

Wide Input Range Data demodulation PWM controller

General Description

The AT1001Z is a three channel data demodulator that transfer the analog input signal into a PWM duty signal for the followed EMP(energy measurement processor). The fourth output signal provide the phase shift information between channel one and two. AT1001Z is designed to allow for operating a wide supply voltage range from 4.5V to 24V. The internal excellent linrarity modulation mechanism makes the converting have good line regulation with flexible external supply voltage design. The PWM signal is operated in a 5kHz switching frequency and a fixed 2kΩ output driving impedance. The devices are available in PSOP-8L packages and require very few external devices for operation.

(Patent Protected)

Features

- V_{IN} Operate with 4.5V ~ 24V Supply Voltage
- UVLO Protection (min=2.5V, typ=2.7V, max=2.9V)
- Internal Fixed Frequency 5 kHz
- Duty Cycle Range (0~100%)
- IN Pin Singal Range 0~3V
- OUT Pin Driving Capability 2kohm
- PSOP-8L Package

Applications

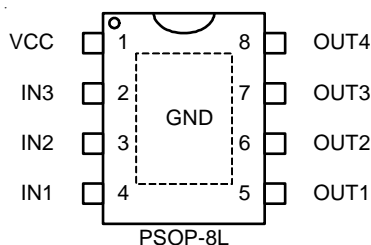
- Data demodulation

Ordering and Marking Information

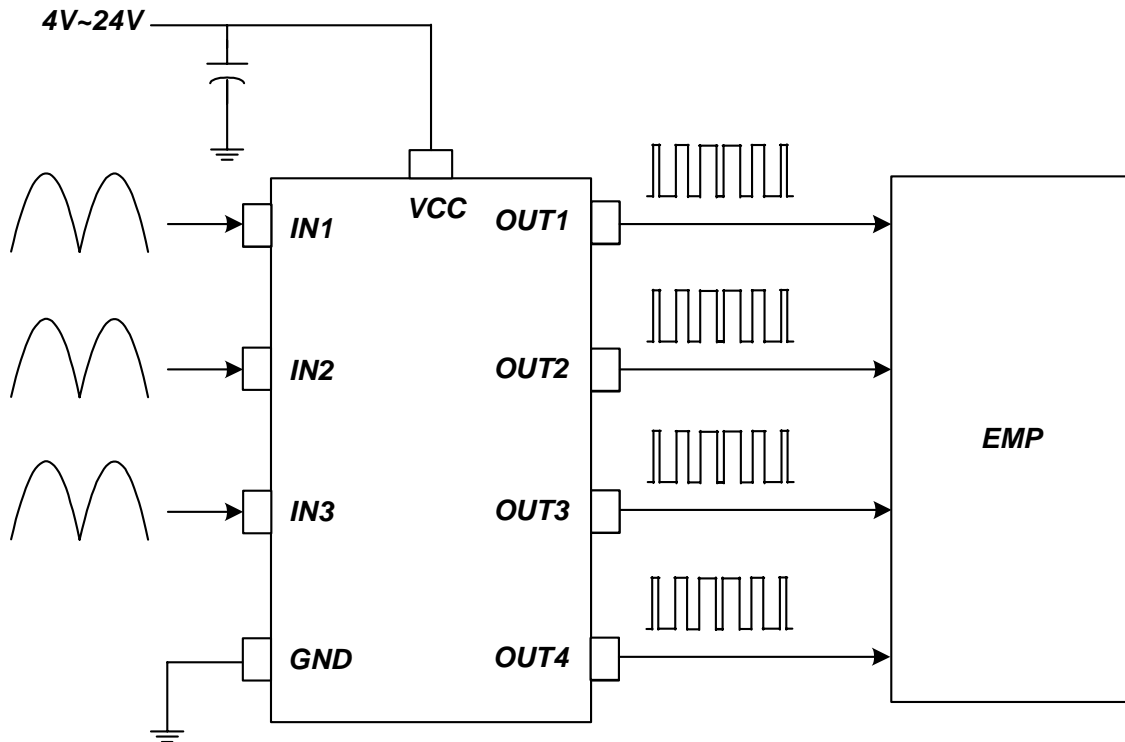
Order Number	Package	Top Marking
AT1001ZSP8	PSOP-8L	AT1001Z

Note: Aplustek products are compatible with the current IPC/JEDEC J-STD-020 requirement. They are halogen-free, RoHS compliant and 100% matte tin (Sn) plating that are suitable for use in SnPb or Pb-free soldering processes.

