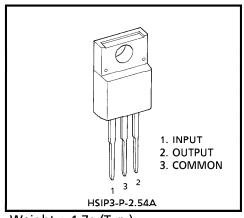
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7805S, TA78057S, TA7806S, TA7807S, TA7808S, TA7809S TA7810S, TA7812S, TA7815S, TA7818S, TA7820S, TA7824S

THREE TERMINAL POSITIVE VOLTAGE REGULATORS 5V, 5.7V, 6V, 7V, 8V, 9V, 10V, 12V, 15V, 18V, 20V, 24V

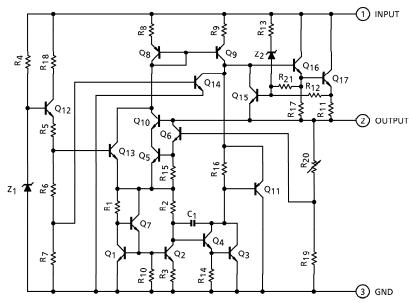
FEATURES

- 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
- Metal Fin (Tab) is fully covered with Mold Resin. (T0-220 NIS package)



Weight: 1.7g (Typ.)

EQUIVALENT CIRCUIT



961001EBA2

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- TOSHIBA Semiconductor Reliability Handbook.
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MAXIMUM RATINGS (Ta = 25°C)

CHARACTER	ISTIC	SYMBOL	RATING	UNIT
	TA7805S			
	TA78057S			
	TA7806S			
	TA7807S			
	TA7808S		35	
land Malkana	TA7809S	N/		.,
Input Voltage	TA7810S	VIN		V
	TA7812S			
	TA7815S			
	TA7818S			
	TA7820S		40	
	TA7824S			
Danier Dissipation	(Ta = 25°C)	D-	2	\A/
Power Dissipation	(Tc = 25°C)	P_{D}	20	W
Operating Temperat	ure	T _{opr}	- 30∼75	°C
Storage Temperature	9	T _{stg}	− 55~150	°C
Operating Junction	Temperature	Tj	- 30∼150	°C
Thormal Posistansa		R _{th (j-c)}	6.25	°C /\\
Thermal Resistance		R _{th (j-a)}	62.5	°C/W

TA7805S **ELECTRICAL CHARACTERISTICS** (V_{IN} = 10V, I_{OUT} = 500mA, 0° C \leq T $_{j}$ \leq 125°C, unless otherwise specified)

	- 1114	, - (, 				<u> </u>	
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	Т	TEST CONDITION			MAX.	UNIT
Output Voltage	VOUT	1	$T_j = 25^{\circ}C$,	I _{OUT} = 100mA	4.8	5.0	5.2	V
L'an Baralatian			T 2506	$7.0V \le V_{ N} \le 25V$	_	3	100	
Line Regulation	Reg.line	1	$ 1_j = 25^{\circ}C$	$7.0V \le V_{1N} \le 25V$ $8.0V \le V_{1N} \le 12V$		1	50	mV
Land Bandation	Danland		T 25°C	$5mA \le I_{OUT} \le 1.4A$ $250mA \le I_{OUT} \le 750mA$	_	15	100	>/
Load Regulation	Reg.load	1	$ 1j = 25^{\circ}C $	250mA ≤ I _{OUT} ≤ 750mA	_	5	50	mV
				$7.0V \le V_{ N} \le 20V$				
Output Voltage	Vout	1	T _i = 25°C	5.0 mA $ \leq I_{OUT} \leq 1.0$ A,	4.75	<u> </u>	5.25	V
			'	P _D ≦ 15W				
Quiescent Current	IB	1	$T_j = 25^{\circ}C$,	I _{OUT} = 5mA	_	4.2	8.0	mA
Quiescent Current	ΔlB	1	7.0V≦ V _I	$7.0V \le V_{\text{IN}} \le 25V$		_	1.3	mA
Change			T- 25°C	1011-2121001-11-				
Output Noise Voltage	V _{NO}	2	1a = 25°C l _{OUT} = 50	, 10Hz≦f≦100kHz)mA		50	_	μ V $_{rms}$
Ripple Rejection	R.R.	3		z, 8.0V≦V _{IN} ≦ 18V	62	78	_	dB
				$DmA, T_j = 25^{\circ}C$	-			
Dropout Voltage	V _D	1	$I_{OUT} = 1.$	0A, T _j = 25°C	_	2.0	_	V
Short Circuit Current	I _{SC}	1	T _i = 25°C			1.6		Α
Limit	'3C	<u>'</u>	1, - 23 C			1.0		,
Average Temperature	Tava	1	 	m A		- 0.6		mV / °C
Coefficient of Output Voltage	Tcvo	1	I _{OUT} = 5r	IIA		- 0.6		111V / C

