

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

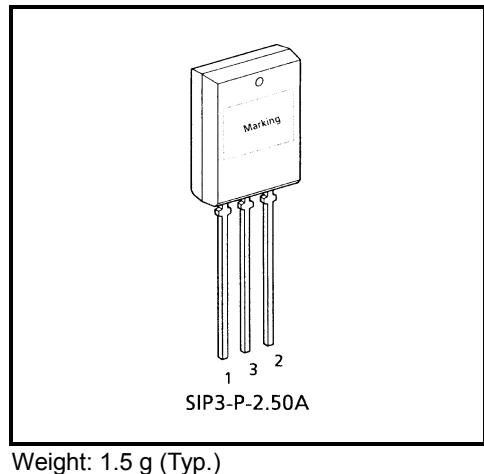
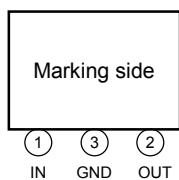
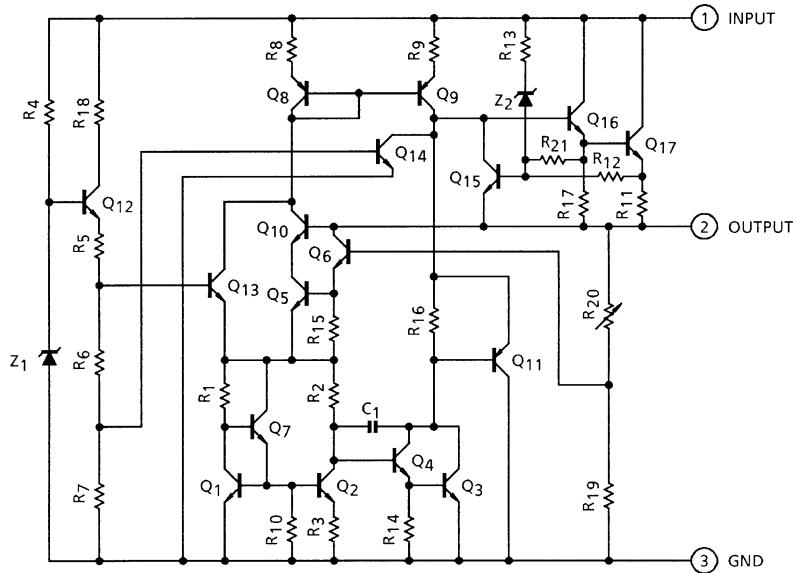
**TA7805SB, TA78057SB, TA7806SB, TA7807SB, TA7808SB, TA7809SB,
TA7810SB, TA7812SB, TA7815SB, TA7818SB, TA7820SB, TA7824SB**

Three-Terminal Positive Voltage Regulators

5 V, 5.7 V, 6 V, 7 V, 8 V, 9 V, 10 V, 12 V, 15 V, 18 V, 20 V, 24 V

Features

- Suitable for CMOS, TTL, the other digital IC's power supply.
- Internal thermal overload protection.
- Internal short circuit current limiting.
- Maximum output current of 1 A.
- Package in the plastic case TPL (PD: 1.8 W).

Pin Assignment**Equivalent Circuit**

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Input voltage	TA7805SB	V _{IN}	35	V
	TA78057SB			
	TA7806SB			
	TA7807SB			
	TA7808SB			
	TA7809SB			
	TA7810SB		40	
	TA7812SB			
	TA7815SB			
	TA7818SB			
	TA7820SB			
	TA7824SB			
Power dissipation	(Ta = 25°C)	P _D	1.8	W
Operating temperature		T _{opr}	-30~85	°C
Storage temperature		T _{stg}	-55~150	°C
Junction temperature		T _j	150	°C
Thermal resistance		R _{th} (j-a)	69.4	°C/W

TA7805SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 10\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		4.8	5.0	5.2	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	7.0 V $\leq V_{IN} \leq 25\text{ V}$	—	3	100	mV
				8.0 V $\leq V_{IN} \leq 12\text{ V}$	—	1	50	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	15	100	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	5	50	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	7.0 V $\leq V_{IN} \leq 20\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	4.75	—	5.25	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.2	8.0	mA	
Quiescent current change	ΔI_B	1	7.0 V $\leq V_{IN} \leq 25\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.3	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	50	—	μV_{rms}
Ripple rejection	R.R.	3	$f = 120\text{ Hz}$, 8.0 V $\leq V_{IN} \leq 18\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$		62	78	—	dB
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$		—	2.0	—	V
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$		—	1.6	—	A
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$		—	-0.6	—	$\text{mV}/^\circ\text{C}$

