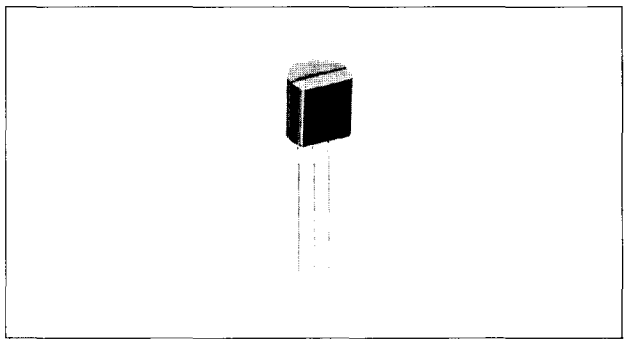
BA704 BA707



The BA704 and BA707 are three-terminal voltage regulators specifically designed for low supply voltages. The BA704 has a rated output voltage of 2.65 V, and the BA707 3.3 V.
With special design consideration for input/output and temperature characteristics, the devices have applications in cameras, reference voltage supply for instrumentation equipment, and other low supply voltage circuits operating under harsh environmental conditions.

Features

1. Wide input voltage range.
2. Excellent line regulation.
3. Excellent load regulation.
4. Excellent temperature stability.
5. Requires no external components.
6. In a compact TO-92 package.

Applications

Reference voltage supply for cameras, instrumentation equipment, etc.

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Input voltage	V_{IN}	12	V
Power dissipation	Pd	250*	mW
Operating temperature range	Topr	−20~60	°C
Storage temperature range	Tstg	−55~125	°C
Load current	I_L	10	mA

*Derating is done at 2.5mW/°C for operation above Ta=25°C.

Dimensions (Unit: mm)

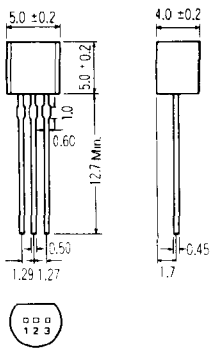


Fig. 1

Block Diagram

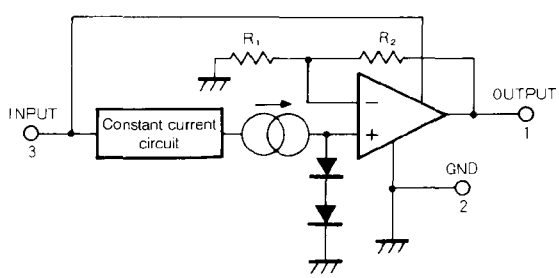


Fig. 2

Electrical Characteristics (Ta=25°C)

BA704

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V_{IN}	3.3	—	10.0	V	—
No-load input current	I_{CC}	—	1.5	2.5	mA	V_{IN}=5.5V, I_{OL}=0mA
Output voltage	V_{OUT}	2.40	2.65	2.90	V	V_{IN}=5.5V, I_{OL}=5mA
Output voltage load stability	ΔVo/Io	—	−8	−15	mV	V_{IN}=5.5V, I_{OL}=0~5mA
Output voltage input stability	ΔVo/Vi	—	5	30	mV	V_{IN}=3.6~9.0 V, I_{OL}=5mA
Output voltage input stability	ΔVo/Vi	—	—	20	mV	V_{IN}=3.3~3.6 V, I_{OL}=5mA
Output voltage temperature stability	ΔVo/T	—	±0.3	±1.0	mV/°C	V_{IN}=5.5V, I_{OL}=5mA

BA707

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	V_{IN}	4.3	—	10.0	V	—
No-load input current	I_{CC}	—	1.8	3.0	mA	V_{IN}=5.5V, I_{OL}=0mA
Output voltage	V_{OUT}	3.0	3.3	3.6	V	V_{IN}=5.5V, I_{OL}=5mA
Output voltage load stability	ΔVo/Io	—	−10	−20	mV	V_{IN}=5.5V, I_{OL}=0~5mA
Output voltage input stability	ΔVo/Vi	—	5	35	mV	V_{IN}=4.3~9.0 V, I_{OL}=5mA
Output voltage temperature stability	ΔVo/T	—	±0.3	±1.0	mV/°C	V_{IN}=5.5V, I_{OL}=5mA

