

# 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.

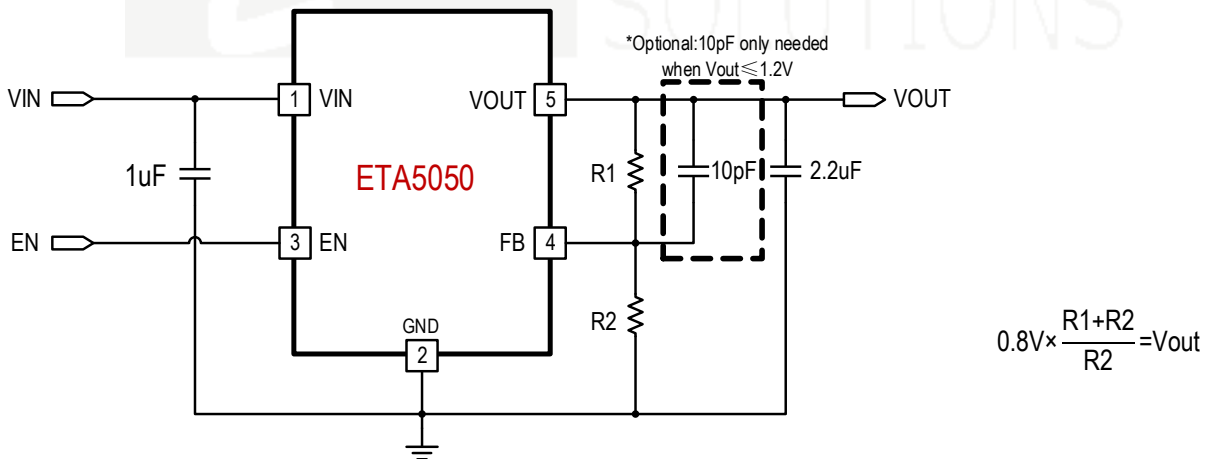
## FEATURES

- 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

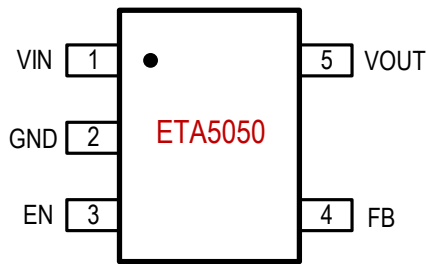
## TYPICAL APPLICATION



## ORDERING INFORMATION

PART No.	PACKAGE	TOP MARK	Pcs/Reel
ETA5050V0S2F	SOT23-5	FAYW	3000

## 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+0.3V
VIN to GND current.....	Internally limited
Operating Temperature Range ...	-40°C to 85°C
Storage Temperature Range ....	-55°C to 150°C
Thermal Resistance $\theta_{JA}$	$\theta_{JC}$
SOT23-5.....	163 .....55..... °C/W

## ELECTRICAL CHARACTERISTICS

(VIN=VOUT+1V, CIN=1µF, COUT=2.2µF, unless otherwise specified. Typical values are at TA = 25°C.)

