70dB PSRR, Low Noise, Fast Response 300mA LDO in SOT23-3

DESCRIPTION

ETA5030 is a fixed output, low-dropout (LDO) low-power linear voltage regulator which features high power-supply rejection ratio (PSRR), ultralow noise, fast start-up, and excellent line and load transient responses. Its PSRR can be as high as 70dB at 1KHz with quiescent current of about 35uA. Therefore, ETA5030 is an ideal power supply for noise-sensitive applications such as RF transmissions, cellphones, CMOS sensors and audios, etc.

ETA5030 is available in SOT23-3 package.

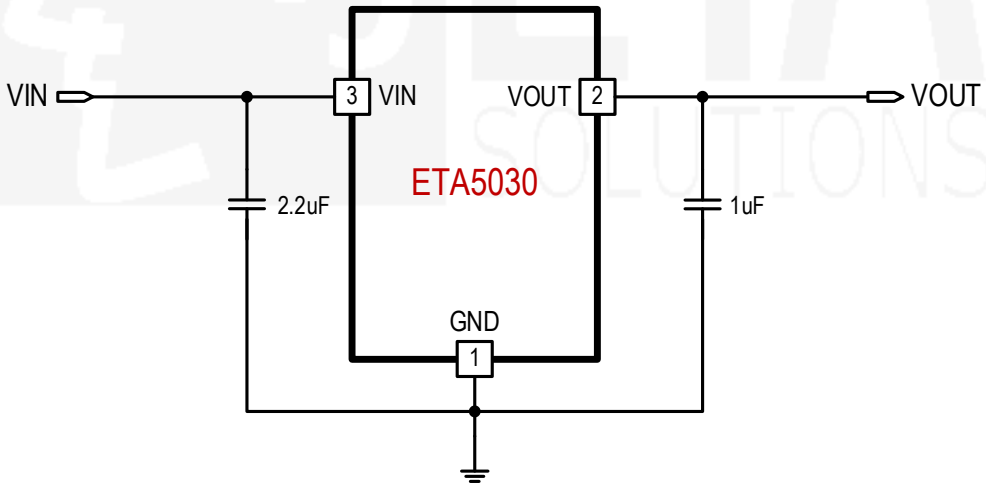
FEATURES

- High PSRR, 73dB at 100Hz, 70dB at 1KHz
- 300mA Output Current
- 35uA Iq
- Stable with a Wide Range of Ceramic Capacitor
- Excellent Load and Line Transient Response
- 0.24V Dropout Voltage for 200mA at Vout=3.3V
- Available in SOT23-3 Package
- RoHS Compliant

APPLICATIONS

- Cellphone
- Security Camera
- Set-Top Box

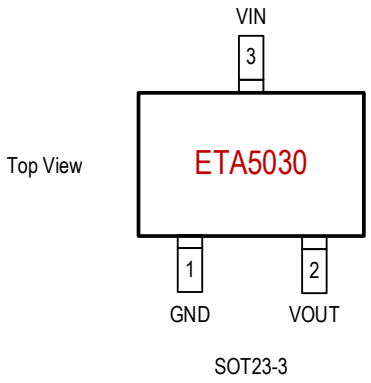
TYPICAL APPLICATION



ORDERING INFORMATION

PART No.	PACKAGE	TOP MARK	Pcs/Reel
ETA5030VXXXOS2D	SOT23-3	PPYW	3000
XXX: voltage code e.g. 330 =3.3V O=N: no discharge; O=D: discharge; O=W: fast discharge		PP: product code (PP1 for fast discharge) YW: date code	

PIN CONFIGURATION



SOT23-3

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, VOUT Voltage.....–0.3V to 6V
Operating Temperature Range.....–40°C to 85°C
Storage Temperature Range.....–55°C to 150°C

Thermal Resistance	θ_{JA}	θ_{JC}	
SOT23-3	336	110	°C/W

Lead Temperature (Soldering 10sec).....260°C
ESD HBM (Human Body Mode) 2KV
ESD CDM (Charged Device Mode) 1KV

