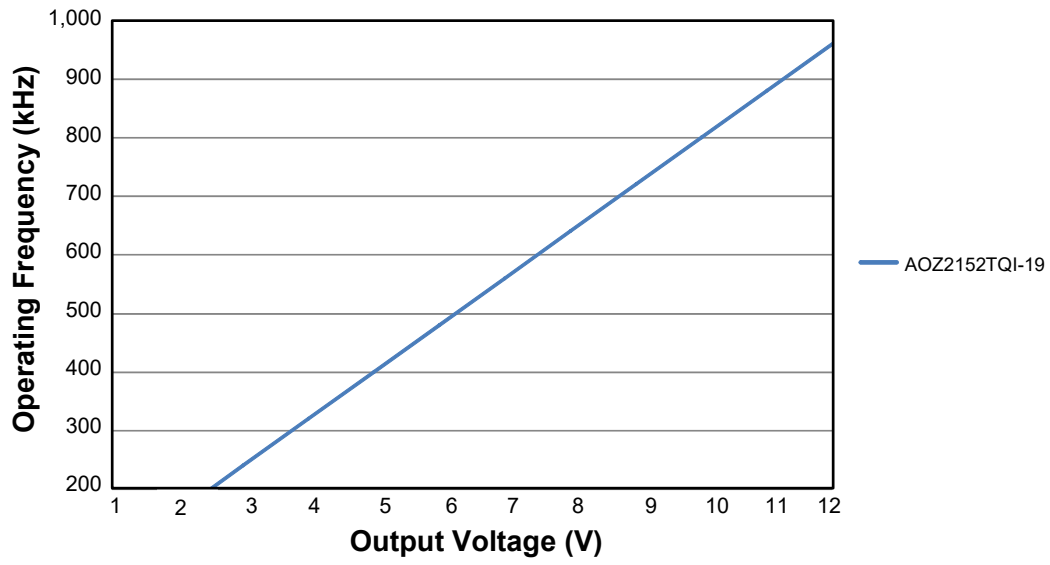
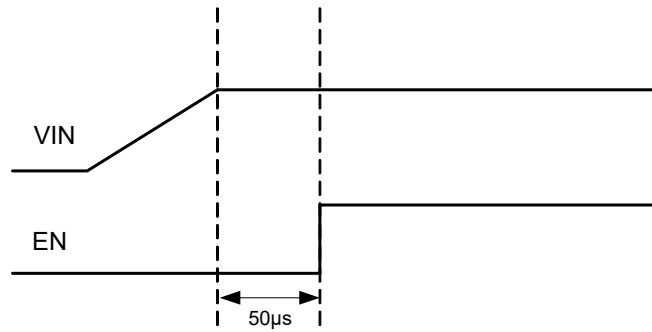


Output Voltage vs. Operating Frequency



Recommended Start-up Sequence



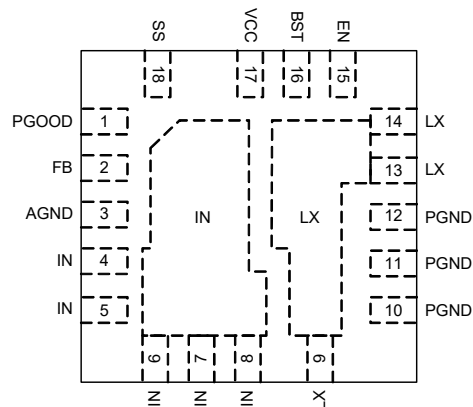
Ordering Information

Part Number	Ambient Temperature Range	Package	Environmental
AOZ2151TQI-19	-40°C to +85°C	18-Pin 3mm x 3mm QFN	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



18-Pin 3mm x 3mm QFN
(Top View)

Pin Description

Pin Number	Pin Name	Pin Function
1	PGOOD	Power Good Signal Output. PGOOD is an open-drain output used to indicate the status of the output voltage. It is internally pulled low when the output voltage is 15% lower than the nominal regulation voltage or 20% higher than the nominal regulation voltage. PGOOD is pulled low during soft-start and shut down.
2	FB	Feedback Input. Adjust the output voltage with a resistive voltage-divider between the regulator's output and AGND.
3	AGND	Analog Ground.
4, 5, 6, 7, 8	IN	Supply Input. IN is the regulator input. All IN pins must be connected together.
9, 13, 14	LX	Switching Node.
10, 11, 12	PGND	Power Ground.
15	EN	Enable Input. The AOZ2151TQI-19 is enabled when EN is pulled high. The device shuts down when EN is pulled low.

