150mA ULTRA LOW DROPOUT POSITIVE FIXED REGULATORS

FEATURES

- **Stable with 2.2uF Low ESR Ceramic Capacitor**
- **2% Voltage Reference Accuracy**
- **Wide Operating Range: 2.5V ~ 16V**
- **5uA Quiescent Current in Shutdown**
- **Current Limit and Thermal Shutdown**
- **Logic Input Enable Pin**
- **RoHS Compliant & Halogen Free**
- **SOT-23-5L Package**

APPLICATIONS

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

DESCRIPTION

The APU8852 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 APU8852 is available in fixed and adjustable output voltage versions in a small SOT-23 5-Pin package.

TYPICAL APPLICATION

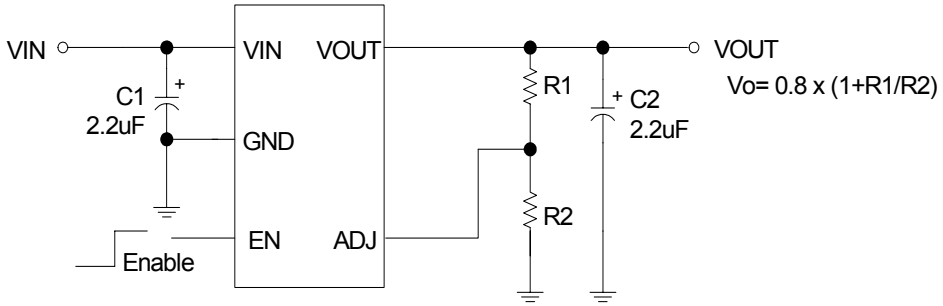


Figure 1 - Typical application of the APU8852 adjustable voltage regulator.

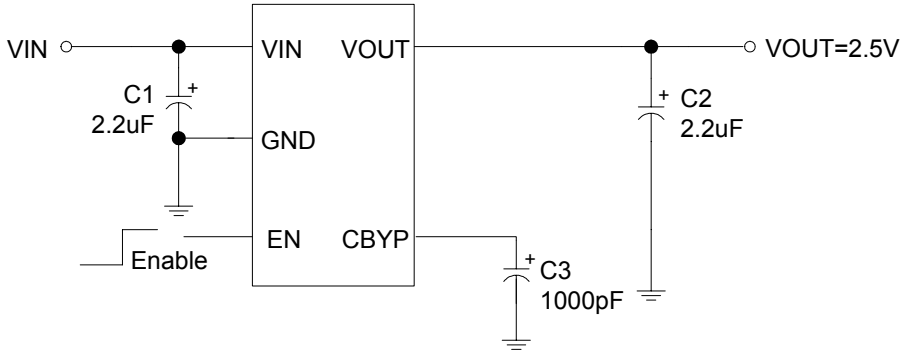


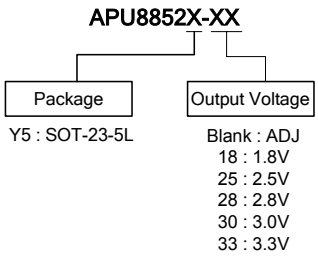
Figure 2 - Typical application of the APU8852-25 fixed voltage regulator.

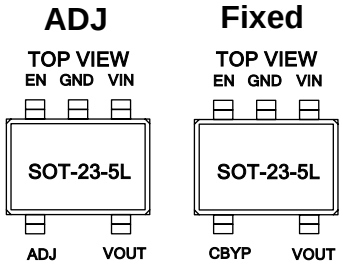
ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified.)

Input Voltage (V_{IN})	18V
Enable Input Voltage (V_{EN})	18V
Storage Temperature Range (T_{ST})	-65 to 150°C
Operating Junction Temperature Range (T_J)	-40 to 85°C
Thermal Resistance Junction to Ambient (Rth_{ja})Note	256°C/W

Note. Rth_{JA} is measured with the PCB copper area of approximately 1 in^2(Multi-layer).

