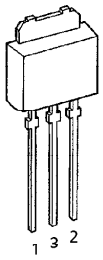
THREE TERMINAL POSITIVE VOLTAGE REGULATORS

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
- Packaged in POWER MOLD.

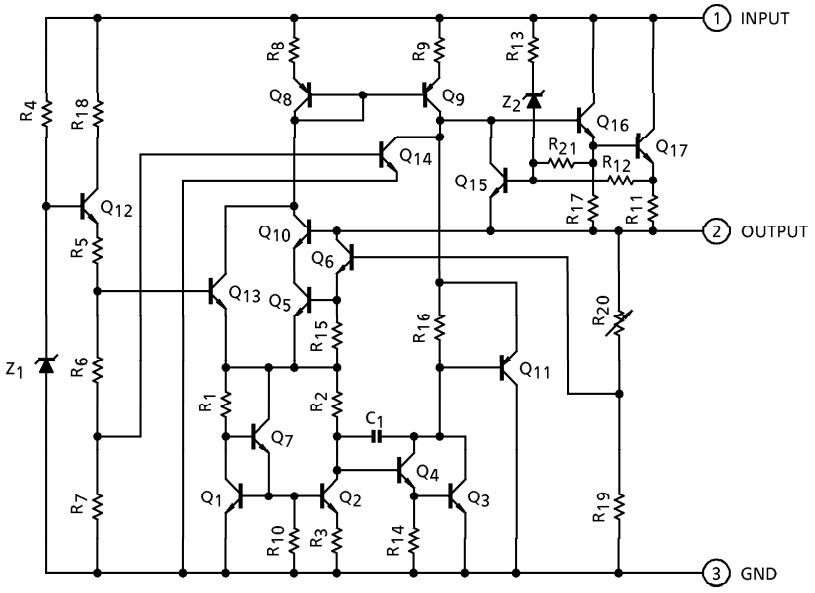


1. INPUT
2. OUTPUT
3. COMMON (CASE)

HSIP3-P-B

Weight : 0.36g (Typ.)

EQUIVALENT CIRCUIT



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage	TA7805F	V_{IN}	35	V
	TA78057F			
	TA7806F			
	TA7807F			
	TA7808F			
	TA7809F			
	TA7810F			
	TA7812F			
	TA7815F			
	TA7818F		40	
	TA7820F			
	TA7824F			
Power Dissipation	(Ta = 25°C)	P_D	1	W
	(Tc = 25°C)		10	
Operating Temperature		T_{opr}	−30~75	°C
Storage Temperature		T_{stg}	−55~150	°C
Operating Junction Temperature		T_j	−30~150	°C
Thermal Resistance		$R_{th\ (j-c)}$	12.5	°C / W
		$R_{th\ (j-a)}$	125	

TA7805F

ELECTRICAL CHARACTERISTICS (V_{IN} = 10V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		4.8	5.0	5.2	V
Line Regulation	Reg.line	1	T_j = 25°C	7.0V ≦ V_{IN} ≦ 25V	—	3	100	mV
				8.0V ≦ V_{IN} ≦ 12V	—	1	50	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	15	100	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	5	50	
Output Voltage	V_{OUT}	1	T_j = 25°C	7.0V ≦ V_{IN} ≦ 20V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	4.75	—	5.25	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.2	8.0	mA
Quiescent Current Change	ΔI_B	1	7.0V ≦ V_{IN} ≦ 25V, I_{OUT} = 5mA		—	—	1.3	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	50	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 10V ≦ V_{IN} ≦ 18V I_{OUT} = 50mA, T_j = 25°C		57	73	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	1.6	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 0.6	—	mV / °C

TA78057F

ELECTRICAL CHARACTERISTICS (V_{IN} = 10.7V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		5.47	5.7	5.93	V
Line Regulation	Reg.line	1	T_j = 25°C	7.7V ≦ V_{IN} ≦ 25V	—	4	110	mV
				8.7V ≦ V_{IN} ≦ 12.7V	—	2	55	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	15	110	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	5	55	
Output Voltage	V_{OUT}	1	T_j = 25°C	7.7V ≦ V_{IN} ≦ 20.7V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	5.42	—	5.98	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	7.7V ≦ V_{IN} ≦ 25V, I_{OUT} = 5mA		—	—	1.3	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	55	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 8.8V ≦ V_{IN} ≦ 18.8V I_{OUT} = 50mA, T_j = 25°C		56	72	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	1.5	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 0.7	—	mV / °C