ELECTRICAL CHARACTERISTICS

(V_{IN} = V_{OUT}+1V, C_{IN}=2.2μF, C_{OUT}=1μF, unless otherwise specified. Typical values are at TA = 25°C.)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage Range (1)		1.6		6.0	V
Ground Current	No Load		35	60	μA
Dropout Voltage	I_{OUT} = 300mA ,V_{OUT}=1.05V		1050	1200	mV
	I_{OUT} = 300mA ,V_{OUT}=1.2V		850	1000	mV
	I_{OUT} = 300mA ,V_{OUT}=1.5V		720	850	mV
	I_{OUT} = 300mA ,V_{OUT}=1.8V		550	700	mV
	I_{OUT} = 300mA ,V_{OUT}=3.0V		350	500	mV
	I_{OUT} = 300mA ,V_{OUT}=3.3V		330	450	mV
Continuous Output Current				300	mA
Output Current Limit	V_{OUT} = 95%	350	500		mA
Output Foldback Current Limit	V_{OUT} = 0V		250		mA
Line Regulation	V_{OUT} + 1V ≤ V_{IN} ≤ 6V			0.12	%/V
Load Regulation	0μA ≤ I_{OUT} ≤ 200 mA		20		mV
Output Voltage Range	Available in 50mV steps	0.8		3.95	V
Output Voltage accuracy	I_{OUT} =30mA	-2		+2	%
Power Supply Rejection Ratio	Freq = 100Hz, I_{OUT} = 30mA		73		dB
	Freq = 1KHz, I_{OUT} = 30mA		70		
Start-up time			50		μs
Thermal Shutdown	Rising, Hysteresis =30°C		150		°C

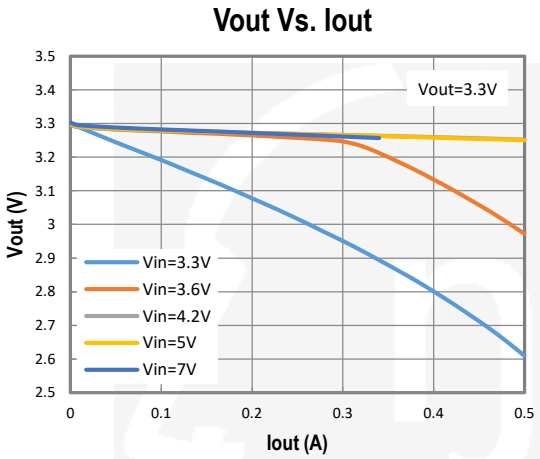
(1): Minimum V_{IN} is 1.6V or V_{OUT} + $V_{DROPOUT}$, whichever is greater.

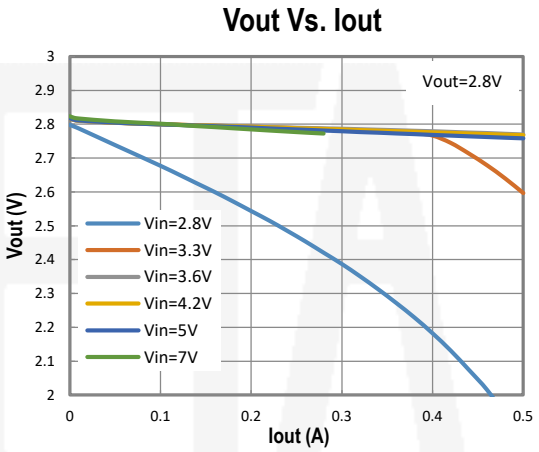
PIN DESCRIPTION

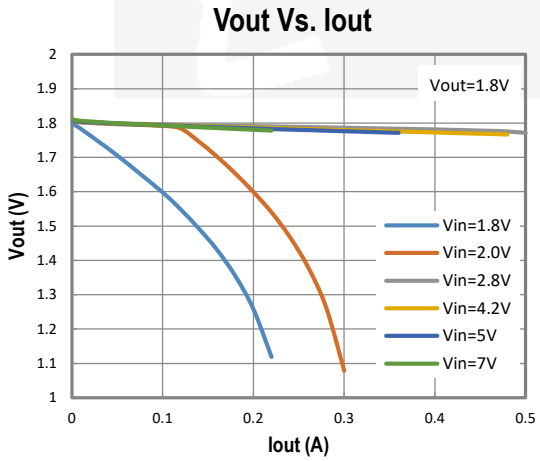
PIN #	NAME	DESCRIPTION
1	GND	Ground
2	VOUT	Output of regulator
3	VIN	Input supply pin

