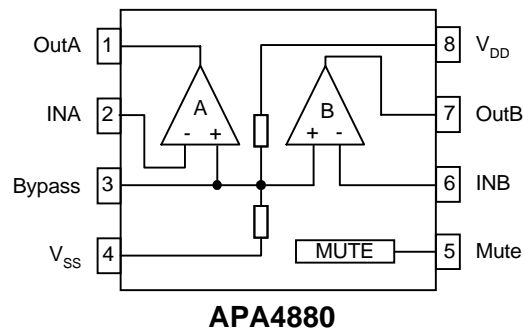


Block Diagram



Pin Function Description

Pin Name	No	I/O	Description
OUTA	1	O	Channel A output pin
INA	2	I	Audio input channel A
Bypass	3	I	Connect to voltage divider for internal mid_supply bias
VSS	4		Ground or negative supply voltage connection for circuitry.
Mute	5	I	mute mode control signal input, place entire IC in mute mode when held high, $I_{mute}=140\mu A$
INB	6	I	Audio input channel B
OUTB	7	O	Channel B output pin
VDD	8		Supply voltage input pin

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
V_{DD}	Supply Voltage	5	V
$T_{SC(O)}$	Output Short-Circuit Duration , at $T_A=25^{\circ}C$, $P_{TOT}=1W$	20	S
T_A	Operating Ambient Temperature range	-40 to 85	$^{\circ}C$
T_J	Maximum Junction Temperature	150	$^{\circ}C$
T_{STG}	Storage Temperature Range	-65 to+150	$^{\circ}C$
T_S	Soldering Temperature , 10 seconds	260	$^{\circ}C$
V_{ESD}	Electrostatic Discharge	-3000 to 3000*1	V

Note : *1. Human body model : $C=100pF$, $R=1500\Omega$, 3 positive pulses plus 3 negative pulses

Thermal Characteristics

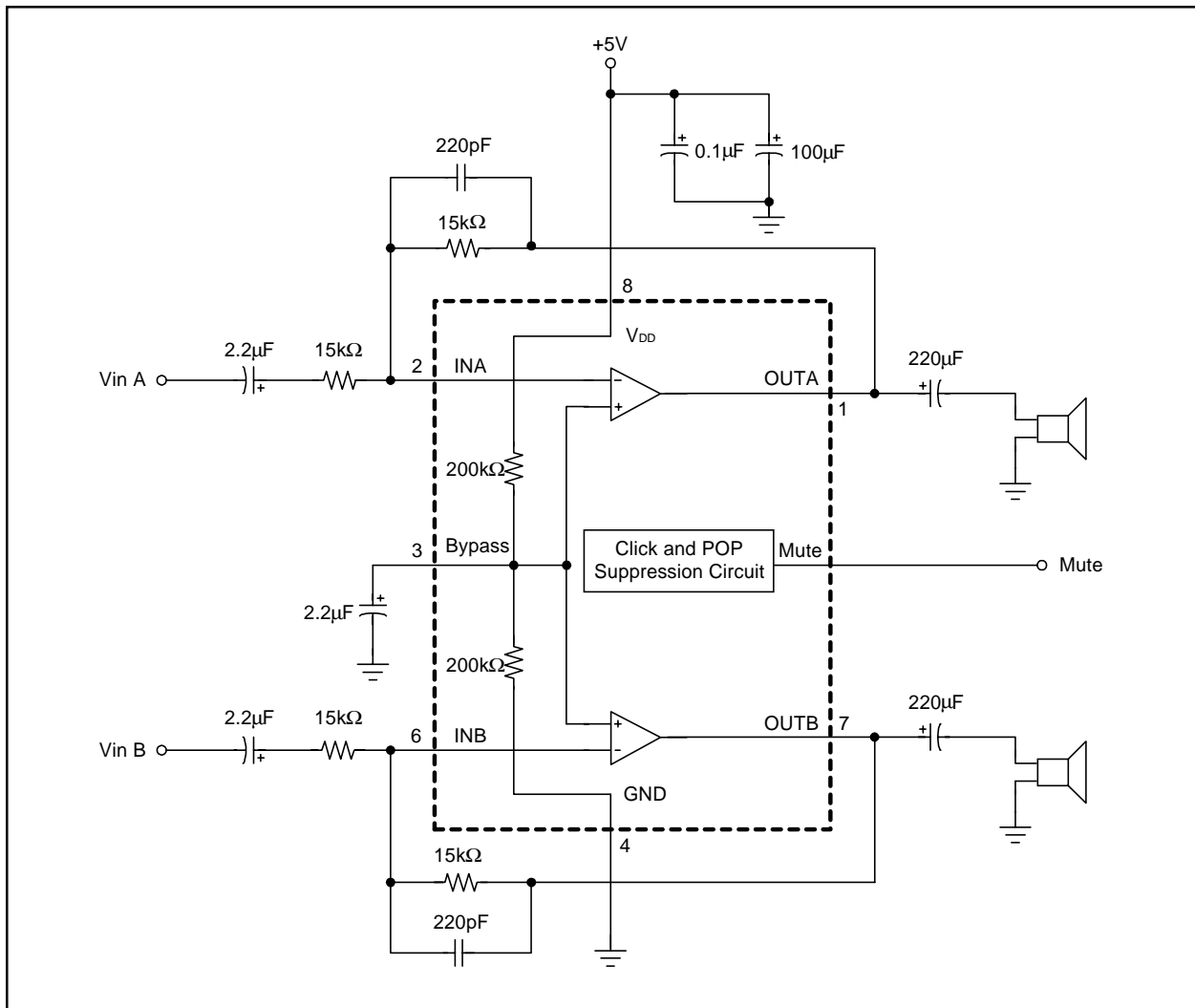
Symbol	Parameter	Value	Unit
R _{THJA}	Thermal Resistance from Junction to Ambient in Free Air		
	SO-8	210	K/W
	TSSOP-8	220	
PDIP-8	109		

