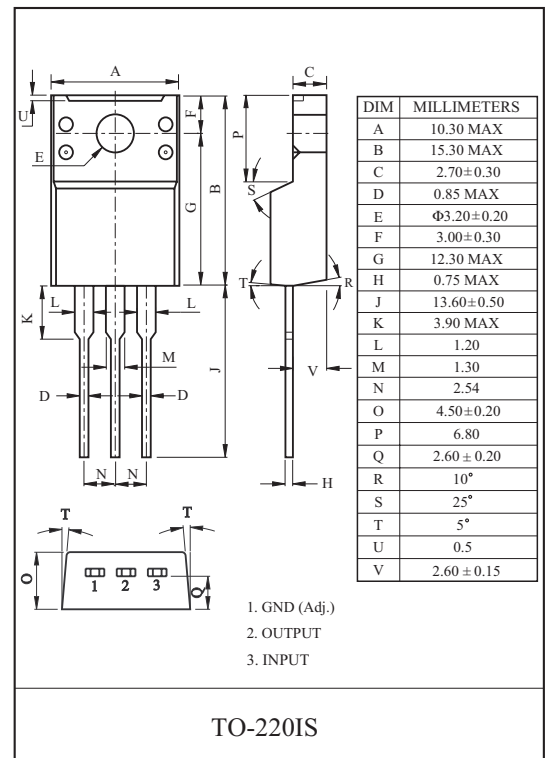


LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATOR

The KIA1117API × × 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 : 2.5mA/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
KIA1117API00	Adjustable (1.25~10V)	API : TO-220IS
KIA1117API15	1.5	
KIA1117API18	1.8	
KIA1117API25	2.5	
KIA1117API28	2.85	
KIA1117API33	3.3	
KIA1117API50	5.0	

MAXIMUM RATINGS ($T_a=25\text{ °C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	10	V
Output Current	I_{OUT}	1.0	A
Power Dissipation 1 (No Heatsink)	P_{D1}	2.0	W
Power Dissipation 2 (Infinite Heatsink)	P_{D2}	20.8	W
Operating Temperature	T_{opr}	-30~125	°C
Storage Temperature	T_{stg}	-55~150	°C

KIA1117API00~KIA1117API50

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

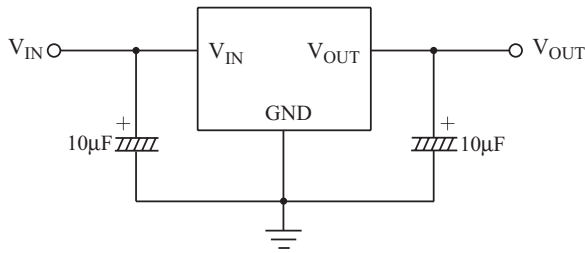
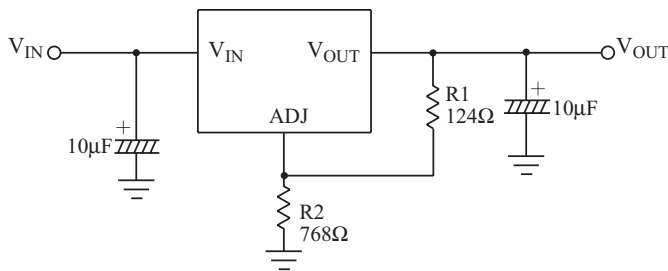
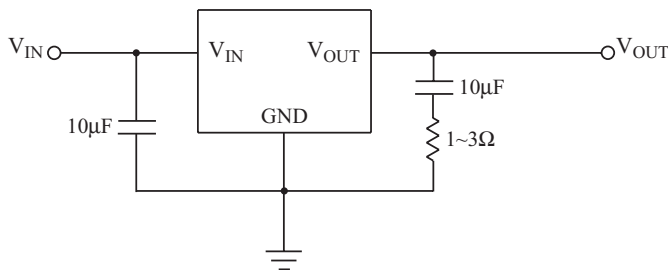


Fig.2 Application Circuit-2 (Adjustable-Type)



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

Fig.3 Application Circuit-3 (With MLCC)



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

ELECTRICAL CHARACTERISTICS

KIA1117API00 (Unless otherwise specified, $T_j = -30 \sim 125 \text{ } ^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$, $T_j = 25 \text{ } ^\circ\text{C}$	$V_{OUT} \times 0.98$	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	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$	-	0.5	-	%

