

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

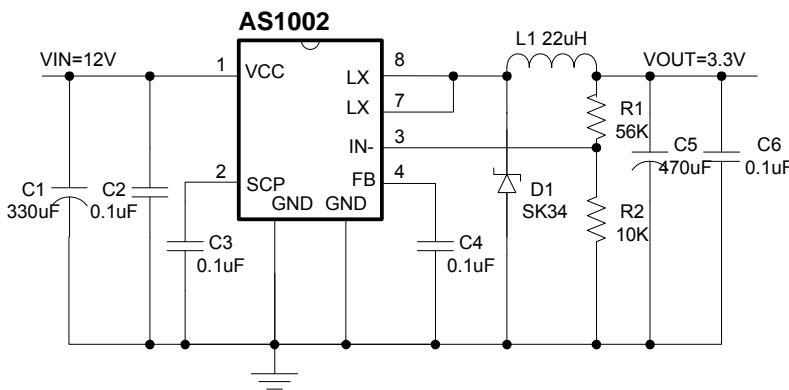
GENERAL DESCRIPTION

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

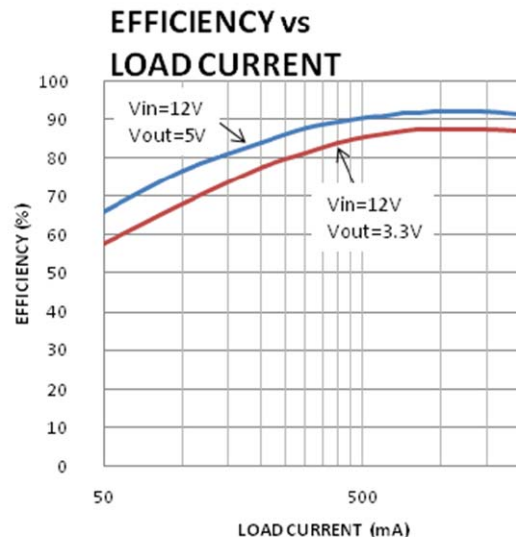
The AS1002 includes a high current P-channel MOSFET, high precision reference (0.5V) for comparing output voltage with feedback amplifier, an internal dead-time control and oscillator for controlling the maximum duty cycle and PWM frequency, and has power-on programmable soft start time and short circuit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

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

TYPICAL APPLICATION



$V_{out} = (1 + R1/R2) * V_{ref}$



ABSOLUTE MAXIMUM RATINGS

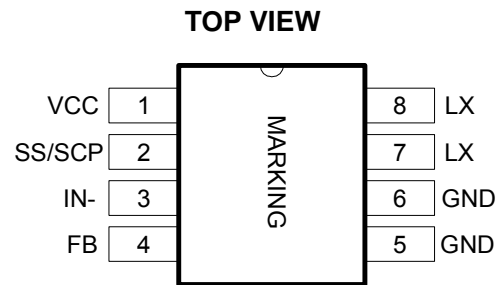
(Note1)

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

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



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	V _{CC} =3.0V to 20V		2	12.5	mV
V _{REF} Change with Temp.	T _A =-25°C to 25°C		1	2	%
	T _A =25°C to 85°C		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	V _{CC} =3.0 V to 20V	-	5		%
f _{osc} Change with Temperature	T _A =-25°C to 85°C	-	5	-	%

ELECTRICAL CHARACTERISTICS

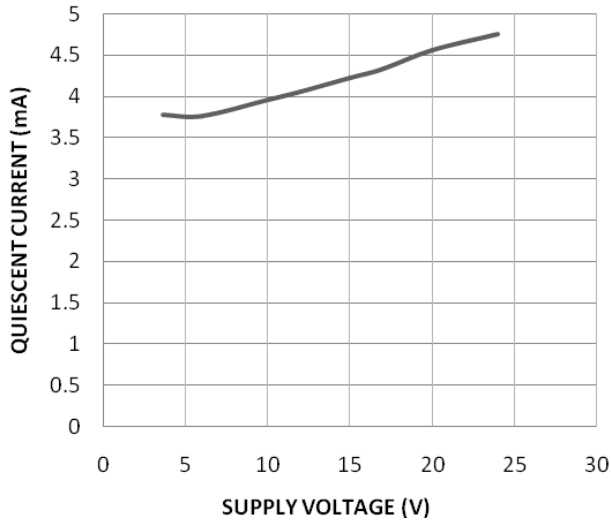
$V_{IN} = 6V$, $T_A = 25^{\circ}C$, unless otherwise noted.

