		5V	Normal	—	15	—	—	15	—	mA
			Power-down	—	60	—	—	60	—	μA
I _A	Power Dissipation	3V	Normal	—	30	—	—	30	—	mW
			Power-down	—	0.09	—	—	0.09	—	
		5V	Normal	—	75	—	—	75	—	mW
			Power-down	—	0.3	—	—	0.3	—	

Timing Diagrams
I²S Mode

- 16-bit data and INT SCLK=32Fs, MCLK/LRCK=512, 256 or 128
- Up to 24-bit data and SCLK=48Fs, MCLK/LRCK=384 or 192

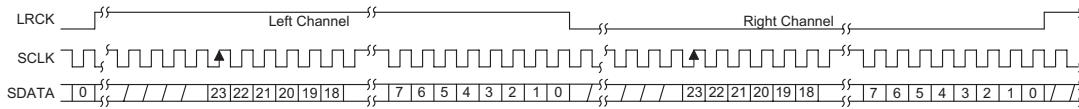

Left Justified 24-Bit Mode

- INT SCLK=64Fs, MCLK/LRCK=512, 256 or 128
- INT SCLK=48Fs, MCLK/LRCK=384 or 192



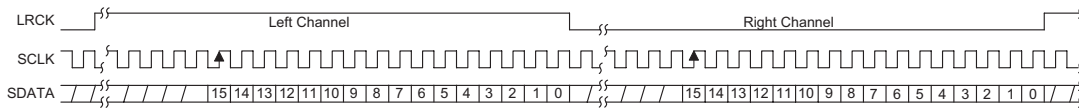
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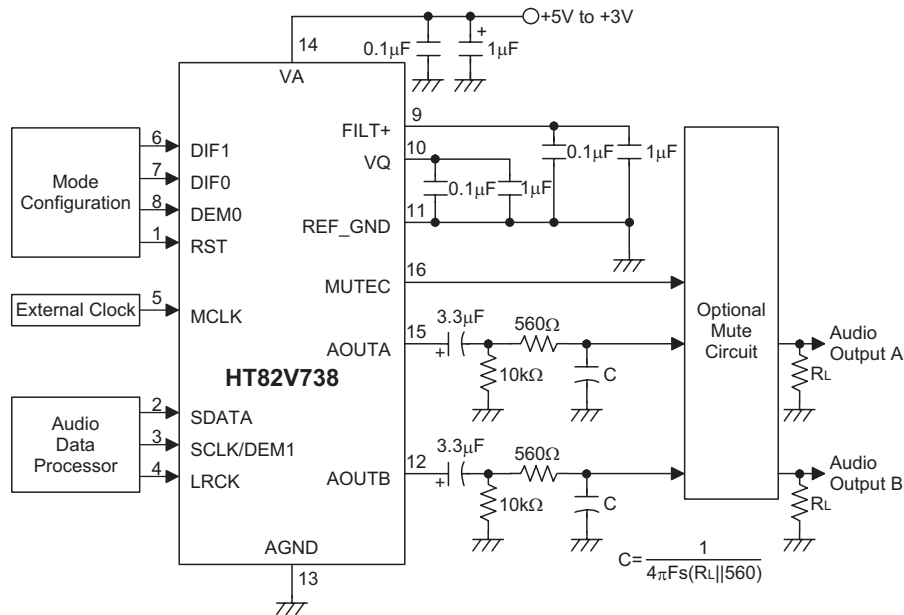


Right Justified 16-Bit Mode

- INT SCLK=32Fs, MCLK/LRCK=512, 256 or 128
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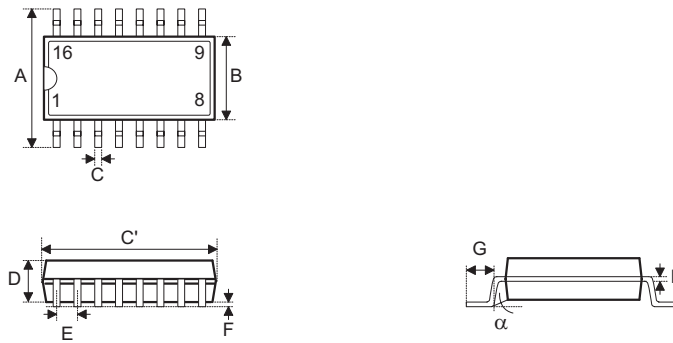


