1A Low Dropout Positive Voltage Regulator

PL5033-XXXFP3

Features

- Adjustable or Fixed Output
- Output Current of 1A
- Low Dropout, 1.4V max at 1A Output Current
- Good Noise Rejection
- Output Current Limiting
- Built-in Thermal Shutdown
- Fast Transient Response

Description

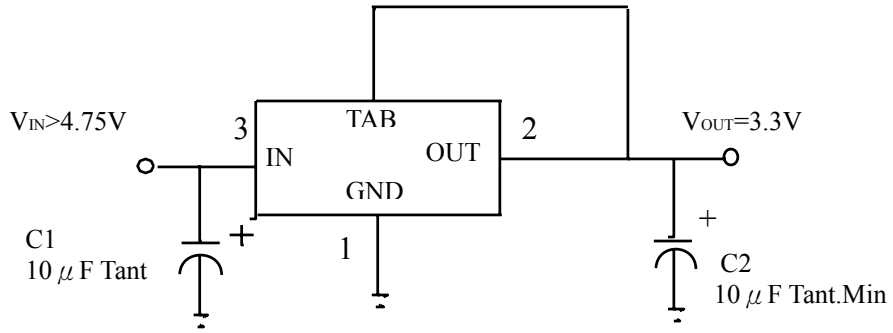
The PL5033 series of positive adjustable and fixed regulators are designed to provide 1A with high efficiency. All internal circuitry is designed to operate down to 1.4V input to output differential. The product is specifically designed to provide well-regulated supply for low-voltage IC application such as high-speed bus termination and low current 3.3V logic supply, and other applications such as VGA cards.

Applications

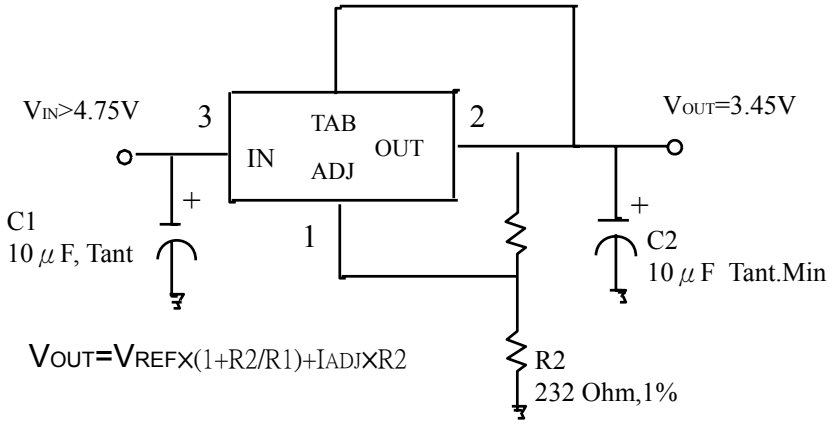
- High Efficiency Linear Regulators
- Post Regulators for Switching Supplies
- Adjustable Power Supply

Typical Application Data

Fixed Voltage Regulator



Adjustable Voltage Regulator

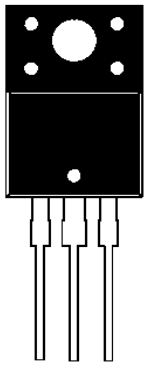


$V_{OUT}=V_{REF}x(1+R2/R1)+I_{ADJ}\times R2$

Notes:
1) C1 needed if device is far from filter capacitors
2) C2 minimum value required for stability

