AS1002

20V, 2A, 350KHz PWM Buck Converter

FEATURES

- Operation Voltage Range: 3.6 to 20V
- 350KHz Fixed oscillator frequency
- Precision Reference Voltage: 0.5V (±2%)
- Low current consumption: 4.5mA
- Programmable Soft-Start function (SS)
- Short Circuit Protection(SCP)
- Auto Re-start Function(ARSCP)
- Built-in P-MOSFET for 2A loading
- Package: SOP-8L

APPLICATIONS

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

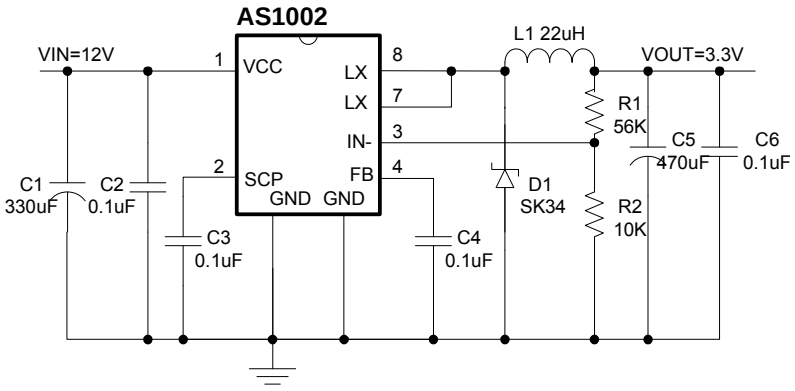
GENERAL DESCRIPTION

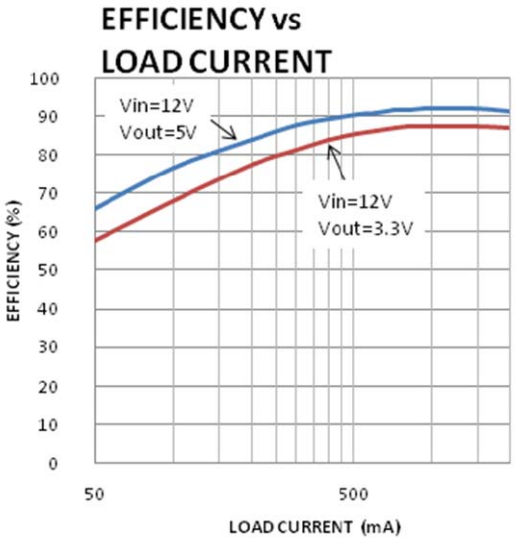
The AS1002 is a buck topology of switching regulator for wide operating voltage applications field.

The AS1002 includes a high current P-channel MOSFET, high precision reference (0.5V) for comparing output voltage with feedback amplifier, an internal dead-time control and oscillator for controlling the maximum duty cycle and PWM frequency, and has power-on programmable soft start time and short circuit PMOS turn-off and auto re-start protection functions.

The AS1002 is available in a low profile SOP-8L package.

TYPICAL APPLICATION





Vout=(1+R1/R2)*Vref

ABSOLUTE MAXIMUM RATINGS

(Note1)

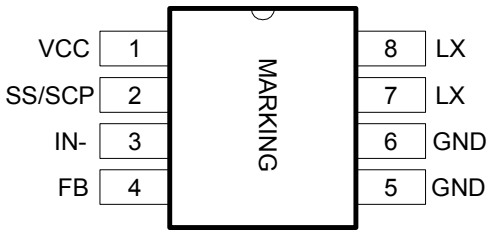
V_{IN} Voltage Range…….…….. 3.6V to 23V
I_{OUT} Output Current ……..……2A
Error Amplifier IN-…….. -0.3V to 1.2V
Junction Temperature…….....…125℃
Operating Temperature Range…… -40℃ to 85℃
Storage Temperature Range ……... -65℃ to 150℃
Lead Temperature (Soldering, 10sec.) ……260℃

Note 1: Absolute Maximum Ratings are those values beyond which the life of a device may be impaired.