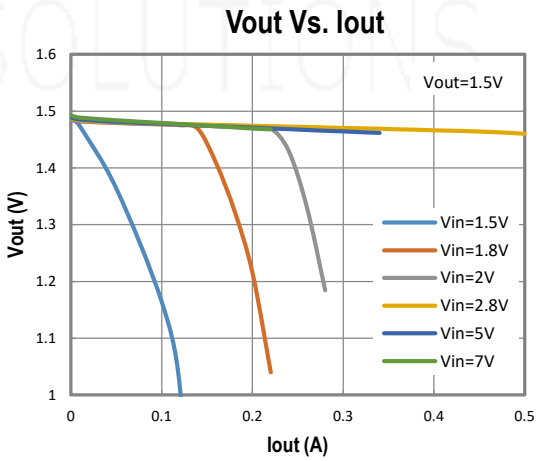
TYPICAL CHARACTERISTICS

(Typical values are at T_A = 25°C unless otherwise specified.)





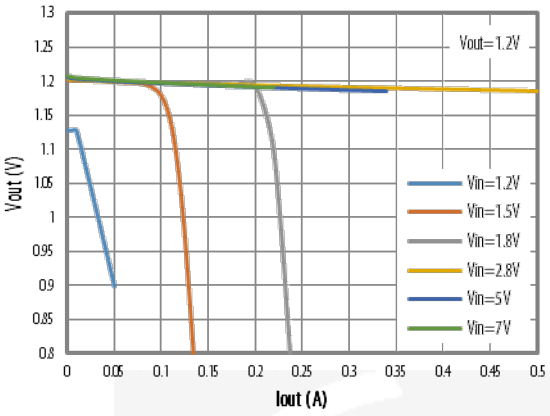




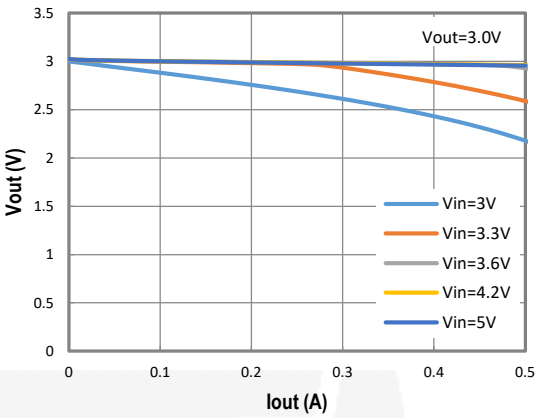
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(Typical values are at T_A = 25°C unless otherwise specified.)

