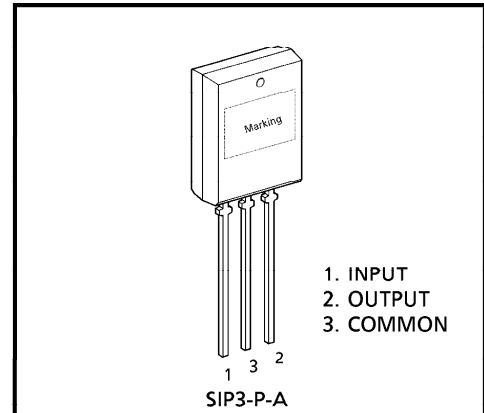


## THREE TERMINAL POSITIVE VOLTAGE REGULATORS

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

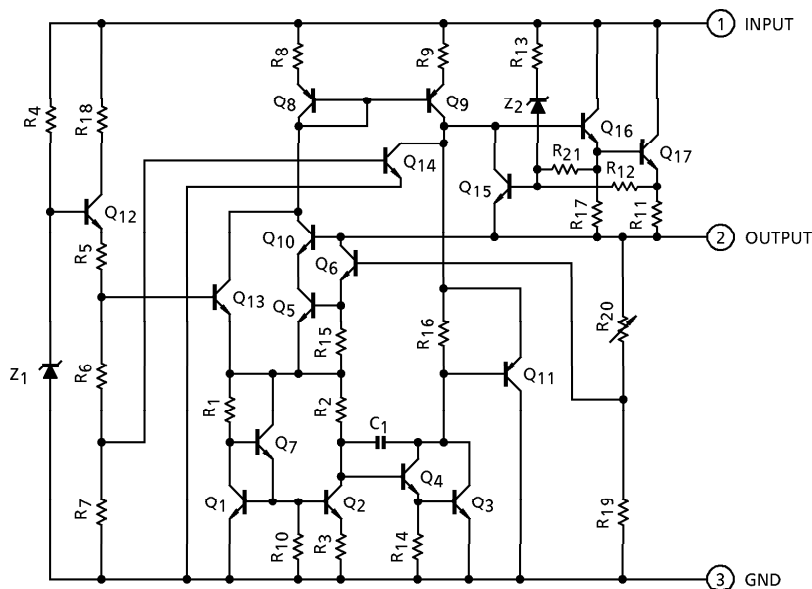
### FEATURES

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



Weight : 1.5g (Typ.)

### EQUIVALENT CIRCUIT



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TA7805SB - 1

1995 - 4 - 3

**TOSHIBA CORPORATION**

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage	TA7805SB	V <sub>IN</sub>	35	V
	TA78057SB			
	TA7806SB			
	TA7807SB			
	TA7808SB			
	TA7809SB			
	TA7810SB			
	TA7812SB			
	TA7815SB			
	TA7818SB		40	
	TA7820SB			
	TA7824SB			
Power Dissipation	(Ta = 25°C)	P <sub>D</sub>	1.8	W
Operating Temperature		T <sub>opr</sub>	- 30~75	°C
Storage Temperature		T <sub>stg</sub>	- 55~150	°C
Operating Junction Temperature		T <sub>j</sub>	- 30~150	°C
Thermal Resistance		R <sub>th(j-a)</sub>	69.4	°C / W

TA7805SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 10V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	4.8	5.0	5.2	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$7.0V \leq V_{IN} \leq 25V$	—	3	100	mV
				$8.0V \leq V_{IN} \leq 12V$	—	1	50	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	15	100	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	5	50	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $7.0V \leq V_{IN} \leq 20V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	4.75	—	5.25	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.2	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$7.0V \leq V_{IN} \leq 25V$	—	—	1.3	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	50	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $8.0V \leq V_{IN} \leq 18V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	62	78	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	1.6	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-0.6	—	mV/ $^{\circ}C$	