Electrical Characteristics

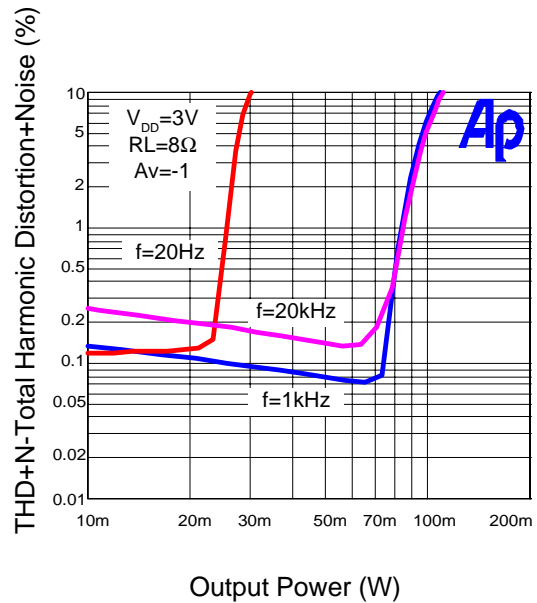
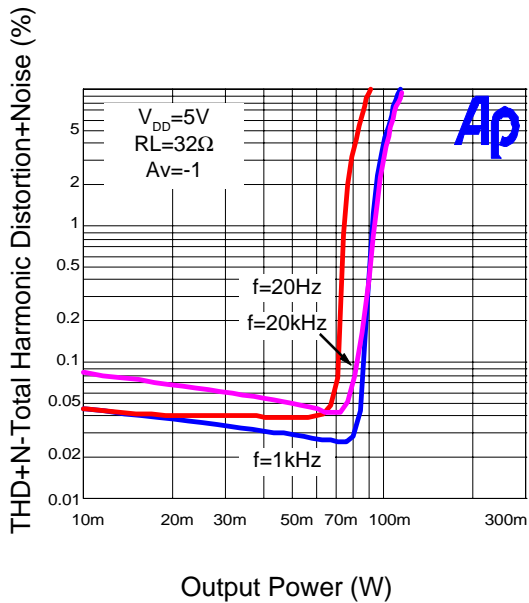
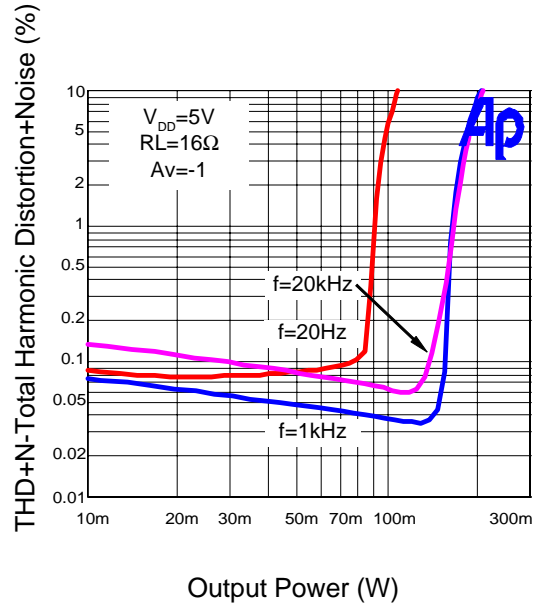
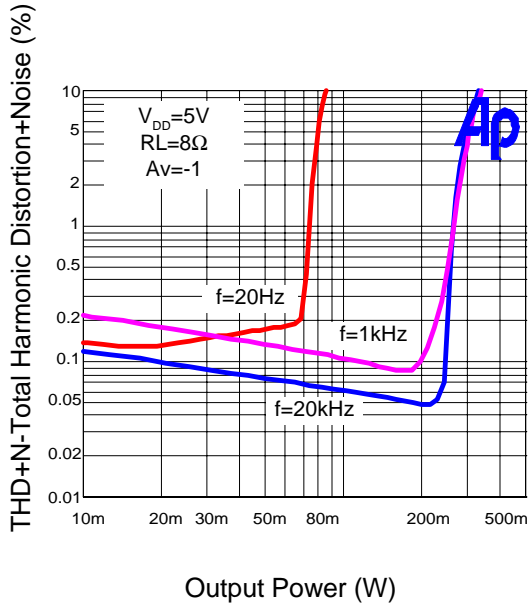
T_A=25°C, V_{DD}=5V, V_{SS}=0V, f=1kHz (unless otherwise noted)

Symbol	Parameter	Test Conditions	APA4880			Unit
			Min.	Typ.	Max.	
I _{DD}	Supply Current	No Load		3.0		mA
I _{MUTE}	Mute Current	V _{PINS}		140		uA
V _{I(OS)}	Input Offset Voltage			5		mV
AC Characteristics						
(THD+N)/S	Total Harmonic Distortion plus Noise to Signal Ratio	P _O =200mW, R _L =8Ω, f=1kHz P _O =120mW, R _L =16Ω, f=1kHz P _O =75mW, R _L =32Ω, f=1kHz		0.05 0.04 0.03		%
P _O	Output Power	(THD+N)/S=0.1%, f=1kHz R _L =8Ω R _L =16Ω R _L =32Ω (THD+N)/S=10%, f=1kHz R _L =8Ω R _L =16Ω R _L =32Ω		240 150 85 330 200 110		mW
PSRR	Power Supply Rejection Ratio	C _S =2.2uF, V _{RIPPLE} =200mV _{RMS} , f=120Hz		50		dB
ATT	Mute attenuation	V _{in} =1V _{rms} , R _L =8Ω		85		dB
Xtalk	Channel Separation	P _O =200mV, R _L =8Ω, C _b =2.2uF		85		dB
G _v	Open Loop Gain			100		dB
F _g	Unity Gain Frequency			7		MHz
SR	Slew Rate			5.5		V/us
S/N	Signal to Noise Ratio	V _{in} =1V _{rms} , R _L =8Ω		20		uV _{rms}

