

LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATOR

The KIA1117BS/BF × × Series are 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 1.2V, 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 μF for stability
- Suitable for MLCC, Tantalum and Low ESR Electrolytic Capacitors
- ESR Range for stability : 1m Ω ~200 Ω
- Available in $\pm 2\%$ (at 25 $^{\circ}C$)
- High Ripple Rejection : 80dB/Typ
- Temperature Range : -40 $^{\circ}C$ ~150 $^{\circ}C$

LINE UP

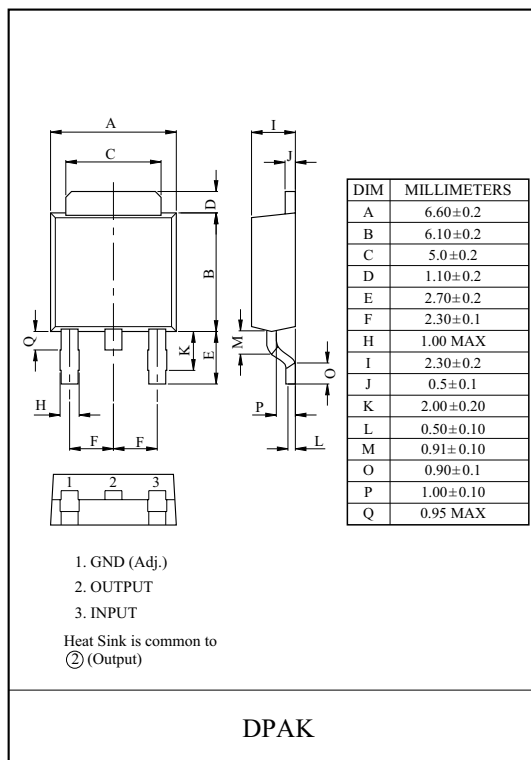
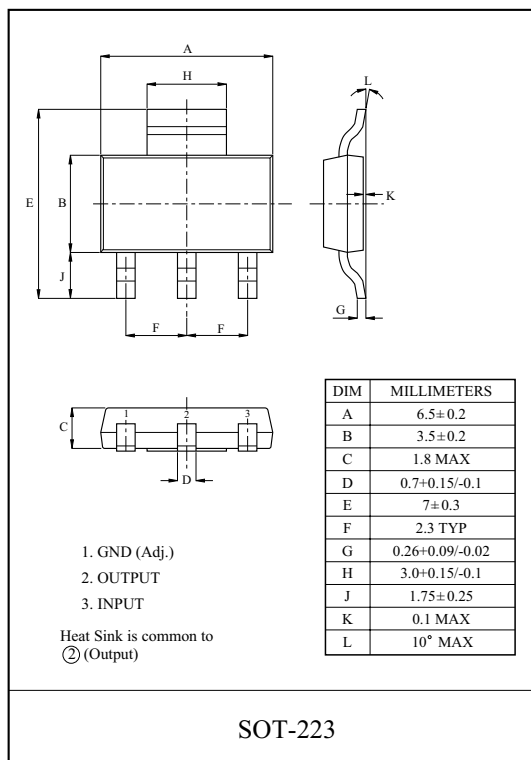
ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA1117BS/BF00	Adjustable (1.25~8V)	S : SOT-223 F : DPAK
KIA1117BS/BF12	1.2	
KIA1117BS/BF15	1.5	
KIA1117BS/BF18	1.8	
KIA1117BS/BF25	2.5	
KIA1117BS/BF28	2.85	
KIA1117BS/BF33	3.3	
KIA1117BS/BF50	5.0	

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

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage		V_{IN}	10	V
Output Current		I_{OUT}	1.0	A
Power Dissipation 1 (No Heatsink)	S (Note)	P_{D1}	1.0	W
	F		1.3	
Power Dissipation 2 (Infinite Heatsink)	S	P_{D2}	8.3	W
	F		13	
Maximum Junction Temperature		$T_{j(max)}$	150	$^{\circ}C$
Operating Junction Temperature		T_{opr}	-40~150	$^{\circ}C$
Storage Temperature		T_{stg}	-55~150	$^{\circ}C$

Note) Package Mounted on FR-4 PCB 36 × 18 × 1.5 mm.

