5V 3A Ultralow Dropout Linear Regulator

Description

The FLD0530 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 FLD0530 is available in DFN3x3-10L and ESOP8 packages.

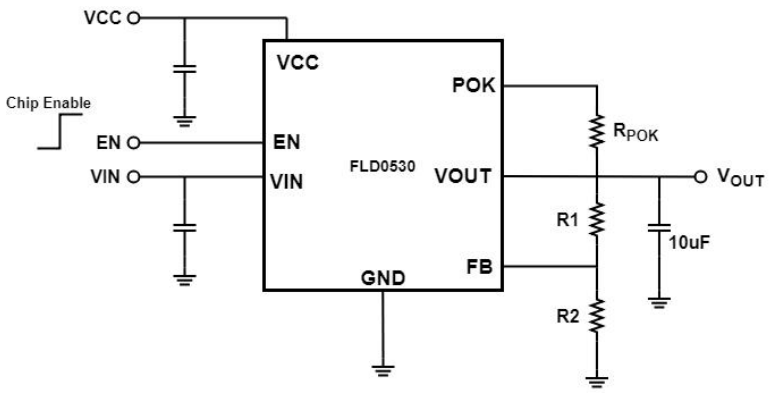
Features

- V_{IN} Range 1V to 6V
- VOUT is Adjustable (0.8V Min)
- Excellent Line Regulation (0.01%/V typ.)
- Excellent Load Regulation(0.1%/A typ.)
- Dropout Voltage Typically 250mV at I_{OUT}=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

TYPICAL APPLICATION



V_{OUT}=0.8*(R1+R2)/R2

Figure 1.Typicla Application for FLD0530

Order Information

Mode	VOUT(V)	Package	Ordering Number	Packing Option
FLD0530	Adj	ESOP8	FLD0530YESOP8G/TR	Tape and Reel,3000
FLD0530	Adj	DFN3x3_10L	FLD0530YDFN3x3G/TR	Tape and Reel,3000