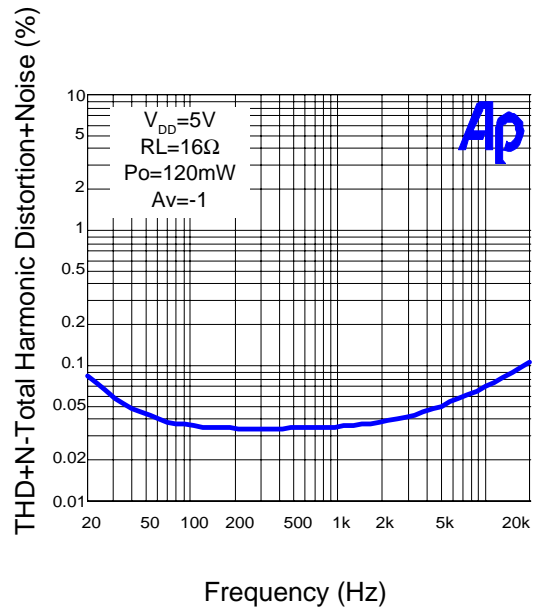
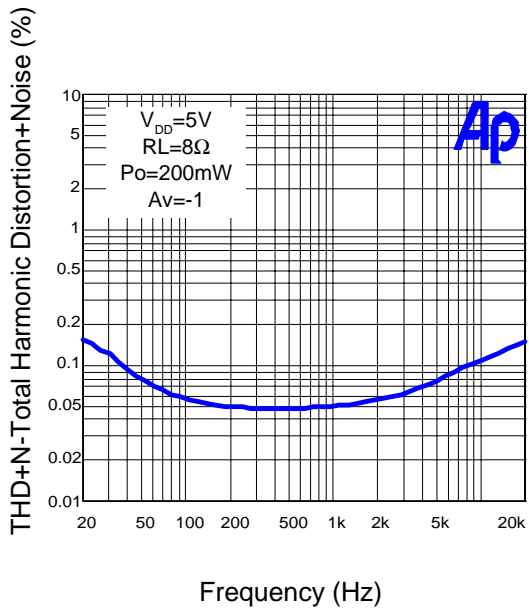
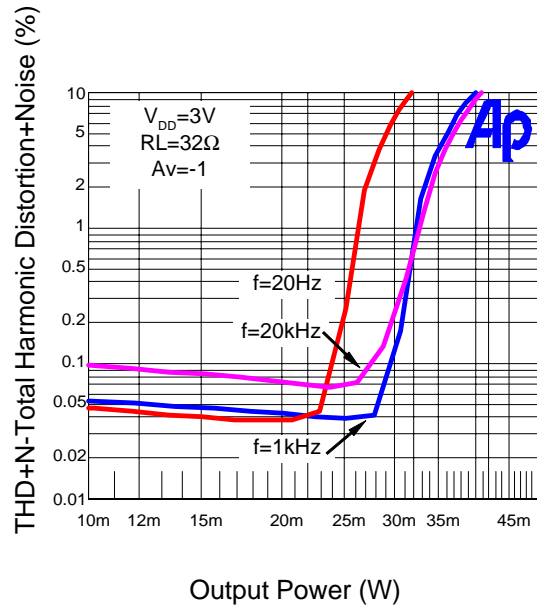
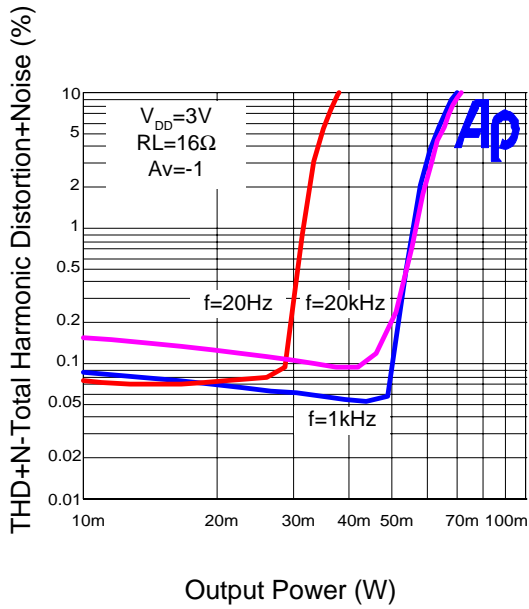
Test And Application Circuits



