

FEATURES

- Stable with low ESR Output Ceramic Capacitors
- Up to 99% On time
- 2A Output Current
- Wide Operating Input Voltage Range 5.5V to 32V
- Fixed 330 kHz Frequency
- Thermal Shutdown
- Cycle-by-cycle Over Current Protection
- Under Voltage Lockout
- 5V reference output
- Adjustable output from 0.6V

APPLICATIONS

- Battery Chargers
- Portable (Notebook) Computers
- Industrial power supply
- Point of regulation for high performance electronics
- Consumer Electronics
- Audio Power Amplifiers
- Distributed Power Systems
- Pre-Regulator for Linear Regulators
- LCD TVs and LCD monitors
- Automotive electronics

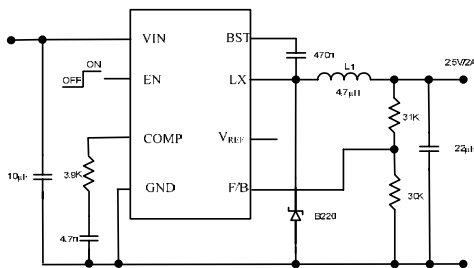
GENERAL DESCRIPTION

The AMS4154 is a 2A step-down converter for high voltage applications. Current mode operation provides easier compensation and fast transient response. Internal cycle-by-cycle current limiting and thermal shutdown provides the necessary protection in faults situation. A 5V reference voltage is available that can supply up to 2mA current. Available in 8-pin SOIC EDP package.

ORDERING INFORMATION

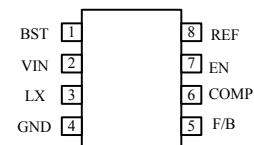
OUTPUT	PACKAGE TYPE	TEMP. RANGE
VOLTAGE	8 Lead SOIC EDP	
Adjustable	AMS4154S	-25°C to 125°C

TYPICAL APPLICATION



PIN CONNECTIONS

8L SOIC SO Package (S)



Top View
Paddle is GND

PIN DESCRIPTION

AMS4154		
PIN NUMBERS	NAME	DESCRIPTION
1	BST	Bootstrap. A capacitor is needed to drive the power switch's drive above the supply voltage. It is connected between LX and BST pins to form a floating supply across the power switch driver.
2	VIN	Supply Voltage. The AMS4154 operates from a+5.5V to +32V unregulated input. C1 is needed to prevent large voltage spikes from appearing at the input.
3	LX	Switch. This connects the inductor to VIN through the internal power switch.
4	GND	Ground. This pin is the ground for voltage reference and for the regulated output voltage. For this reason care must be taken in its layout.
5	FB	Feedback. An external resistor divider from the output to GND, tapped to the FB pin sets the output voltage.
6	COMP	Compensation. This node is the output of the transconductance error amplifier and the input to the current comparator. Frequency compensation is done at this node by connecting a series R-C to ground.
7	EN	Enable. A voltage greater than 2.5V enables operation. For complete low current shutdown the EN pin voltage needs to be less than 2.3V.
8	REF	5V reference voltage capable of supplying 1mA for other external circuits.

ABSOLUTE MAXIMUM RATINGS

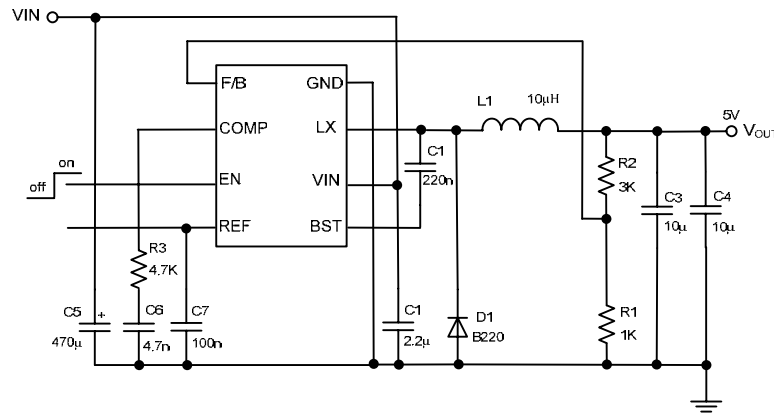
Input Supply Voltage	-0.3V to +34V	Junction Temperature	+150°C
SW Voltage	-1V to $V_{IN} + 0.3V$	Storage Temperature	-65°C to +150°C
BS Voltage	$V_{LX} - 0.3V$ to $V_{LX} + 6V$	Lead Temperature	260°C
All Other Pins	-0.3V to +6V		

