5V 3A Ultralow Dropout Linear Regulator

General Description

The HM6230 is a 3A low dropout linear regulator designed for low dropout and high current applications. This device works with dual supplies, a control input for the control circuitry and a power input as low as 1.0V for providing current to output. It features 3A output current and ultra-low-drop output voltage as well as full protection functions. VOUT can be as low as 0.8V.

The other features include soft start, under voltage protection, current limit protection, Power-On-Reset function, and over temperature protection. The HM6230 is available in DFN3x3-10L and PSOP8 packages.

Ordering Information

Part Number	Package	Body Size
HM6230	DFN3X3 10L ESOP8	

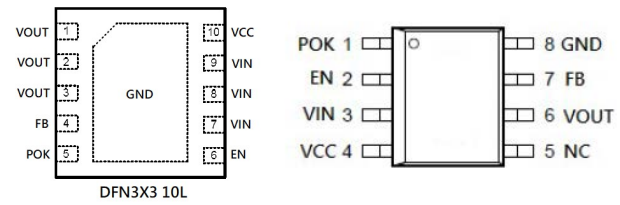
Features

- VIN Range 1.0V to 6.0V
- VOUT is Adjustable (0.8V Min)
- Excellent Line Regulation (0.01%/V typ.)
- Excellent Load Regulation(0.1%/A typ.)
- Dropout Voltage Typically 250 mV at IOUT = 3A
- Internal Thermal Overload Protection
- Internal Short-Circuit Current Limit
- VOUT Under Voltage Protection
- Ceramic Capacitor Stable

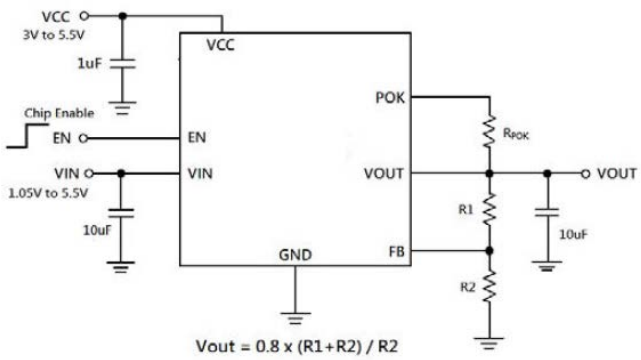
Applications

- Notebook, Netbook, Graphic Cards
- Low Voltage Logic Supplies
- Chipset Supplies
- Server System
- SMPS Post Regulators

