

Advanced Monolithic Systems

AMS3106

500mA LOW DROPOUT VOLTAGE REGULATOR

RoHS compliant

FEATURES

- 0.6V to 6V in 100mV steps Fixed or Adjustable Voltage
- Active High On/Off Control
- Output Current of 500mA
- Quiescent Current of <math><1\mu\text{A}</math> when in Shutdown
- Low Dropout Voltage of 500mV at 500mA
- Wide Supply Voltage Range 1.5V to 15V
- Short Circuit and Thermal Protection
- Power Good function option
- Ceramic Output Capacitor OK
- Reference bypass for low noise

APPLICATIONS

- Battery Powered Systems
- Cellular Phones
- Cordless Telephones
- Portable (Notebook) Computers
- Portable Instrumentation
- Portable Consumer Equipment
- Personal Communication Equipment
- Radio Control Systems
- Low Voltage Systems
- MP3 Player

GENERAL DESCRIPTION

The AMS3106 is a 500mA low dropout fixed voltage regulator, featuring an internal electronic switch controlled by TTL or CMOS logic levels. When the Enable pin is pulled to a logic high level, the device is in the ON state. Designed specifically for battery powered applications where low quiescent current, low dropout and low standby current are required, the AMS3106 is ideal to use in standby power systems. Like other regulators the AMS3106 series also includes internal current limiting and thermal shutdown. A high precision 0.6V voltage reference enables the device to provide very low output voltages. A key feature includes a reference bypass pin to improve its low-noise performance for fixed output versions.

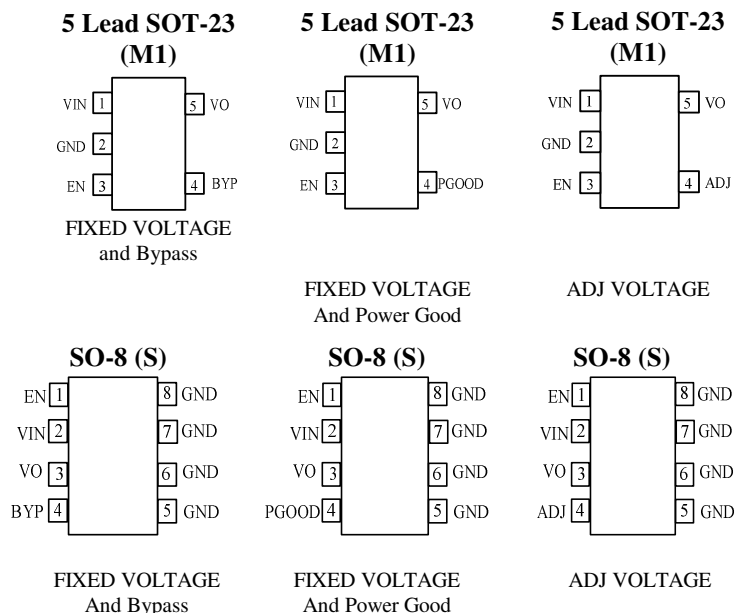
Ideal for space critical applications, the AMS3106 is available in the 5-pin SOT-23 surface mount package and 8-pin SOIC EDP. The Power Good option is used when the Output Voltage drop must be detected. If the Output Voltage drops by approximately 15% of its nominal value, the open collector on PG pin will pull down to Low state.

ORDERING INFORMATION

PACKAGE TYPE	
5L SOT-23	SO-8 (ADP)
AMS3106AM1-XXBP	AMS3106AS-XXBP
AMS3106M1-XXBP	AMS3106S-XXBP
AMS3106AM1-XXPG	AMS3106AS-XXPG
AMS3106M1-XXPG	AMS3106S-XXPG
AMS3106AM1	AMS3106AS
AMS3106M1	AMS3106S

XX =specify the output voltage required

PIN CONNECTIONS (Top View)



ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Voltage	16V	Maximum Junction Temperature	+150°C
Power Dissipation	Internally limited	Storage Temperature	-65°C to +150°C
Thermal Resistance (M1/SO-8)	410/45°C/W*	Lead Temperature (Soldering 25 sec)	265°C
Operating Temperature Range	-40°C to +125°C	ESD Rating	2kV

ELECTRICAL CHARACTERISTICS

Electrical Characteristics at $V_{IN} = V_{OUT} + 1V$, $I_O = 1mA$, $C_{IN} = 10\mu F$, $C_{OUT} = 22\mu F$, $V_{ON/OFF} = 2V$ unless otherwise specified.