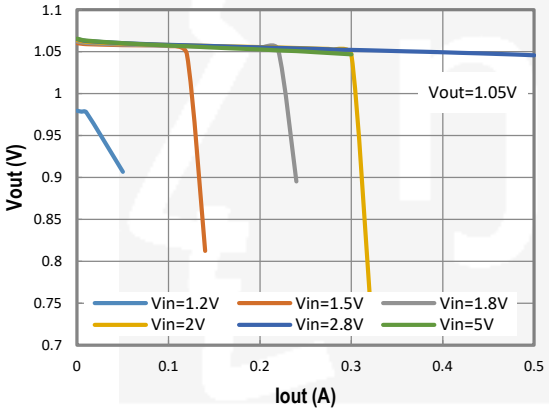
Vout Vs. Iout



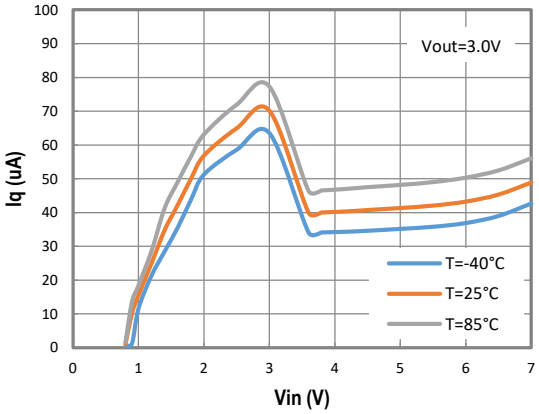
Vout Vs. Iout



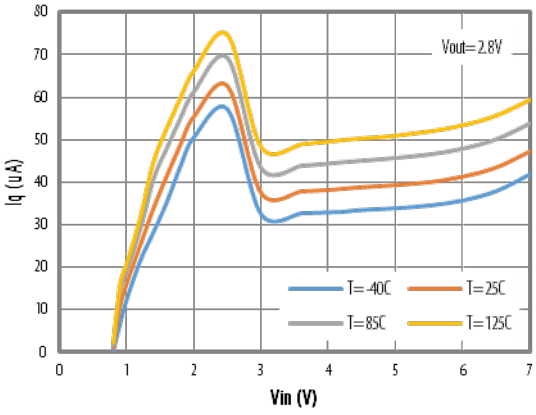
Vout Vs. Iout



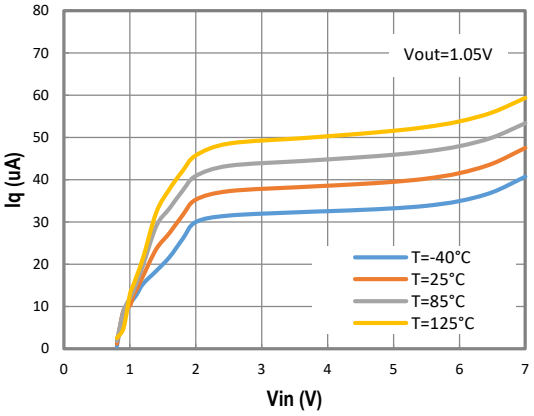
Iq Vs. Vin



Iq Vs. Vin



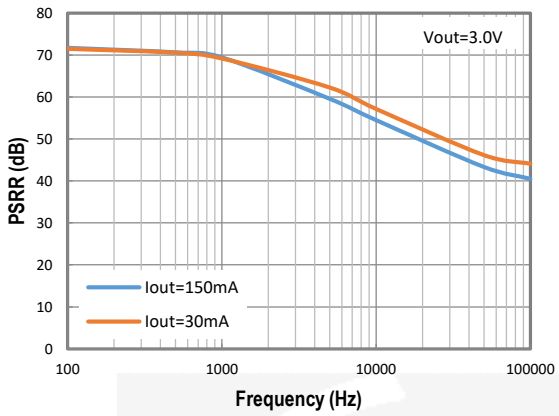
Iq Vs. Vin



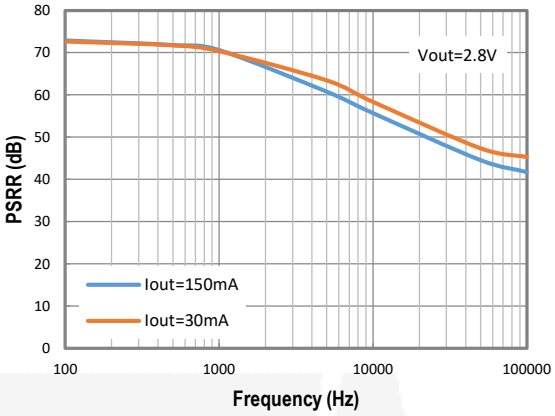
TYPICAL CHARACTERISTICS (cont')

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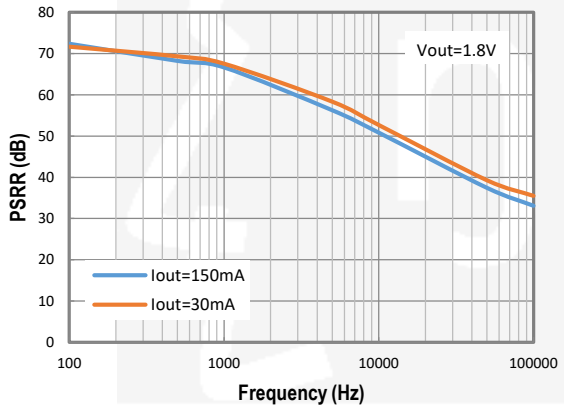
PSRR Vs. Freq.



