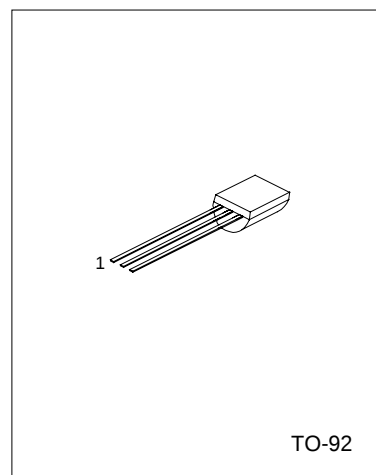


**3-TERMINAL 0.1A POSITIVE
VOLTAGE REGULATORS****DESCRIPTION**

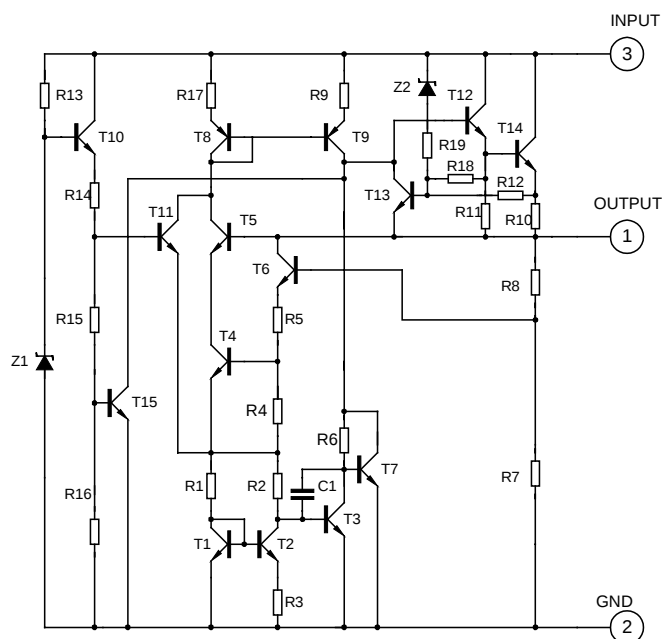
The UTC78LXX series of fixed voltage monolithic integrated circuit voltage regulators are suitable for applications that required supply up to 100mA.

FEATURE

- *Maximum output current of 100mA
- *Output voltage of 5V,6V,8V,9V,10V,12V,15V and 24V
- *Thermal overload protection
- *Short circuit current limiting



1:Output 2:GND; 3:Input

BLOCK DIAGRAM

ABSOLUTE MAXIMUM RATINGS (Operating temperature range applies unless otherwise specified)

CHARACTERISTICS	SYMBOL	VALUE	UNITS
Input voltage(for $V_o=5,8V$) (for $V_o=12,15V$)	V_i	30	V
	V_i	35	V
Operating Junction Temperature Range	T_{OPR}	-20~+120	°C
Storage Temperature Range	T_{STG}	-55~+150	°C

UTC78L05 ELECTRICAL CHARACTERISTICS

(VI=10V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_o	Tj=25°C	4.8	5.0	5.2	V
		7V≤Vi≤20V, Io=1mA~40mA	4.75		5.25	V
		7V≤Vi≤VMAX, Io=1mA~70mA	4.75		5.25	V (note 2)
Load Regulation	ΔV_o	Tj=25°C, Io=1mA~100mA		11	60	mV
		Tj=25°C, Io=1mA~40mA		5.0	30	mV
Line regulation	ΔV_o	7V≤Vi≤20V, Tj=25°C		8	150	mV
		8V≤Vi≤20V, Tj=25°C		6	100	mV
Quiescent Current	I_q			2.0	5.5	mA
Quiescent Current Change	ΔI_q	8V≤Vi≤20V			1.5	mA
	ΔI_q	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz		40		μV
Temperature coefficient of V_o	$\Delta V_o/\Delta T$	Io=5mA		-0.65		mV/°C
Ripple Rejection	RR	8V≤Vi≤20V, f=120Hz, Tj=25°C	41	80		dB
Dropout Voltage	V_d	Tj=25°C		1.7		V