TA78057SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 10.7\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		5.47	5.7	5.93	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	7.7 V $\leq V_{IN} \leq 25\text{ V}$	—	4	110	mV
				8.7 V $\leq V_{IN} \leq 12.7\text{ V}$	—	2	55	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	15	110	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	5	55	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	7.7 V $\leq V_{IN} \leq 20.7\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	5.42	—	5.98	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	7.7 V $\leq V_{IN} \leq 25\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.3	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	55	—	μV_{rms}
Ripple rejection	R.R.	3	$f = 120\text{ Hz}$, 8.8 V $\leq V_{IN} \leq 18.8\text{ V}$, $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$		62	77	—	dB
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$		—	2.0	—	V
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$		—	1.5	—	A
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$		—	-0.7	—	$\text{mV}/^\circ\text{C}$

TA7806SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 11\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		5.75	6.0	6.25	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	8.0 V $\leq V_{IN} \leq 25\text{ V}$	—	4	120	mV
				9 V $\leq V_{IN} \leq 13\text{ V}$	—	2	60	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	15	120	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	5	60	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	8 V $\leq V_{IN} \leq 21\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	5.7	—	6.3	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	8.0 V $\leq V_{IN} \leq 25\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.3	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	55	—	μV_{rms}
Ripple rejection	R.R.	3	f = 120 Hz, 9 V $\leq V_{IN} \leq 19\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$	61	77	—	dB	
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$	—	2.0	—	V	
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$	—	1.5	—	A	
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.7	—	mV/ $^\circ\text{C}$	

TA7807SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 12\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		6.72	7.0	7.28	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	9 V $\leq V_{IN} \leq 25\text{ V}$	—	5	140	mV
				10 V $\leq V_{IN} \leq 14\text{ V}$	—	2	70	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	15	140	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	5	70	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	9 V $\leq V_{IN} \leq 22\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	6.65	—	7.35	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	9 V $\leq V_{IN} \leq 25\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.3	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	60	—	μV_{rms}
Ripple rejection	R.R.	3	f = 120 Hz, 10 V $\leq V_{IN} \leq 20\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$	59	75	—	dB	
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$	—	2.0	—	V	
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$	—	1.3	—	A	
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-0.8	—	mV/ $^\circ\text{C}$	

TA7808SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 14\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		7.7	8.0	8.3	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	10.5 V $\leq V_{IN} \leq 25\text{ V}$	—	6	160	mV
				11 V $\leq V_{IN} \leq 17\text{ V}$	—	2	80	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	160	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	80	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	10.5 V $\leq V_{IN} \leq 23\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	7.6	—	8.4	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	10.5 V $\leq V_{IN} \leq 25\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	70	—	μV_{rms}
Ripple rejection	R.R.	3	f = 120 Hz, 11.5 V $\leq V_{IN} \leq 21.5\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$	58	74	—	dB	
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$	—	2.0	—	V	
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$	—	1.1	—	A	
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-1.0	—	mV/ $^\circ\text{C}$	

TA7809SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 15\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		8.64	9.0	9.36	V
Line regulation	Reg.line	1	$T_j = 25^\circ\text{C}$	11.5 V $\leq V_{IN} \leq 26\text{ V}$	—	7	180	mV
				13 V $\leq V_{IN} \leq 19\text{ V}$	—	2.5	90	
Load regulation	Reg.load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	180	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	90	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	11.5 V $\leq V_{IN} \leq 24\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	8.55	—	9.45	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	11.5 V $\leq V_{IN} \leq 26\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	75	—	μV_{rms}
Ripple rejection	R.R.	3	f = 120 Hz, 12.5 V $\leq V_{IN} \leq 22.5\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$	56	72	—	dB	
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$	—	2.0	—	V	
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$	—	1.0	—	A	
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-1.1	—	mV/ $^\circ\text{C}$	

TA7810SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 16\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		9.6	10.0	10.4	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	12.5 V $\leq V_{IN} \leq 27\text{ V}$	—	8	200	mV
				14 V $\leq V_{IN} \leq 20\text{ V}$	—	2.5	100	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	200	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	100	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	12.5 V $\leq V_{IN} \leq 25\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	9.5	—	10.5	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	12.5 V $\leq V_{IN} \leq 27\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	80	—	μV_{rms}
Ripple rejection	R.R.	3	$f = 120\text{ Hz}$, 13.5 V $\leq V_{IN} \leq 23.5\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$		55	72	—	dB
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$		—	2.0	—	V
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$		—	0.9	—	A
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$		—	-1.3	—	$\text{mV}/^\circ\text{C}$

