

500mA Low Noise, High PSRR, Fast Transient Response LDO with Adjustable Output Voltage

DESCRIPTION

ETA5050 is a 500mA low noise and fast transient response linear regulator with adjustable output voltage and ultra-low dropout voltage. Its output voltage is programmed by a resistor divider, and can be as low as 0.8V, which satisfies the most advanced ICs which may require supply voltage to be 0.9V – 1.2V.

ETA5050 consists of a precise voltage reference, an error amplifier, a compensation network and a low ON-resistance power P-MOSFET. It also integrates many protection circuitry, like current limit and over-temperature protection module.

ETA5050 is in a tiny SOT23-5 package.

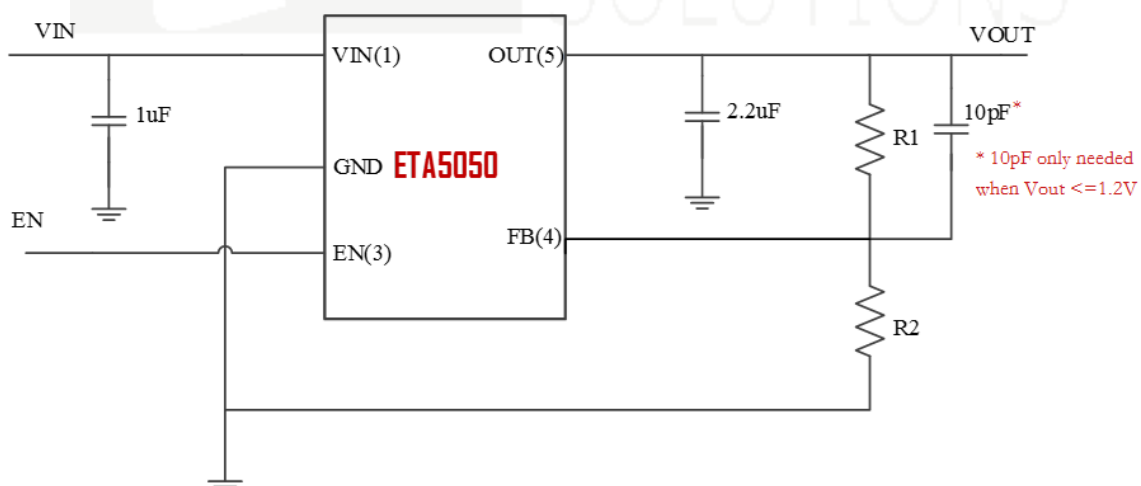
FEATURES

- 500mA output current
- Adjustable output voltage
- Minimum output voltage as low as 0.8V
- Ultra low dropout voltage 370mV @ 500mA
- Low quiescent current 40uA
- <1uA shutdown current
- Short-circuit protection
- Over-temperature protection

APPLICATIONS

- Cellphones
- Camera modules
- Medical Instruments
- Battery powered devices

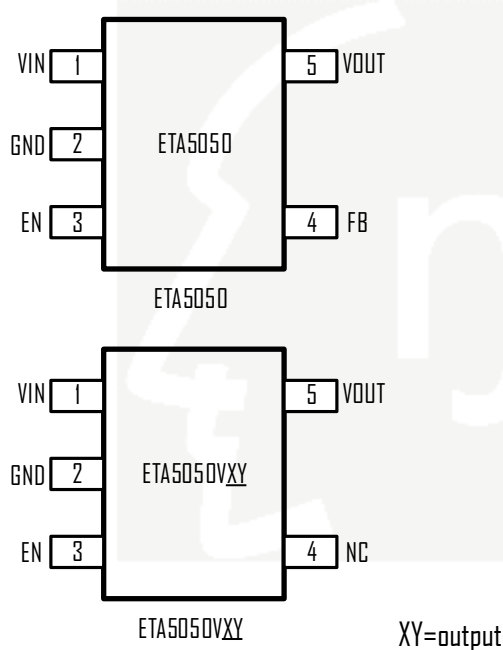
TYPICAL APPLICATION



ORDERING INFORMATION

PART	PACKAGE PIN	TOP MARK	Top Mark Explanation
ETA5050V0S2F	SOT23-5	FAYW	FA = Product Code, YW = Date Code
ETA5050V12S2F	SOT23-5	I2YW	I2= Product Code, YW = Date Code
ETA5050V18S2F	SOT23-5	I8YW	I8= Product Code, YW = Date Code
ETA5050V28S2F	SOT23-5	28YW	28= Product Code, YW = Date Code
ETA5050V30S2F	SOT23-5	30YW	30= Product Code, YW = Date Code
ETA5050V33S2F	SOT23-5	33YW	33= Product Code, YW = Date Code

PIN CONFIGURATION



ABSOLUTE MAXIMUM RATINGS

(Note: Exceeding these limits may damage the device. Exposure to absolute maximum rating conditions for long periods may affect device reliability.)

