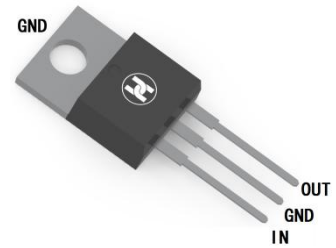


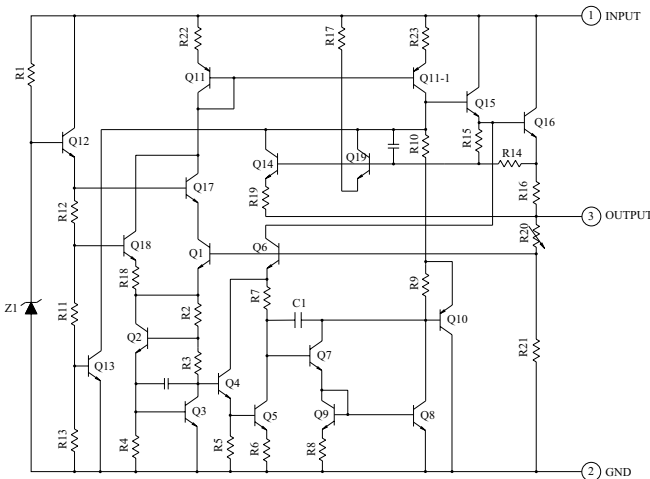
PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

FEATURES

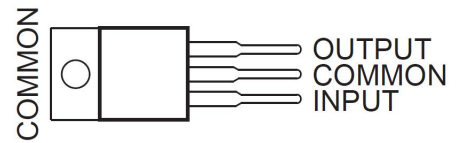
- Maximum Output Current I_o : 1.5A
- Output Voltage V_o : 5V,6V,7V,8V,9V,10V,12V,15V,18V,24V;
- Continuous Total Dissipation
 P_D : 1.5 W ($T_a = 25\text{ }^\circ\text{C}$)
- Surface Mount device



SCHEMATIC DIAGRAM



TO-220



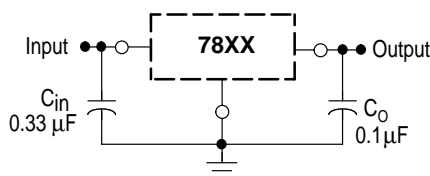
MECHANICAL DATA

- Case: TO-220
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 2.30 grams (approximate)

MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

Parameter	Symbol	Value	Unit
Input Voltage	V_i	$V_o=5.0-18V$	35
		$V_o=24V$	40
Power Dissipation	P_D	Internally Limited	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	66.7	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	5.0	
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 ~ +150	$^\circ\text{C}$

TYPICAL APPLICATION



Note: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as Possible to the regulators.

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS
**ELECTRICAL CHARACTERISTICS OF 7805 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=10V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	4.80	5.0	5.20	V	$T_J=+25^\circ C$
		4.75	5.0	5.25	V	$7V \leq V_i \leq 20V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		4	100	mV	$7V \leq V_i \leq 25V, T_J=+25^\circ C$
			1.6	50	mV	$8V \leq V_i \leq 12V, T_J=+25^\circ C$
Load Regulation	ΔV_o		9	100	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	50	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		5	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q		0.3	1.3	mA	$7V \leq V_i \leq 25V, T_J=25^\circ C$
			0.03	0.5	mA	$5mA \leq I_o \leq 1.0A, T_J=25^\circ C$
Output Noise Voltage	V_N		42		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	62	73		dB	$8V \leq V_i \leq 18V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		10		$m\Omega$	$f=1kHz$
Short Circuit Current	I_{SC}		230		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-1.1		$mV/^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

**ELECTRICAL CHARACTERISTICS OF 7806 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=11V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	5.75	6.0	6.25	V	$T_J=+25^\circ C$
		5.7	6.0	6.3	V	$8V \leq V_i \leq 21V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		5	120	mV	$8V \leq V_i \leq 25V, T_J=+25^\circ C$
			1.5	60	mV	$9V \leq V_i \leq 13V, T_J=+25^\circ C$
Load Regulation	ΔV_o		14	120	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	60	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1.3	mA	$8V \leq V_i \leq 25V, T_J=25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=25^\circ C$
Output Noise Voltage	V_N		45		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	59	75		dB	$9V \leq V_i \leq 19V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		10		$m\Omega$	$f=1kHz$
Short Circuit Current	I_{SC}		550		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-0.8		$mV/^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS
**ELECTRICAL CHARACTERISTICS OF 7807 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=12V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	6.7	7.0	7.3	V	$T_J=+25^\circ C$
		6.6	7.0	7.4	V	$9V \leq V_i \leq 22V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		5	140	mV	$9V \leq V_i \leq 25V, T_J=+25^\circ C$
			2	70	mV	$10V \leq V_i \leq 14V, T_J=+25^\circ C$
Load Regulation	ΔV_o		15	140	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			5	70	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1.3	mA	$9V \leq V_i \leq 25V, T_J=25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=25^\circ C$
Output Noise Voltage	V_N		60		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	59	75		dB	$10V \leq V_i \leq 20V, I_o=100mA, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1A, T_J=+25^\circ C$
Output Resistance	R_o		16		m Ω	$f=1kHz$
Short Circuit Current	I_{sc}		500		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-0.8		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