TA78057S ELECTRICAL CHARACTERISTICS ($V_{IN} = 10.7V$, $I_{OUT} = 500$ mA, 0° C $\leq T_{j} \leq 125^{\circ}$ C, unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	VOUT	1	$T_j = 25$ °C, $I_{OUT} = 100$ mA	5.47	5.7	5.93	V
Line Demulation	Don line	4	$T_j = 25^{\circ}C$ $7.7V \le V_{ N} \le 25V$ $8.7V \le V_{ N} \le 12.7V$	T —	4	110	\/
Line Regulation	Reg.line	1	$ V_j = 25 \text{ C}$ $ 8.7 \text{V} \le \text{V}_{\text{IN}} \le 12.7 \text{V}$	_	2	55	mV
Lood Domilotion	Dog lood	1	T. 25°C 5mA≦l _{OUT} ≦1.4A	_	15	110	\/
Load Regulation	Reg.load	l	$T_j = 25^{\circ}C$ $\frac{5mA \le I_{OUT} \le 1.4A}{250mA \le I_{OUT} \le 750mA}$	<u> </u>	5	55	mV
			7.7V≦ V _{IN} ≦ 20.7V				
Output Voltage	Vout	1	$ T_j = 25^{\circ}C 5.0 \text{mA} \le I_{OUT} \le 1.0 \text{A}$, 5.42	—	5.98	V
			P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.3	8.0	mA
Quiescent Current	Δl _B	1	7.7V≦ V _{IN} ≦ 25V			1.3	mA
Change	2.8	'	•••			1.5	111/4
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz≦f≦ 100kHz	_	55	l	μ V $_{rms}$
	3110	_	I _{OUT} = 50mA				۲. · ۱۱۱۱۶
Ripple Rejection	R.R.	3	$f = 120Hz, 8.8V \le V_{IN} \le 18.8V$	62	77	 	dВ
			$I_{OUT} = 50 \text{mA}, T_j = 25^{\circ}\text{C}$				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0	_	V
Short Circuit Current	I _{SC}	1	T _i = 25°C	l	1.5	l	A
Limit	'3C	'			1.5		
Average Temperature							
Coefficient of Output	Tcvo	1	I _{OUT} = 5mA	-	-0.7	—	mV / °C
Voltage							

TA7806S ELECTRICAL CHARACTERISTICS (V_{IN} = 11V, I_{OUT} = 500mA, 0° C \leq T $_{j}$ \leq 125 $^{\circ}$ C, unless otherwise specified)

			701				
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT}	1	$T_j = 25^{\circ}C$, $I_{OUT} = 100$ mA	5.75	6.0	6.25	V
Line Demulation		1	$T_j = 25^{\circ}C$	/ —	4	120	\/
Line Regulation	Reg.line	1	$V_{ij} = 25 \text{ C} \boxed{9V \le V_{ij} \le 13V}$	_	2	60	mV
Lood Domilotion	Domlood	1	$T_{j} = 25^{\circ}C$ $5mA \le I_{OUT} \le 1.$ $250mA \le I_{OUT} \le 1.$.4A —	15	120	\/
Load Regulation	Reg.load	1	$1j = 25$ C $250\text{mA} \le 1_{\text{OUT}} \le$	≨750mA —	5	60	mV
			8V≦V _{IN} ≦21V				
Output Voltage	Vout	1	$T_j = 25^{\circ}C \mid 5.0 \text{ mA} \leq I_{OUT}$	≦ 1.0A, 5.7	_	6.3	V
			P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA		4.3	8.0	mA
Quiescent Current	Δl _B	1	8.0V≦V _{IN} ≦ 25V			1.3	mΑ
Change	21B	'				1.5	111/4
Output Noise Voltage	V _{NO}	2	Ta = 25°C, $10Hz \le f \le 100k$	Hz	55		μ V $_{rms}$
	1110		I _{OUT} = 50mA				۲. TITIS
Ripple Rejection	R.R.	3	$f = 120Hz, 9V \le V_{IN} \le 19V$	61	77		dB
			$I_{OUT} = 50 \text{mA}, T_j = 25 ^{\circ}\text{C}$				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0		V
Short Circuit Current	I _{SC}	1	T _i = 25°C		1.5		Α
Limit	'3C	'			1.5		
Average Temperature							
Coefficient of Output	Tcvo	1	$I_{OUT} = 5mA$	-	- 0.7	_	mV / °C
Voltage							

