翔硕电子

AM1037

3A Step-Down PWM Switch-Mode DC/DC Regulators

Features

- Continuous Output Current：3A
- Stable with Low ESR Output Ceramic Capacitors
- Thermal Shutdown
- Cycle-by-cycle over current protection
- Wide 5V to 16V operating input range
- Output Adjustable from 1.2V to 16V
- Available in 8 pin SO package
- High Frequency up to 400KHz

Application

- Battery Charger
- Distributed Power Systems
- Pre-Regulator for Linear Regulators

Description

The AM1037 is a step down switch mode converter with a built in internal power MOSFET. It achieves 3A continuous output current over a wide input supply range with excellent load and line regulation.

Current mode operation provides fast transient response and eases loop stabilization.

Fault condition protection includes cycle-by-cycle current limiting and thermal shutdown.

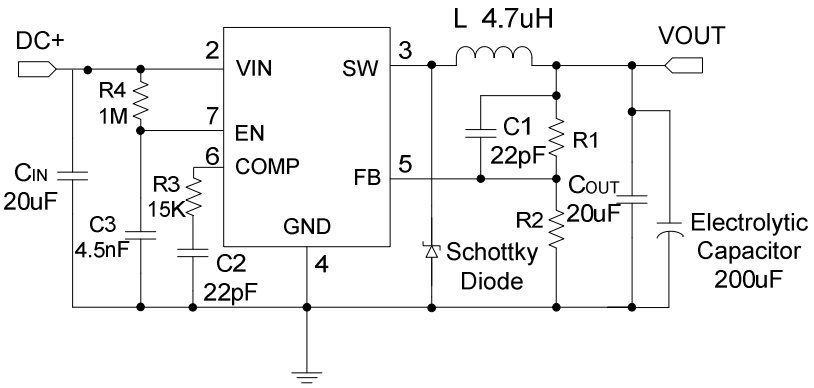
The AM1037 requires a minimum number of readily available standard external components.

Order Information

AM1037 – ① ②:

Symbol	Description
①	Denotes Output voltage: A: Adjustable Output Voltage;
②	Denotes Package Types: G: SOP-8L

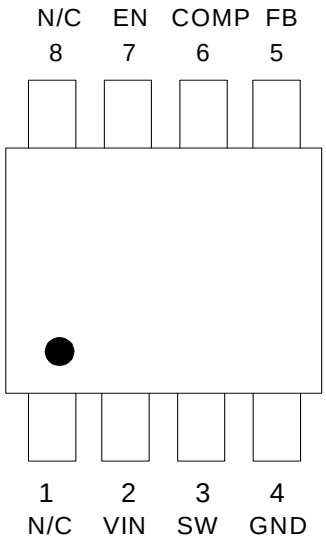
Typical Applications



* V_{OUT} = 0.8V [1 + (R1/ R2)]

Pin Assignment

Top View



SOP-8L

PIN NUMBER	PIN NAME	FUNCTION
1,8	N/C	No Used
2	VIN	Input
3	SW	Switch Node
4	GND	Ground
5	FB	Feedback
6	COMP	Optional External Compensation
7	EN	ON/OFF Control(High Enable)

Absolute Maximum Ratings

- V_{IN} ……- 0.3 V ～ + 20 V
- V_{SW} ……- 0.3 V ～ (V_{IN} + 0.3) V
- V_{FB}……- 0.3 V ～ + 6 V
- Operating Temperature Range ……- 40℃ ～ + 85℃
- Lead Temperature (Soldering 10 sec.) ……+ 300℃
- Storage Temperature Range ……- 65℃ ～ + 150℃
- ESD Susceptibility (Note 2)

  HBM (Human Body Mode) ……2kV

  MM (Machine Mode) ……200V

Note 1. Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2. Devices are ESD sensitive. Handling precaution recommended.