**ELECTRICAL CHARACTERISTICS OF 7808 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=14V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	7.7	8.0	8.3	V	$T_J=+25^\circ C$
		7.6	8.0	8.4	V	$10.5V \leq V_i \leq 23V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		12	160	mV	$10.5V \leq V_i \leq 25V, T_J=+25^\circ C$
			4	80	mV	$11V \leq V_i \leq 17V, T_J=+25^\circ C$
Load Regulation	ΔV_o		6	160	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			2	80	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$10.5V \leq V_i \leq 25V, T_J=25^\circ C$
				0.5	mA	$10mA \leq I_o \leq 1A, T_J=25^\circ C$
Output Noise Voltage	V_N		52		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	55	72		dB	$11.5V \leq V_i \leq 21.5V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1A, T_J=+25^\circ C$
Output Resistance	R_o		10		m Ω	$f=1kHz$
Short Circuit Current	I_{sc}		450		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-0.8		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS
**ELECTRICAL CHARACTERISTICS OF 7809 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=15V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq 125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	8.65	9.0	9.35	V	$T_J=+25^\circ C$
		8.55	9.0	9.45	V	$11.5V \leq V_i \leq 24V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		7	180	mV	$11.5V \leq V_i \leq 27V, T_J=+25^\circ C$
			2	90	mV	$13V \leq V_i \leq 19V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	180	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	90	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$11.5V \leq V_i \leq 27V, T_J=25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=25^\circ C$
Output Noise Voltage	V_N		60		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	55	70		dB	$12V \leq V_i \leq 22V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		18		m Ω	$f=1kHz$
Short Circuit Current	I_{SC}		400		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-1.0		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

**ELECTRICAL CHARACTERISTICS OF 7810 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=16V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq 125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	9.6	10	10.4	V	$T_J=+25^\circ C$
		9.5	10	10.5	V	$12.5V \leq V_i \leq 27V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		8	200	mV	$12.5V \leq V_i \leq 27V, T_J=+25^\circ C$
			2.5	100	mV	$14V \leq V_i \leq 20V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	200	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	100	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$12.5V \leq V_i \leq 27V, T_J=25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=25^\circ C$
Output Noise Voltage	V_N		63		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	55	72		dB	$13.5V \leq V_i \leq 23.5V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		16		m Ω	$f=1kHz$
Short Circuit Current	I_{SC}		400		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-0.8		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS
**ELECTRICAL CHARACTERISTICS OF 7812 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=19V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	11.5	12	12.5	V	$T_J=+25^\circ C$
		11.4	12	12.6	V	$14.5V \leq V_i \leq 27V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		10	240	mV	$14.5V \leq V_i \leq 30V, T_J=+25^\circ C$
			3	120	mV	$16V \leq V_i \leq 22V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	240	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	120	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$14.5V \leq V_i \leq 30V, T_J=+25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=+25^\circ C$
Output Noise Voltage	V_N		75		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	55	71		dB	$15V \leq V_i \leq 25V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		18		m Ω	$f=1kHz$
Short Circuit Current	I_{sc}		350		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.2		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_J$		-1		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

