Features

- 300mA Output Current
- Low Quiescent Current: 60μA
- Input Voltage: 3V ～ 5.5V
- 0.47μF～10μF Ceramic Capacitors Ensure the Stability
- Overload/Over Temperature Protection
- Package: DFN1.2*1.6-4L/DFN2*2-6L (lead-free packaging is now available)
- Specified from: -40℃ ～ +85℃

Applications

- MP3/MP4 Players
- Cellular phones, radiophone, digital cameras, and portable electronics
- Laptop/notebook/palmtop computers
- Portable devices
- Disk driver
- Battery chargers
- Bluetooth and other radio products

Description

The HX2101 is 300mA low dropout linear regulator optimized to provide a high performance solution to low power system.

The device offers a new level of cost-effective performance in cellular phones, laptop and notebook computers, and other portable devices. Proprietary design techniques ensure high performance.

The HX2101 is designed to make use of low cost ceramic capacitors which ensure the stability of the output current, and enhance the efficiency in order to prolong the battery life of those portable devices.

The HX2101 regulators are available in the industry standard DFN1.2*1.6-4L/DFN2*2-6L power packages (or upon request).

Order Information

HX2101-①②:

SYMBOL	DESCRIPTION
①	Denotes Output Voltage: E:2.8V L:3.1V G: 3.3V
②	Denotes Package Type: D: DFN1.2*1.6-4L K: DFN2*2-6L

Typical Application Circuit

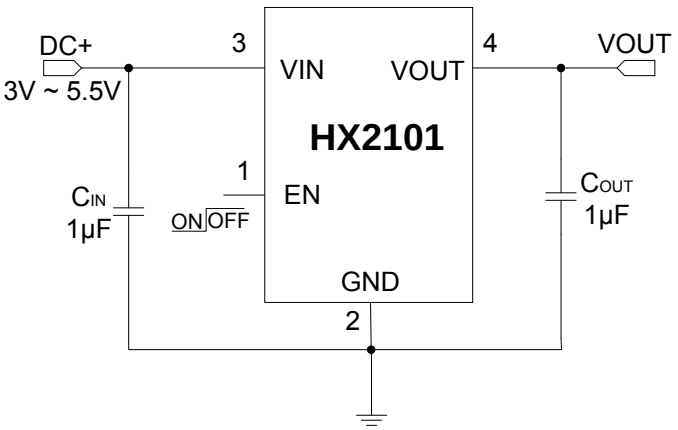


Figure 1: For DFN1.2*1.6-4L Package

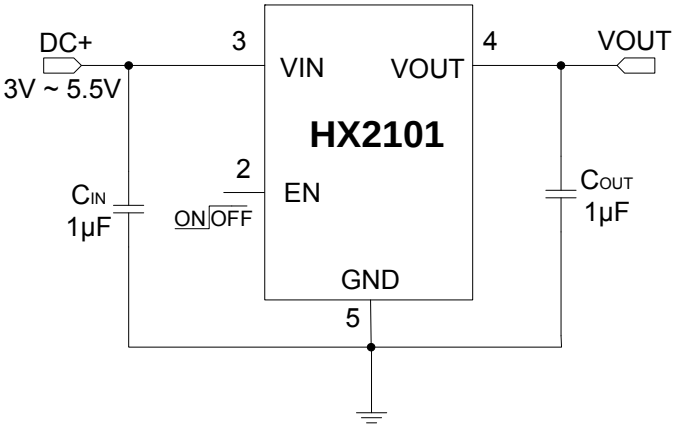
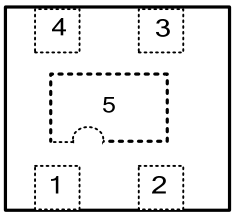


Figure 2: For DFN2*2-6L Package

Model	VOUT（V）	VIN（V）	Package
HX2101-ED	2.8	3.0 ～ 5.5	DFN1.2*1.6-4L
HX2101-LK	3.1	3.3 ～ 5.5	DFN2*2-6L
HX2101-GD	3.3	3.4 ～ 5.5	DFN1.2*1.6-4L

Pin Assignment and Description

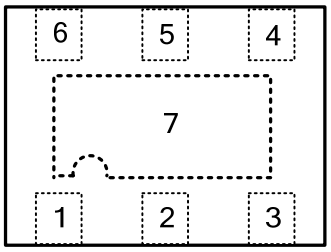
TOP VIEW



DFN1.2*1.6-4L

PIN	NAME	FUNCTION
1	EN	ON/OFF Control (High Enable)
2	GND	Ground
3	VIN	Power Input
4	VOUT	Output Pin