Package Information

TO-220FP



G O I

Pin	Name
1	ADJ/GND
2	OUTPUT
3	INPUT

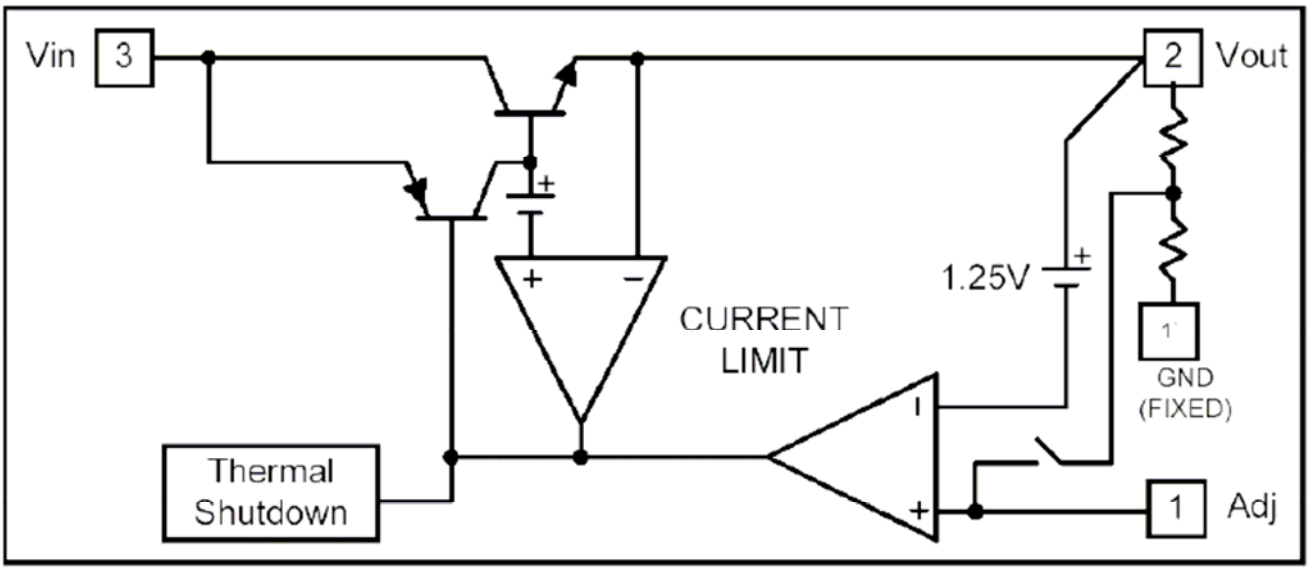
Absolute Maximum Ratings

Symbol	Parameter	Ratings	Units
P_D	Power Dissipation	Internally Limited	W
V_{IN}	Input Voltage	-0.3 ~ +15	V
T_{OPR}	Operating Junction Temperature Range	0 ~ +125	℃
T_{STG}	Storage Temperature	-65 ~ +150	℃
T_{MJ}	Maximum Junction Temperature	150	℃

Device Selection Guide

Device	Output Voltage
PL5033-ADJ	Adjustable
PL5033-1.5	1.5V
PL5033-1.8	1.8V
PL5033-2.5	2.5V
PL5033-3.3	3.3V
PL5033-5.0	5.0V

Block Diagram



Electrical Characteristics @ I_O=10mA,T_J=25℃, unless otherwise specified

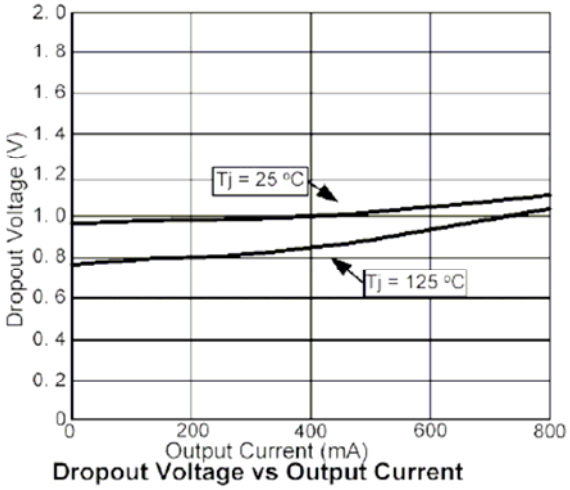
Parameter	Device	Test Conditions	Min	Typ	Max	Units
Reference voltage	Adj version	V_{IN}-V_{OUT}=1.5V	1.225	1.250	1.275	V
Output Voltage	PL5033-1.5	3.0V≤V_{IN}≤12V	1.470	1.500	1.530	V
	PL5033-1.8	3.3V≤V_{IN}≤12V	1.764	1.800	1.836	V
	PL5033-2.5	4.0V≤V_{IN}≤12V	2.450	2.500	2.550	V
	PL5033-3.3	4.8V≤V_{IN}≤12V	3.235	3.300	3.365	V
	PL5033-5.0	6.5V≤V_{IN}≤12V	4.900	5.000	5.100	V
Line Regulation	All version	V_{OUT}+1.5V≤V_{IN}≤12V	-	-	0.2	%
Load Regulation (Note 1, 2)	PL5033-ADJ	V_{IN}=3.3V, Vadj=0, 10mA≤I_O≤1A	-	-	1	%
	PL5033-1.5	V_{IN}=3.0V, 0mA≤I_O≤1A	-	12	15	mV
	PL5033-1.8	V_{IN}=3.3V, 0mA≤I_O≤1A	-	15	18	mV
	PL5033-2.5	V_{IN}=4.0V, 0mA≤I_O≤1A	-	20	25	mV
	PL5033-3.3	V_{IN}=5.0V, 0mA≤I_O≤1A	-	26	33	mV
	PL5033-5.0	V_{IN}=8.0V, 0mA≤I_O≤1A	-	40	50	mV
Dropout Voltage (V_{IN}-V_{OUT})	All version	I_O=0.1A, Vin= Vout+1.3V	-	1.06	1.2	V
		I_O=0.5A, Vin= Vout+1.3V	-	1.16	1.25	V
		I_O=1.0A, Vin= Vout+1.3V	-	1.24	1.4	V
Current Limit	All version	V_{IN}-V_{OUT}=5V	1.1	-	-	A
Minimum Load Current	Adj version	V_{IN}=5V	-	5	10	mA
Adjust Pin Current	Adj version	V_{IN}=12V, I_O=10mA	-	50	100	μA
Quiescent Current	Fixed version	V_{IN}=12V, I_O=0mA	-	-	12	mA