PACKAGE / ORDERING INFORMATION





ELECTRICAL SPECIFICATIONS

Unless otherwise specified, these specifications apply over C_{IN}=C_O=2.2F, I_O=100A, $V_{IN(MIN)}$=2.5V(Adjustabledevices) 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	Vo		-2	-	2	%
Line Regulation	ΔV_I	V_O + 1V<V_{IN}<16V	-	0.1	-	%/V
Load Regulation (Note 1)	ΔV_L	1mA < I_O < 100mA	-	1.5	-	%
Dropout Voltage (Note 2)	V_{DROP}	I_O=100uA	-	10	-	mV
		I_O=50mA	-	50	-	
		I_O=100mA	-	120	-	
Ground Current (Note 3)	I_Q	V_{EN} = 2V, I_O = 100uA	-	120	200	uA
Minimum Load Current	I_{Min}		-	5	-	mA
Ground Current-SD Activated	$I_{Q(SD)}$	V_{EN} = 0V to 0.8V or Open	-	5	-	uA
Current Limit	I_{CL}	V_O=0V	150	-	-	mA
Thermal Regulation	$\triangle V_P$	V_{IN} = 10V, I_O = 150mA, 10ms Pulse	-	0.05	-	%/W
Adj Pin Current	I_{Adj}	V_{IN} = 2.5V, V_O = V_{ADJ}	-	0.1	-	uA
Enable Pin Input LO Voltage	V_{ENL}	Regulator OFF	-	-	0.8	V
Enable Pin Input HI Voltage	V_{ENH}	Regulator ON	2	-	-	
Enable Pin Input LO Current		V_{ENL} = 0V	-	0.01	-	uA
Enable Pin Input HI Current		V_{ENH} = 2V	-	20	-	

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.
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 1Ω capacitor must be connected from this pin to ground to insure stability.

BLOCK DIAGRAM

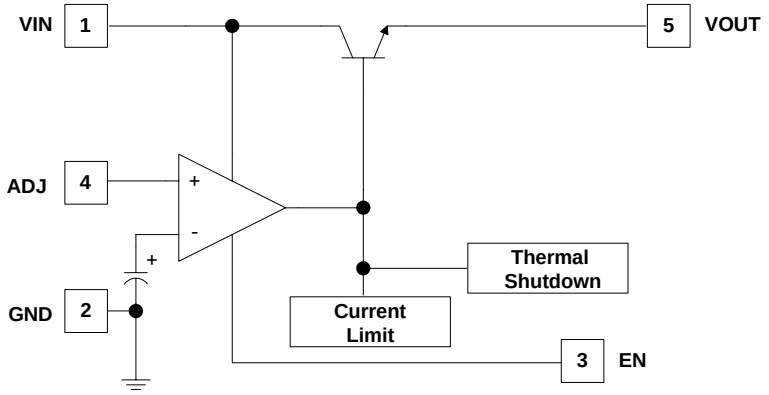


Figure 3 - APU8852Y5 Adjustable output block diagram.

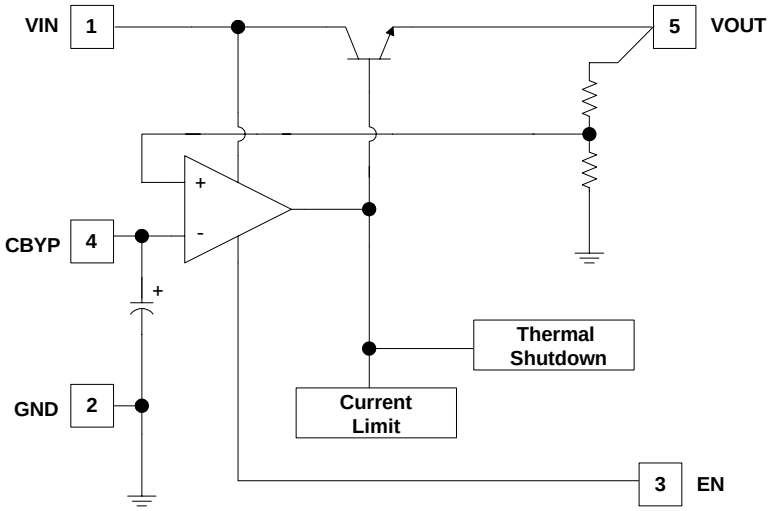
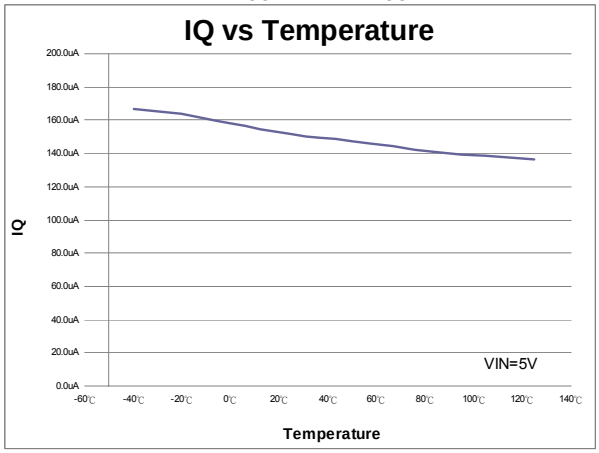


Figure 4 - APU8852Y5 Fixed Mode output block diagram.