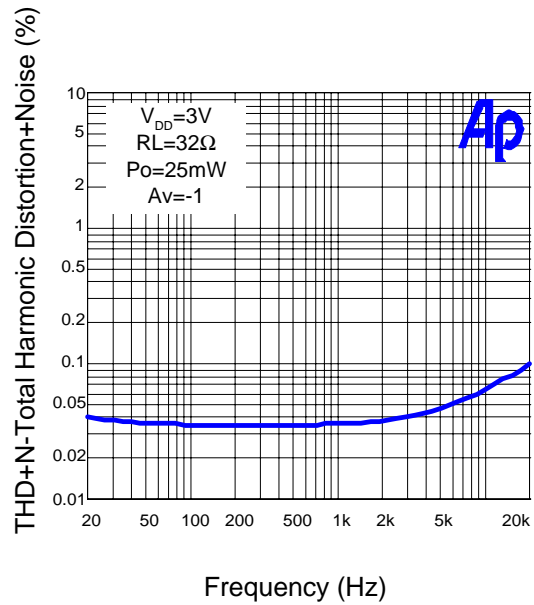
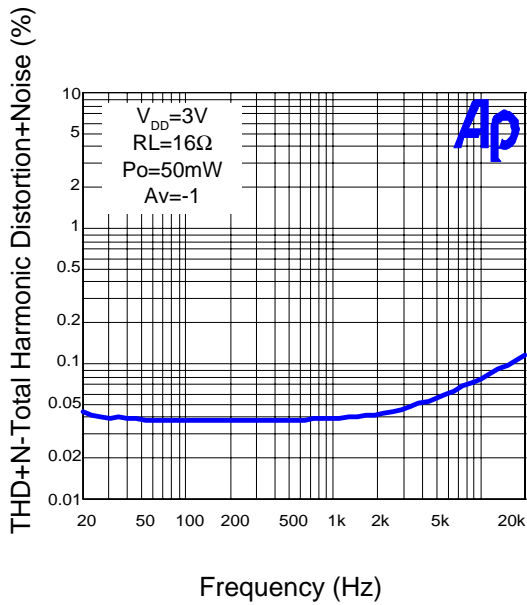
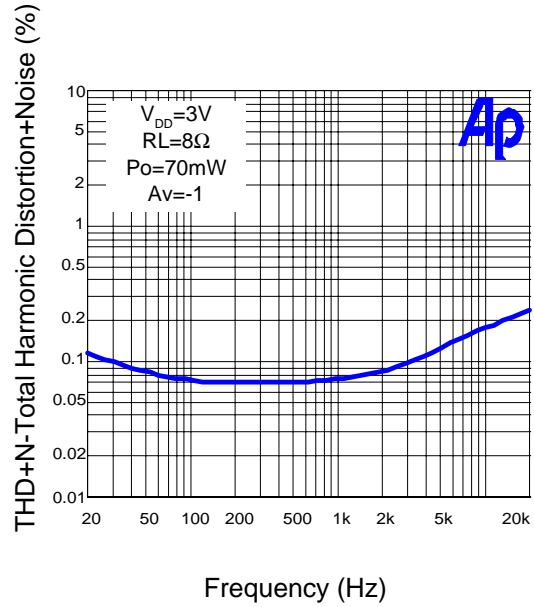
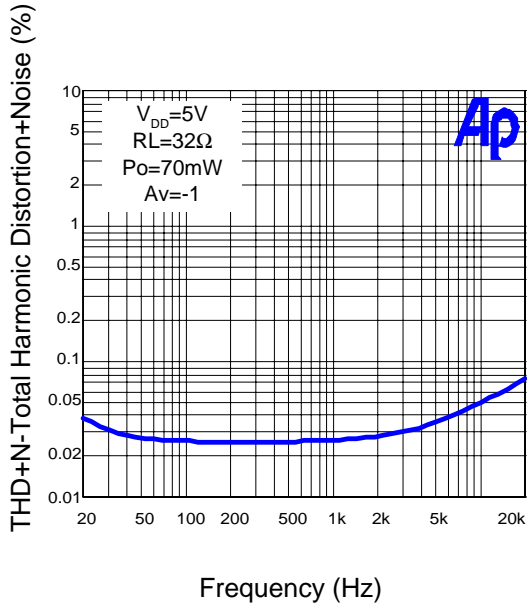
Typical Characteristics



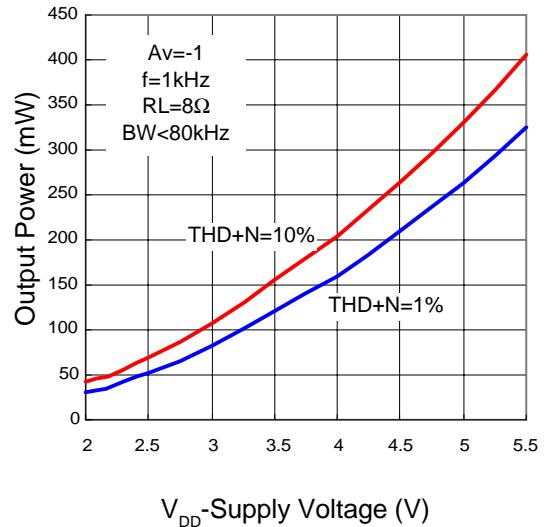
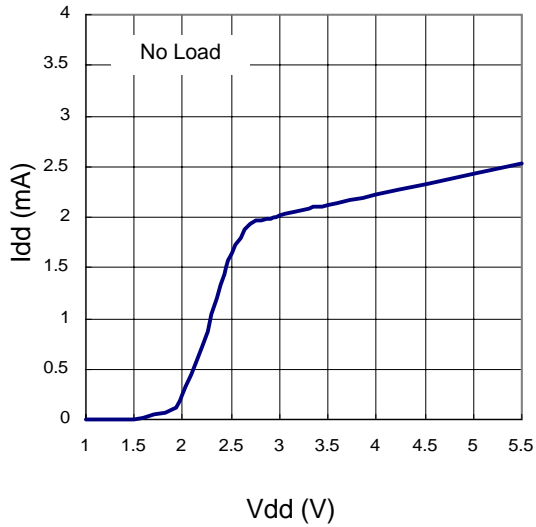
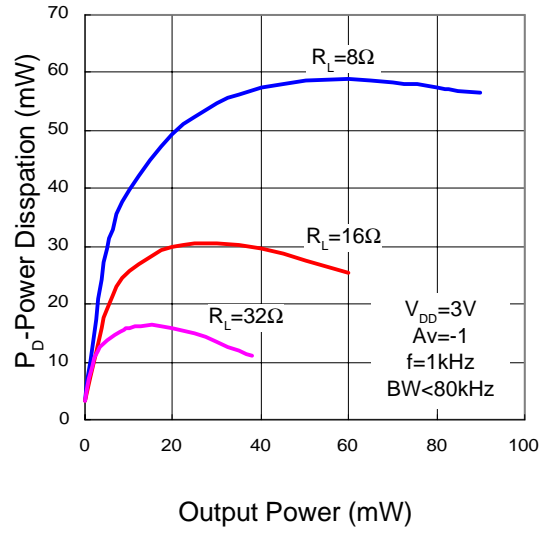
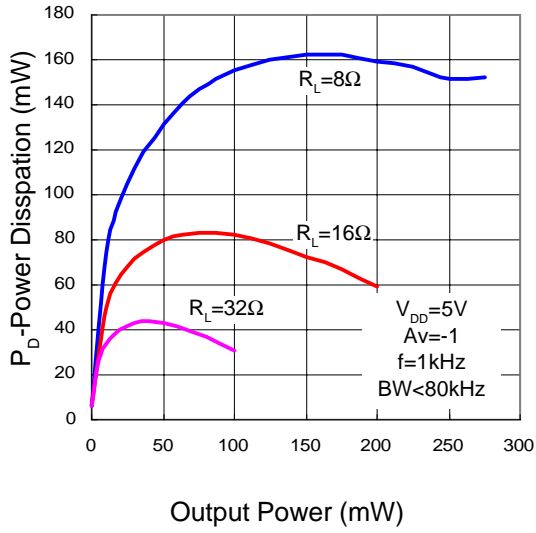
Typical Characteristics Cont.