Pin Configuration



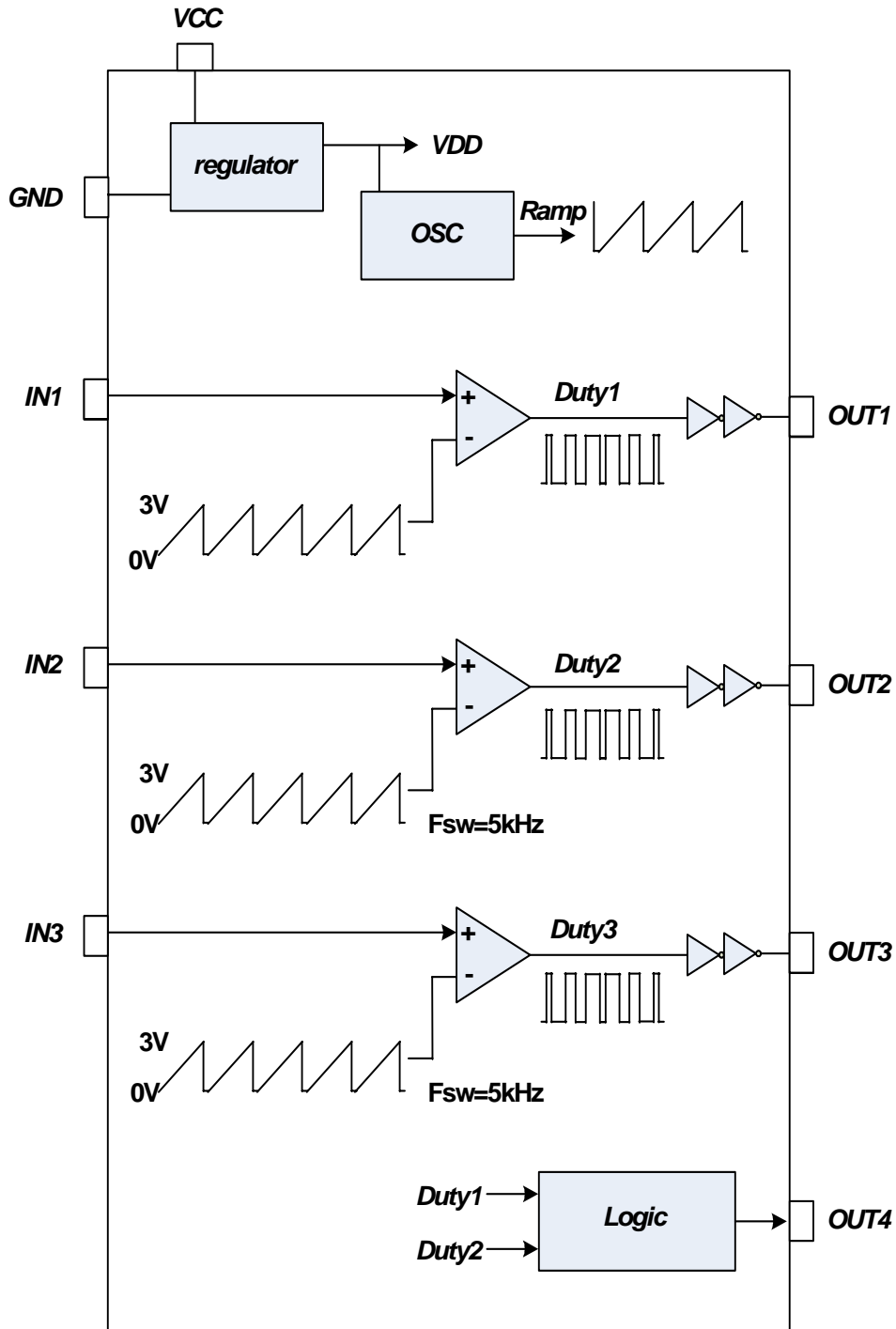
Typical Application Circuit



Function Pin Description

No.	Pin Name	Pin Function
1	VCC	Power Supply Input. Bypass this pin with a 0.1uF ceramic capacitor to GND, placed as close to the IC as possible.
2	IN3	Analog signal input pin. The input signal voltage is recommended from 0~3V.
3	IN2	Analog signal input pin. The input signal voltage is recommended from 0~3V.
4	IN1	Analog signal input pin. The input signal voltage is recommended from 0~3V.
5	OUT1	PWM Output Pin. The PWM duty signal is transfer the IN1 signal to output. This pin is designed to have a fixed 2kΩ output impedance.
6	OUT2	PWM Output Pin. The PWM duty signal is transfer the IN2 signal to output. This pin is designed to have a fixed 2kΩ output impedance.
7	OUT3	PWM Output Pin. The PWM duty signal is transfer the IN3 signal to output. This pin is designed to have a fixed 2kΩ output impedance.
8	OUT4	PWM Output Pin. The PWM duty signal provide the phase shift information between IN1 and IN2 signal. This pin is designed to have a fixed 2kΩ utput impedance.
	Exposed Pad	Ground. The Exposed pad is the device`s gnd.

