

Helping to increase average speaker volume levels

## Audio Power Amplifier with Built-in AGC AN12972A

### Overview

Increasing volume settings when using small speakers results in distortion as the output signal distorts at high gain settings. The AN12972A audio power amplifier features built-in automatic gain control (AGC) circuitry to minimize distortion by decreasing too high an input gain level. Using a low-noise amp minimizes noise even when the speaker is placed close to an ear.

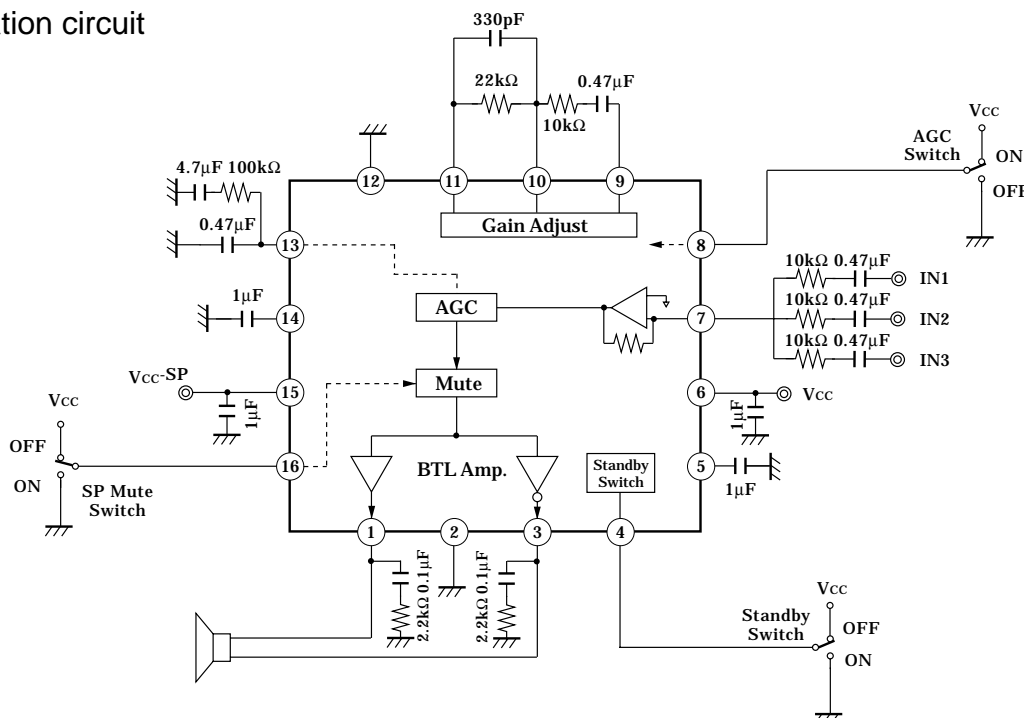
### Features

- Built-in AGC circuitry if an input level is too high, the AGC is activated to minimize distortion, raising the overall volume level and reducing noise.
- Low noise amplifier.
- Input circuit format accommodates different input signals (mixing possible)
- Standby and speaker mute functions.
- Small package.

### Applications

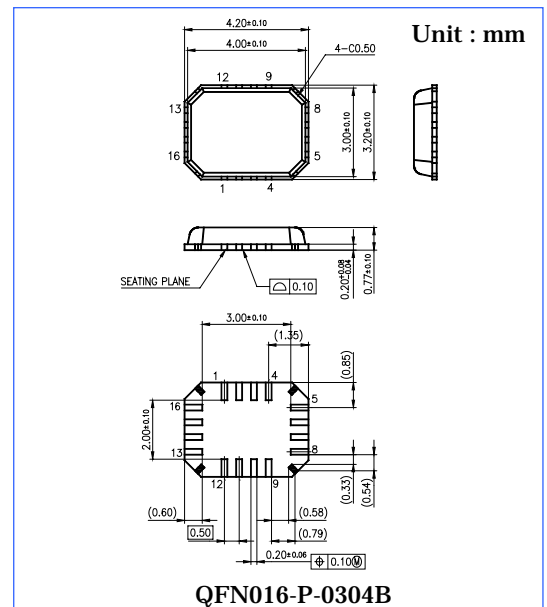
- Cellular phones, PDAs and other mobile equipment