PIN CONFIGURATION

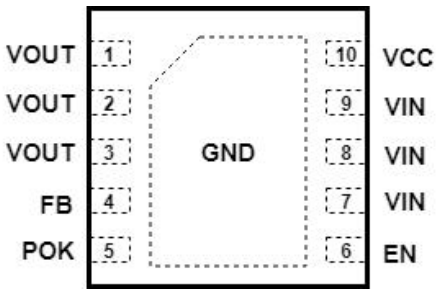


Figure 2. Pin Assignment of FLD0530 Package DFN3x3-10L

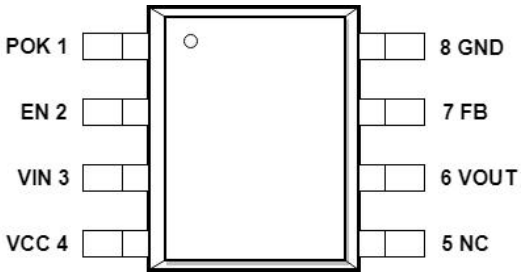


Figure 3. Pin Assignment of FLD0530 Package ESOP8

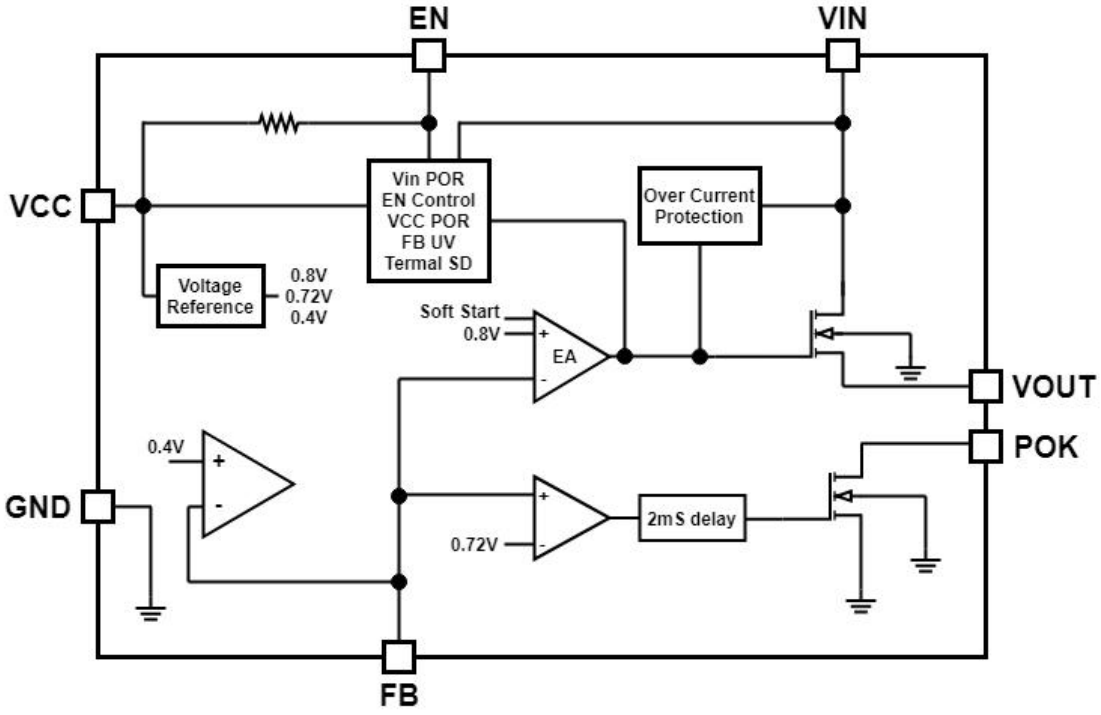
PIN DESCRIPTION

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

Absolute Maximum Ratings

- VIN----------0.3V to +6.5V
- Junction Temperature ----------125℃
- Lead Temperature (Soldering, 10 sec.) ----------300℃
- Storage Temperature----------65℃ to 150℃

FUNCTIONAL Block Diagram



ELECTRICAL CHARACTERISTICS

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

Paramter	Symbol	Conditions	Min	Typ	Max	Unit
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	90	--	94	%
	VPOKL	VFB falling	80	--	84	%
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	--	0.4	--	V
Thermal Shutdown Temperature	TSD		--	165	--	C
Thermal Shutdown	TSDHY		--	30	--	C

TYPICAL PERFORMANCE CHARACTERISTICS

V_{IN}=5V, V_{CC}=5V, C_{IN}=10uF, C_{OUT}=10uF, TJ=25℃, unless otherwise specified