Pin Configuration



Typical Application Circuit

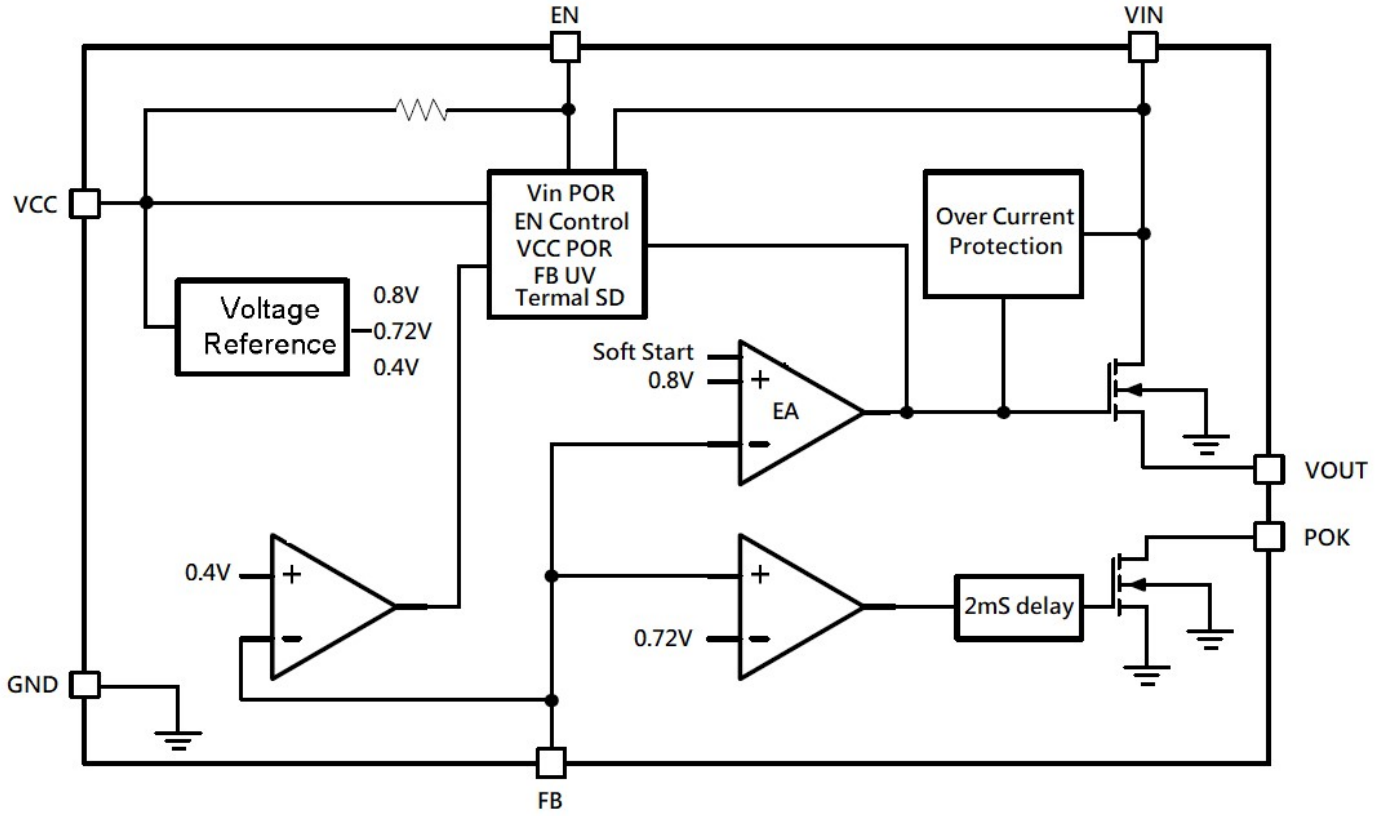


Ceramic Capacitor Stable

Pin Assignment

Pin Name	Pin No. DFN3X3 10L	Pin No. PSOP8	Pin Function
POK	5	1	Power OK indication, open drain output.
FB	4	7	Feedback
VOUT	1, 2, 3	6	Output Voltage pin, the Source of power device.
VIN	7, 8, 9	3	Input Voltage pin, the Drain of power device.
EN	6	2	Enable pin. Internal pull high to VCC
VCC	10	4	Supply input of control circuit.
GND	11(Exposed PAD)	2&(Exposed PAD)	Ground
NC	--	5	Non connect

Function Block Diagram



Absolute Maximum Ratings (Note1)

- VIN ---------- -0.3V to +6.0V
- VCC ---------- -0.3V to +6.0V
- Other pins ---------- -0.3V to (VCC+0.3V)
- Junction Temperature---------- 125°C
- Lead Temperature (Soldering, 10 sec.)---------- 300°C
- Storage Temperature ---------- –65°C to 150°C

Recommended Operating Conditions

- VIN ---------- +1.05V to VCC
- VCC ---------- +3.0V to +5.5V
- Junction Temperature ---------- 0°C to 125°C

Electrical Characteristics

VCC=5V, T_J=25℃, unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Control Input Voltage VCC	VCC	VOUT= VREF	3.0	--	6.0	V
VCC POR Threshold	VCCPOR		2.5	--	2.9	V
VCC POR Hysteresis	VCCHY		--	0.4	--	V
Power Input Voltage VIN	VIN	VOUT= VREF	1.05	--	VCC	V
VIN POR Threshold	VINPOR		0.8	--	1.0	V
VIN POR Hysteresis	VINHY		0.2	--	0.5	V
VIN POR Deglitch Time	TDEG		--	100	--	uS
Control Input Current in Shutdown	IVCCSD	VIN=VCC=5V, VEN=0V	--	10	30	uA
Quiescent Current	IQ	VIN=VCC= VEN =5V, IOUT=0A	--	0.9	1.5	mA
Reference Voltage	VREF	VIN=VCC= VEN =5V, IOUT=0A, VOUT=VREF	0.785	0.8	0.815	V
VIN Line Regulation	VREFLINE	1.05V<VIN<5V, VCC= VEN =5V	--	0.01	0.1	%/V
Load Regulation	VREFLOAD	0A<IOUT<3A, VCC= VEN =5V	--	0.1	0.5	%/A
Dropout Voltage	VDROP	IOUT=3A, VCC=5V, VOUT=1.2V	--	250	360	mV
VOUT Pull Low Resistance	RPULL	VCC= 5V, VEN =0V, Sink =5mA	--	--	150	ohm
Enable High Level	VEN		1.1	--	--	V
Disable Low Level	VSD		--	--	0.3	V
Enable Source Current	IEN	VCC= 5V, VEN =0V	--	5	10	uA
Enable pull high resistor	REN		500K	--	--	ohm
Output Voltage Ramp Up Time	TSS		0.6	1	2	mS

