300mA ULTRA LOW DROPOUT POSITIVE ADJUSTABLE AND FIXED REGULATORS

FEATURES

- Stable with 2.2uF Ceramic Capacitor
- 2% Voltage Reference Accuracy
- Only 270mV Dropout at 300mA and 170mV Dropout at 150mA
- 5uA Quiescent Current in Shutdown
- Current Limit and Thermal Shutdown
- Logic Input Enable Pin
- RoHS Compliant & Halogen-Free
- SOT-23-5L & SOT-23-5LR Package

APPLICATIONS

- Laptop, Notebook & Palmtop computers
- Battery Powered Equipments
- PCMCIA Vcc & Vpp Regulator
- Consumer Electronics
- High Efficiency Linear Power Supplies

DESCRIPTION

The APU1205 device is an efficient linear voltage regulator with better than 2% initial voltage accuracy, very low dropout voltage and very low ground current designed especially for hand held, battery powered applications. Other features of the device are: TTL compatible enable/shutdown control input, current limiting and thermal shutdown.

The APU1205 is available in fixed and adjustable output voltage versions in a small SOT-23 5-Pin package.

TYPICAL APPLICATION

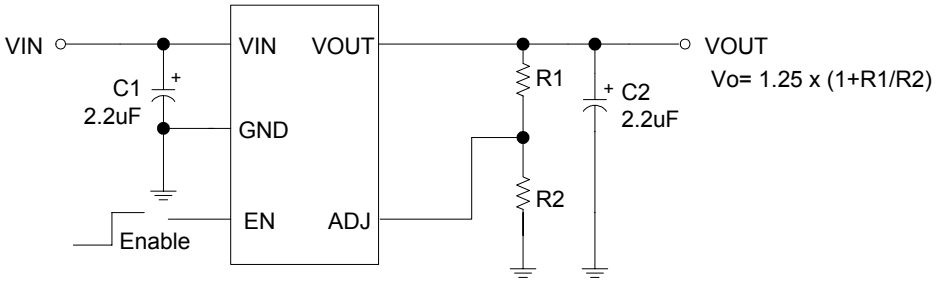


Figure 1 - Typical application of the APU1205 adjustable voltage regulator.

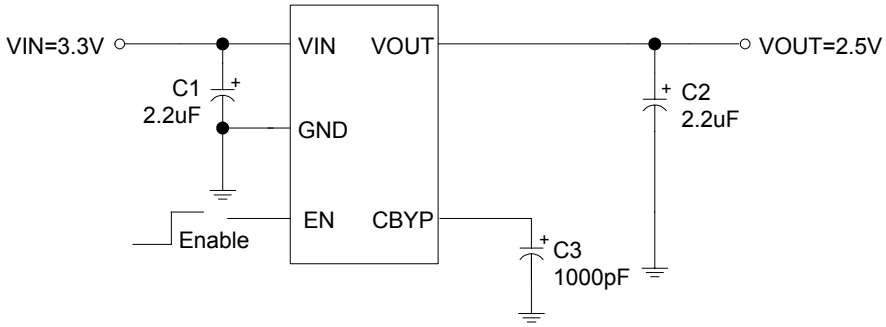
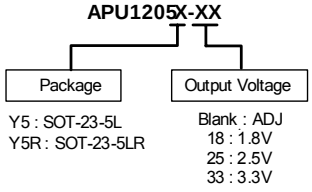
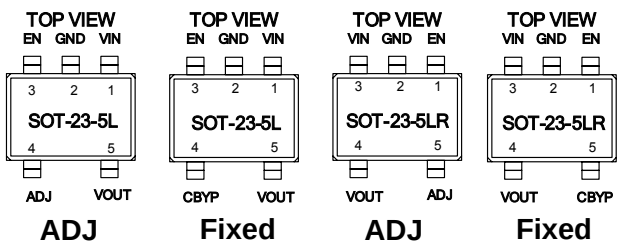


Figure 2 - Typical application of the APU1205-25 fixed voltage regulator.

PACKAGE / ORDERING INFORMATION





ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified.)