ELECTRICAL CHARACTERISTICS

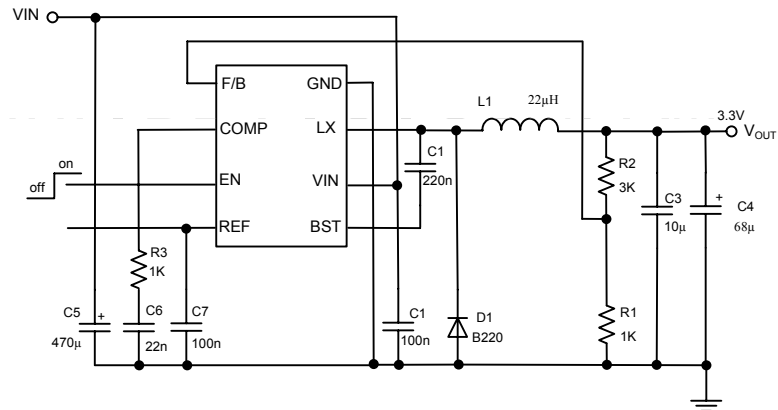
Electrical Characteristics at $T_A = 25^\circ\text{C}$ and $V_{IN} = 12V$ (unless otherwise noted).

PARAMETER	TEST CONDITIONS	AMS4154			Units
		Min.	Typ.	Max.	
Feedback Voltage	$12V \leq V_{IN} \leq 32V, V_{COMP} < 2V$	1.202	1.230	1.258	V
Supply Current	$V_{EN} = 2.6V, V_{FB} = 1.4V$		2.0	3.5	mA
Shutdown Supply Current	$V_{EN} = 0V$		0.5	1	μA
Current Limit		2.5	3.6	3.9	A
Current Sense to COMP Transconductance			5.0		A/V
Oscillation Frequency		280	330	380	KHz
Maximum Duty Cycle	$V_{FB} = 1.0V$		90	99	%
Minimum Duty Cycle	$V_{FB} = 1.5V$		0		%
EN Threshold Voltage	V_{EN} Rising, Output ON	2.5	2.6	2.8	V
EN Threshold Voltage	V_{EN} Falling, Output OFF		2.2	2.3	V
EN Threshold Hysteresis			100		mV
Enable Current	$V_{EN} = 0V$		1.8		μA
Thermal Shutdown			160		$^\circ\text{C}$
5V REF Voltage	$I_{REF} = 0$	4.8	5.0	5.2	V
REF Load Regulation	$\Delta I_{REF} = 0$ to 1mA		50		mV
REF Line Regulation	$I_{REF} = 100\mu\text{A}, V_{IN} = 6.5$ to 32V		30		mV

