

7V Input , 500mA , Ultra Low Noise ,High PSRR, CMOS LDO
Description

The AF6213 series of low-dropout linear regulators are ultralow noise LDOs with high accuracy, high ripple rejection and ultra-fast load transient performance. The AF6213 has the FB pin and the fold-back maximum output current which depends on the output voltage.

The series are very suitable for the battery-powered equipment such as RF applications and other systems requiring a quiet voltage source.

Applications

- Portable consumer equipment
- Wireless handsets, Smart Phones
- Bluetooth, Digital cameras and Digital audio
- PDAs and other handheld products

Device Information

AF 6213 – ADJ C

- ① ② ③ ④

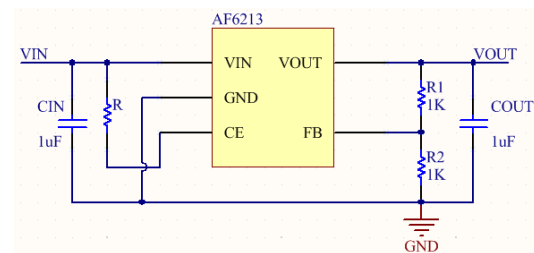
①	Standard
②	Product Name
③	Output Voltage Adjustable
④	C: SOT23-5L Package

Ordering Information

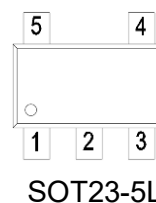
Packing	Shipping
Tape and Reel	3K

Features

- Input Voltage Range: 1.8V~7V
- Adjustable Output Voltage Range: 0.6V~5.5V
- Output Current: 500mA
- Quiescent Current: 45uA
- Dropout Voltage: 110mV@100mA
- Fixed Voltage Accuracy: $\pm 2\%$ (Typ.)
- PSRR: 70dB at 1kHz
- Excellent Line and Load Transient Response
- Short-Circuit Protection
- Ultralow-Noise: 40 μ VRMS(10Hz~100kHz)

Typical Application

Pin Configuration

Symbol	Package Pin
	SOT23-5L
VIN	1
GND	2
CE	3
FB	4
OUT	5



**Absolute Maximum Ratings⁽¹⁾**

(Unless otherwise specified, all voltage are with respect to GND, TA=25°C)

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage	V _{IN}	-0.3~8	V
Output Voltage	V _{OUT}	-0.3~V _{IN}	V
Output Current	I _{OUT}	750	mA
Power Dissipation	P _D	0.4	W
Operating Junction Temperature	T _J	-40~125	°C
Storage Temperature	T _{STG}	-40~125	°C
Lead Temperature(Soldering, 10 sec)	T _L	260	°C

(1). Stresses beyond those listed under absolute maximum ratings may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under recommended operating conditions is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Electronics Characteristics(Unless otherwise specified, V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1uF, TA=25°C)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	V _{IN} ⁽²⁾		1.8		7	V
Output Voltage	V _{OUT}		0.98 V _{OUT}	V _{OUT}	1.02 V _{OUT}	V
Output Current	I _{OUT}		500			mA
Dropout Voltage	V _{DIF}	I _{OUT} =100mA		110		mV
Quiescent Current	I _Q	I _{OUT} =0		45	80	uA
Shutdown current	I _{CEL}	V _{CE} =V _{SS}			0.1	uA
Line Regulation	ΔV _{LINE}	I _{OUT} =10mA V _{OUT} +1V≤V _{IN} ≤7V		0.01	0.2	%/V
Load Regulation	ΔV _{LOAD}	V _{IN} =V _{OUT} +1V 1mA≤I _{OUT} ≤100mA		1		mV
FB Voltage	V _{FB}	I _{OUT} =1mA	0.588	0.6	0.612	V
Temperature Coefficient	TC	I _{OUT} =10mA -40°C<T _A <85°C		50		ppm
Current Limit	I _{LIM}		600	750		mA
Short Current	I _{SHORT}	V _{OUT} =V _{SS}		20		mA
CE High Voltage	V _{CEH}		1.2		V _{IN}	V
CE Low Voltage	V _{CEL}				0.3	V



AF6213 Series

Power Supply Rejection Ratio	PSRR	I _{OUT} =50 mA	1kHz	70	dB
			10kHz	50	
Output noise voltage		BW=10Hz to 100kHz, I _{OUT} =10mA		40	μV _{RMS}

(2). Minimum V_{IN} is 1.8V or V_{OUT} + V_{DO}, whichever is greater.