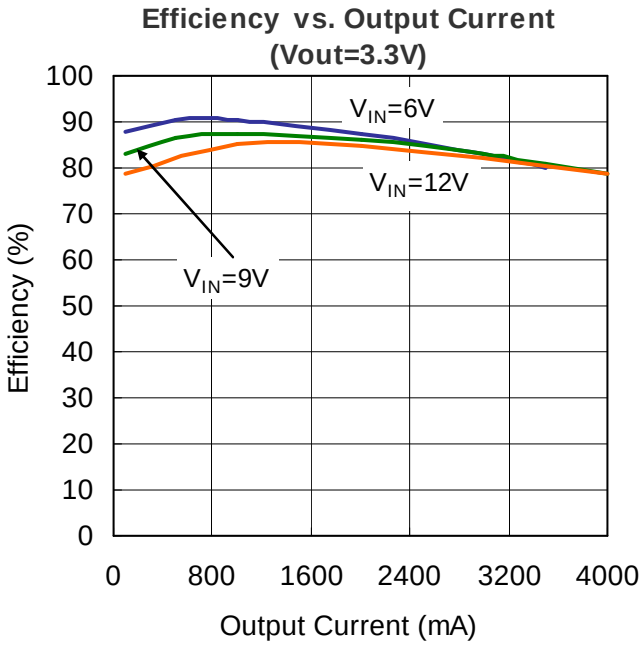
Electrical Characteristics

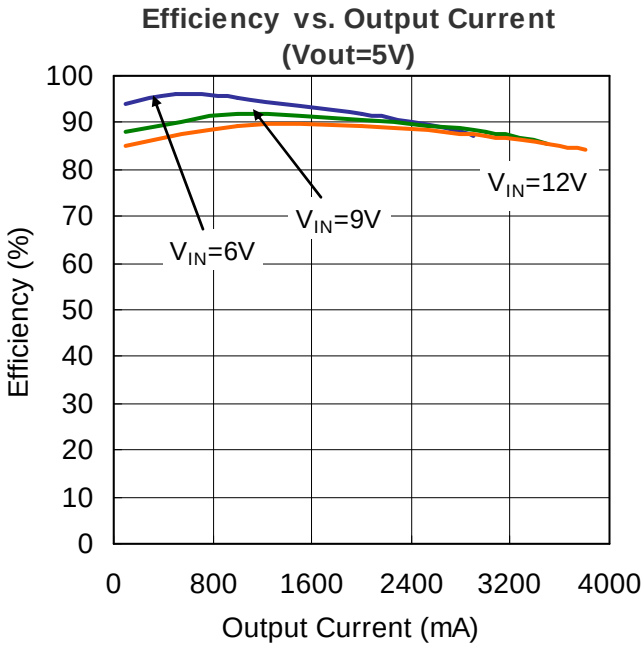
Operating Conditions: T_A=25℃, V_{IN}=6V unless otherwise specified.

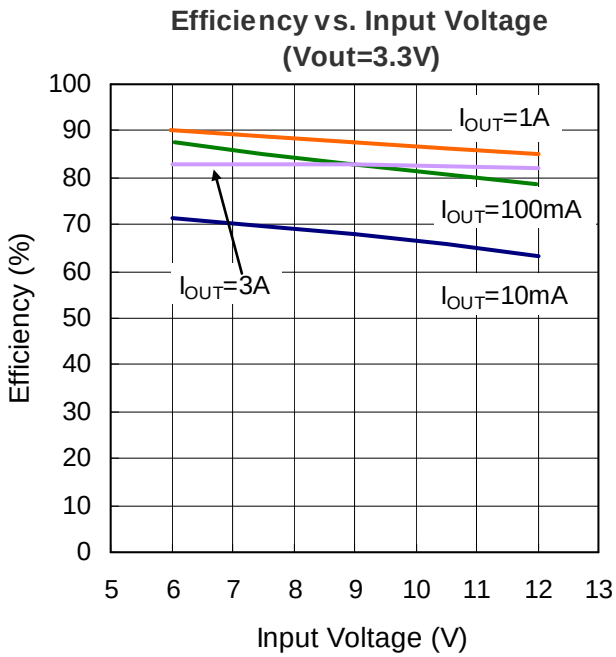
SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{OUT}	Output Voltage		1.2		16	V
V_{IN}	Input Voltage Range		5		16	V
V_{FB}	Feedback Voltage	T_A = 25℃		0.8		V
F_{OSC}	Oscillator Frequency	V_{OUT} = 5V, I_{OUT} = 100mA		400		KHz
I_Q	Quiescent Current	V_{OUT} = 5V, I_{LOAD} = 0A		790		μA
I_S	Shutdown Current	V_{EN} = 0V, V_{IN} = 12V		45.5		μA
EFFI*	Efficiency	When connected to ext. components V_{IN}=9V V_{OUT} = 5V, I_{OUT}=1A		92		%