TA7806F

ELECTRICAL CHARACTERISTICS (V_{IN} = 11V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		5.75	6.0	6.25	V
Line Regulation	Reg.line	1	T_j = 25°C	8.0V ≦ V_{IN} ≦ 25V	—	4	120	mV
				9V ≦ V_{IN} ≦ 13V	—	2	60	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	15	120	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	5	60	
Output Voltage	V_{OUT}	1	T_j = 25°C	8V ≦ V_{IN} ≦ 21V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	5.7	—	6.3	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	8.0V ≦ V_{IN} ≦ 25V, I_{OUT} = 5mA		—	—	1.3	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	55	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 11V ≦ V_{IN} ≦ 19V I_{OUT} = 50mA, T_j = 25°C		56	72	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	1.5	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 0.7	—	mV / °C

TA7807F

ELECTRICAL CHARACTERISTICS (V_{IN} = 12V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		6.72	7.0	7.28	V
Line Regulation	Reg.line	1	T_j = 25°C	9V ≦ V_{IN} ≦ 25V	—	5	140	mV
				10V ≦ V_{IN} ≦ 14V	—	2	70	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	15	140	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	5	70	
Output Voltage	V_{OUT}	1	T_j = 25°C	9V ≦ V_{IN} ≦ 22V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	6.65	—	7.35	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	9V ≦ V_{IN} ≦ 25V, I_{OUT} = 5mA		—	—	1.3	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	60	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 12V ≦ V_{IN} ≦ 20V I_{OUT} = 50mA, T_j = 25°C		54	70	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	1.3	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 0.8	—	mV / °C

TA7808F

ELECTRICAL CHARACTERISTICS (V_{IN} = 14V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		7.7	8.0	8.3	V
Line Regulation	Reg.line	1	T_j = 25°C	10.5V ≦ V_{IN} ≦ 25V	—	6	160	mV
				11V ≦ V_{IN} ≦ 17V	—	2	80	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	160	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	80	
Output Voltage	V_{OUT}	1	T_j = 25°C	10.5V ≦ V_{IN} ≦ 23V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	7.6	—	8.4	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	10.5V ≦ V_{IN} ≦ 25V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	70	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 14V ≦ V_{IN} ≦ 21.5V I_{OUT} = 50mA, T_j = 25°C		53	69	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	1.1	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 1.0	—	mV / °C

TA7809F

ELECTRICAL CHARACTERISTICS (V_{IN} = 15V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		8.64	9.0	9.36	V
Line Regulation	Reg.line	1	T_j = 25°C	11.5V ≦ V_{IN} ≦ 26V	—	7.0	180	mV
				13V ≦ V_{IN} ≦ 19V	—	2.5	90	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	180	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	90	
Output Voltage	V_{OUT}	1	T_j = 25°C	11.5V ≦ V_{IN} ≦ 24V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	8.55	—	9.45	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	11.5V ≦ V_{IN} ≦ 26V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	75	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 15V ≦ V_{IN} ≦ 22.5V I_{OUT} = 50mA, T_j = 25°C		51	67	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	1.0	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 1.1	—	mV / °C

TA7810F

ELECTRICAL CHARACTERISTICS (V_{IN} = 16V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		9.6	10.0	10.4	V
Line Regulation	Reg.line	1	T_j = 25°C	12.5V ≦ V_{IN} ≦ 27V	—	8	200	mV
				14V ≦ V_{IN} ≦ 20V	—	2.5	100	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	200	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	100	
Output Voltage	V_{OUT}	1	T_j = 25°C	12.5V ≦ V_{IN} ≦ 25V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	9.5	—	10.5	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	12.5V ≦ V_{IN} ≦ 27V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	80	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 16V ≦ V_{IN} ≦ 23.5V I_{OUT} = 50mA, T_j = 25°C		50	66	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	0.9	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 1.3	—	mV / °C