TA7807S ELECTRICAL CHARACTERISTICS (V_{IN} = 12V, I_{OUT} = 500mA, 0° C \leq T_{j} \leq 125°C, unless otherwise specified)

			701				
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT}	1	$T_j = 25^{\circ}C$, $I_{OUT} = 100$ mA	6.72	7.0	7.28	V
Line Demulation		1	$T_{j} = 25^{\circ}C \begin{cases} 9V \le V_{IN} \le 25V \\ 10V \le V_{IN} \le 14V \end{cases}$		5	140	
Line Regulation	Reg.line	1	$I_j = 25^{\circ}C $	_	2	70	mV
Load Bogulation	Poglood	1	$T_j = 25^{\circ}C$ $ \begin{array}{r} 5mA \le I_{OUT} \le 1.4A \\ 250mA \le I_{OUT} \le 750m \end{array} $		15	140	mV
Load Regulation	Reg.load	1	$15 = 25$ C 250 mA ≤ 1 OUT ≤ 750 m	A —	5	70	IIIV
			9V≦ V _{IN} ≦ 22V				
Output Voltage	Vout	1	$\left T_{j} = 25^{\circ}C \right 5.0 mA \leq I_{OUT} \leq 1.0 A$	·, 6.65	—	7.35	V
			P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA		4.3	8.0	mA
Quiescent Current	ΔlB	1	9V≦V _{IN} ≦25V			1.3	mA
Change	в						111/4
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz≦ f≦ 100kHz	<u> </u>	60	<u> </u>	μ V $_{rms}$
- Catput Hoise Voltage	1100	_	I _{OUT} = 50mA				۲ · ۱۱۱۱۶
Ripple Rejection	R.R.	3	$f = 120Hz, 10V \le V_{IN} \le 20V$	59	75	<u> </u>	dB
			$I_{OUT} = 50 \text{mA}, T_j = 25^{\circ}\text{C}$				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$	_	2.0	_	V
Short Circuit Current	lsc	1	T _i = 25°C		1.3		Α
Limit	ISC		1] = 23 C		1.3		
Average Temperature							
Coefficient of Output	Tcvo	1	I _{OUT} = 5mA	-	- 0.8	—	mV / °C
Voltage							

TA7808S ELECTRICAL CHARACTERISTICS (V_{IN} = 14V, I_{OUT} = 500mA, 0° 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	$T_j = 25$ °C, $I_{OUT} = 100$ mA	7.7	8.0	8.3	V
Line Demulation		1	$T_j = 25^{\circ}C$ $10.5V \le V_{IN} \le 25V$ $11V \le V_{IN} \le 17V$	—	6	160	>/
Line Regulation	Reg.line	1	$ 1 = 25 \text{ C}$ $ 11 \text{V} \le \text{V}_{ N} \le 17 \text{V}$	_	2	80	mV
Load Bogulation	Poglood	1	$T_j = 25^{\circ}C$ $ \begin{array}{c} 5mA \le I_{OUT} \le 1.4A \\ 250mA \le I_{OUT} \le 750mA \end{array} $	_	12	160	mV
Load Regulation	Reg.load	1	$250 \text{mA} \le 1_{\text{OUT}} \le 750 \text{m}$	$\sqrt{}$	4	80	""
			10.5V≦ V _{IN} ≦ 23V				
Output Voltage	Vout	1	$ T_j = 25^{\circ}C 5.0 \text{ mA} \le I_{OUT} \le 1.0 \text{ A}$, 7.6	—	8.4	V
			P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.3	8.0	mA
Quiescent Current	ΔlB	1	10.5V≦V _{IN} ≦ 25V			1.0	mA
Change	2.B	'				1.0	111/4
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz≦f≦ 100kHz	_	70	<u> </u>	μV_{rms}
	1100		I _{OUT} = 50mA				7-11113
Ripple Rejection	R.R.	3	$f = 120Hz, 11.5V \le V_{IN} \le 21.5V$	58	74	<u> </u>	dB
			I _{OUT} = 50mA, T _j = 25°C				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$	<u> </u>	2.0	_	V
Short Circuit Current	I _{SC}	1	T _i = 25°C		1.1		Α
Limit	'3C	'	1, -23 C		'-'		
Average Temperature							
Coefficient of Output	Tcvo	1	I _{OUT} = 5mA	-	- 1.0	—	mV / °C
Voltage							