**ELECTRICAL CHARACTERISTICS OF 7815 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=23V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	14.4	15	15.6	V	$T_J=+25^\circ C$
		14.25	15	15.75	V	$17.5V \leq V_i \leq 30V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		12	300	mV	$17.5V \leq V_i \leq 30V, T_J=+25^\circ C$
			3	150	mV	$20V \leq V_i \leq 26V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	300	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	150	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.3	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$17.5V \leq V_i \leq 30V, T_J=+25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=+25^\circ C$
Output Noise Voltage	V_N		90		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	54	70		dB	$18.5V \leq V_i \leq 28.5V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		19		m Ω	$f=1kHz$
Short Circuit Current	I_{sc}		230		mA	$T_J=+25^\circ C$
Peak Current	I_{pk}		2.1		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o/\Delta T_J$		-1		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS
**ELECTRICAL CHARACTERISTICS OF 7818 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=27V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	17.3	18	18.7	V	$T_J=+25^\circ C$
		17.1	18	18.9	V	$21V \leq V_i \leq 33V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		13	360	mV	$21V \leq V_i \leq 33V, T_J=+25^\circ C$
			4	180	mV	$24V \leq V_i \leq 30V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	360	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	180	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.5	8	mA	$I_o=0mA, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$21V \leq V_i \leq 33V, T_J=+25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1.0A, T_J=+25^\circ C$
Output Noise Voltage	V_N		125		μV	$10Hz \leq f \leq 100kHz$
Ripple Rejection	RR	52	68		dB	$22V \leq V_i \leq 32V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		16		m Ω	$f=1kHz$
Short Circuit Current	I_{SC}		400		mA	$T_J=+25^\circ C$
Peak Current	I_{PK}		2.1		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-2.5		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

**ELECTRICAL CHARACTERISTICS OF 7820 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=29V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	19.2	20	20.8	V	$T_J=+25^\circ C$
		19	20	21	V	$23V \leq V_i \leq 35V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		15	400	mV	$23V \leq V_i \leq 35V, T_J=+25^\circ C$
			5	200	mV	$26V \leq V_i \leq 32V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	400	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	200	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.6	8	mA	$I_o=0, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$23V \leq V_i \leq 35V, T_J=+25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1A, T_J=+25^\circ C$
Output Noise Voltage	V_N		135		μV	$10Hz \leq f \leq 100kHz, T_J=+25^\circ C$
Ripple Rejection	RR	50	66		dB	$24V \leq V_i \leq 34V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		22		m Ω	$f=1kHz$
Short Circuit Current	I_{SC}		400		mA	$T_J=+25^\circ C$
Peak Current	I_{PK}		2.1		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-3.0		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS
**ELECTRICAL CHARACTERISTICS OF 7824 AT SPECIFIED VIRTUAL JUNCTION TEMPERATURE
($V_i=33V, I_o=500mA, C_i=0.33\mu F, C_o=0.1\mu F, 0^\circ C \leq T_J \leq +125^\circ C$ unless otherwise specified)**

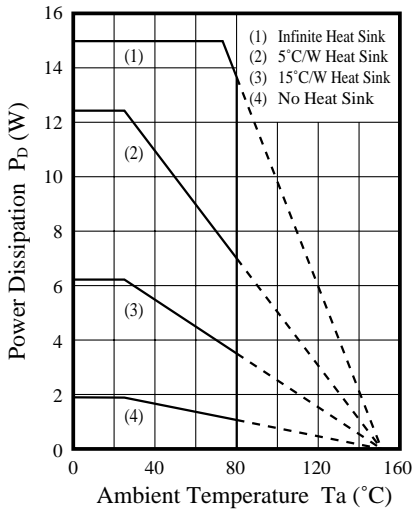
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Output voltage	V_o	23	24	25	V	$T_J=+25^\circ C$
		22.8	24	25.2	V	$27V \leq V_i \leq 38V, I_o=5mA \sim 1A, P_D \leq 15W$
Line regulation	ΔV_o		18	480	mV	$27V \leq V_i \leq 38V, T_J=+25^\circ C$
			6	240	mV	$30V \leq V_i \leq 36V, T_J=+25^\circ C$
Load Regulation	ΔV_o		12	480	mV	$I_o=5mA \sim 1.5A, T_J=+25^\circ C$
			4	240	mV	$I_o=250mA \sim 750mA, T_J=+25^\circ C$
Quiescent Current	I_q		4.6	8	mA	$I_o=0mA, T_J=+25^\circ C$
Quiescent Current Change	ΔI_q			1	mA	$27V \leq V_i \leq 38V, T_J=+25^\circ C$
				0.5	mA	$5mA \leq I_o \leq 1.0A, T_J=+25^\circ C$
Output Noise Voltage	V_N		170		μV	$10Hz \leq f \leq 100kHz, T_J=+25^\circ C$
Ripple Rejection	RR	50	65		dB	$28V \leq V_i \leq 38V, f=120Hz$
Dropout Voltage	V_d		2		V	$I_o=1.0A, T_J=+25^\circ C$
Output Resistance	R_o		28		m Ω	$f=1kHz$
Short Circuit Current	I_{SC}		300		mA	$V_i=38V, T_J=+25^\circ C$
Peak Current	I_{PK}		2.1		A	$T_J=+25^\circ C$
Average Temperature Coefficient of Output Voltage	$\Delta V_o / \Delta T_J$		-3.5		mV/ $^\circ C$	$I_o=5mA, 0^\circ C \leq T_J \leq +125^\circ C$

Note: Load and line regulation are specified at constant junction temperature. Changes in V_o due to heating effects must be taken into account separately. Pulse testing with low duty cycle is used.