VIN Voltage	-0.3V to 8V		
All Other Pin Voltage	VIN-0.3V to VIN+0.3		
VIN to GND current	Internally limited		
Operating Temperature Range	-40°C to 85°C		
Storage Temperature Range	-55°C to 150°C		
Thermal Resistance	θ_{JA}	θ_{JC}	
SOT23-5	190	110	°C/W

ELECTRICAL CHARACTERISTICS

(VIN = 5V, unless otherwise specified. Typical values are at TA = 25°C.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
INPUT Range		2.5		6.0	V
Quiescent Current (Iq)	Vfb=1V		40		μA
Feedback Voltage (Vfb)	For Adjustable Output	0.775	0.8	0.825	V
Output Voltage	For Fixed Output	Vout*0.98	Vout	Vout*1.02	V
Softstart time			30	60	μS
Dropout Voltage (Vdrop)	Iout=100mA		75		mV
	Iout=300mA		225		mV

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
	I _{out} =500mA		370		mV
Line Regulation	2.5V < V _{in} < 5.5		0.075		%/V
Load Regulation	0mA < I _{out} < 500mA		0.6		%/A
Maximum Output Current (I _{out_Max})	V _{in} - V _{out} = 1V		0.9	1.05	A
Current Limit			1.05		A
EN logic "high" Voltage	Voltage to turn on the chip	1.5			V
EN logic "low" Voltage	Voltage to turn off the chip			0.5	V
Thermal Protection			150		°C

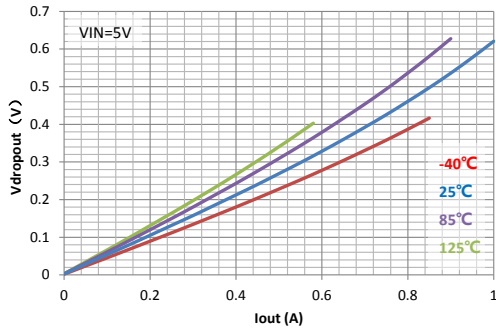
PIN DESCRIPTION

PIN #	NAME	DESCRIPTION
1	VIN	Input voltage pin, connect a 1μF capacitor to GND
2	GND	Ground
3	EN	Enable pin. Pull this pin "high" to turn on the chip and "low" to turn off
4 ¹	FB (For adjustable output)	Feedback pin. Feedback voltage is set to be 0.8V. Output voltage is programmed by a resistor divider from V _{out} thru FB to GND, and by the equation $0.8V \times \frac{R1+R2}{R2} = V_{out}$
4 ²	NC (For fixed output)	No Connect
5	VOUT	Output voltage pin, connect a 2.2μF capacitor to GND

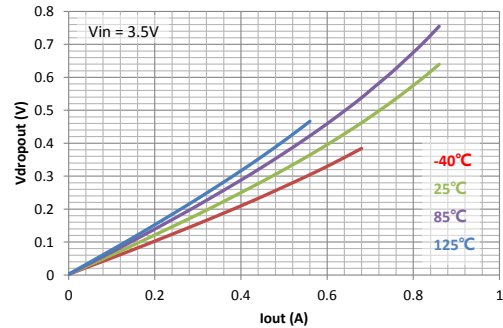
TYPICAL CHARACTERISTICS

(Typical values are at $T_A = 25^\circ\text{C}$ unless otherwise specified.)