TA7809S **ELECTRICAL CHARACTERISTICS** ($V_{IN} = 15V$, $I_{OUT} = 500$ mA, $0^{\circ}C \le T_{j} \le 125^{\circ}C$, unless otherwise specified)

			,01				
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT}	1	$T_j = 25$ °C, $I_{OUT} = 100$ mA	8.64	9.0	9.36	٧
Line Demulation		1	$T_j = 25^{\circ}C$ $11.5V \le V_{ N} \le 26^{\circ}$ $13V \le V_{ N} \le 19V$	v —	7	180	\/
Line Regulation	Reg.line	1	$I_j = 25 \text{ C} \boxed{13V \le V_{\text{IN}} \le 19V}$	_	2.5	90	mV
Load Bogulation	Pog lood	1	$T_j = 25^{\circ}C$ $T_j = 25^{\circ}C$ $\frac{5mA \le I_{OUT} \le 1.4}{250mA \le I_{OUT} \le 1.4}$	1A —	12	180	mV
Load Regulation	Reg.load	l	$250 \text{mA} \le 10 \text{UT} \le$	750mA —	4	90	IIIV
			11.5V≦ V _{IN} ≦ 24'				
Output Voltage	Vout	1	$T_j = 25^{\circ}C \mid 5.0 \text{mA} \leq I_{OUT} \leq$	≨ 1.0A, 8.55	<u> </u>	9.45	V
			P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.3	8.0	mA
Quiescent Current	ΔlB	1	11.5V≦ V _{IN} ≦ 26V			1.0	mA
Change	2.B	'				1.0	"""
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz ≤ f ≤ 100kl	Hz	75	<u> </u>	μ V $_{rms}$
	1100		I _{OUT} = 50mA				۲. TIII5
Ripple Rejection	R.R.	3	$f = 120Hz, 12.5V \le V_{IN} \le 22$	2.5V 56	72	<u> </u>	dB
			$I_{OUT} = 50 \text{mA}, T_j = 25^{\circ}\text{C}$				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0	_	V
Short Circuit Current	I _{SC}	1	T _i = 25°C		1.0	_	A
Limit	'3C	'			1.0		
Average Temperature							
Coefficient of Output	Tcvo	1	$I_{OUT} = 5mA$	_	- 1.1	—	mV / °C
Voltage							

TA7810S ELECTRICAL CHARACTERISTICS ($V_{IN} = 16V$, $I_{OUT} = 500$ mA, 0° C $\leq T_{j} \leq 125^{\circ}$ C, unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vout	1	$T_j = 25^{\circ}C$, $I_{OUT} = 100$ mA	9.6	10.0	10.4	V
Line Demoletien	Dan Bas	_	T 25°C 12.5V≦V _{IN} ≦27V	_	8	200	\/
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$ $12.5V \le V_{IN} \le 27V$ $14V \le V_{IN} \le 20V$	_	2.5	100	mV
Land Danielation	Danlaad	4	$T_j = 25^{\circ}C$	—	12	200	>/
Load Regulation	Reg.load	1	$I_j = 25^{\circ}C$ 250mA $\leq I_{OUT} \leq 750$ m	Δ —	4	100	mV
			12.5V≦ V _{IN} ≦ 25V				
Output Voltage	Vout	1	$ T_j = 25^{\circ}C 5.0$ mA $\leq I_{OUT} \leq 1.0$ A	, 9.5	 —	10.5	V
			P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.3	8.0	mA
Quiescent Current	⊿l _B	1	12.5V≦ V _{IN} ≦ 27V			1.0	mA
Change	2.B	'	•••			1.0	111/4
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz≦ f≦ 100kHz	_	80	l	μ V $_{rms}$
	110	_	I _{OUT} = 50mA				۲. TIIIS
Ripple Rejection	R.R.	3	$f = 120Hz, 13.5V \le V_{IN} \le 23.5V$	55	72	 	dВ
			$I_{OUT} = 50 \text{mA}, T_j = 25^{\circ}\text{C}$				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0	_	V
Short Circuit Current	I _{SC}	1	T _i = 25°C	l	0.9	l	A
Limit	,2C	'	· - 23 C		0.5		
Average Temperature							
Coefficient of Output	Tcvo	1	I _{OUT} = 5mA	-	- 1.3	-	mV / °C
Voltage							

TA7812S **ELECTRICAL CHARACTERISTICS** ($V_{IN} = 19V$, $I_{OUT} = 500$ mA, $0^{\circ}C \le T_{j} \le 125^{\circ}C$, unless otherwise specified)