Dropout Voltage Chart

Setting Output Voltage	Dropout Voltage (mV) Typ.			
V _{OUT} (V)	I _{OUT} =100mA	I _{OUT} =200mA	I _{OUT} =300mA	I _{OUT} =500mA
1.2	372mV	642mV	876mV	1.368V
1.5	248mV	471mV	681mV	1.128V
1.8	189mV	370mV	550mV	947mV
2.1	157mV	311mV	469mV	820mV
2.5	132mV	265mV	400mV	706mV
2.8	120mV	241mV	365mV	645mV
3.0	111mV	229mV	348mV	612mV
3.3	107mV	214mV	325mV	574mV
3.6	101mV	203mV	307mV	542mV
4.0	98mV	184mV	292mV	506mV
4.5	93mV	183mV	275mV	474mV
5.0	88mV	173mV	261mV	446mV

Application Information

The following table shows the typical application circuit with AF6213-ADJ. The external resistor sets the output voltage according to the following equation:

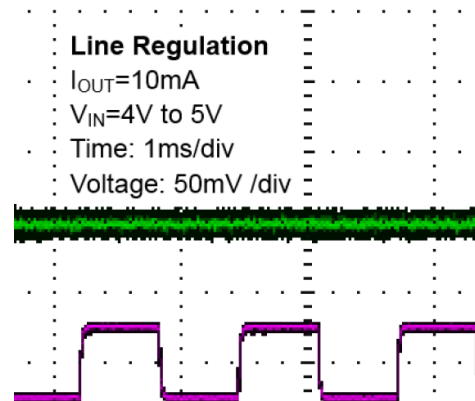
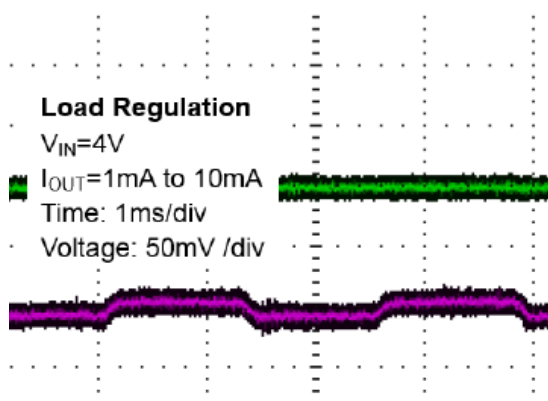
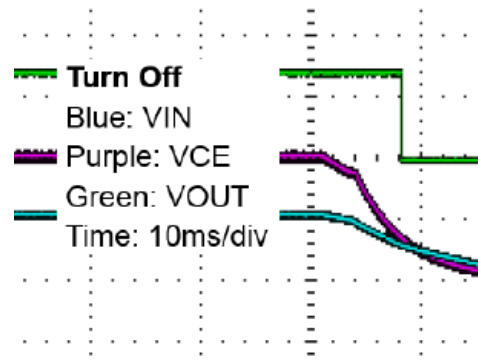
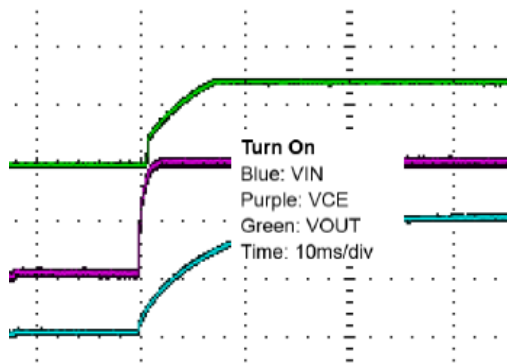
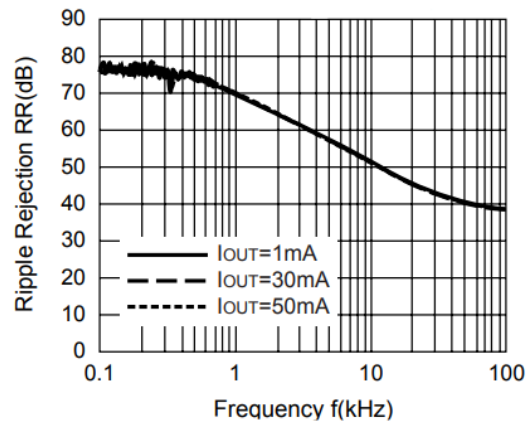
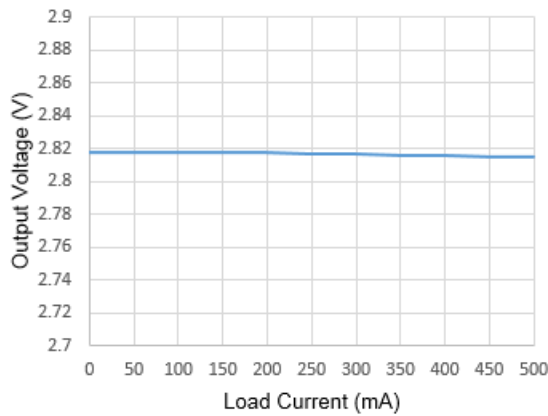
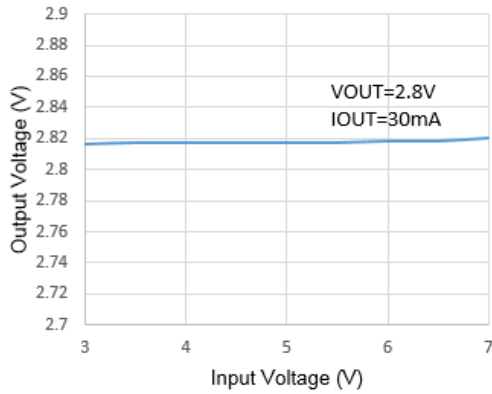
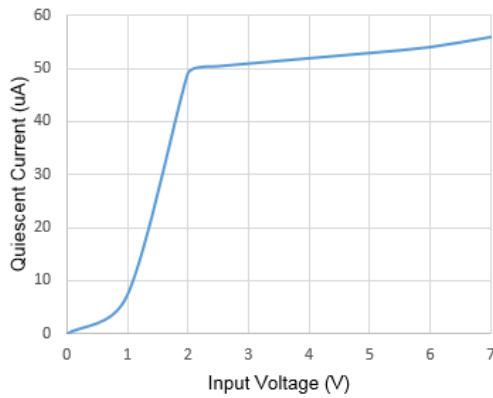
$$V_{OUT} = 0.6V \times \left(1 + \frac{R1}{R2} \right)$$

Resistor select for output voltage setting:

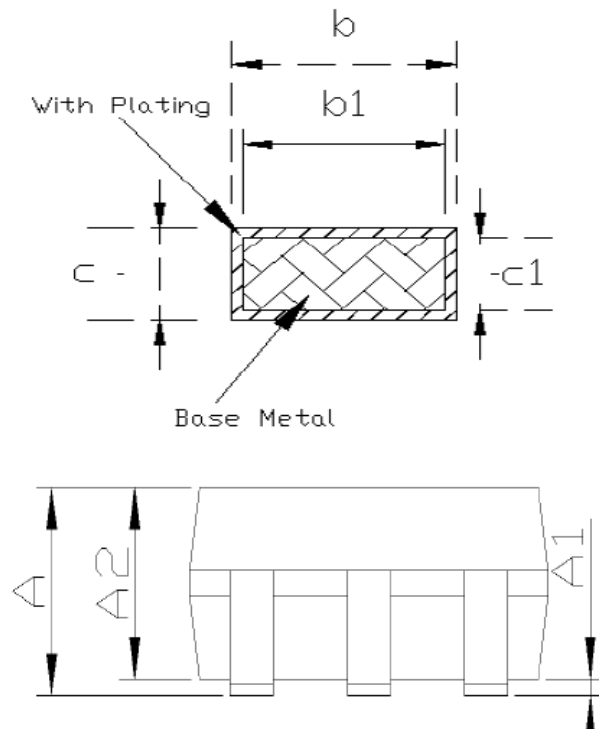
V _{OUT}	R1	R2
1.2V	30.1K	30.1K
1.5V	45.3K	30.1K
1.8V	60.4K	30.1K
2.5V	95.3K	30.1k
2.8V	110K	30.1k
3.0V	120K	30.1K
3.3V	137K	30.1K
5.0V	221K	30.1k

