

General Description

The AOZ3015PI is a high efficiency, easy to use, 3 A synchronous buck regulator. The AOZ3015PI works from 4.5 V to 18 V input voltage range, and provides up to 3 A of continuous output current with an output voltage adjustable down to 0.8 V.

The AOZ3015PI comes in an exposed pad SO-8 package and is rated over a -40 °C to +85 °C operating ambient temperature range.

Features

- 4.5 V to 18 V operating input voltage range
- Synchronous Buck: 85 mΩ internal high-side switch and 50 mΩ internal low-side switch (at 12 V)
- PEM (pulse energy mode) enables >85% efficiency with $I_{OUT} = 10 \text{ mA}$ ($V_{IN} = 12 \text{ V}$, $V_{OUT} = 5 \text{ V}$)
- 350 μA supply current under typical application
- Up to 95 % efficiency
- Internal soft-start
- Output voltage adjustable to 0.8 V
- 3 A continuous output current
- 500 kHz PWM operation
- Cycle-by-cycle current limit
- Pre-bias start-up
- Short-circuit protection
- Thermal shutdown
- Exposed pad SO-8 package

Applications

- Point of load DC/DC converters
- LCD TV
- Set top boxes
- DVD and Blu-ray players/recorders
- Cable modems



Typical Application

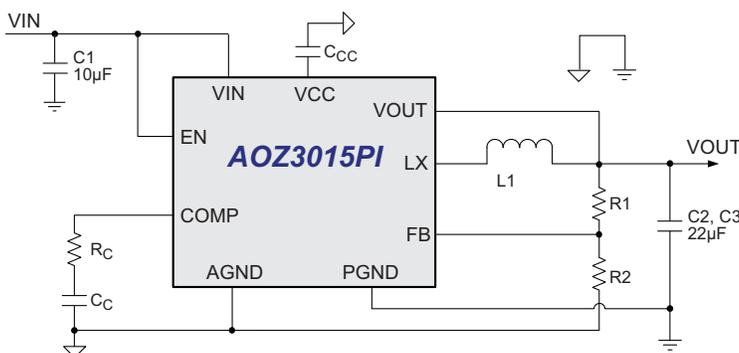
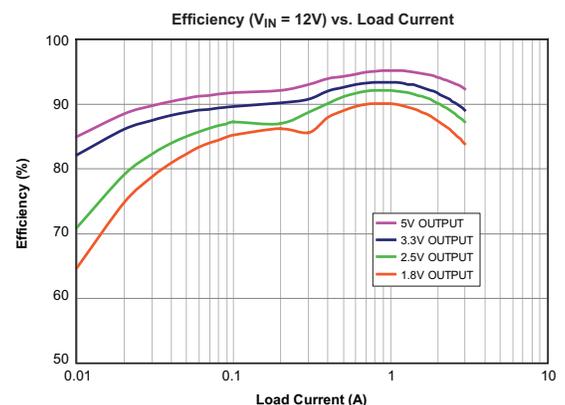


Figure 1. 3 A Synchronous Buck Regulator, $F_s = 500 \text{ kHz}$



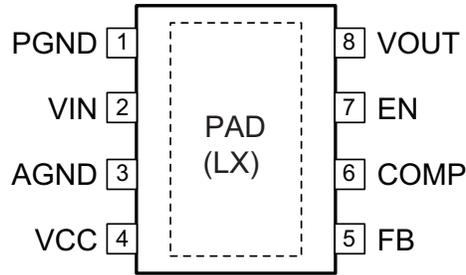
Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ3015PI	-40 °C to +85 °C	EPAD SO-8	Green Product



AOS Green Products use reduced levels of Halogens, and are also RoHS compliant. Please visit www.aosmd.com/media/AOSGreenPolicy.pdf for additional information.

