

Low Quiescent, High Efficiency 1.5A Buck-Boost Converter with I²C Interface

Features

- Buck, Buck-Boost and Boost Operation with Seamless Mode Transition
- 2.2V to 5.5V Input Supply Voltage Range
- 1.4V to 4.575V Output Voltage Range with Digitally Programmable (25mV/steps)
- 2.8uA Low Quiescent Current
- 0.3uA Shutdown Current
- Excellent Load Transient Response
- Allows Dynamically-Voltage-Scaling Control (SR:2V/ms, 5V/ms, 10V/ms, 20V/ms)
- Allows Dynamically-Voltage-Scaling Control
- Automatic PFM Mode and Forced PWM Mode Selection
- Up to 1MHz I2C Interface (VSEL=H, ADDR=0X75; VSEL=L, ADDR=0X76)
- Converter I2C Default EN = 0
- Output Voltage Selection (VSEL=H, VOUT=2.875V Default; VSEL=L, VOUT=2.675V Default)
- Maximum Continuous Output Current:
Up to 1A for VIN ≥ 2.5V, VOUT = 3.5V
Up to 1.2A for VIN ≥ 3V, VOUT = 4.5V
Up to 1.5A for VIN ≥ 4V, VOUT = 4.5V
- WLCSP 1.3X1.3-9B Package

Applications

- AF & OIS Driver
- Wearable Devices
- Portable Devices
- TWS Earbud Chargers
- Optical Heart Rate Monitor LED Bias
- Battery Powered Systems
- Smartphones

General Description

The AWP37702 is a high-efficiency, single inductor, advanced COT synchronous Buck-Boost converter with 2.2V to 5.5V wide input voltage range and well regulate to the digitally programmable output voltage from 1.4V to 4.575V. Which is suitable for wide input supply range applications, regardless of input voltage is lower, higher than or even equal to the output voltage. The COT control architecture features outstanding line/load transient response, seamless transition between buck and boost modes, provides stable operation with small ceramic output capacitors and without complicated external compensation.

The AWP37702 features I²C interface, which allows programmable output voltage, soft-start slew-rate adjusted and device status monitoring. The target output voltage can also be switched through external VSEL pin to perform dynamically-voltage-scaling (DVS), and the ramp-up slew-rate and ramp mode of DVS can also be set by setting the related registers.

The AWP37702 has internal soft start module to limits the inrush current. Full protection features include over current protection(OCP), over voltage protection(OVP), under voltage protection(UVP) and over temperature protection(OTP). The AWP37702 is available in WLCSP 1.3X1.3-9B package.

Typical Application Circuit

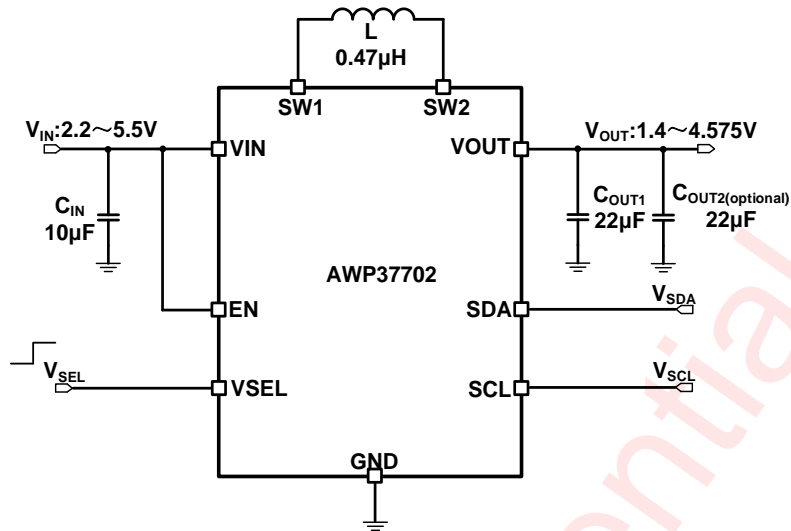


Figure 1 AWP37702 Typical Application Circuit

NOTE: When the I_{OUT} is $\leq 1A$, a 22 μ F C_{OUT} is recommended. When the I_{OUT} is $>1A$, 2 \times 22 μ F C_{OUT} capacitors are recommended.