Thermal Regulation	All version	T_A=25℃, 30ms pulse	-	0.008	0.04	%/W
Ripple Rejection	All version	f=120Hz, V_{IN}=V_{OUT}+3V, I_O= 1A, C_{OUT}=25μF tantalum	-	60	70	dB
Temperature Stability	All version	I_O= 10mA	-	0.5	-	%
Thermal Resistance, Junction to Ambient(No heat sink, no air flow)	All version	No heat sink, no air flow	-	98	-	℃/W
Thermal Resistance, Junction to Case	All version	Control Circuitry/ Power transistor	-	15	-	℃/W

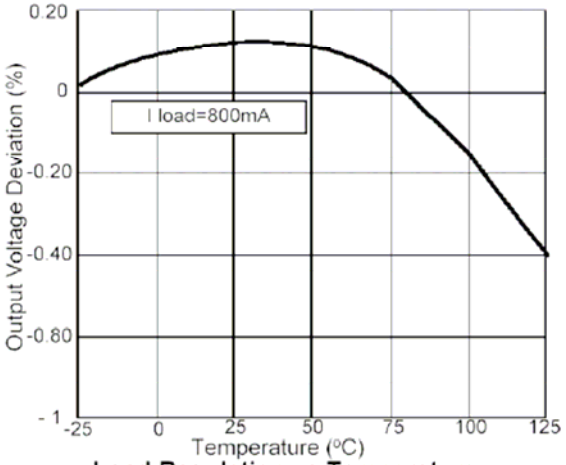
Note : 1.See thermal regulation specifications for changes in output voltage due to heating effects. Line and load regulation are measured at a constant junction temperature by low duty cycle pulse testing. Load regulation is measured at the output lead 1/18" from the package.

2. Line and load regulation are guaranteed up to the maximum power dissipation of 15W. Power dissipation is determined by the difference in input and output and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