TA7812SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 19\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		11.5	12.0	12.5	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	14.5 V $\leq V_{IN} \leq 30\text{ V}$	—	10	240	mV
				16 V $\leq V_{IN} \leq 22\text{ V}$	—	3	120	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	240	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	120	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	14.5 V $\leq V_{IN} \leq 27\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	11.4	—	12.6	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.3	8.0	mA	
Quiescent current change	ΔI_B	1	14.5 V $\leq V_{IN} \leq 30\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	90	—	μV_{rms}
Ripple rejection	R.R.	3	$f = 120\text{ Hz}$, 15 V $\leq V_{IN} \leq 25\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$		55	71	—	dB
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$		—	2.0	—	V
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$		—	0.7	—	A
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$		—	-1.6	—	$\text{mV}/^\circ\text{C}$

TA7815SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 23\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		14.4	15.0	15.6	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	17.5 V $\leq V_{IN} \leq 30\text{ V}$	—	11	300	mV
				20 V $\leq V_{IN} \leq 26\text{ V}$	—	3	150	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	300	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	150	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	17.5 V $\leq V_{IN} \leq 30\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	14.25	—	15.75	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.4	8.0	mA	
Quiescent current change	ΔI_B	1	17.5 V $\leq V_{IN} \leq 30\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	110	—	μV_{rms}
Ripple rejection	R.R.	3	$f = 120\text{ Hz}$, 18.5 V $\leq V_{IN} \leq 28.5\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$		54	70	—	dB
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$		—	2.0	—	V
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$		—	0.5	—	A
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$		—	-2.0	—	$\text{mV}/^\circ\text{C}$

TA7818SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 27\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

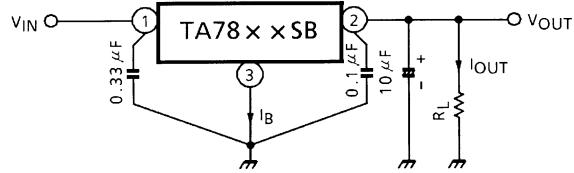
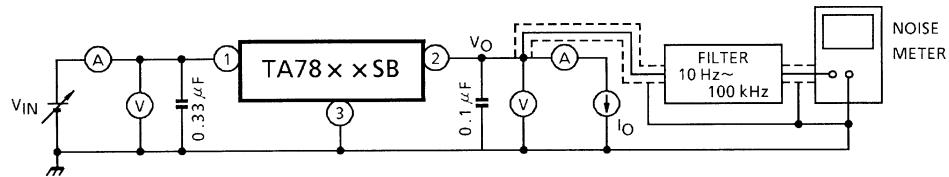
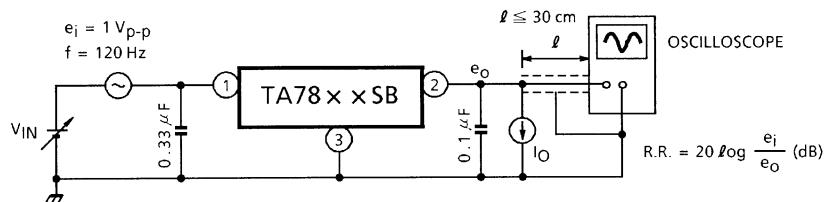
Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		17.3	18.0	18.7	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	21 V $\leq V_{IN} \leq 33\text{ V}$	—	13	360	mV
				24 V $\leq V_{IN} \leq 30\text{ V}$	—	4	180	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	360	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	180	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	21 V $\leq V_{IN} \leq 33\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	17.1	—	18.9	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.5	8.0	mA	
Quiescent current change	ΔI_B	1	21 V $\leq V_{IN} \leq 33\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	125	—	μV_{rms}
Ripple rejection	R.R.	3	$f = 120\text{ Hz}$, 22 V $\leq V_{IN} \leq 32\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$		52	68	—	dB
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$		—	2.0	—	V
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$		—	0.4	—	A
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$		—	-2.5	—	$\text{mV}/^\circ\text{C}$