### Application circuit



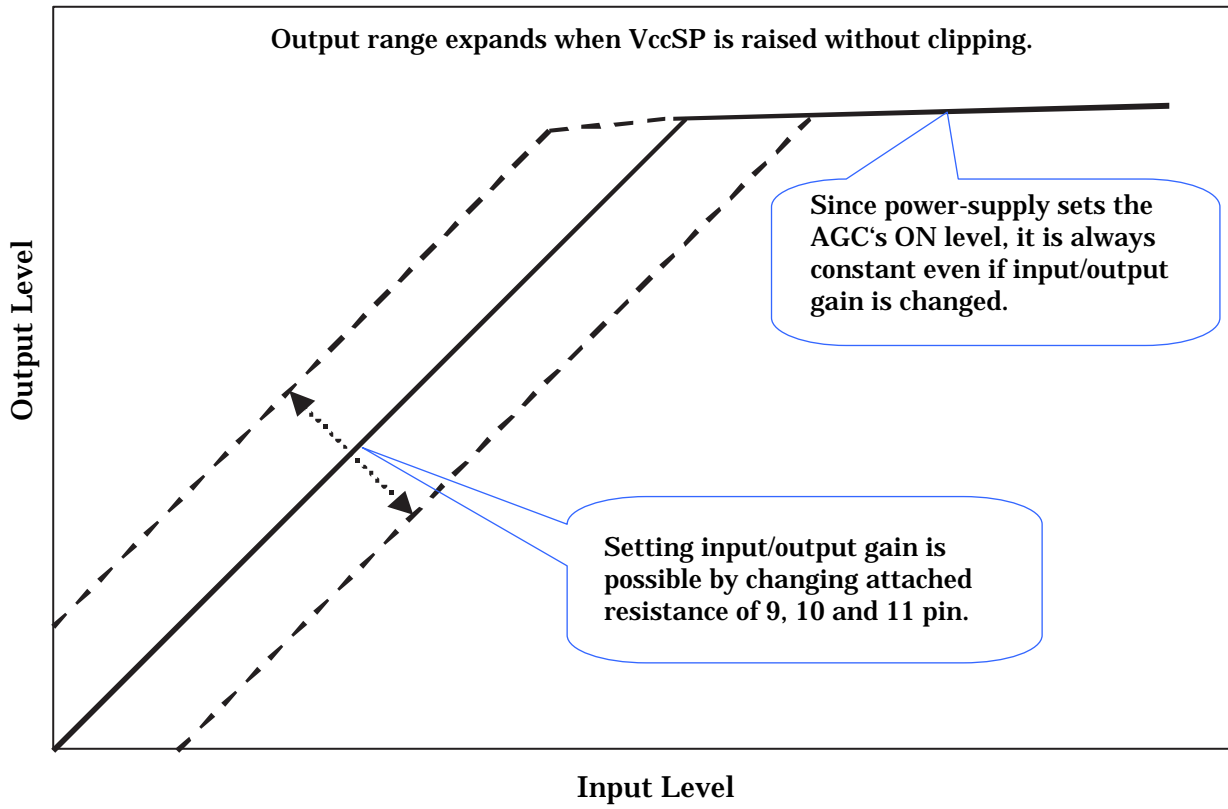
Products and specifications are subject to change without notice. Please ask for the latest Product Standards to guarantee the satisfaction of your product requirements.

Semiconductor Company, Matsushita Electric Industrial Co., Ltd.