TA78057SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 10.7V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	5.47	5.7	5.93	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$7.7V \leq V_{IN} \leq 25V$	—	4	110	mV
				$8.7V \leq V_{IN} \leq 12.7V$	—	2	55	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	15	110	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	5	55	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $7.7V \leq V_{IN} \leq 20.7V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	5.42	—	5.98	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$7.7V \leq V_{IN} \leq 25V$	—	—	1.3	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	55	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $8.8V \leq V_{IN} \leq 18.8V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	62	77	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	1.5	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-0.7	—	mV/ $^{\circ}C$	

TA7806SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 11V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	5.75	6.0	6.25	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$8.0V \leq V_{IN} \leq 25V$	—	4	120	mV
				$9V \leq V_{IN} \leq 13V$	—	2	60	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	15	120	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	5	60	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $8V \leq V_{IN} \leq 21V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	5.7	—	6.3	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$8.0V \leq V_{IN} \leq 25V$	—	—	1.3	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	55	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $9V \leq V_{IN} \leq 19V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	61	77	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	1.5	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-0.7	—	mV/ $^{\circ}C$	

TA7807SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 12V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	6.72	7.0	7.28	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$9V \leq V_{IN} \leq 25V$	—	5	140	mV
				$10V \leq V_{IN} \leq 14V$	—	2	70	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	15	140	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	5	70	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $9V \leq V_{IN} \leq 22V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	6.65	—	7.35	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$9V \leq V_{IN} \leq 25V$	—	—	1.3	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	60	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $10V \leq V_{IN} \leq 20V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	59	75	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	1.3	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-0.8	—	mV/ $^{\circ}C$	

TA7808SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 14V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	7.7	8.0	8.3	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$10.5V \leq V_{IN} \leq 25V$	—	6	160	mV
				$11V \leq V_{IN} \leq 17V$	—	2	80	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	160	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	80	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $10.5V \leq V_{IN} \leq 23V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	7.6	—	8.4	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$10.5V \leq V_{IN} \leq 25V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	70	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $11.5V \leq V_{IN} \leq 21.5V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	58	74	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	1.1	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-1.0	—	mV/ $^{\circ}C$	

TA7809SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 15V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	8.64	9.0	9.36	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$11.5V \leq V_{IN} \leq 26V$	—	7	180	mV
				$13V \leq V_{IN} \leq 19V$	—	2.5	90	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	180	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	90	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $11.5V \leq V_{IN} \leq 24V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	8.55	—	9.45	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$11.5V \leq V_{IN} \leq 26V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	75	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $12.5V \leq V_{IN} \leq 22.5V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	56	72	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	1.0	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-1.1	—	mV/ $^{\circ}C$	



TA7810SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 16V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	9.6	10.0	10.4	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$12.5V \leq V_{IN} \leq 27V$	—	8	200	mV
				$14V \leq V_{IN} \leq 20V$	—	2.5	100	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	200	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	100	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $12.5V \leq V_{IN} \leq 25V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	9.5	—	10.5	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$12.5V \leq V_{IN} \leq 27V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	80	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $13.5V \leq V_{IN} \leq 23.5V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	55	72	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	0.9	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-1.3	—	mV/ $^{\circ}C$	

TA7812SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 19V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	11.5	12.0	12.5	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$14.5V \leq V_{IN} \leq 30V$	—	10	240	mV
				$16V \leq V_{IN} = 22V$	—	3	120	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	240	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	120	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $14.5V \leq V_{IN} \leq 27V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	11.4	—	12.6	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.3	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$14.5V \leq V_{IN} \leq 30V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	90	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $15V \leq V_{IN} \leq 25V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	55	71	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	0.7	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-1.6	—	mV/ $^{\circ}C$	

TA7815SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 23V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	14.4	15.0	15.6	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$17.5V \leq V_{IN} \leq 30V$	—	11	300	mV
				$20V \leq V_{IN} \leq 26V$	—	3	150	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	300	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	150	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $17.5V \leq V_{IN} \leq 30V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	14.25	—	15.75	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.4	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$17.5V \leq V_{IN} \leq 30V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	110	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $18.5V \leq V_{IN} \leq 28.5V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	54	70	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	0.5	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-2.0	—	mV/ $^{\circ}C$	