TA7812F

ELECTRICAL CHARACTERISTICS (V_{IN} = 19V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		11.5	12.0	12.5	V
Line Regulation	Reg.line	1	T_j = 25°C	14.5V ≦ V_{IN} ≦ 30V	—	10	240	mV
				16V ≦ V_{IN} = 22V	—	3	120	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	240	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	120	
Output Voltage	V_{OUT}	1	T_j = 25°C	14.5V ≦ V_{IN} ≦ 27V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	11.4	—	12.6	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.3	8.0	mA
Quiescent Current Change	ΔI_B	1	14.5V ≦ V_{IN} ≦ 30V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	90	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 19V ≦ V_{IN} ≦ 25V I_{OUT} = 50mA, T_j = 25°C		50	66	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	0.7	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 1.6	—	mV / °C

TA7815F

ELECTRICAL CHARACTERISTICS (V_{IN} = 23V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		14.4	15.0	15.6	V
Line Regulation	Reg.line	1	T_j = 25°C	17.5V ≦ V_{IN} ≦ 30V	—	11	300	mV
				20V ≦ V_{IN} ≦ 26V	—	3	150	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	300	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	150	
Output Voltage	V_{OUT}	1	T_j = 25°C	17.5V ≦ V_{IN} ≦ 30V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	14.25	—	15.75	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.4	8.0	mA
Quiescent Current Change	ΔI_B	1	17.5V ≦ V_{IN} ≦ 30V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	110	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 23V ≦ V_{IN} ≦ 28.5V I_{OUT} = 50mA, T_j = 25°C		49	65	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	0.5	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 2.0	—	mV / °C

TA7818F

ELECTRICAL CHARACTERISTICS (V_{IN} = 27V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°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} = 100mA		17.3	18.0	18.7	V
Line Regulation	Reg.line	1	T_j = 25°C	21V ≦ V_{IN} ≦ 33V	—	13	360	mV
				24V ≦ V_{IN} ≦ 30V	—	4	180	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	360	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	180	
Output Voltage	V_{OUT}	1	T_j = 25°C	21V ≦ V_{IN} ≦ 33V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	17.1	—	18.9	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.5	8.0	mA
Quiescent Current Change	ΔI_B	1	21V ≦ V_{IN} ≦ 33V, I_{OUT} = 5mA		—	—	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, 27V ≦ V_{IN} ≦ 32V I_{OUT} = 50mA, T_j = 25°C		47	63	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	0.4	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 2.5	—	mV / °C

TA7820F

ELECTRICAL CHARACTERISTICS (V_{IN} = 29V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°C, unless otherwise specified)

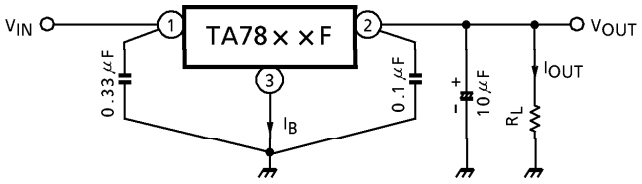
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j = 25°C, I_{OUT} = 100mA		19.2	20.0	20.8	V
Line Regulation	Reg.line	1	T_j = 25°C	23V ≦ V_{IN} ≦ 35V	—	15	400	mV
				26V ≦ V_{IN} ≦ 32V	—	5	200	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	400	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	200	
Output Voltage	V_{OUT}	1	T_j = 25°C	23V ≦ V_{IN} ≦ 35V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	19.0	—	21.0	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.6	8.0	mA
Quiescent Current Change	ΔI_B	1	23V ≦ V_{IN} ≦ 35V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	135	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 29V ≦ V_{IN} ≦ 34V I_{OUT} = 50mA, T_j = 25°C		45	61	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current Limit	I_{SC}	1	T_j = 25°C		—	0.4	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 3.0	—	mV / °C