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	$T_a = -25^{\circ}C$ to $85^{\circ}C$	-	1	-	%
Input Bias Current	--	-1.0	-0.2	1.0	μA
Voltage Gain	--	-	100	-	V/V
Frequency Bandwidth	$A_v = 0$ 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	m Ω
	$V_{CC} = 10V$, $V_{IN-} = 0V$		42	65	
Output leakage current	SCP active		5	-	μA
Total device					
Standby supply current		-	4.5	6	mA

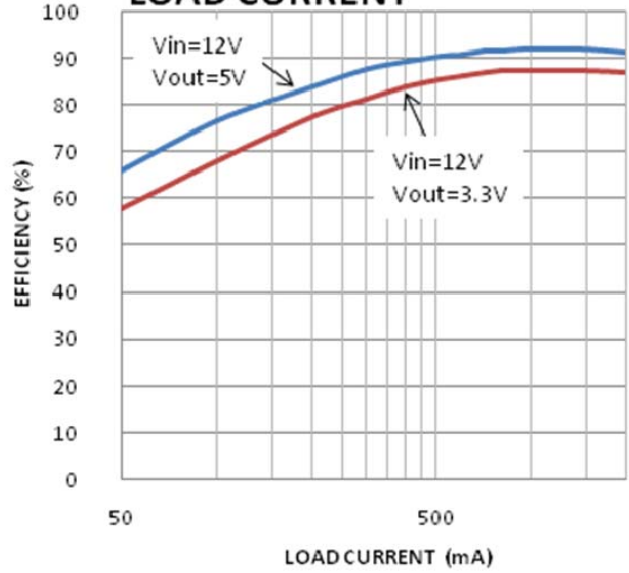
TYPICAL PERFORMANCE CHARACTERISTICS

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

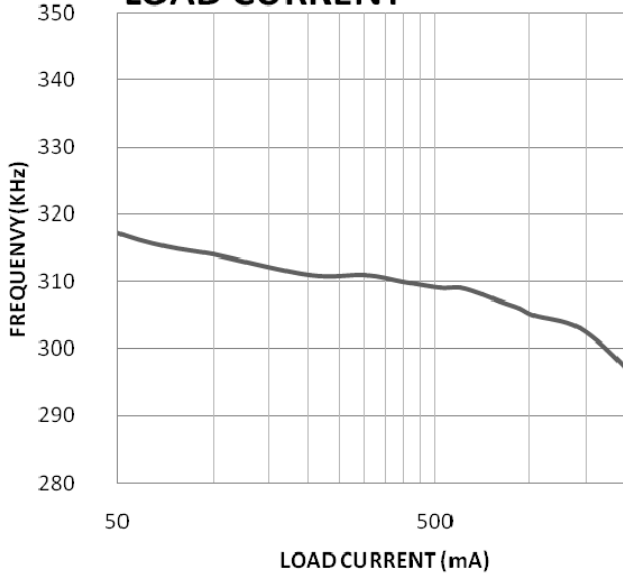
QUIESCENT CURRENT vs SUPPLY VOLTAGE



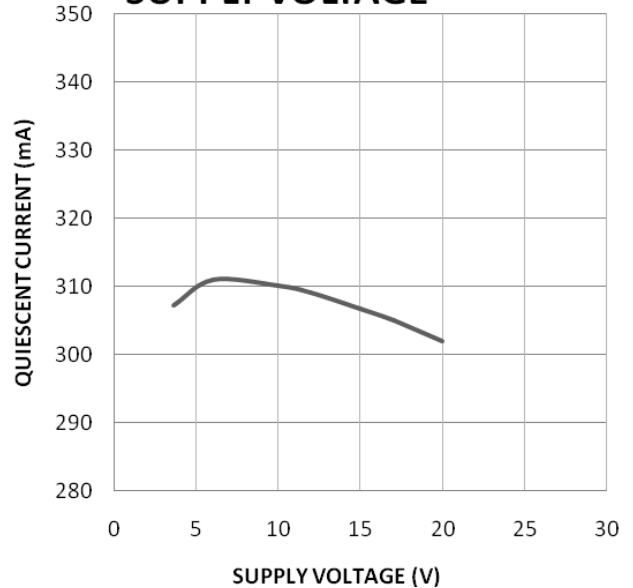