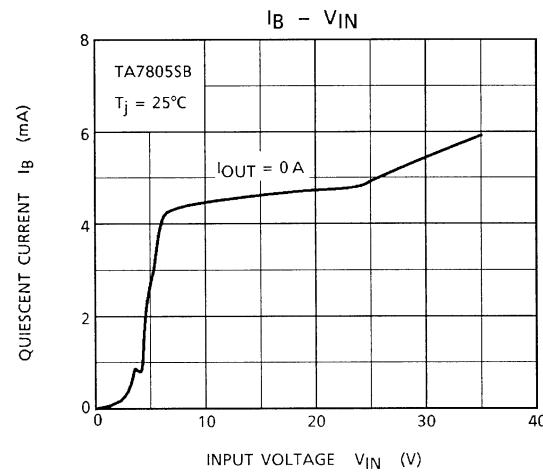
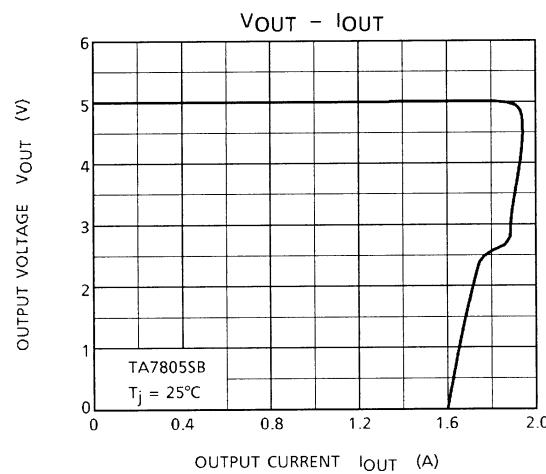
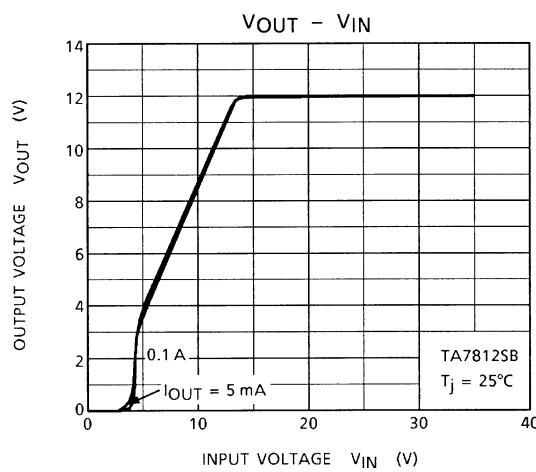
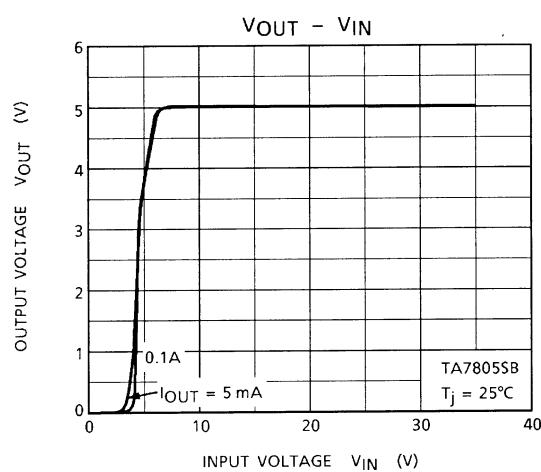
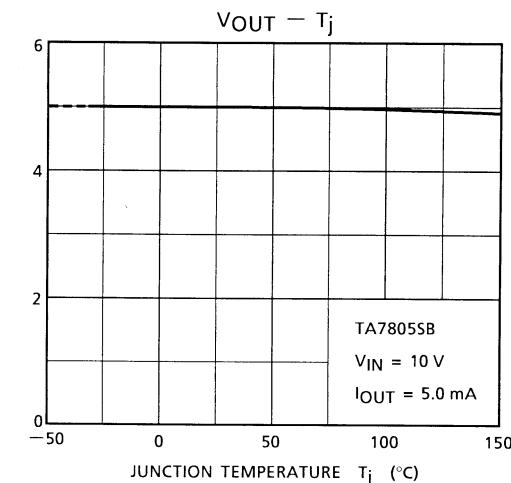
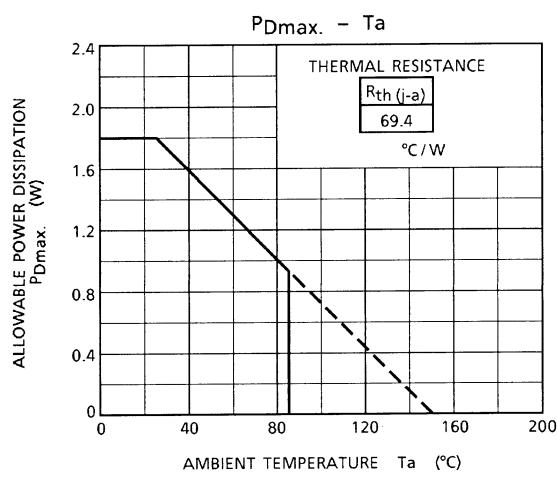
TA7820SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 29\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