Pin Number	Pin Name	Pin Function
16	BST	Bootstrap Capacitor Connection. The AOZ2151TQI-19 includes an internal bootstrap diode. Connect an external capacitor between BST and LX as shown in the Typical Application diagram.
17	VCC	Supply Input for analog functions. Bypass VCC to AGND with a 4.7 μ F~10 μ F ceramic capacitor. Place the capacitor close to VCC pin.
18	SS	Soft-Start Time Setting Pin. Connect a capacitor between SS and AGND to set the soft-start time.

Absolute Maximum Ratings

Exceeding the Absolute Maximum Ratings may damage the device.

Parameter	Rating
IN to AGND	-0.3V to 30V
LX to AGND ⁽¹⁾	-0.3V to 30V
BST to AGND	-0.3V to 36V
SS, PGOOD, FB, EN, VCC to AGND	-0.3V to 6V
PGND to AGND	-0.3V to +0.3V
Junction Temperature (T _J)	+150°C
Storage Temperature (T _S)	-65°C to +150°C
ESD Rating ⁽²⁾	2kV

Notes:

- LX to PGND Transient (t<20ns) ----- -7V to V_{IN}+7V.
- Devices are inherently ESD sensitive, handling precautions are required. Human body model rating: 1.5kΩ in series with 100pF.

Maximum Operating Ratings

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

Parameter	Rating
Supply Voltage (V _{IN})	6.5V to 28V
Output Voltage Range	0.8V to 0.85*V _{IN}
Ambient Temperature (T _A)	-40°C to +85°C
Package Thermal Resistance	
θ _{JA}	40°C/W
θ _{JC}	6°C/W

Electrical Characteristics

T_A = 25°C, V_{IN}=12V, EN = 5V, unless otherwise specified. Specifications in **BOLD** indicate a temperature range of -40°C to +85°C.

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
V _{IN}	IN Supply Voltage		6.5		28	V
V _{UVLO}	Under-Voltage Lockout Threshold of V _{IN}	V _{IN} rising V _{IN} falling	3.2	4.0 3.7	4.4	V
I _q	Quiescent Supply Current of V _{IN}	I _{OUT} = 0, V _{EN} > 2V, PFM		0.16		mA
I _{OFF}	Shutdown Supply Current	V _{EN} = 0V		15		μA
V _{FB}	Feedback Voltage	T _A = 25°C T _A = 0°C to 85°C	0.792 0.788	0.800 0.800	0.808 0.812	V
	Load Regulation			0.5		%
	Line Regulation			1		%
I _{FB}	FB Input Bias Current				200	nA
Enable						
V _{EN}	EN Input Threshold	Off threshold On threshold	1.4		0.5	V
V _{EN_HYS}	EN Input Hysteresis			100		mV
Modulator						
T _{ON_MIN}	Minimum On Time			60		ns
T _{OFF_MIN}	Minimum Off Time			300		ns
Soft-Start						
I _{SS_OUT}	SS Source Current	V _{SS} = 0 C _{SS} = 0.001μF to 0.1μF	7	11	15	μA

Electrical Characteristics

$T_A = 25^\circ\text{C}$, $V_{IN} = 12\text{V}$, $V_{EN} = 5\text{V}$, unless otherwise specified. Specifications in **BOLD** indicate a temperature range of -40°C to $+85^\circ\text{C}$.

Symbol	Parameter	Conditions	Min.	Typ.	Max	Units
Power Good Signal						
V_{PG_LOW}	PGOOD Low Voltage	$I_{OL} = 1\text{mA}$			0.5	V
	PGOOD Leakage Current				± 1	μA
V_{PGH}	PGOOD Threshold (Low Level to High Level)	FB rising		90		%
V_{PGL}	PGOOD Threshold (High Level to Low Level)	FB rising FB falling		120 85		%
	PGOOD Threshold Hysteresis			5		%
Under Voltage and Over Voltage Protection						
V_{PL}	Under Voltage Threshold	FB falling		70		%
T_{PL}	Under Voltage Delay Time			32		μs
V_{PH}	Over Voltage Threshold	FB rising		120		%
Power Stage Output						
$R_{DS(ON)}$	High-Side NFET On-Resistance	$V_{IN} = 12\text{V}$		28		$\text{m}\Omega$
	High-Side NFET Leakage	$V_{EN} = 0\text{V}$, $V_{LX} = 0\text{V}$			10	μA
$R_{DS(ON)}$	Low-Side NFET On-Resistance	$V_{LX} = 12\text{V}$		28		$\text{m}\Omega$
	Low-Side NFET Leakage	$V_{EN} = 0\text{V}$			10	μA
Over-current and Thermal Protection						
I_{LIM}	Current Limit		6			A
	Thermal Shutdown Threshold	T_J rising T_J falling		150 100		$^\circ\text{C}$

Functional Block Diagram

