3-TERMINAL 1.5A POSITIVE ADJUSTABLE REGULATOR

The KIA317F/FP/PI/S is adjustable 3-terminal positive voltage regulator capable of supplying in excess of 1.5A over a 1.25V to 37V output range. This is exceptionally easy to use and require only two external resistors to set the output voltage. Further, both line and load regulation are better than standard fixed regulators.

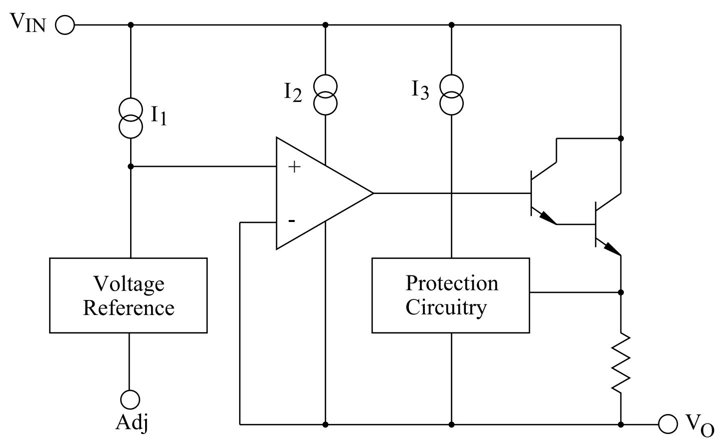
FEATURES

· Adjustable output between 1.25V and 37V
· Guaranteed 1.5A output current
· Line regulation typically 0.001%/V
· Load regulation typically 0.1%
· 80dB ripple rejection (with Cadj)
· Internal thermal overload protection
· Internal short-circuit current limiting
· Output transistor safe-area compensation

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC			SYMBOL	RATING	UNIT
Input-Output Voltage Differential			V_{IN}	40	V
Output Current			I_{OUT}	1.5	A
Power Dissipation (No Heatsink)	F	DPAK	P_D	1.3	W
	PI	TO-22IS		2.0	
Maximum Junction Temperature			$T_{j(max)}$	150	℃
Operating Junction Temperature			T_{opr}	-30 125	℃
Storage Temperature			T_{stg}	-65 150	℃
Lead Temperature			Tlead	230	℃

BLOCK DIAGRAM



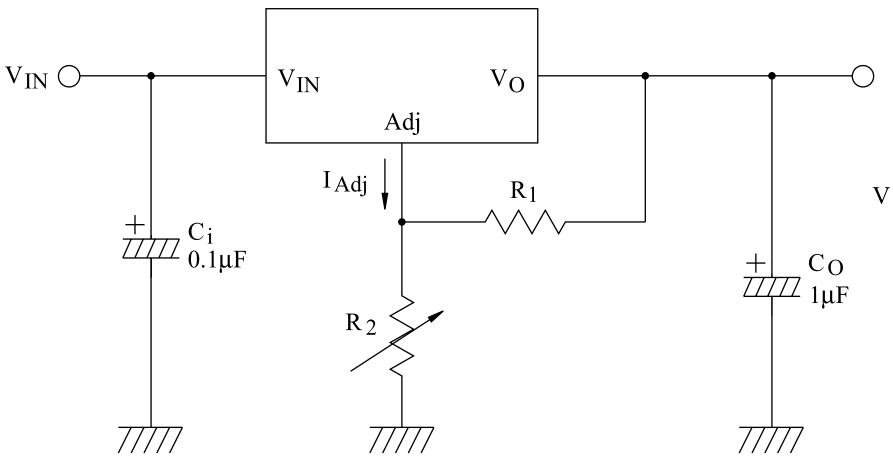
ELECTRICAL CHARACTERISTICS (Ta=25℃)

(V_I-V_O=5V, I_O=0.5A, 0℃≤Tj≤125℃, I_{MAX}=1.5A, unless otherwise specified.)