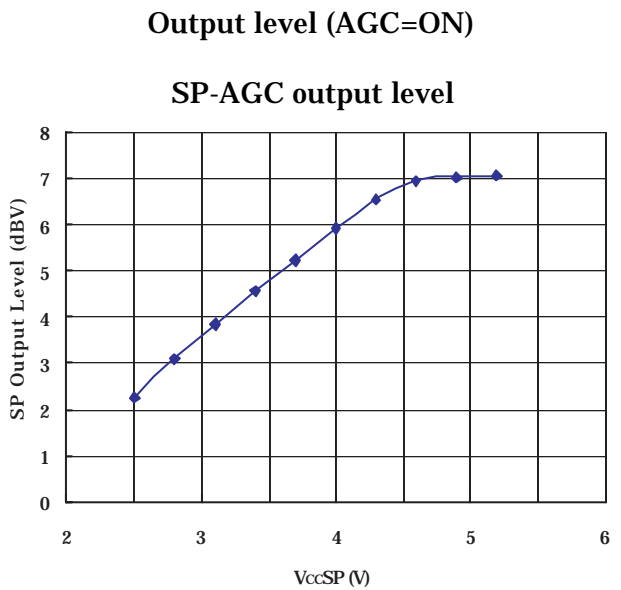
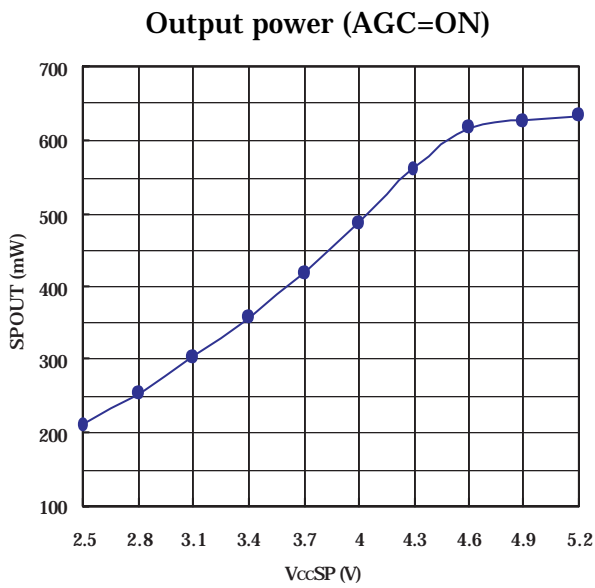


■ AGC Function

AGC's ON level changes in conjunction with Vcc SP value.



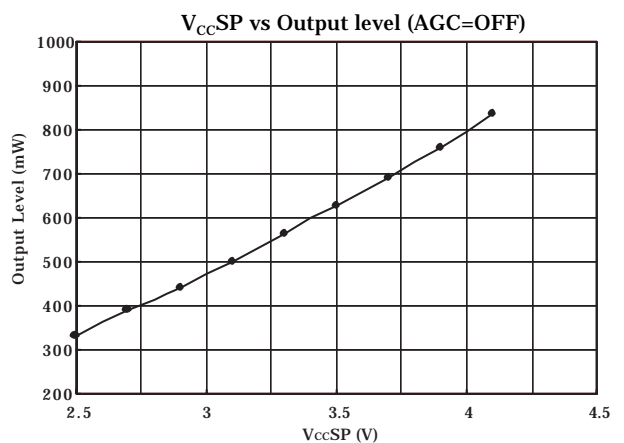
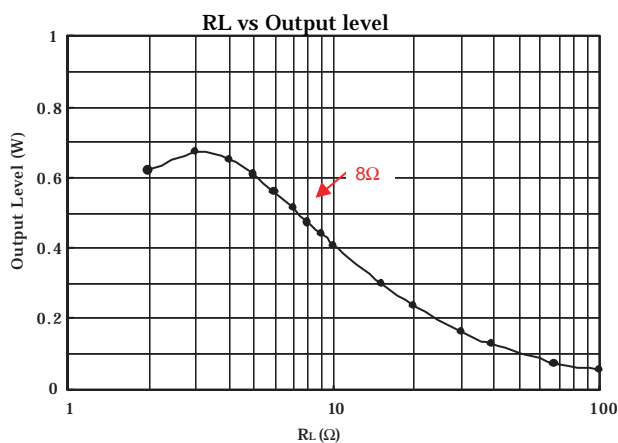
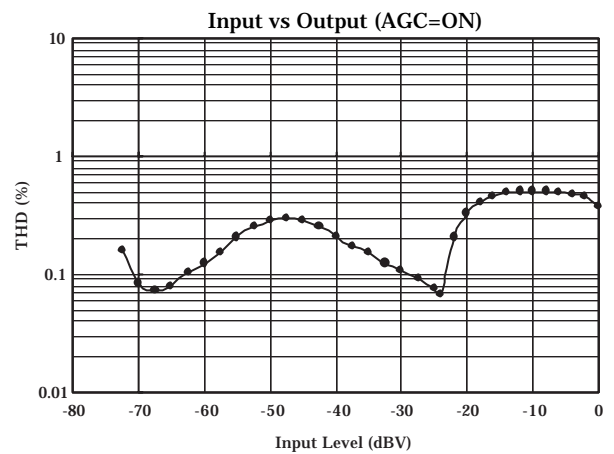
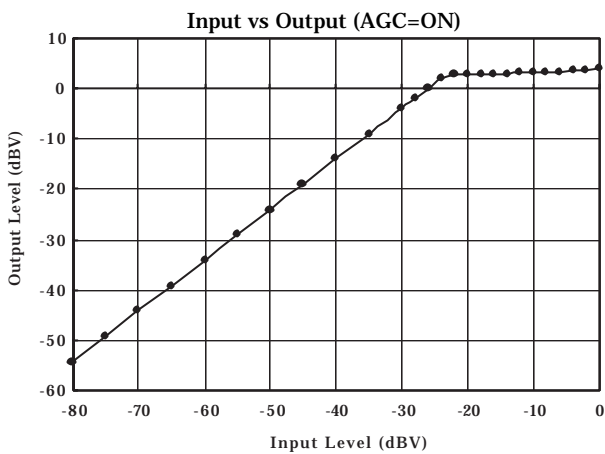
■ Output Power (AGC ON)



