

3-TERMINAL 1.5A POSITIVE ADJUSTABLE REGULATOR

The KIA317F/PI 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.

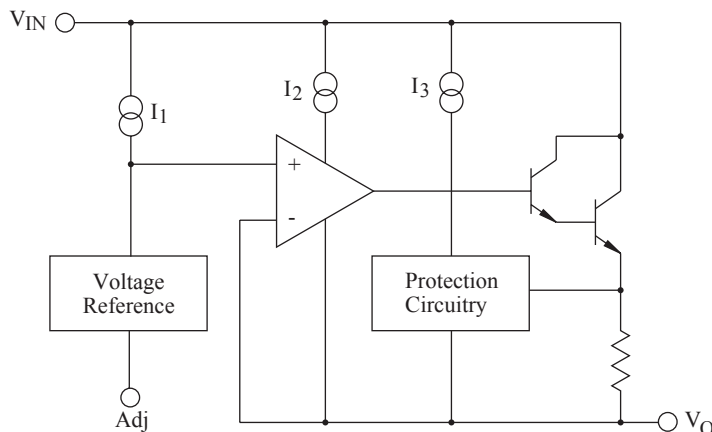
FEATURES

- 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
- Suffix U : Qualified to AEC-Q100
ex) KIA317F-RTF/PU

MAXIMUM RATINGS (Ta=25°C)

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, DPAK(3)	P_D	1.3	W
	PI TO-22IS		2.0	
Operating Junction Temperature		T_j	-40 ~ 150	°C
Operating Temperature		T_{opr}	-40 ~ 125	°C
Storage Temperature		T_{stg}	-65 ~ 150	°C
Lead Temperature		T_{lead}	230	°C

BLOCK DIAGRAM



KIA317F/PI

ELECTRICAL CHARACTERISTICS (Ta=25°C)

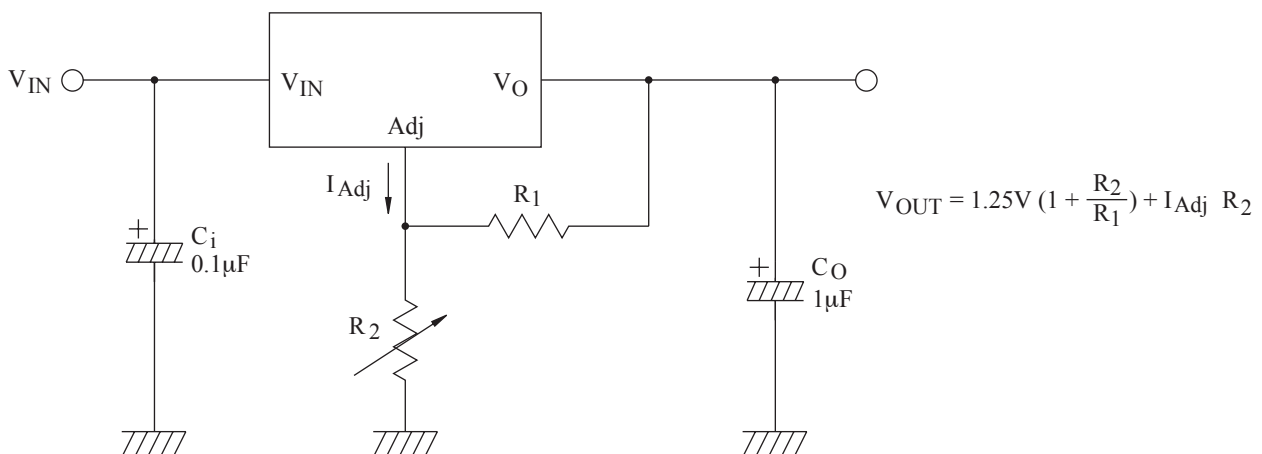
(V_I-V_O=5V, I_O=0.5A, 0°C ≤ T_j ≤ 125°C, I_{MAX}=1.5A, unless otherwise specified.)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Line Regulation	ΔV _O (Line)	Ta=25°C, I _O =10mA	3V ≤ Vin-Vout ≤ 40V	-	0.01	0.04	% / V
		Ta=0 ~ 125°C, I _O =10mA		-	0.02	0.07	
Load Regulation	ΔV _O (Load)	Ta=25°C,	10mA ≤ Iout ≤ I _{MAX}	-	0.1	0.5	%
		Ta=0 ~ 125°C,		-	0.3	1.5	
Adjustable Pin Current	I _{Adj}		-	50	100	μA	
Adjustable Pin Current Change	ΔI _{Adj}	10mA ≤ I _O ≤ I _{MAX} , 3V ≤ Vin-Vout ≤ 40V	-	0.2	5	μA	
Reference Voltage	V _{ref}	10mA ≤ I _O ≤ I _{MAX} , 3V ≤ Vin-Vout ≤ 40V, P ≤ P _{MAX}	1.20	1.25	1.30	V	
Temperature Stability	ST _T	T _{Min} ≤ T _j ≤ T _{MAX}	-	1	-	%	
Minimum Load Current to Maintain Regulation	I _{O(MIN)}	(Vin-Vout)=40V	-	3.5	10	mA	
Current Limit	I _{O(MAX)}	(Vin-Vout) ≤ 15V, P ≤ P _{MAX}	1.5	2.2	3.4	A	
		(Vin-Vout) ≤ 40V, P ≤ P _{MAX} , Ta=25°C	0.15	0.4	-	A	
Output Noise Voltage	V _{NO}	Ta=25°C, 10Hz ≤ f ≤ 10kHz, % of Vout	-	0.0003	-	%	
Ripple Rejection Ratio	RR	V _O =10V, f=120Hz	-	65	-	dB	
		C _{Adj} =10μF	66	80	-		
Long Term Stability	ST	Ta=25°C for end point measurement, 1000 Hr	-	0.3	1	%	