POK Threshold	VPOKH	VFB Rising		92		%
	VPOKL	VFB falling		82		%
POK Sink Voltage	VPOK	Sinking Current = 5mA	--	--	0.4	V
POK Delay Time	TPOKDE	From VOUT>92% to POK rising	1	2	4	mS
OCP Threshold Level	IOCP		3.2	4.5	--	A
Under Voltage Threshold	VUVP	VFB Falling	--	0.15	--	V
Thermal Shutdown Temperature	TSD		--	165	--	°C
Thermal Shutdown Hysteresis	TSDHY		--	30	--	°C

Typical Characteristics

VIN=5V, VCC=5V, V_{OUT}=0.8V, C_{IN}=10uF, C_{OUT}=10uF, T_J=25℃, unless otherwise specified

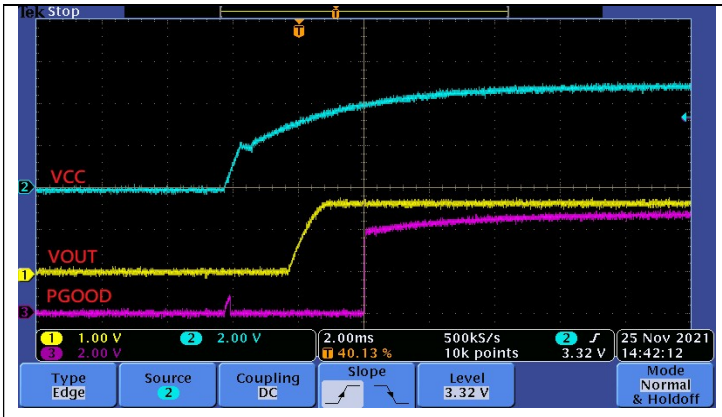


