



### Features

- FB voltage: 0.8V
- Dropout Voltage: 100mV @ 100mA (3.0V type)
- High Ripple Rejection: 70dB@1KHz
- Internal protector: current limiter, short protector and over temperature protection
- Low Power Consumption: 25uA (TYP.)
- Minimum Output Current : 500mA (VIN ≧ VOUT+1V)
- Standby Current: less than 0.1μA
- Instructions with Power Good
- No fast discharge function
- SOT23-5 Package

### Applications

- Cellular Handsets
- Battery-Powered Equipment
- Wi-Fi Router Portable AV equipment
- Hand-Held Instruments
- Portable Information Application
- Adjustable power supply

### General Description

The MB6050 series are highly precise, low noise, positive voltage LDO regulators manufactured using CMOS processes. The series achieves high ripple rejection and low dropout and consists of a standard voltage source, an error correction, current limiter and a phase compensation circuit plus a driver transistor. External output feedback,

customers can easily get the required voltage. In order to make the load current does not exceed the current capacity of the output transistor, built-in over-current protection, over temperature protection and short circuit protection. The internal op amp with advanced structure, the output capacitor can be omitted.

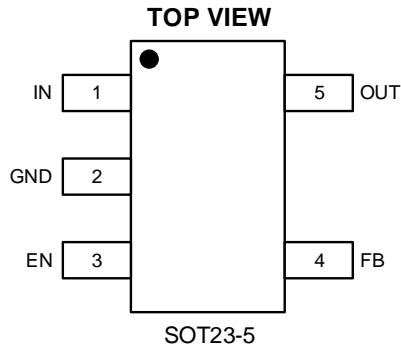
### Order Information

#### MB6050①②

Designator	Symbol	Description
①	M5	Package:SOT23-5
②	R	RoHS / Pb Free
	G	Halogen Free



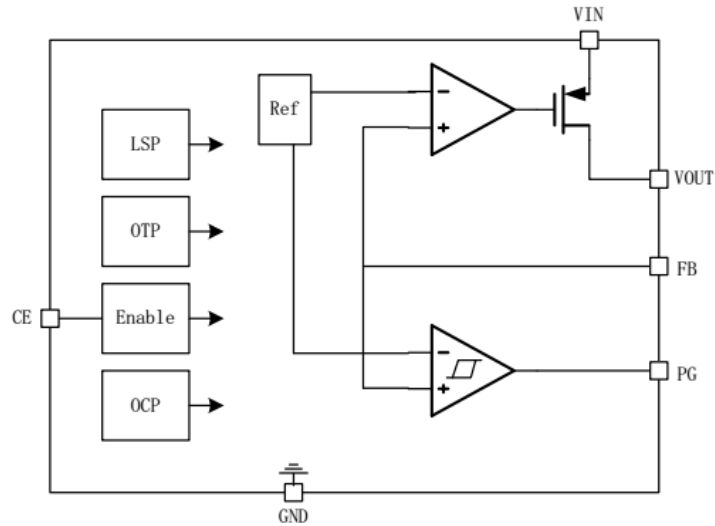
**Pin Configuration**



**Pin Assignment**

Pin No.	Pin Name	Function
1	IN	Input voltage pin for the regulator
2	GND	Ground
3	EN	Enable Control
4	FB	FB pin for adjustable output option
5	OUT	Output voltage pin for the regulator

**Function Block Diagram**





### Absolute Maximum Ratings

Item	Min	Max	Unit
V <sub>IN</sub> voltage	2	V <sub>SS</sub> +6.5	V
V <sub>EN</sub> voltage	V <sub>SS</sub> -0.3	V <sub>IN</sub> +0.3	V
V <sub>FB</sub> voltage	V <sub>SS</sub> -0.3	V <sub>IN</sub> +0.3	V
V <sub>OUT</sub> voltage	V <sub>SS</sub> -0.3	V <sub>IN</sub> +0.3	
Power dissipation	500		mW
Operating Ambient Temperature	-40	85	°C
Maximum junction temperature		125	°C
Storage temperature, T <sub>stg</sub>	-40	125	°C

Note (1): Exceeding these ratings may damage the device.

Note (2): The device is not guaranteed to function outside of its operating conditions.

**Caution:** The absolute maximum ratings are rated values exceeding which the product could suffer physical damage. These values must therefore not be exceeded under any conditions.