TOP VIEW



DFN2*2-6L

PIN	NAME	FUNCTION
1, 6	NC	Not Connect
2	EN	ON/OFF Control (High Enable)
3	VIN	Power Input
4	VOUT	Output Pin
5,7	GND	Ground

Absolute Maximum Ratings (Note 1)

- Supply Input Voltage ……-0.3V ～ 6V
- EN Input Voltage ……-0.3V ～ 6V
- Operating Temperature Range(Note 2)……..-40°C ～ +85℃
- Junction Temperature Range ……. -40°C ～ +125℃
- Storage Temperature Range ……-65℃ ～ +150℃
- Lead Temperature (Soldering, 10 sec.) ……+265℃

Note 1: Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2: The HX2101 is guaranteed to meet performance specifications from 0°C to 70°C. Specifications over the –40°C to 85°C operating temperature range are assured by design, characterization and correlation with statistical process controls.

Electrical Characteristics

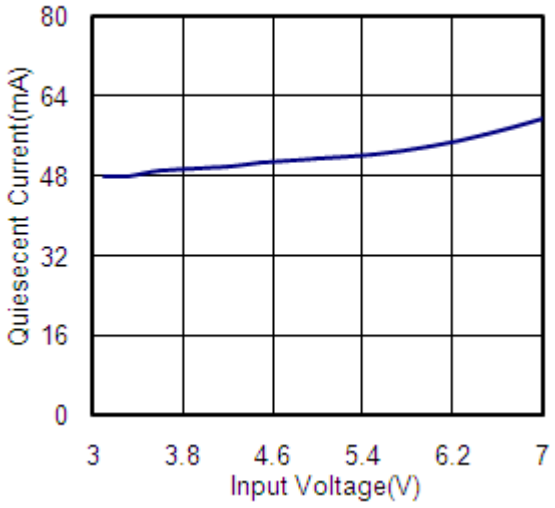
Operating Conditions: T_A=25℃, V_{IN}= V_{OUT} + 1V, C_{IN} = C_{OUT} =1μF, unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Input Voltage Range		3		5.5	V
ΔV_{OUT}	Output Voltage Accuracy	I_{OUT} = 10mA	-2		+2	%
I_Q	Quiescent Current	I_{OUT} = 0mA		60		μA
I_{LIM}	Current Limit	V_{IN} = 4.2V		500		mA
V_{DROP}	Dropout Voltage(Note 3)	I_{OUT} = 150mA		150		mV
V_{ENH}	EN Threshold Voltage(High)		1.2			V
V_{ENL}	EN Threshold Voltage(Low)				0.8	V
I_{EN}	Enable Pin Current	V_{EN}(H), V_{EN} = 2V		0.12		μA
		V_{EN}(L), V_{EN} = 0.2V		0.1		μA
ΔV_{LINE}	Line Regulation	V_{IN} = (V_{OUT}+1) to 5.5V, I_{OUT} = 1mA		2		mV
ΔV_{LOAD}	Load Regulation	0mA ≤ I_{OUT} ≤ 200mA V_{IN} = 3.6V		30		mV

Note 3: The dropout voltage is defined as V_{IN}-V_{OUT}, which is measured when V_{OUT} is $V_{OUT\ (NORMAL)}$ – 100mV.

