

## *Class AB Stereo Headphone Driver*

### *Low Distortion, Excellent PSRR*

#### FEATURES

- Low supply voltage 2.8 to 5.5V
- No switch-ON/OFF clicks
- Excellent power supply ripple rejection
- Low power consumption
- Short-circuit resistant
- High performance :
  - high SNR
  - high slew rate
  - low distortion
- Large output voltage swing
- Space saving package SOP8, MSOP8

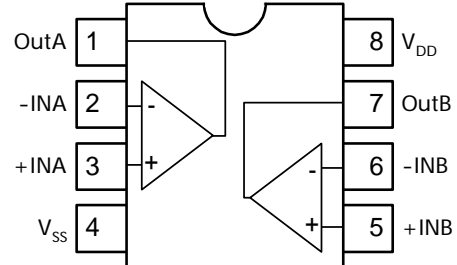
#### APPLICATIONS

- CD-RW 、DVD-RW
- CD-ROM 、DVD-ROM
- MP3 、PDA
- Portable Digital Audio
- Cross-reference :  
TDA1308T

#### DESCRIPTION

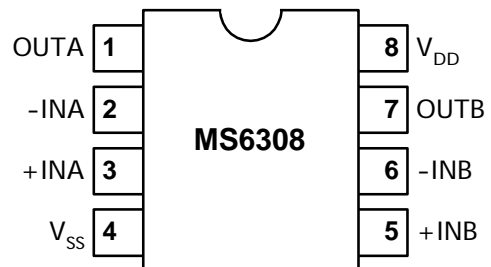
The MS6308 is an integrated class AB stereo headphone driver contained in an SO8 package. The device is fabricated in a CMOS process and has been primarily developed for portable digital audio applications. MS6308 is pin and function compatible with the Philips, TDA1308T.

#### BLOCK DIAGRAM



#### PIN CONFIGURATION

Symbol	Pin	Description
OUTA	1	Output A
-INA	2	Inverting input A
+INA	3	Non-inverting input A
V <sub>SS</sub>	4	Negative supply
+INB	5	Non-inverting input B
-INB	6	Inverting input B
OUTB	7	Output B
V <sub>DD</sub>	8	Positive supply



## ORDERING INFORMATION

Package	Part number	Packaging Marking	Transport Media
8-Pin SOP	MS6308TR	MS6308	2.5k Units Tape and Reel
8-Pin SOP	MS6308U	MS6308	100 Units Tube
8-Pin SOP (lead free)	MS6308GTR	MS6308G	2.5k Units Tape and Reel
8-Pin SOP (lead free)	MS6308GU	MS6308G	100 Units Tube
8-Pin MSOP	MS6308MTR	6308	3.5k Units Tape and Reel
8-Pin MSOP	MS6308MU	6308	80 Units Tube
8-Pin MSOP (lead free)	MS6308MGTR	6308G	3.5k Units Tape and Reel
8-Pin MSOP (lead free)	MS6308MGU	6308G	80 Units Tube

## ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Rating	Unit
V <sub>DD</sub>	Supply Voltage	7	V
V <sub>ESD</sub>	Electrostatic Handling	-6000 to 6000	V
T <sub>STG</sub>	Storage Temperature Range	-65 to 150	°C
T <sub>A</sub>	Operating Ambient Temperature Range	-40 to 85	°C
T <sub>J</sub>	Maximum Junction Temperature	150	°C
T <sub>S</sub>	Soldering Temperature, 10 seconds	260	°C
R <sub>THJA</sub>	Thermal Resistance from Junction to Ambient in Free Air SOP8	210	°C/W