### Thermal Information

Item	Description	Value	Unit
R <sub>θJA</sub>	Junction-to-ambient thermal resistance <sup>(1)(2)</sup>	120	°C/W
R <sub>θJC(top)</sub>	Junction-to-case (top) thermal resistance	90	°C/W

Note (1): The package thermal impedance is calculated in accordance to JESD 51-7.

Note (2): Thermal Resistances were simulated on a 4-layer, JEDEC board

### Typical Application Circuit

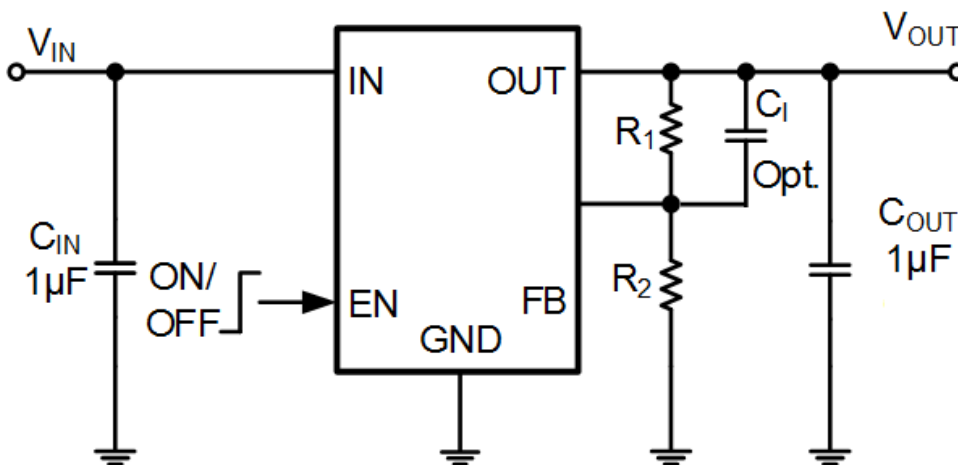


Figure1: Typical Application Circuit With FB

Note1:  $V_{OUT}=0.8 \times (1+R1/R2)$



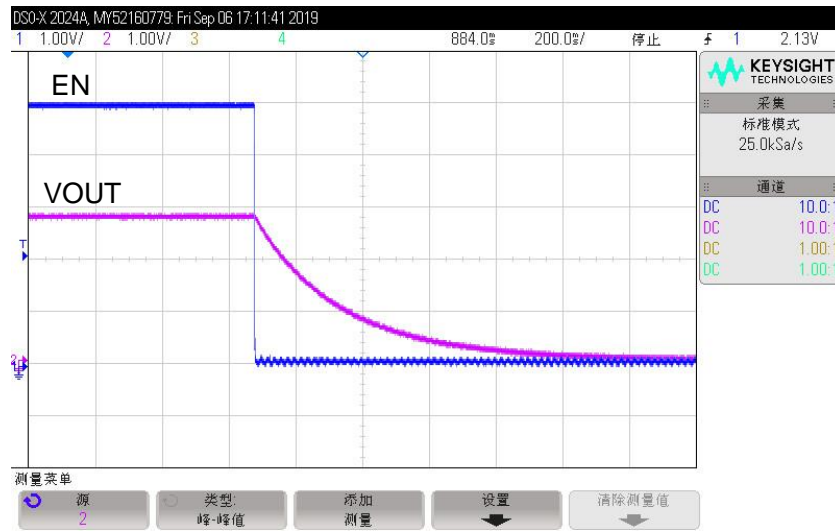
Note2:  $R2 \geq 100K\omega$ ,  $C1=22pF$