Pin Configuration

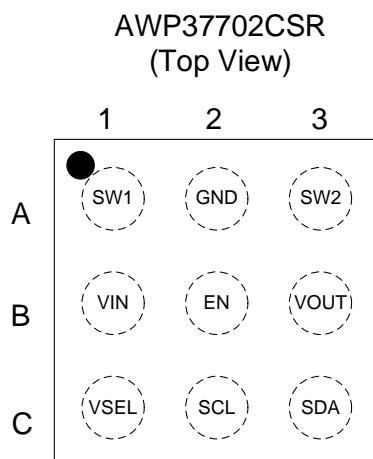
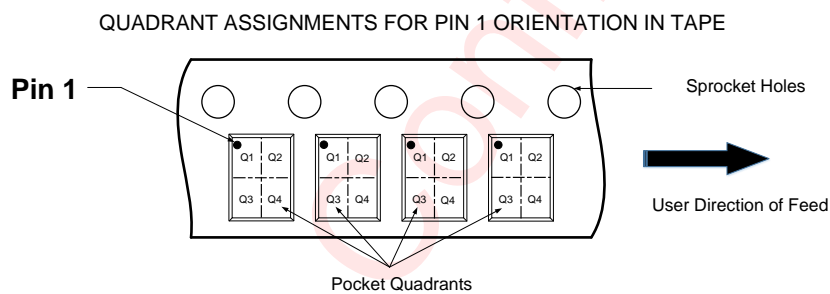
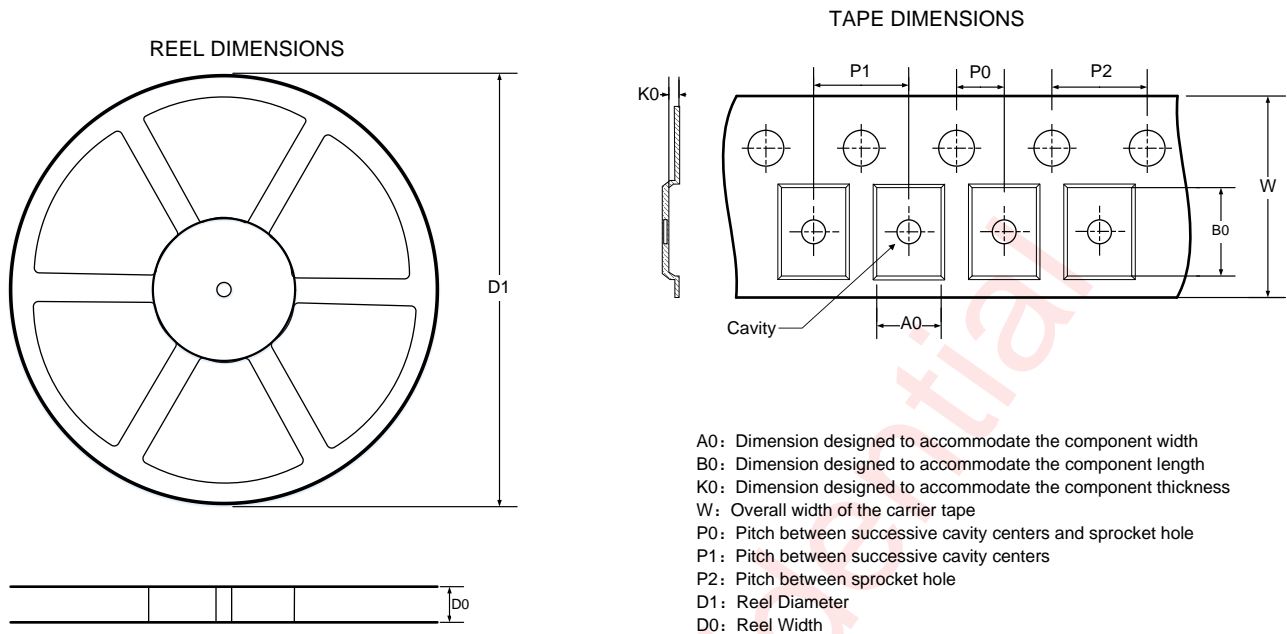