## OPERATING RATINGS

Symbol	Parameter	Min	Typ	Max	Unit
V <sub>DD</sub>	Supply Voltage	2.8	-	5.5	V

## 5V ELECTRICAL CHARACTERISTICS

( $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=5\text{V}$ ,  $V_{SS}=0\text{V}$ ,  $V_O=3.5\text{V}_{pp}$ ,  $f=1\text{kHz}$ ,  $R_L=32\Omega$ ; unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>DC Characteristics</b>						
$I_Q$	Quiescent current	$V_O=0\text{V}_{pp}$ , 2 channels	-	3.2	4	mA
$V_O$	Maximum output voltage swing	$(\text{THD+N})/S < 0.1\%$	3.5	4	-	$\text{V}_{pp}$
PSRR	Power supply rejection ratio	$V_{ripple} = -20\text{dBV}$ , 100Hz	-	70	-	dB
CS	Cannel separation		-	100	-	dB
<b>AC Characteristics</b>						
THD+N	Total harmonic distortion plus noise	$(\text{THD+N})/S < 0.1\%$	-	-75	-67	dB
			-	0.017	0.044	%
S/N	Signal-to-noise ratio		100	110	-	dB
SR	Slew rate	Unity gain inverting	-	5	-	$\text{V}/\mu\text{s}$
$P_o$	Maximum output power	$(\text{THD+N})/S < 0.1\%$ , 2 ch	-	124	-	mW

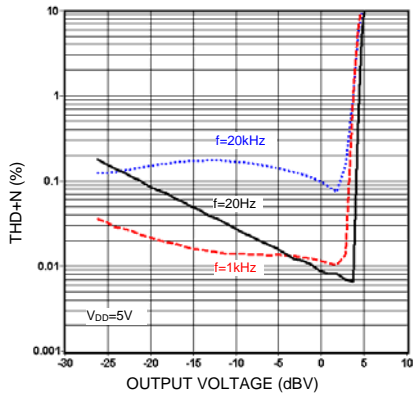
## 2.8V ELECTRICAL CHARACTERISTICS

( $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=2.8\text{V}$ ,  $V_{SS}=0\text{V}$ ,  $V_O=2\text{V}_{pp}$ ,  $f=1\text{kHz}$ ,  $R_L=32\Omega$ ; unless otherwise specified)

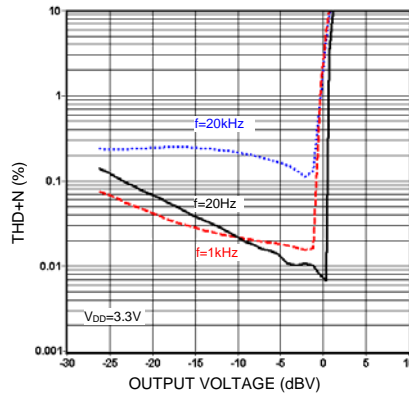
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>DC Characteristics</b>						
$I_Q$	Quiescent current	$V_O=0\text{V}_{pp}$ , 2 channels	-	2.3	3	mA
$V_O$	Maximum output voltage swing	$(\text{THD+N})/S < 0.1\%$	1.8	2	-	$\text{V}_{pp}$
PSRR	Power supply rejection ratio	$V_{ripple} = -20\text{dBV}$ , 100Hz	-	66	-	dB
CS	Cannel separation		-	92	-	dB
<b>AC Characteristics</b>						
THD+N	Total harmonic distortion plus noise	$(\text{THD+N})/S < 0.1\%$	-	-70	-63	dB
			-	0.031	0.070	%
S/N	Signal-to-noise ratio		90	100	-	dB
$P_o$	Maximum output power	$(\text{THD+N})/S < 0.1\%$ , 2 ch	-	31	-	mW

## TYPICAL PERFORMANCE CHARACTERISTICS

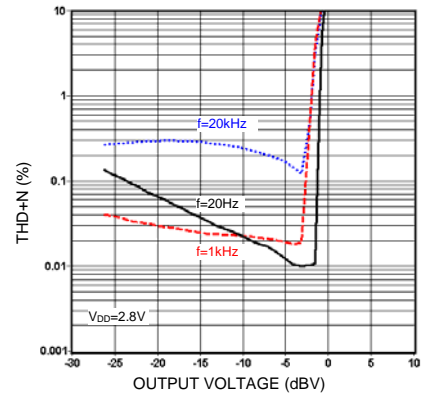
( $T_a=25^\circ\text{C}$ ,  $R_L=32\Omega$ ; unless otherwise specified)



