DATA SHEET

GPY0030A

Audio Driver

AUG. 21, 2006

Version 1.1

Table of Contents

PAGE

AUDIO DRIVER

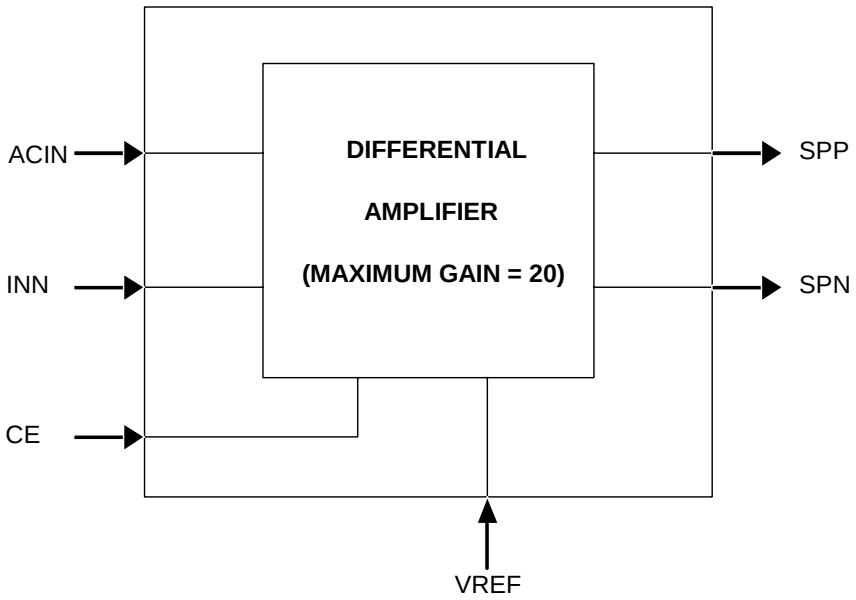
1. GENERAL DESCRIPTION

The GPY0030A is an audio driver whose gain can be adjusted by external resistor. (Maximum gain is 20) Normally, it is applied for GPC series, GPF series, GPL series and other GENERALPLUS products. The GPY0030A is easily to be used in various applications and products.

2. FEATURES

- Wide operation range: 2.4V - 6.8V
- Dual-end output mode
- Low distortion: THD+N = 0.55% (Typ.)
  (For VDD = 5.0V, R_l = 8.0Ω & P_{out} = 500mW)
- High output power: P_{OUT} = 825mW
  (For VDD = 5.0V, THD+N =10%, f =1.0KHz & R_L = 8.0Ω)
- Low standby current: 1.0μA

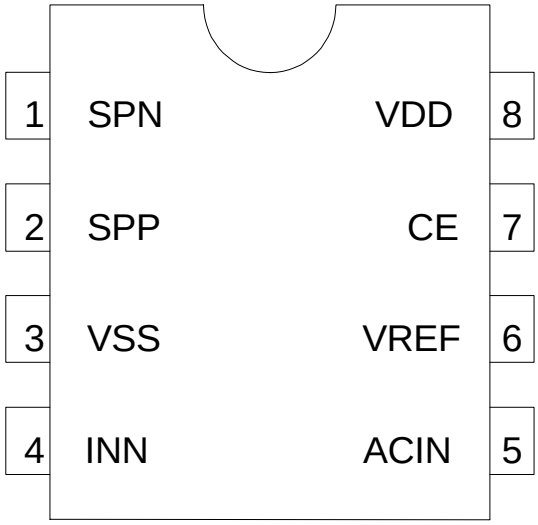
3. BLOCK DIAGRAM



4. SIGNAL DESCRIPTIONS

Mnemonic	PIN No.	Type	Description	Electrical Characteristics
VDD	8	I	Power VDD	2.4V - 6.8V
VSS	3	I	Power VSS	-
SPP	2	O	Audio output positive	-
SPN	1	O	Audio output negative	-
ACIN	5	I	Signal input positive	-
INN	4	I	Signal input negative	-
CE	7	I	Chip enable	-
VREF	6	O	Reference voltage	VDD/2

4.1. PIN Assignment



5. ELECTRICAL SPECIFICATIONS

5.1. Absolute Maximum Ratings

Characteristics	Symbol	Ratings
DC Supply Voltage	V_+	< 7.0V
Input Voltage Range	V_{IN}	-0.5V to V_+ + 0.5V
Operating Temperature	T_A	0℃ to + 60℃
Storage Temperature	T_{STO}	-50℃ to + 150℃

