

## General Description

The AP2126 is a 300mA, positive Voltage regulator ICs fabricated by CMOS process.

Each of AP2126 is equipped with a voltage reference, an error amplifier, a resistor network for setting output voltage, a chip enable circuit, a current limit circuit and OSTD (over temperature shut down) circuit to prevent the IC from over current and over temperature.

The AP2126 has features of high ripple rejection, low dropout voltage, low noise, high output voltage accuracy, and low current consumption which make it ideal for use in various battery-powered apparatus.

AP2126 has 3.3V fixed voltage version. It is available in SOT-23-5 Package.

## Features

- Low Dropout Voltage: 170mV@300mA
- High Output Voltage Accuracy:  $\pm 2\%$
- High Ripple Rejection: 65dB@ f=1kHz, 45dB@ f=10kHz
- Low Standby Current: 0.1 $\mu$ A
- Low Quiescent Current: 60 $\mu$ A Typical
- Low Output Noise: 60 $\mu$ Vrms
- Short Current Limit: 50mA
- Over Temperature Protection
- Compatible with Low ESR Ceramic Capacitor: 1 $\mu$ F for C<sub>IN</sub> and C<sub>OUT</sub>
- Excellent Line/Load Regulation
- Soft Start Time: 50 $\mu$ s
- Auto Discharge Resistance: R<sub>DS(ON)</sub>=60 $\Omega$

## Applications

- Datacom
- Notebook Computers
- Mother Board

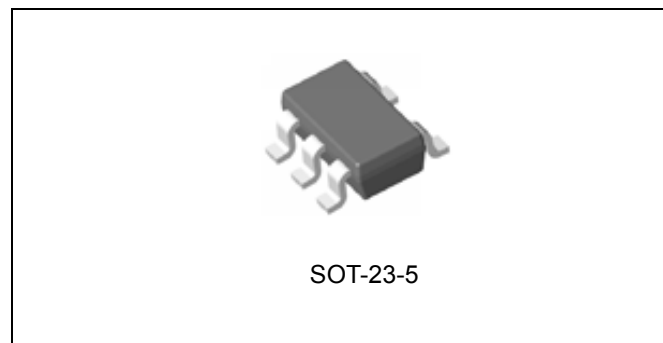


Figure 1. Package Type of AP2126

**Pin Configuration**

K Package  
(SOT-23-5)

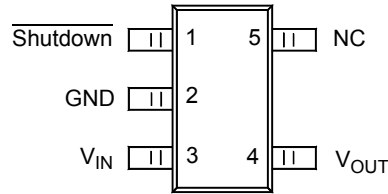


Figure 2. Pin Configuration of AP2126 (Top View)

**Functional Block Diagram**

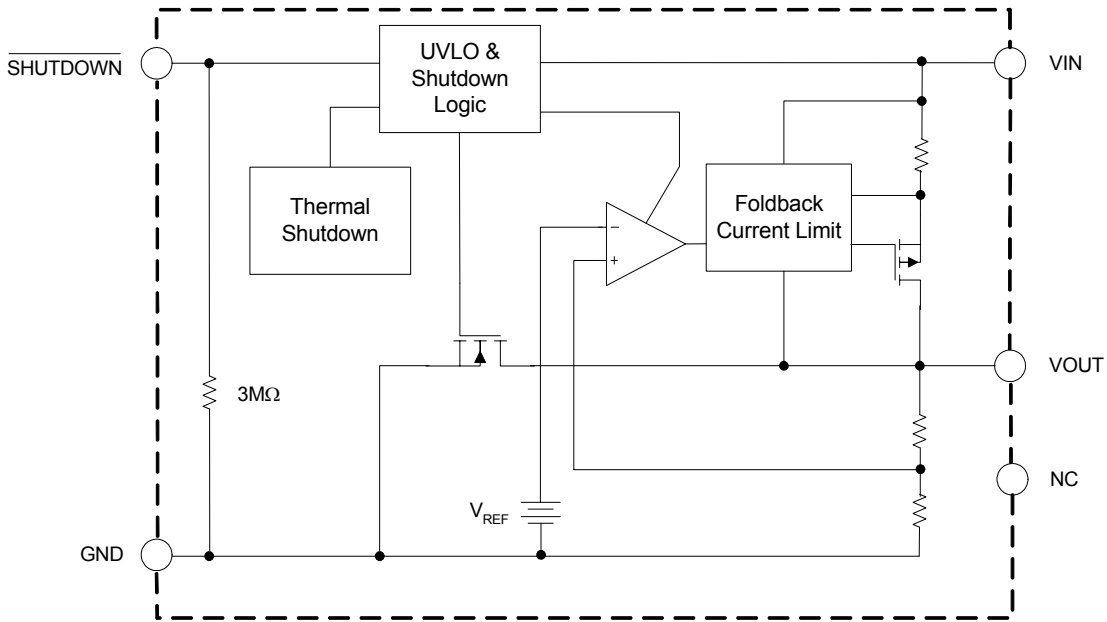
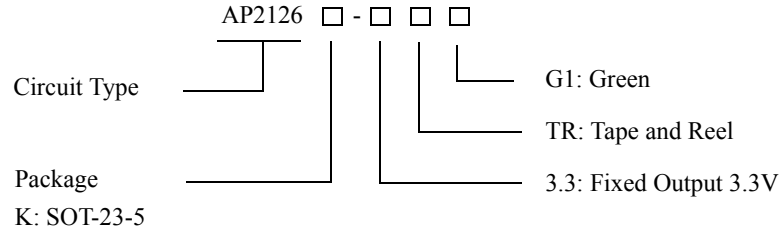