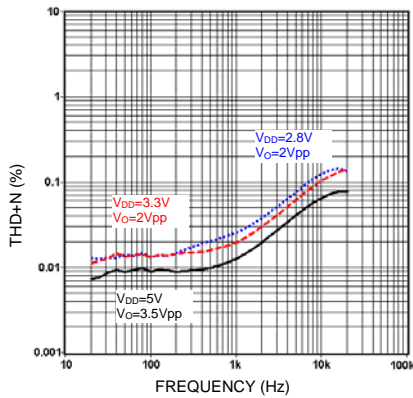
**THD+N vs. output voltage**



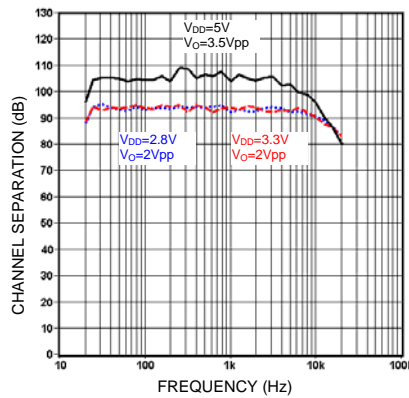
**THD+N vs. output voltage**



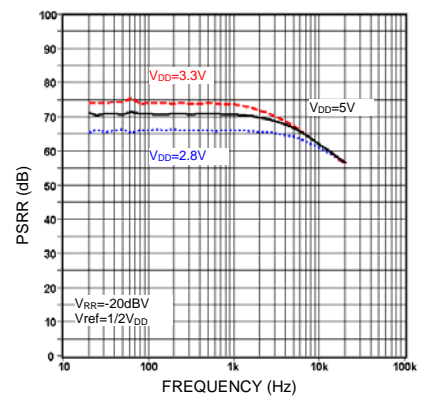
**THD+N vs. output voltage**



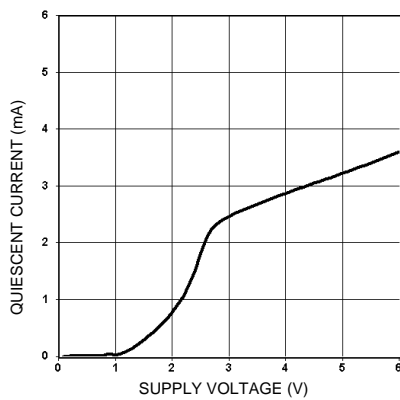
**THD+N vs. frequency**



**Channel separation vs. frequency**



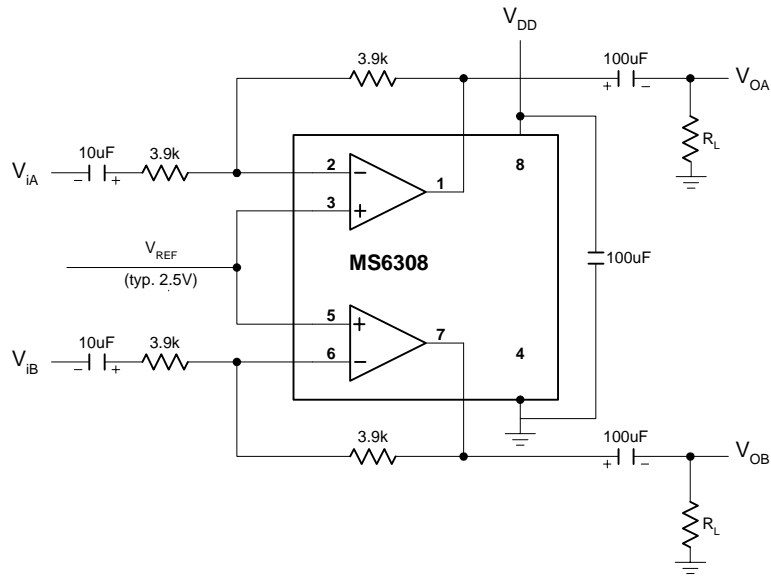