TA7818SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 27V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	17.3	18.0	18.7	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$21V \leq V_{IN} \leq 33V$	—	13	360	mV
				$24V \leq V_{IN} \leq 30V$	—	4	180	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	360	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	180	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $21V \leq V_{IN} \leq 33V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	17.1	—	18.9	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.5	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$21V \leq V_{IN} \leq 33V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	125	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $22V \leq V_{IN} \leq 32V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	52	68	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	0.4	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-2.5	—	$mV/^{\circ}C$	

TA7820SB

ELECTRICAL CHARACTERISTICS ( $V_{IN} = 29V$ ,  $I_{OUT} = 500mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ , unless otherwise specified)

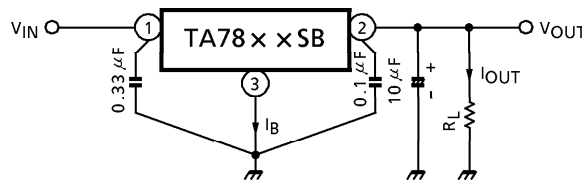
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 100mA$	19.2	20.0	20.8	V	
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$	$23V \leq V_{IN} \leq 35V$	—	15	400	mV
				$26V \leq V_{IN} \leq 32V$	—	5	200	
Load Regulation	Reg.load	1	$T_j = 25^{\circ}C$	$5mA \leq I_{OUT} \leq 1.4A$	—	12	400	mV
				$250mA \leq I_{OUT} \leq 750mA$	—	4	200	
Output Voltage	$V_{OUT}$	1	$T_j = 25^{\circ}C$ $23V \leq V_{IN} \leq 35V$ $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	19.0	—	21.0	V	
Quiescent Current	$I_B$	1	$T_j = 25^{\circ}C$ , $I_{OUT} = 5mA$	—	4.6	8.0	mA	
Quiescent Current Change	$\Delta I_B$	1	$23V \leq V_{IN} \leq 35V$	—	—	1.0	mA	
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^{\circ}C$ , $10Hz \leq f \leq 100kHz$ $I_{OUT} = 50mA$	—	135	—	$\mu V_{rms}$	
Ripple Rejection	R.R.	3	$f = 120Hz$ , $24V \leq V_{IN} \leq 34V$ $I_{OUT} = 50mA$ , $T_j = 25^{\circ}C$	50	66	—	dB	
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^{\circ}C$	—	2.0	—	V	
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^{\circ}C$	—	0.4	—	A	
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-3.0	—	mV/ $^{\circ}C$	