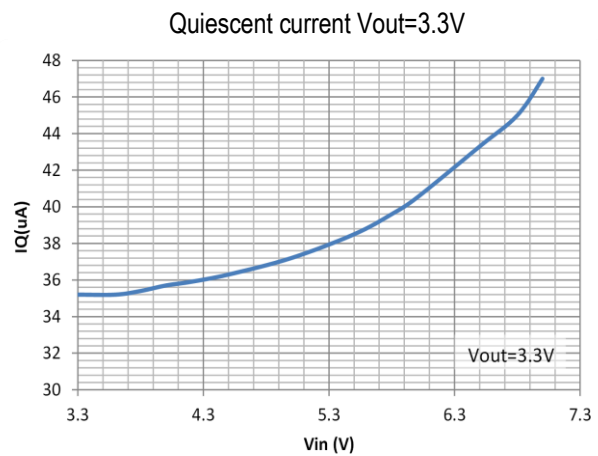
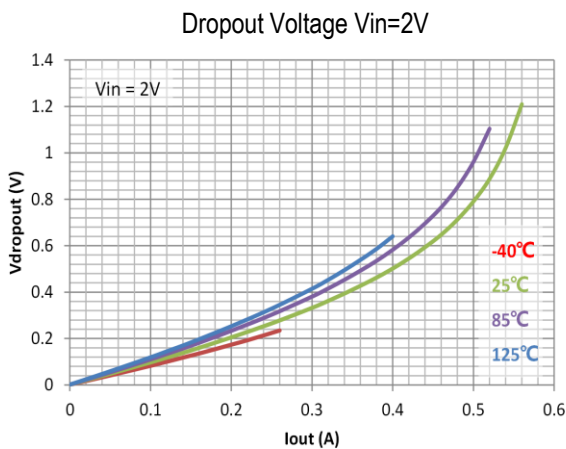
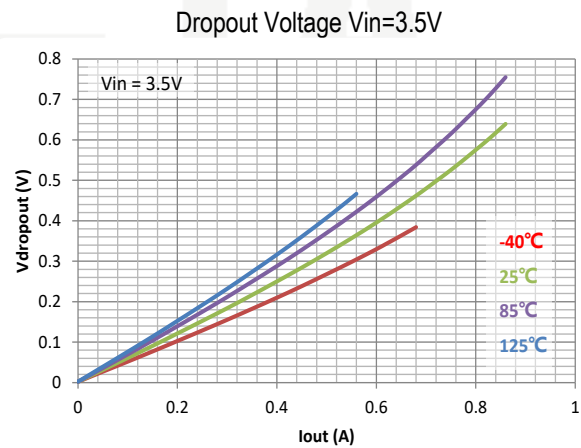
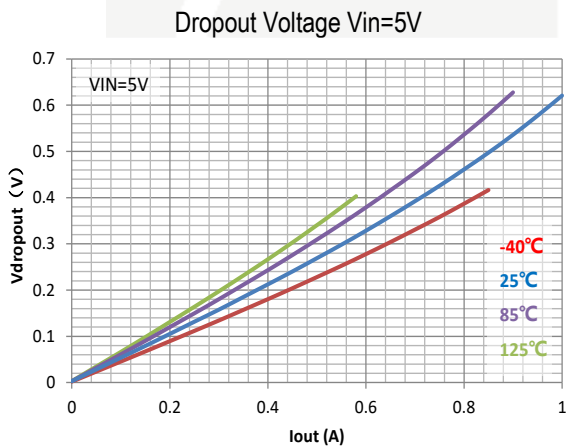
PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Input Range		2.0		6.0	V
Quiescent Current (IQ)	VFB=1V		37	60	µA
Shutdown Supply Current at IN	VEN=GND		0	1	µA
Feedback Voltage (VFB)		0.784	0.8	0.816	V
Soft start time			30	60	µS
Dropout Voltage (Vdrop)	IOUT=300mA, VOUT=1.8V		350	450	mV
	IOUT=300mA, VOUT=3.3V		225	265	mV
	IOUT=500mA, VOUT=3.3V		370	440	mV
Power Supply Rejection Ratio (PSRR)	Freq=100Hz, IOU=30mA		73		dB
	Freq=1kHz, IOU=30mA		70		dB
Output Noise Voltage (eN)	BW=10Hz to 100kHz		65		µVRMS
Line Regulation	(VOUT+1V) < VIN < 5.5V, IOUT=1mA.		0.06	0.2	%/V
Load regulation	1mA < IOUT < 300mA, VIN=VOUT+1V		15	35	mV
Maximum Output Current (IOUT_Max)	VIN - VOUT= 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
EN logic "high" Voltage	Voltage to turn on the chip@VIN=3.3V	1			V
EN logic "low" Voltage	Voltage to turn off the chip@VIN=3.3V			0.65	V
Thermal Protection			150		°C

## PIN DESCRIPTION

PIN #	NAME	DESCRIPTION
1	VIN	Input voltage pin, connect a 1uF 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	FB	Feedback pin. Feedback voltage is set to be 0.8V. Output voltage is programmed by a resistor divider from Vout thru FB to GND, and by the equation $0.8V \times \frac{R1+R2}{R2} = V_{out}$
5	VOUT	Output voltage pin, connect a 2.2uF capacitor to GND

## TYPICAL CHARACTERISTICS

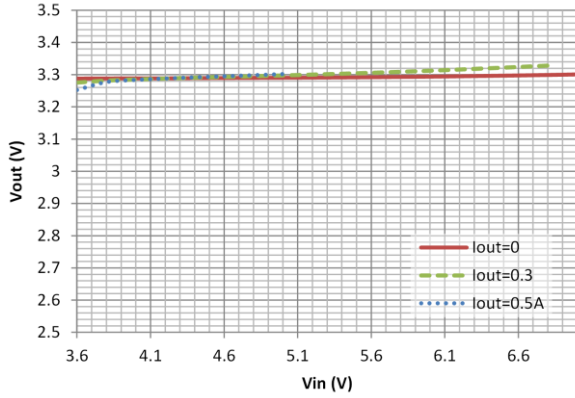
(Typical values are at T<sub>A</sub> = 25°C unless otherwise specified.)