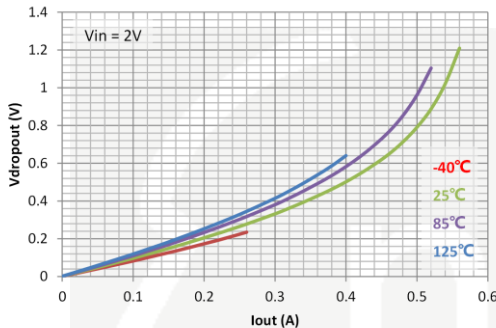
Dropout Voltage $V_{in}=5\text{V}$



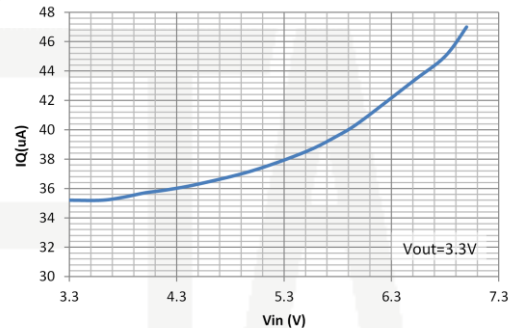
Dropout Voltage $V_{in}=3.5\text{V}$



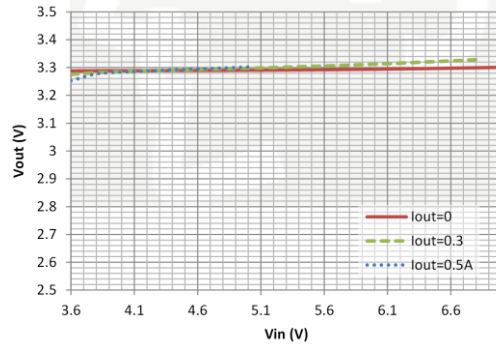
Dropout Voltage $V_{in}=2\text{V}$



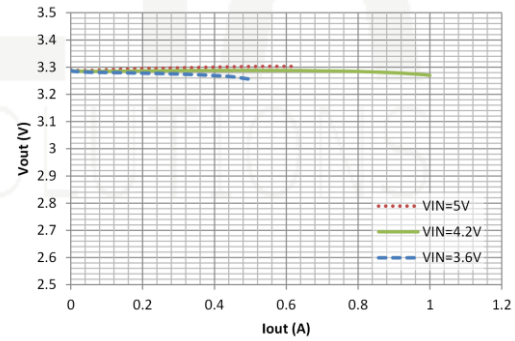
Quiescent current $V_{out}=3.3\text{V}$



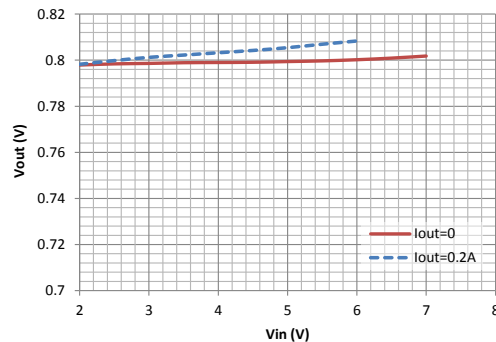
Line Regulation $V_{out}=3.3\text{V}$



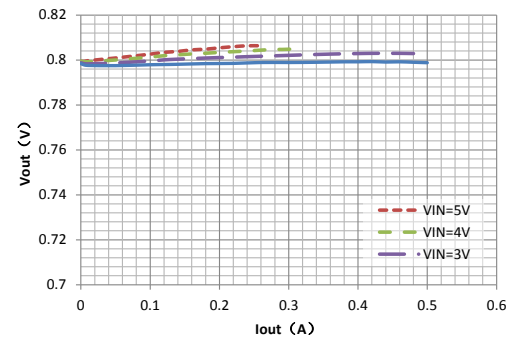
Load Regulation $V_{out}=3.3\text{V}$



Line Regulation $V_{out}=0.8\text{V}$



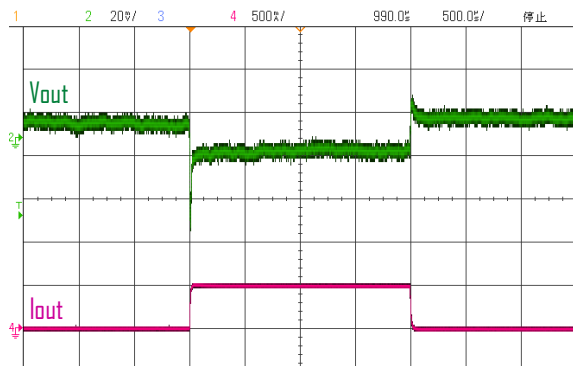
Load Regulation $V_{out}=0.8\text{V}$



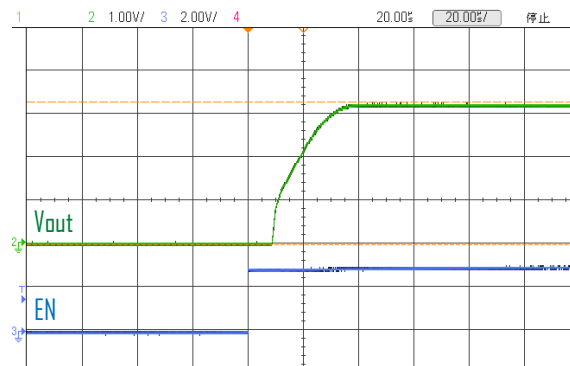
TYPICAL CHARACTERISTICS waveforms

(Typical values are at $T_A = 25^\circ\text{C}$ unless otherwise specified.)

Load Transient Response at $I_{out} = 500\text{mA}$, $V_{out} = 3.3\text{V}$



Startup Waveform at $I_{out} = 200\text{mA}$, $V_{out} = 3.3\text{V}$



PACKAGE OUTLINE

