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 (Vref=1.25V)

FEATURES

- Low Dropout Voltage : 1.1V/Typ. (Iout=1.0A)
- Very Low Quiescent Current : 5㎃/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 : Vref=1.25V
- Internal Current and Thermal Limit
- A Minimum of 10㎌ for stability
- Suitable for MLCC, Tantalum and Low ESR Electrolytic Capacitors
- ESR Range for stability : 1mΩ~200Ω
- Available in ±2%(at 25℃)
- High Ripple Rejection : 80dB/Typ
- Temperature Range : -40℃ 150℃

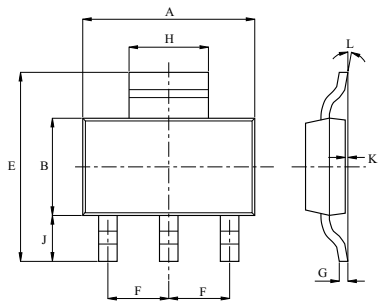
LINE UP

ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA1117BS/BF00	Adjustable (1.25~10V)	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 (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage		V_{IN}	12	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	℃
Operating Junction Temperature		T_{opr}	-40 150	℃
Storage Temperature		T_{stg}	-55 150	℃

Note) Package Mounted on FR-4 PCB 36×18×1.5㎜.
: mounting pad for the GND Lead min. 6㎠

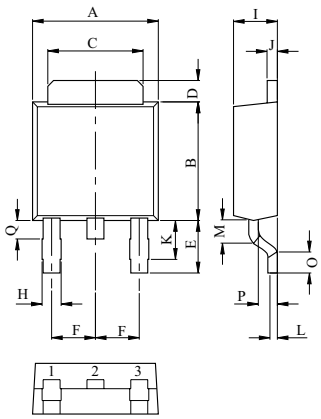


DIM	MILLIMETERS
A	6.5±0.2
B	3.5±0.2
C	1.8 MAX
D	0.7+0.15/-0.1
E	7±0.3
F	2.3 TYP
G	0.26+0.09/-0.02
H	3.0+0.15/-0.1
J	1.75±0.25
K	0.1 MAX
L	10° MAX

1. GND (Adj.)
2. OUTPUT
3. INPUT

Heat Sink is common to ② (Output)

SOT-223 / SOT-223(1)



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. GND (Adj.)
2. OUTPUT
3. INPUT

Heat Sink is common to ② (Output)

DPAK

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF00 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
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}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF12 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF15 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF18 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF25 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF28 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF33 (Unless otherwise specified, Tj=25℃)

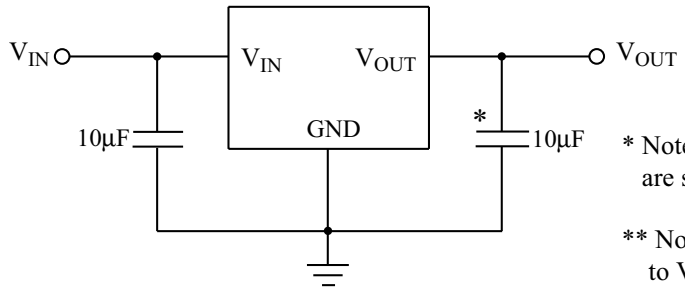
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1117BS/BF50 (Unless otherwise specified, Tj=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	$V_{OUT}\times0.98$	V_{OUT}	$V_{OUT}\times1.02$	V
	V_{OUT2}	$10mA\leq I_{OUT}\leq1A$, $V_{OUT}+1.5V\leq V_{IN}\leq10V$	$V_{OUT}\times0.97$	V_{OUT}	$V_{OUT}\times1.03$	
Line Regulation	Reg Line	$V_{OUT}+1.5V\leq V_{IN}\leq10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA\leq I_{OUT}\leq1A$, $V_{IN}=V_{OUT}+2.0V$	-	0.5	1	%
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	5	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	5	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz\leq f\leq10kHz$	-	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, Vripple=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℃	-	0.5	-	%

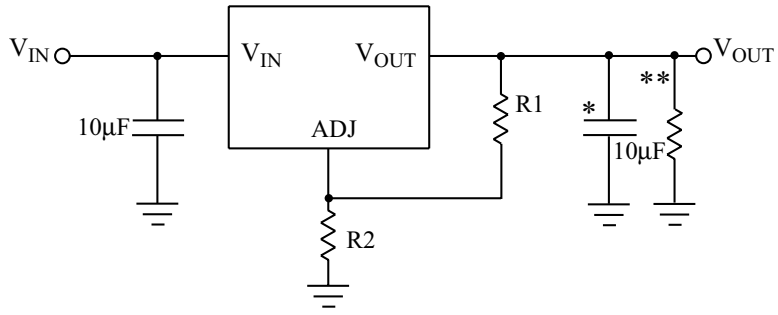
Fig.1 Application Circuit-1 (Fixed-Type)