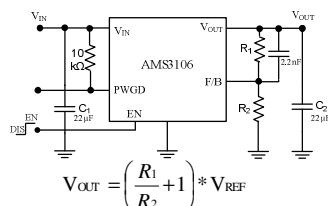
PARAMETER	CONDITIONS	AMS3106A-X			AMS3106-X			Units
		Min.	Typ.	Max.	Min.	Typ.	Max.	
Reference Voltage	(Adjustable device option)	0.594	0.600	0.606	0.488	0.600	0.612	V
Output Voltage	1mA $\leq I_O \leq$ 500 mA	-1		1	-2		2	%
(Fixed Output Version)		-2		2	-3.5		3.5	%
Line Regulation	$V_{OUT} + 1V \leq V_{IN} \leq 15V$		0.6	1	0.6		1	mV/V
				2			2	
Load Regulation	$I_L = 1mA$ to 500mA		0.1	0.4		0.1	0.4	mV/mA
				0.8			0.8	
Ground Pin Current	$I_O = 0$ mA		60	90		60	90	μA
	$I_O = 500$ mA		8	12		8	12	mA
Dropout Voltage	$I_O = 500$ mA		200	250		200	250	mV
Shutdown	$V_{EN} \leq 0.8V$ (shutdown)					0.01	1	μA
Quiescent Current	$V_{EN} \leq 0.8V$ (shutdown)			5			5	μA
Ripple Rejection	$f = 1kHz$, $C_{OUT} = 10\mu F$		75			75		dB
Output Noise Voltage	$300Hz < f < 50kHz$, $C_O = 10\mu F$		30			30		μV
Short Circuit Current	$R_L = 0\Omega$		500			500		mA
Control Terminal Specifications (note 2)								
Enable Input Current	$V_{ON/OFF} = 0V$		0	-1		0	-1	μA
	$V_{ON/OFF} = 5V$		5	15		5	15	μA
Enable Input Voltage	High = Output On		1.2	1.3		1.2	1.3	V
	Low = Output Off		0.9			0.9		V

Note 1: Absolute Maximum Ratings are limits beyond which damage to the device may occur. For guaranteed performance limits and associated test conditions, see the Electrical Characteristics tables.

Note 2: The ON/OFF inputs must be properly driven to prevent possible misoperation.

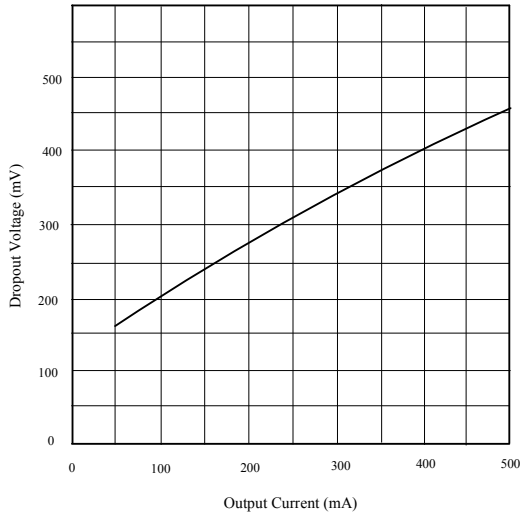
Note 3: Limits appearing in **boldface** type apply over the entire junction temperature range for operation. Limits appearing in normal type apply for $T_A = T_J = 25^\circ C$

*Due to thermal resistance the power dissipation for SOT-23 package should be limited to 320mW and 2.5W for 8-L SOIC package.