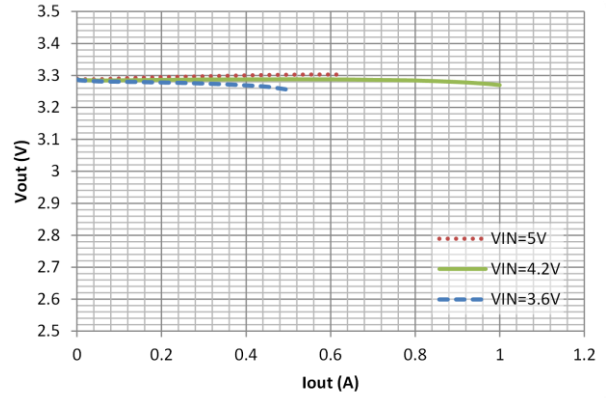
## TYPICAL CHARACTERISTICS Cont'

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

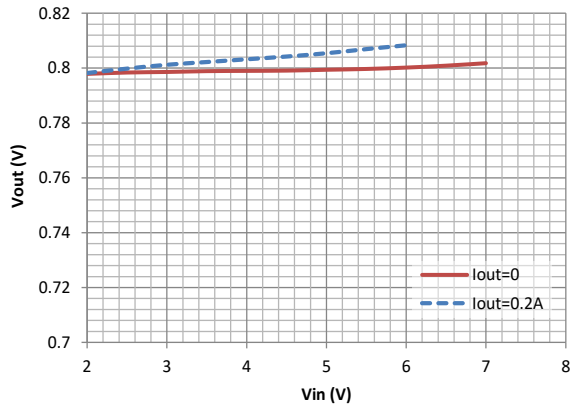
Line Regulation  $V_{out}=3.3\text{V}$



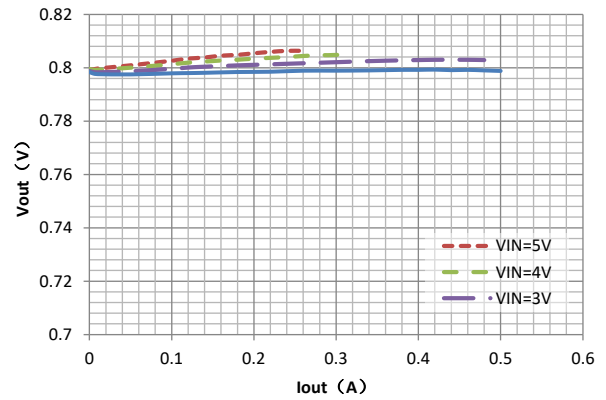
Load Regulation  $V_{out}=3.3\text{V}$



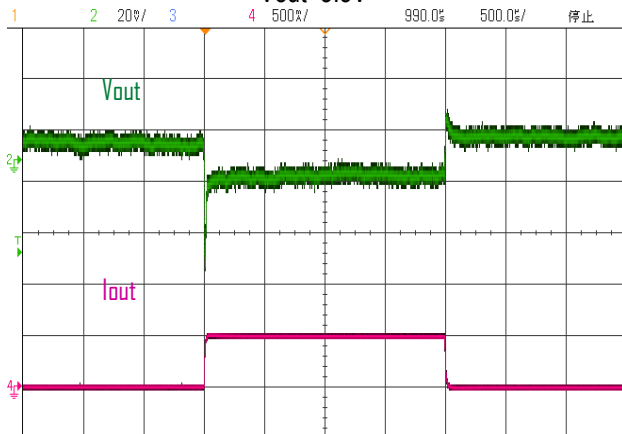
Line Regulation  $V_{out}=0.8\text{V}$



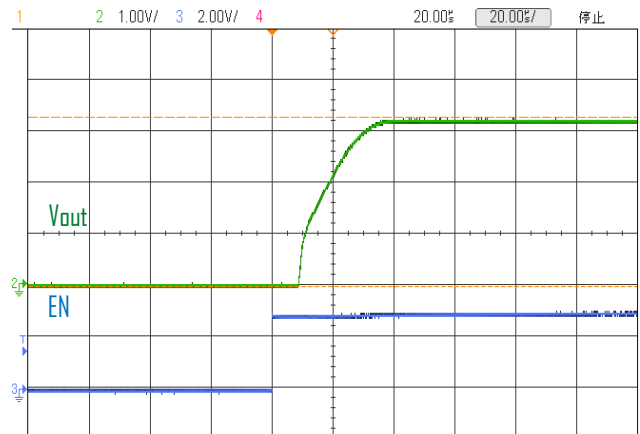
Load Regulation  $V_{out}=0.8\text{V}$



Load Transient Response at  $I_{out} 1 - 500\text{mA}$ ,  $V_{out}=3.3\text{V}$

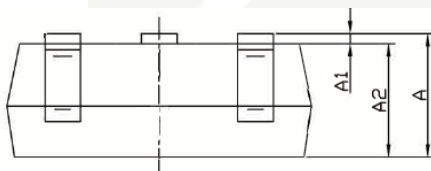