Figure 3. Functional Block Diagram of AP2126

**300mA HIGH SPEED, EXTREMELY LOW NOISE CMOS LDO REGULATOR AP2126**

**Ordering Information**



Product	Package	Temperature Range	Part Number	Marking ID	Packing Type
			Green	Green	
AP2126	SOT-23-5	-40 to 85°C	AP2126K-3.3TRG1	FEF	Tape & Reel

BCD Semiconductor's products, as designated with "G1" suffix in the part number, are RoHS compliant and Green.

**300mA HIGH SPEED, EXTREMELY LOW NOISE CMOS LDO REGULATOR AP2126****Absolute Maximum Ratings (Note 1)**

Parameter	Symbol	Value	Unit
Input Voltage	$V_{IN}$	6.5	V
Shutdown Input Voltage	$V_{CE}$	-0.3 to $V_{IN}+0.3$	V
Output Current	$I_{OUT}$	450	mA
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-65 to 150	°C
Lead Temperature (Soldering, 10sec)	$T_{LEAD}$	260	°C
Thermal Resistance	$R_{\theta JA}$	250	°C/W
ESD (Human Body Model)	ESD	6000	V
ESD (Machine Model)	ESD	300	V

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

**Recommended Operating Conditions**

Parameter	Symbol	Min	Max	Unit
Input Voltage	$V_{IN}$	-	6	V
Operating Junction Temperature Range	$T_J$	-40	85	°C