Fig 1. VCC Power ON, IOUT=200mA

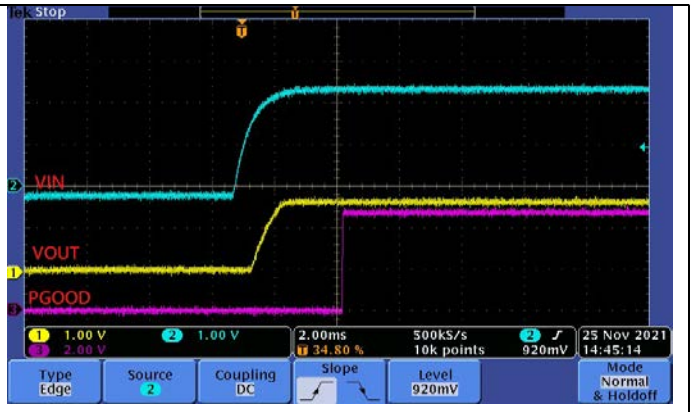


Fig 2. VIN Power ON, IOUT=200mA

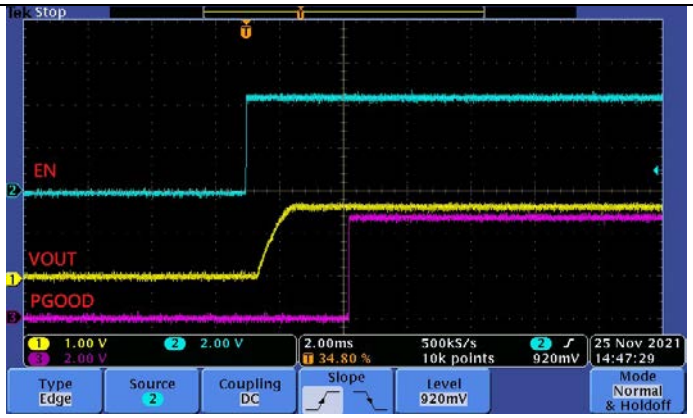


Fig 3. EN Power ON, IOUT=200mA

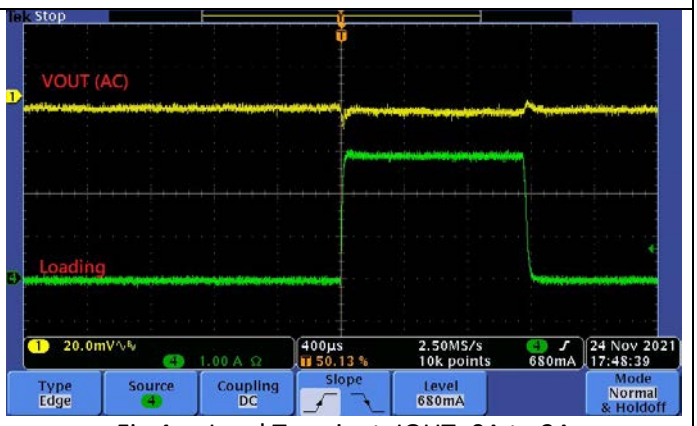


Fig 4. Load Transient, IOUT=0A to 3A

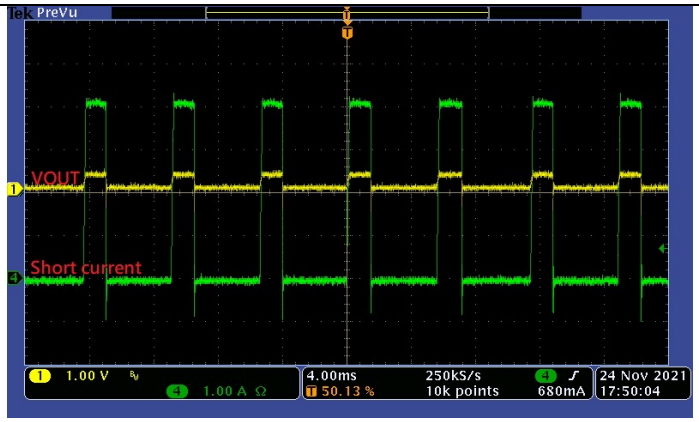


Fig 5. VOUT Short circuit

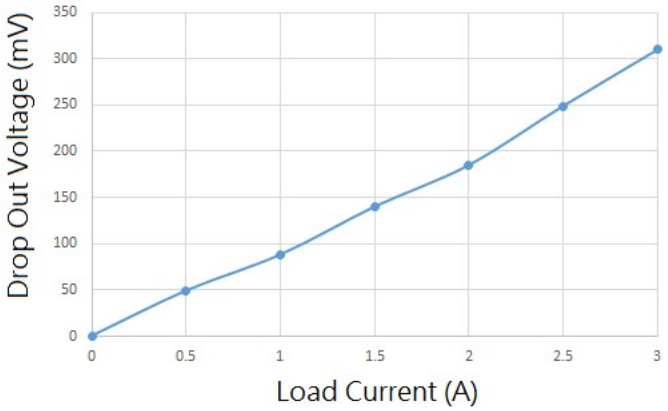
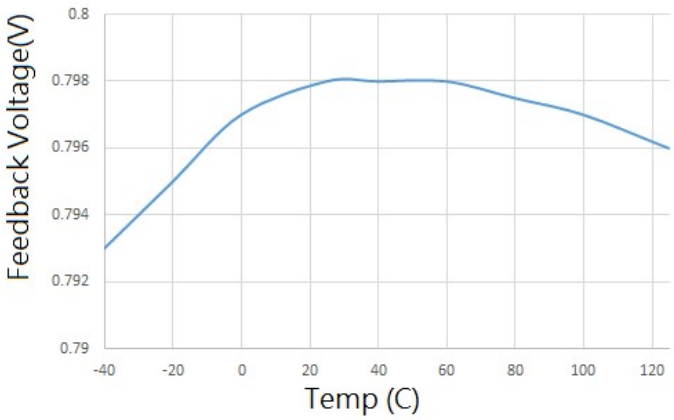
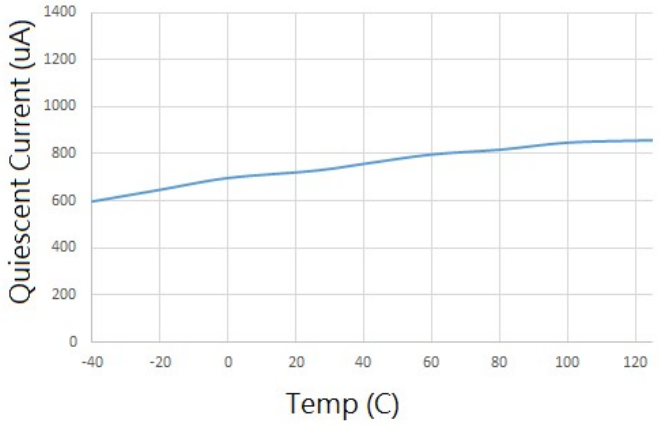


Fig 6. VDROP vs Output Current



FB Voltage vs Temperature



Quiescent Current vs Temperature