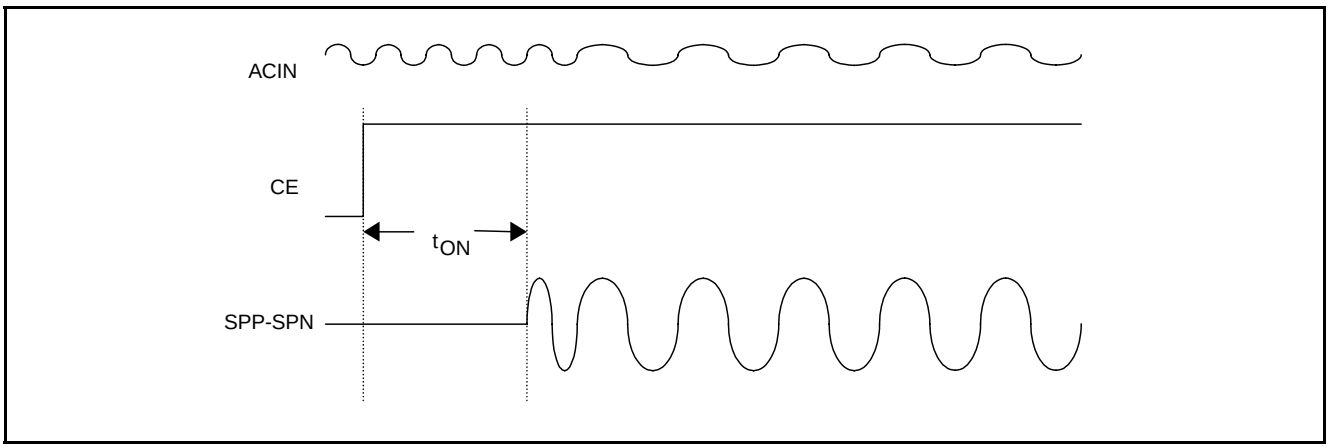
Note: Stresses beyond those given in the Absolute Maximum Rating table may cause operational errors or damage to the device. For normal operational conditions see AC/DC Electrical Characteristics.

5.2. DC Characteristics (T_A = 25°C)

Characteristics	Symbol	Limit			Unit	Test Condition
		Min.	Typ.	Max.		
Operating Voltage	VDD	2.4	-	6.8	V	For 2- or 3-battery application
Standby Current	I_{STBY}	-	-	1.0	μA	CE low
Reference Voltage	V_{VREF}	-	VDD/2	-	V	CE high, the voltage of VREF (PIN 6)
Total Harmonic Distortion + Noise	THD+N	-	0.55	1.0	%	VDD = 5.0V, R_L = 8.0Ω, P_{OUT} = 500mW
Input Resistor (CE)	R_{CE}	-	20	-	KΩ	V_{IH} = VDD, Pull-low
Input Current (CE)	I_{CE}	200	-	-	μA	V_{IH} = 2.3V at VDD = 5.0V
Operating Current	I_{CC}	-	3.0	6.0	mA	CE high, no load & ACIN floating
Output Power (See Note 1)	P_{OUT}	500	675	-	mW	VDD = 5.0V, THD+N = 1%, f = 1.0KHz & R_L = 8.0Ω
		-	825	-	mW	VDD = 5.0V, THD+N = 10%, f = 1.0KHz & R_L = 8.0Ω
Enable Time (See Note 2)	T_{ON}	-	15	-	ms	VDD = 5.0V
		-	30	-	ms	VDD = 3.0V

