

LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATOR

The KIA1117AS/AF × × is a Low Drop Voltage Regulator able to provide up to 1A of output current, available even in adjustable version ($V_{ref}=1.25V$)

FEATURES

- Low Dropout Voltage : 1.1V/Typ. ($I_{out}=1.0A$)
- Very Low Quiescent Current : 2.5 mA/Typ.
- Output Current up to 1A
- Fixed Output Voltage of 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5.0V
- Adjustable Version Availability : $V_{ref}=1.25V$
- Internal Current and Thermal Limit
- A Minimum of $10\mu F$ for stability
- Available in $\pm 2\%$ (at 25 °C)
- High Ripple Rejection : 80dB/Typ
- Temperature Range : -30 °C ~ 125 °C

LINE UP

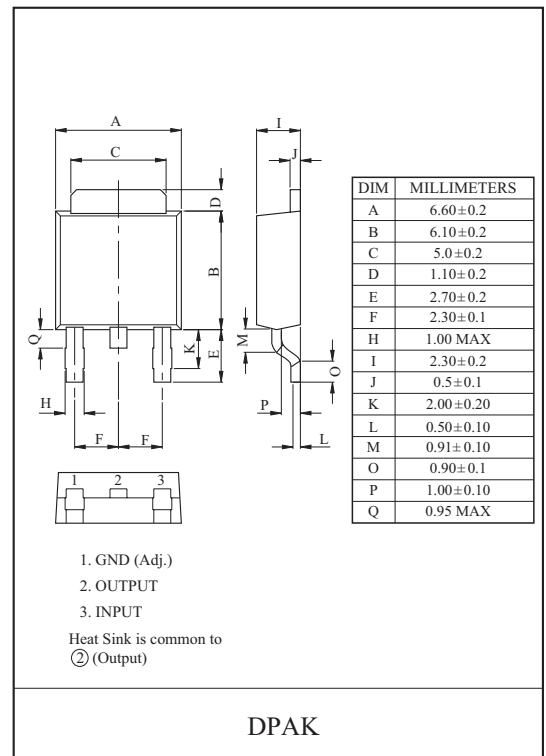
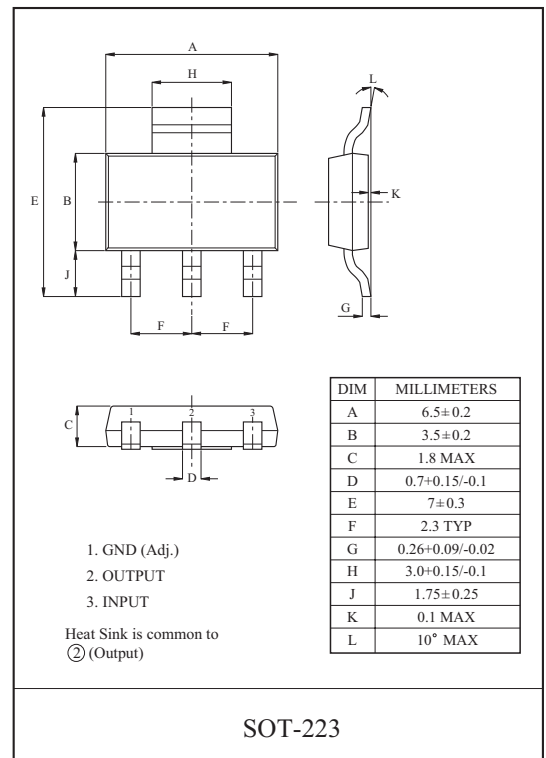
ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA1117AS/AF00	Adjustable (1.25~8V)	AS : SOT-223 AF : DPAK
KIA1117AS/AF15	1.5	
KIA1117AS/AF18	1.8	
KIA1117AS/AF25	2.5	
KIA1117AS/AF28	2.85	
KIA1117AS/AF33	3.3	
KIA1117AS/AF50	5.0	

MAXIMUM RATINGS ($T_a=25\text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	10	V
Output Current	I_{OUT}	1.0	A
Power Dissipation 1 (No Heatsink)	S (Note)	1.0	W
	F	1.3	
Power Dissipation 2 (Infinite Heatsink)	S	8.3	W
	F	13	
Operating Temperature	T_{opr}	-30 ~ 125	°C
Storage Temperature	T_{stg}	-55 ~ 150	°C

Note) Package Mounted on FR-4 PCB $36 \times 18 \times 1.5$ mm.

