UP6206

300mA Low Power CMOS LDO

■ DESCRIPTION

The UP6206 series are a highly precise, lower consumption, 3 terminals, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The UP6206 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error correction circuit. The series is compatible with low ESR ceramic capacitors. The current limiter's foldback circuit operates as a short circuit protection as well as the output current limiter for the output pin. Output voltages are internally by laser trimming technologies. It is selectable in 0.1V increments within a range of 1.2V to 5.0V. UP6206 series are available in SOT23, DFN packages

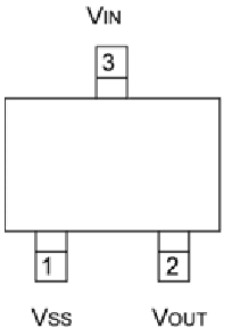
■ FEATURE

- ***Low power consumption***
- ***Low voltage drop***
- ***Low temperature coefficient***
- ***Quiescent current 8uA at 6V***
- ***High output current 300mA***
- ***Output voltage accuracy: tolerance 2%***
- ***SOT23, DFN2X2 packages***

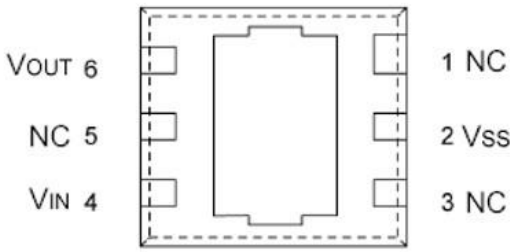
■ APPLICATIONS

- Battery-powered equipment
- Communication equipment
- Audio/Video equipmetn

■ PIN CONFIGURATION



SOT-23
(TOP VIEW)



USP-6B
(BOTTOM VIEW)

■ PART NUMBER INFORMATION

UP6206-①②③④	① ②=Output Voltage 1.2V ~ 5.0V ③=Output Voltage Accuracy 1=1%, 2=2% ④=Package Code S=SOT23 D=DFN

■ ORDERING INFROMATION

Part Number	Output Voltage	Package	Marking
UP6206-332S	3.3	SOT23	3000EA / T&R
UP6206-332D	3.3	DFN2X2	3000EA / T&R

■ ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ Unless otherwise noted)

Symbol	Parameter	Typical	Unit
$V_{IN(MAX)}$	Supply Voltage	8	V
I_{OUT}	Output Current	300	mA
V_{OUT}	Output Voltage	V_{SS}-0.3~V_{IN}+0.3	
T_J	Operation Junction Temperature	150	℃
T_{STG}	Storage Temperature Range	-55~+150	℃
T_{OPR}	Operation Temperature	-40~+80	℃

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied

■ THERMAL DATA

Symbol	Parameter	Package	Max	Unit
P_D	Power Dissipation	SOT23	0.2	W
		DFN2X2	0.5	W

■ ELECTRICAL CHARACTERISTICS(T_A=25℃ Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
V_{IN}	Input Voltage		1.8		8	V
V_{OUT}	Output Voltage	$V_{IN}=V_{OUT}+1V$ I_{OUT}=10mA	V_{OUT}*0.98		V_{OUT}*1.02	V
I_{OUT}	Output Current Note1	$V_{IN}=V_{OUT}+1V$		300		mA
ΔV_{OUT}	Load Regulation	$V_{IN}=V_{OUT}+1V$, 1mA≤I_{OUT}≤80mA		15	30	mV
V_{DIF}	Dropout Voltage Note2	Refer to the next table				
I_{SS}	Quiescent Current	No Load		8	15	uA
$\Delta V_{OUT}/\Delta V_{IN}*V_{OUT}$	Line Regulation	$V_{OUT}+1V≤V_{IN}≤6V$, I_{OUT}=40mA			0.2	%V
$V_{OUT}/(T_A*V_{OUT})$	Output Voltage Temperature Coefficiency	I_{OUT}=30mA 0℃≤T_A≤70℃		100		Ppm/℃
PSRR	PSRR	F=1KHz $V_{IN}=V_{OUT}+1V$		50		dB
I_{SHORT}	Short Circuit Current	$V_{IN}=V_{OUT}+1.5V$ $V_{OUT}=V_{SS}$		120		mA
I_{LIMIT}	Over Current Protection			500	550	mA

