NEW PRODUCT

PAM8904

18VPP OUTPUT PEIZO SOUNDER DRIVER

Description

The PAM8904 is a piezo sounder driver with integrated a charge pump boost converter. The PAM8904 is capable for driving a ceramic/piezo sounder with 18Vpp from a 3V power supply. The charge pump can operate in either of a 1X, 2X and 3X mode.

The boost converter operates at a fixed frequency of 1.0MHz and provides a 9V output with a minimum number of external components. The PAM8904 can drive up to 15nF loading. PAM unique drive technology provides small inrush current, low EMI and high efficiency.

PAM8904 built-in automatic shutdown and wake up that guarantees longer battery life.

PAM8904 features thermal shutdown, over current protection, over voltage protection and under voltage lock-out.

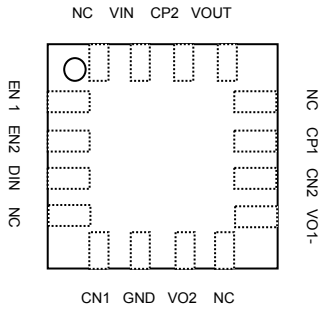
The PAM8904 is available in a 16pin U-QFN3030 package.

Features

- Supply voltage Range From 2.3V to 5.5V
- 18V_{PP} Output from a 3V Supply
- Integrated Boost Converter Generates 9V Supply
- Input signal 20 Hz to 300KHz
- No Voltage Cross Output At Shutdown Mode
- Low Current Consumption
- Automatic Standby and Wake-up Control
- Available in Space Saving Packages 16pin QFN package

Pin Assignments

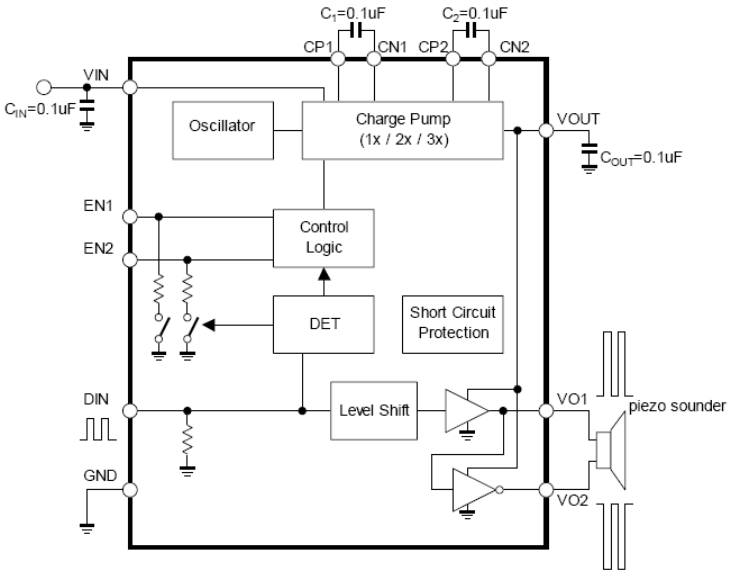
U-QFN3030-16L



Applications

- Health Care System
- Alarm Clock
- Security Device
- Home Appliance

Typical Applications Circuit



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Pin Descriptions

Pin Name	I/O/P	Function
VIN	P	Power Supply
EN1	I	Charge pump mode select 1
EN2	I	Charge pump mode select 2
DIN	I	Signal Input
CN1	I	Capacitor 1 Negative Terminal
GND	P	Ground
VO2	O	Positive Output
VO1	O	Negative Output
CN2	I	Capacitor 2 Negative Terminal
CP1	I	Capacitor 1 Positive Terminal
VOUT	O	Boost Output
CP2	I	Capacitor 2 Positive Terminal
NC	—	No Connect

Absolute Maximum Ratings (@ T_A = +25°C, unless otherwise specified.)

Symbol	Characteristics	Value	Unit
V_{IN}	Supply Voltage	-0.3 to +6.0	V
V_I	EN1, EN2	GND -0.3 to V_{IN} +0.3	V
T_A	Operating Free-Air Temperature Range	-40 to +85	°C
T_J	Operating Junction Temperature Range	-40 to +150	°C
T_{STG}	Storage Temperature Range	-65 to +150	°C

Recommended Operating Conditions (@ T_A = +25°C, unless otherwise specified.)