TYPICAL PERFORMANCE CHARACTERISTICS

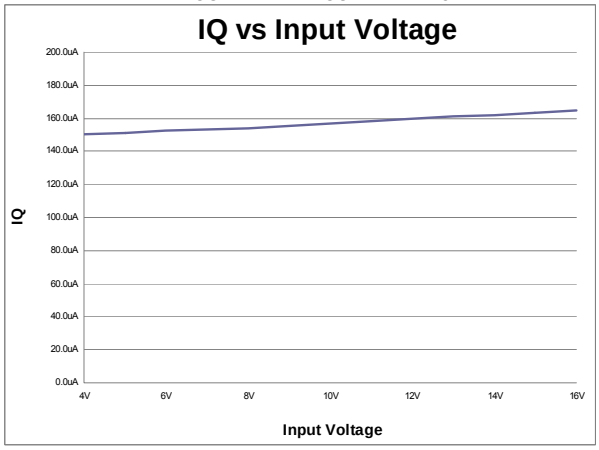
Quiescent Current vs. Temperature

V_{IN}=5V , V_{OUT}=3.3V , I_{OUT}=0A



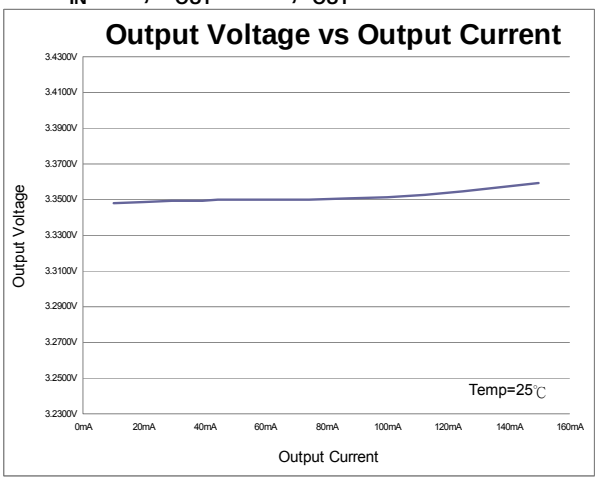
Quiescent Current vs. Input Voltage

V_{IN}=4V~16V, V_{OUT}=3.3V, I_{OUT}=0A, T_J=25°C



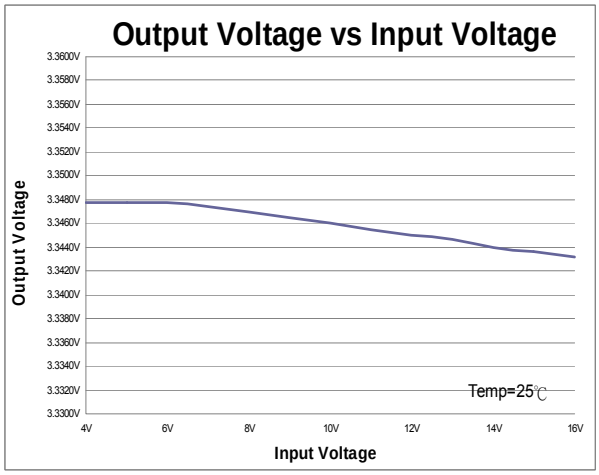
Output Voltage vs. Output Current

V_{IN}=5V , V_{OUT}=3.3V , I_{OUT}=10mA~150mA



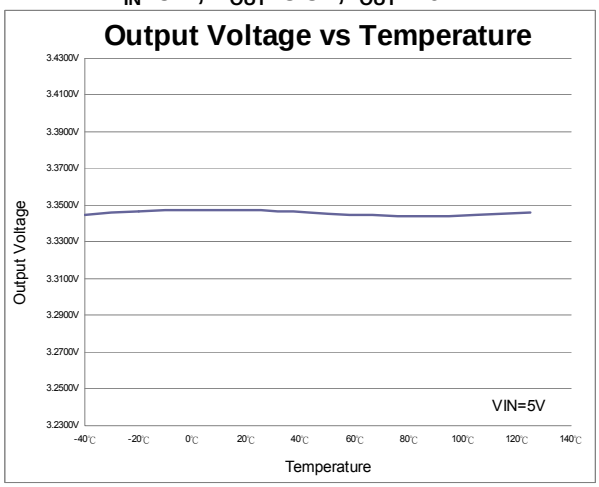
Output Voltage vs. Input Voltage

V_{IN}=4~16V , V_{OUT}=3.3V, I_{OUT}=10mA



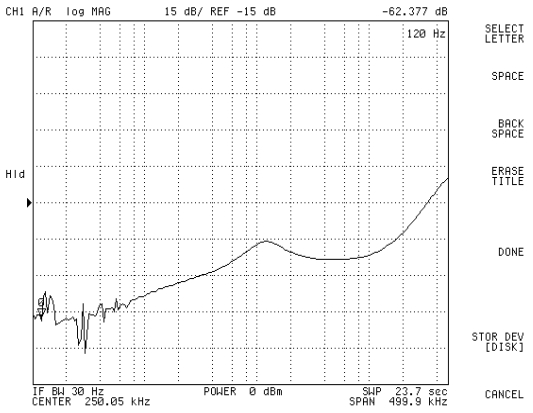
Output Voltage vs. Temperature