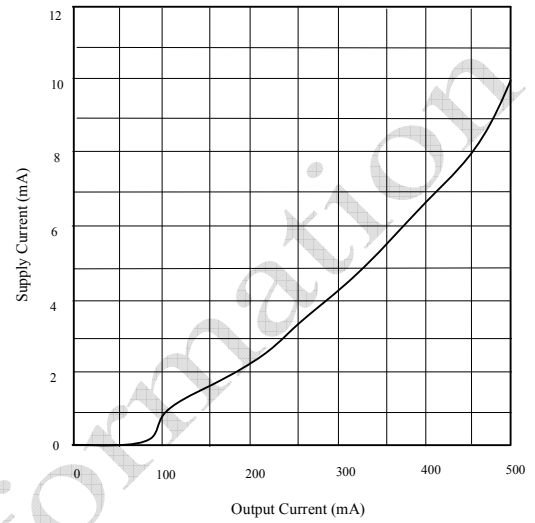
TYPICAL APPLICATION CIRCUIT

TYPICAL CHARACTERISTICS

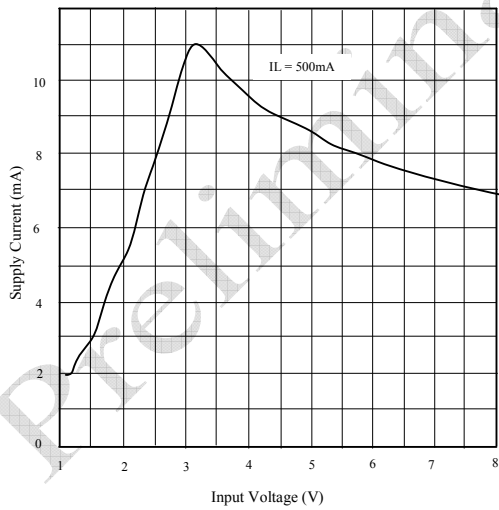
Dropout Voltage vs. Output Current



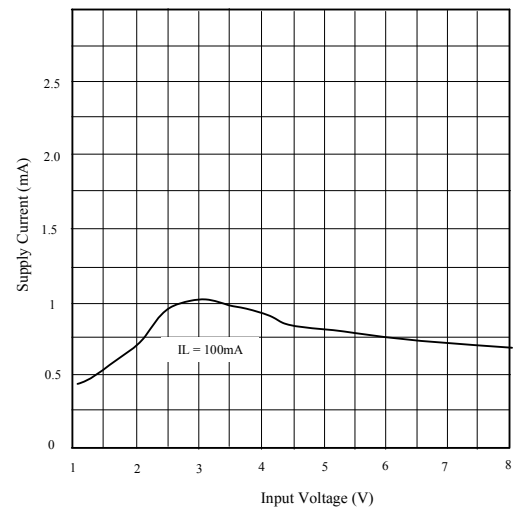
Supply Current vs. Load Current



Supply Current vs. Input Voltage

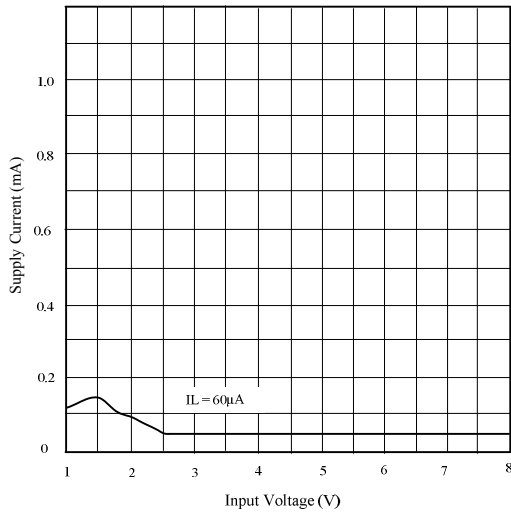


Supply Current vs. Input Voltage

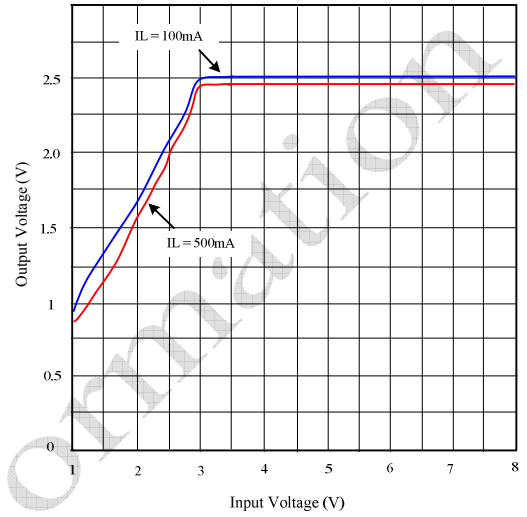


TYPICAL CHARACTERISTICS

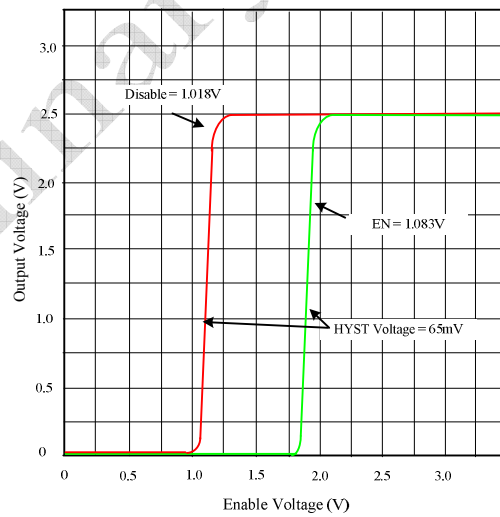
Supply Current vs. Input Voltage



Dropout Characteristics

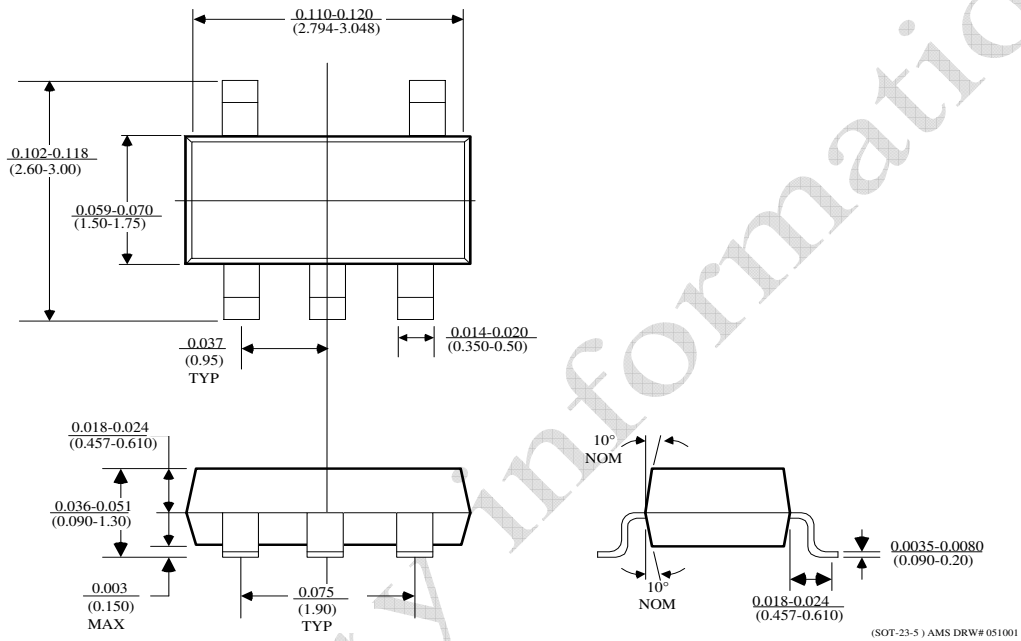