Note 2: T_J is calculated from the ambient temperature T_A and power dissipation P_D according to the following formula: $T_J = T_A + P_D \times \Theta_{JA}$.

PACKAGE/ORDER INFORMATION

TOP VIEW



PART NUMBER	PACKAGE	MARKING
AS1002EBT	SOP-8L	AS1002

ELECTRICAL CHARACTERISTICS

V_{IN} =6V, T_A = 25°C, unless otherwise noted.

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Reference					
V_{REF} Voltage	COMP connected to FB	0.490	0.5	0.510	V
V_{REF} Regulation	Vcc=3.0V to 20V		2	12.5	mV
V_{REF} Change with Temp.	T_A=-25℃ to 25℃		1	2	%
	T_A=25℃ to 85℃		1	2	
Soft Start (SS)					
S.S. Source Current	V_{SS}= 0V	-15	-10	-7	μA
Soft Start Threshold Voltage	-	0.8	0.9	1.0	V
Short Circuit Protection(SCP)					
S.C.P Source Current	V_{SCP}=0V	-15	-10	-7	μA
SCP Re-start/Hold time	V_{COMP}>0.8V		1/20		-
S.C.P Threshold Voltage	V_{FB}>450mV	0.9	1.0	1.1	V
Oscillator(OSC)					
f_{OSC}		300	350	400	KHz
f_{OSC} Change with Voltage	Vcc=3.0 V to 20V	-	5		%
f_{OSC} Change with Temperature	T_A=--25℃ to 85℃	-	5	-	%

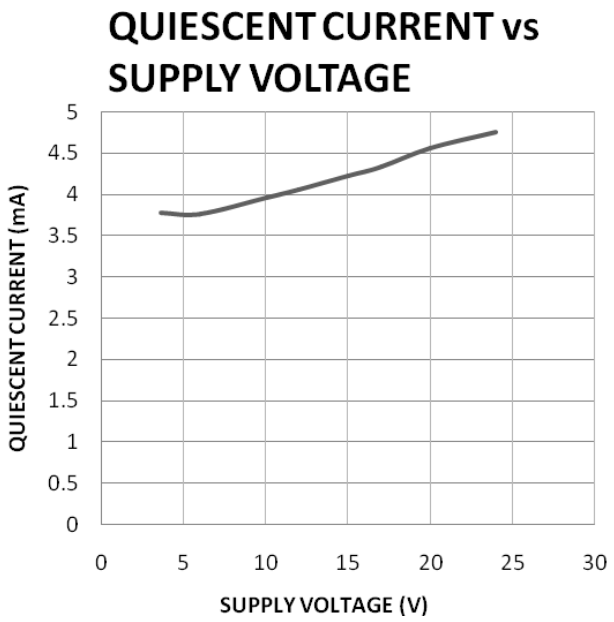
ELECTRICAL CHARACTERISTICS

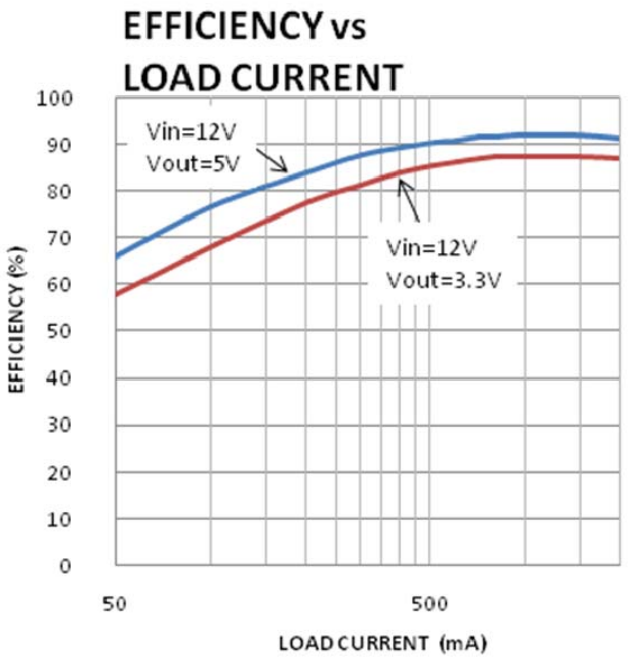
V_{IN} =6V, T_A =25°C, unless otherwise noted.