KIA1117API00~KIA1117API50

ELECTRICAL CHARACTERISTICS

KIA1117API15 (Unless otherwise specified, $T_j = -30 \sim 125 \text{ }^\circ\text{C}$)

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	$R \cdot R$	$I_{OUT} = 40mA$, $f = 120Hz$, $V_{ripple} = 1V_{p-p}$ $V_{IN} = V_{OUT} + 3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT} = 1A$, $V_{IN} = 0.95V_{OUT}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN} = V_{OUT} + 1.5V$, $I_{OUT} = 10mA$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117API18 (Unless otherwise specified, $T_j = -30 \sim 125 \text{ }^\circ\text{C}$)

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	$R \cdot R$	$I_{OUT} = 40mA$, $f = 120Hz$, $V_{ripple} = 1V_{p-p}$ $V_{IN} = V_{OUT} + 3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT} = 1A$, $V_{IN} = 0.95V_{OUT}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN} = V_{OUT} + 1.5V$, $I_{OUT} = 10mA$	-	0.5	-	%

KIA1117API00~KIA1117API50

ELECTRICAL CHARACTERISTICS

KIA1117API25 (Unless otherwise specified, $T_j = -30 \sim 125 \text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$, $T_j = 25 \text{ }^\circ\text{C}$	$V_{OUT} \times 0.98$	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	
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 · R	$I_{OUT} = 40\text{mA}$, $f = 120\text{Hz}$, $V_{\text{ripple}} = 1\text{V}_{\text{p-p}}$ $V_{IN} = V_{OUT} + 3\text{V}$	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	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117API28 (Unless otherwise specified, $T_j = -30 \sim 125 \text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$, $T_j = 25 \text{ }^\circ\text{C}$	$V_{OUT} \times 0.98$	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	
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 · R	$I_{OUT} = 40\text{mA}$, $f = 120\text{Hz}$, $V_{\text{ripple}} = 1\text{V}_{\text{p-p}}$ $V_{IN} = V_{OUT} + 3\text{V}$	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	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$	-	0.5	-	%

KIA1117API00~KIA1117API50

ELECTRICAL CHARACTERISTICS

KIA1117API33 (Unless otherwise specified, T_j=-30~125 °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	-	μVrms
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	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117API50 (Unless otherwise specified, T_j=-30~125 °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	-	μVrms
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	-	0.5	-	%