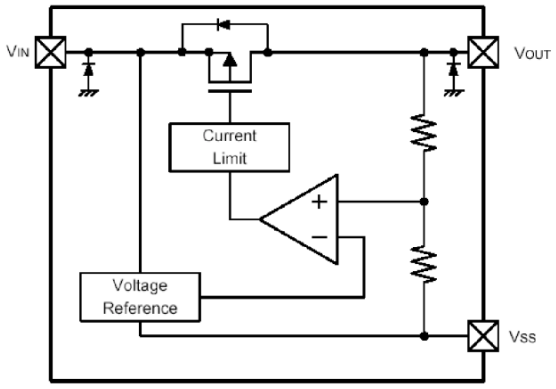
Note1: The deviation parameters V_{OUT} and I_{OUT} are defined as the difference between the maximum and minimum values obtained over the rated temperature range

Note2: $I_{OUT}=P_D/(V_{IN}-V_{OUT})$

Electrical characteristics by Output Voltage

Output Voltage V_{OUT} (V)	Dropout Voltage Vdif (mV)		
	Conditions	Typ	Max
V_{OUT}≤1.5V	I_{OUT}=100mA	650	850
1.8V≤V_{OUT}≤2.5V		280	420
2.5V≤V_{OUT}≤5.0V		190	350

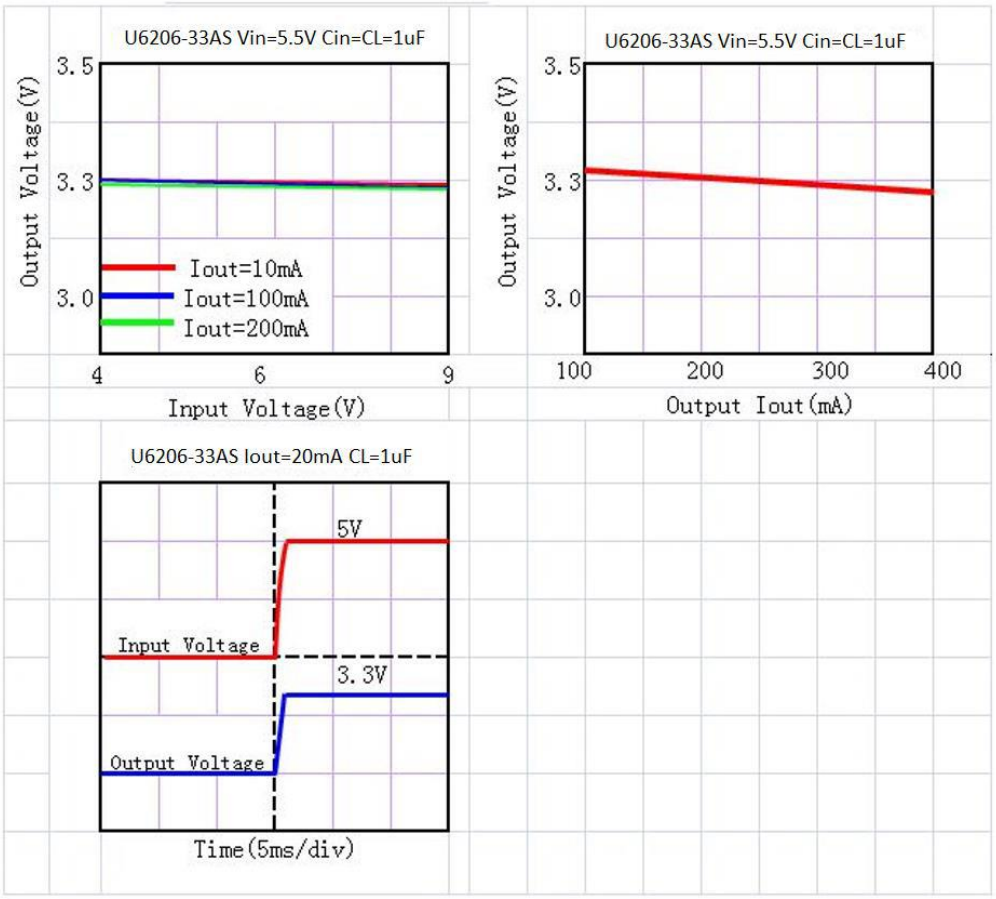
■ FUNCTION BLOCK DIAGRAM



*Diodes inside the circuit are an ESD protection diode and a parasitic diode.