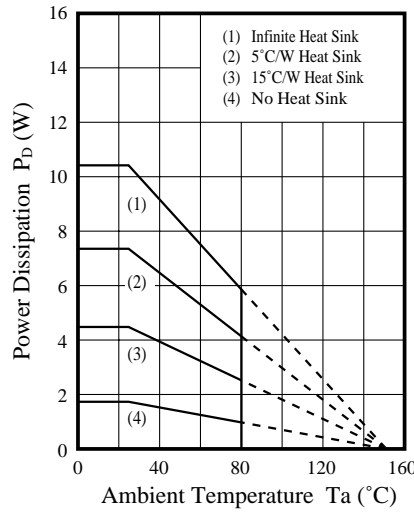
PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

Typical Characteristics

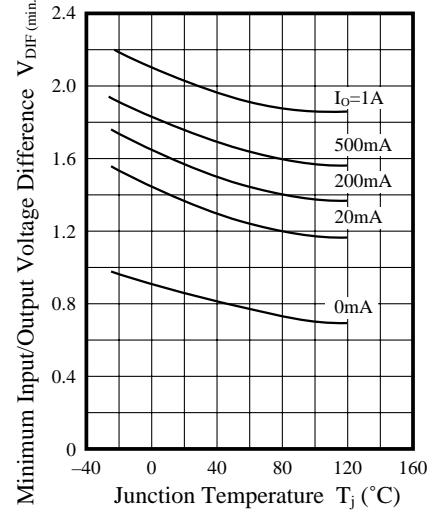
$P_D - T_a$ (7800 Series)



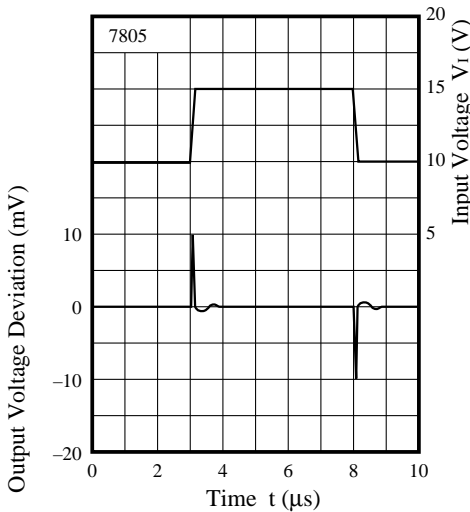
$P_D - T_a$ (7800F Series)