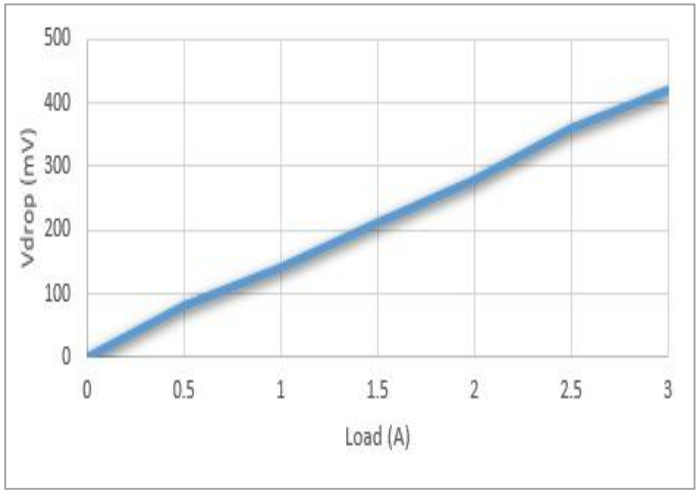


Fig 1. V_{DROP} vs Output Current

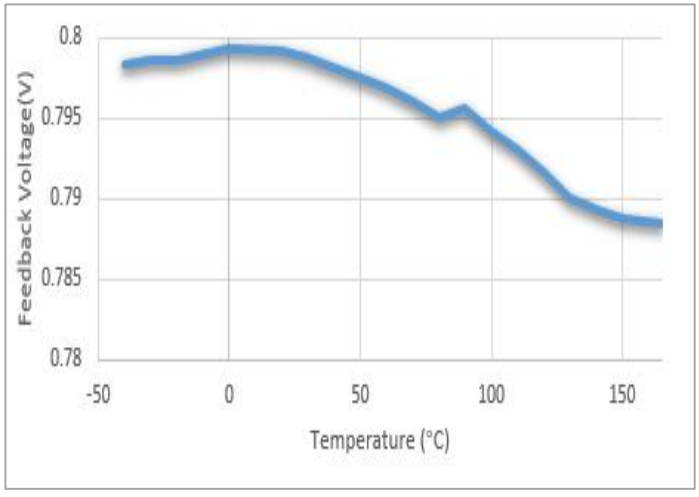


Fig 2. FB Voltage vs Temperature

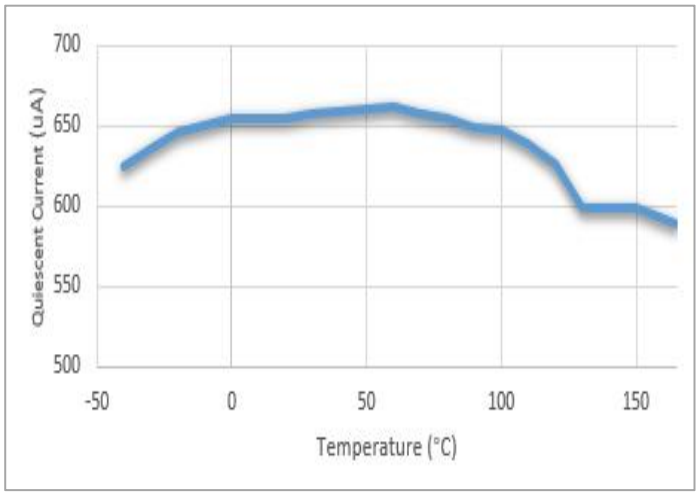


Fig 3. Quiescent Current vs Temperature

Operating Waveforms

V_{IN}=4V, V_{CC}=4V, V_{OUT}=1.8V, C_{IN}=10uF, C_{OUT}=10uF, TJ=25℃, unless otherwise specified

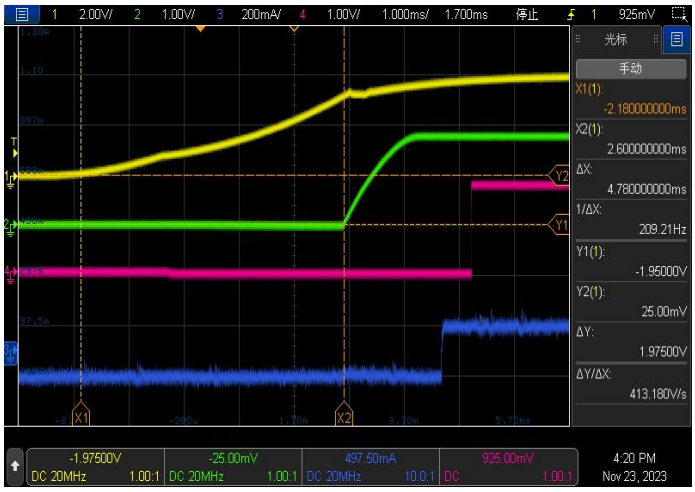


Fig 1. V_{CC} Power ON, I_{OUT}=200mA
CH1:V_{CC},2V/Div,DC; CH2:V_{OUT},1V/Div,DC
CH3:V_{POK},1V/Div,DC; CH2:I_{OUT},200mA/Div,DC

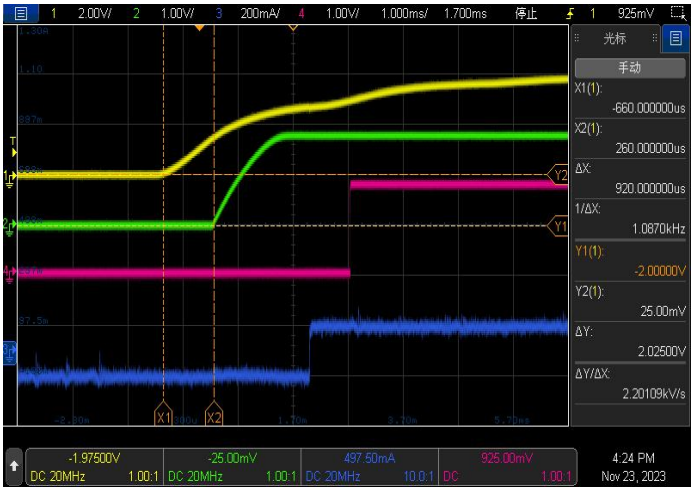


Fig 2. V_{IN} Power ON, I_{OUT}=200mA
CH1:V_{IN},2V/Div,DC; CH2:V_{OUT},1V/Div,DC
CH3:V_{POK},1V/Div,DC; CH2:I_{OUT},200mA/Div,DC