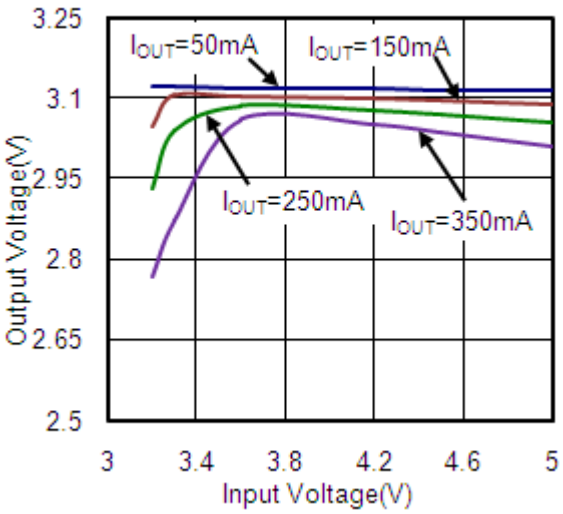
Typical Performance Characteristics

Quiescent Current vs. Input Voltage

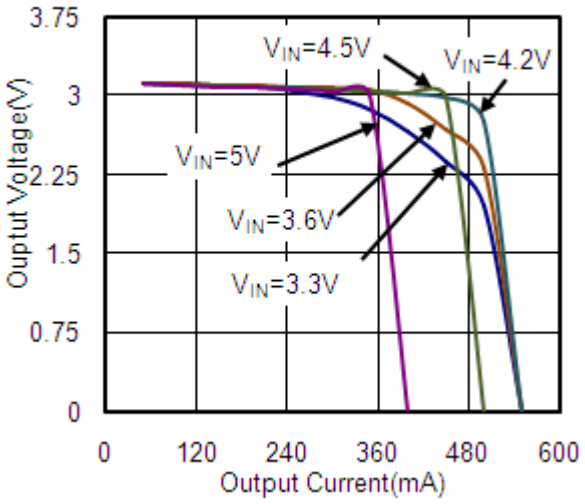


Load Voltage vs.Dropout voltage

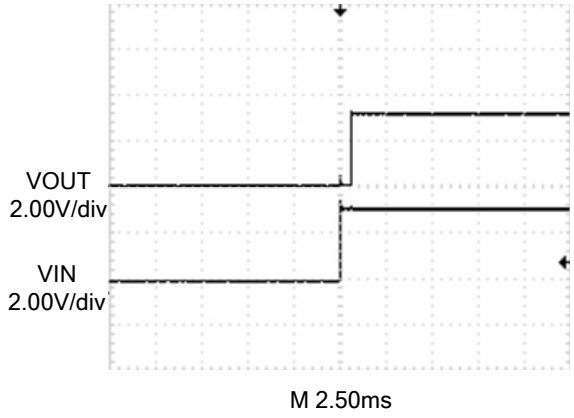
Input Voltage vs. Output Voltage



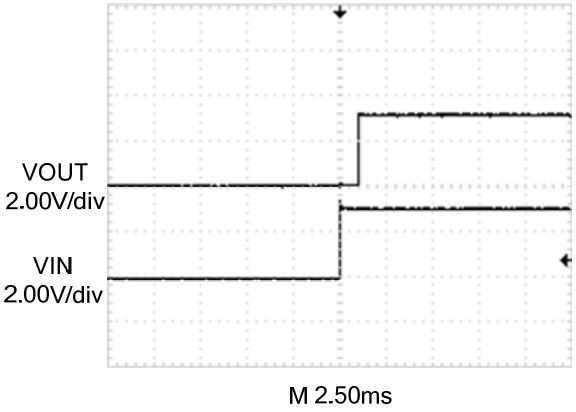
Output Current vs. Output Voltage



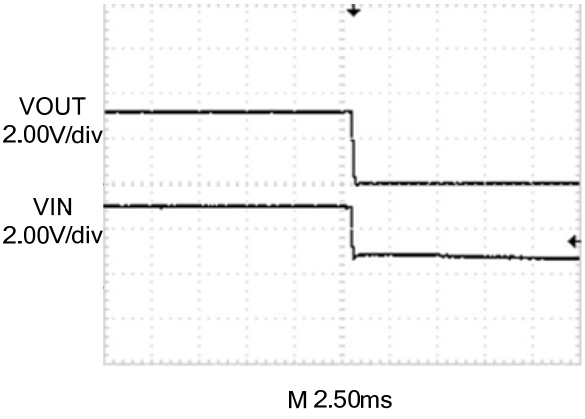
Start Up
(V_{IN} = 3.6V, I_{OUT} = 100mA)



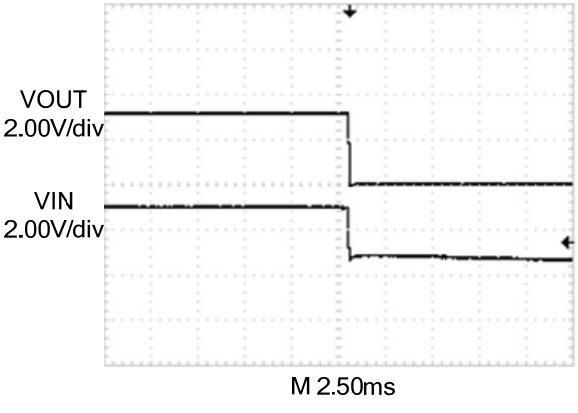
Start Up
(V_{IN} = 3.6V, I_{OUT} = 300mA)



Shut Down
(V_{IN} = 3.6V, I_{OUT} = 100mA)



Shut Down
(V_{IN} = 3.6V, I_{OUT} = 200mA)



Pin Functions (DFN2*2-6L Package)

NC (Pin 1, 6): Not Connect.