TYPICAL APPLICATION

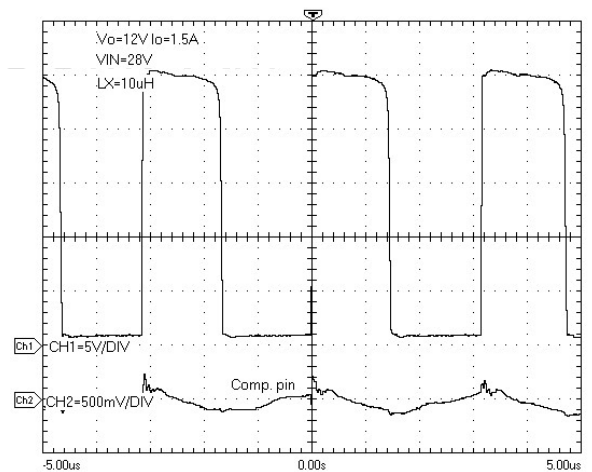
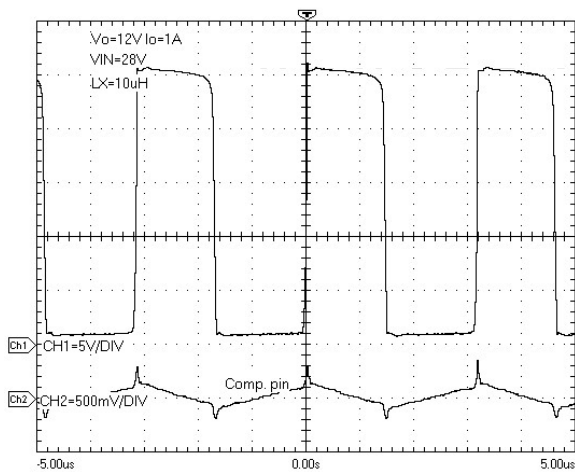
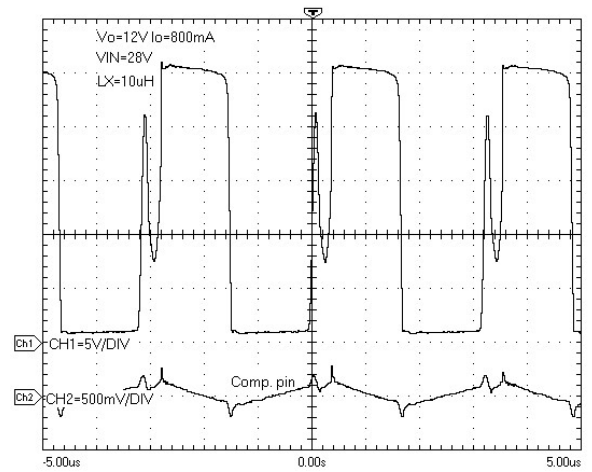
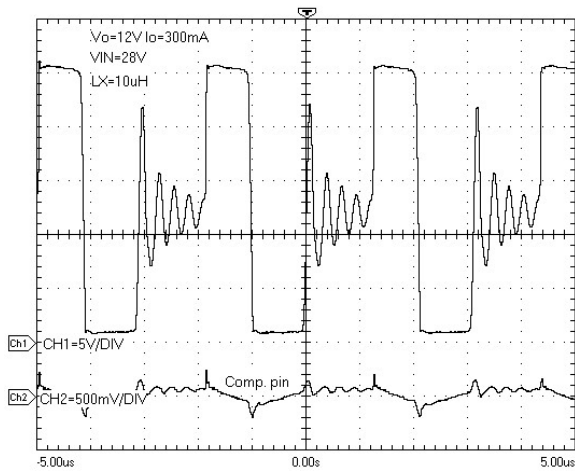