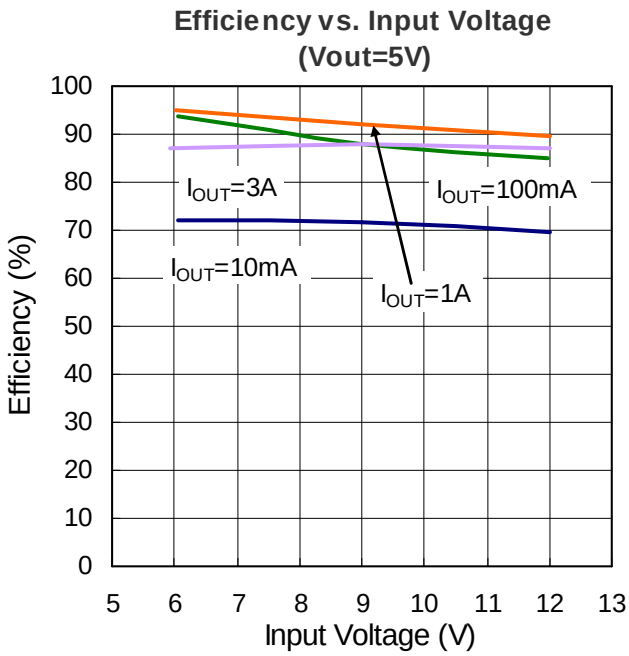
* EFFI = [(Output Voltage × Output Current) / (Input Voltage × Input Current)] × 100%