: mounting pad for the GND Lead min. 6cm^2



KIA1117AS/AF00~KIA1117AS/AF50

Fig.1 Application Circuit-1 (Fixed-Type)

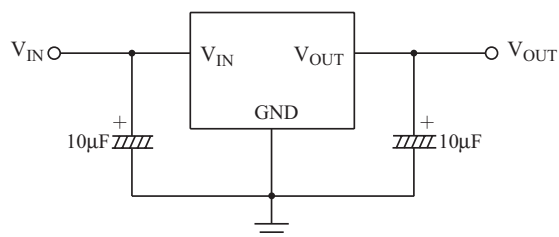
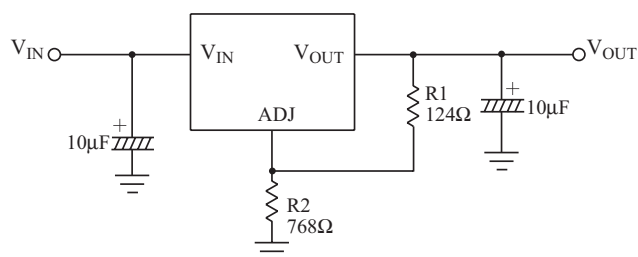
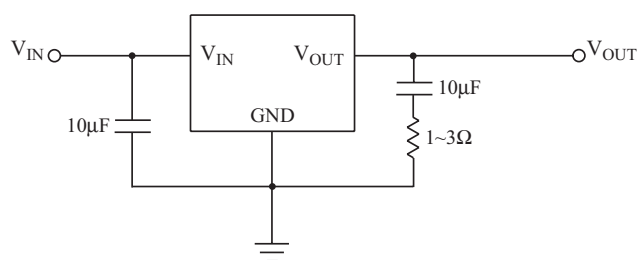


Fig.2 Application Circuit-2 (Adjustable-Type)



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

Fig.3 Application Circuit-3 (With MLCC)



- When using a ceramic capacitor, set an additional series resistor 1~3 for stability.

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF00 (Unless otherwise specified, $T_j=25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=25^\circ\text{C}$	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
	V_{OUT2}	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $V_{OUT}+1.5\text{V} \leq V_{IN} \leq 10\text{V}$	$V_{OUT} \times 0.97$	V_{OUT}	$V_{OUT} \times 1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5\text{V} \leq V_{IN} \leq 10\text{V}$, $I_{OUT}=10\text{mA}$	-	1	10	mV
Load Regulation	Reg Load	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $V_{IN}=V_{OUT}+2.0\text{V}$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25\text{V}$, $I_{OUT}=0\text{A}$	-	2.5	5	mA
	I_{B2}	$V_{IN}=10\text{V}$, $I_{OUT}=0\text{A}$	-	2.5	5	
Adjustable Pin Current	I_{ADJ}	$V_{IN}=V_{OUT}+1.5\text{V}$	-	35	-	μA
Minimum Load Current	I_{MIN}	$V_{IN}=V_{OUT}+1.5\text{V}$	10	-	-	mA
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25\text{V}$, $I_{OUT}=40\text{mA}$, $10\text{Hz} \leq f \leq 10\text{kHz}$	-	100	-	μV_{rms}
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.1	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{ripple}=1\text{V}_{p-p}$ $V_{IN}=V_{OUT}+3\text{V}$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1\text{A}$, $V_{IN}=0.95V_{OUT}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=-30 \sim 125^\circ\text{C}$	-	0.5	-	%