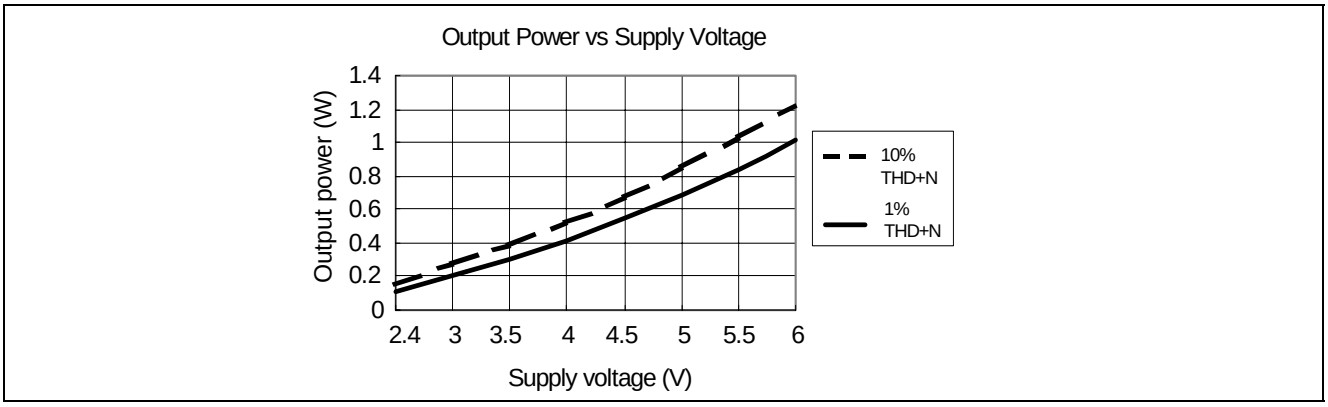
Note1: Output power = $(V_{O(PEAK)})^2/2/RL$; $V_{O(PEAK)} = (V_{I(PEAK)})$*GAIN;
So we can get the input range from output power, output loading and audio driver's gain.

Note2: t_{ON} is the time from CE high (chip enable) to SPP or SPN output.

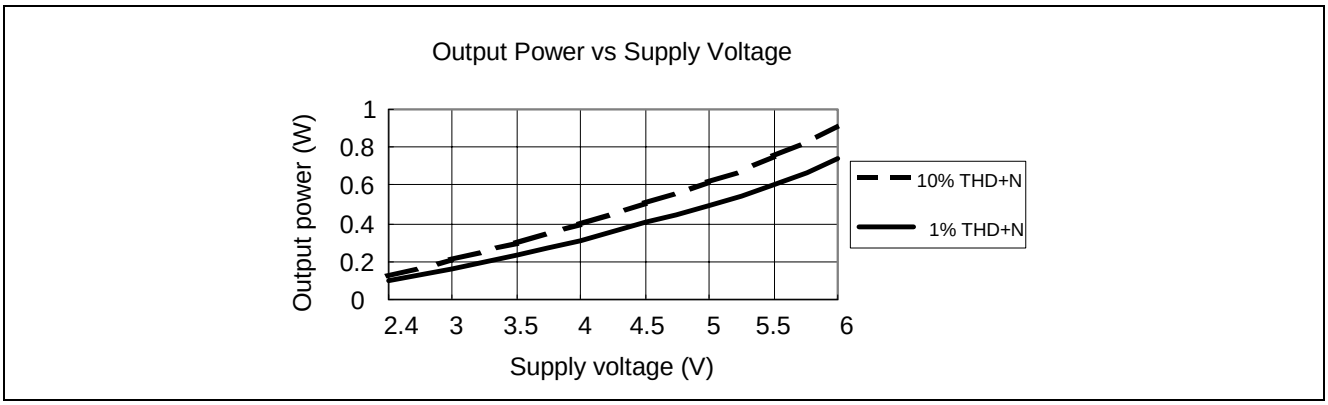


5.3. Typical Performance Characteristics

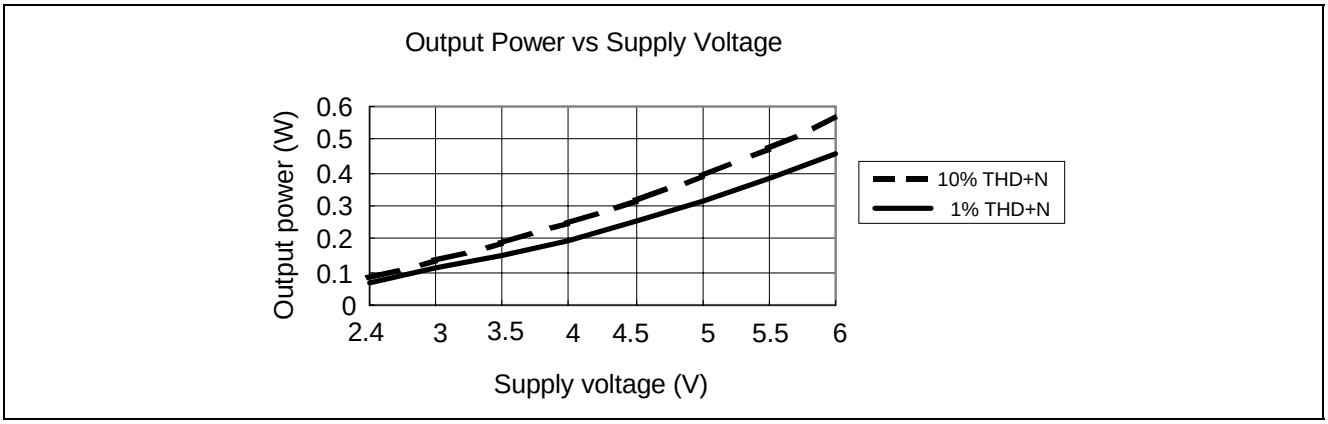
5.3.1. Output power vs. supply voltage (f_{IN} = 1.0 KHz, R_L = 8.0Ω, 20Hz<BW<22 KHz)