Figure 2 Pin Configuration

Pin Definition

No.	NAME	DESCRIPTION
A1	SW1	Switching node 1. Connect to the inductor.
A2	GND	Ground. All signals are referenced to this pin.
A3	SW2	Switching node 2. Connect to the inductor.
B1	VIN	Power input.
B2	EN	Enable control input. A logic-high enables the converter; a logic-low forces the device into shutdown mode.
B3	VOUT	Power output.
C1	VSEL	Voltage select pin. When this pin is logic low, VOUT is set by the VOUT1 register; This pin is logic high, VOUT is set by the VOUT2 register.
C2	SCL	I ² C serial interface clock.
C3	SDA	I ² C serial interface data.

Tape And Reel Information



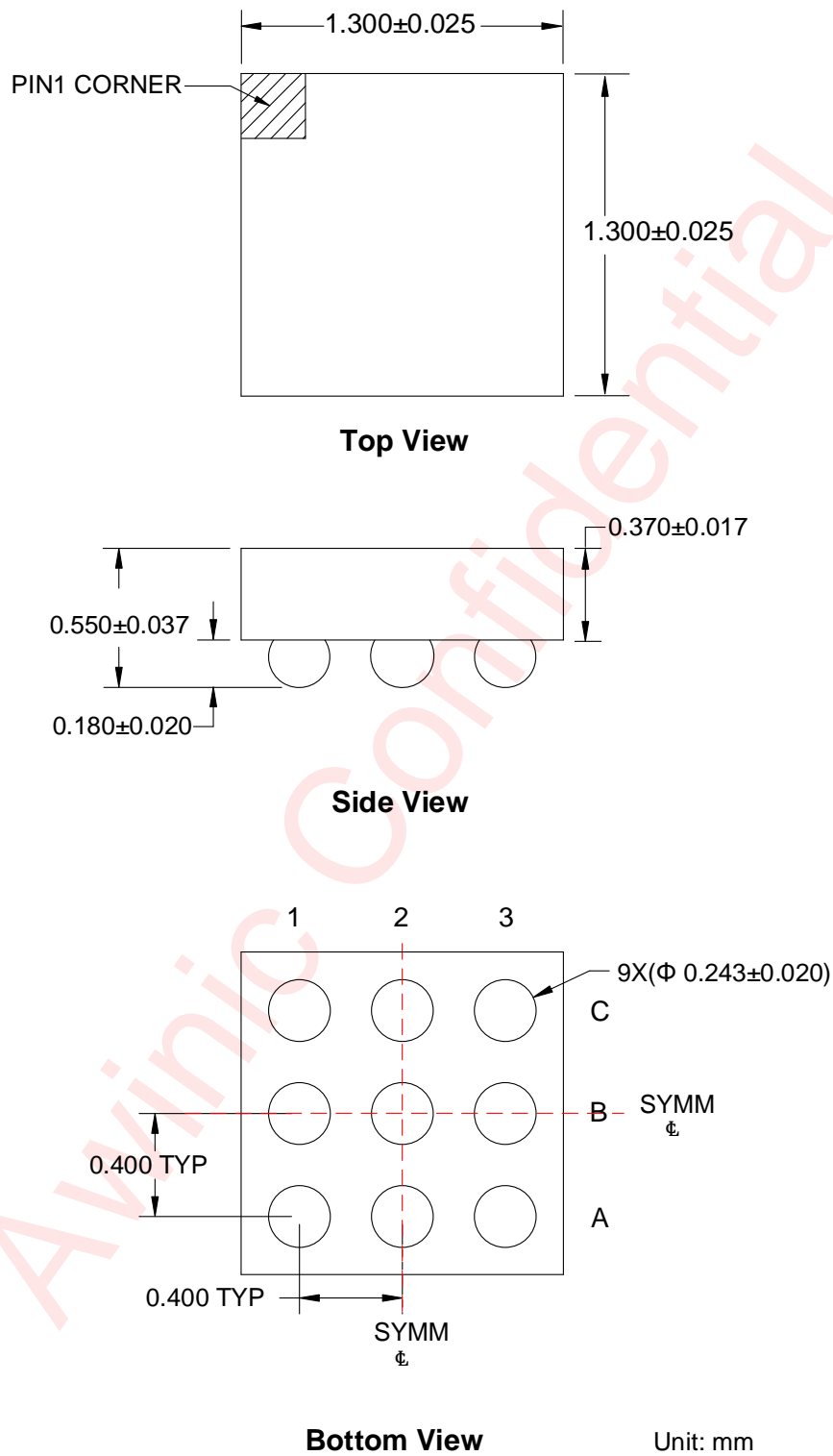
Note: The above picture is for reference only. Please refer to the value in the table below for the actual size