			701				
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT}	1	$T_j = 25$ °C, $I_{OUT} = 100$ mA	11.5	12.0	12.5	٧
Line Demulation		1	$T_{j} = 25^{\circ}C \begin{vmatrix} 14.5V \le V_{ N } \le 30V \\ 16V \le V_{ N } = 22V \end{vmatrix}$	_	10	240	\/
Line Regulation	Reg.line	1	$1j = 25 \text{ C}$ $16V \le V_{IN} = 22V$	_	3	120	mV
Lood Domilotion	Domland	1	$T_{j} = 25^{\circ}C \begin{cases} 5mA \le I_{OUT} \le 1.4A \\ 250mA \le I_{OUT} \le 750mA \end{cases}$	_	12	240	\/
Load Regulation	Reg.load	1	$15 = 25 \text{ C} \boxed{250\text{mA} \le 1_{\text{OUT}} \le 750\text{m/s}}$	<u> </u>	4	120	mV
			14.5V≦ V _{IN} ≦ 27V				
Output Voltage	Vout	1	$T_j = 25$ °C 5.0 mA $\leq I_{OUT} \leq 1.0$ A	, 11.4	<u> </u>	12.6	V
			$P_{D} \le 15W$				
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.3	8.0	mA
Quiescent Current	⊿l _B	1	14.5V≦ V _{IN} ≦ 30V			1.0	mΑ
Change	21B	'				1.0	"""
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz≦f≦ 100kHz	1_	90	l	μ V $_{rms}$
	1110		I _{OUT} = 50mA				۲. TIII5
Ripple Rejection	R.R.	3	$f = 120Hz, 15V \le V_{IN} \le 25V$	55	71	 	dB
			$I_{OUT} = 50 \text{mA}, T_j = 25^{\circ}\text{C}$				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0		V
Short Circuit Current	I _{SC}	1	T _i = 25°C	1_	0.7	l	A
Limit	'3C	'	1, -23 C		0.7		
Average Temperature							
Coefficient of Output	Tcvo	1	$I_{OUT} = 5mA$	-	- 1.6	—	mV / °C
Voltage							

TA7815S **ELECTRICAL CHARACTERISTICS** (V_{IN} = 23V, I_{OUT} = 500mA, $0^{\circ}C \le T_{j} \le 125^{\circ}C$, unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TE	EST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vout	1	$T_j = 25^{\circ}C, I$	I _{OUT} = 100mA	14.4	15.0	15.6	V
Line Demulation	Dear line	1	T. 25°C	17.5V≦ V _{IN} ≦ 30V	_	11	300	\/
Line Regulation	Reg.line	1	1 j = 23 C 2	$17.5V \le V_{1N} \le 30V$ $20V \le V_{1N} \le 26V$	_	3	150	mV
Load Boaulation	Pog lood	1	T 25°C	$5mA \le I_{OUT} \le 1.4A$ $250mA \le I_{OUT} \le 750mA$	_	12	300	mV
Load Regulation	Reg.load		1j = 25 C 2	250mA≦I _{OUT} ≦750mA	_	4	150	iiiv
			•	17.5V≦ V _{IN} ≦ 30V				
Output Voltage	Vout	1	T _j = 25°C 5	5.0 mA $ \le I_{OUT} \le 1.0$ A,	14.25		15.75	V
				P _D ≦ 15W				
Quiescent Current	IB	1	$T_j = 25^{\circ}C, I$	$I_{OUT} = 5mA$		4.4	8.0	mA
Quiescent Current	⊿l _B	1	17.5V≦ V _{II}	N≦30V		_	1.0	mA
Change				anu e te anni u				
Output Noise Voltage	V _{NO}	2	1a = 25°C, I _{OUT} = 50r	10Hz≦f≦100kHz mA	_	110	_	μ V $_{rms}$
Ripple Rejection	R.R.	3		18.5V≦V _{IN} ≦ 28.5V	54	70	_	dB
				mA, T _j = 25°C				
Dropout Voltage	V_{D}	1	$I_{OUT} = 1.0$	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0	_	V
Short Circuit Current	I _{SC}	1	T _i = 25°C			0.5		A
Limit	'3C	<u>'</u>	1, - 23 C			0.5		
Average Temperature Coefficient of Output Voltage	T _{CVO}	1	I _{OUT} = 5m	Α	_	- 2.0	_	mV / °C