CHARACTERISTIC	SYMBOL	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Line Regulation	ΔV_O(Line)	Ta=25℃, Io=10mA	3V≤Vin-Vout≤40V	-	0.01	0.04	%/V
		Ta=0 125℃, Io=10mA		-	0.02	0.07	
Load Regulation	ΔV_O(Load)	Ta=25℃,	10mA≤Iout≤I_{MAX}	-	0.1	0.5	%
		Ta=0 125℃,		-	0.3	1.5	
Adjustable Pin Current	I_{Adj}			-	50	100	μA
Adjustable Pin Current Change	ΔI_{Adj}	10mA≤Io≤I_{MAX}, 3V≤Vin-Vout≤40V		-	0.2	5	μA
Reference Voltage	V_{ref}	10mA≤Io≤I_{MAX}, 3V≤Vin-Vout≤40V, P≤P_{MAX}		1.20	1.25	1.30	V
Temperature Stability	ST_T	T_{Min}≤Tj≤T_{MAX}		-	1	-	%
Minimum Load Current to Maintain Regulation	$Io_{(MIN)}$	(Vin-Vout)=40V		-	3.5	10	mA
Current Limit	$Io_{(MAX)}$	(Vin-Vout)≤15V, P≤P_{MAX}		1.5	2.2	3.4	A
		(Vin-Vout)≤40V, P≤P_{MAX}, Ta=25℃		0.15	0.4	-	A
Output Noise Voltage	V_{NO}	Ta=25℃, 10H_Z≤f≤10k$H_{Z,}$ % of Vout		-	0.0003	-	%
Ripple Rejection Ratio	RR	Vo=10V, f=120H_Z		-	65	-	dB
		C_{Adj}=10μF		66	80	-	
Long Term Stability	ST	Ta=25℃ for end point measurement, 1000 Hr		-	0.3	1	%

Note : Load and line regulation are specified at constant junction temperature.
Change in Vo due to heating effects must be taken into account separately. Pulse testing with low duty is used.

TYPICAL APPLICATION (PROGRAMMABLE REGULATOR)



$$V_{OUT} = 1.25V\left(1 + \frac{R_2}{R_1}\right) + I_{Adj}\ R_2$$

Ci is required when regulator is located an appreciable distance from power supply filter.

Co is not needed for stability, however, in the range of 1μF to 100μF of aluminum or tantalum electrolytic are commonly used to provide improved output impedance and rejection of transients.

Since I_{Adj} is controlled to less then 100μA, the error associated with this term is negligible in most applications.