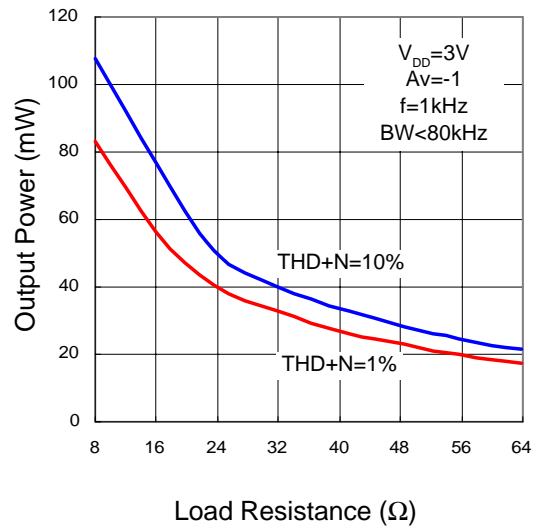
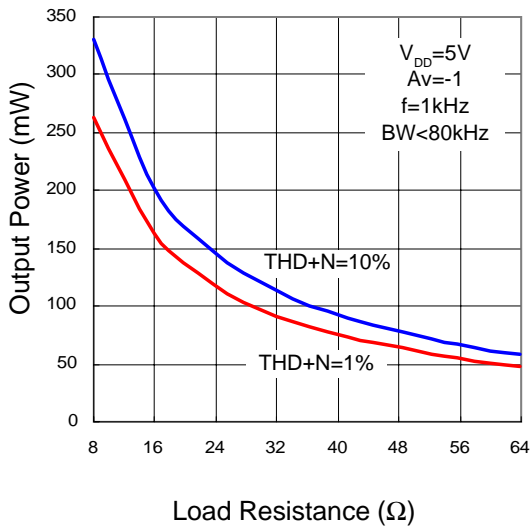
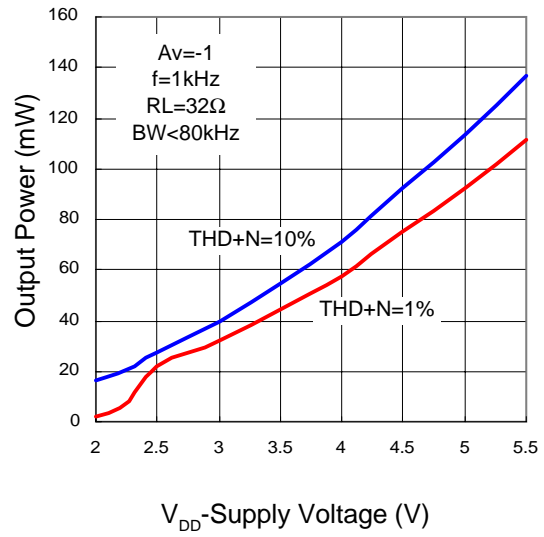
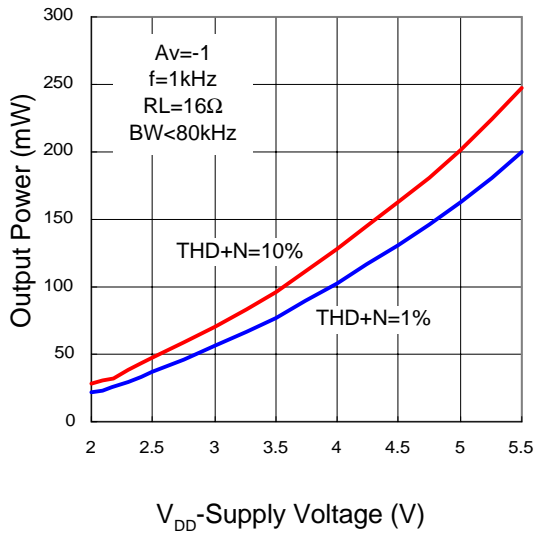
Typical Characteristics Cont.