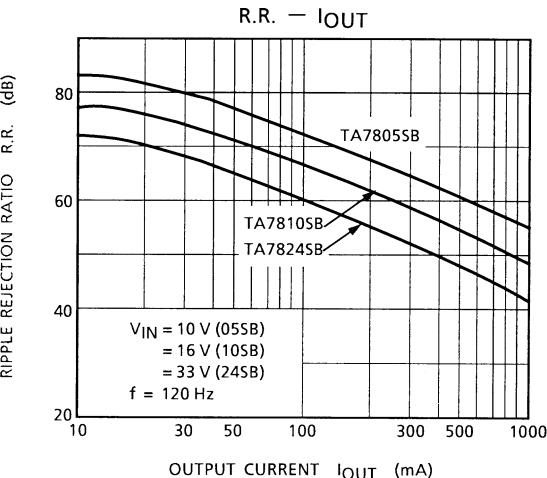
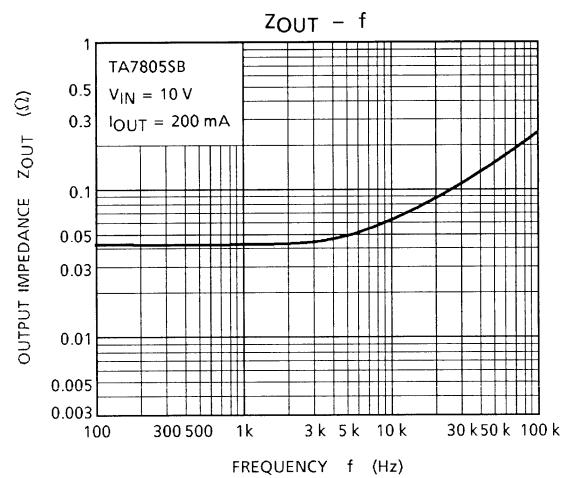
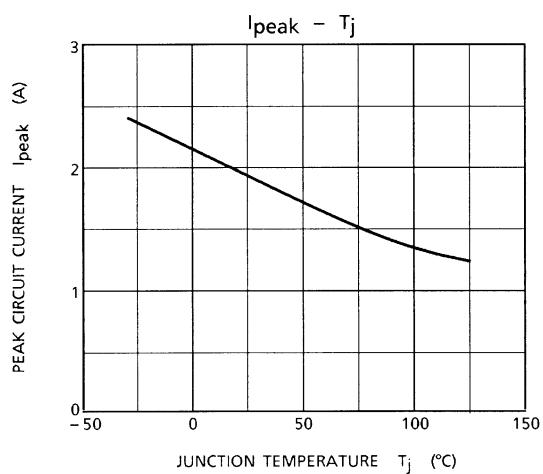
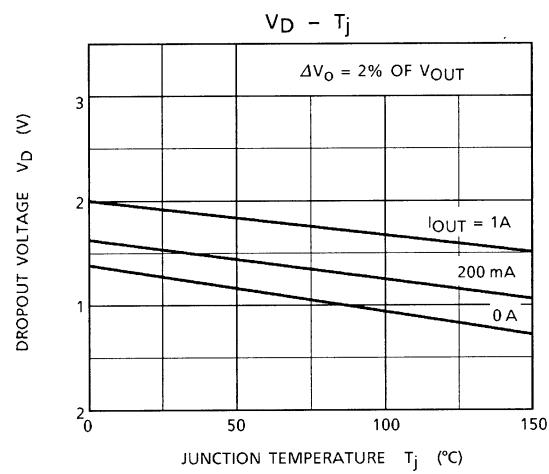
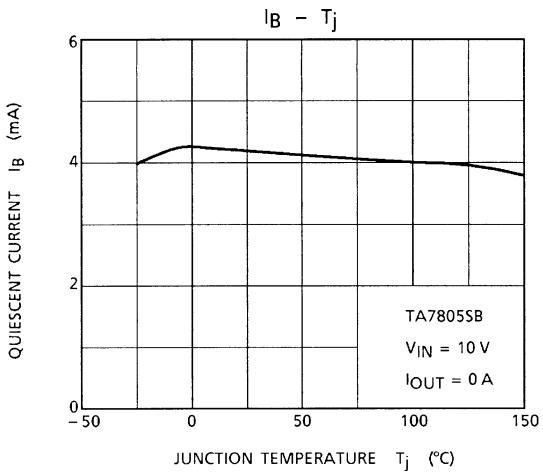
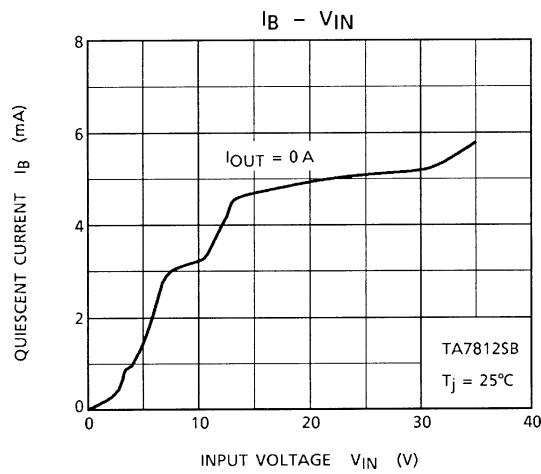
Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		19.2	20.0	20.8	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	23 V $\leq V_{IN} \leq 35\text{ V}$	—	15	400	mV
				26 V $\leq V_{IN} \leq 32\text{ V}$	—	5	200	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	400	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	200	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	23 V $\leq V_{IN} \leq 35\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	19.0	—	21.0	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.6	8.0	mA	
Quiescent current change	ΔI_B	1	23 V $\leq V_{IN} \leq 35\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	135	—	μV_{rms}
Ripple rejection	R.R.	3	f = 120 Hz, 24 V $\leq V_{IN} \leq 34\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$	50	66	—	dB	
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$	—	2.0	—	V	
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$	—	0.4	—	A	
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-3.0	—	mV/ $^\circ\text{C}$	