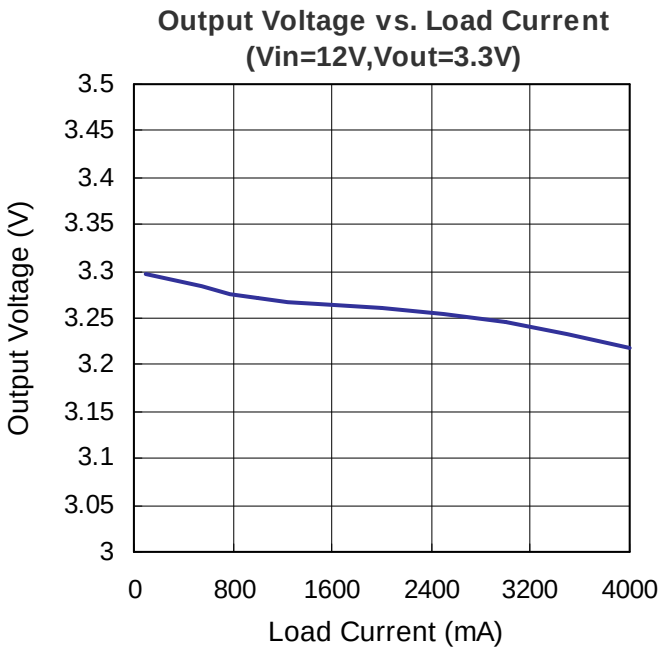
Typical Performance Characteristics

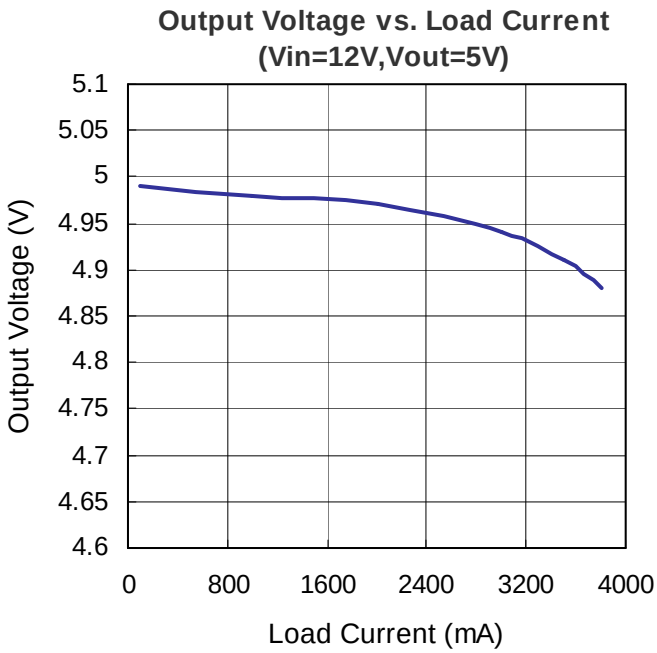


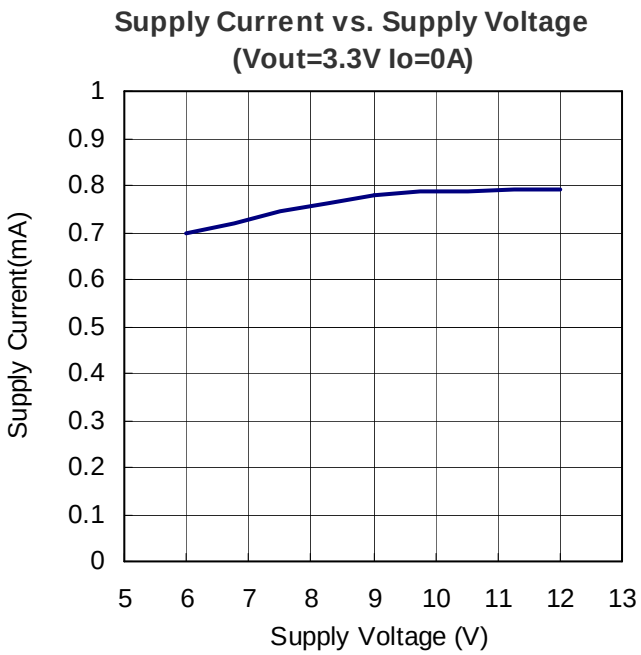


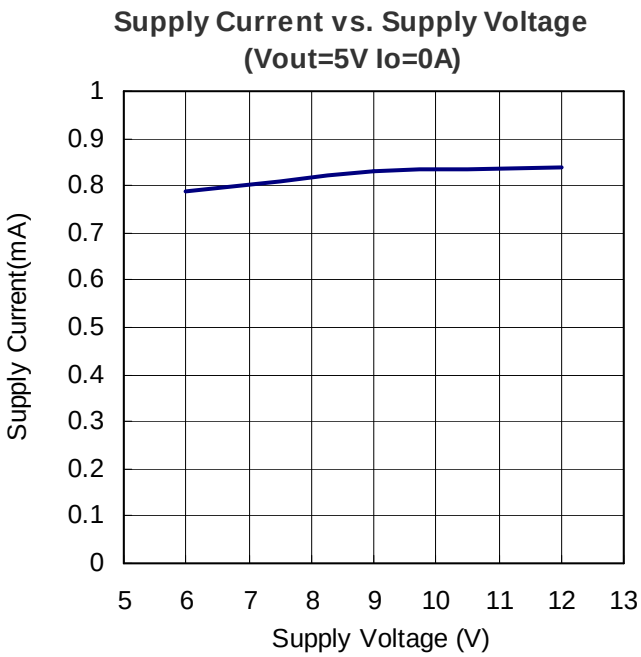




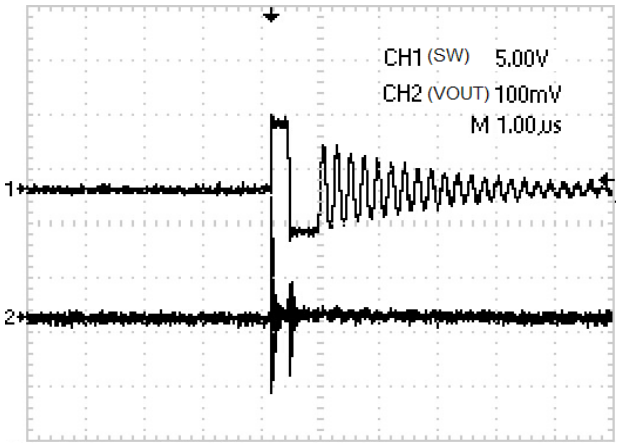

Output Voltage vs. Load Current
(Vin=12V,Vout=3.3V)
Output Voltage (V)
3.5
3.45
3.4
3.35
3.3
3.25
3.2
3.15
3.1
3.05
3
0
800
1600
2400
3200
4000
Load Current (mA)


Output Voltage vs. Load Current
(Vin=12V,Vout=5V)