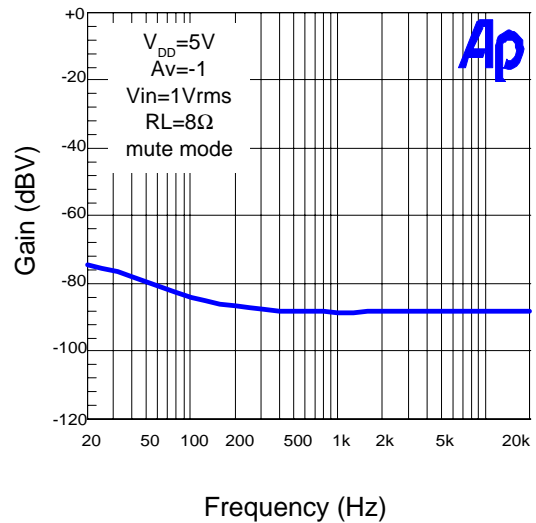
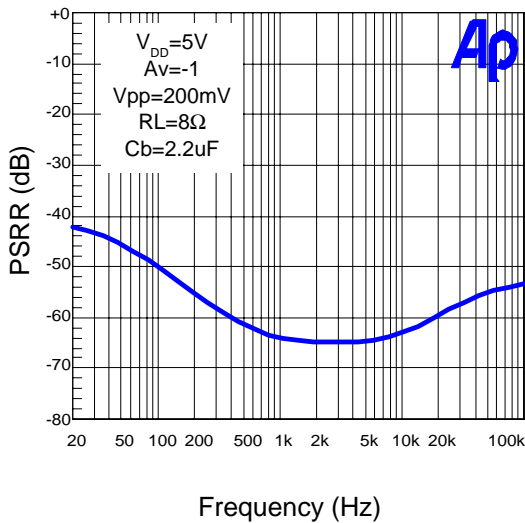
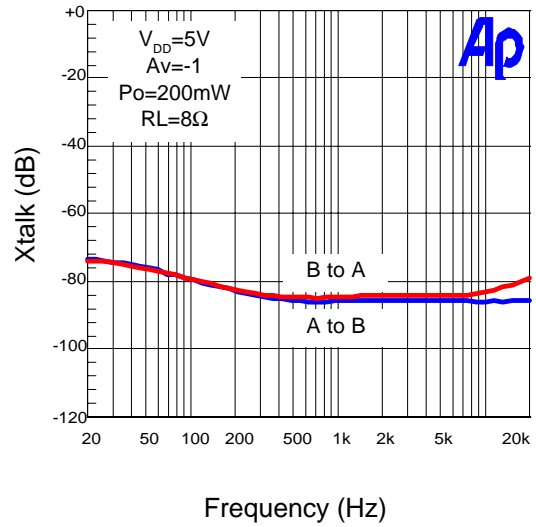
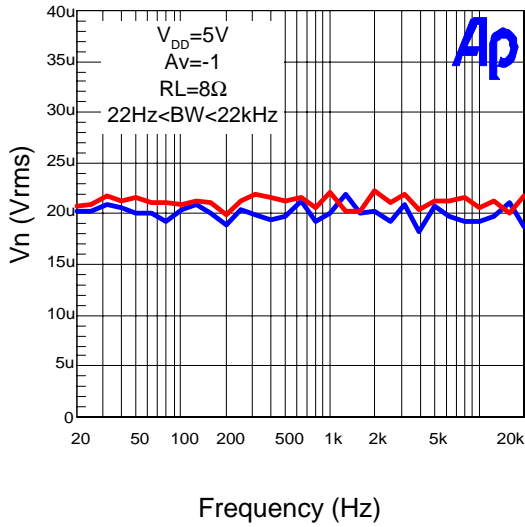
Typical Characteristics Cont.



Typical Characteristics Cont.

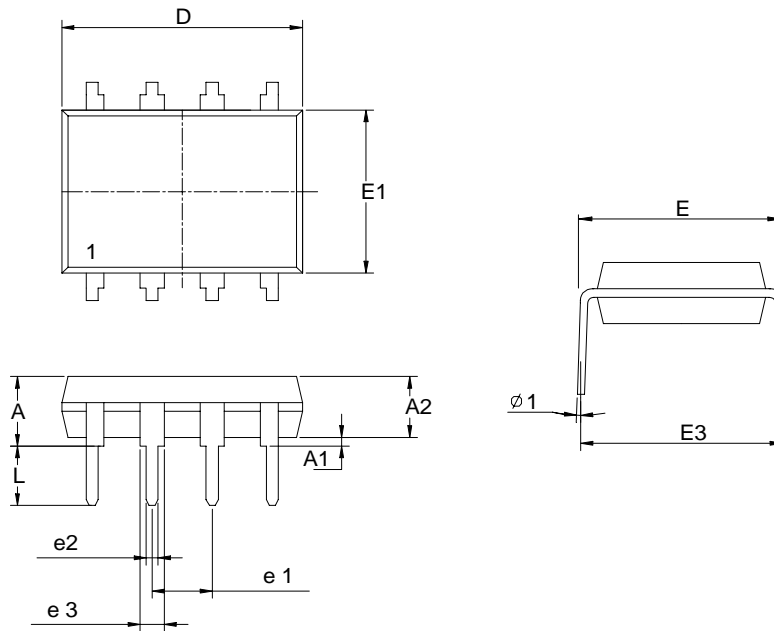


Typical Characteristics Cont.



Packaging Information

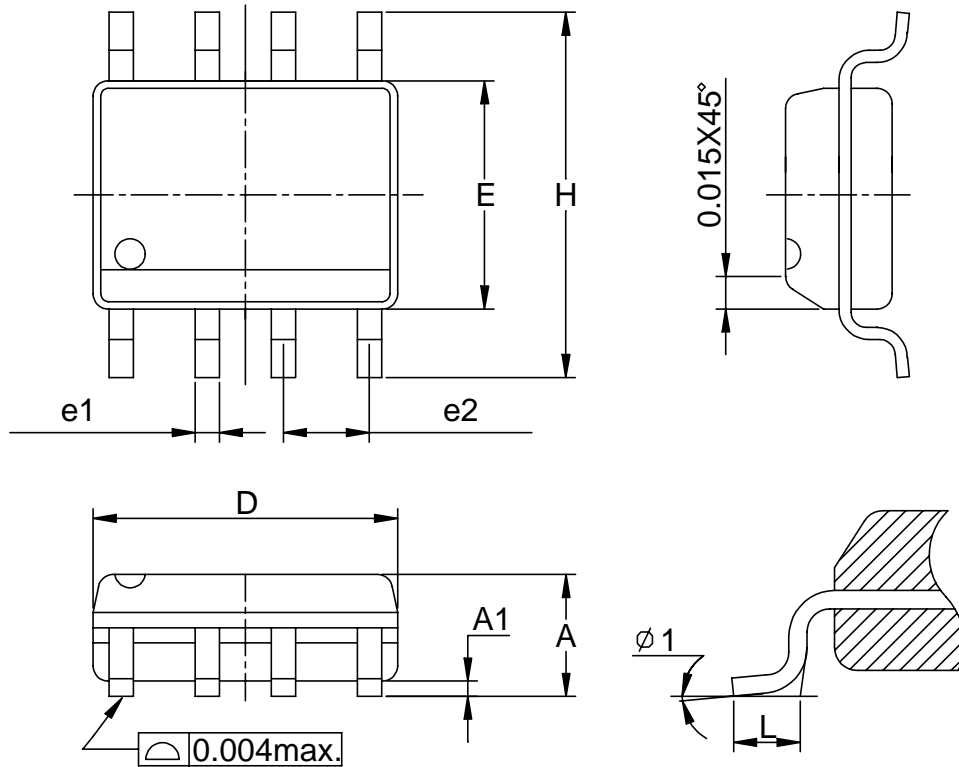
PDIP-8 pin (Reference JEDEC Registration MS-001)