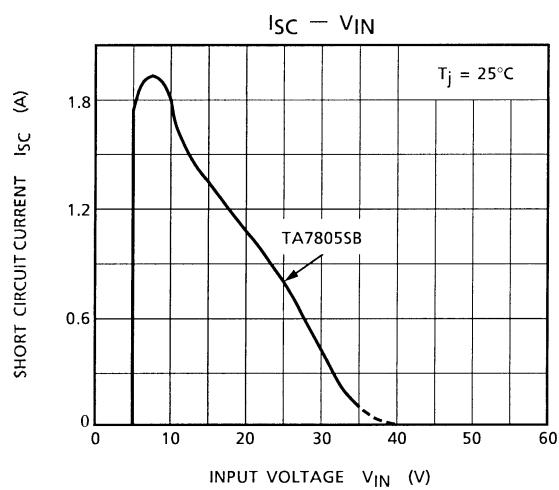
TA7824SB**Electrical Characteristics**(Unless otherwise specified, $V_{IN} = 33\text{ V}$, $I_{OUT} = 500\text{ mA}$, $0^\circ\text{C} \leq T_j \leq 125^\circ\text{C}$)

Characteristics	Symbol	Test Circuit	Test Condition		Min	Typ.	Max	Unit
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 100\text{ mA}$		23.0	24.0	25.0	V
Line regulation	Reg-line	1	$T_j = 25^\circ\text{C}$	27 V $\leq V_{IN} \leq 38\text{ V}$	—	18	480	mV
				30 V $\leq V_{IN} \leq 36\text{ V}$	—	6	240	
Load regulation	Reg-load	1	$T_j = 25^\circ\text{C}$	5 mA $\leq I_{OUT} \leq 1.4\text{ A}$	—	12	480	mV
				250 mA $\leq I_{OUT} \leq 750\text{ mA}$	—	4	240	
Output voltage	V_{OUT}	1	$T_j = 25^\circ\text{C}$	27 V $\leq V_{IN} \leq 38\text{ V}$ 5.0 mA $\leq I_{OUT} \leq 1.0\text{ A}$	22.8	—	25.2	V
Quiescent current	I_B	1	$T_j = 25^\circ\text{C}$, $I_{OUT} = 5\text{ mA}$	—	4.6	8.0	mA	
Quiescent current change	ΔI_B	1	27 V $\leq V_{IN} \leq 38\text{ V}$, $I_{OUT} = 5\text{ mA}$, $T_j = 25^\circ\text{C}$	—	—	1.0	mA	
Output noise voltage	V_{NO}	2	$T_a = 25^\circ\text{C}$, 10 Hz $\leq f \leq 100\text{ kHz}$ $I_{OUT} = 50\text{ mA}$		—	150	—	μV_{rms}
Ripple rejection	R.R.	3	f = 120 Hz, 28 V $\leq V_{IN} \leq 38\text{ V}$ $I_{OUT} = 50\text{ mA}$, $T_j = 25^\circ\text{C}$	50	66	—	dB	
Dropout voltage	V_D	1	$I_{OUT} = 1.0\text{ A}$, $T_j = 25^\circ\text{C}$	—	2.0	—	V	
Short circuit current limit	I_{SC}	1	$T_j = 25^\circ\text{C}$	—	0.3	—	A	
Average temperature coefficient of output voltage	T_{CVO}	1	$I_{OUT} = 5\text{ mA}$	—	-3.5	—	mV/ $^\circ\text{C}$	

