ZHEJIANG UNIU-NE Technology CO.,LTD

浙 江 宇 力 微 新 能 源 科 技 有 限 公 司

U6213 Data Sheet

V 1.2

Features

- Input voltage:2.5V~6.5V
- Output range:1.0V~3.6V (customized by every 0.1V step)
- Maximum output current: 300mA @ VIN-VOUT=0.5V
- PSRR: 75dB @1KHz
- Dropout voltage:220mV @ IOUT=200mA
- Quiescent current: 50μA Typ.
- Shut-down current: <1μA
- Recommend capacitor:1μF
- Ultra Low Output Noise:20μVRMS

Applications

- MP3/MP4 Players
- Cellphones, radiophone, digital cameras
- Bluetooth, wireless handsets
- Others portable electronics device

General Description

The U6213 is a high accuracy, low noise, high speed, low dropout CMOS Linear regulator with high ripple rejection and fast discharge function. The devices offer a new level of cost effective performance in cellular phones, laptop and notebook computers, and other portable devices.

U6213 can provide product selections of output value in the range of 1.0V~3.6V by every 0.1V step.

The current limiter's fold-back circuit also operates as a short circuit protection and an output current limiter at the output pin.

The U6213 regulators are available in standard SOT23-5L packages.

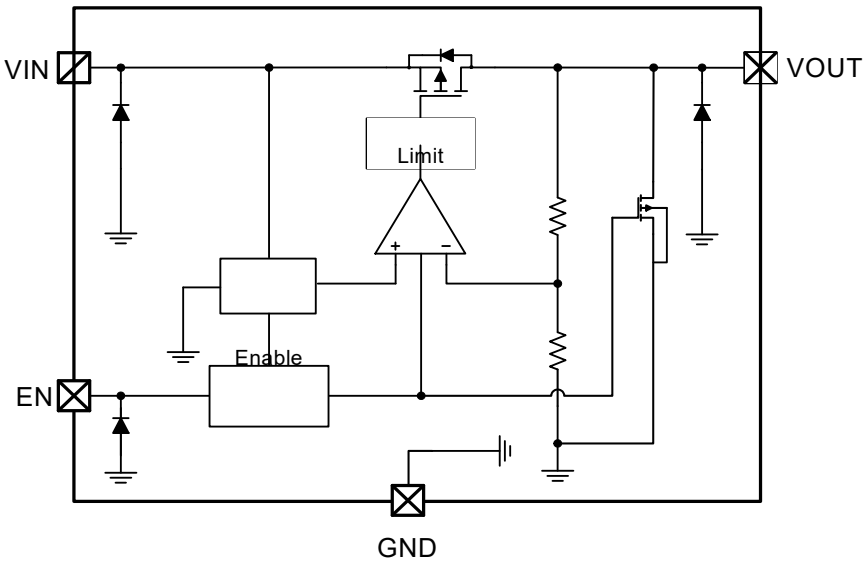
Standard products are Pb-free and Halogen-free.

Selection Table

Part No.	Package	Temperature	Tape & Reel
U6213-X.XV	SOT23-5L	-40 ~ +105℃	3000/REEL

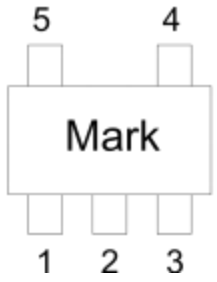
Note: X.XV indicates 1.0V~3.3V by 0.1V step. For example, 3.3V means product outputs 3.3V

Block Diagram



Pin Assignment

SOT23-5 (Top View)



PIN NO SOT23-5L	SYMBOL	I/O	DESCRIPTTION
1	VIN	Power	Input
2	GND	Ground	Ground
3	EN	I	Enable(Active high, not floating)
4	NC	/	Not connected
5	VOUT	O	Output

Mark：① ② ③ ④

① Represents product series

Mark	Product Series
L	U6213

② Represents type of regulator

Mark		Product series
Vout:0.1~3.3V	Vout:3.4~6.0V	
V	A	U6213

③ Represents output Voltage

Mark	Output Voltage(V)		Mark	Output Voltage(V)	
0	-	3.1	F	1.6	4.6
1	-	3.2	H	1.7	4.7
2	-	3.3	K	1.8	4.8
3	-	3.4	L	1.9	4.9
4	-	3.5	M	2.0	5.0
5	-	3.6	N	2.1	-
6	-	3.7	P	2.2	-
7	-	3.8	R	2.3	-
8	0.9	3.9	S	2.4	-
9	1.0	4.0	T	2.5	-
A	1.1	4.1	U	2.6	-
B	1.2	4.2	V	2.7	-
C	1.3	4.3	X	2.8	-
D	1.4	4.4	Y	2.9	-
E	1.5	4.5	Z	3.0	-

④ Respresents production lot number

0 to 9, Ato Z reverse character of 0 to 9, Ato Z repeated (G, I, O, Q, W excepted)

Absolute Maximum Ratings

Input Voltage……..-0.3V to 8V
Output Current……300mA
Operating Temperature .....-40℃ to 105℃
Ambient Temperature……..……-40℃ to 105℃
Storage Temperature .....-55℃ to 150℃
Package Lead Soldering Temperature.....260℃
Junction Temperature…… -40℃ to 125℃

Note: These are stress ratings only. Stresses exceeding the range specified under "Absolute Maximum Ratings" may cause substantial damage to the device. Functional operation of this device at other conditions beyond those listed in the specification is not implied and prolonged exposure to extreme conditions may affect device reliability.