Function Blocks





Absolute Maximum Ratings

(Note1)

Supply Input Voltage, V_{CC}	-----	-0.3V to +30V
IN1/2/3 to GND DC	-----	- 0.3V to +7V
OUT1/2/3/4 to GND DC	-----	-0.3V to 30V
Storage Temperature Range	-----	-65°C to +150°C
Junction Temperature	-----	-40°C to +150°C
Lead Temperature Range(Soldering 10sec)	-----	260°C
ESD Rating (Note2)		
HBM(Human Body Mode)	-----	2KV
MM(Mechine Mode)	-----	200V

Thermal Characteristics

Package Thermal Resistance (Note3)

PSOP-8L θ_{JA}	-----	50°C/W
PSOP-8L θ_{JC}	-----	5°C/W
Power Dissipation, PD @ $T_A = 25^\circ\text{C}$		
PSOP-8L	-----	2.0W

Electrical Characteristics

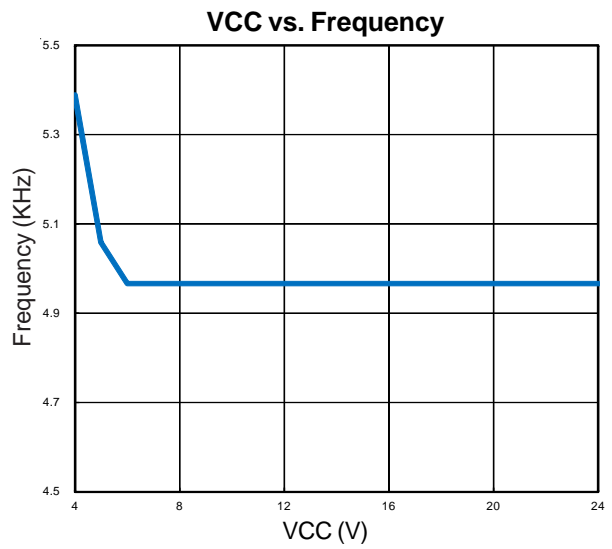
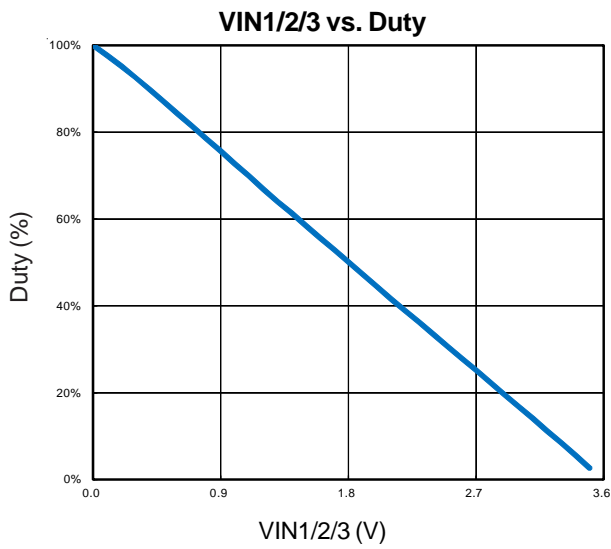
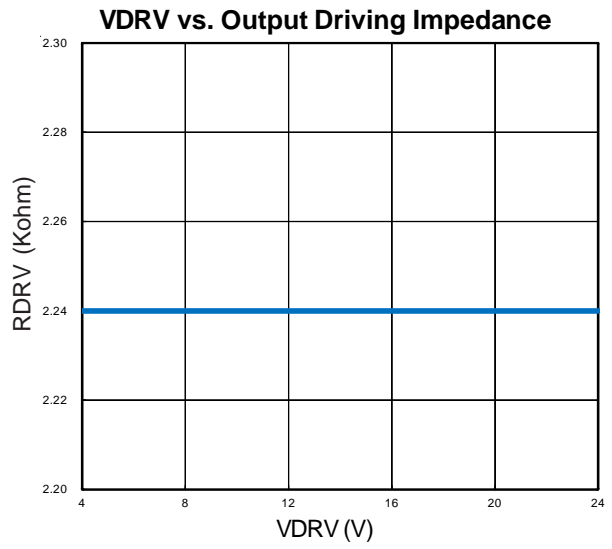
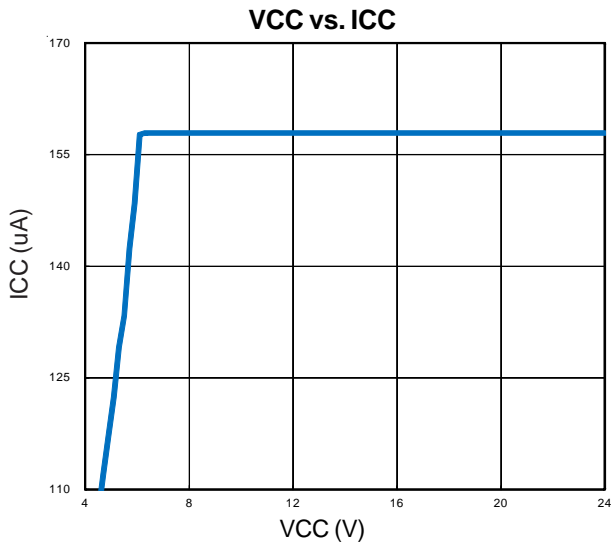
($V_{CC} = 12\text{V}$, $T_A = +25^\circ\text{C}$ unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Input Section						
VCC operation range	$V_{CC,R}$		4.5		24	V
VCC UVLO threshold	$V_{CC,R}$	VCC Rising	--	2.7	--	V
	$V_{CC,F}$	VCC Falling	--	2.65	--	V
VCC operation current	I_{CC}	VCC=4.5V to 24V , IN1/2/3=5V , OUT1/2/3/4 Floating		150	300	uA
IN1/2/3 Section						
IN1/2/3 pin input leakage	$I_{INLEAK1/2/3}$	$IN_{1/2/3} = 0\sim 3\text{V}$	--	0.1	1	uA
OUT1/2/3/4 Section						
OUT1/2/3/4 pin output driving impedance	$R_{DRV1/2/3/4}$		--	2	--	k Ω
OUT1/2/3/4 pin output leakage	$I_{OLEAK1/2/3/4}$	VOUT1/2/3/4=4.5V to 24V	--	0.1	1	uA
Oscillator Section						
OUT1/2/3 PWM frequency	F_{SW}		--	5	--	kHz
Frequency Variation vs. V_{CC} Deviation	F_{DV}	$V_{CC} = 4.5\text{V to } 24\text{V}$	0	0.02	2.00	%
Frequency Variation vs. Temperature Deviation	F_{DT}	$T_A = -40\text{ to } +125^\circ\text{C}$	-2	--	+2	%