Note : Load and line regulation are specified at constant junction temperature.

Change in V_O due to heating effects must be taken into account separately. Pulse testing with low duty is used.

TYPICAL APPLICATION (PROGRAMMABLE REGULATOR)



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

C_o 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 than 100μA, the error associated with this term is negligible in most applications.

Fig1. Load Regulation

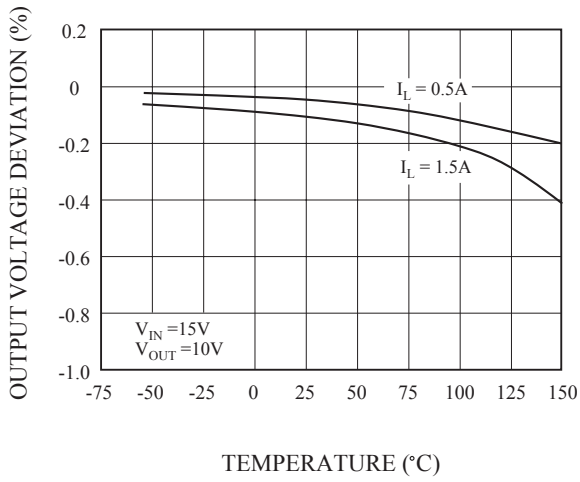


Fig2. Current Limit

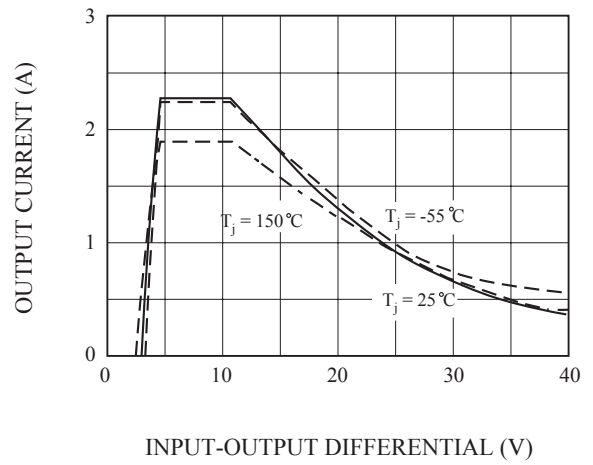


Fig3. Adjustment Current

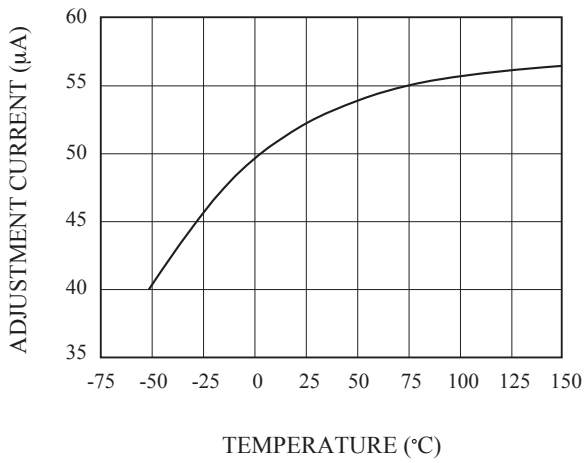


Fig4. Dropout Voltage

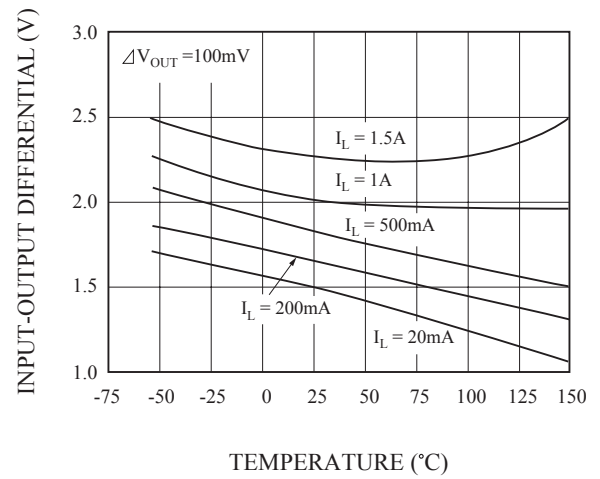


Fig5. Temperature Stability