Output Voltage (V)
5.1
5.05
5
4.95
4.9
4.85
4.8
4.75
4.7
4.65
4.6
0
800
1600
2400
3200
4000
Load Current (mA)

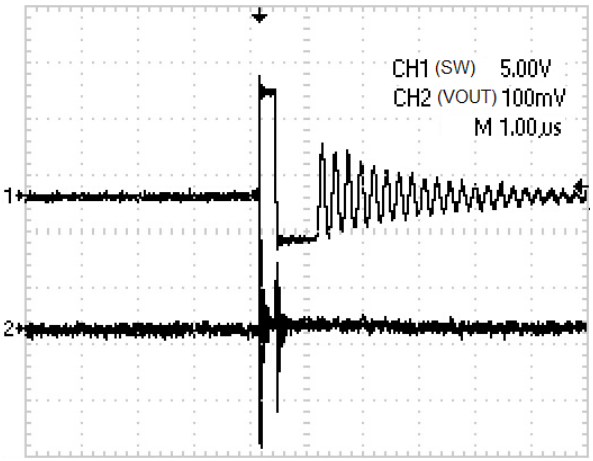

Supply Current vs. Supply Voltage
(Vout=3.3V Io=0A)
Supply Current(mA)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
6
7
8
9
10
11
12
13
Supply Voltage (V)


Supply Current vs. Supply Voltage
(Vout=5V Io=0A)
Supply Current(mA)
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
5
6
7
8
9
10
11
12
13
Supply Voltage (V)