**300mA HIGH SPEED, EXTREMELY LOW NOISE CMOS LDO REGULATOR AP2126**

**Electrical Characteristics (Continued)**

(AP2126-3.3V, C<sub>IN</sub>=1μF, C<sub>OUT</sub>=1μF, Bold typeface applies over -40°C≤T<sub>J</sub>≤85°C, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Output Voltage	V <sub>OUT</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +1V 1mA≤I <sub>OUT</sub> ≤300mA	98%* V <sub>OUT</sub>		102%* V <sub>OUT</sub>	V
Input Voltage	V <sub>IN</sub>				6	V
Maximum Output Current	I <sub>OUT(MAX)</sub>			450		mA
Load Regulation	$\frac{\Delta V_{OUT}}{(\Delta I_{OUT} * V_{OUT})}$	V <sub>IN</sub> -V <sub>OUT</sub> =1V, 1mA≤I <sub>OUT</sub> ≤300mA			0.6	%/A
Line Regulation	$\frac{\Delta V_{OUT}}{(\Delta V_{IN} * V_{OUT})}$	V <sub>OUT</sub> +0.5V≤V <sub>IN</sub> ≤6V I <sub>OUT</sub> =30mA			0.06	%/V
Dropout Voltage	V <sub>DROP</sub>	V <sub>OUT</sub> =3.3V, I <sub>OUT</sub> =300mA		170	300	mV
Quiescent Current	I <sub>Q</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +1V, I <sub>OUT</sub> =0mA		60	90	μA
Standby Current	I <sub>STD</sub>	V <sub>IN</sub> =V <sub>OUT</sub> +1V, V <sub>SHUTDOWN</sub> in off mode		0.1	1.0	μA
Power Supply Rejection Ratio	PSRR	Ripple 1Vp-p V <sub>IN</sub> =V <sub>OUT</sub> +1V	f=100Hz	65		dB
			f=1KHz	65		dB
			f=10KHz	45		dB
Output Voltage Temperature Coefficient	$\frac{(\Delta V_{OUT}/V_{OUT})}{\Delta T}$	I <sub>OUT</sub> =30mA, -40°C≤T <sub>J</sub> ≤85°C		±100		ppm/°C
Output Current Limit	I <sub>LIMIT</sub>	V <sub>IN</sub> -V <sub>OUT</sub> =1V, V <sub>OUT</sub> =0.98*V <sub>OUT</sub>		400		mA
Short Current Limit	I <sub>SHORT</sub>	V <sub>OUT</sub> =0V		50		mA
Soft Start Time	t <sub>UP</sub>			50		μs
RMS Output Noise	V <sub>NOISE</sub>	T <sub>A</sub> =25°C, 10Hz ≤f≤100kHz		60		μVrms
Shutdown "High" Voltage		Shutdown input voltage "High"	1.5		6	V
Shutdown "Low" Voltage		Shutdown input voltage "Low"	0		0.4	V
V <sub>OUT</sub> Discharge MOSFET R <sub>DS(ON)</sub>		Shutdown input voltage "Low"		60		Ω
Shutdown Pull Down Resistance				3		MΩ
Thermal Shutdown				165		°C
Thermal Shutdown Hysteresis				30		°C