TA7824SB

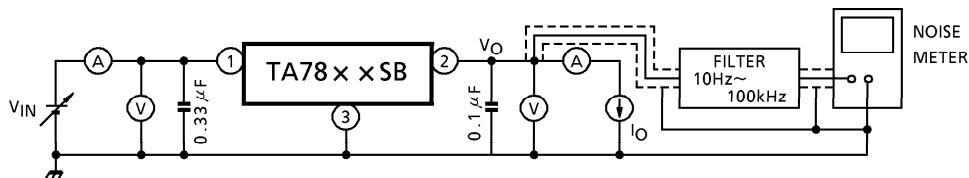
ELECTRICAL CHARACTERISTICS ( $V_{IN} = 33V$ ,  $I_{OUT} = 500mA$ ,  $0^\circ C \leq T_j \leq 125^\circ C$ , unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	$V_{OUT}$	1	$T_j = 25^\circ C$ , $I_{OUT} = 100mA$	23.0	24.0	25.0	V
Line Regulation	Reg.line	1	$T_j = 25^\circ C$ , $27V \leq V_{IN} \leq 38V$	—	18	480	mV
			$30V \leq V_{IN} \leq 36V$	—	6	240	
Load Regulation	Reg.load	1	$T_j = 25^\circ C$ , $5mA \leq I_{OUT} \leq 1.4A$	—	12	480	mV
			$250mA \leq I_{OUT} \leq 750mA$	—	4	240	
Output Voltage	$V_{OUT}$	1	$T_j = 25^\circ C$ , $27V \leq V_{IN} \leq 38V$ , $5.0mA \leq I_{OUT} \leq 1.0A$ , $P_D \leq 15W$	22.8	—	25.2	V
Quiescent Current	$I_B$	1	$T_j = 25^\circ C$ , $I_{OUT} = 5mA$	—	4.6	8.0	mA
Quiescent Current Change	$\Delta I_B$	1	$27V \leq V_{IN} \leq 38V$	—	—	1.0	mA
Output Noise Voltage	$V_{NO}$	2	$T_a = 25^\circ C$ , $10Hz \leq f \leq 100kHz$ , $I_{OUT} = 50mA$	—	150	—	$\mu V_{rms}$
Ripple Rejection	R.R.	3	$f = 120Hz$ , $28V \leq V_{IN} \leq 38V$ , $I_{OUT} = 50mA$ , $T_j = 25^\circ C$	50	66	—	dB
Dropout Voltage	$V_D$	1	$I_{OUT} = 1.0A$ , $T_j = 25^\circ C$	—	2.0	—	V
Short Circuit Current Limit	$I_{SC}$	1	$T_j = 25^\circ C$	—	0.3	—	A
Average Temperature Coefficient Of Output Voltage	$T_{CVO}$	1	$I_{OUT} = 5mA$	—	-3.5	—	$mV/^\circ C$

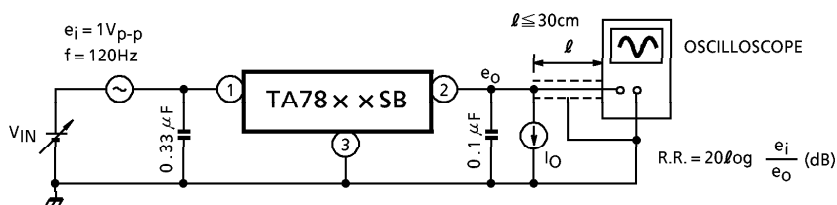
TEST CIRCUIT 1 / STANDARD APPLICATION CIRCUIT