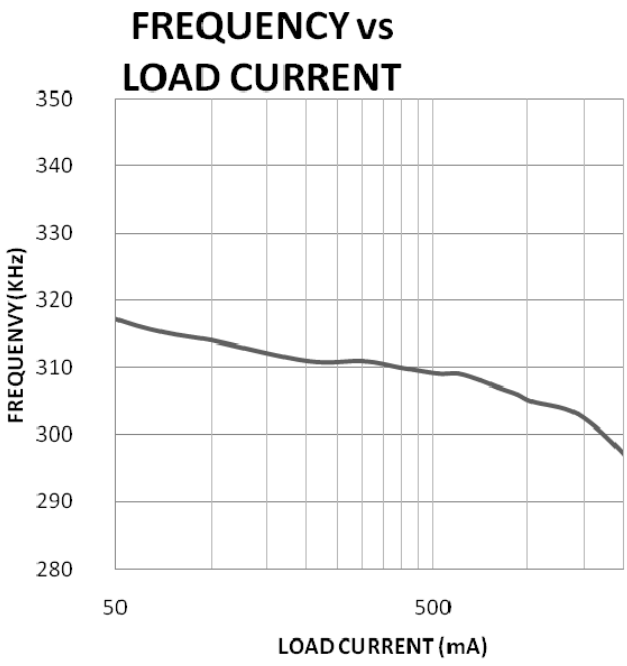
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Error Amplifier(EA)					
Input Threshold Voltage	V_{FB}=450mV	490	500	510	mV
V_T Change with Voltage	V_{CC}=3V to 20V	-	5	20	mV
V_T Change with Temperature	Ta = -25℃to 85℃	-	1	-	%
Input Bias Current	--	-1.0	-0.2	1.0	μA
Voltage Gain	--	-	100	-	V/V
Frequency Bandwidth	Av=0 dB	-	6	-	MHz
Output Voltage Swing Positive	V_{IN-}=0.3V	0.78	0.87	-	V
Output Voltage Swing Negative	V_{IN-}=0.7V	-	0.05	0.2	
Output Source Current	V_{FB}=450mV	-	-45	-30	μA
Output Sink Current		30	45	-	μA
Idle Period Adjustment					
Maximum duty cycle	V_{IN-} =0.2V	-	80	-	%
Output					
PMOS D-S voltage	V_{FB}=0.1V		-25	-	V
PMOS source current			-2		A
PMOS On resistance	V_{CC}=5.0V, V_{IN-}=0V		70	90	mΩ
	V_{CC}=10V, V_{IN-}=0V		42	65	
Output leakage current	SCP active		5	-	μA
Total device					
Standby supply current		-	4.5	6	mA