Symbol	Characteristics		Min	Max	Unit
VIN	Supply Voltage		2.3	5.0	V
V_{IH}	High-Level Input Voltage	EN1,EN2	1.2 to V_{IN} +0.3		V
V_{IL}	Low-Level Input Voltage	EN1,EN2	-0.3	+0.4	V
T_A	Operating Free-Air Temperature		-40	+85	°C

Thermal Information

Parameter	Symbol	Package	Maximum	Unit
Thermal Resistance (Junction to Ambient)	θ_{JA}	U-QFN3030-16L	35	°C/W
Thermal Resistance (Junction to Case)	θ_{JC}	U-QFN3030-16L	14	°C/W

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Electrical Characteristics (@T_A = +25°C,VIN=3.0V, C_{Piezo}=15nF, f_{DIN}=4KHz, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage	V_{OUT1}	1x Mode	2.8		3	V
	V_{OUT2}	2x Mode	5.2		6	V
	V_{OUT3}	3x Mode	7.2		9	V
Operating Current 1	I_{DD11}	1x Mode, C_{PIEZO} = No Load		50		μA
	I_{DD12}	2x Mode, C_{PIEZO} = No Load		720		μA
	I_{DD13}	3x Mode, C_{PIEZO} = No Load		1700		μA
Operating Current 2	I_{DD21}	1x Mode, Single-ended application		0.3		mA
	I_{DD22}	2x Mode, Single-ended application		1.4		mA
	I_{DD23}	3x Mode, Single- ended application		3.9		mA
Operating Current 3	I_{DD31}	1x Mode, Differential application		0.9		mA
	I_{DD32}	2x Mode, Differential application		3.6		mA
	I_{DD33}	3x Mode, Differential application		7.9		mA
Shutdown Current	I_{SD}	DIN = 0V			1	μA
Input Frequency	f_{IN}	Rectangular pulse		4		kHz
Oscillating Frequency	f_{OSC}			1		MHz
VOUT Start Delay Time	T_{ON1}	1x Mode, From DIN signal High to 90% V_{OUT} steady state		270		μs
	T_{ON2}	2x Mode, From DIN signal High to 90% V_{OUT} steady state		320		μs
	T_{ON3}	3x Mode From DIN signal High to 90% V_{OUT} steady state		350		μs
Shutdown Delay Time	T_{OFF}	DIN = H- >L		42		ms
Output Short-circuit Current	I_{SC}			40		mA
Control Terminal Voltage H	VIH	EN1, EN2, DIN pins	0.8*V_{IN}		V_{IN}	V
Control Terminal Voltage L	VIL	EN1, EN2, DIN pins	0		0.2*V_{IN}	V
Control Terminal Current 1	IIH1	DIN = 3V			1	μA
Control Terminal Current 2	IIH2	VEN1, VEN2 = 3V,DIN = 3V			1	μA
Control Terminal Current 3	IIH3	VEN1, VEN2 = 3V, DIN = 0V			1	μA