TA7824F

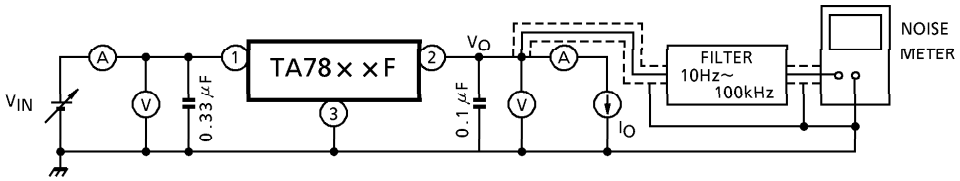
ELECTRICAL CHARACTERISTICS (V_{IN} = 33V, I_{OUT} = 500mA, 0°C ≦ T_j ≦ 125°C, unless otherwise specified)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	T_j = 25°C, I_{OUT} = 100mA		23.0	24.0	25.0	V
Line Regulation	Reg.line	1	T_j = 25°C	27V ≦ V_{IN} ≦ 38V	—	18	480	mV
				30V ≦ V_{IN} ≦ 36V	—	6	240	
Load Regulation	Reg.load	1	T_j = 25°C	5mA ≦ I_{OUT} ≦ 1.4A	—	12	480	mV
				250mA ≦ I_{OUT} ≦ 750mA	—	4	240	
Output Voltage	V_{OUT}	1	T_j = 25°C	27V ≦ V_{IN} ≦ 38V 5.0mA ≦ I_{OUT} ≦ 1.0A, P_D ≦ 15W	22.8	—	25.2	V
Quiescent Current	I_B	1	T_j = 25°C, I_{OUT} = 5mA		—	4.6	8.0	mA
Quiescent Current Change	ΔI_B	1	27V ≦ V_{IN} ≦ 38V, I_{OUT} = 5mA		—	—	1.0	mA
Output Noise Voltage	V_{NO}	2	Ta = 25°C, 10Hz ≦ f ≦ 100kHz I_{OUT} = 50mA		—	150	—	μV_{rms}
Ripple Rejection	R.R.	3	f = 120Hz, 33V ≦ V_{IN} ≦ 38V I_{OUT} = 50mA, T_j = 25°C		45	61	—	dB
Dropout Voltage	V_D	1	I_{OUT} = 1.0A, T_j = 25°C		—	2.0	—	V
Short Circuit Current	I_{SC}	1	T_j = 25°C		—	0.3	—	A
Average Temperature Coefficient Of Output Voltage	T_{CVO}	1	I_{OUT} = 5mA		—	– 3.5	—	mV / °C

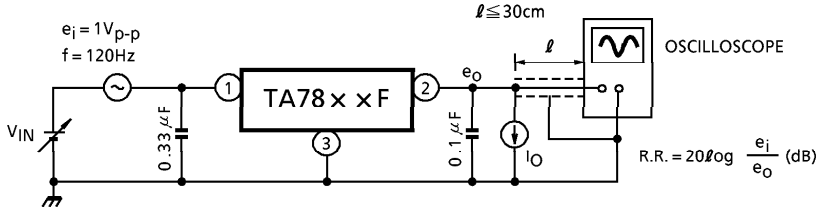
TEST CIRCUIT 1 / STANDARD APPLICATION CIRCUIT



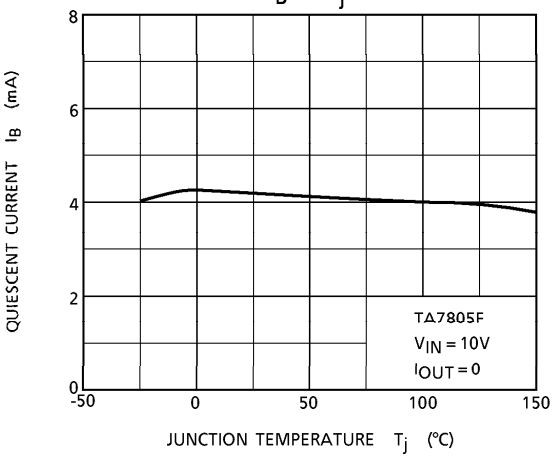
TEST CIRCUIT 2 V_{NO}



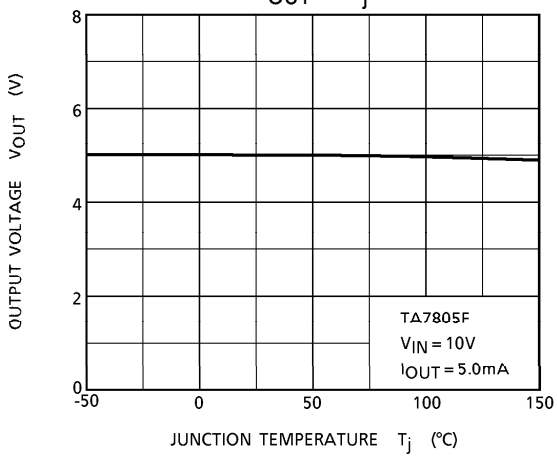
TEST CIRCUIT 3 R.R.