**Typical Performance Characteristics**

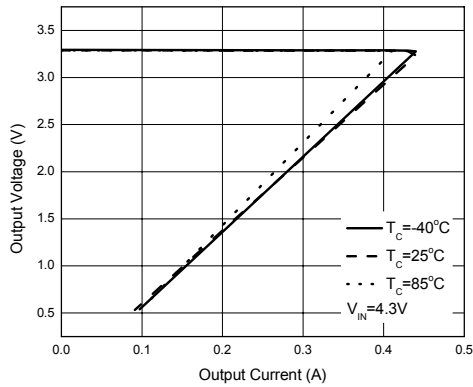


Figure 4. Output Voltage vs. Output Current

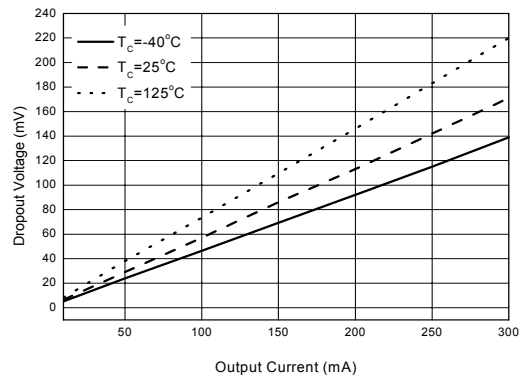


Figure 5. Dropout Voltage vs. Output Current,  $V_{OUT}=3.3V$

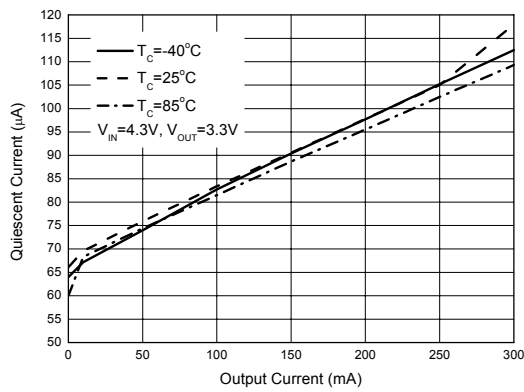


Figure 6. Quiescent Current vs. Output Current

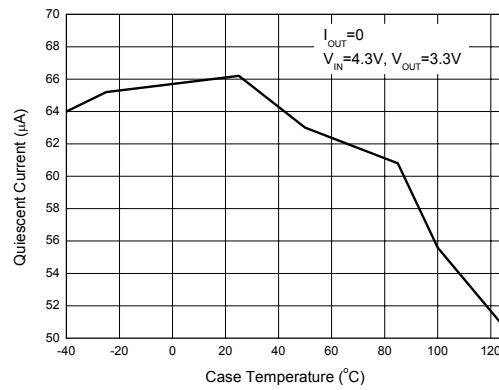


Figure 7. Quiescent Current vs. Case Temperature

**Typical Performance Characteristics (Continued)**

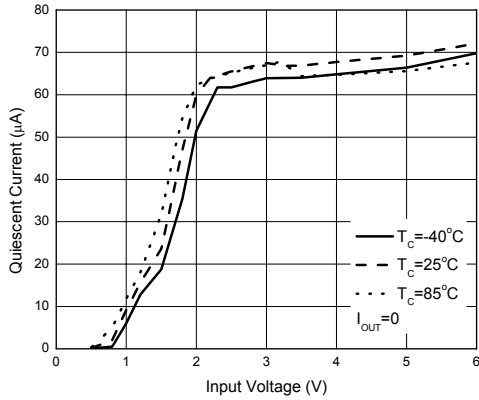


Figure 8. Quiescent Current vs. Input Voltage

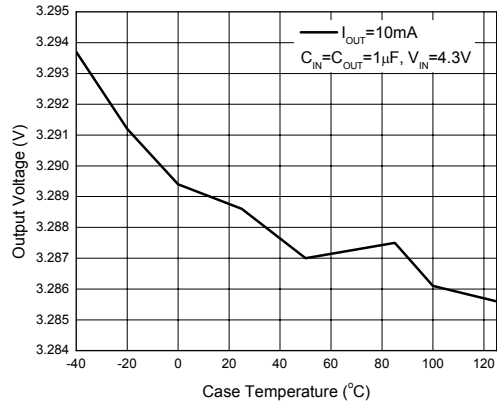


Figure 9. Output Voltage vs. Case Temperature

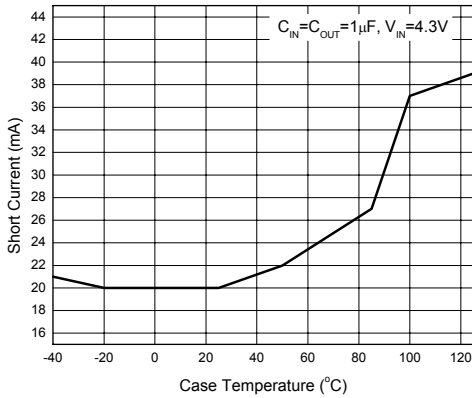


Figure 10. Short Current vs. Case Temperature

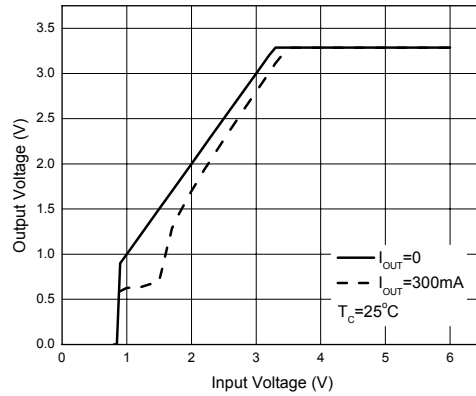


Figure 11. Output Voltage vs. Input Voltage