Typical Enable/Disable Voltage



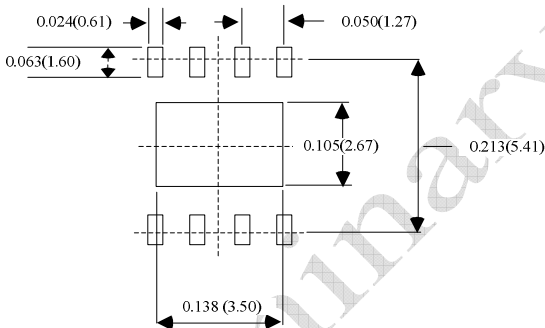
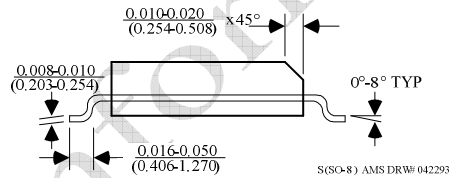
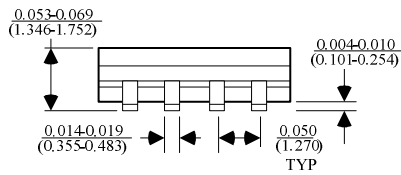
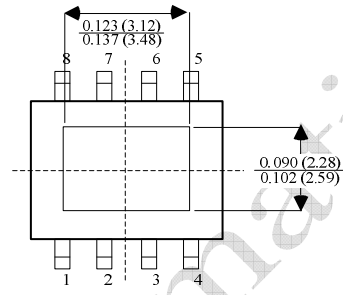
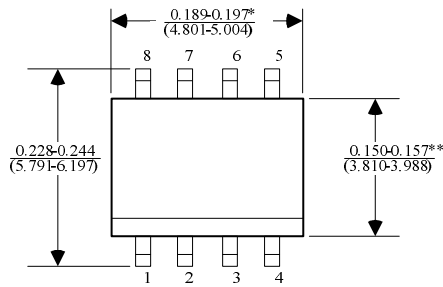
PACKAGE DIMENSIONS inches (millimeters) unless otherwise noted.

5 LEAD SOT-23 PLASTIC PACKAGE (M1)



PACKAGE DIMENSIONS (continued) inches (millimeters) unless otherwise noted.

8 LEAD SOIC PLASTIC PACKAGES (S)



RECOMMENDED LAYOUT PATTERN

*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