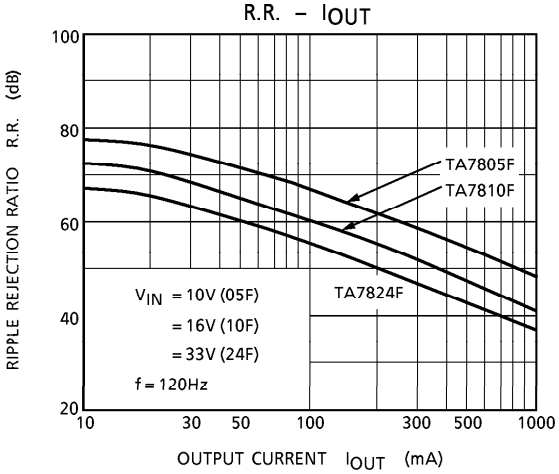
$I_B - T_j$



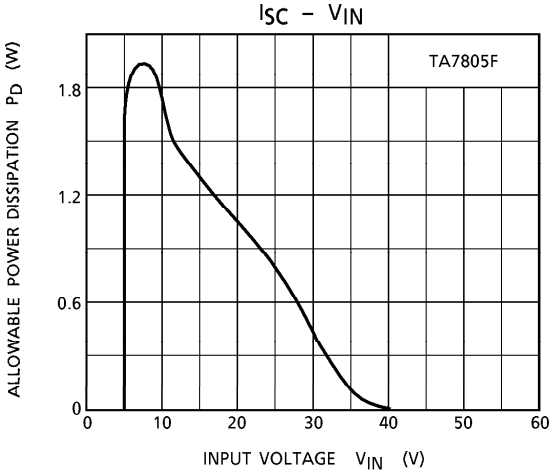
$V_{OUT} - T_j$



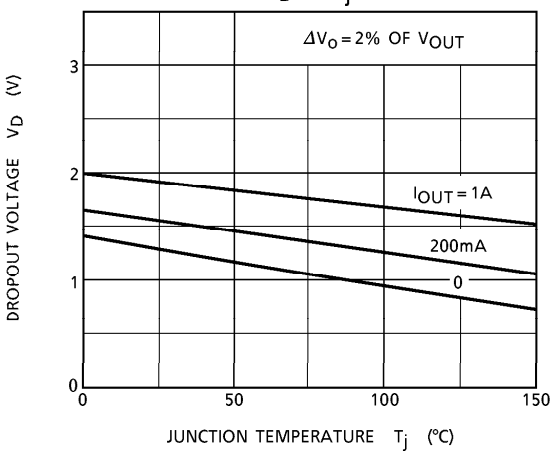
R.R. - I_{OUT}



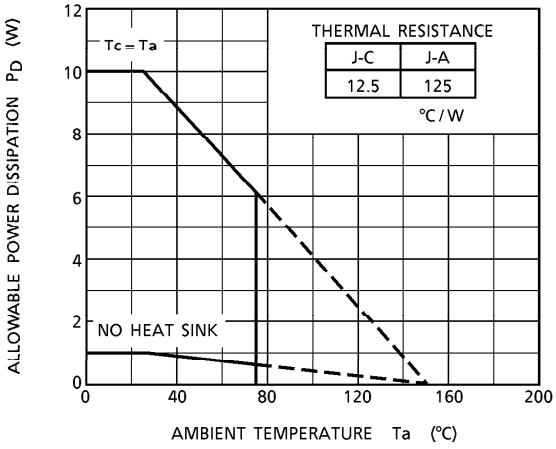
$I_{SC} - V_{IN}$



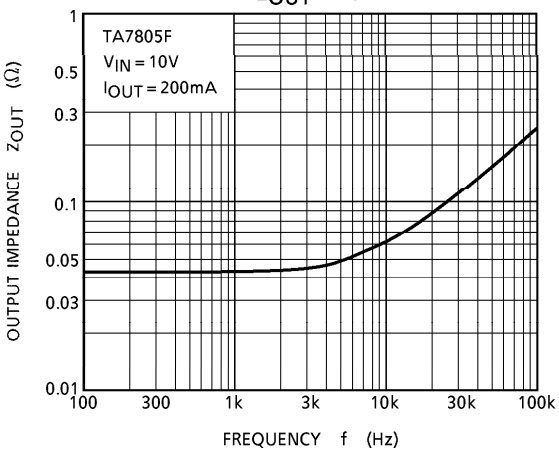
$V_D - T_j$



$P_D - Ta$



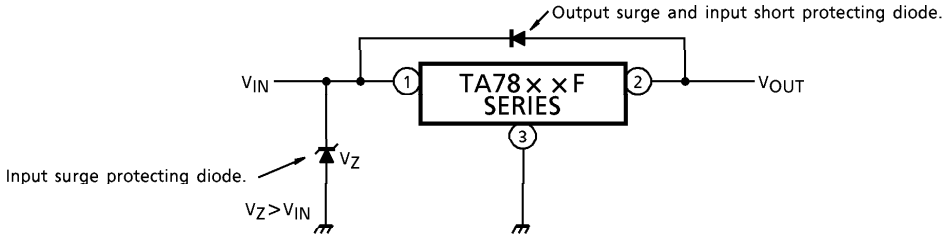
$Z_{OUT} - f$



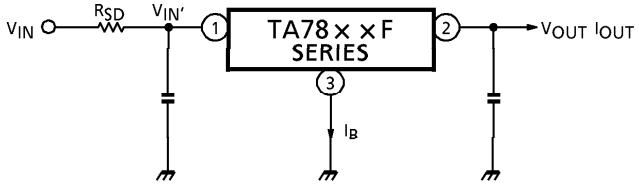
PRECAUTIONS ON APPLICATION

(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.

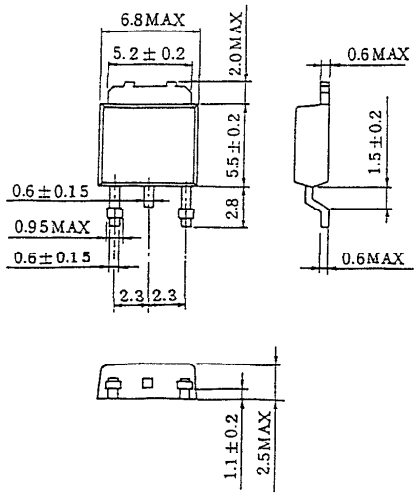
$$P_D = (V_{IN'} - V_{OUT}) \cdot I_{OUT} + V_{IN'} \cdot I_B$$

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

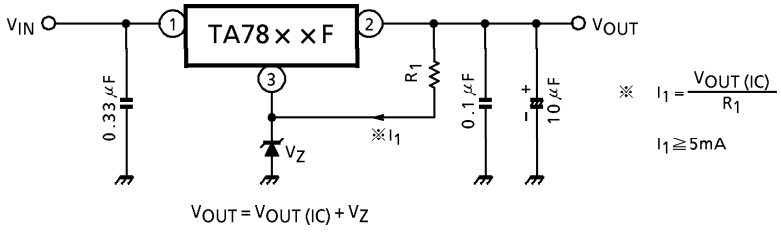
(5) The molded plastic portion of this unit, measuring 5.5mm (L) by 6.8mm (W) by 2.5mm (T), is more comapact compared to its equivalents TO-220.
The collector fin extends directly out of the main body, and can be soldered directly to the ceramic circuitboard, to significantly increase the collector power dissipation of the collector.
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.



