

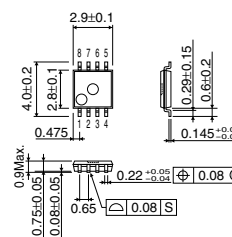
## Programmable negative supply IC

# BD6112FVM

### ● Description

BD6112FVM is a charge-pump negative supply IC with a built-in regulator. The charge-pump block inverts the positive supply voltage in the VBAT pin into a negative voltage, which generates from the NEGOUT pin. The regulator block stabilizes this negative voltage with low-noise that produces from the OUT pin. Output voltage values of this regulator can be controlled by voltage value inputted to the VIN pin and determined by  $OUT = -1.6 \times VIN$ .

### ● Dimension (Units : mm)



MSOP8

### ● Features

- 1) Built-in high efficiency, inverting charge-pump
- 2) Built-in negative voltage regulator  
(low noise, output voltage variable)
- 3) Built-in standby SW (pull down resistance 1M $\Omega$ )
- 4) Ultra small MSOP8 package

### ● Applications

Small terminal devices such as cellular phones, PHS, and PDA etc.  
Other equipments driven by battery required for negative voltage.

### ● Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Maximum applied supply voltage	VBAT	-0.3 ~ +6.0	V
Maximum applied input voltage	VIN	-0.3 ~ +6.0	V
Power dissipation	Pd	350 *	mW
Operating temperature range	Topr	-30 ~ +85	°C
Storage temperature range	Tstg	-55 ~ +125	°C

\* Derating : 3.5mW/°C for operation above Ta=25°C

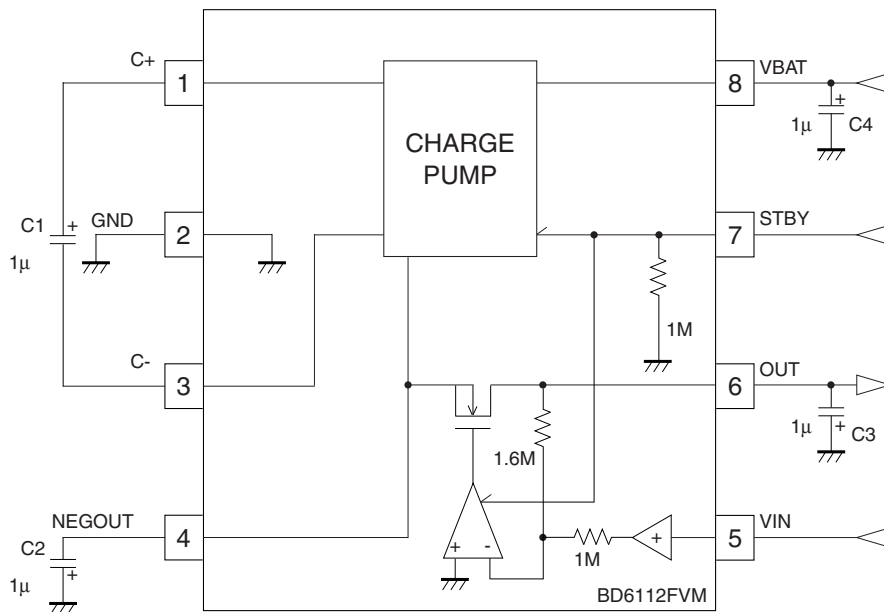
● Recommended Operating Conditions (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V <sub>BAT</sub>	2.5	3.6	5.5	V

● Electrical characteristics (Unless otherwise noted; Ta=25°C, V<sub>BAT</sub>=3.6V, STBY=3.6V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	
Circuit current	I <sub>Q1</sub>	–	0.5	3	mA	No load, V <sub>IN</sub> =1.25V	
Stand-by current	I <sub>Q2</sub>	–	–	5	μA	No load, V <sub>IN</sub> =0V, STBY=0V	
<Regulator block>							
Output voltage 1	V <sub>o</sub>	–2.1	–2.0	–1.9	V	V <sub>IN</sub> =1.25V, I <sub>OUT</sub> =5mA	
Output voltage 2	V <sub>o2</sub>	V <sub>o</sub> x 0.95	V <sub>o</sub>	V <sub>o</sub> x 1.05	V	V <sub>IN</sub> =0.5~1.8V, V <sub>o</sub> =–1.6 x V <sub>IN</sub> , I <sub>OUT</sub> =5mA	
Output ripple voltage	V <sub>RR</sub>	–	–70	–60	dBV	V <sub>IN</sub> =1.25V, I <sub>OUT</sub> =5mA	
Maximum output current	I <sub>OMAX</sub>	10	–	–	mA	V <sub>IN</sub> =1.25V, V <sub>OUT</sub> ≤V <sub>o</sub> +0.1V	
Load regulation	ΔV <sub>OL</sub>	–	2	40	mV	V <sub>IN</sub> =1.25V, I <sub>o</sub> =0~5mA	
Line regulation	ΔV <sub>OI</sub>	–	10	40	mV	V <sub>BAT</sub> =3.0~6.0V, I <sub>o</sub> =5mA	
V <sub>IN</sub> pin inflow current	I <sub>IN</sub>	–	0	2	μA	V <sub>IN</sub> =1.25V	
<Charge-pump block>							
Oscillation frequency	f <sub>osc</sub>	–	120	–	kHz		
Voltage conversion efficiency	V <sub>CE</sub>	–	97	–	%	No load, NEGOUT monitor	
Stand-by pin pull down resistance	R <sub>STBY</sub>	0.6	1.0	1.6	MΩ		
Stand-by pin control voltage	Operating	V <sub>IH</sub>	2.0	–	–	V	
	Non-operating	V <sub>IL</sub>	–0.3	–	0.3	V	

● Application Circuit



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