TA7818S **ELECTRICAL CHARACTERISTICS** (V_{IN} = 27V, I_{OUT} = 500mA, 0° C \leq T $_{j}$ \leq 125°C, unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	Vout	1	T _i = 25°C, I _{OUT} = 100mA	17.3	18.0	18.7	V
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$ $21V \le V_{ N} \le 33V$ $24V \le V_{ N} \le 30V$	<u>-</u>	13	360 180	mV
Load Regulation	Reg.load	1	$T_{j} = 25^{\circ}C \begin{cases} 5mA \le I_{OUT} \le 1.4A \\ 250mA \le I_{OUT} \le 750mA \end{cases}$		12	360 180	mV
Output Voltage	Vоит	1	$7_{j} = 25^{\circ}C$ $21V \le V_{IN} \le 33V$ $5.0 \text{ mA} \le I_{OUT} \le 1.0 \text{ A}$ $P_{D} \le 15W$		_	18.9	V
Quiescent Current	IB	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.5	8.0	mA
Quiescent Current Change	⊿I _B	1	21V≦V _{IN} ≦33V	_	_	1.0	mA
Output Noise Voltage	V _{NO}	2	Ta = 25°C, 10Hz≦f≦ 100kHz I _{OUT} = 50mA	-	125	_	μV _{rms}
Ripple Rejection	R.R.	3	f = 120Hz, $22V \le V_{IN} \le 32V$ $I_{OUT} = 50mA$, $T_i = 25^{\circ}C$	52	68	_	dB
Dropout Voltage	V _D	1	I _{OUT} = 1.0A, T _j = 25°C	1 —	2.0	_	V
Short Circuit Current Limit	I _{SC}	1	T _j = 25°C	_	0.4	_	Α
Average Temperature Coefficient of Output Voltage	Tcvo	1	I _{OUT} = 5mA	_	- 2.5		mV/°C

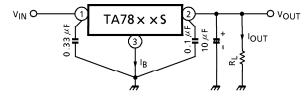
TA7820S ELECTRICAL CHARACTERISTICS ($V_{IN} = 29V$, $I_{OUT} = 500$ mA, 0° C $\leq T_{j} \leq 125^{\circ}$ C, unless otherwise specified)

			701					
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TI	EST 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 Demoletien		,	T 35°C	23V≦ V _{IN} ≦ 35V	_	15	400	>/
Line Regulation	Reg.line	1	$ 1_j = 25^{\circ}C $	$23V \le V_{\text{IN}} \le 35V$ $26V \le V_{\text{IN}} \le 32V$		5	200	mV
Lood Domilotion	Domland	1	T. 25°C	$5mA \le I_{OUT} \le 1.4A$ $250mA \le I_{OUT} \le 750mA$		12	400	\/
Load Regulation	Reg.load	1	1j = 25 C	250mA≦I _{OUT} ≦750mA	_	4	200	mV
				23V≦V _{IN} ≦35V				
Output Voltage	VOUT	1	T _j = 25°C	5.0 mA \leq IOUT \leq 1.0A,	19.0	<u> </u>	21.0	V
				P _D ≦ 15W				
Quiescent Current	ΙΒ	1	$T_j = 25^{\circ}C$,	$I_{OUT} = 5mA$	I	4.6	8.0	mA
Quiescent Current	Δl _B	1	23V≦V _{IN}	≤ 35 V			1.0	mA
Change	2.B	'					1.0	"""
Output Noise Voltage	V _{NO}	2	_	10Hz≦f≦ 100kHz	_	135	l	μV_{rms}
	1100		I _{OUT} = 50					7. 11113
Ripple Rejection	R.R.	3	1	, 24V≦V _{IN} ≦34V	50	66	 	dВ
				mA, T _j = 25°C				
Dropout Voltage	V _D	1	$I_{OUT} = 1.0$	I _{OUT} = 1.0A, T _j = 25°C		2.0		V
Short Circuit Current	I _{SC}	1	T _i = 25°C		_	0.4	l	A
Limit	'3C	'	1j=25 C			0.4		
Average Temperature								
Coefficient of Output	Tcvo	1	IOUT = 5m	nΑ	_	- 3.0	—	mV / °C
Voltage								

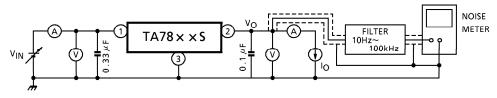
TA7824S **ELECTRICAL CHARACTERISTICS** (V_{IN} = 33V, I_{OUT} = 500mA, 0° C \leq T $_{i}$ \leq 125°C, unless otherwise specified)