Thermal Information

Symbol	Parameter	Package	Max.	Unit
θ_{JA}	Thermal Resistance (Junction to Ambient) (Assume no ambient airflow, no heat sink)	SOT23-5	500	℃/W
P_D	Power Dissipation	SOT23-5	0.30	W

Note: P_D is measured at Ta= 25℃

Electrical Characteristics

The following specifications apply for V_{OUT}=2.8V,T_A=25℃, unless specified otherwise

SYMBOL	ITEMS	CONDITIONS	MIN	TYP	MAX	UNIT
V_{IN}	Input Voltage				6.5	V
V_{OUT}	Output Range	V_{OUT} <2V V_{IN}=2.7V, I_{OUT}=1mA	-3	V_{OUT}	3	%
		V_{OUT} ⩾2V, I_{OUT}=1mA	-2	V_{OUT}	2	
I_Q	Quiescent Current	V_{OUT}=2.8V, I_{OUT}=0		50		μA
I_{LIMIT}	Current Limit	V_{IN}=V_{EN}=4.5V		300		mA
V_{DROP}	Dropout Voltage	V_{OUT}=2.8V, I_{OUT}=200mA		220	250	mV
		V_{OUT}=2.8V, I_{OUT}=300mA		320	350	
$\triangle V_{LINE}$	Line Regulation	V_{IN}=2.7~5.5V, I_{OUT}=1mA		0.01	0.15	%/V
$\triangle V_{LOAD}$	Load Regulation	V_{OUT}=2.8V, I_{OUT}=1~300mA		40	70	mV
I_{SHORT}	Short Current	V_{EN}=V_{IN}, V_{OUT} Short to GND with 1 Ω		80		mA
I_{SHDN}	Shut-down Current	V_{EN}=0V			1	μA
PSRR	Power Supply Rejection Rate	V_{IN}=5V_{DC}+0.5V_{P-P} F=1KHz, I_{OUT}=10mA		75		dB
		V_{IN}=5V_{DC}+0.5V_{P-P} F=1MHz, I_{OUT}=10mA		55		
V_{ENH}	EN logic high voltage	V_{IN}=5.5V, I_{OUT}=1mA	1.2		V_{IN}	V
V_{ENL}	EN logic low voltage	V_{IN}=5.5V, V_{OUT}=0V			0.4	V
I_{EN}	EN Input Current	V_{EN}= 0 to 5.5V			1	μA
e_{NO}	Output Noise Voltage	10Hz to 100KHz, C_{OUT}=1 μF		20		μV_{RMS}

Application Information

INPUT CAPACITOR

An input capacitor of ≥ 1.0μF is required between the VIN and GND pin. This capacitor must be located within 1cm distance from VIN pin and connected to a clear ground. A ceramic capacitor is recommended although a good quality tantalum or film may be used at the input. However, a tantalum capacitor can suffer catastrophic failures due to surge current when connected to a low impedance power supply (such as a battery or a very large capacitor).

There is no requirement for the ESR on the input capacitor, but the tolerance and temperature coefficient must be considered in order to ensure the capacitor work within the operation range over the full range of temperature and operating conditions.

OUTPUT CAPACITOR

In applications, it is important to select the output capacitor to keep in stable operation. The output capacitor must meet all the requirements specified in the following recommended capacitor table over all conditions in applications. The minimum capacitance for stability and correct operation is 0.6μF. The capacitance tolerance should be ±30% or better over the operation temperature range. The recommended capacitor type isX7R to meet the full device temperature specification.

The capacitor application conditions also include DC-bias, frequency and temperature. Unstable operation will result if the capacitance drops below minimum specified value (see the next section Capacitor Characteristics).

The U6213 is designed to work with very small ceramic output capacitors. A 1.0μF capacitor (X7R type) with ESR type between 0 and 400mΩ is suitable in the applications. X5R capacitors may be used but have a narrow temperature range. With these and other capacitor types (Y5V, Z6U) that may be used, selection relies on the range of operating conditions and temperature range for a specified application. It may also be possible to use tantalum or film capacitors at the output, but these are not as good for reasons of size and cost. It is also recommended that the output capacitor be located within 1cm from the output pin and return to a clean ground wire.

NO-LOAD STABILITY

The U6213 will remain stable and in regulation with no external load. This is especially important in CMOSRAM keep-alive applications.

ON/OFF INPUT OPERATION

The U6213 is turned off by pulling the EN pin low, and turned on by pulling it high. If this function is not used, the VEN pin should be tied to VIN to keep the regulator output on at all time. To assure proper operation, the signal source used to drive the VEN input must be able to swing above and below the specified turn-on/off voltage thresholds listed in the Electrical Characteristics section under VIL and VIH.

1.版本记录

DATE	REV.	DESCRIPTION
2019/04/11	1.0	首次发布
2022/03/13	1.1	布局调整
2025/04/10	1.2	区分封装SOT23-5 DFN1*1-4、修正标签

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