5.3.2. Output power vs. supply voltage (f_{IN} = 1.0 KHz, R_L = 16Ω, 20Hz<BW<22 KHz)



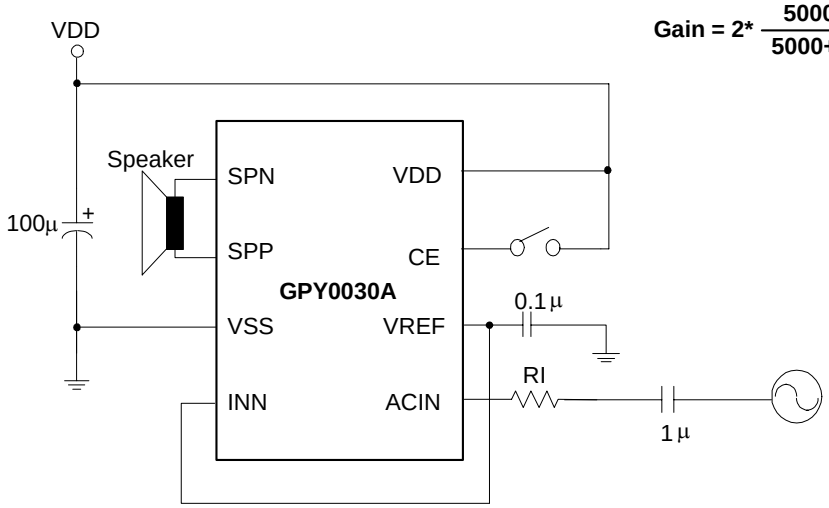
5.3.3. Output power vs. supply voltage (f_{IN} = 1.0 KHz, R_L = 32Ω, 20Hz<BW<22 KHz)