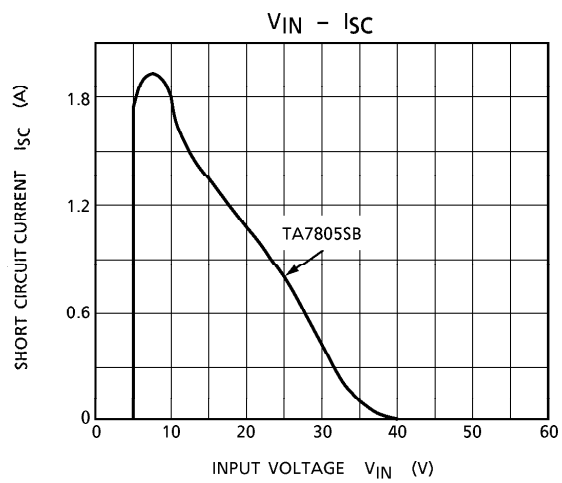
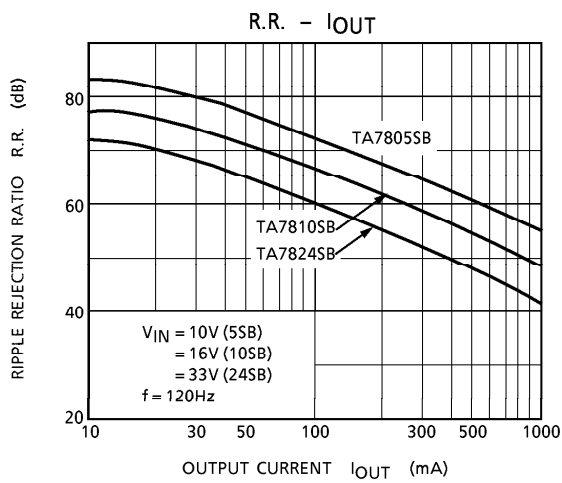
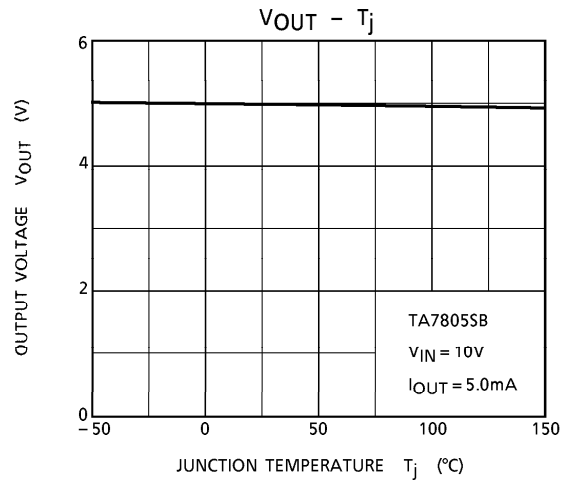
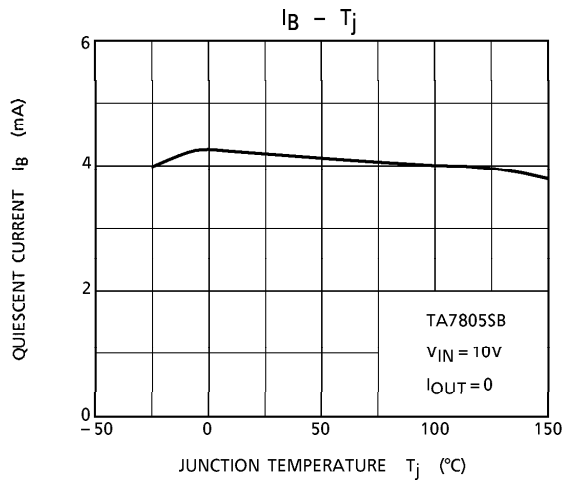


TEST CIRCUIT 2  $V_{NO}$

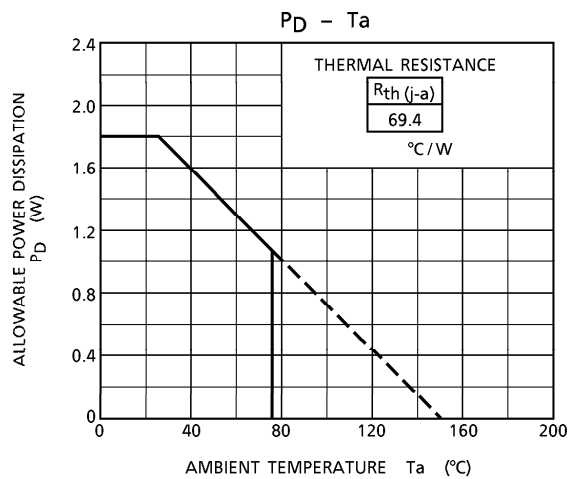
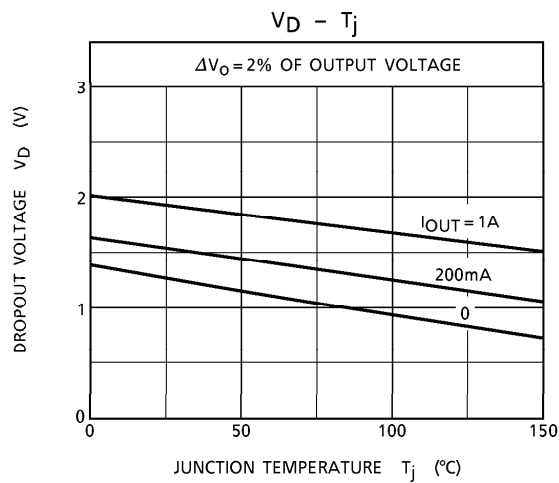