V_{IN}=5V , V_{OUT}=3.3V, I_{OUT}=10mA



PSRR

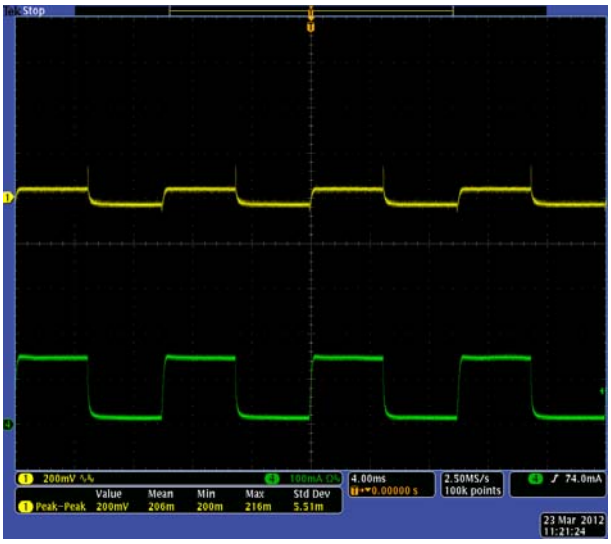
V_{IN}=5V , V_{OUT}=3.3V , I_{OUT}=10mA



TYPICAL PERFORMANCE CHARACTERISTICS

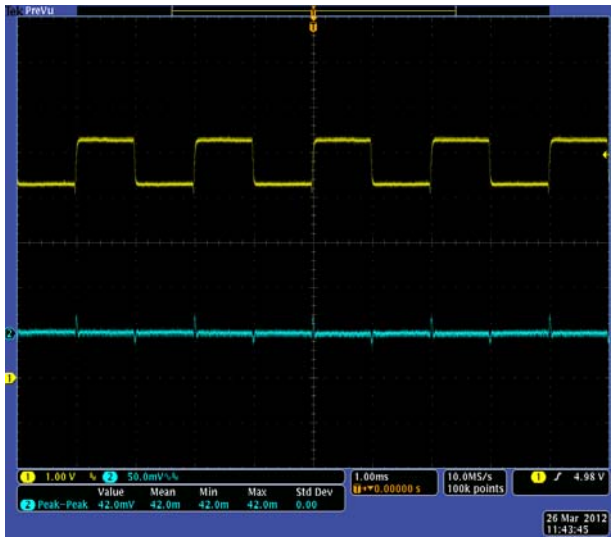
Load Transient

V_{IN}=5V , V_{OUT}=3.3V , I_{OUT}=10~150mA / 5ms , 2.5A/us



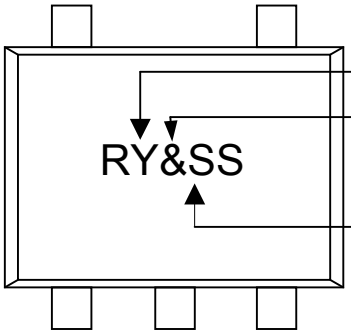
Line Transient

V_{IN}=4.3~5.3V, V_{OUT}=3.3V, I_{OUT}=10mA



MARKING INFORMATION

SOT-23-5L



Part Number : RY

Output Voltage :

Date Code

SS:2004,2008,2012…

SS:2003,2007,2011…

SS:2002,2006,2010…

SS:2001,2005,2009…

Identification Code	V_{OUT}
Blank	Adj
D	1.8V
F	2.5V
G	2.8V
H	3.0V
I	3.3V