KIA1117AS/AF00~KIA1117AS/AF50

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF15 (Unless otherwise specified, $T_j=25\text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_j=25\text{ }^\circ\text{C}$	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
	V_{OUT2}	$10mA \leq I_{OUT} \leq 1A, V_{OUT}+1.5V \leq V_{IN} \leq 10V$	$V_{OUT} \times 0.97$	V_{OUT}	$V_{OUT} \times 1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V, I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \leq I_{OUT} \leq 1A, V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V, I_{OUT}=0A$	-	2.5	5	mA
	I_{B2}	$V_{IN}=10V, I_{OUT}=0A$	-	2.5	5	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V, I_{OUT}=40mA,$ $10Hz \leq f \leq 10kHz$	-	100	-	μV_{rms}
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA, f=120Hz, V_{ripple}=1Vp-p$ $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1A, V_{IN}=0.95V_{OUT}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_j=-30\sim 125\text{ }^\circ\text{C}$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF18 (Unless otherwise specified, $T_j=25\text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_j=25\text{ }^\circ\text{C}$	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
	V_{OUT2}	$10mA \leq I_{OUT} \leq 1A, V_{OUT}+1.5V \leq V_{IN} \leq 10V$	$V_{OUT} \times 0.97$	V_{OUT}	$V_{OUT} \times 1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V, I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \leq I_{OUT} \leq 1A, V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V, I_{OUT}=0A$	-	2.5	5	mA
	I_{B2}	$V_{IN}=10V, I_{OUT}=0A$	-	2.5	5	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V, I_{OUT}=40mA,$ $10Hz \leq f \leq 10kHz$	-	100	-	μV_{rms}
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA, f=120Hz, V_{ripple}=1Vp-p$ $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1A, V_{IN}=0.95V_{OUT}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_j=-30\sim 125\text{ }^\circ\text{C}$	-	0.5	-	%

KIA1117AS/AF00~KIA1117AS/AF50

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF25 (Unless otherwise specified, T_j=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =25 °C	V _{OUT} × 0.98	V _{OUT}	V _{OUT} × 1.02	V
	V _{OUT2}	10mA ≤ I _{OUT} ≤ 1A, V _{OUT} +1.5V ≤ V _{IN} ≤ 10V	V _{OUT} × 0.97	V _{OUT}	V _{OUT} × 1.03	
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1A, V _{IN} =V _{OUT} +2.0V	-	0.5	1	%
Quiescent Current	I _{B1}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =0A	-	2.5	5	mA
	I _{B2}	V _{IN} =10V, I _{OUT} =0A	-	2.5	5	
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.1	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p V _{IN} =V _{OUT} +3V	60	80	-	dB
Dropout Voltage	V _D	I _{OUT} =1A, V _{IN} =0.95V _{OUT}	-	1.1	1.4	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =-30~125 °C	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF28 (Unless otherwise specified, T_j=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =25 °C	V _{OUT} × 0.98	V _{OUT}	V _{OUT} × 1.02	V
	V _{OUT2}	10mA ≤ I _{OUT} ≤ 1A, V _{OUT} +1.5V ≤ V _{IN} ≤ 10V	V _{OUT} × 0.97	V _{OUT}	V _{OUT} × 1.03	
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1A, V _{IN} =V _{OUT} +2.0V	-	0.5	1	%
Quiescent Current	I _{B1}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =0A	-	2.5	5	mA
	I _{B2}	V _{IN} =10V, I _{OUT} =0A	-	2.5	5	
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.1	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p V _{IN} =V _{OUT} +3V	60	80	-	dB
Dropout Voltage	V _D	I _{OUT} =1A, V _{IN} =0.95V _{OUT}	-	1.1	1.4	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =-30~125 °C	-	0.5	-	%