**Electrical Characteristics** $V_{IN} = V_{OUT} + 1V$ ,  $T_A = 25^\circ C$ , unless otherwise noted.

Parameter	Symbol	Test Conditions	Min	Typ.	Max	Units
Feedback Voltage	$V_{FB}$	$V_{IN}=4.2V$ , $V_{OUT}=3.3V$ , $I_{OUT}=30mA$	780	800	820	mV
Output Current	$I_{OUT}$	$V_{IN} \geq V_{OUT(S)} + 0.6V$	500			mA
Dropout Voltage	$V_{drop}$	$I_{OUT}=50\text{ mA}$	-	0.10	0.15	V
		$I_{OUT}=100\text{ mA}$	-	0.15	0.2	
Line Regulations	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$V_{OUT(S)} + 0.5V \leq V_{IN} \leq 7V$ $I_{OUT}=30mA$	-	0.10	0.20	%/V
Load Regulation	$\Delta V_{OUT2}$	$V_{IN}=V_{OUT(S)}+1.0V$ $1.0mA \leq I_{OUT} \leq 100mA$	-	50	100	mV
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{T_A \times V_{OUT}}$	$V_{IN}=V_{OUT(S)}+1.0V$ , $I_{OUT}=10mA$ $-40^\circ C \leq T_A \leq 85^\circ C$	-	$\pm 100$	-	ppm/ $^\circ C$
Supply Current	$I_{SS1}$	$V_{IN}=V_{OUT(S)}+1.0V$	-	25	-	$\mu A$
Shutdown Current	$I_{shut}$	$V_{IN}=5V$ , $V_{EN}=0$	-	-	0.1	$\mu A$
Input Voltage	$V_{IN}$	-	-	-	6	V
Ripple-Rejection	PSRR	$V_{IN}=V_{OUT(S)}+1.0V$ , $f=1kHz$ , $V_{RIP}=0.5V_{rms}$ , $I_{OUT}=50mA$	-	70	-	dB
Short-circuit Current	$I_{short}$	$V_{IN}=V_{OUT(S)}+1.0V$ , ON/OFF Terminal is ON, $V_{OUT}=0V$	-	100	-	mA
EN "High Voltage"	$V_{ENH}$		0.9			V
EN "Low" Voltage	$V_{ENL}$				0.4	V
EN "High Current"	$I_{ENH}$	$V_{IN}=V_{EN}=V_{OUT(T)}+1V$	-0.1		0.1	$\mu A$
EN "Low" Current	$I_{ENL}$	$V_{IN}=V_{OUT(T)}+1V$ , $V_{EN}=V_{SS}$	-0.1		0.1	$\mu A$

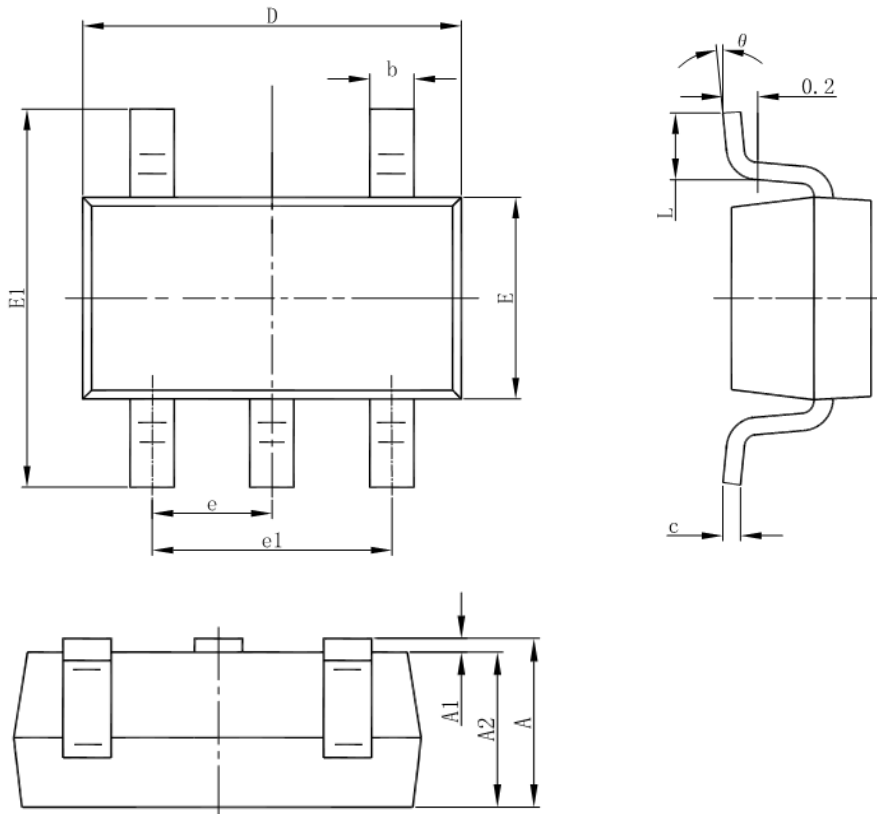


### MB6050-M5R with no fast discharge function



**Package Information**

- SOT-23-5L



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
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°

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