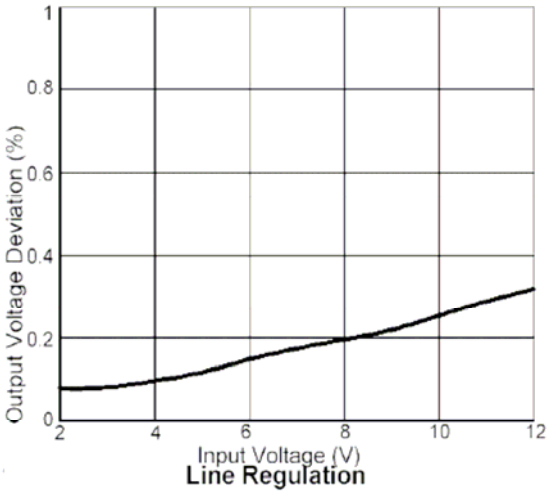
Characteristic Curves



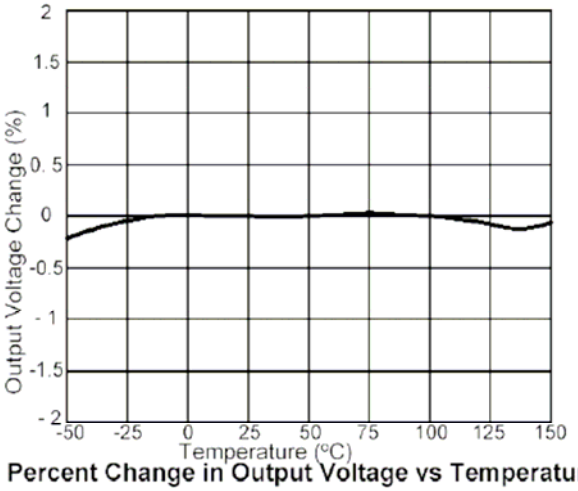
Dropout Voltage vs Output Current



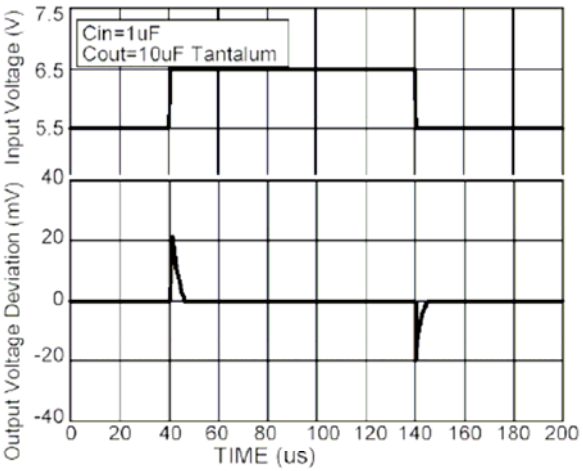
Load Regulation vs Temperature



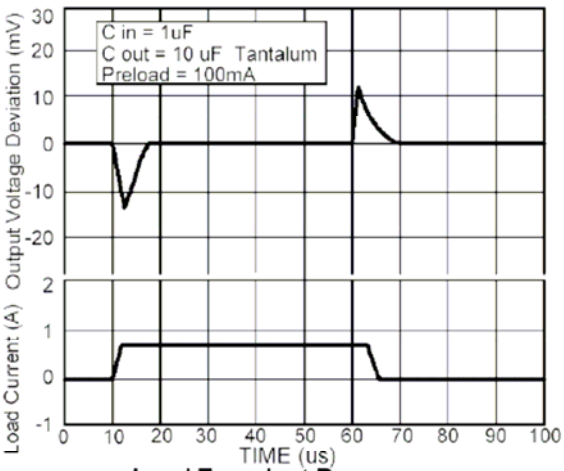
Line Regulation



Percent Change in Output Voltage vs Temperature

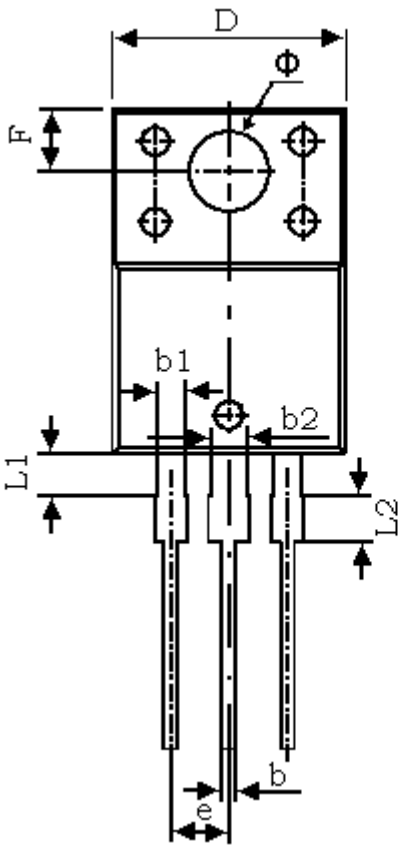


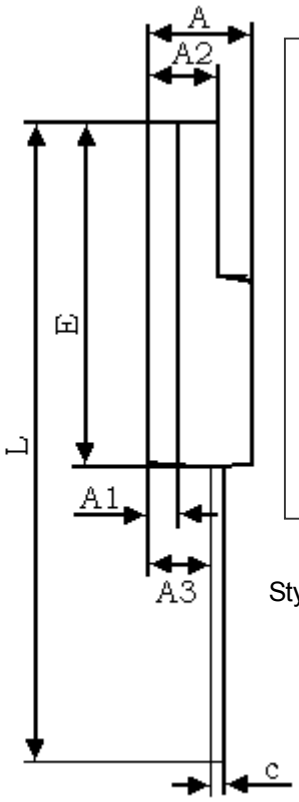
Line Transient Response



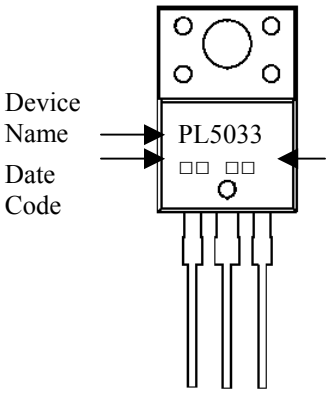
Load Transient Response

TO-220FP Dimension





Marking:



Style: Pin 1.GND/ADJ 2.Output 3.Input 4.Output

3-Lead TO-220FP Plastic Package
CYStek Package Code: FP

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.169	0.185	4.300	4.700	D	0.392	0.408	9.960	10.360
A1	0.051 REF		1.300 REF		E	0.583	0.598	14.800	15.200
A2	0.110	0.126	2.800	3.200	e	0.100 TYP		2.540 TYP	
A3	0.098	0.114	2.500	2.900	F	0.106 REF		2.700 REF	
b	0.020	0.030	0.500	0.750	Φ	0.138 REF		3.500 REF	
b1	0.043	0.053	1.100	1.350	L	1.102	1.118	28.000	28.400
b2	0.059	0.069	1.500	1.750	L1	0.067	0.075	1.700	1.900
c	0.020	0.030	0.500	0.750	L2	0.075	0.083	1.900	2.100

Notes: 1.Controlling dimension: millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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