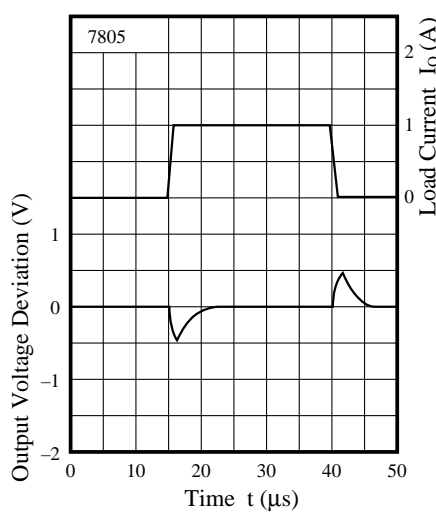
$V_{DIF(min)} - T_j$



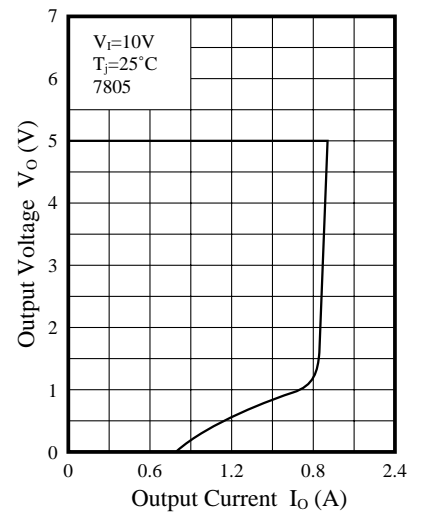
Input Transient Response



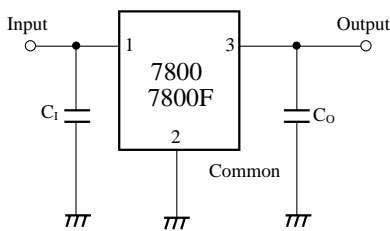
Load Transient Response



Current Limiting Characteristic



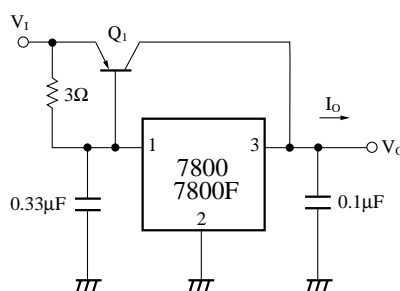
Basic Regulator Circuit



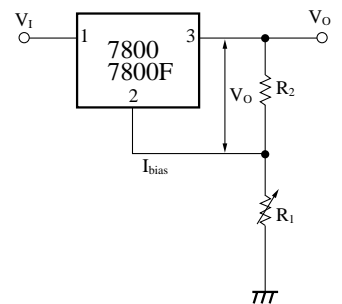
C_1 is set when the input line is long.
 C_o improves the transient response.

Application Circuit

1) Current Boost Circuit



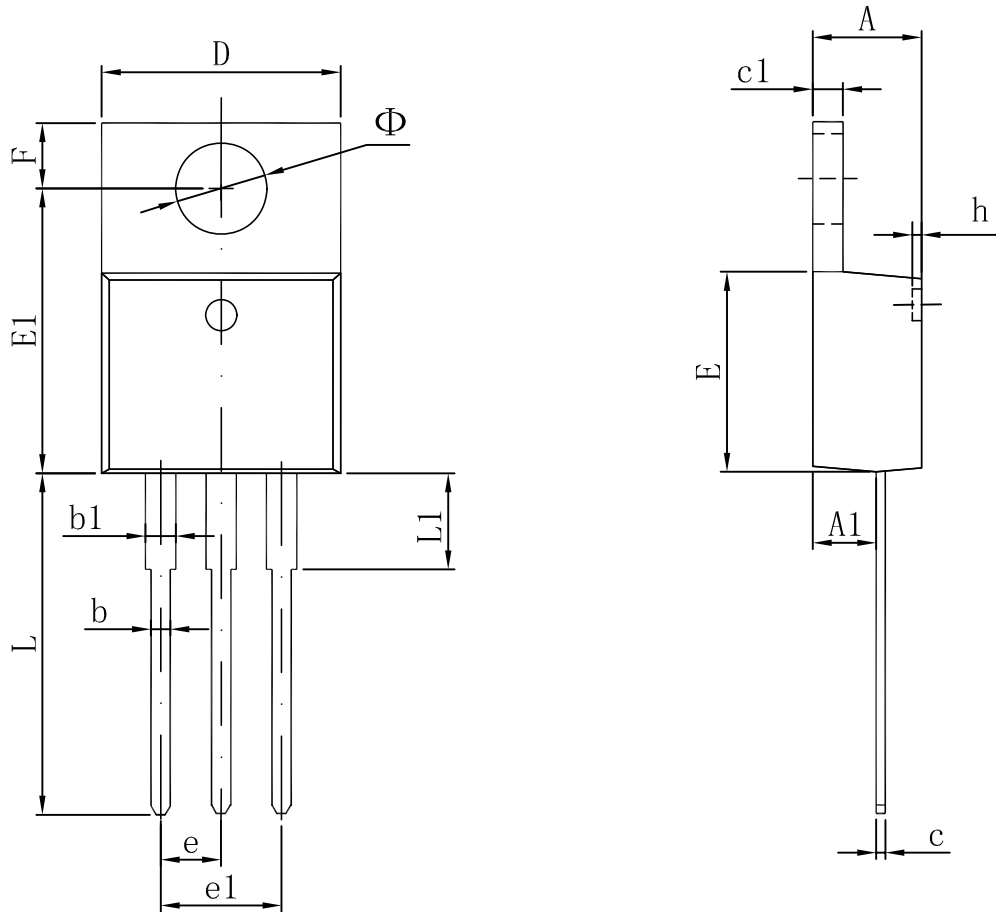
2) Adjustable Output Regulator



$$V_o = V_o + \left(I_{bias} + \frac{V_o}{R_2} \right) R_1$$

PLASTIC-ENCAPSULATE VOLTAGE REGULATORS

TO-220 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.470	4.670	0.176	0.184
A1	2.520	2.820	0.099	0.111
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
E1	12.060	12.460	0.475	0.491
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.590	2.890	0.102	0.114
h	0.000	0.300	0.000	0.012
L	13.400	13.800	0.528	0.543
L1	3.560	3.960	0.140	0.156
Φ	3.735	3.935	0.147	0.155