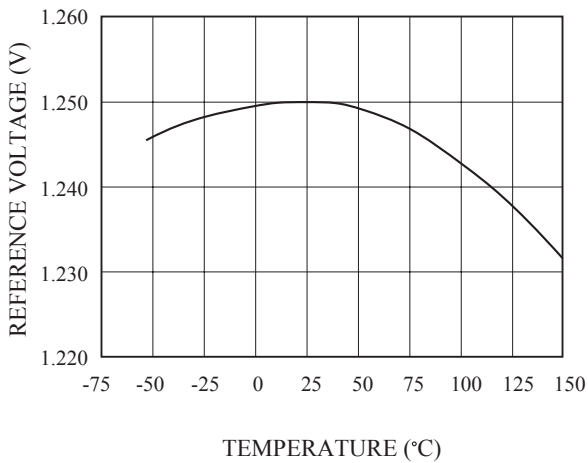


Fig6. Minimum Operating Current

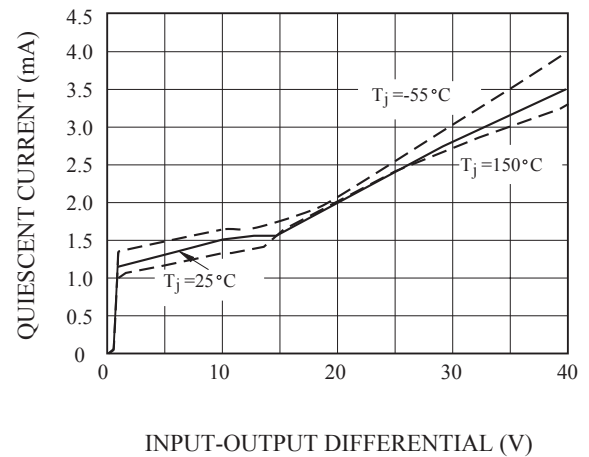


Fig7. Ripple Rejection

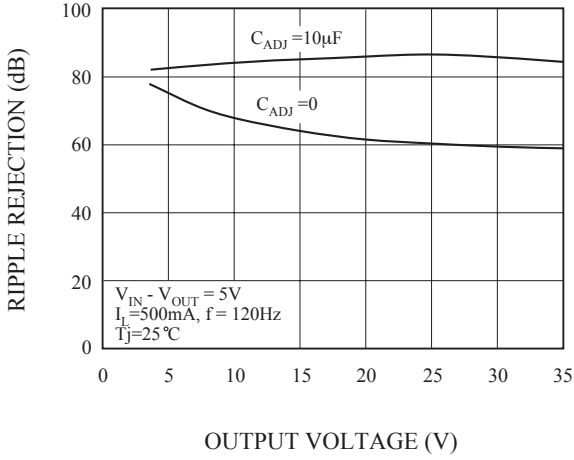


Fig8. Ripple Rejection

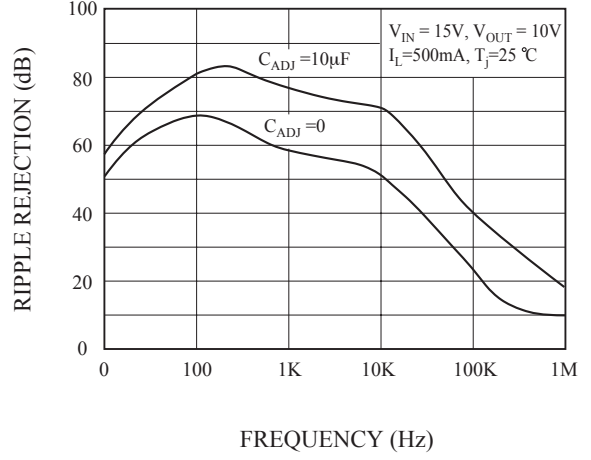


Fig9. Ripple Rejection

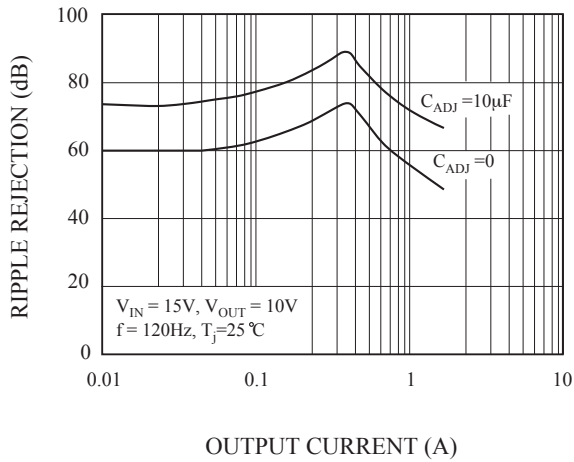


Fig10. Output Impedance