Vin=-4dBV f=1kHz RL=8Ω

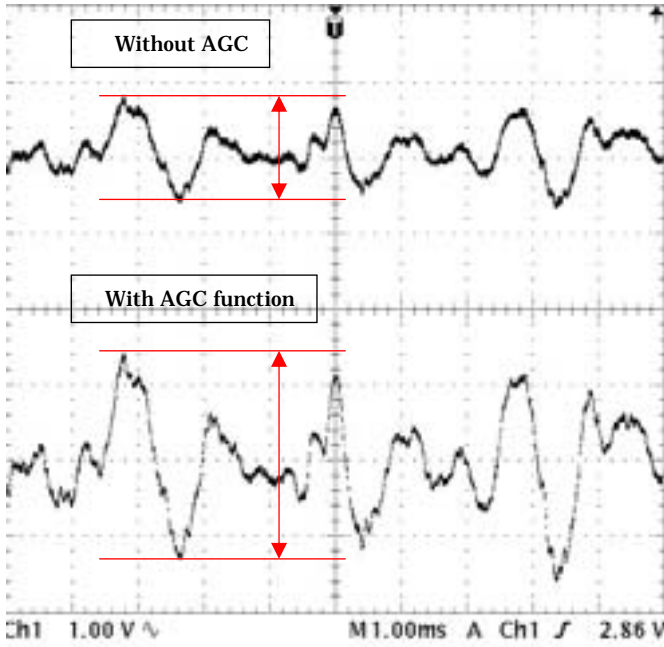
## ■ Electrical Characteristics

Parameter	Condition	Min.	Typ.	Max.	Unit
Circuit current At non-signal ( $V_{CC}$ )	$V_{CC}=3V$ STB=OFF,SP=ON	0.5	1.6	3.0	mA
Circuit current At non-signal ( $V_{CC}$ -SP)	$V_{CC}=3V$ STB=OFF,SP=ON	1.0	10	20	mA
Circuit current At STB mode ( $V_{CC}$ )	$V_{CC}=3V$ STB=ON,SP=OFF	—	0.1	1.0	$\mu A$
Circuit current At STB mode ( $V_{CC}$ -SP)	$V_{CC}=3V$ STB=ON,SP=OFF	—	0.01	1.0	$\mu A$
Circuit current At SP mute ( $V_{CC}$ )	$V_{CC}=3V$ STB=OFF,SP=ON	—	1.5	2.9	mA
Circuit current At SP mute ( $V_{CC}$ -SP)	$V_{CC}=3V$ STB=OFF,SP=ON	—	0.2	0.5	mA
SP reference output level	$V_{CC}=3V, V_{in}=-34dBV, 1kHz$ STB=OFF,SP=OFF	-9.5	-8.0	-6.5	dBV
SP reference output distortion	$V_{CC}=3V, V_{in}=-34dBV, 1kHz$ STB=OFF,SP=OFF, THD=5次	—	0.3	0.5	%
SP reference output noise	$V_{CC}=3V, \text{入力なし}$ STB=OFF,SP=OFF, Aカーブ フィルタ	—	-80	-75	dBV
SP AGC2 output level	$V_{CC}=3V, V_{in}=-4dBV, 1kHz$ STB=OFF,SP=OFF	2	4	6	dBV
SP maximum rating output (AGC OFF)	$V_{CC}=3V, V_{in}=-4dBV, 1kHz$ STB=OFF,SP=OFF	300	400	—	dBV



■ Amplifier output

- Achieving a big sound volume without clipping distortion by small speakers.



Average sound volume cannot be big without AGC (wave patters clips when input signal is big and sound distortion occurs)



Average sound volume can be big with AGC(AGC prevents sound distortion when input signal is big)

Record output wave patterns by inputting same signals with 2 amplifiers.	
AGC OFF	
AGC ON	