Fig1. Load Regulation

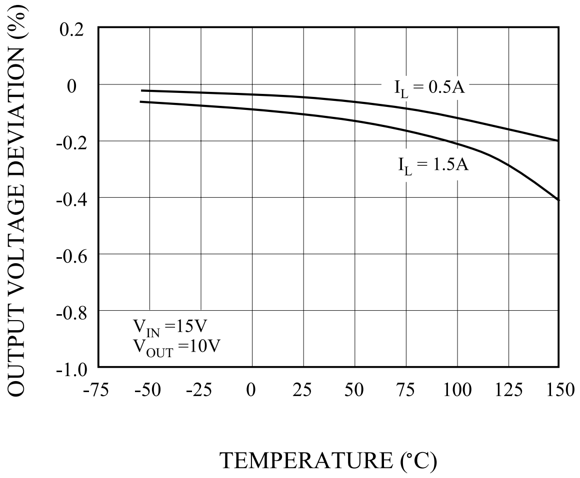


Fig2. Current Limit

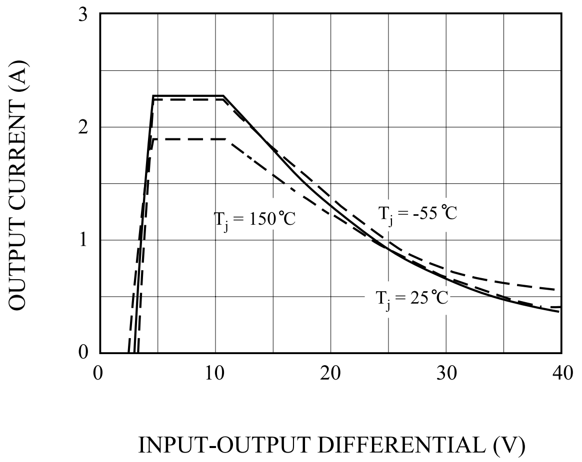


Fig3. Adjustment Current

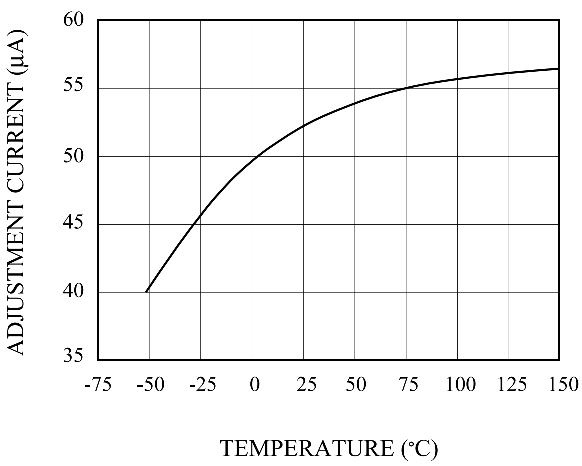


Fig4. Dropout Voltage

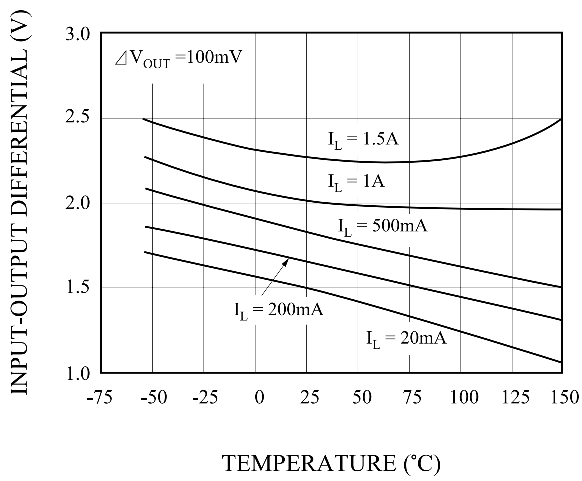


Fig5. Temperature Stability

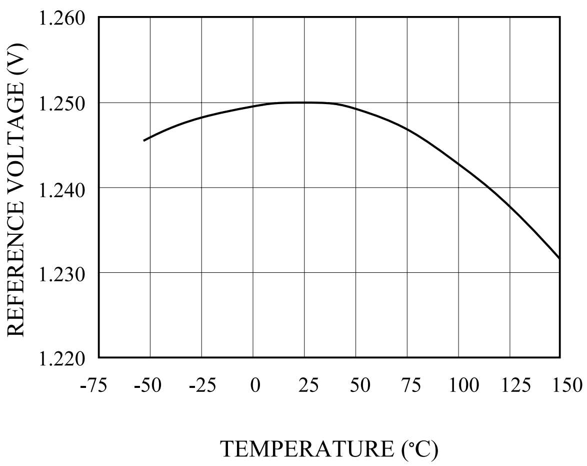


Fig6. Minimum Operating Current

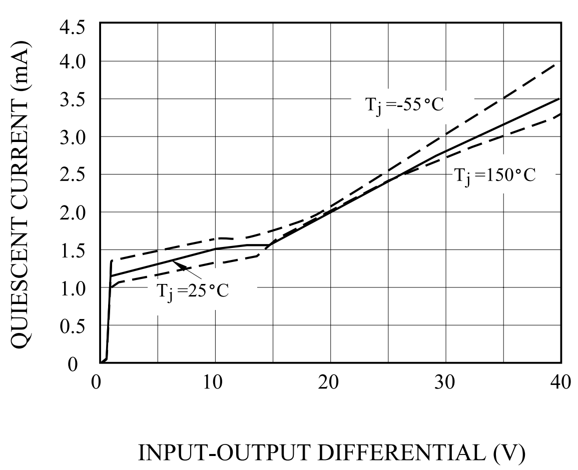


Fig7. Ripple Rejection