**PSRR vs. frequency**



**Quiescent current vs. supply voltage**

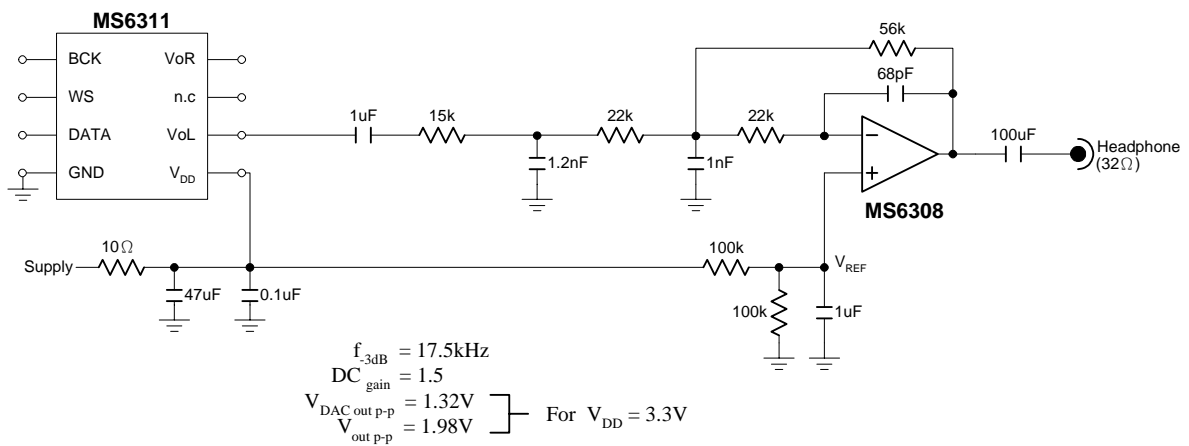
## APPLICATION INFORMATION

### Inverting application



**Fig.2** Measurement circuit, inverting application

### Example of CD application with MS6311



**Fig.3** Example of a multiple feedback third order lowpass filter application.