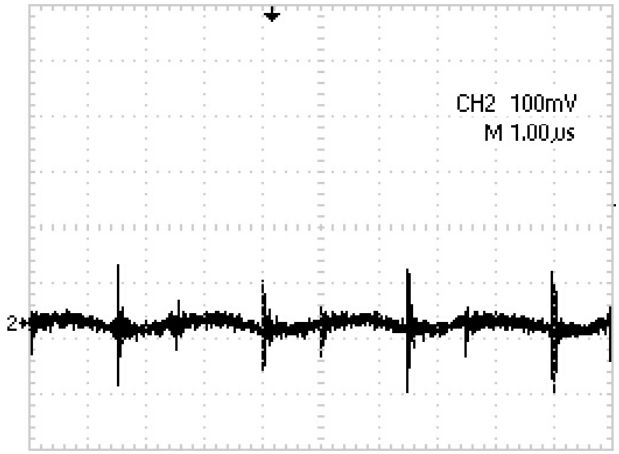
Start –up from Shutdown（VIN=9V）



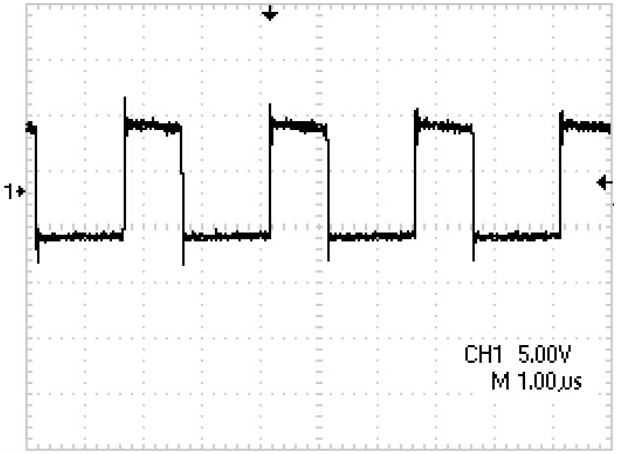
Start –up from Shutdown（VIN=12V）



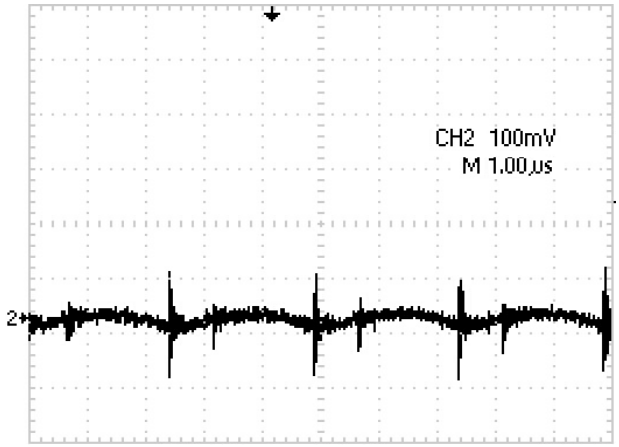
Output Noise （V_{IN}=9V, V_{OUT}=3.3V, I_{LOAD}=1A）



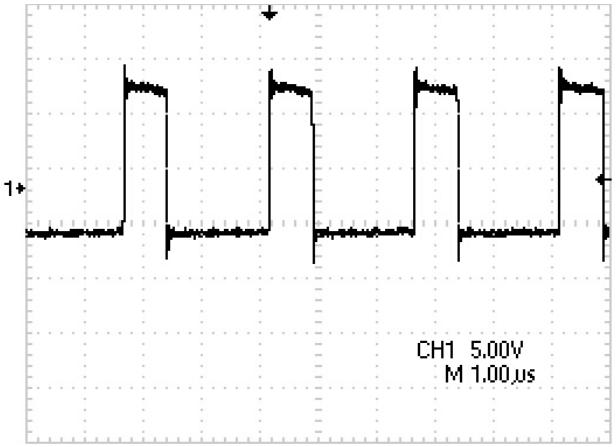
SW（V_{IN}=9V, V_{OUT}=3.3V, I_{LOAD}=1A）



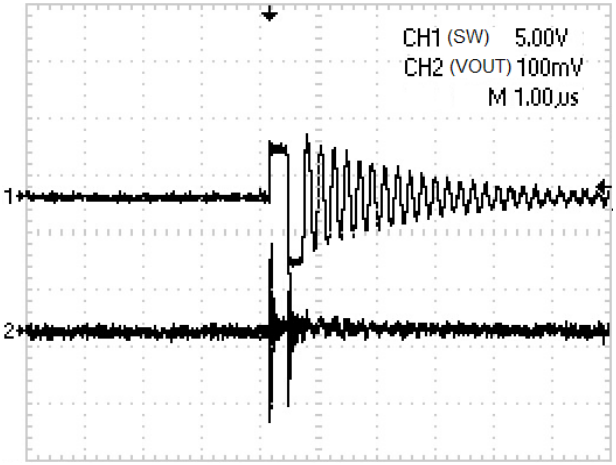
Output Noise （V_{IN}=12V, V_{OUT}=3.3V, I_{LOAD}=1A）



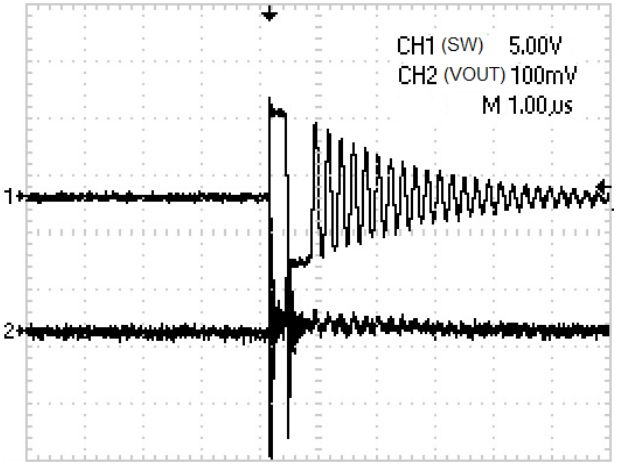
SW（V_{IN}=12V, V_{OUT}=3.3V, I_{LOAD}=1A）