12V Input to 5V Output



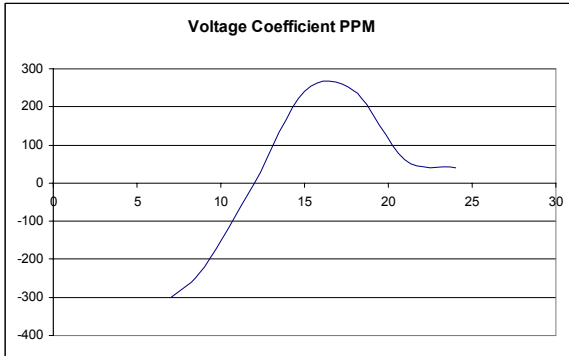
24V Input to 3.3V Output @2A

TYPICAL PERFORMANCE

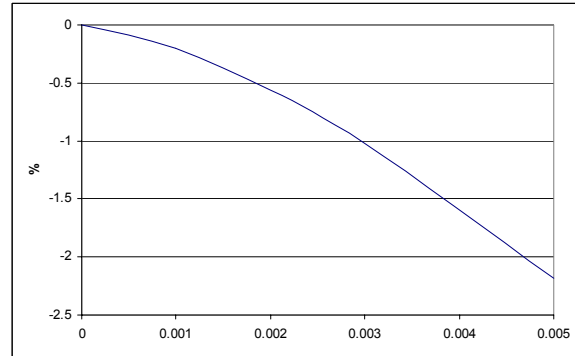


TYPICAL PERFORMANCE

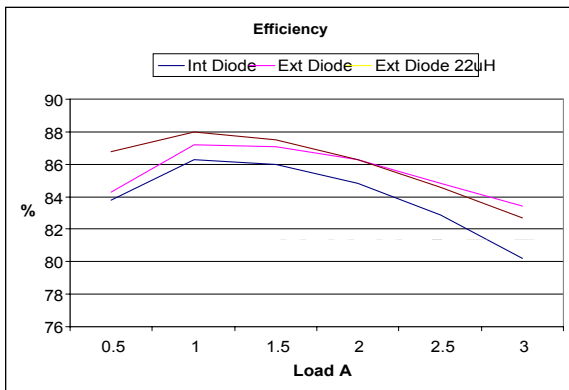
Output Variation due to Supply (1A Load)