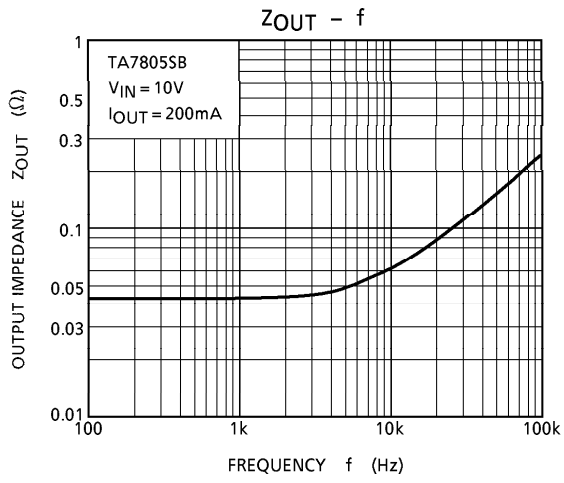
TEST CIRCUIT 3 R.R.





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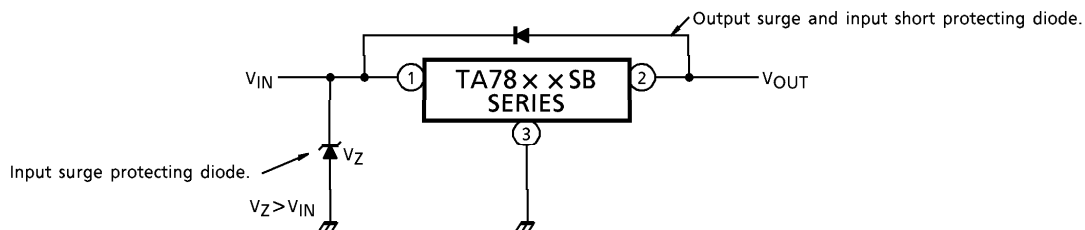
**PRECAUTIONS ON APPLICATION**

- (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.

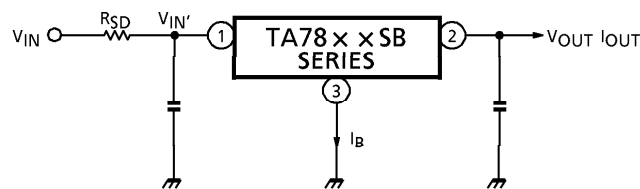
Specially, in the latter case, great care is necessary.

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.

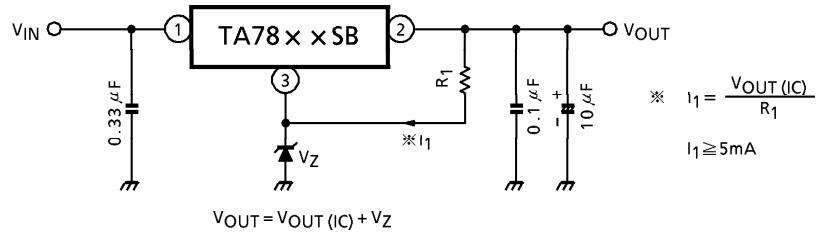
$$R_{SD} < \frac{V_{IN} - V_{IN'}}{I_{OUT} + I_B}$$

- (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 printed patterns. In particular, adequate investigation should be made so that there is no problem even at time of high or low temperature.