**300mA HIGH SPEED, EXTREMELY LOW NOISE CMOS LDO REGULATOR AP2126**

**Typical Performance Characteristics (Continued)**

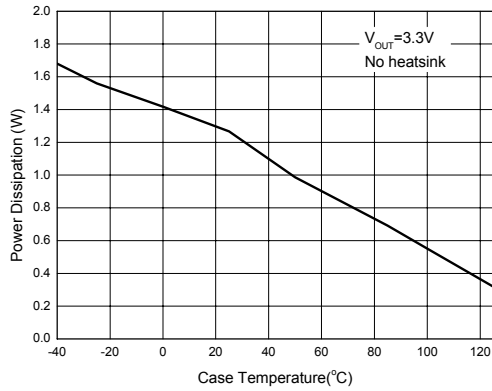


Figure 12. Power Dissipation vs. Case Temperature

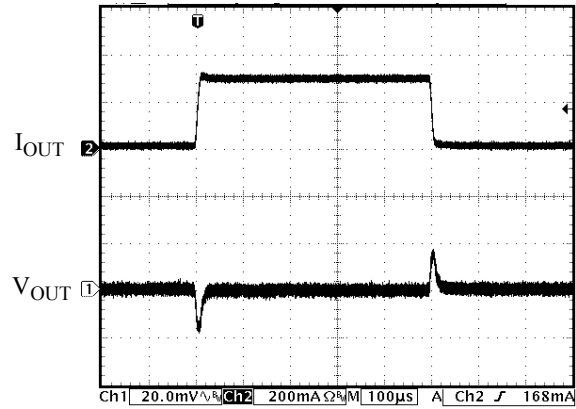


Figure 13. Load Transient  
(Conditions:  $C_{IN}=C_{OUT}=1\mu F$ ,  $V_{IN}=4.4V$ ,  $V_{OUT}=3.3V$ )

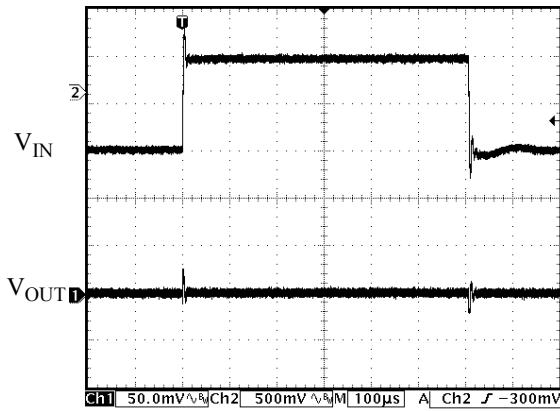


Figure 14. Line Transient  
(Conditions:  $I_{OUT}=30mA$ ,  $C_{IN}=C_{OUT}=1\mu F$ ,  $V_{IN}=4$  to  $5V$ ,  $V_{OUT}=3.3V$ )

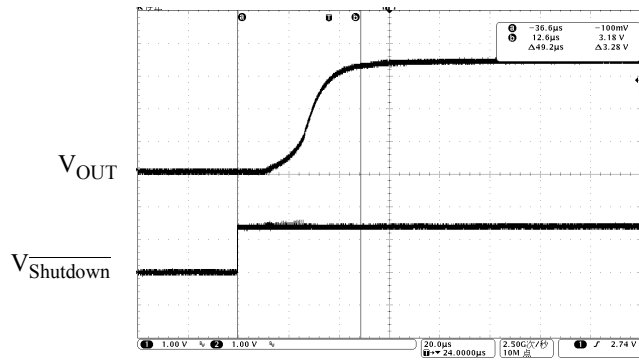


Figure 15. Soft Start Time  
(Conditions:  $I_{OUT}=0mA$ ,  $C_{IN}=C_{OUT}=1\mu F$ ,  $V_{Shutdown}=0$  to  $2V$ ,  $V_{OUT}=3.3V$ )



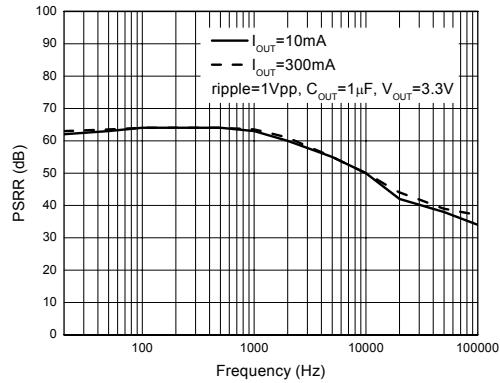
**Typical Performance Characteristics (Continued)**