Input Voltage (V_{IN}) ---------- 10V
Enable Input Voltage (V_{EN}) ---------- 10V
Storage Temperature Range (T_{ST}) ---------- -65 to 150°C
Operating Junction Temperature Range (T_J) ------- 0 to 150°C
Thermal Resistance Junction to Ambient (R_{thja}) 256°C/W

ELECTRICAL SPECIFICATIONS

Unless otherwise specified, these specifications apply over C_{IN}=C_O=2.2uF, I_O=100uA, $V_{IN(MIN)}$=2.5V(Adjustable devices), V_{IN}=V_O + 1V(for fixed voltage devices), V_{OUT}=V_{FB}(for adjustable version only), C_{BYP}=470pF (for fixed voltage devices), V_{EN}=2V and T_A=25°C. Typical values refer to T_A=25°C. Low duty cycle pulse testing is used which keeps junction and case temperatures equal to the ambient temperature.

Parameter	SYM	TEST CONDITION	MIN	TYP	MAX	UNITS
Reference Voltage (See Table 1 for typical values)	Vo		-2	-	2	%
Line Regulation	ΔV_I	V_O + 1V<V_{IN}<10V	-	0.005	-	%/V
Load Regulation (Note 1)	ΔV_L	1mA<I_O<100mA	-	0.8	-	%
		100mA<I_O<300mA	-	0.1	-	%
Dropout Voltage (Note 2)	V_{DROP}	I_O=100uA	-	10	50	mV
		I_O=50mA	-	85	110	
		I_O=150mA	-	170	220	
		I_O=300mA	-	270	350	
Ground Current (Note 3)	I_Q	V_{EN}=2V, I_O=100uA	-	120	160	uA
		V_{EN}=2V, I_O=50mA	-	460	600	
		V_{EN}=2V, I_O=150mA	-	2200	2900	
		V_{EN}=2V, I_O=300mA	-	7200	9500	
Ground Current-SD Activated	$I_{Q(SD)}$	V_{EN} =0V to 0.8V or Open	-	5	-	uA
Adjust Pin Current	I_{ADJ}	V_{IN}=2.5V, V_O=V_{ADJ}	-	0.1	-	uA
Current Limit	I_{CL}	V_O=0V	320	420	-	mA
Thermal Regulation	ΔV_P	V_{IN}=10V, I_O=150mA, 10ms Pulse	-	0.05	-	%/W
Enable Pin Input LO Current		$V_{EN(L)}$ =0V to 0.8V	-	0.01	-	uA
Enable Pin Input HI Current		$V_{EN(H)}$=2V to VIN	-	20	-	
Enable Pin Input LO Voltage	$V_{EN(L)}$	Regulator OFF	-	-	0.8	V
Enable Pin Input HI Voltage	$V_{EN(H)}$	Regulator ON	2	-	-	V

Note 1: Low duty cycle pulse testing with Kelvin connections is required in order to maintain accurate data.

Note 2: Dropout voltage is defined as the minimum differential voltage between VIN and VOUT required to maintain regulation at VOUT. It is measured when the output voltage drops 1% below its nominal value.

Note 3: Ground current is the regulator quiescent current plus the pass transistor current. The total current from the supply is the sum of the load current plus the ground pin current.

PIN DESCRIPTIONS

PIN SYMBOL	PIN DESCRIPTION
VIN	The input pin of the regulator. Typically a large storage capacitor is connected from this pin to ground to insure that the input voltage does not sag below the minimum drop out voltage during the load transient response. This pin must always be higher than VOUT by at least the amount of the dropout voltage and some margin in order for the device to regulate properly.
GND	Ground pin. This pin must be connected to the lowest potential in the system and all other pins must be at higher potential with respect to this pin.
EN	Enable pin. A low signal or left open on this pin shuts down the output. This pin must be tied HI or to VIN for normal operation.
Adj (Adjustable only)	A resistor divider from this pin to the VOUT pin and ground sets the output voltage. To minimize the error due to the error amplifier, select the values of the resistor dividers to be less than 10K .
C_{BYP} (Fixed only)	A 470 to 1000pF bypass capacitor connected to this pin reduces the output noise.
VOUT	The output of the regulator. A minimum of 2.2uF with max ESR of 1 Ω capacitor must be connected from this pin to ground to insure stability.

Part Number	Output Voltage
APU1205	1.25V
APU1205-18	1.8V
APU1205-25	2.5V
APU1205-33	3.3V

Table 1- Nominal output voltage vs. part number.