MP3 digital to analog converting solution. Fig.4, Fig5

MP3 DECODER

DAC

Headphone Driver

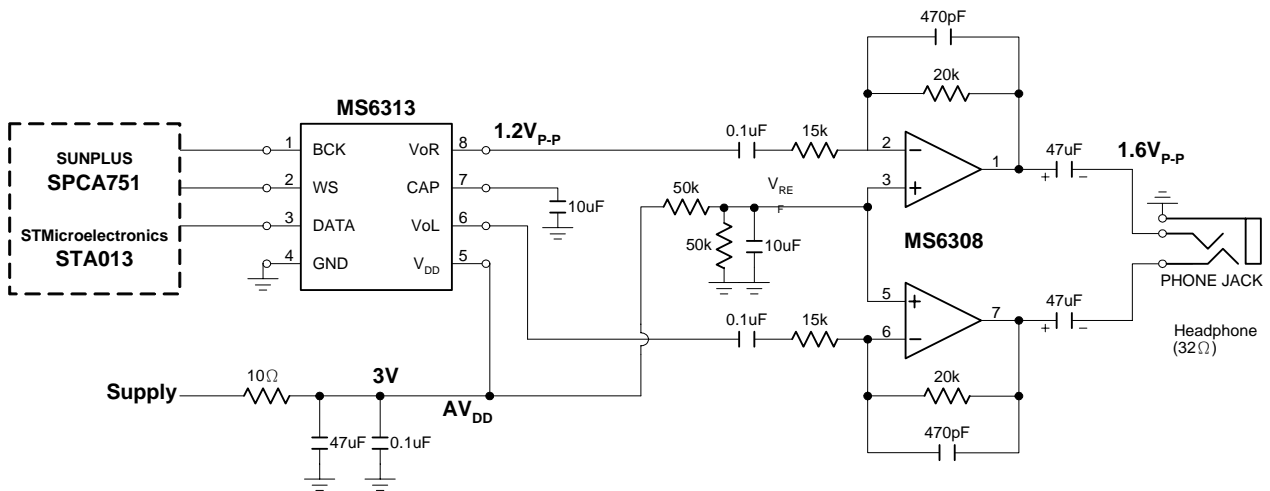


Fig.4 A first order lowpass filter for DAC output with MS6313

MP3 DECODER

DAC

Headphone Driver

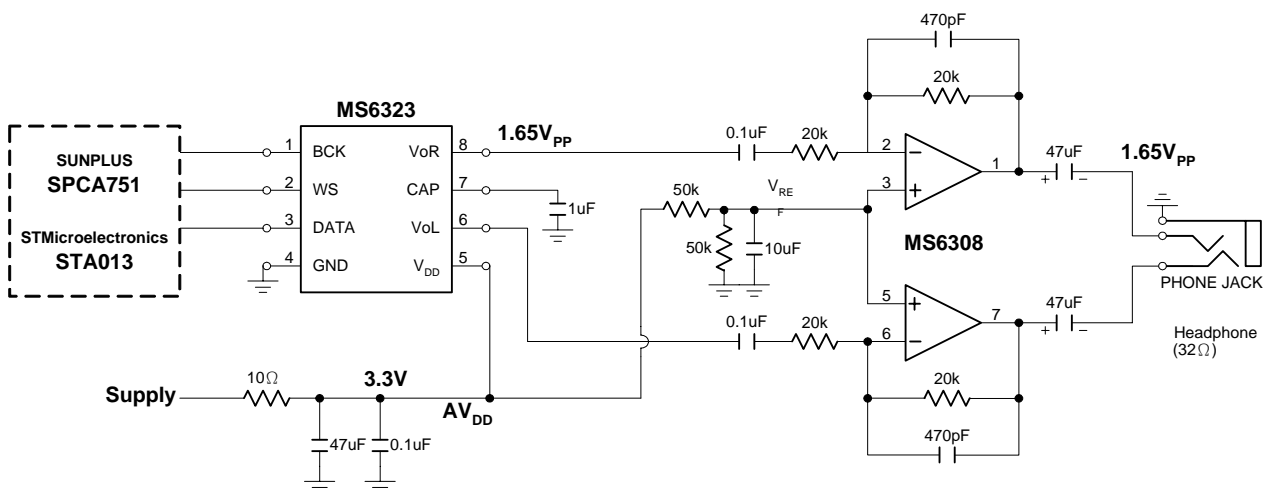
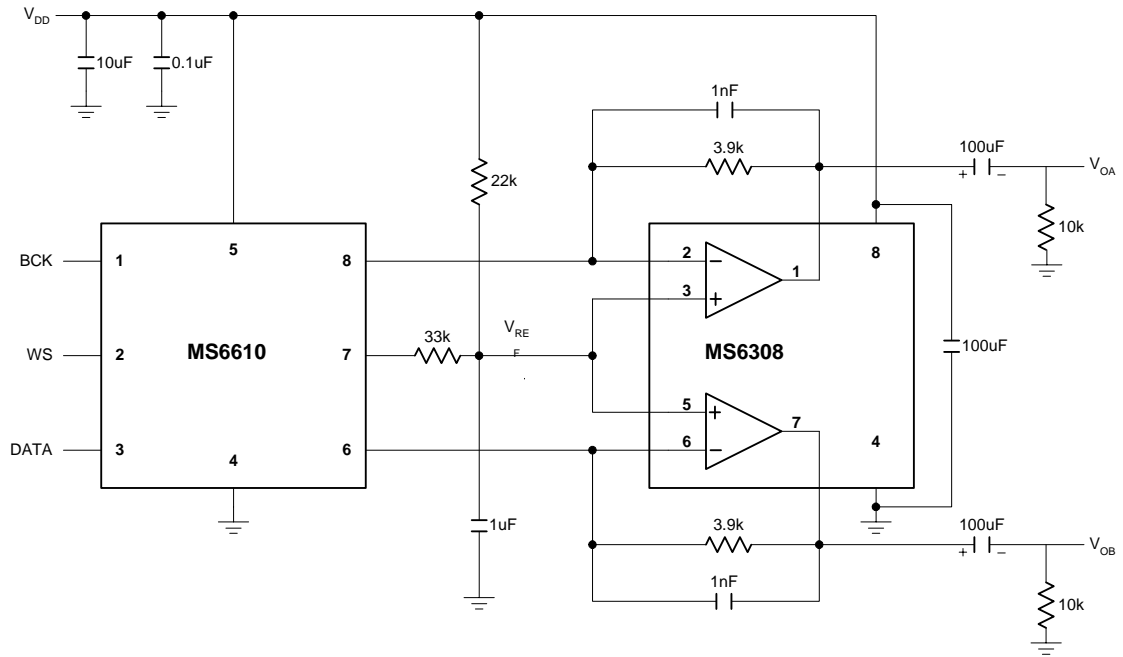