EFFICIENCY vs LOAD CURRENT



FREQUENCY vs LOAD CURRENT



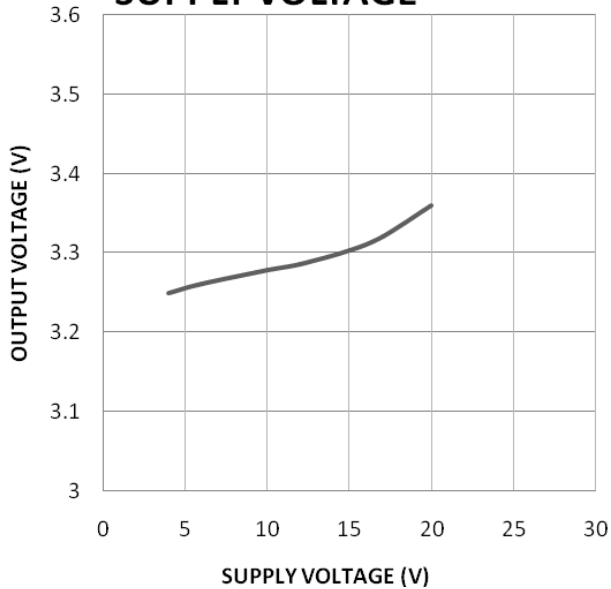
FREQUENCY vs SUPPLY VOLTAGE



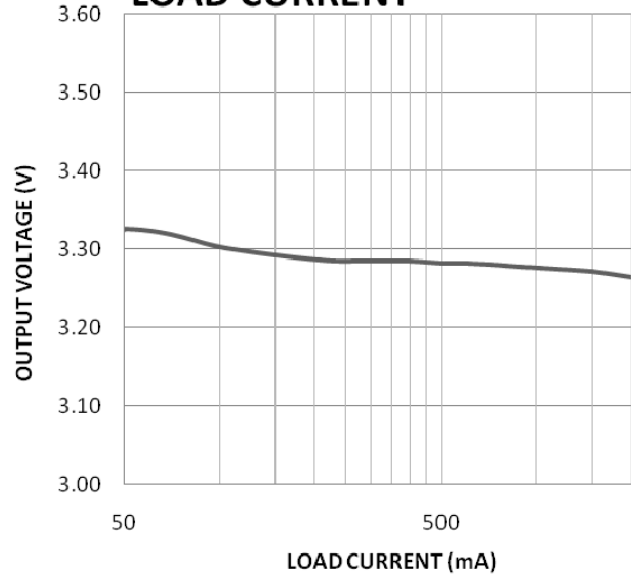
TYPICAL PERFORMANCE CHARACTERISTICS(Continued)

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

OUTPUT VOLTAGE vs SUPPLY VOLTAGE

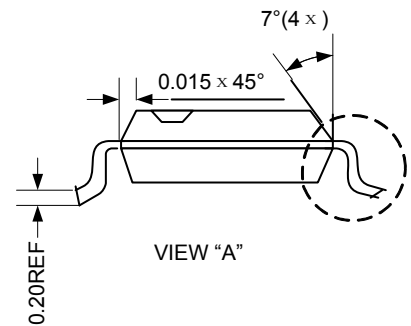
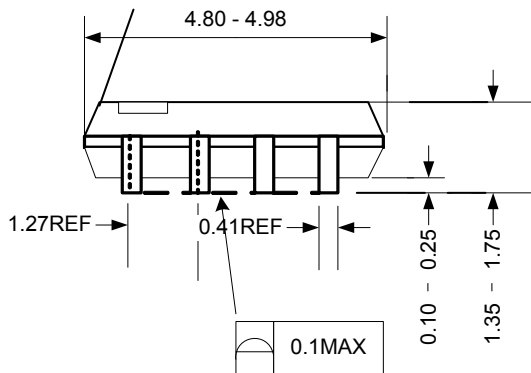
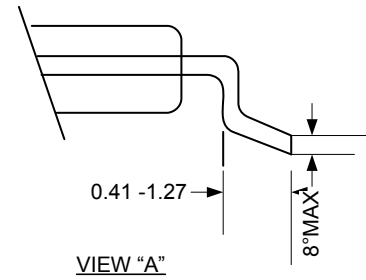
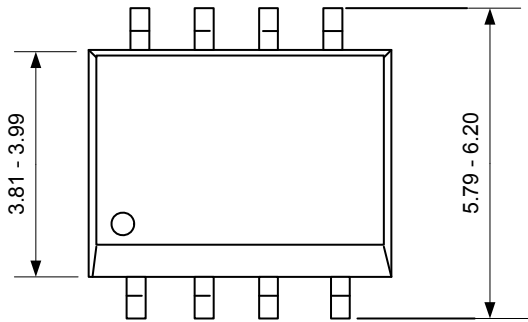


OUTPUT VOLTAGE vs LOAD CURRENT



PACKAGE DESCRIPTION Units: mm

Package
8-Lead Plastic SOP-8L



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