Test Circuit 1/Standard Application Circuit

Test Circuit 2
V_{NO}

Test Circuit 3
R.R.


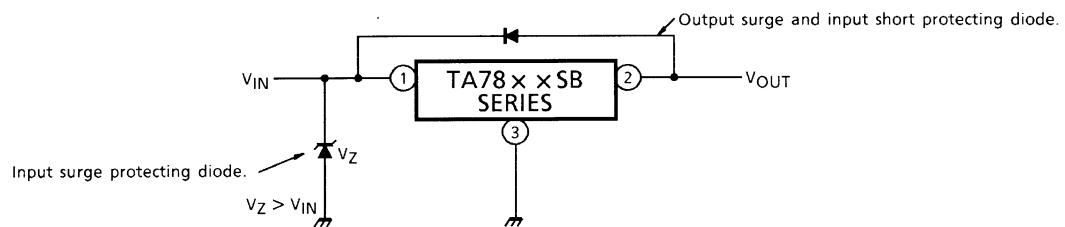




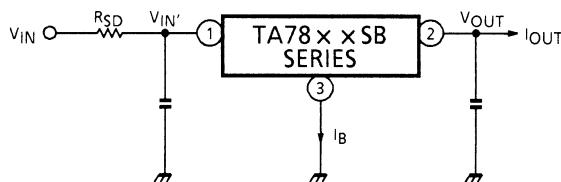


Precautions on Application

- (1) In regard to GND, be careful not to apply a negative voltage to the input/output terminal. Further, special care is necessary in case of a voltage boost application.
- (2) When a surge voltage exceeding maximum rating is applied to the input terminal or when a voltage in excess of the input terminal voltage is applied to the output terminal, the circuit may be destroyed. Specially, in the latter case, great care is necessary. Further, if the input terminal shorts to GND in a state of normal operation, the output terminal voltage becomes higher than the input voltage (GND potential), and the electric charge of a chemical capacitor connected to the output terminal flows into the input side, which may cause the destruction of circuit. In these cases, take such steps as a zener diode and a general silicon diode are connected to the circuit, as shown in the following figure.



- (3) When the input voltage is too high, the power dissipation of three terminal regulator increases because of series regulator, so that the junction temperature rises. In such a case, it is recommended to reduce the power dissipation by inserting the power limiting resistor R_{SD} in the input terminal, and to reduce the junction temperature as a result.



The power dissipation P_D of IC is expressed in the following equation.

$$P_D = (V_{IN'} - V_{OUT}) \cdot I_{OUT} + V_{IN'} \cdot I_B$$

If $V_{IN'}$ is reduced below the lowest voltage necessary for the IC, the parasitic oscillation will be caused according to circumstances.

In determining the resistance value of R_{SD} , design with margin should be made by making reference to the following equation.

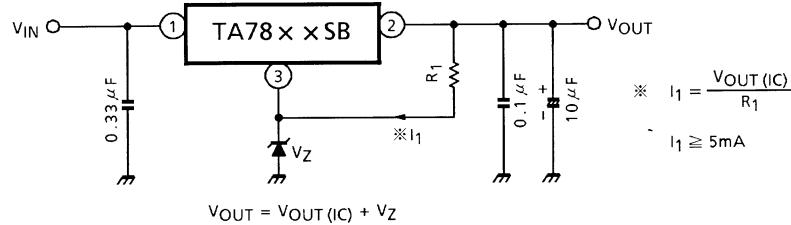
$$R_{SD} < \frac{V_{IN} - V_{IN'}}{I_{OUT} + I_B}$$

- (4) Connect the input terminal and GND, and the output terminal and GND, by capacitor respectively. The capacitances should be determined experimentally because they depend on PCB patterns. In particular, adequate investigation should be made so that there is no problem even at time of high or low temperature.