	, 114	, ,	,				
CHARACTERISTIC	SYMBOL	TEST CIR- CUIT	TEST CONDITION		TYP.	MAX.	UNIT
Output Voltage	V _{OUT}	1	$T_j = 25^{\circ}C$, $I_{OUT} = 100$ mA	23.0	24.0	25.0	V
Line Regulation	Reg.line	1	$T_j = 25^{\circ}C$ $27V \le V_{ N} \le 38V$ $30V \le V_{ N} \le 36V$		18	480	mV
			1) - 53 C 30V \(\text{VIN} \geq 36V		6	240	
Load Regulation	Reg.load		$T_j = 25^{\circ}C$ $ \begin{array}{c} 5mA \le I_{OUT} \le 1.4A \\ 250mA \le I_{OUT} \le 750 \\ 270/ \le 1/2 \le 280/ \end{array} $		12	480	m∨
			1) - 23 C 250mA \(\sigma\) 10UT \(\sigma\)	JMA —	4	240	240 ""
Output Voltage	Vout	1	$T_j = 25^{\circ}C$ $ \begin{vmatrix} 277 & \Rightarrow V_{ N} & \Rightarrow 38V \\ 5.0 & \text{mA} & \leq I_{OUT} & \leq 1. \\ P_D & \leq 15W \end{vmatrix} $		_	25.2	V
Quiescent Current	ΙΒ	1	$T_j = 25$ °C, $I_{OUT} = 5$ mA	_	4.6	8.0	mA
Quiescent Current Change	ΔIB	1	27V≦V _{IN} ≦38V	_	_	1.0	mA
Output Noise Voltage	V _{NO}	2	Ta = 25°C, $10Hz \le f \le 100kHz$ $I_{OUT} = 50mA$		150	_	μ V $_{rms}$
Ripple Rejection	R.R.	3	$f = 120Hz, 28V \le V_{ N} \le 38V$ $l_{OUT} = 50mA, T_j = 25^{\circ}C$	50	66	_	dB
Dropout Voltage	V_{D}	1	$I_{OUT} = 1.0A, T_j = 25^{\circ}C$		2.0	l —	V
Short Circuit Current Limit	I _{SC}	1	T _j = 25°C	_	0.3	_	А
Average Temperature Coefficient of Output Voltage	T _{CVO}	1	I _{OUT} = 5mA		- 3.5		mV / °C

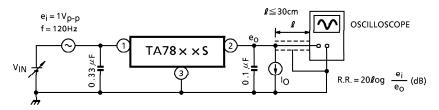
TEST CIRCUIT 1/STANDARD APPLICATION CIRCUIT

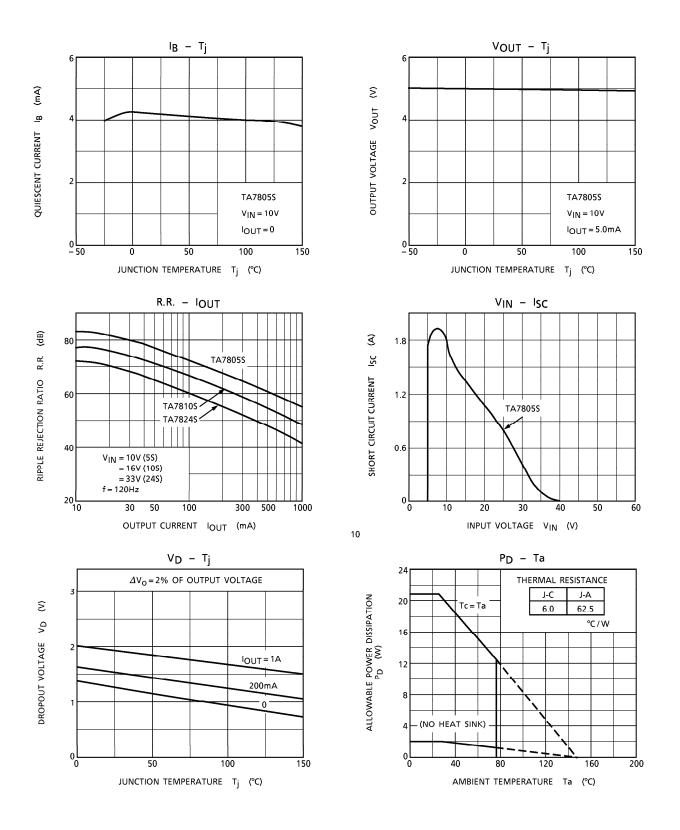


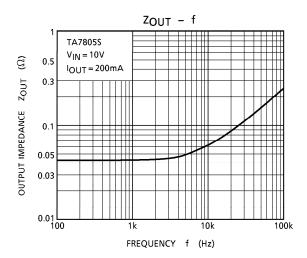
TEST CIRCUIT 2 VNO



TEST CIRCUIT 3 R.R.