Application Circuits



Package Information

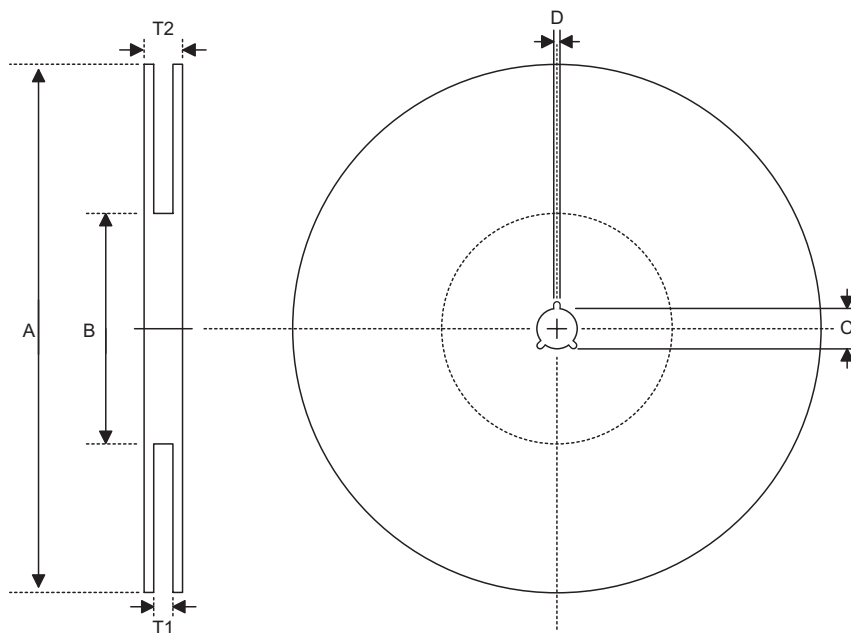
16-pin NSOP (150mil) Outline Dimensions



Symbol	Dimensions in mil		
	Min.	Nom.	Max.
A	228	—	244
B	149	—	157
C	14	—	20
C'	386	—	394
D	53	—	69
E	—	50	—
F	4	—	10
G	22	—	28
H	4	—	12
α	0°	—	10°

Product Tape and Reel Specifications

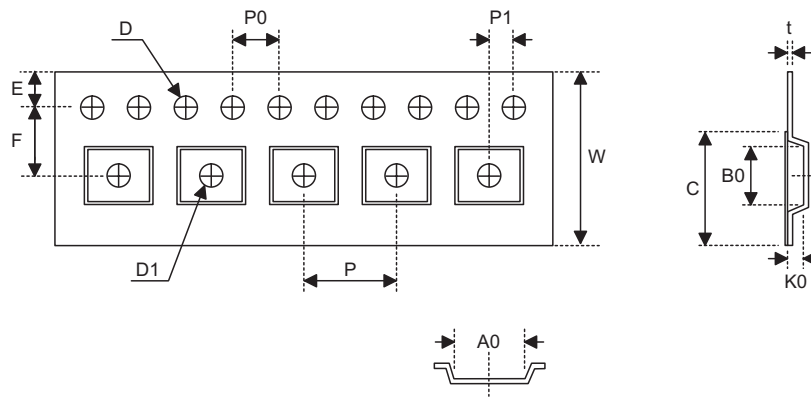
Reel Dimensions



SOP 16N (150mil)

Symbol	Description	Dimensions in mm
A	Reel Outer Diameter	330±1.0
B	Reel Inner Diameter	62±1.5
C	Spindle Hole Diameter	13.0+0.5 -0.2
D	Key Slit Width	2.0±0.5
T1	Space Between Flange	16.8+0.3 -0.2
T2	Reel Thickness	22.2±0.2

Carrier Tape Dimensions



SOP 16N (150mil)

Symbol	Description	Dimensions in mm
W	Carrier Tape Width	16.0±0.3
P	Cavity Pitch	8.0±0.1
E	Perforation Position	1.75±0.1
F	Cavity to Perforation (Width Direction)	7.5±0.1
D	Perforation Diameter	1.55±0.1
D1	Cavity Hole Diameter	1.5±0.25
P0	Perforation Pitch	4.0±0.1
P1	Cavity to Perforation (Length Direction)	2.0±0.1
A0	Cavity Length	6.5±0.1
B0	Cavity Width	10.3±0.1
K0	Cavity Depth	2.1±0.1
t	Carrier Tape Thickness	0.3±0.05
C	Cover Tape Width	13.3

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