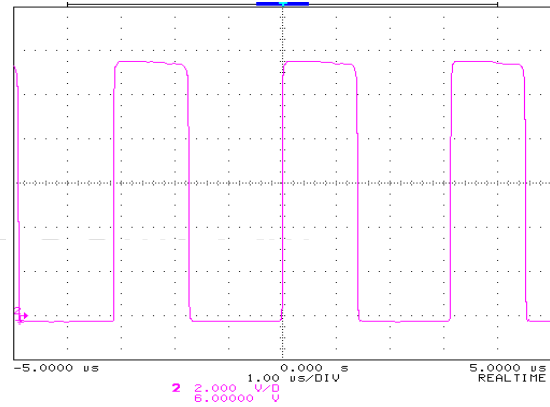
Reference Output Load Regulation



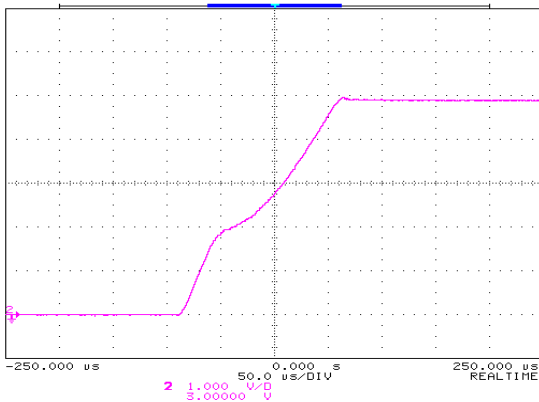
Efficiency for 5V Output with 12V Input



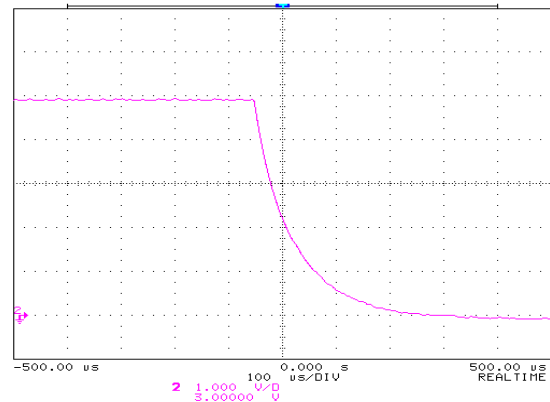
Switching Output at 1A



Start Up into 1A resistive Load

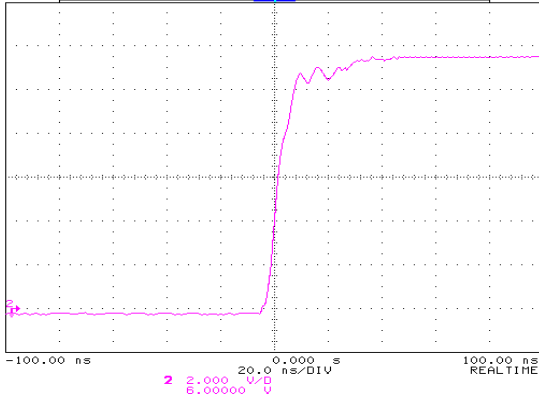


Output Stop into 1A resistive Load

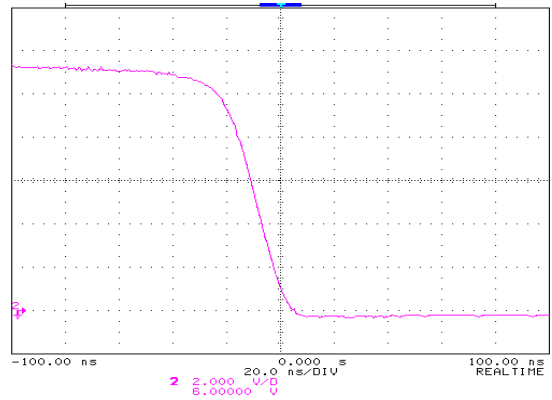


TYPICAL PERFORMANCE (continued)

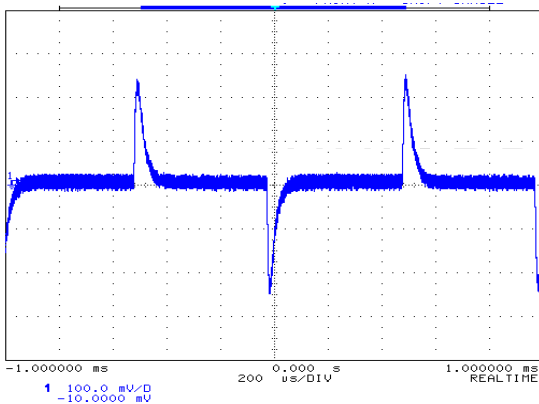
Rise Time at Switching node and 1A Load



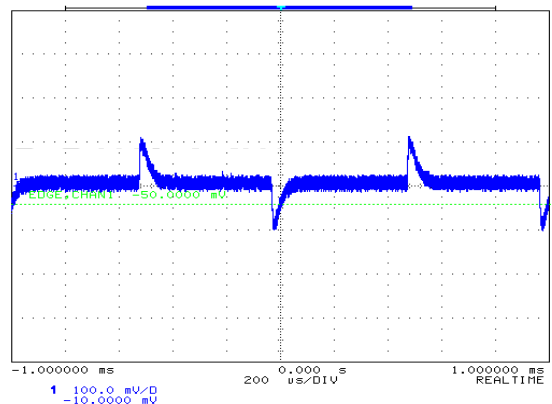
Fall Time at Switching node and 1A Load



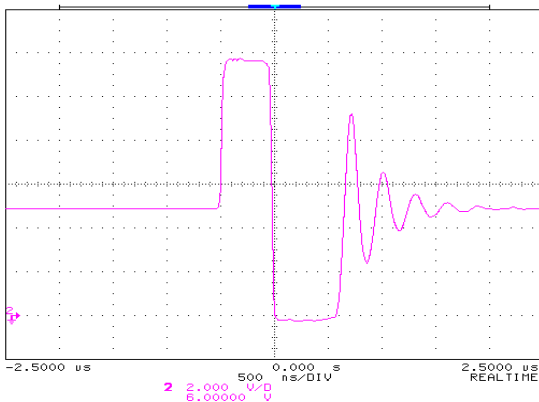
Load Transient response 0.5-2.5A 1µS Rise/Fall Time Compensation 4.7k/4.7n



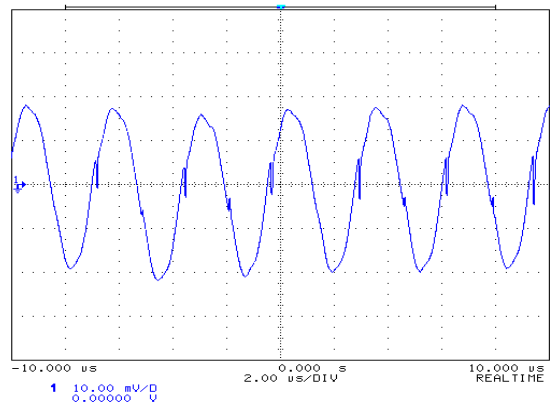
Load Transient 1.5-1.5A 1µS Rise/Fall Time Compensation 1.7k/4.7n