Typical Characteristics

(Unless otherwise specified, $V_{IN}=V_{OUT}+1V$, $C_{IN}=C_{OUT}=1\mu F$, $T_A=25^\circ C$)

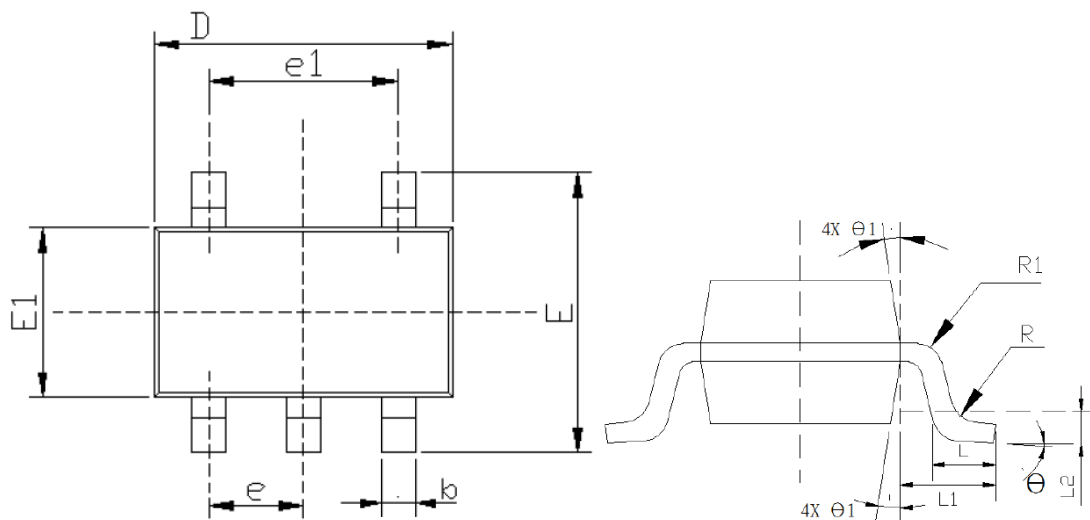


Package Information



Common Dimensions			
(Units of Measure=Millimeter)			
SYMBOL	MINIMUM	NOMINAL	MAXIMUM
A	-	-	1.35
A1	0	-	0.15
A2	1.00	1.10	1.20
b	0.35	-	0.45
b1	0.32	-	0.38
c	0.14	-	0.20
c1	0.14	0.15	0.16
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.6 REF		
L2	0.25 REF		
R	0.10	-	-
R1	0.10	-	0.25
θ	0°	4°	8°
θ_1	5°	10°	15°

SOT23-5L





History Version

V1.0	Product datasheet	2017-05-12
V1.6	Organize typesetting	2019-11-20
V1.7	Increase the input voltage range of the CE pin	2020-08-26

DISCLAIMER

AFSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. AFSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENCE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

THE GRAPHS PROVIDED IN THIS DOCUMENT ARE STATISTICAL SUMMARIES BASED ON A LIMITED NUMBER OF SAMPLES AND ARE PROVIDED FOR INFORMATIONAL PURPOSE ONLY. THE PERFORMANCE CHARACTERISTICS LISTED IN THEM ARE NOT TESTED OR GUARANTEED. IN SOME GRAPHS, THE DATA PRESENTED MAY BE OUTSIDE THE SPECIFIED OPERATING RANGE (E.G. OUTSIDE SPECIFIED POWER SUPPLY RANGE) AND THEREFORE OUTSIDE THE WARRANTED RANGE.