Electrical Characteristic Curves

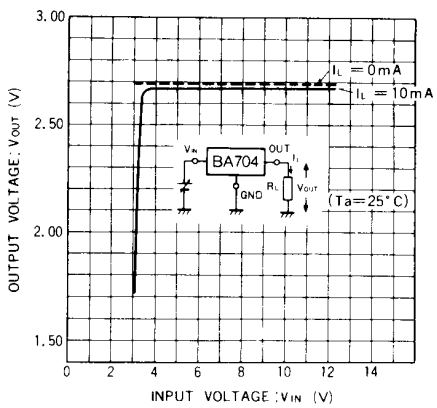


Fig. 3 Input/output characteristics

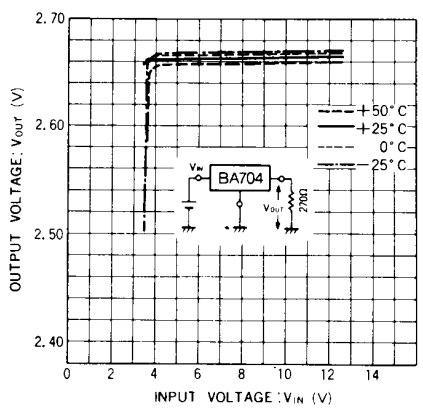


Fig. 4 Input/output temperature characteristics

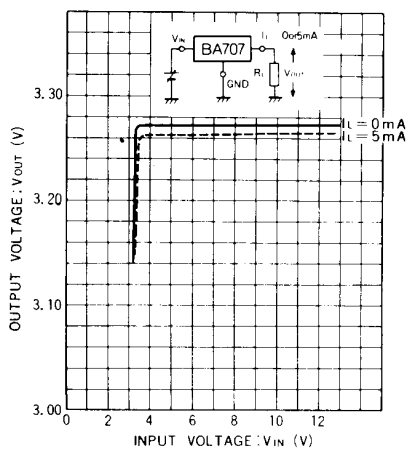


Fig. 5 Input/output characteristics

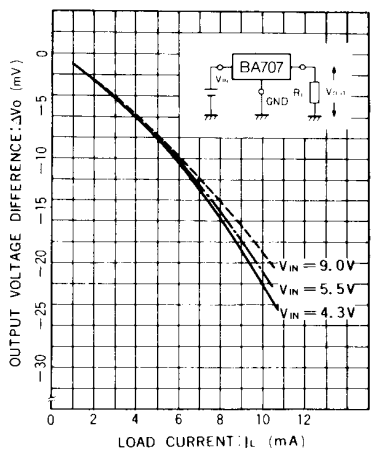
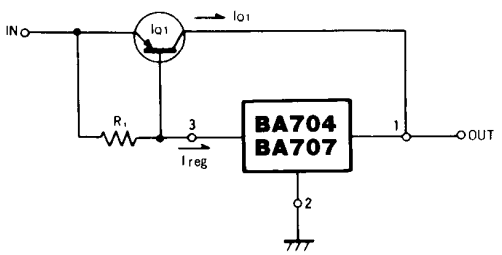


Fig. 6 Output voltage difference vs. load current

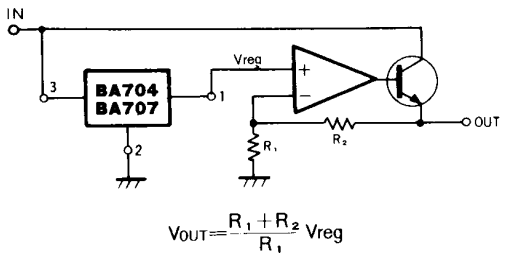
Application Examples



$$Ireg = \frac{V_{BE}}{R_1} \qquad I_{Q1} = \beta\, Ireg$$

While the BA704 and BA707 alone can only supply a load current of around 10 mA, they can provide a larger load current when used with a discrete PNP transistor.

Fig. 7 Large current circuit



$$V_{OUT} = \frac{R_1 + R_2}{R_1} Vreg$$

This figure shows another application example for the BA704 and BA707 as a variable power supply. The output voltage $V_{OUT} = Vreg \times (R_1 + R_2)/R_1$ Vreg: BA704 and BA707's output voltage.

Fig. 8 Output voltage variable circuit

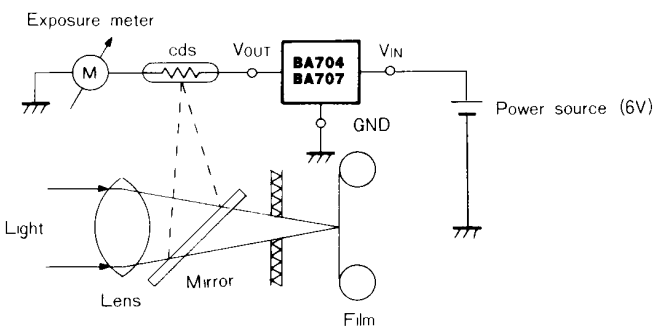


Fig. 9 Camera

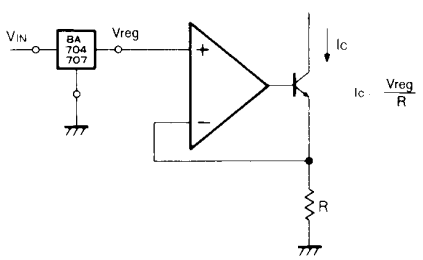


Fig. 10 Constant current source

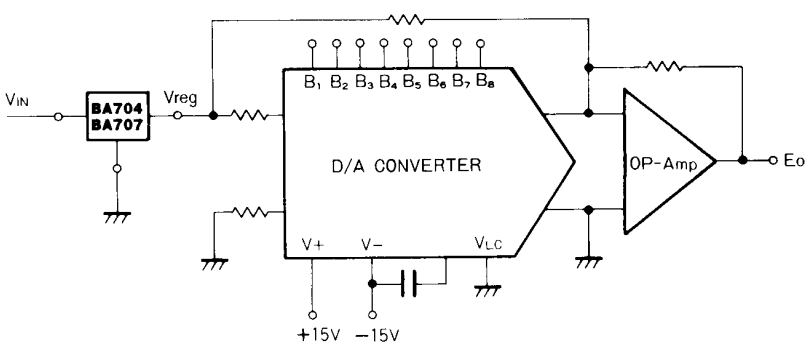


Fig. 11 Reference supply voltage for a D/A converter