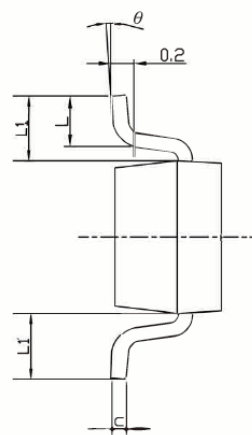
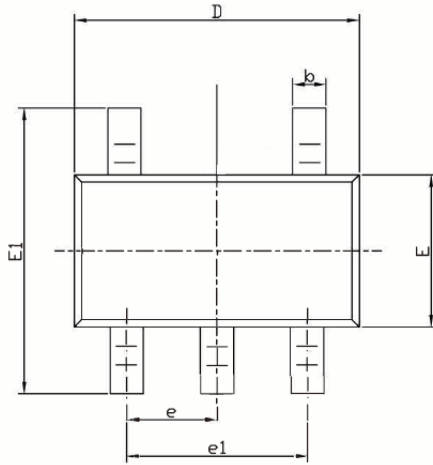


Startup Waveform at  $I_{out}=200\text{mA}$ ,  $V_{out}=3.3\text{V}$

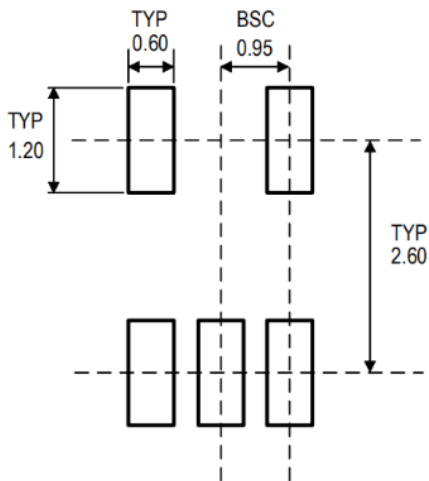


## PACKAGE OUTLINE

Package: SOT23-5

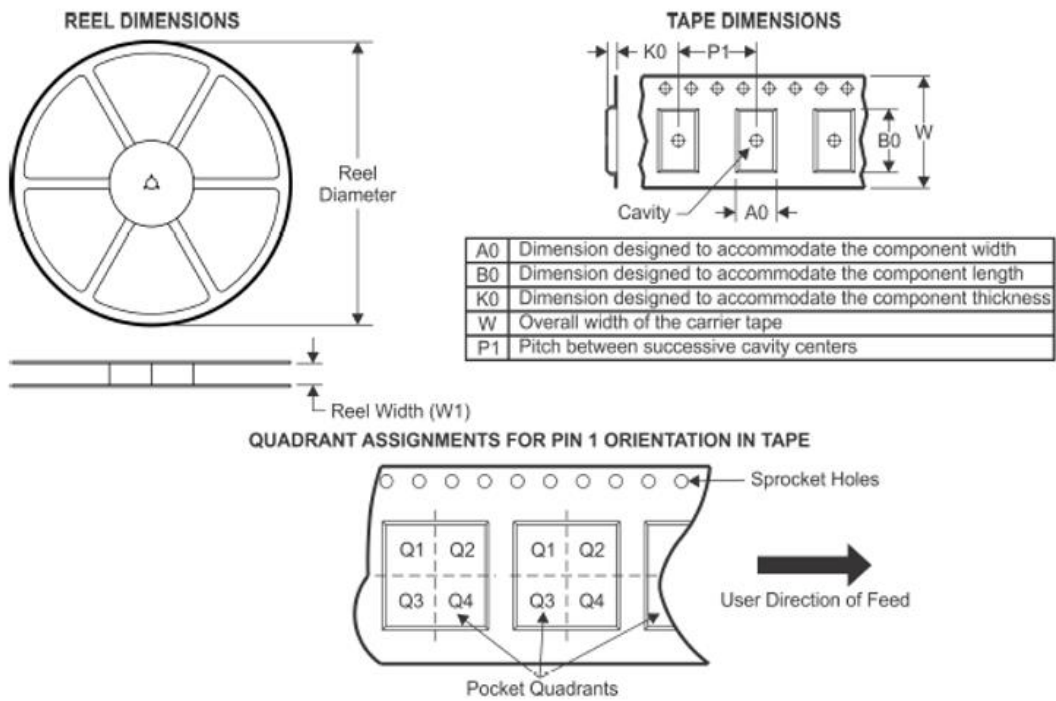


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.850	3.050	0.112	0.120
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°



RECOMMENDED LAND PATTERN

## TAPE AND REEL INFORMATION



Device	Package Type	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
ETA5050V0S2F	SOT23-5	5	3000	180	9.5	3.17	3.23	1.37	4	8	Q3