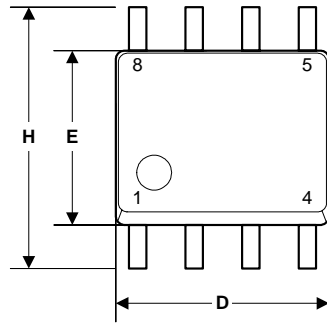
Fig.5 A first order lowpass filter for DAC output with MS6323

**Example of application with MS6610 (current output)**

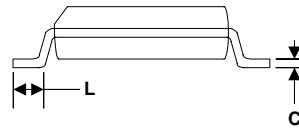
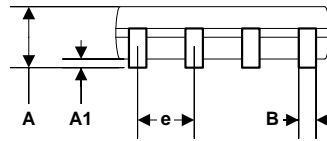


## EXTERNAL DIMENSIONS

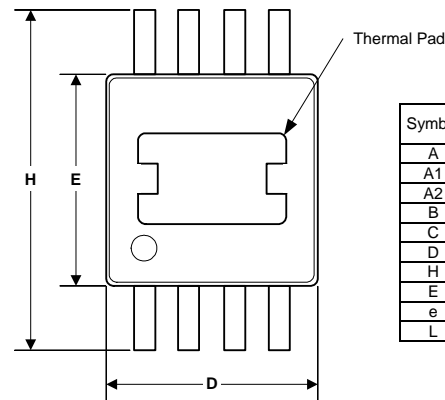
### SOP8



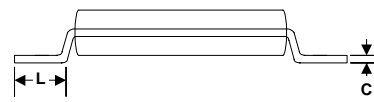
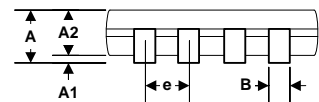
Symbol	Dimension in mm		Dimension in inch	
	Min	Max	Min	Max
A	1.35	1.75	0.0532	0.0688
A1	0.10	0.25	0.0040	0.0098
B	0.33	0.51	0.013	0.020
C	0.19	0.25	0.0075	0.0098
D	4.80	5.00	0.1890	0.1968
H	5.80	6.20	0.2284	0.2440
E	3.80	4.00	0.1497	0.1574
e	1.27 BSC		0.050 BSC	
L	0.40	1.27	0.016	0.050



### MSOP8 (Thermal Pad)



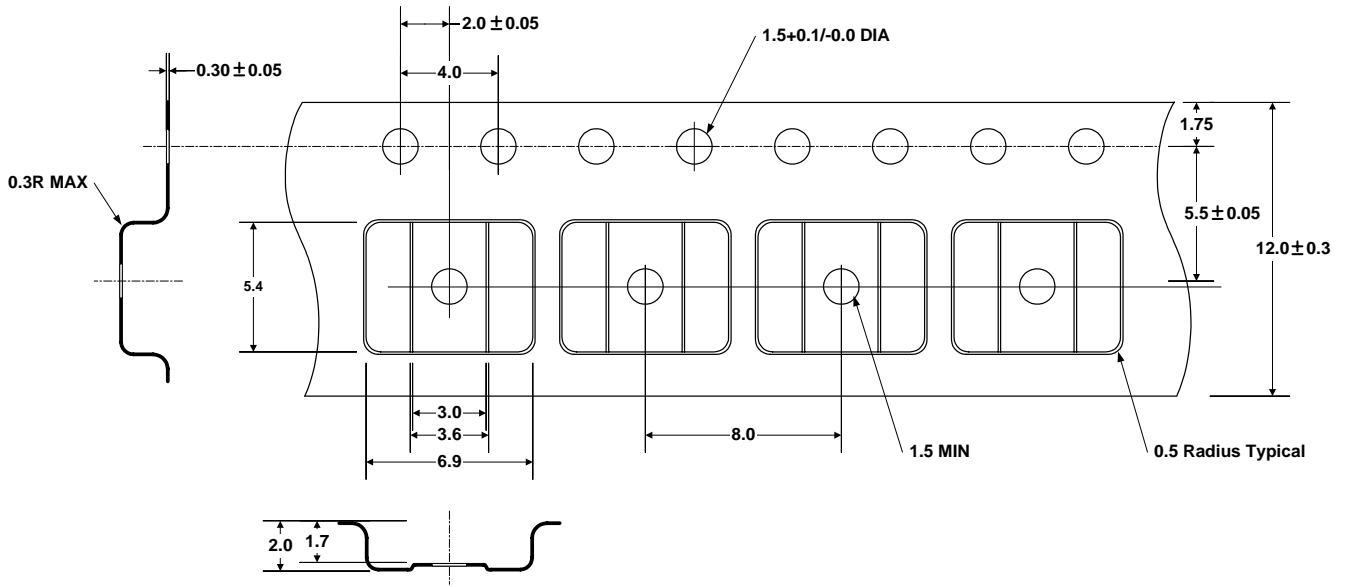
Symbol	Dimension in mm		Dimension in inch	
	Min	Max	Min	Max
A	0.81	1.12	0.032	0.048
A1	0.05	0.15	0.002	0.006
A2	0.76	0.86	0.030	0.038
B	0.28	0.38	0.011	0.015
C	0.13	0.23	0.005	0.009
D	2.90	3.10	0.114	0.122
H	4.70	5.10	0.185	0.201
E	2.90	3.10	0.114	0.122
e	0.65		0.026	
L	0.40	0.66	0.016	0.026