APPLICATION CIRCUITS

(1) VOLTAGE BOOST REGULATOR

(a) Voltage boost by use of zener diode

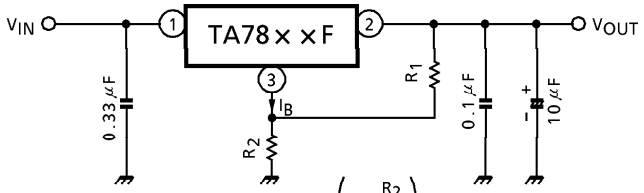


※ $I_1 = \frac{V_{OUT(IC)}}{R_1}$

$I_1 \geqq 5mA$

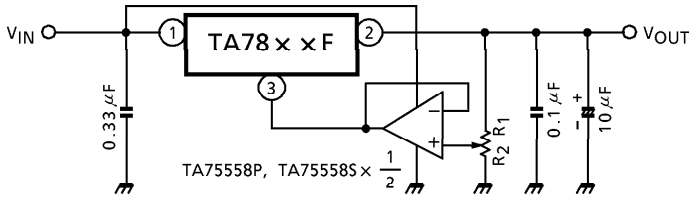
$V_{OUT} = V_{OUT(IC)} + V_Z$

(b) Voltage boost by use of resistor



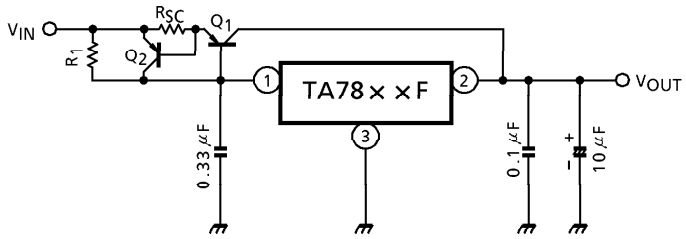
$V_{OUT} = V_{OUT(IC)} \left(1 + \frac{R_2}{R_1}\right) + R_2 \cdot I_B$

(c) Adjustable output regulator



$V_{OUT} = V_{OUT(IC)} \left(1 + \frac{R_2}{R_1}\right)$

(2) CURRENT BOOST REGULATOR



Heat sink is needed for Q_1.

$$R_1 \leqq \frac{V_{BE1}}{I_{B\ MAX}}$$

where,

V_{BE1} : V_{BE} of external transistor Q_1.
$I_{B\ MAX}$: Quiescent current of IC.

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

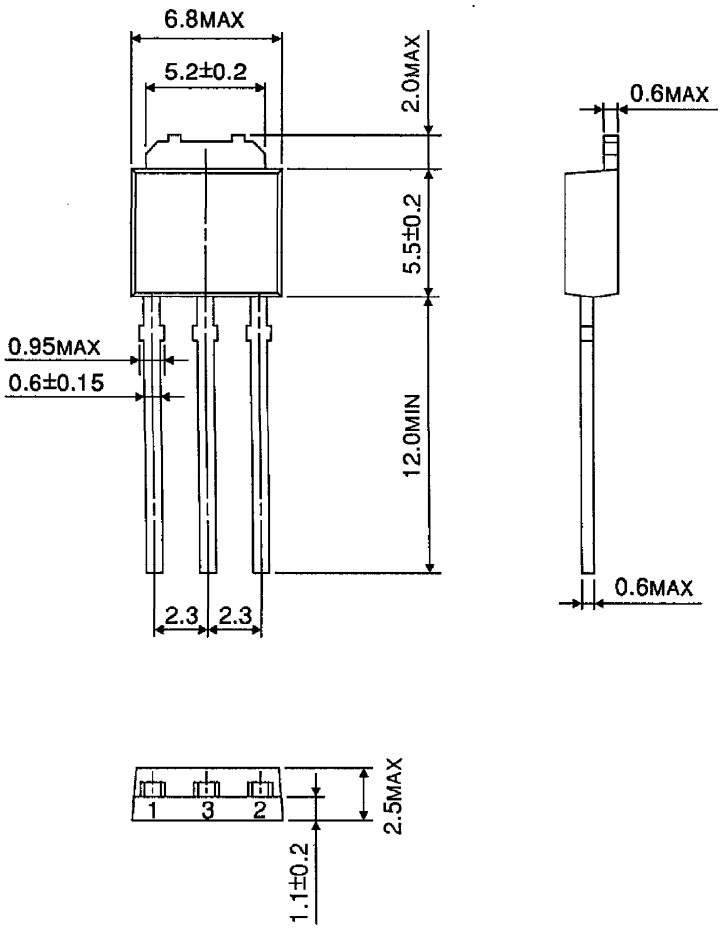
where,

I_{SC} : Short-circuit current.

OUTLINE DRAWING

HSIP3-P-B

Unit : mm



Weight : 0.36g (Typ.)