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		5.33		0.210
A1	0.38		0.015	
A2	2.92	3.68	0.115	0.145
D	9.02	10.16	0.355	0.400
e1	2.54BSC		0.100BSC	
e2	0.36	0.56	0.014	0.022
e3	1.14	1.78	0.045	0.070
E	7.62 BSC		0.300 BSC	
E1	6.10	7.11	0.240	0.280
E3		10.92		0.430
L	2.92	3.81	0.115	0.150
φ 1	15°		15°	

Packaging Information

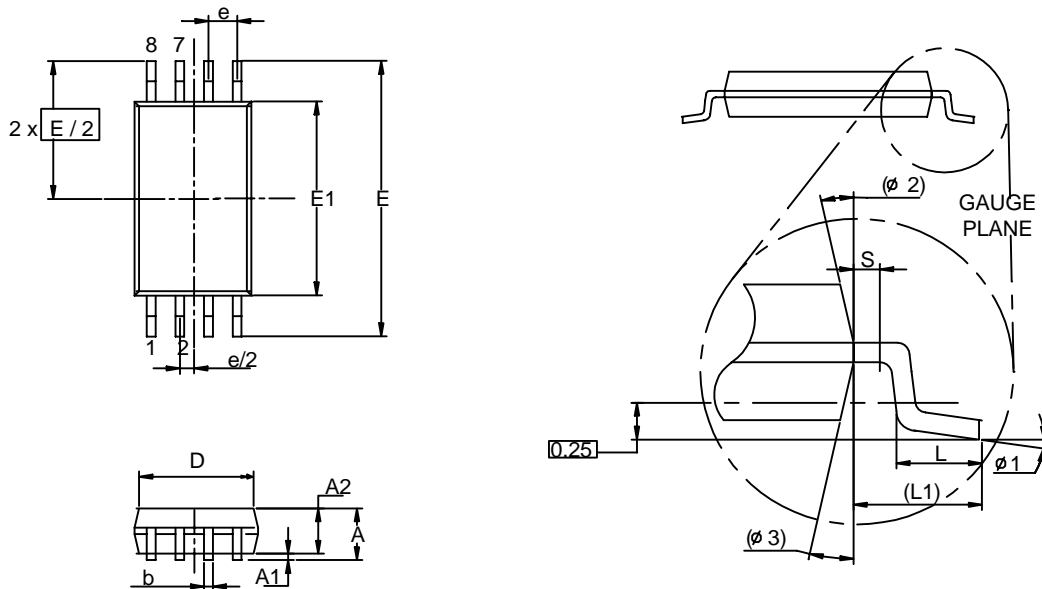
SOP-8 pin (Reference JEDEC Registration MS-012)



Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	5.00	0.189	0.197
E	3.80	4.00	0.150	0.157
H	5.80	6.20	0.228	0.244
L	0.40	1.27	0.016	0.050
e1	0.33	0.51	0.013	0.020
e2	1.27BSC		0.50BSC	
φ 1	8°		8°	

Packaging Information

TSSOP-8



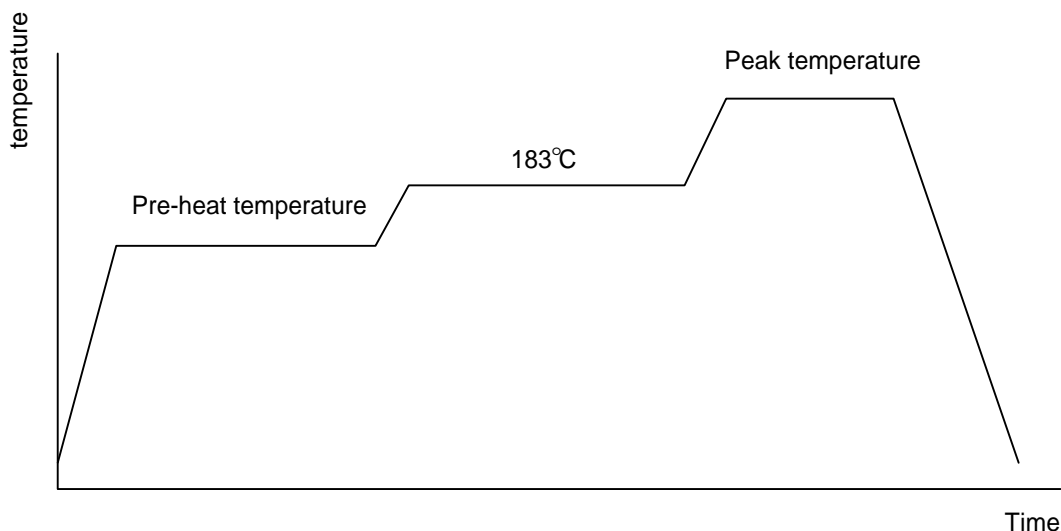
Dim	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		1.2		0.047
A1	0.00	0.15	0.000	0.006
A2	0.80	1.05	0.031	0.041
b	0.19	0.30	0.007	0.012
D	2.9	3.1	0.114	0.122
e	0.65 BSC		0.026 BSC	
E	6.40 BSC		0.252 BSC	
E1	4.30	4.50	0.169	0.177
L	0.45	0.75	0.018	0.030
L1	1.0 REF		0.039 REF	
R	0.09		0.004	
R1	0.09		0.004	
S	0.2		0.008	
phi 1	0°	8°	0°	8°
phi 2	12° REF		12° REF	
phi 3	12° REF		12° REF	