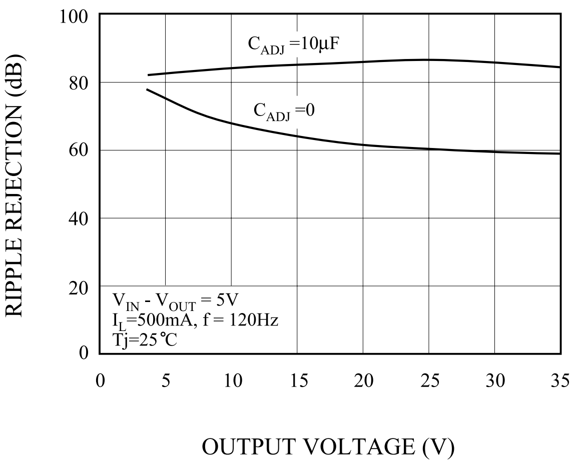


Fig8. Ripple Rejection

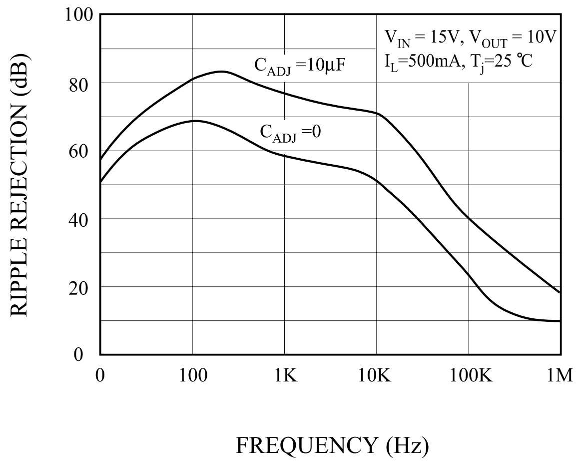


Fig9. Ripple Rejection

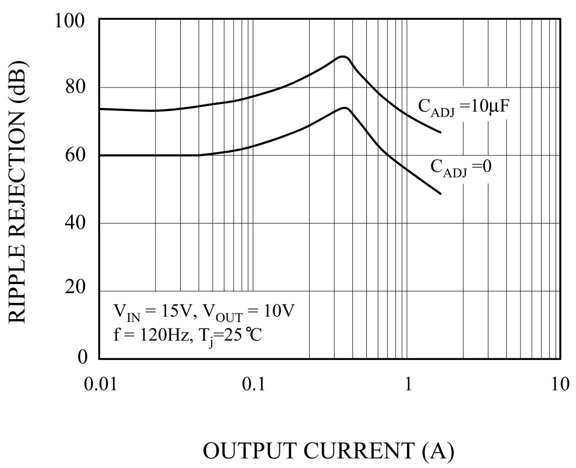


Fig10. Output Impedance

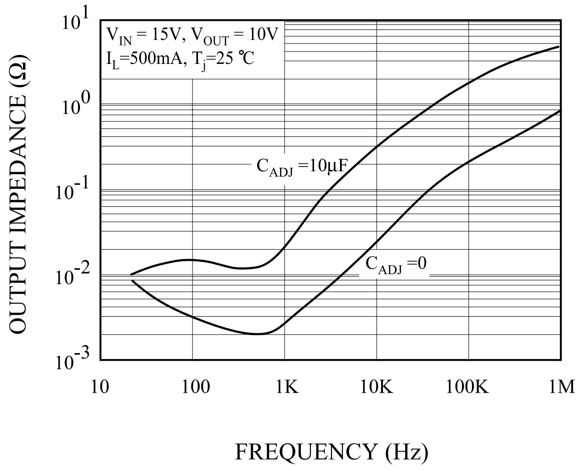


Fig11. Line Transient Response

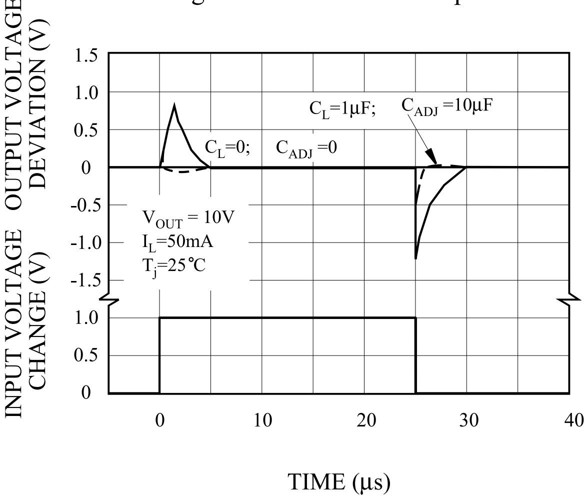


Fig12. Line Transient Response

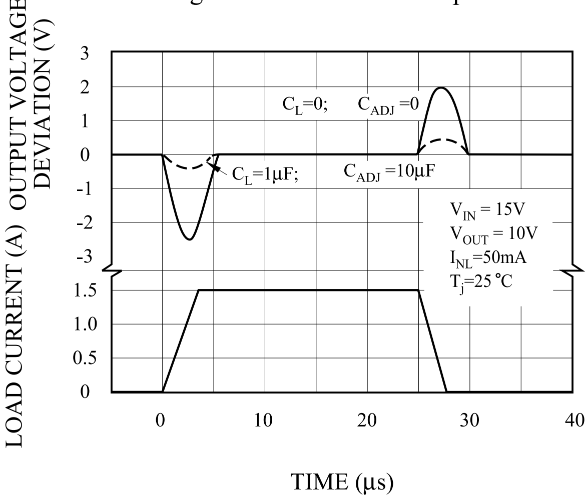


Fig13. Power Dissipation-2 (DPAK)