: mounting pad for the GND Lead min. 6cm²



ELECTRICAL CHARACTERISTICS**KIA1117BS/BF00** (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	
Adjustable Pin Current	I _{ADJ}	V _{IN} =V _{OUT} +1.5V	-	35	-	μA
Minimum Load Current	I _{MIN}	V _{IN} =V _{OUT} +1.5V	10	-	-	mA
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μVrms
Short 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	-	1.1	1.4	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =-40~150 °C	-	0.5	-	%

ELECTRICAL CHARACTERISTICS**KIA1117BS/BF15** (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	-	μVrms
Short 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	-	1.1	1.4	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, T _j =-40~150 °C	-	0.5	-	%

ELECTRICAL CHARACTERISTICS**KIA1117BS/BF18** (Unless otherwise specified, $T_j=25\text{ }^{\circ}\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=25\text{ }^{\circ}\text{C}$	$V_{OUT} \times 0.98$	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}
Short Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.1	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{Vp-p}$ $V_{IN}=V_{OUT}+3\text{V}$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1\text{A}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=-40\sim 150\text{ }^{\circ}\text{C}$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS**KIA1117BS/BF25** (Unless otherwise specified, $T_j=25\text{ }^{\circ}\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=25\text{ }^{\circ}\text{C}$	$V_{OUT} \times 0.98$	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}
Short Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.1	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{Vp-p}$ $V_{IN}=V_{OUT}+3\text{V}$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1\text{A}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=-40\sim 150\text{ }^{\circ}\text{C}$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS**KIA1117BS/BF28** (Unless otherwise specified, $T_j=25^\circ\text{C}$)

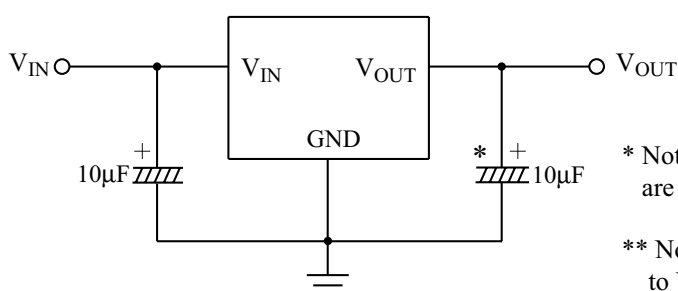
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=25^\circ\text{C}$	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
	V_{OUT2}	$10\text{mA} \leq I_{OUT} \leq 1\text{A}$, $V_{OUT}+1.5\text{V} \leq V_{IN} \leq 10\text{V}$	$V_{OUT} \times 0.97$	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	
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}
Short Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.1	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{Vp-p}$ $V_{IN}=V_{OUT}+3\text{V}$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1\text{A}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=-40 \sim 150^\circ\text{C}$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS**KIA1117BS/BF33** (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	
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}
Short Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.1	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{Vp-p}$ $V_{IN}=V_{OUT}+3\text{V}$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1\text{A}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=-40 \sim 150^\circ\text{C}$	-	0.5	-	%

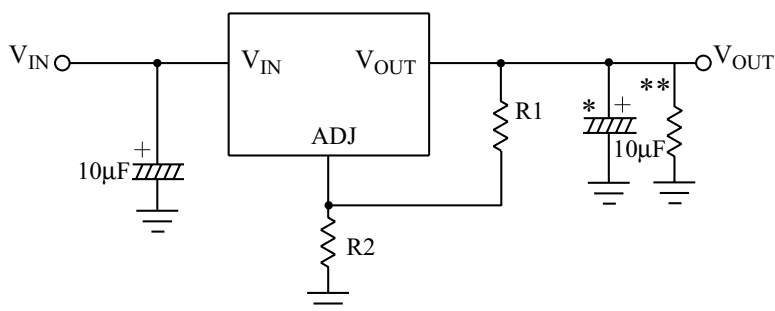
ELECTRICAL CHARACTERISTICS**KIA1117BS/BF50** (Unless otherwise specified, $T_j=25^\circ\text{C}$)