6. APPLICATION CIRCUIT

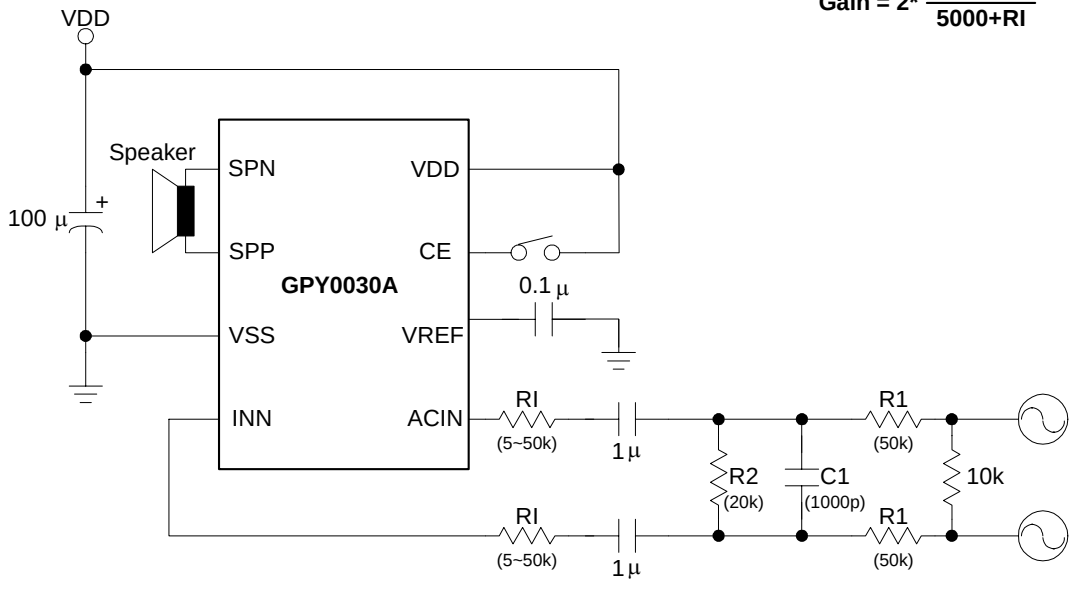
1. Double-end

$$\text{Gain} = 2^* \frac{50000}{5000+RI}$$



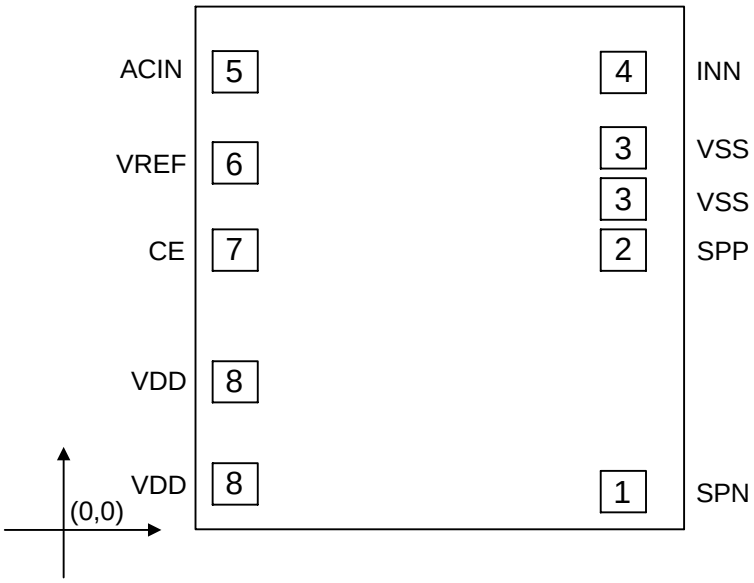
2.PWM

$$\text{Gain} = 2^* \frac{50000}{5000+RI}$$



7. PACKAGE/PAD LOCATIONS

7.1. PAD Assignment



This IC substrate should be connected to VSS

Note1: To ensure the IC functions properly, please bond all of VDD and VSS pins.

Note2: The 0.1μF capacitor between VDD and VSS should be placed to IC as close as possible.