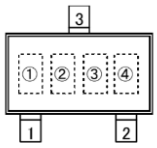
■ TYPICAL PERFORMANCE CHARACTERISTICS(T_A=25℃ Unless otherwise noted)

Output Voltage VS Input Voltage and Output Voltage VS Output Current and Input Transient Response



■ *MARK RULE*

SOT23



SOT-23
(TOP VIEW)

① Represents product number

Marking	Product series
6	UP6206****

② Represents 3 pins regulator

Marking		Product series
Voltage=1.2V~3.0V	Voltage=3.0V~5.0V	
5	6	UP6206

③ Represents output voltage

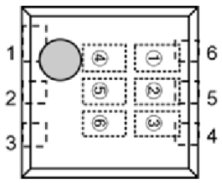
Marking	Voltage (V)			Marking	Voltage (V)		
0		3.1		F	1.6	4.6	
1		3.2		H	1.7	4.7	
2		3.3		K	1.8	4.8	
3		3.4		L	1.9	4.9	
4		3.5		M	2.0	5.0	
5		3.6		N	2.1		
6		3.7		P	2.2		
7		3.8		R	2.3		
8		3.9		S	2.4		
9		4.0		T	2.5		
A		4.1		U	2.6		
B	1.2	4.2		V	2.7		
C	1.3	4.3		X	2.8		
D	1.4	4.4		Y	2.9		
E	1.5	4.5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

Highlighted voltage is mass production

④ Represents production lot number
0 to 9, A to Z, and inverted 0 to 9, A to Z repeated (G, I, J, O, Q, W excepted)