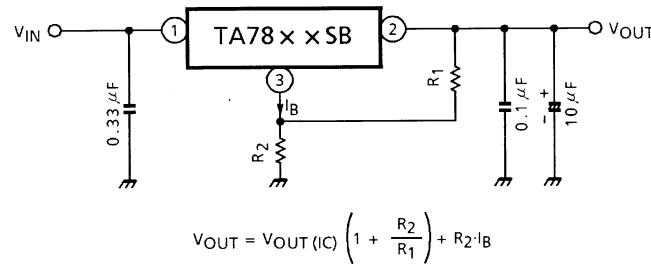
Application Circuits

(1) Voltage boost regulator

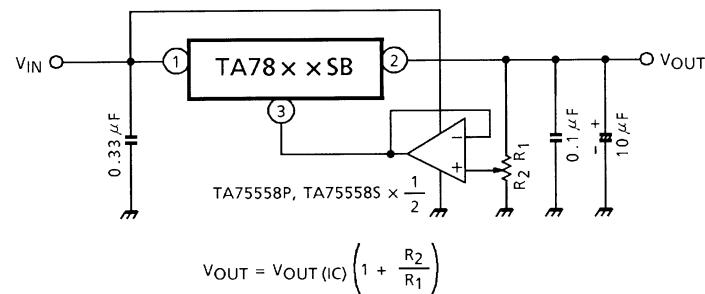
(a) Voltage boost by use of zener diode



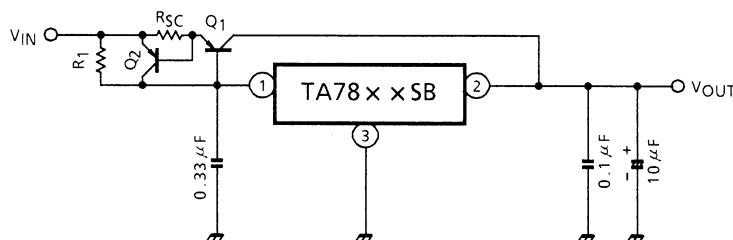
(b) Voltage boost by use of resistor



(c) Adjustable output regulator



(2) Current boost regulator



$$R_1 \leq \frac{V_{BE1}}{I_B \text{ MAX}}$$

where,

V_{BE1} : V_{BE} of external transistor Q1.
 $I_B \text{ MAX}$: Quiescent current of IC.

$$R_{SC} = \frac{V_{BE2}}{I_{SC}}$$

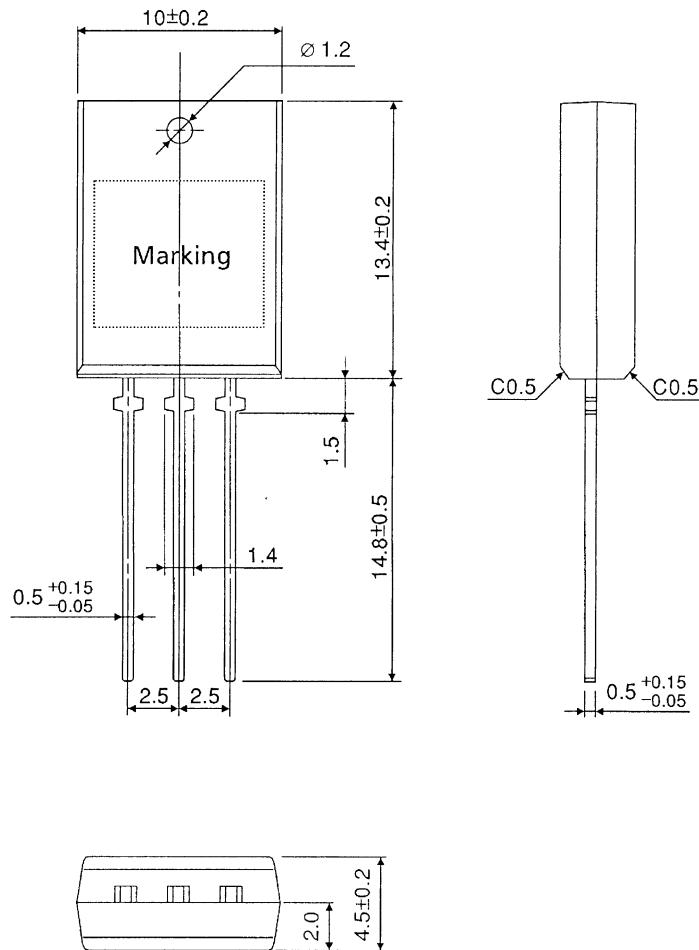
where,

I_{SC} : Short-circuit current.

Package Dimensions

SIP3-P-2.50A

Unit : mm



Weight : 1.5 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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