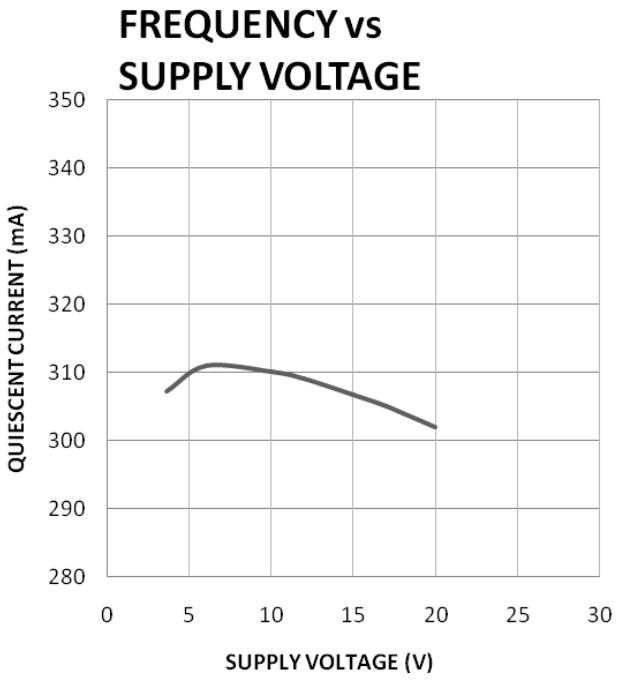
TYPICAL PERFORMANCE CHARACTERISTICS

L=22uH, Cin=330uF, Cout=470uF,Vin=12V, Vout=3.3V,Iload=0.5A, unless otherwise noted.



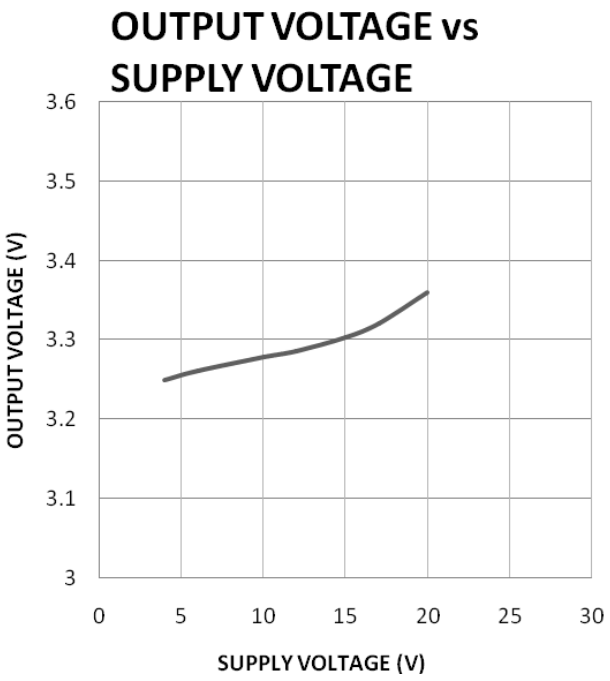


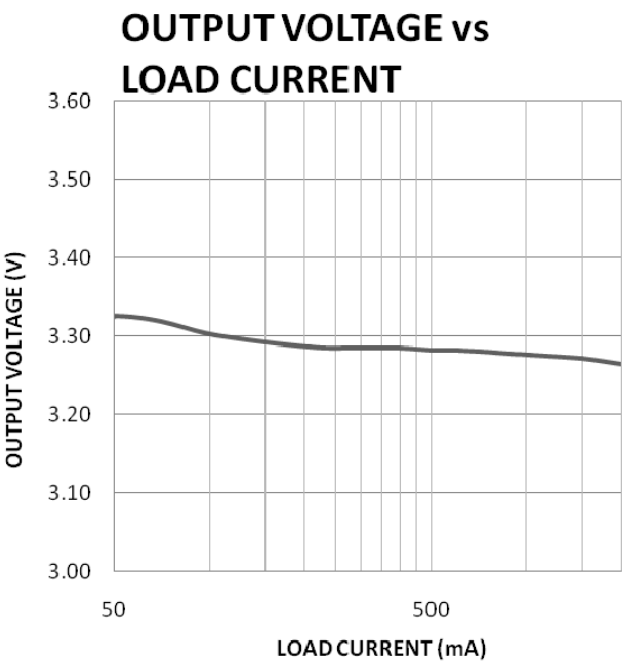




TYPICAL PERFORMANCE CHARACTERISTICS(Continued)

L=22uH, Cin=330uF, Cout=470uF,Vin=12V, Vout=3.3V,Iload=0.5A, unless otherwise noted.





PACKAGE DESCRIPTION Units: mm

Package
8-Lead Plastic SOP-8L