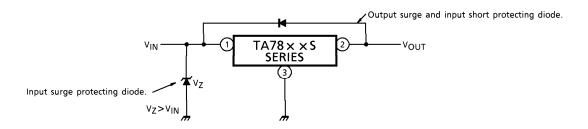
PRECAUTIONS ON APPLICATION

- (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.

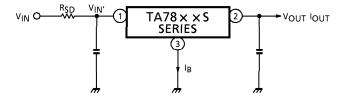
Specially, in the latter case, great care is necessary.

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 PD 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 determing 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 prented patterns. In particular, adequate investigation should be made so that there is no problem even at time of high or low temperature.
- (5) Installation of IC for power supply
 For obtaining high reliability on the heat sink design of the regulator IC, it is generally
 required to derate more than 20% of maximum junction temperature (T_j MAX.).
 Further, full consideration should be given to the installation of IC to the heat sink.

(a) Heat sink design

The thermal resistance of IC itself is required from the viewpoint of the design of elements, but the thermal resistance from the IC package to the open air varies with the contact thermal resistance.

TABLE 1 shows how much the value of the contact thermal resistance ($\theta_C + \theta_S$) is changed by insulating sheet (mica) and heat sink grease.

TABLE 1 Unit: °C/W

PACKAGE	MODEL No.	TORQUE	MICA	$\theta_{c} + \theta_{s}$
TO-220NIS	TA78××S	0.6N•m	Not Provided	0.4~0.6 (1.0~1.5)

The figures given in parentheses denote the values at time of no grease.

The package of regulator IC serves as GND, therefore, usually use the value at time of "no mica."

(b) Silicon grease

When a circuit not exceeding maximum rating is designed, it is to be desired that the grease should be used if possible. If it is required that the contact thermal resistance is reduced from the viewpoint of the circuit design, it is recommended that the following methods be adopted.

A: Use Thercon (NOTE)

B: Use YG6260 (TOSHIBA SILICON CORPORATION), if grease is used.

(NOTE) Thercon is a registered trademark of Fuji High Polymer Kogyo K.K..

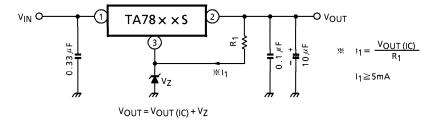
(c) Torque

When installing IC on a heat sink or the like, tighten the IC with the torque of less than the rated value. If it is tightened with the torque in excess of the rated value, sometimes the internal elements of the IC are adversely affected. Therefore, great care should be given to the installing operation.

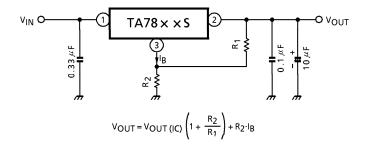
Further, if polycarbonate screws are used, the torque causes a change with the passage of time, which may lessen the effect of radiation.

APPLICATION CIRCUITS

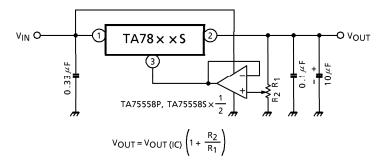
- (1) VOLTAGE BOOST REGULATOR
 - (a) Voltage boost by use of zener diode



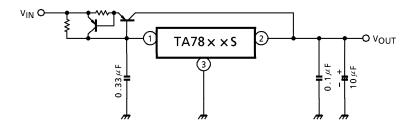
(b) Voltage boost by use of resistor



(c) Adjustable output regulator

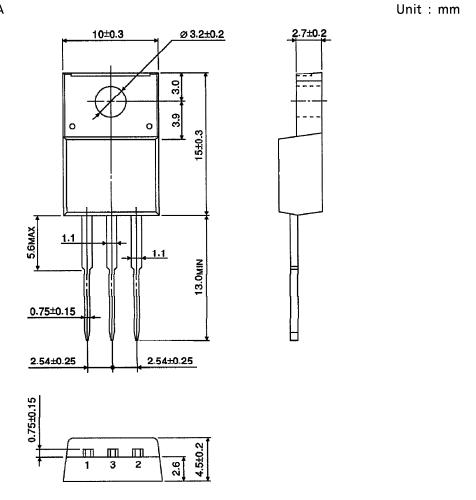


(2) CURRENT BOOST REGULATOR



OUTLINE DRAWING

HSIP3-P-2.54A



Weight: 1.7g (Typ.)