KIA1117AS/AF00~KIA1117AS/AF50

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF33 (Unless otherwise specified, T_j=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =25 °C	V _{OUT} × 0.98	V _{OUT}	V _{OUT} × 1.02	V
	V _{OUT2}	10mA ≤ I _{OUT} ≤ 1A, V _{OUT} +1.5V ≤ V _{IN} ≤ 10V	V _{OUT} × 0.97	V _{OUT}	V _{OUT} × 1.03	
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1A, V _{IN} =V _{OUT} +2.0V	-	0.5	1	%
Quiescent Current	I _{B1}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =0A	-	2.5	5	mA
	I _{B2}	V _{IN} =10V, I _{OUT} =0A	-	2.5	5	
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.1	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p V _{IN} =V _{OUT} +3V	60	80	-	dB
Dropout Voltage	V _D	I _{OUT} =1A, V _{IN} =0.95V _{OUT}	-	1.1	1.4	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =-30~125 °C	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117AS/AF50 (Unless otherwise specified, T_j=25 °C)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =25 °C	V _{OUT} × 0.98	V _{OUT}	V _{OUT} × 1.02	V
	V _{OUT2}	10mA ≤ I _{OUT} ≤ 1A, V _{OUT} +1.5V ≤ V _{IN} ≤ 10V	V _{OUT} × 0.97	V _{OUT}	V _{OUT} × 1.03	
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1A, V _{IN} =V _{OUT} +2.0V	-	0.5	1	%
Quiescent Current	I _{B1}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =0A	-	2.5	5	mA
	I _{B2}	V _{IN} =10V, I _{OUT} =0A	-	2.5	5	
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.1	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p V _{IN} =V _{OUT} +3V	60	80	-	dB
Dropout Voltage	V _D	I _{OUT} =1A, V _{IN} =0.95V _{OUT}	-	1.1	1.4	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =-30~125 °C	-	0.5	-	%