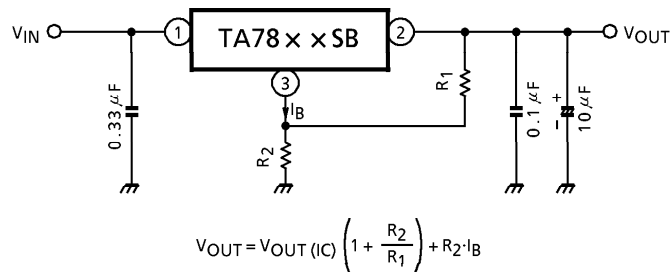
**APPLICATION CIRCUITS**

(1) Voltage boost regulator

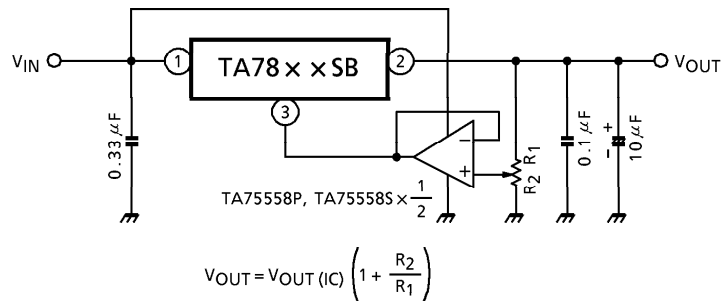
(a) Voltage boost by use of zener diode



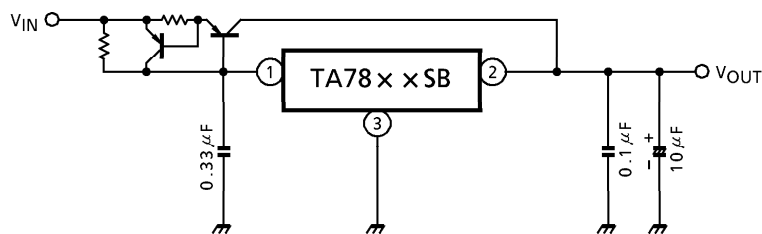
(b) Voltage boost by use of resistor



(c) Adjustable output regulator

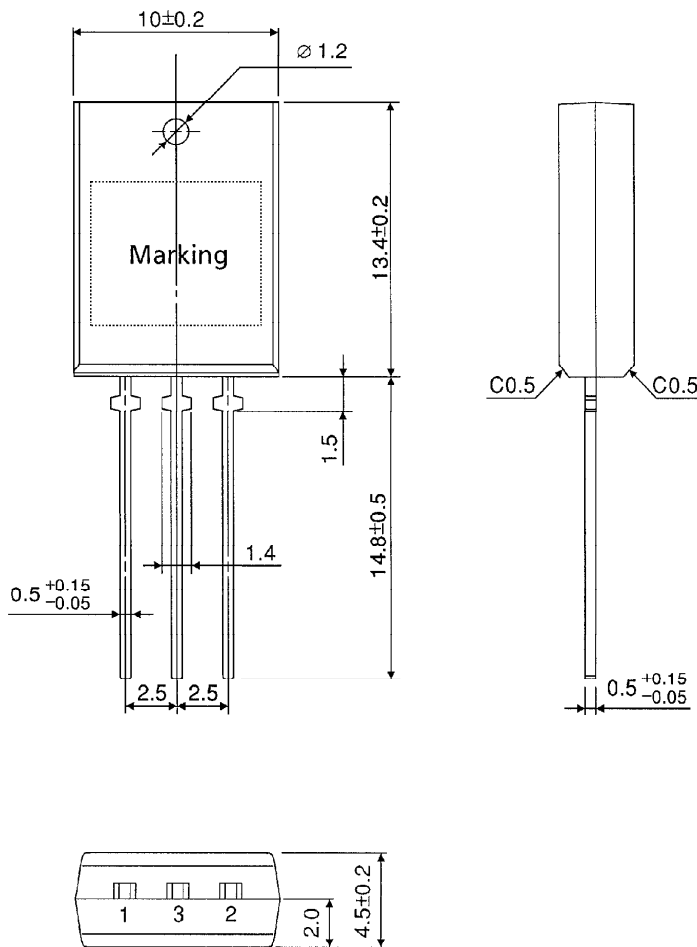


(2) Current boost regulator



OUTLINE DRAWING  
SIP3-P-A

Unit : mm



- 1 : INPUT
- 2 : OUTPUT
- 3 : COMMON

Weight : 1.5g (Typ.)