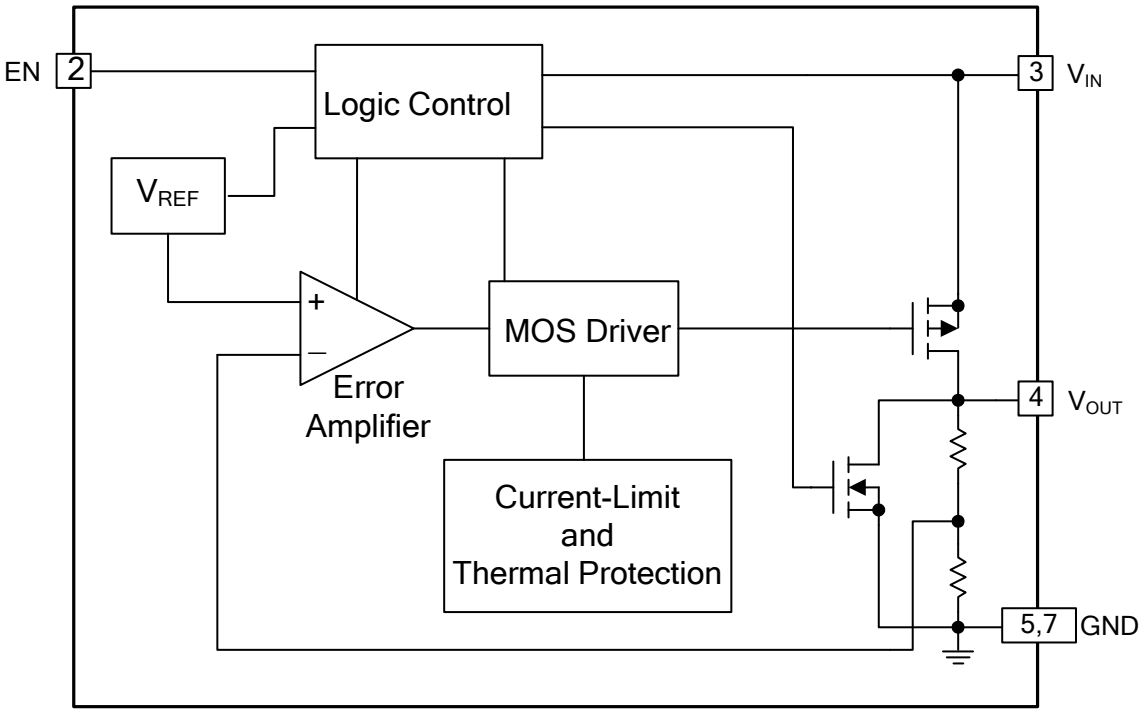
EN (Pin 2): ON/OFF Control (High Enable). Forcing this pin above 1.2V enables the part. Forcing this pin below 0.8V can shuts down the device. In shutdown, all functions are disabled drawing <1μA supply current. Do not leave EN floating.

VIN (Pin 3): Power Input Voltage. Must be locally bypassed.

VOUT (Pin 4): Output Voltage. It is a fixed output voltage for the Micropower LDO Regulator.

GND (Pin 5, 7): Signal and Power Ground. Provide a short direct PCB path between GND and the (–) side of the output capacitor(s).

Block Diagram (DFN2*2-6L Package)



Application Information

Input and Output Capacitor

Like any low dropout regulator, the external capacitors used with the HX2101 must be carefully selected for regulator stability and performance. Using a capacitor whose value is >1μF on the HX2101 input and the amount of capacitance can be increased without limit. The input capacitor must be located a distance of not more than 0.5 inch from the input pin of the IC and returned to a clean analog ground. Any good quality ceramic or tantalum can be used for this capacitor. The capacitor with larger value and lower ESR (equivalent series resistance) provides better PSRR and line-transient response. The output capacitor must meet both requirements for minimum amount of capacitance and ESR in all LDOs application.

The HX2101 is designed specifically to work with low ESR ceramic output capacitor in space-saving and performance consideration. Using a ceramic capacitor whose value is at least 1μF with ESR is > 25mΩ on the HX2101 output ensures stability. The HX2101 still works well with output capacitor of other types due to the wide stable ESR range.

Enable Function

The HX2101 features an LDO regulator enable/disable function. To assure the LDO regulator will switch on, the EN turn on control level must be greater than 1volts.