KIA1117AS/AF00~KIA1117AS/AF50

Fig. 3 $V_D - I_{OUT}$

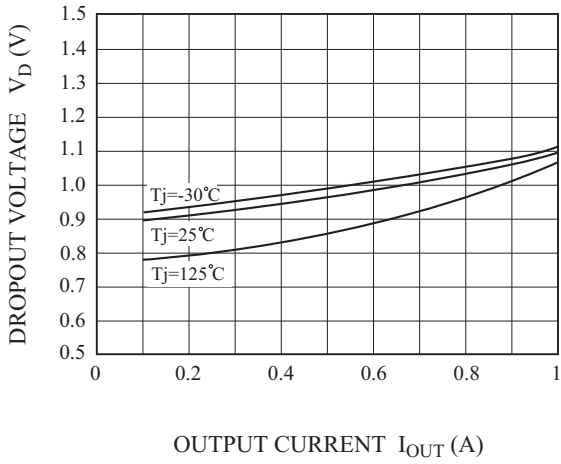


Fig. 4 $V_{OUT}(\text{CHANGE}) - T_j$

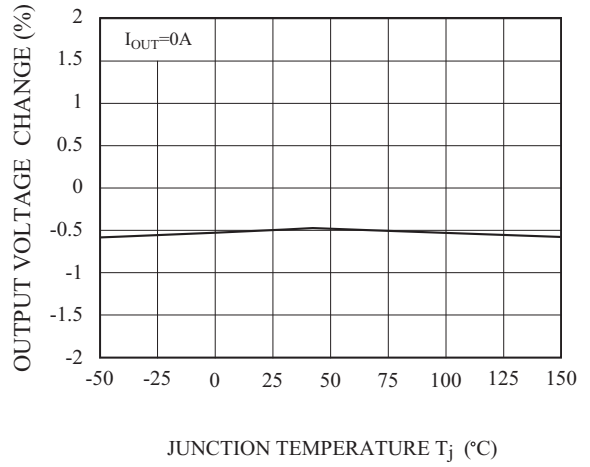


Fig. 5 LINE REGULATION

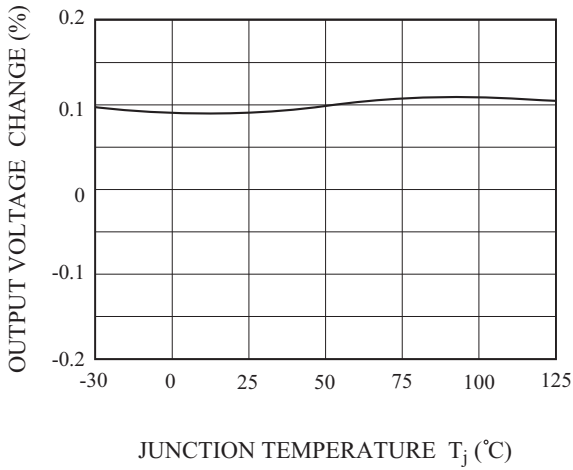


Fig. 6 LOAD REGULATION

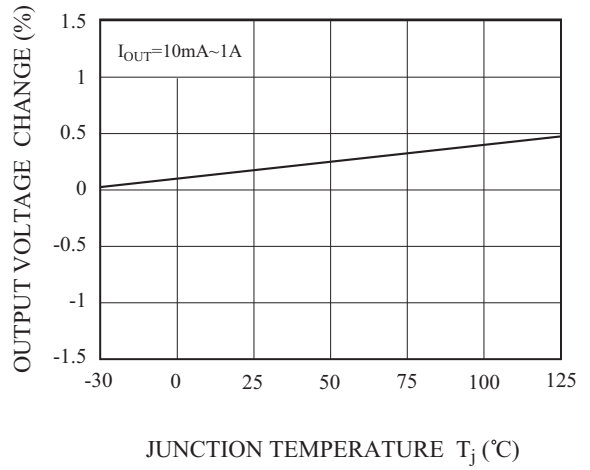


Fig.7 $I_Q - T_j$

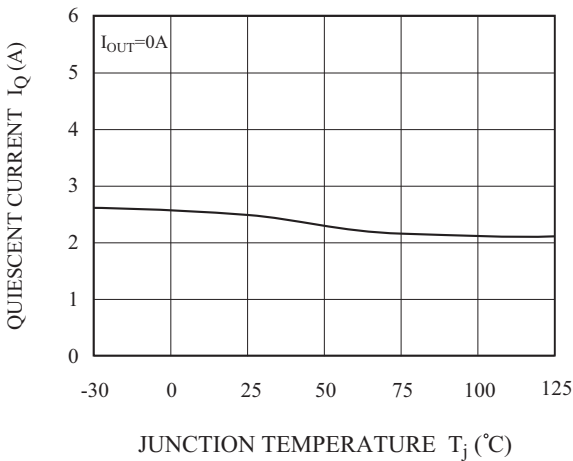
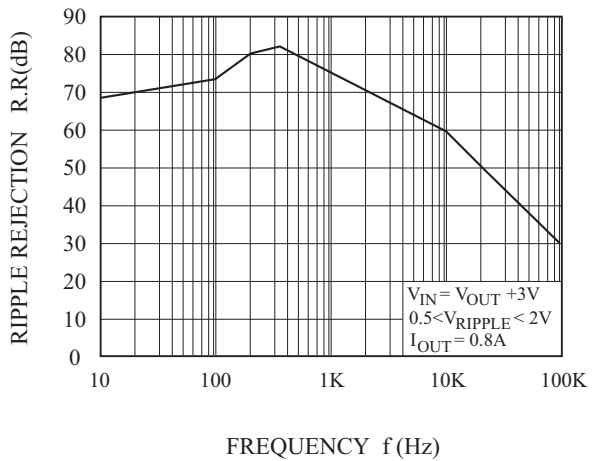


Fig.8 R.R - f



KIA1117AS/AF00~KIA1117AS/AF50

Fig.9 P_D - T_a (AS-Type : SOT-223)

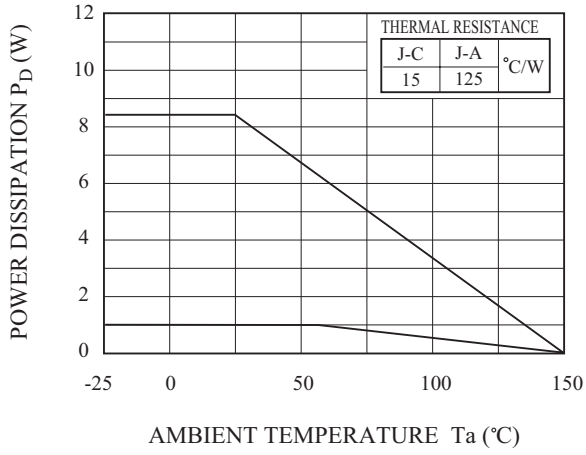


Fig.9 P_D - T_a (AF-Type : DPAK)