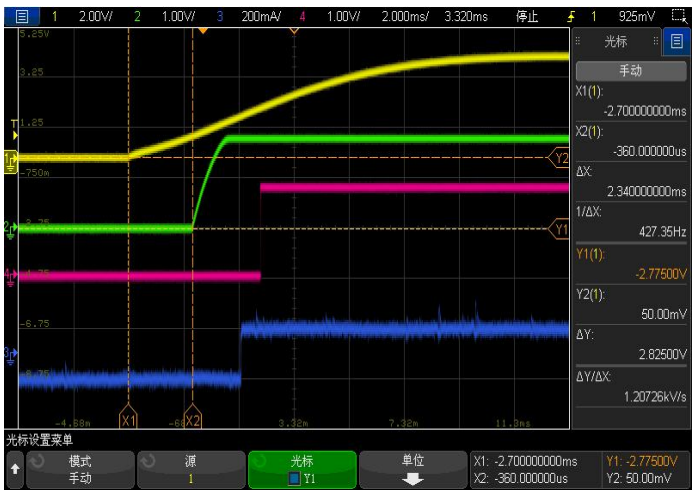


Fig 3. EN Power ON, I_{OUT}=200mA

CH1:V_{EN},2V/Div,DC; CH2:V_{OUT},1V/Div,DC

CH3:V_{POK},1V/Div,DC; CH2:I_{OUT},200mA/Div,DC

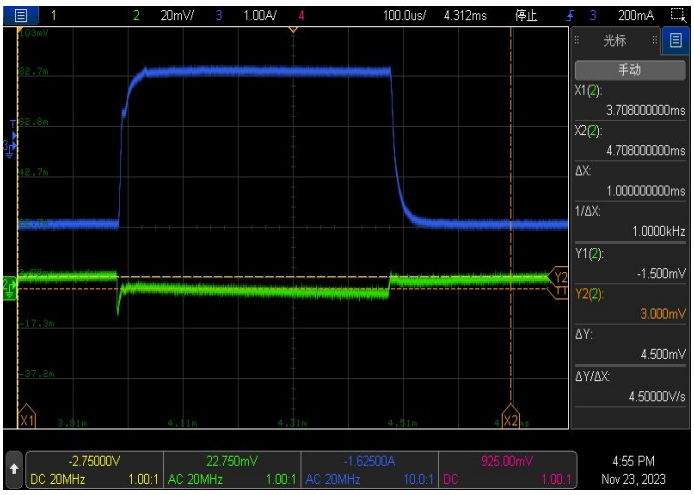
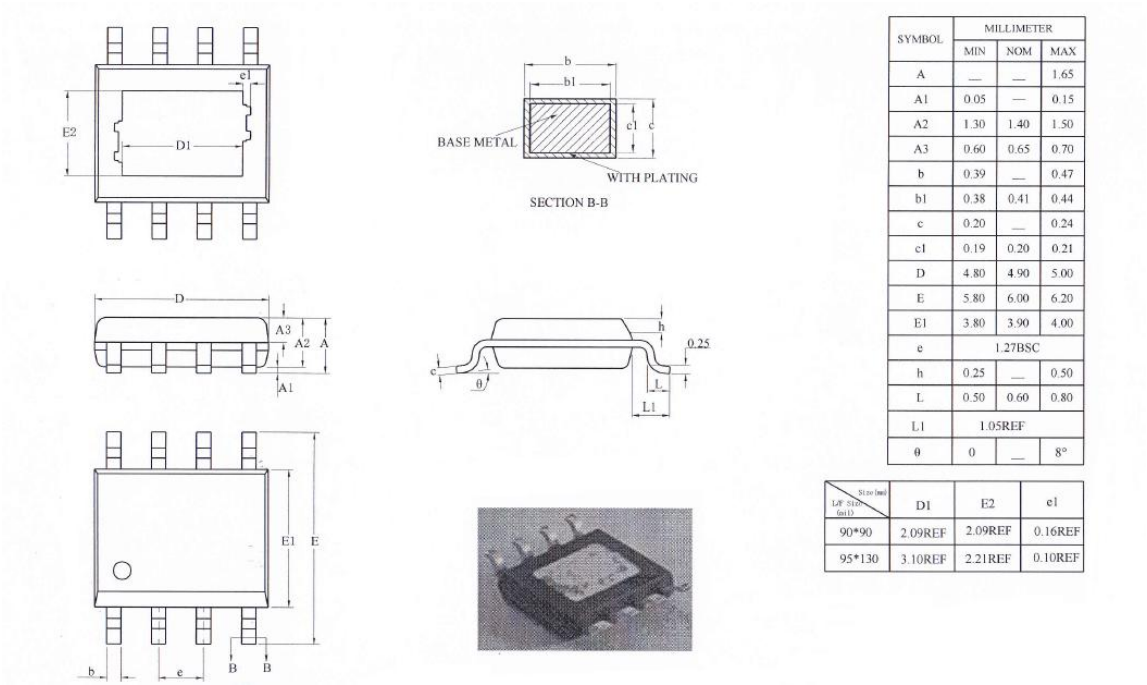


Fig 4. Load Transient, I_{OUT}=0A to 3A

Package Outline Dimensions(All dimensions in mm.)

(1) Package Type: ESOP8



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.65
A1	0.05	—	0.15
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
b	0.39	—	0.47
b1	0.38	0.41	0.44
c	0.20	—	0.24
c1	0.19	0.20	0.21
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
e	1.27BSC		
h	0.25	—	0.50
L	0.50	0.60	0.80
L1	1.05REF		
θ	0	—	8°

Size (mil) / LF Size (mil)	D1	E2	e1
90*90	2.09REF	2.09REF	0.16REF
95*130	3.10REF	2.21REF	0.10REF