Note 1. Exceeding these limits may impair the life of the device. Exposure to absolute maximum rating conditions for long periods may affect device reliability.

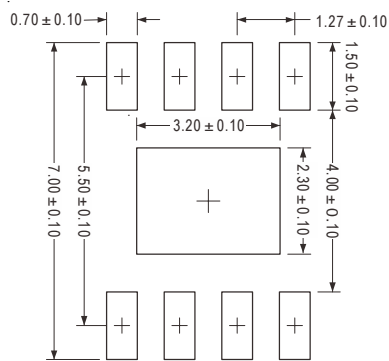
Note 2. θ_{JA} is measured with the component mounted on a high effective thermal conductivity test board in free air. The exposed pad of the package is soldered directly on the PCB.

Typical Operation Characteristics

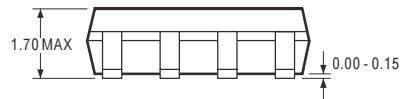
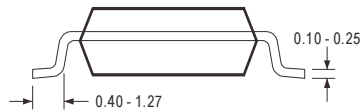
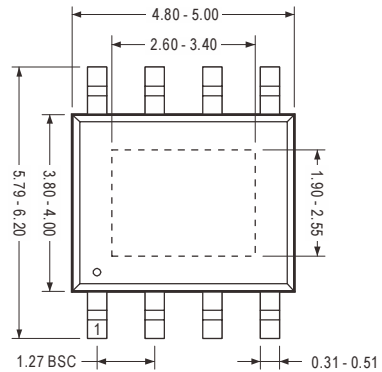


Package Information

PSOP-8L



Recommended Solder Pad Layout



Note

1. Package Outline Unit Description:

BSC: Basic. Represents theoretical exact dimension .

MAX: Maximum dimension specified.

MIN: Minimum dimension specified.

REF: Represents dimension for reference use only. The value is not the device specification.

TYP: Represents as a typical value. The value is not the device specification.

2. All linear dimensions are in Millimeters.