■ *MARK RULE (continuous)*

DFN1.8X2.0-6L



① ② Represents product number

Marking		Product series
①	②	
0	6	UP6206-XX2D

③Represents 3 pins regulator

Marking	Product series
P	UP6206-XXXD

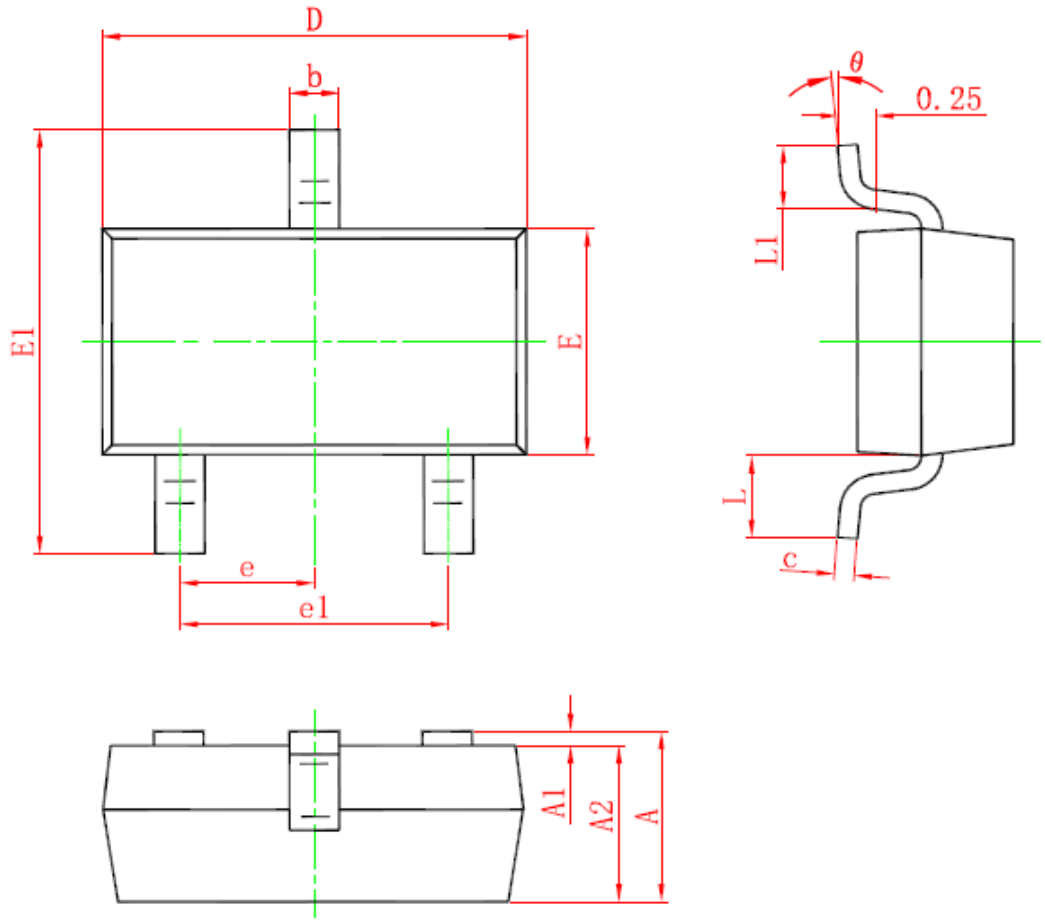
④⑤ Represents output voltage

Marking		Voltage (V)	Product series
④	⑤		
3	3	3.3	UP6206-33XD
5	0	5.0	UP6206-50XD

⑥Represents production lot number

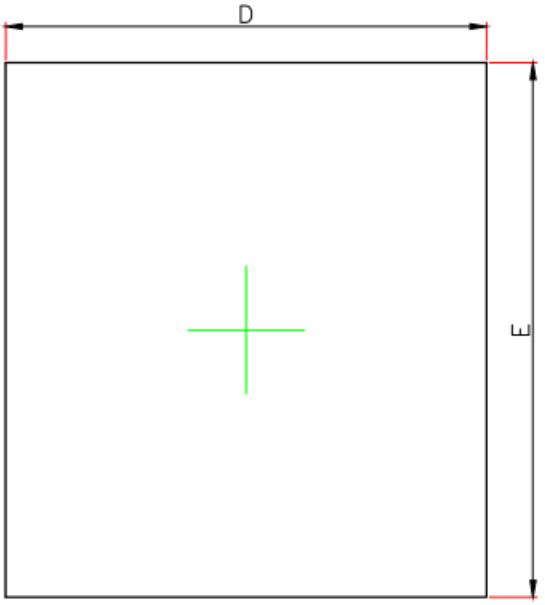
0 to 9, A to Z, and inverted 0 to 9, A to Z repeated (G, I, J, O, Q, W excepted)

■ SOT23 PACKAGE OUTLINE DIMENSIONS

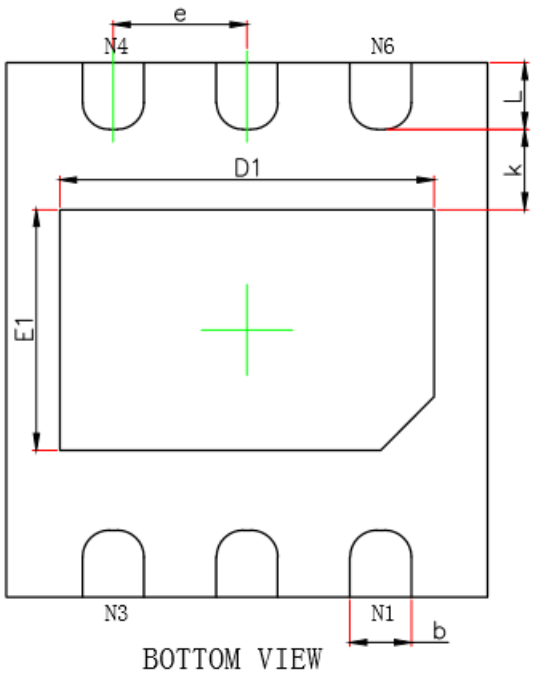


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

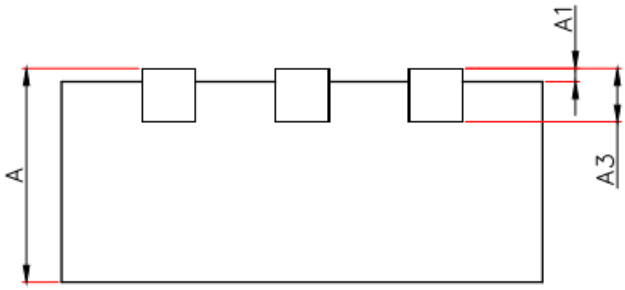
■ DFN1.8X2-6L PACKAGE OUTLINE DIMENSIONS