DIMENSIONS AND PIN1 ORIENTATION

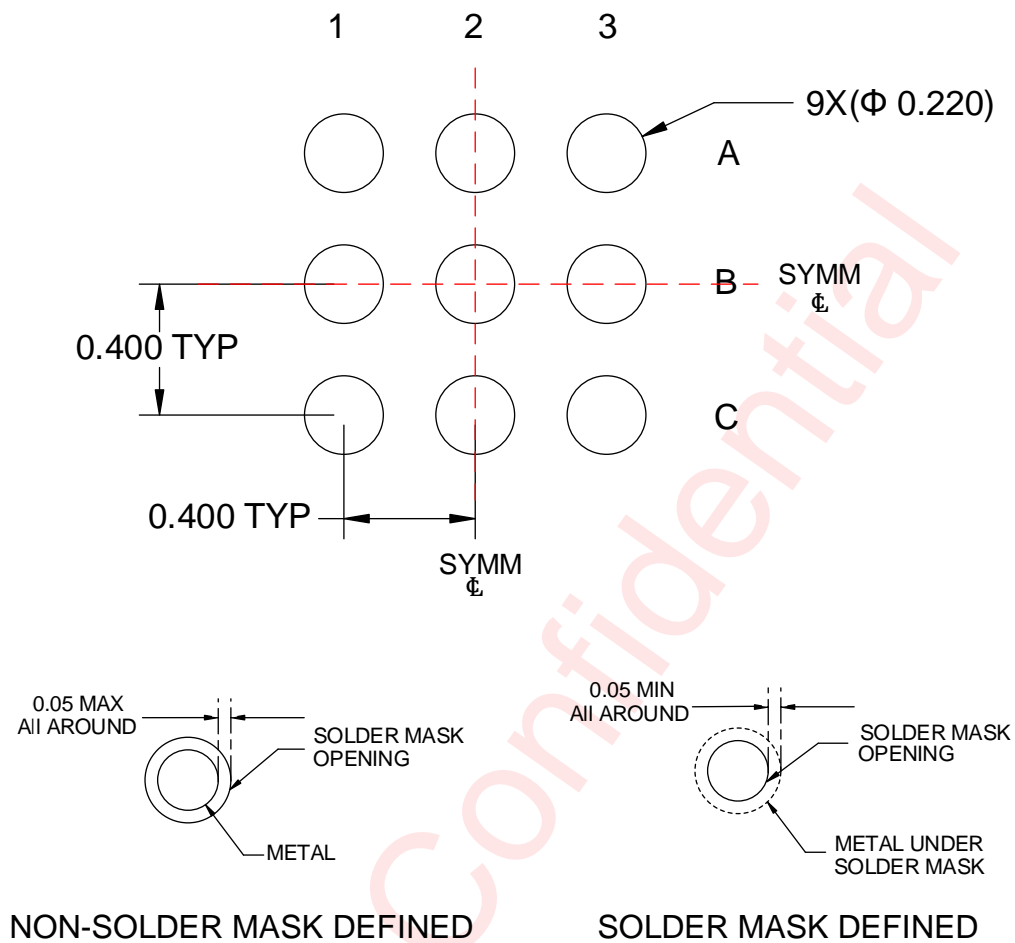
D1 (mm)	D0 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P0 (mm)	P1 (mm)	P2 (mm)	W (mm)	Pin1 Quadrant
180.00	8.60	1.50	1.46	0.68	2.00	4.00	4.00	8.00	Q1

All dimensions are nominal

Package Description



Land Pattern Data



Unit: mm

Revision History

Version	Date	Change Record
V1.0	Apr. 2025	Officially released
V1.1	Jul. 2025	1. Update <i>Features</i> . (P1) 2. Update <i>Typical Application Circuit</i> . (P2)

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