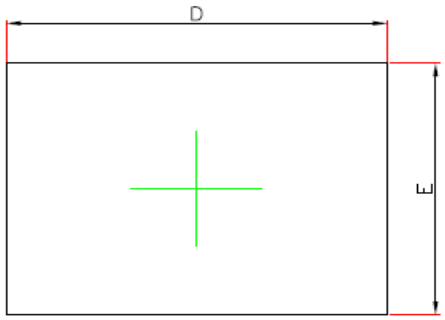
For to protecting the system, the HX2101 have a quick-discharge function. If the enable function is not needed in a specific application, it may be tied to VIN to keep the LDO regulator in a continuously on state.

Current Limit

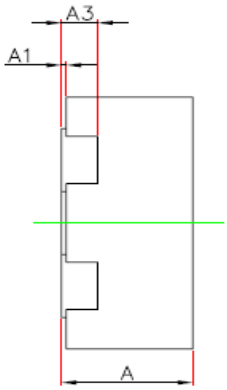
The HX2101 contains an independent current limiter, which monitors and controls the pass transistor's gate voltage, limiting the output current to 0.5A (typ.). The output can be shorted to ground indefinitely without damaging the part.

Packaging Information

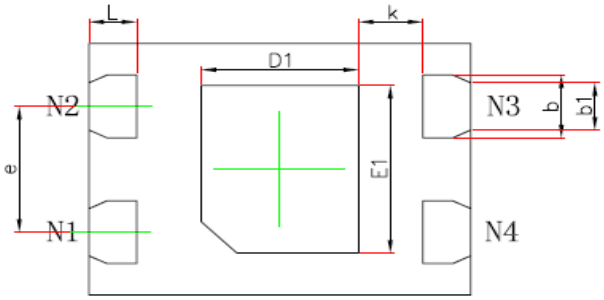
DFN1.2*1.6-4L Package Outline Dimension



TOP VIEW



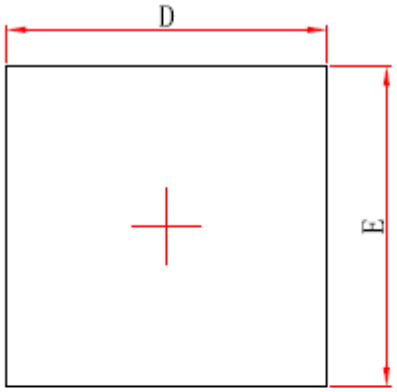
SIDE VIEW



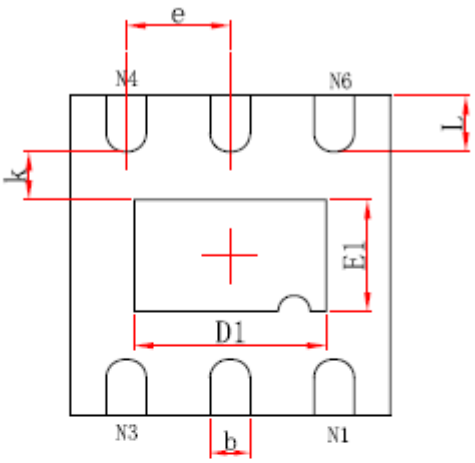
BOTTOM VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN.	MAX.	MIN.	MAX.
A	0.500	0.600	0.020	0.024
A1	0.000	0.050	0.000	0.002
A3	0.152REF.		0.006REF.	
D	1.500	1.700	0.059	0.067
E	1.100	1.300	0.043	0.051
D1	0.560	0.760	0.022	0.030
E1	0.700	0.900	0.028	0.035
b	0.250	0.350	0.010	0.014
b1	0.175	0.275	0.007	0.011
e	0.600TYP.		0.024TYP.	
L	0.150	0.250	0.006	0.010
k	0.200MIN.		0.008TYP.	

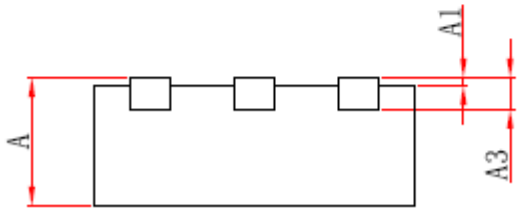
DFN2*2-6L Package Outline Dimension



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	1.924	2.076	0.076	0.082
E	1.924	2.076	0.075	0.083
D1	1.100	1.300	0.043	0.051
E1	0.600	0.800	0.024	0.031
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.007	0.012
e	0.650TYP.		0.026TYP.	
L	0.274	0.426	0.011	0.017

Subject changes without notice