TOP VIEW



BOTTOM VIEW

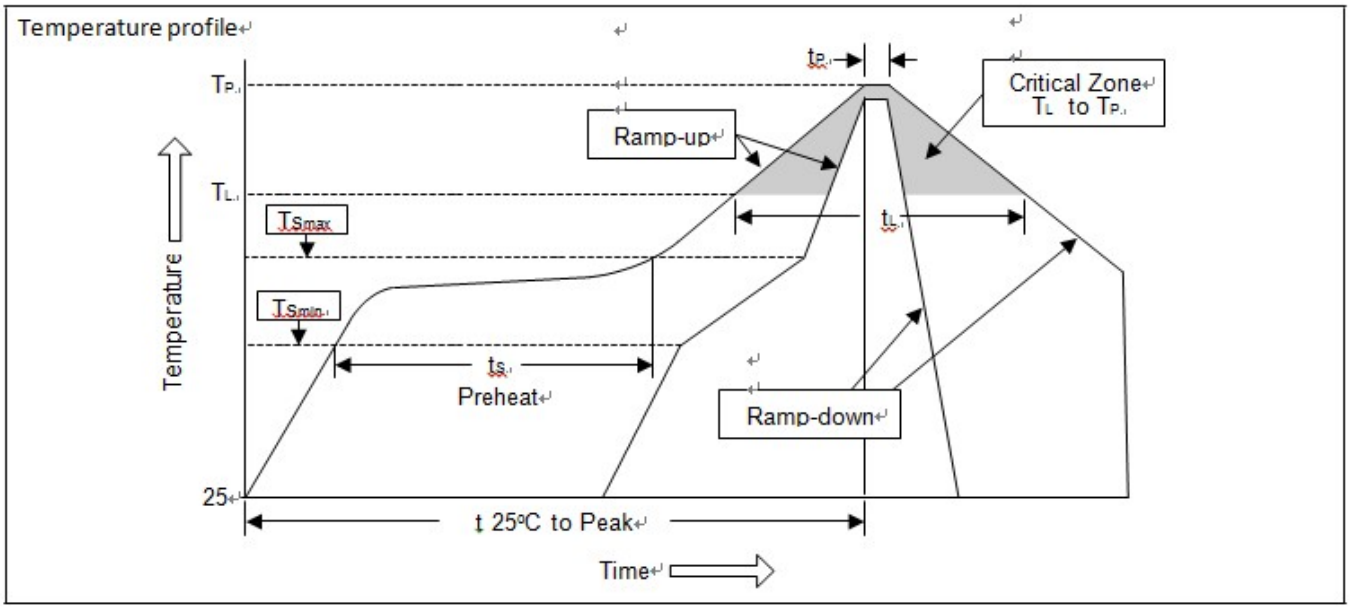


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450/0.500/0.550	0.550/0.600/0.650	0.018/0.020/0.022	0.022/0.024/0.026
A1	0.000	0.050	0.000	0.002
A3	0.700	0.800		
A3	0.150REF.		0.006REF.	
D	1.724	1.876	0.068	0.074
E	1.924	2.076	0.076	0.082
D1	1.300	1.500	0.051	0.059
E1	0.800	1.000	0.031	0.039
k	0.200MIN.		0.008MIN.	
b	0.180	0.280	0.007	0.011
e	0.500TYP.		0.020TYP.	
L	0.174	0.326	0.007	0.013

■ SOLDERING METHODS FOR UNIVERCHIP

Storage environment Temperature=10℃~35℃ Humidity=65%±15%

Reflow soldering of surface mount device



Profile Feature	Sn-Pb Eutectic Assembly	Pb free Assembly
Average ramp-up rate (T_L to T_P)	<3℃/sec	<3℃/sec
Preheat -Temperature Min (T_{Smin}) -Temperature Max (T_{Smax}) -Time (min to max) (ts)	 100℃ 150℃ 60~120 sec	 150℃ 200℃ 60~180 sec
Tsmax to T_L -Ramp-up Rate	<3℃/sec	<3℃/sec
Time maintained above -Temperature (T_L) -Time (t_L)	 183℃ 60~150 sec	 217℃ 60~150 sec
Peak Temperature (T_P)	240℃+0/-5℃	260℃+0/-5℃
Time within 5℃ of actual Peak Temperature (t_P)	10~30 sec	20~40 sec
Ramp-down Rate	<6℃/sec	<6℃/sec
Time 25℃ to Peak Temperature	<6 minutes	<6 minutes

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.