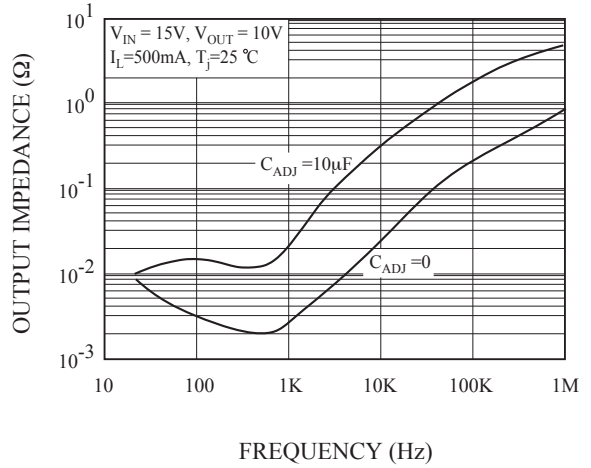


Fig11. Line Transient Response

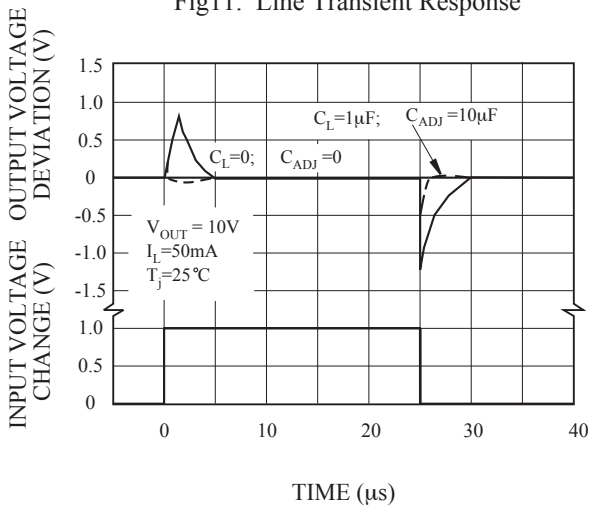


Fig12. Line Transient Response

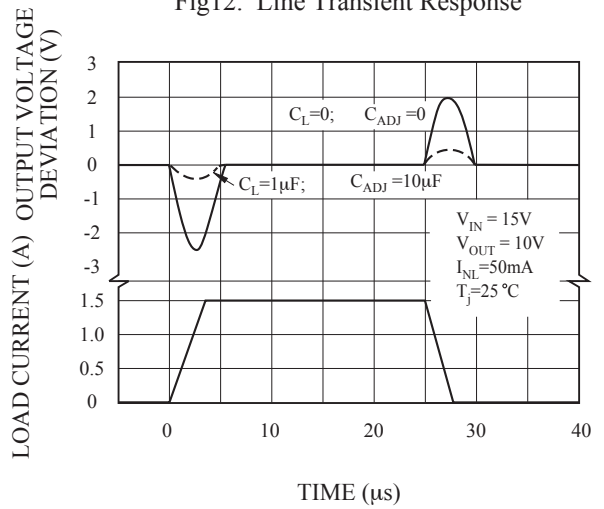


Fig13. Power Dissipation-2 (DPAK)

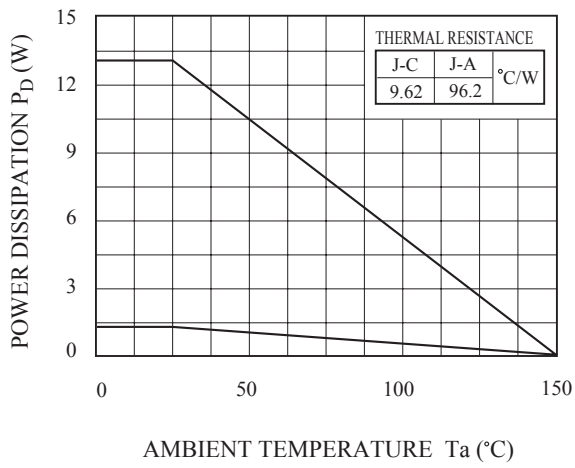
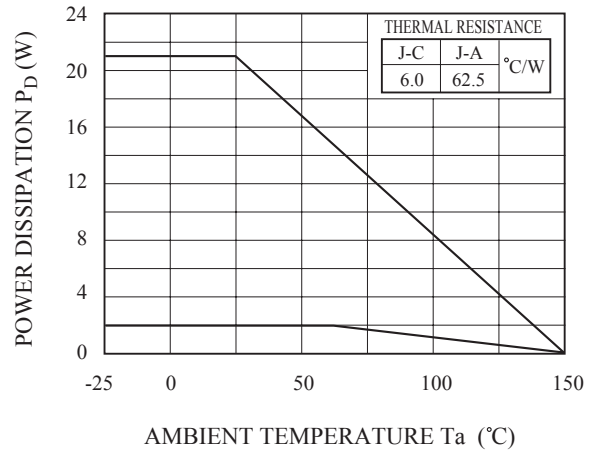


Fig14. Power Dissipation-1 (TO-220IS)



KIA317F/PI