No Load Waveform

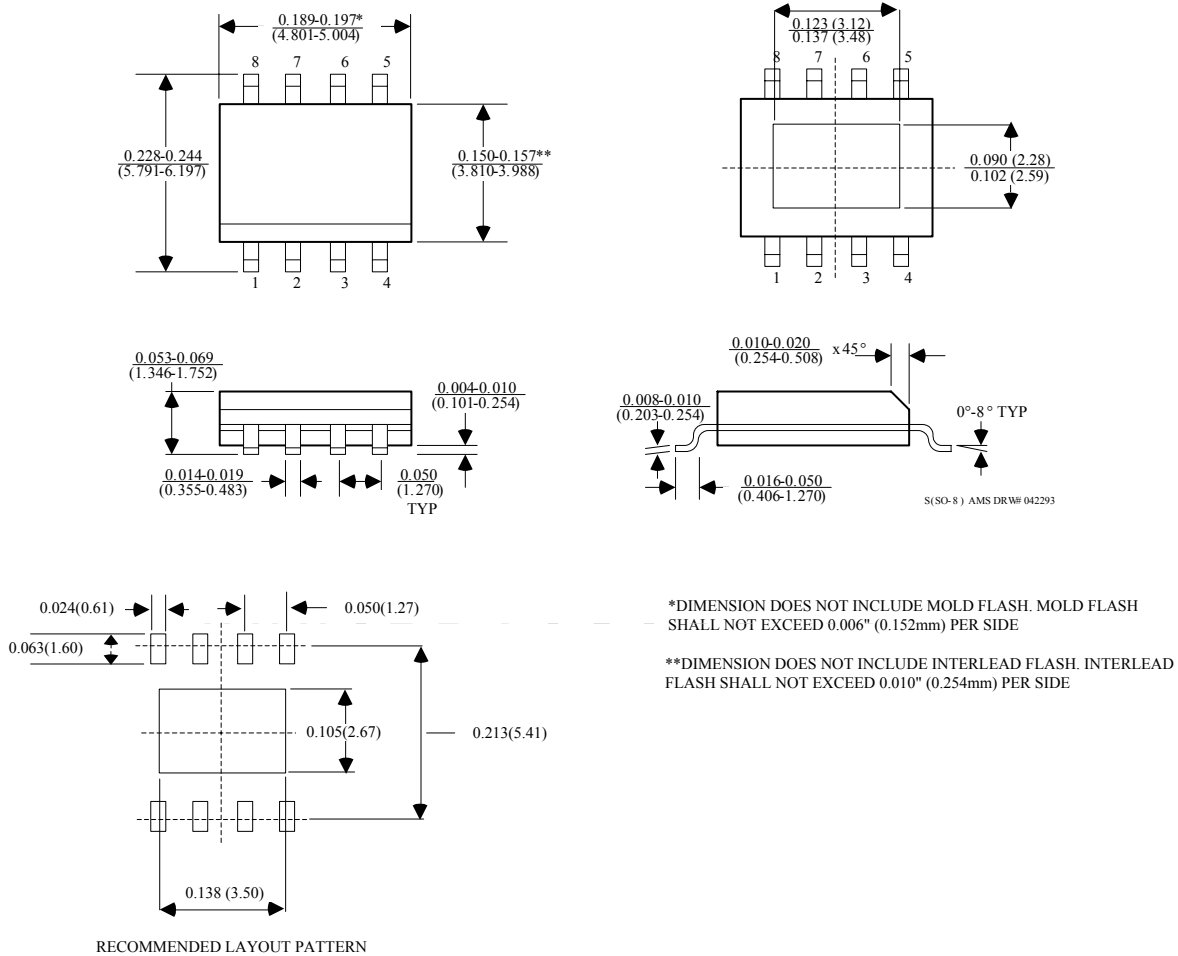


Output Ripple as 3A for 5V Output 2x 10µF ceramic Output and 10µH inductor



PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted.

8 LEAD SOIC PLASTIC PACKAGE (S)



*DIMENSION DOES NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.006" (0.152mm) PER SIDE

**DIMENSION DOES NOT INCLUDE INTERLEAD FLASH. INTERLEAD FLASH SHALL NOT EXCEED 0.010" (0.254mm) PER SIDE

S(SO-8) AMS DRW 042293