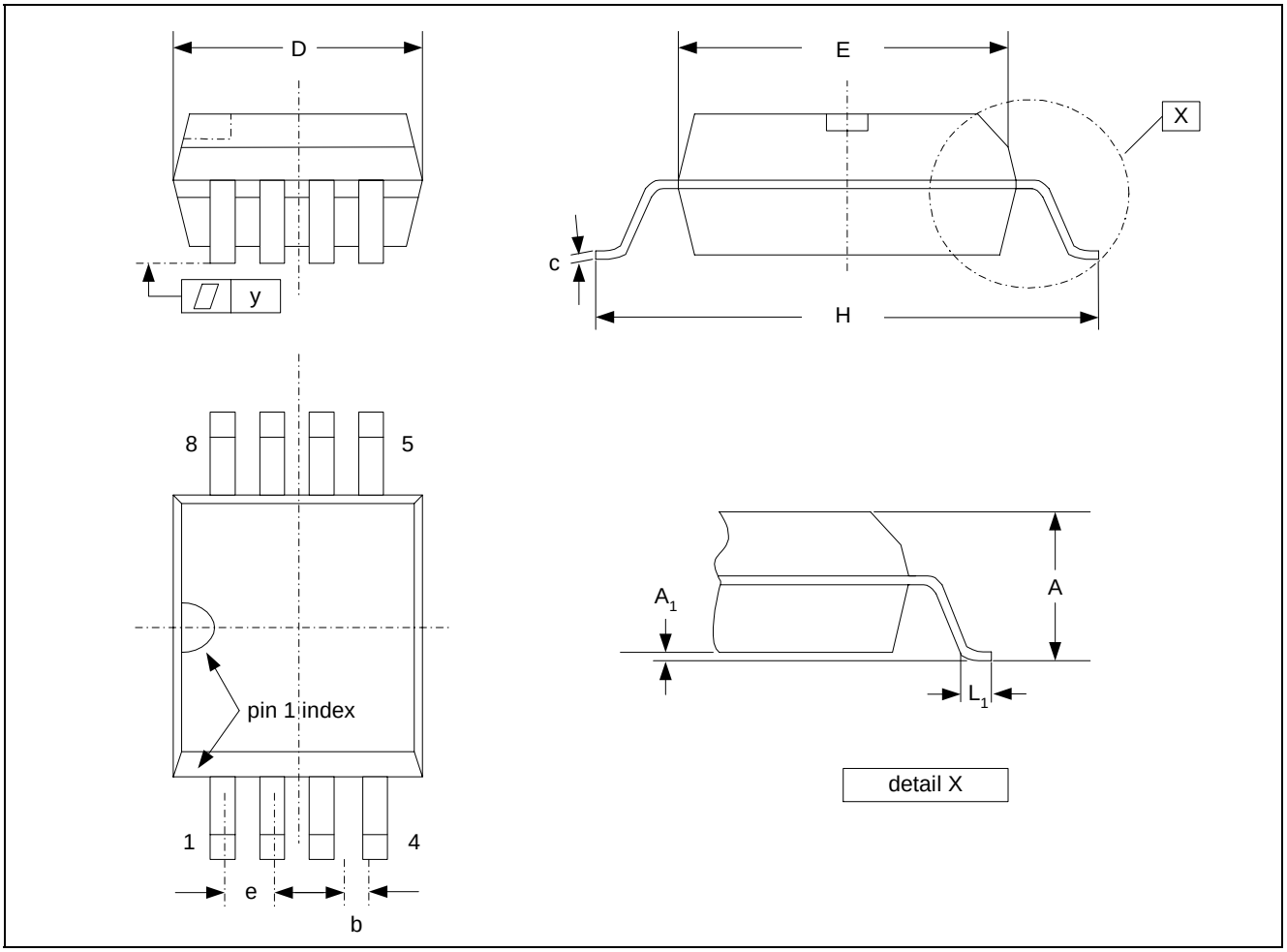
7.2. Ordering Information

Product Number	Package Type
GPY0030A - C	Chip form
GPY0030A - PS01x	Package form - SOP8 (150mil)
GPY0030A - PD01x	Package form - PDIP 8 (300mil)
GPY0030A - HS01x	Green Package form - SOP8 (150mil)
GPY0030A - HD01x	Green Package form - PDIP 8 (300mil)

Note: Package form number (x = 0 - 9, serial number).

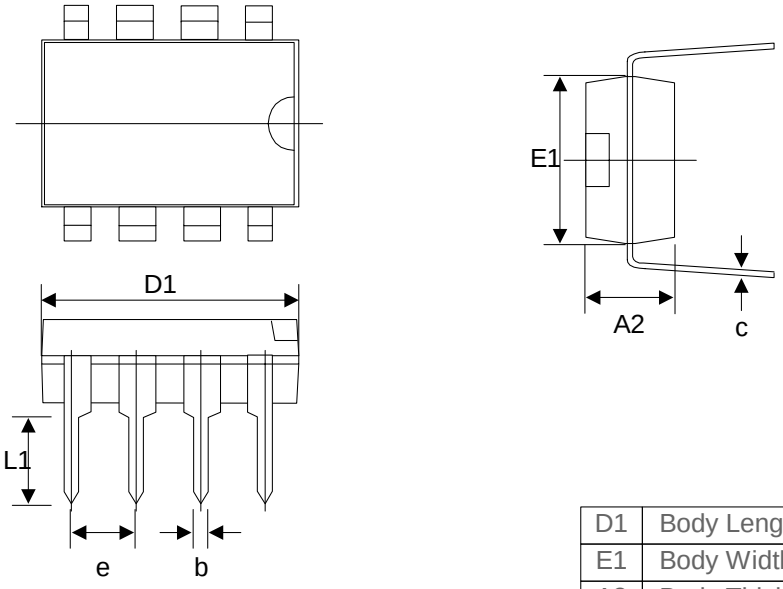
7.3. Package Information

7.3.1. SOP 8



Symbol	Dimension in inch		
	Min.	Typ.	Max.
A	0.053	-	0.069
A_1	0.004	-	0.010
b	-	0.016	-
D	0.189	-	0.196
E	0.150	-	0.157
e	-	0.050	-
H	0.228	-	0.244
L_1	0.016	-	0.050
y	-	-	0.004

7.3.2. PDIP 8



Body Size			Lead Size			
D1	E1	A2	L1	b	c	e
374±10	250±4	130±5	130±15	18±2	10Typ	100Typ

All units are in mil. 1mil = 25.4μm

D1	Body Length
E1	Body Width
A2	Body Thickness
L1	Lead Length
b	Lead Width
c	Lead Thickness
e	Lead Pitch

PDIP-8-300

8. DISCLAIMER

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9. REVISION HISTORY

Date	Revision #	Description	Page
AUG. 21, 2006	1.1	Modify the “Ordering Information” in section 7.2.	8
FEB. 13, 2006	1.0	Original Note: The GPY0030A data sheet v1.0 is a continued version of SPY0030A data sheet v1.0.	12