KIA1117API00~KIA1117API50

Fig. 3 $V_D - I_{OUT}$

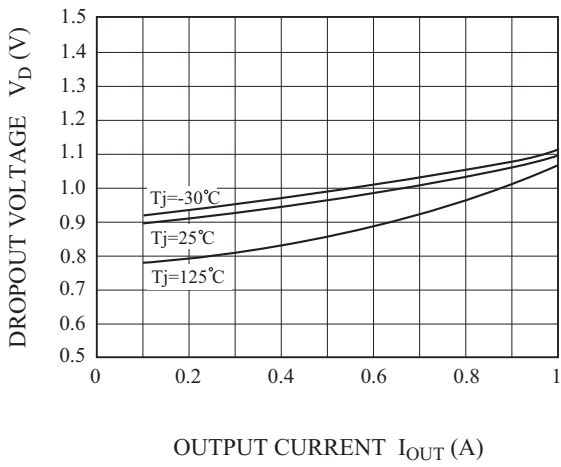


Fig. 4 $V_{OUT}(\text{CHANGE}) - T_j$

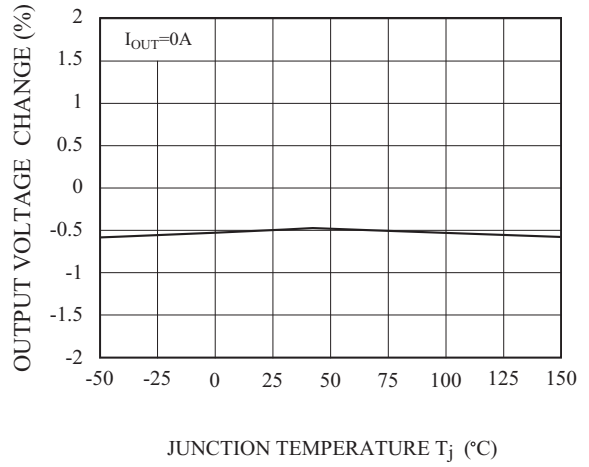


Fig. 5 LINE REGULATION

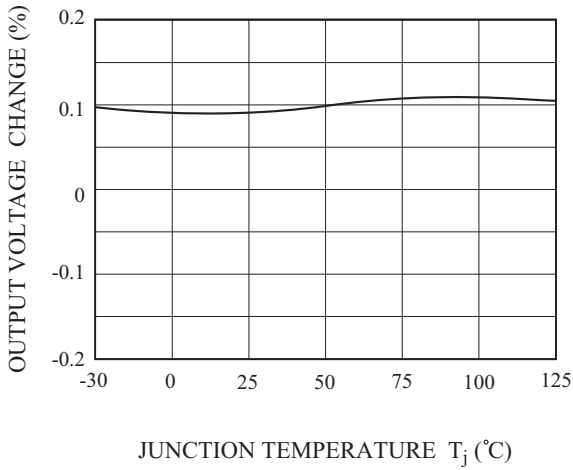


Fig. 4 LOAD REGULATION

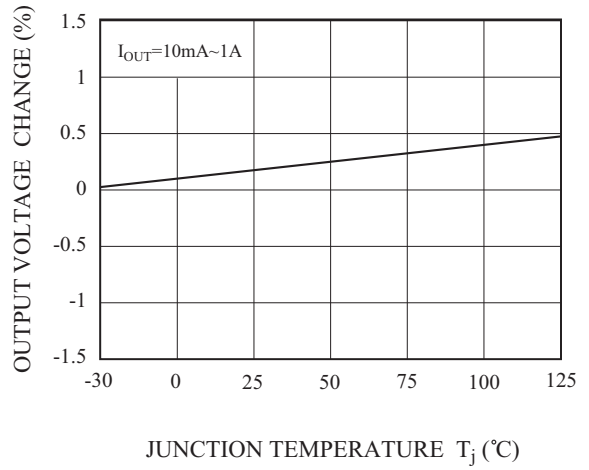


Fig.7 $I_Q - T_j$

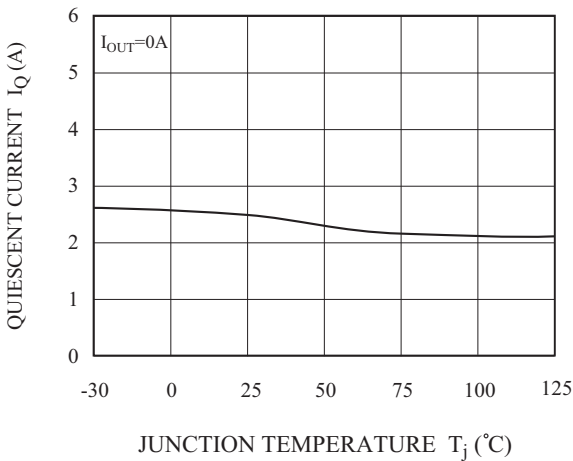
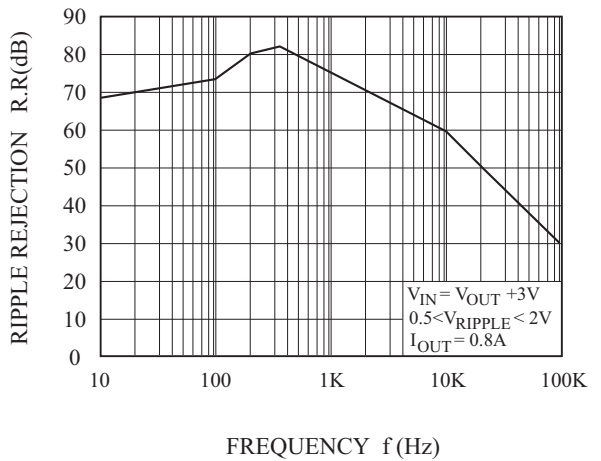


Fig.8 R.R - f



KIA1117API00~KIA1117API50

Fig.9 $P_D - T_a$ (API-Type : TO-220IS)