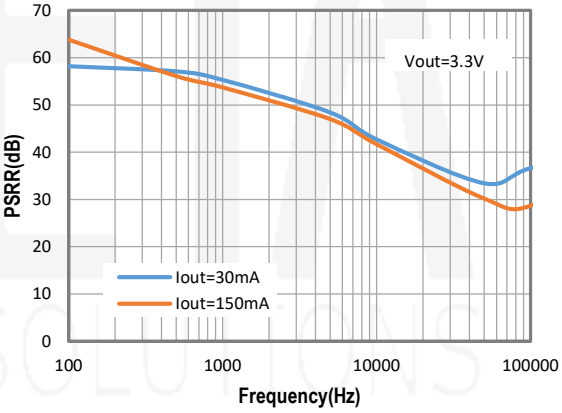
PSRR Vs. Freq.



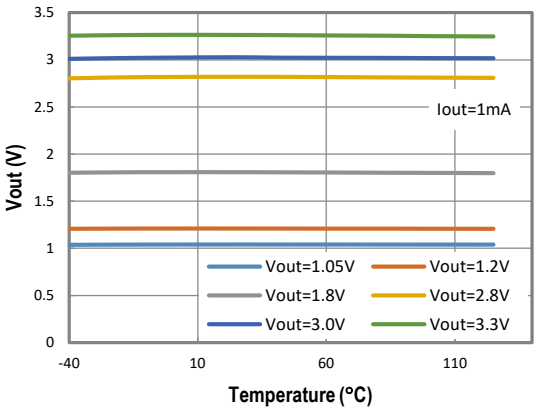
PSRR Vs. Freq.



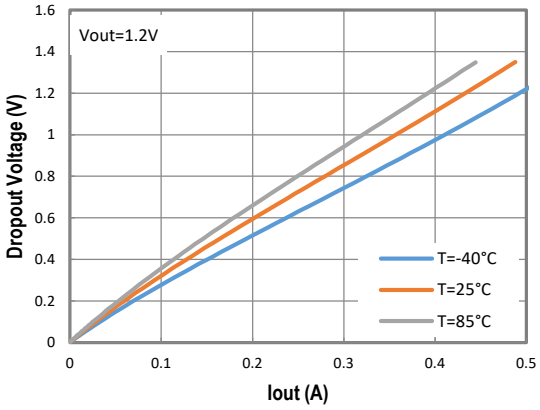
PSRR Vs. Freq.



Vout Vs. Temp



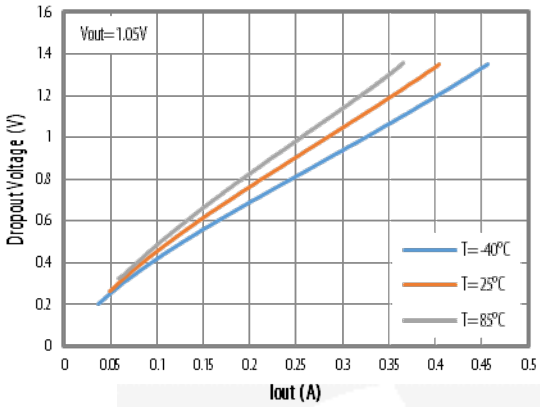
Dropout Vs. Iout



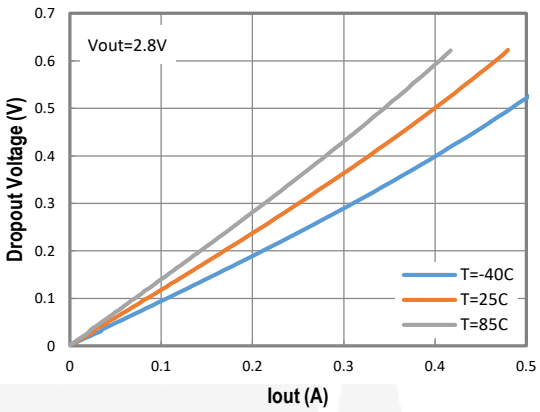
TYPICAL CHARACTERISTICS (cont')