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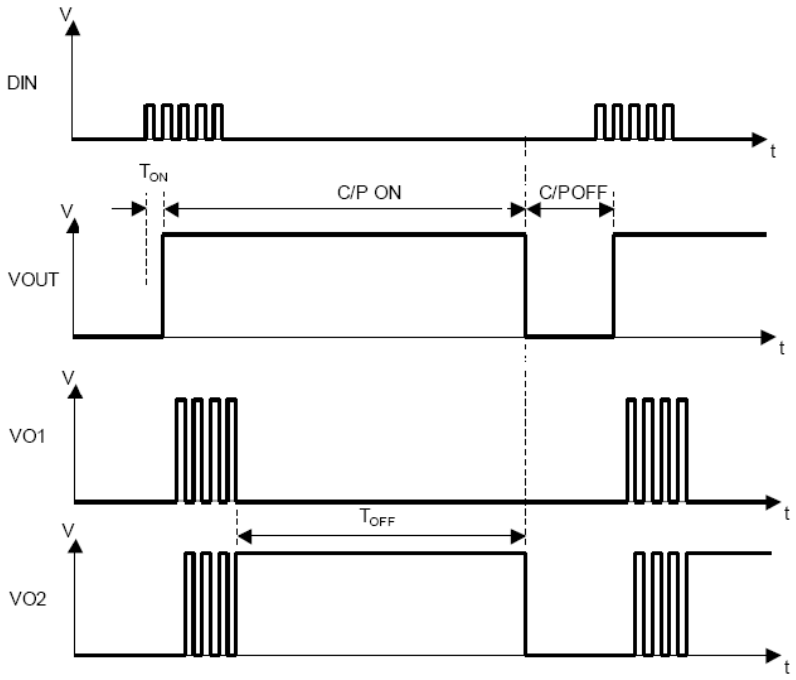
Application Information

Charge Pump Mode Setting

DIN	EN1	EN2	MODE
0	—	—	Shutdown Mode
1	0	0	Shutdown Mode
1	0	1	1X Mode
1	1	0	2X Mode
1	1	1	3X Mode

Timing Chart



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Ordering Information

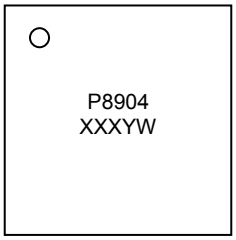
PAM8904 X X X

Package Type	Pin Configuration	Shipping Package
J: U-QFN3030	E: 16 Pin	R: Tape & Reel

Part Number	Package Type	Shipping
PAM8904JER	U-QFN3030-16L	3,000/Tape & Reel

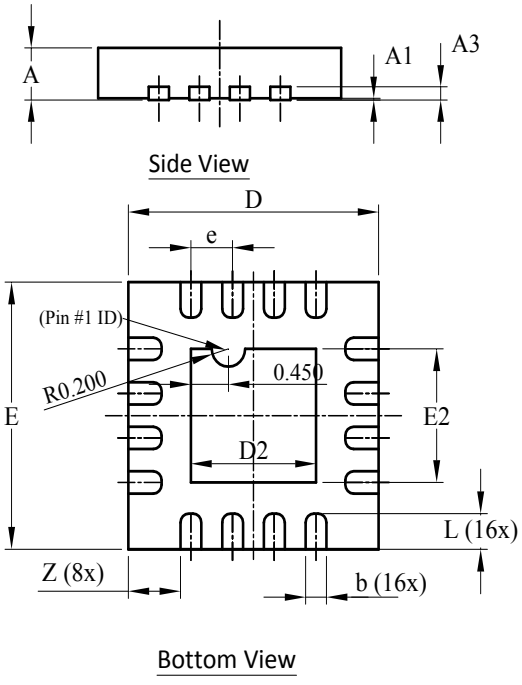
Marking Information

U-QFN3030-16L



Package Outline Dimensions (All dimensions in mm.)

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



U-QFN3030-16 Type B			
Dim	Min	Max	Typ
A	0.55	0.65	0.60
A1	0	0.05	0.02
A3	—	—	0.15
b	0.18	0.28	0.23
D	2.95	3.05	3.00
D2	1.40	1.60	1.50
E	2.95	3.05	3.00
E2	1.40	1.60	1.50
e	—	—	0.50
L	0.35	0.45	0.40
Z	—	—	0.625
All Dimensions in mm			

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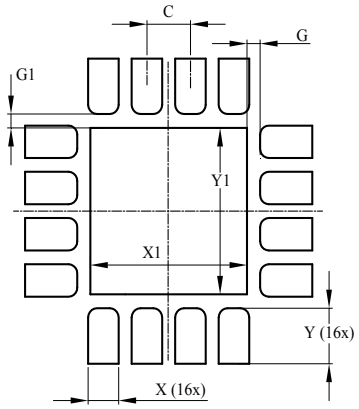
Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version



Dimensions	Value (in mm)
C	0.500
G	0.150
G1	0.150
X	0.350
X1	1.800
Y	0.600
Y1	1.800