The output voltage of the adjustable device can be set using:

$$V_O = 1.25 \times (1+R1/R2)$$

Where:
R1 = Resistor connected from output to the Adj pin
R2 = Resistor connected from Adj pin to Gnd

BLOCK DIAGRAM

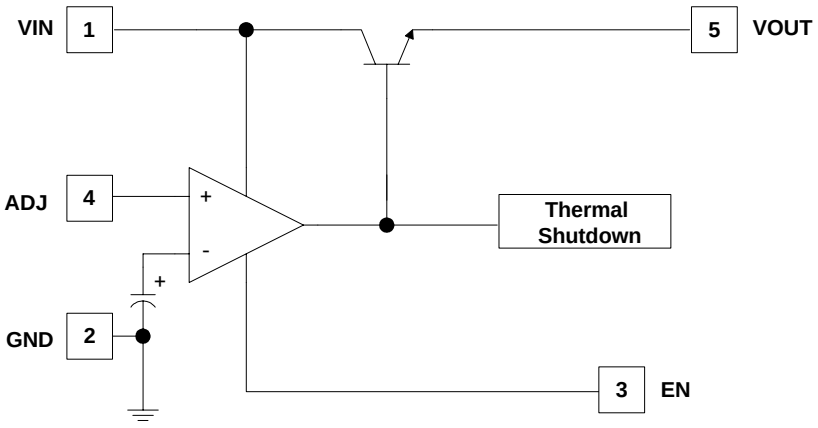


Figure 3 - APU1205Y5 Adjustable output block diagram.

BLOCK DIAGRAM

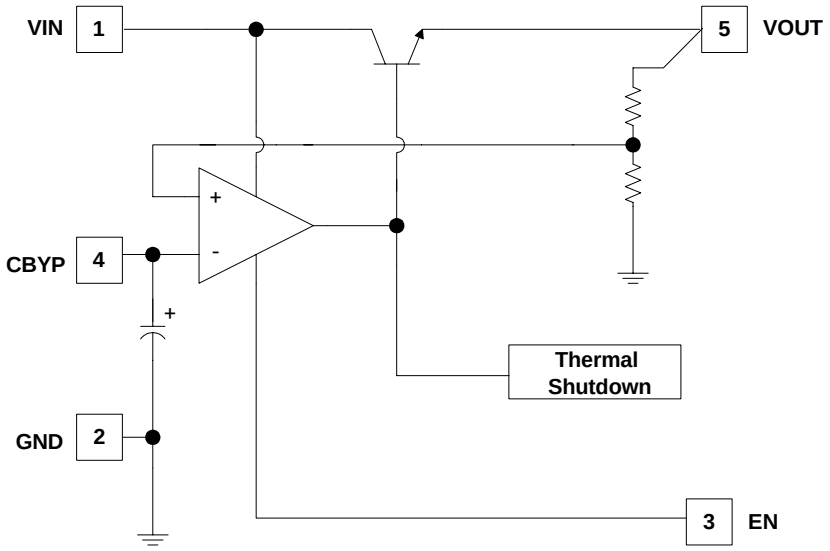
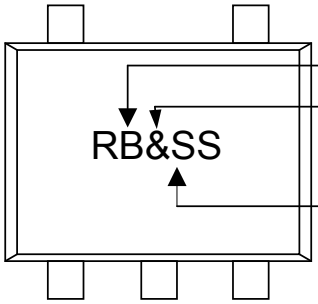


Figure 4 - APU1205-18, APU1205-25 and APU1205-33 Fixed output block diagram.

MARKING INFORMATION

SOT-23-5L



Part Number : RB

Output Voltage :

Output Voltage	V_{OUT} Code
ADJ	Blank
1.8V	A
2.5V	B
3.3V	E

Date Code

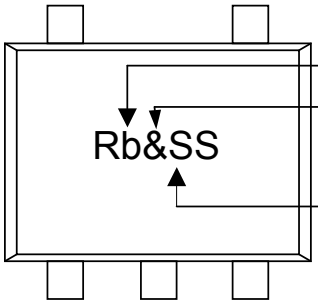
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SS:2003,2007,2011…

SS:2002,2006,2010…

SS:2001,2005,2009…

SOT-23-5LR



Part Number : Rb

Output Voltage :

Output Voltage	V_{OUT} Code
ADJ	Blank
1.8V	A
2.5V	B
3.3V	E

Date Code

SS:2004,2008,2012…

SS:2003,2007,2011…

SS:2002,2006,2010…

SS:2001,2005,2009…