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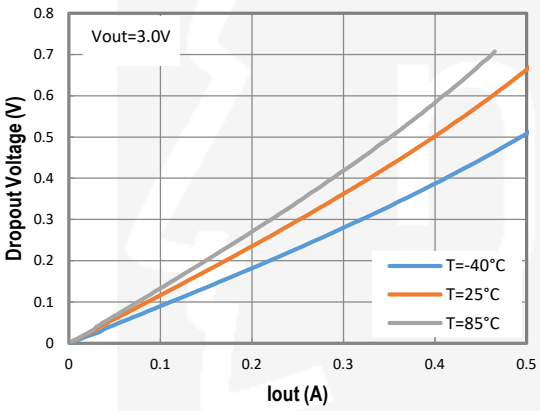
Dropout Vs. Iout



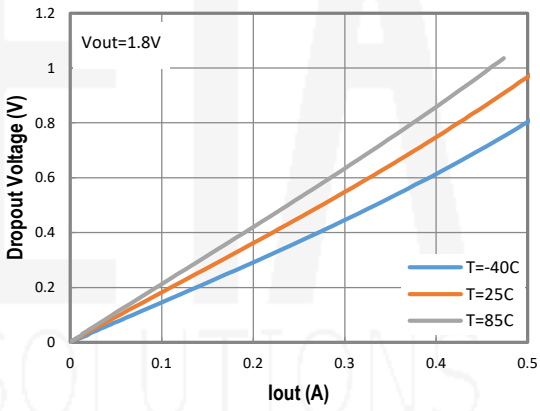
Dropout Vs. Iout



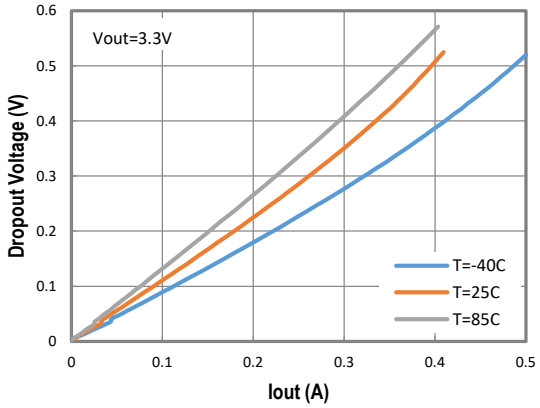
Dropout Vs. Iout



Dropout Vs. Iout

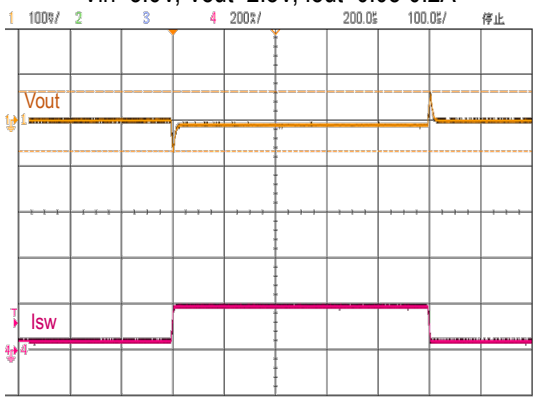


Dropout Vs. Iout

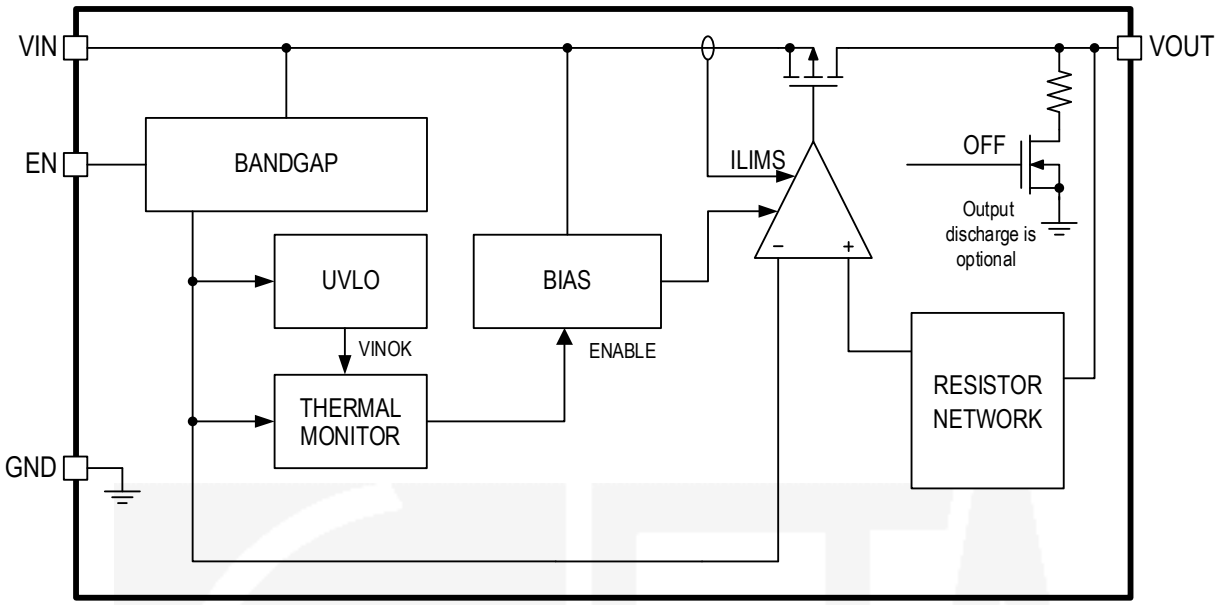


Load Transient Response

Vin=3.6V, Vout=2.8V, Iout=0.05-0.2A



FUNCTIONAL BLOCK DIAGRAM



FUNCTIONAL DESCRIPTION

The ETA5030 family of LDO regulators has been optimized for application in noise-sensitive equipment. The device features low dropout voltages, high PSRR, low quiescent current.

Output Current Limit and Foldback Current Limit

ETA5030 family features an internal current limit. In normal operation, the ETA5030 limits output current to approximately 500mA. When current limiting engages, the output voltage scales back linearly until the over current condition ends.

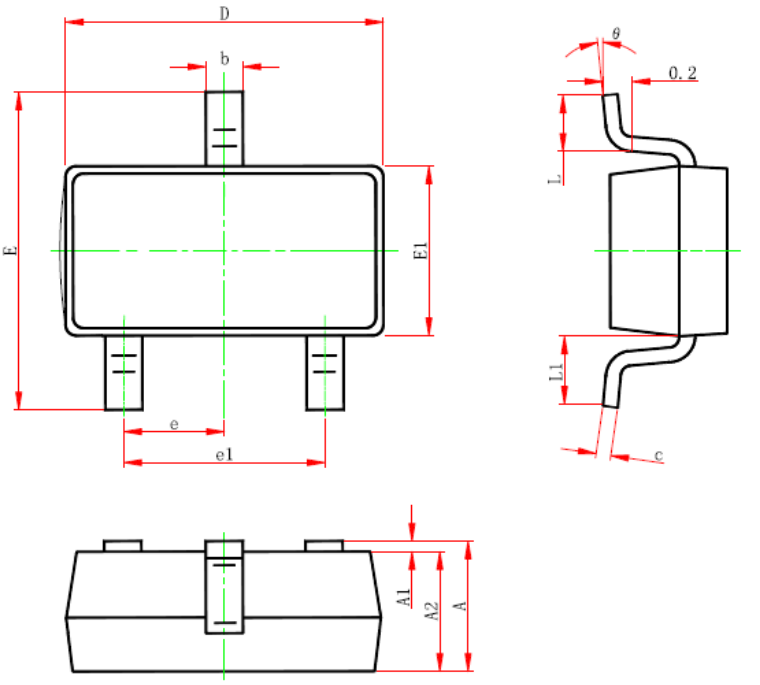
In case output is in hard short conditions, ETA5030 also features an internal foldback limit that reduces the output current limit to a lower level, 250mA, then reduce power dissipation ratings of the package.

Over-Temperature Protection

Thermal protection disables the output when the junction temperature rises to approximately 150°C, allowing the device to cool down. When the junction temperature cools to approximately 120°C, the output circuitry is again enabled. Depending on power dissipation, thermal resistance, and ambient temperature, the thermal protection circuit may cycle on and off. This cycling limits regulator dissipation, protecting the device from damage as a result of overheating.

PACKAGE OUTLINE

Package: SOT23-3



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	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	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
L1	0.600REF.		0.024REF.	
θ	0°	8°	0°	8°