Physical Specifications

Terminal Material	Solder-Plated Copper (Solder Material : 90/10 or 63/37 SnPb)
Lead Solderability	Meets EIA Specification RSI86-91, ANSI/J-STD-002 Category 3.

Reflow Condition (IR/Convection or VPR Reflow)

Reference JEDEC Standard J-STD-020A APRIL 1999



Classification Reflow Profiles

	Convection or IR/ Convection	VPR
Average ramp-up rate(183°C to Peak)	3°C/second max.	10 °C /second max.
Preheat temperature 125 ± 25°C)	120 seconds max	
Temperature maintained above 183°C	60 – 150 seconds	
Time within 5°C of actual peak temperature	10 –20 seconds	60 seconds
Peak temperature range	220 +5/-0°C or 235 +5/-0°C	215-219°C or 235 +5/-0°C
Ramp-down rate	6 °C /second max.	10 °C /second max.
Time 25°C to peak temperature	6 minutes max.	

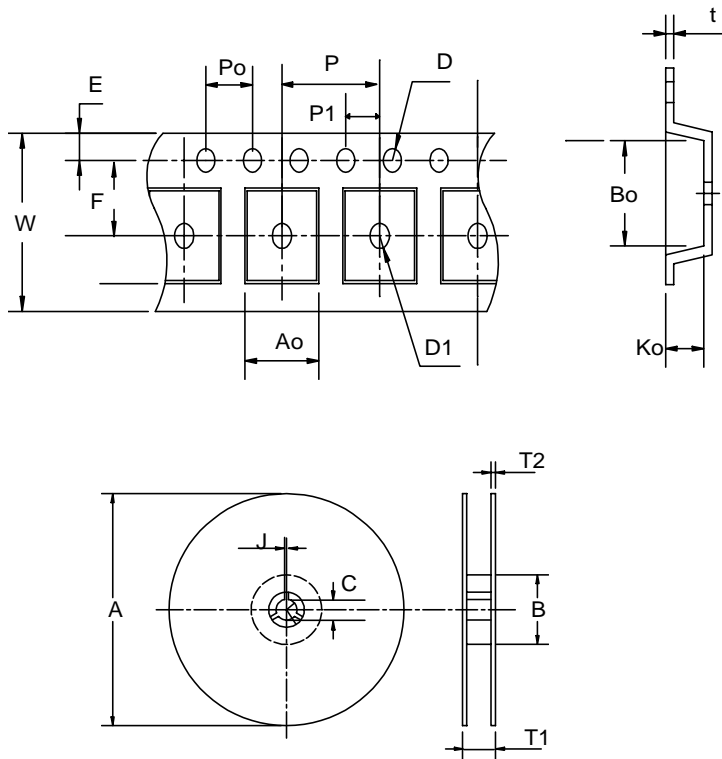
Package Reflow Conditions

pkg. thickness ≥ 2.5mm and all bgas	pkg. thickness < 2.5mm and pkg. volume ≥ 350 mm ³	pkg. thickness < 2.5mm and pkg. volume < 350mm ³
Convection 220 +5/-0 °C		Convection 235 +5/-0 °C
VPR 215-219 °C		VPR 235 +5/-0 °C
IR/Convection 220 +5/-0 °C		IR/Convection 235 +5/-0 °C

Reliability test Program

Test item	Method	Description
SOLDERABILITY	MIL-STD-883D-2003	245° C , 5 SEC
HOLT	MIL-STD-883D-1005.7	1000 Hrs Bias @ 125 °C
PCT	JESD-22-B, A102	168 Hrs, 100 % RH , 121 °C
TST	MIL-STD-883D-1011.9	-65°C ~ 150°C , 200 Cycles
ESD	MIL-STD-883D-3015.7	VHBM > 2KV, VMM > 200V
Latch-Up	JESD 78	10ms , I _{tr} > 100mA

Carrier Tape & Reel Dimensions



Application	A	B	C	J	T1	T2	W	P	E
SOP- 8	330 ± 1	62 +1.5	12.75+ 0.15	2 ± 0.5	12.4 ± 0.2	2 ± 0.2	12± 0.3	8± 0.1	1.75±0.1
	F	D	D1	Po	P1	Ao	Bo	Ko	t
	5.5± 1	1.55 +0.1	1.55+ 0.25	4.0 ± 0.1	2.0 ± 0.1	6.4 ± 0.1	5.2± 0.1	2.1± 0.1	0.3±0.013
Application	A	B	C	J	T1	T2	W	P	E
TSSOP-8	330 ± 1	62 +1.5	12.75+ 0.15	2 + 0.5	12.4 ± 0.2	2 ± 0.2	12± 0.3	8± 0.1	1.75±0.1
	F	D	D1	Po	P1	Ao	Bo	Ko	t
	5.5 ± 0.1	1.5 + 0.1	1.5 + 0.1	4.0 ± 0.1	2.0 ± 0.1	7.0 ± 0.1	3.6 ± 0.3	1.6 ± 0.1	0.3±0.013

(mm)

Cover Tape Dimensions

Application	Carrier Width	Cover Tape Width	Devices Per Reel
SOP- 8	12	9.3	2500
TSSOP- 8	12	9.3	2500

Customer Service

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