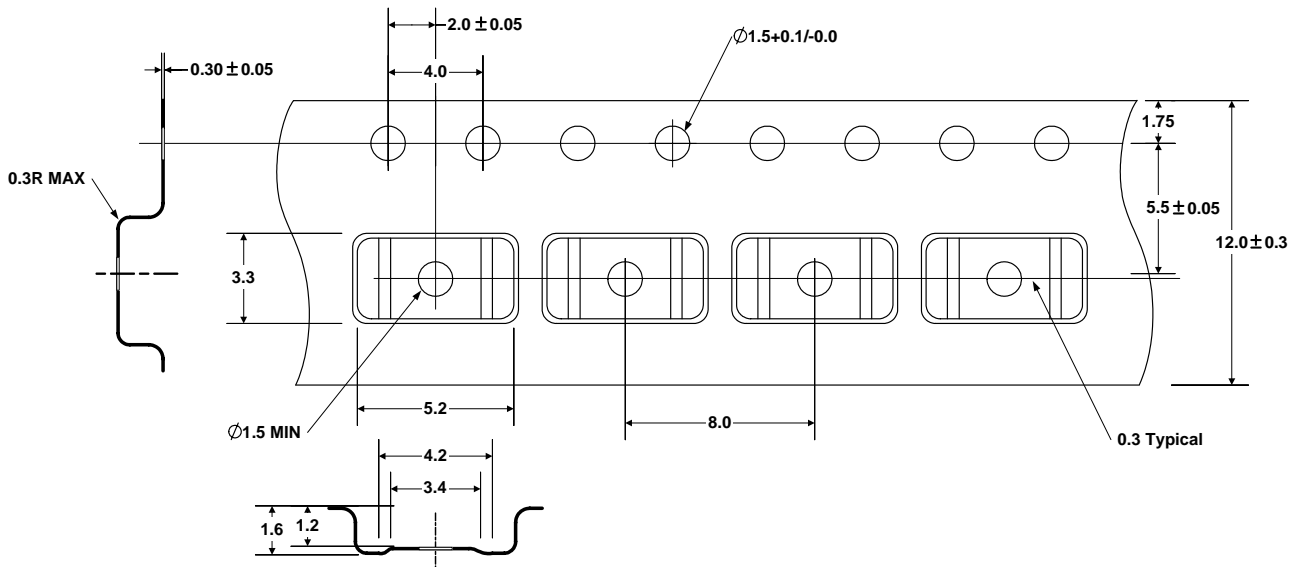
Note : Die pad exposure size is according to lead frame design.



**TAPE AND REEL** (Unit : mm)



**SOP8**



**MSOP8**