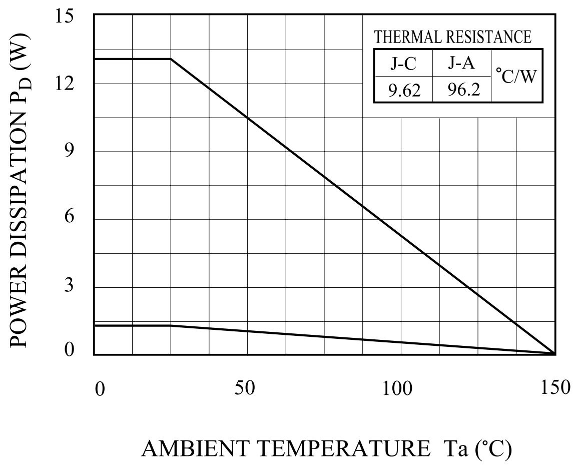
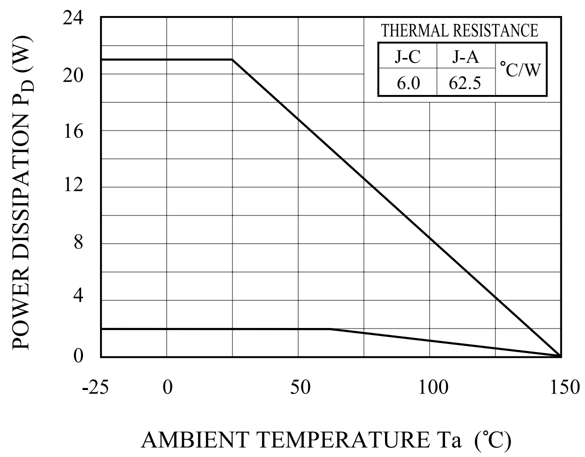
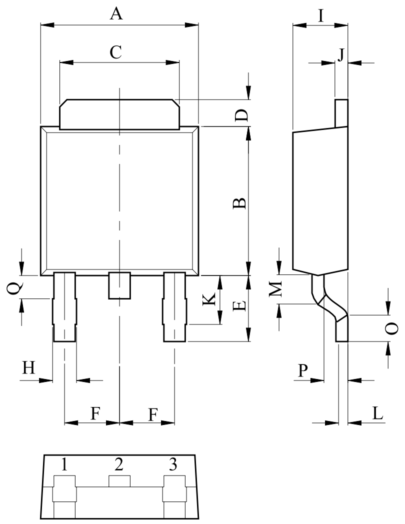


Fig14. Power Dissipation-1 (TO-220IS)

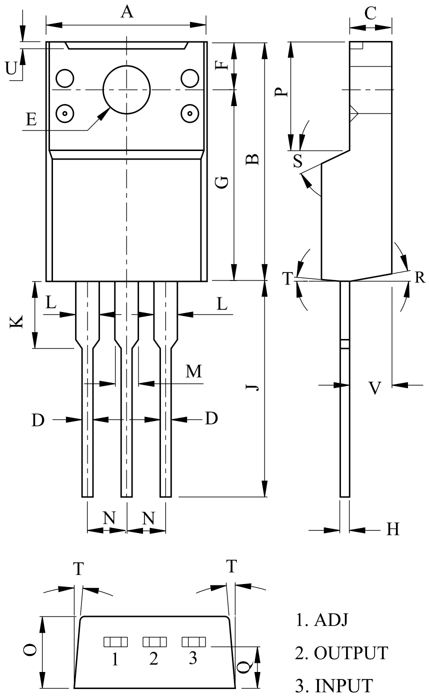




DIM	MILLIMETERS
A	6.60±0.2
B	6.10±0.2
C	5.0±0.2
D	1.10±0.2
E	2.70±0.2
F	2.30±0.1
H	1.00 MAX
I	2.30±0.2
J	0.5±0.1
K	2.00±0.20
L	0.50±0.10
M	0.91±0.10
O	0.90±0.1
P	1.00±0.10
Q	0.95 MAX

1. ADJ
2. OUTPUT
3. INPUT

DPAK



DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	2.70±0.30
D	0.85 MAX
E	Φ3.20±0.20
F	3.00±0.30
G	12.30 MAX
H	0.75 MAX
J	13.60±0.50
K	3.90 MAX
L	1.20
M	1.30
N	2.54
O	4.50±0.20
P	6.80
Q	2.60±0.20
R	10°
S	25°
T	5°
U	0.5
V	2.60±0.15

1. ADJ
2. OUTPUT
3. INPUT

TO-220IS