Pin Configuration

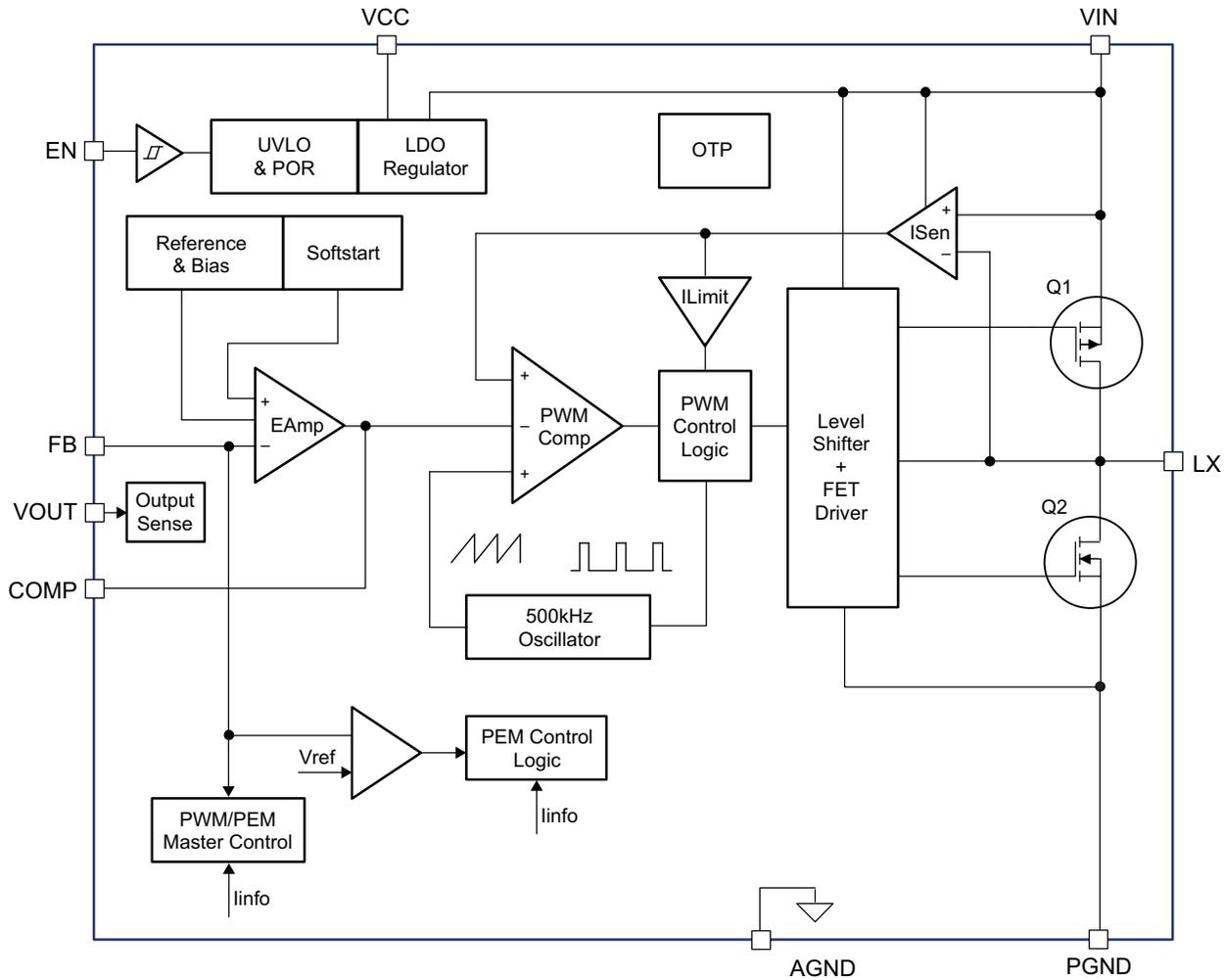


Exposed Pad SO-8
(Top View)

Pin Description

Pin Number	Pin Name	Pin Function
1	PGND	Power ground. PGND needs to be electrically connected to AGND.
2	VIN	Supply voltage input. When VIN rises above the UVLO threshold and EN is logic high, the device starts up.
3	AGND	Analog ground. AGND is the reference point for controller section. AGND needs to be electrically connected to PGND.
4	VCC	Internal LDO output.
5	FB	Feedback input. The FB pin is used to set the output voltage via a resistive voltage divider between the output and AGND.
6	COMP	External loop compensation pin. Connect a RC network between COMP and AGND to compensate the control loop.
7	EN	Enable pin. Pull EN to logic high to enable the device. Pull EN to logic low to disable the device. If on/off control is not needed, connect EN to VIN and do not leave it open.
8	VOUT	VOUT sense pin for protection purposes.
Exposed pad	LX	Switching node. LX is the drain of the internal power FETs. LX is used as the thermal pad of the power stage.

Block Diagram



Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
Supply Voltage (V_{IN})	20 V
LX to AGND	-0.7 V to $V_{IN}+0.3$ V
LX to AGND (<20 ns)	-5 V to 22 V
EN, VOUT to AGND	-0.3 V to $V_{IN}+0.3$ V
VCC, FB, COMP to AGND	-0.3 V to 6.0 V
PGND to AGND	-0.3 V to +0.3 V
Junction Temperature (T_J)	+150 °C
Storage Temperature (T_S)	-65 °C to +150 °C
ESD Rating ⁽¹⁾	2.0 kV

Note:

1. Devices are inherently ESD sensitive, handling precautions are required. Human body model rating: 1.5 k Ω in series with 100 pF.

Recommended Operating Conditions

The device is not guaranteed to operate beyond the Maximum Recommended Operating Conditions.

Parameter	Rating
Supply Voltage (V_{IN})	4.5 V to 18 V
Output Voltage Range	0.8 V to $0.85 \cdot V_{IN}$
Ambient Temperature (T_A)	-40 °C to +85 °C
Package Thermal Resistance Exposed Pad SO-8 (Θ_{JA}) ⁽²⁾	50 °C/W

Note:

2. The value of Θ_{JA} is measured with the device mounted on a 1-in² FR-4 board with 2 oz. Copper, in a still air environment with $T_A = 25$ °C. The value in any given application depends on the user's specific board design.