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

** Note 2) When R1 is much larger than 124Ω, 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}

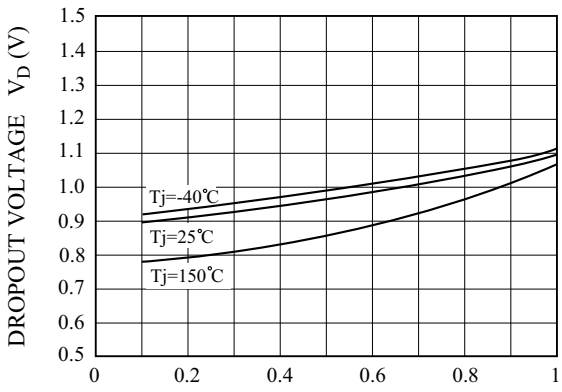


Fig. 4 V_{OUT}(CHANGE) - T_j

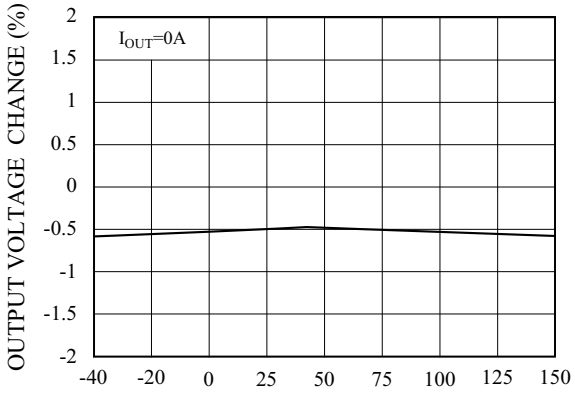


Fig. 5 LINE REGULATION

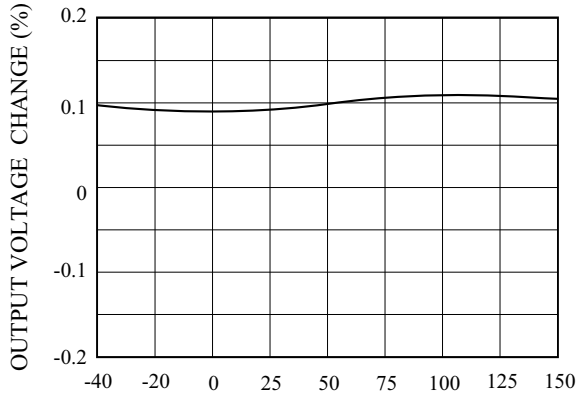


Fig. 6 LOAD REGULATION

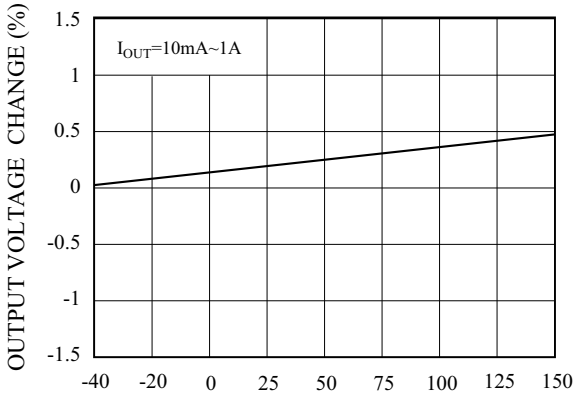


Fig.7 I_Q - T_j

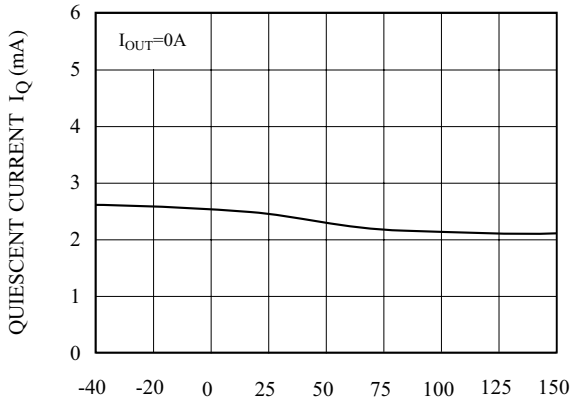


Fig.8 R.R - f

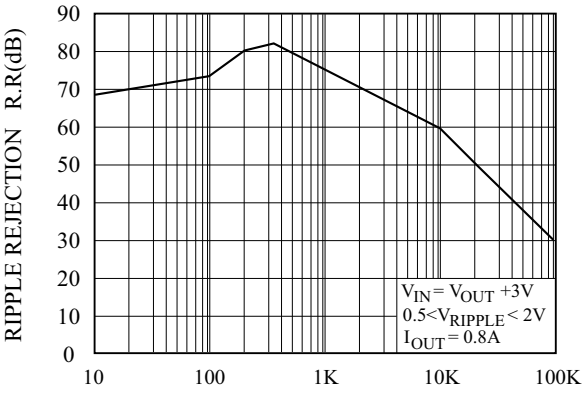


Fig.9 P_D - Ta (S-Type : SOT-223)

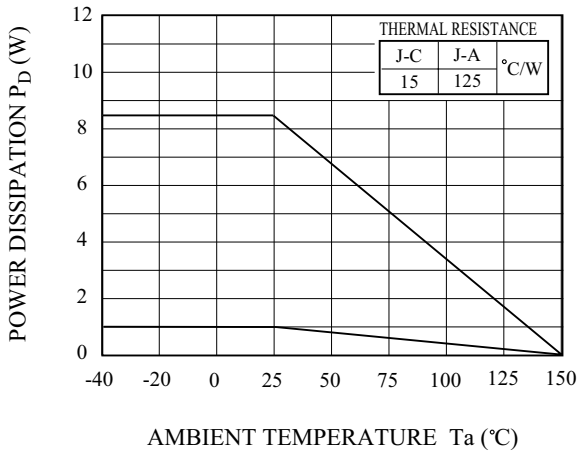


Fig.10 P_D - Ta (F-Type : DPAK)