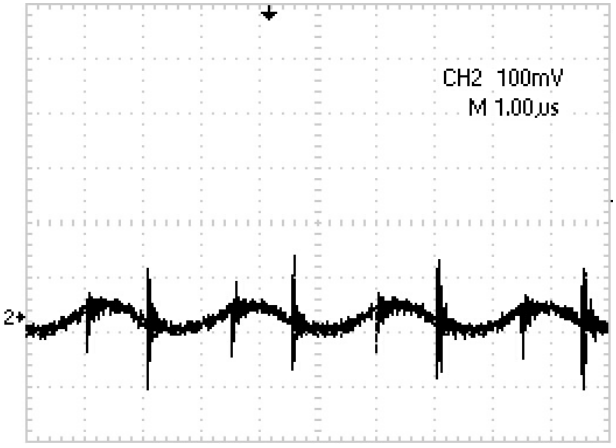
Start –up from Shutdown（VIN=9V）



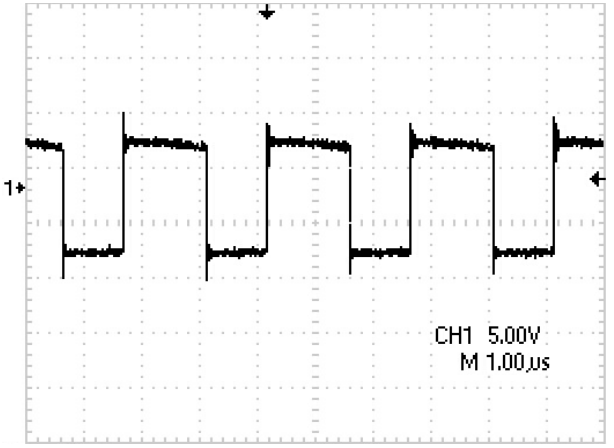
Start –up from Shutdown（VIN=12V）



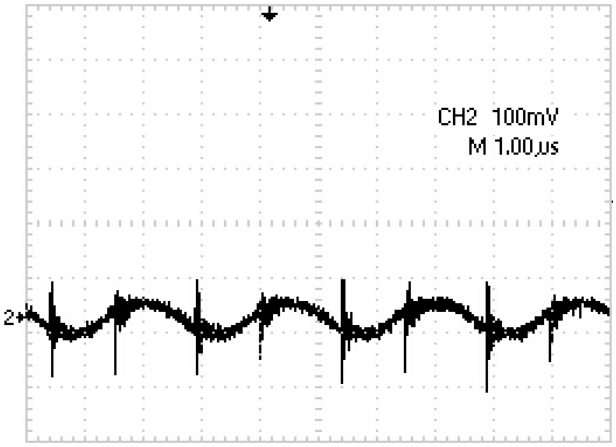
Output Noise （V_{IN}=9V, V_{OUT}=3.3V, I_{LOAD}=1A）



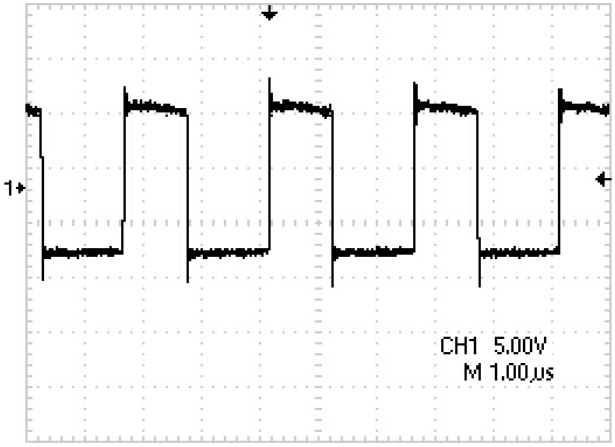
SW（V_{IN}=9V, V_{OUT}=3.3V, I_{LOAD}=1A）