Figure 16. PSRR vs. Frequency

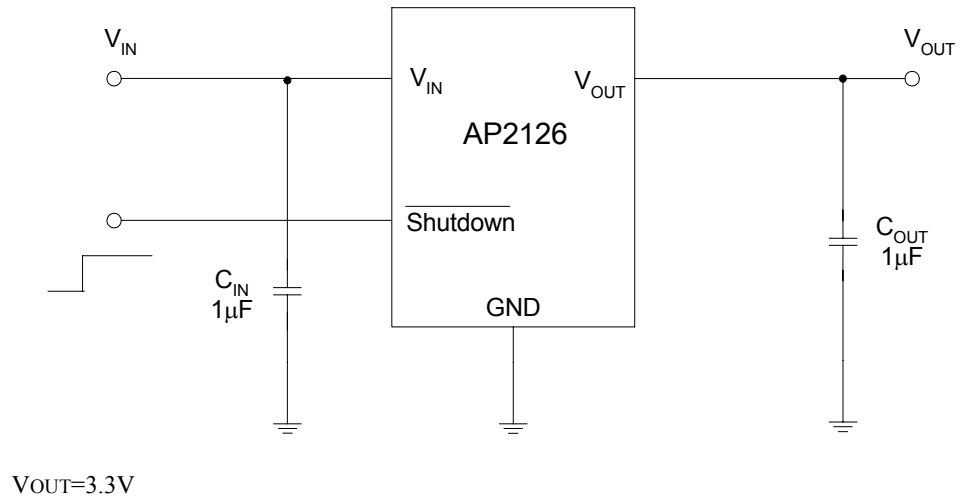
**Typical Application**

Figure 17. Typical Application of AP2126

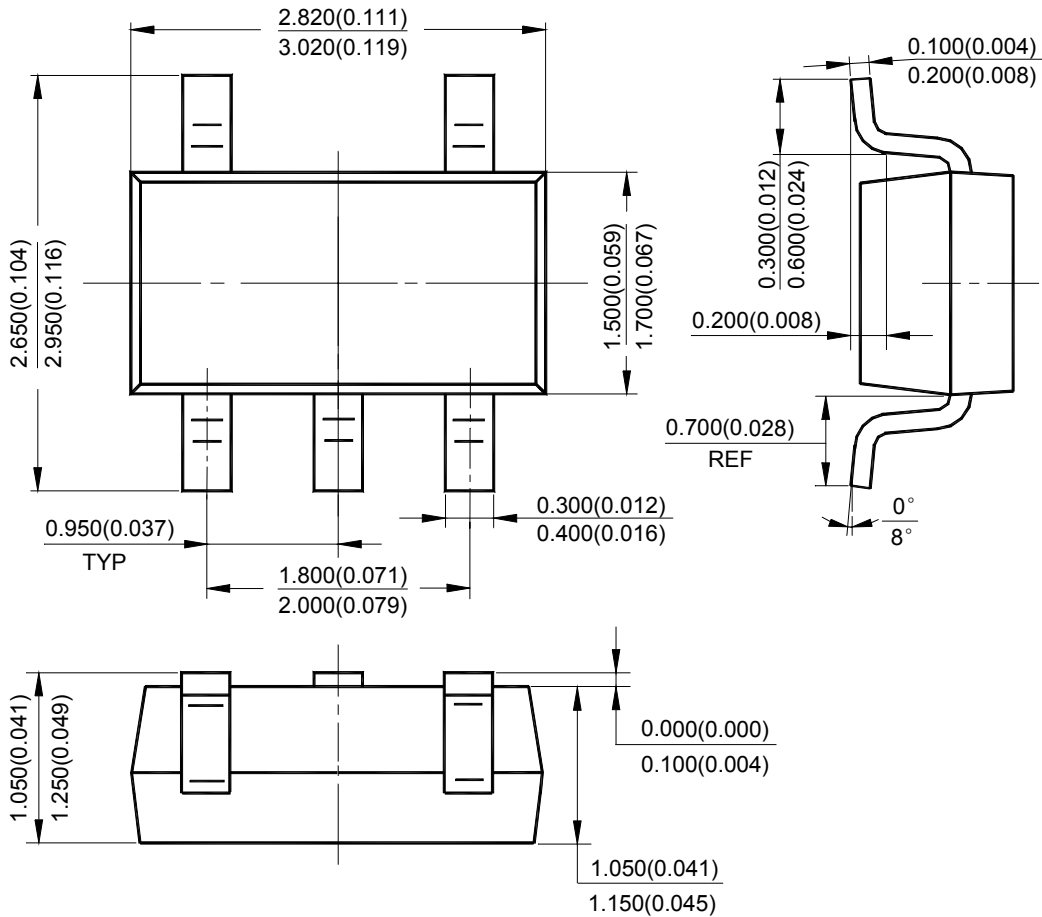


**300mA HIGH SPEED, EXTREMELY LOW NOISE CMOS LDO REGULATOR AP2126**

**Mechanical Dimensions**

**SOT-23-5**

**Unit: mm(inch)**





## BCD Semiconductor Manufacturing Limited

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