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	
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}
Short Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0\text{V}$	1.1	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{V}_{\text{p-p}}$ $V_{IN}=V_{OUT}+3\text{V}$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=1\text{A}$	-	1.1	1.4	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_j=-40 \sim 150^\circ\text{C}$	-	0.5	-	%

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

* Note 1) MLCC, Tantalum, Low ESR Electrolytic Capacitors are suitable in ESR range for stability (1m~200 Ω)

** Note 2) When R1 is much larger than 124 Ω , apply 8~10mA to Vout-GND by setting an additional dummy resistor for stability of Vout under no load condition

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

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

Fig. 3 $V_D - I_{OUT}$

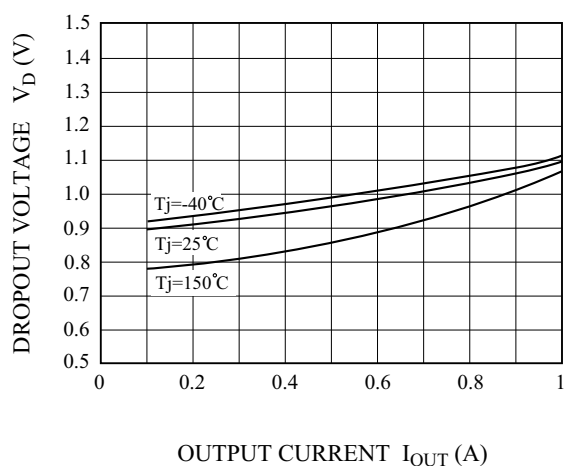


Fig. 4 $V_{OUT}(\text{CHANGE}) - T_j$

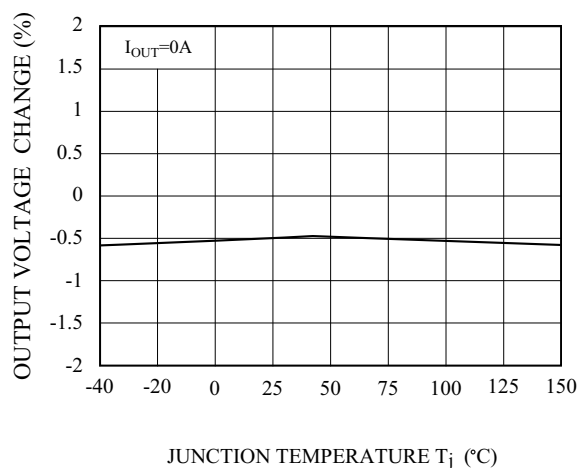


Fig. 5 LINE REGULATION

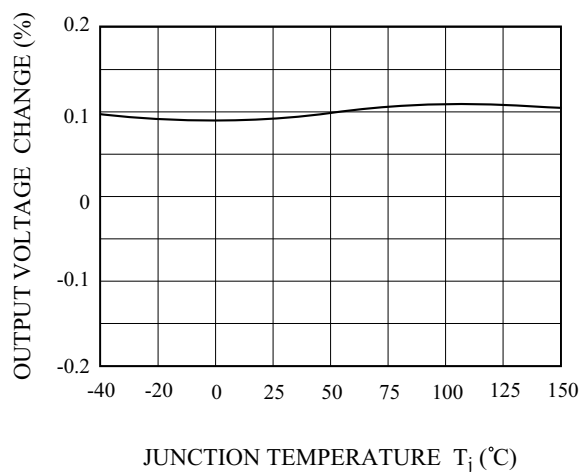


Fig. 6 LOAD REGULATION

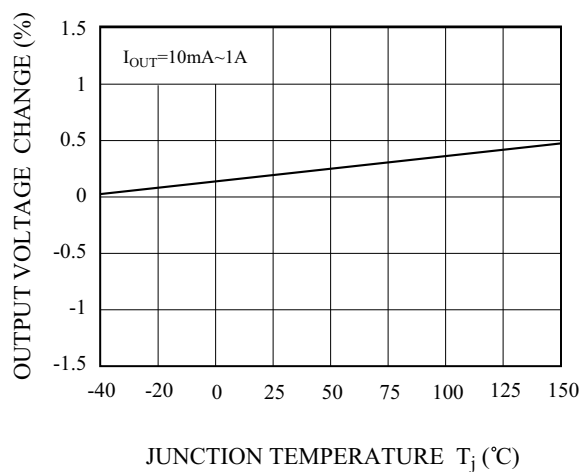


Fig.7 $I_Q - T_j$

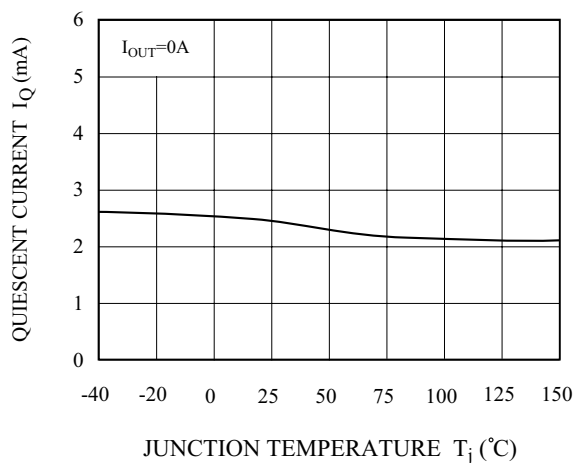


Fig.8 R.R - f

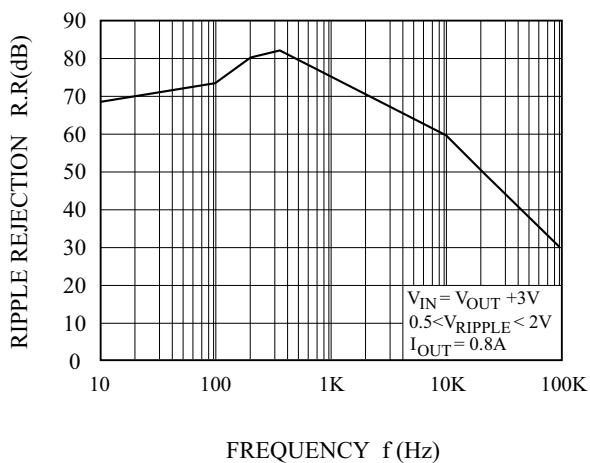


Fig.9 P_D - T_a (S-Type : SOT-223)

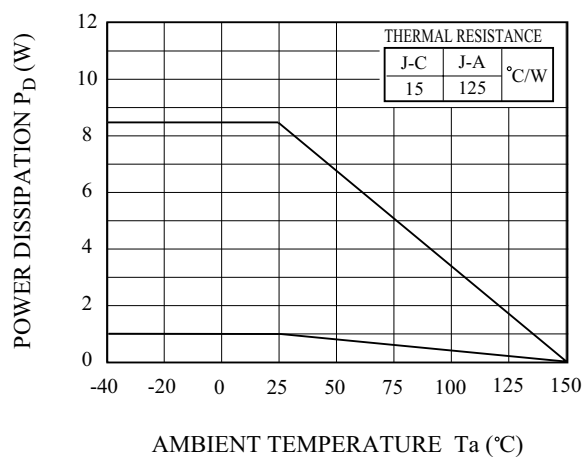


Fig.9 P_D - T_a (F-Type : DPAK)