Output Noise （V_{IN}=12V, V_{OUT}=3.3V, I_{LOAD}=1A）



SW（V_{IN}=12V, V_{OUT}=3.3V, I_{LOAD}=1A）



Application Information

PIN ASSIGNMENT

VIN (Pin 2): Main Supply Pin. The AM1037 operates from a +5V to +16V unregulated input. It must be closely decoupled to GND, Pin 4, with a 20µF or greater ceramic capacitor to prevent large voltage spikes from appearing at the input.

SW (Pin 3): Switch Node Connection to Inductor. This pin connects to the drains of the internal main and synchronous power MOSFET switches.

GND (Pin 4): Ground Pin.

FB (Pin 5): Feedback Pin. Receive the feedback voltage from an external resistive divider across the output. In the adjustable version, the output voltage is fixed. The Output voltage is set by R1 and R2: V_{OUT} = 0.8V [1 + (R1/ R2)]

COMP (Pin 6): 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.

EN (Pin 7): En Control Input. Do not leave EN floating.

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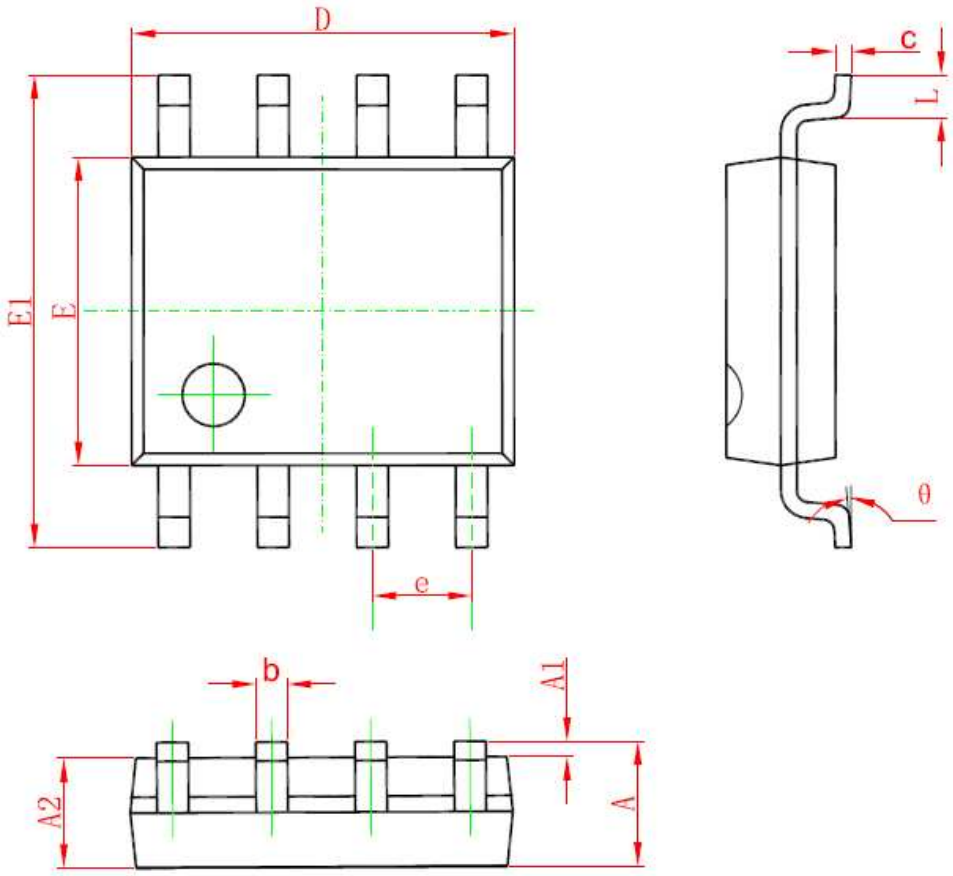
Packaging Information

SOP-8L Package Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°