UTC78L06 ELECTRICAL CHARACTERISTICS

(VI=12V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	V_o	Tj=25°C	5.75	6.0	6.25	V
		8.5V≤Vi≤20V, Io=1mA~40mA	5.7		6.3	V
		8.5V≤Vi≤VMAX, Io=1mA~70mA	5.7		6.3	V (note 2)
Load Regulation	ΔV_o	Tj=25°C, Io=1mA~100mA		12.8	80	mV
		Tj=25°C, Io=1mA~70mA		5.8	40	mV
Line regulation	ΔV_o	8.5V≤Vi≤20V, Tj=25°C		64	175	mV
		9V≤Vi≤20V, Tj=25°C		54	125	mV
Quiescent Current	I_q			3.9	6.0	mA
Quiescent Current Change	ΔI_q	9V≤Vi≤20V			1.5	mA
	ΔI_q	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	V_N	10Hz≤f≤100kHz		49		μV
Temperature coefficient of V_o	$\Delta V_o/\Delta T$	Io=5mA		0.75		mV/°C
Ripple Rejection	RR	10V≤Vi≤20V, f=120Hz, Tj=25°C	40	46		dB
Dropout Voltage	V_d	Tj=25°C		1.7		V

UTC78L08 ELECTRICAL CHARACTERISTICS

(VI=14V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	7.7	8.0	8.3	V
		10.5V≤Vi≤23V, Io=1mA~40mA	7.6		8.4	V
		10.5V≤Vi≤VMAX, Io=1mA~70mA	7.6		8.4	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		15	80	mV
		Tj=25°C, Io=1mA~70mA		8.0	40	mV
Line regulation	ΔVo	10.5V≤Vi≤23V, Tj=25°C		10	175	mV
		11V≤Vi≤23V, Tj=25°C		8	125	mV
Quiescent Current	Iq			2.0	5.5	mA
Quiescent Current Change	ΔIq	11V≤Vi≤23V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		49		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		0.75		mV/°C
Ripple Rejection	RR	11V≤Vi≤23V, f=120Hz, Tj=25°C	39	70		dB
Dropout Voltage	Vd	Tj=25°C		1.7		V

UTC78L09 ELECTRICAL CHARACTERISTICS

(VI=15V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	8.64	9.0	9.36	V
		11.5V≤Vi≤24V, Io=1mA~40mA	8.55		9.45	V
		11.5V≤Vi≤VMAX, Io=1mA~70mA	8.55		9.45	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		20	90	mV
		Tj=25°C, Io=1mA~40mA		10	45	mV
Line regulation	ΔVo	11.5V≤Vi≤24V, Tj=25°C		90	200	mV
		13V≤Vi≤24V, Tj=25°C		100	150	mV
Quiescent Current	Iq			2.0	6.0	mA
Quiescent Current Change	ΔIq	13V≤Vi≤24V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		49		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		0.75		mV/°C
Ripple Rejection	RR	12V≤Vi≤23V, f=120Hz, Tj=25°C	38	44		dB
Dropout Voltage	Vd	Tj=25°C		1.7		V

UTC78L10 ELECTRICAL CHARACTERISTICS

(VI=16V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	9.6	10.0	10.4	V
		12.5V≤Vi≤23V, Io=1mA~40mA	9.5		10.5	V
		12.5V≤Vi≤VMAX, Io=1mA~70mA	9.5		10.5	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		20	94	mV
		Tj=25°C, Io=1mA~70mA		10	47	mV
Line regulation	ΔVo	12.5V≤Vi≤23V, Tj=25°C		100	220	mV
		14V≤Vi≤23V, Tj=25°C		200	170	mV
Quiescent Current	Iq			4.2	6.5	mA
Quiescent Current Change	ΔIq	12.5V≤Vi≤23V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		74		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		0.95		mV/°C
Ripple Rejection	RR	15V≤Vi≤23V, f=120Hz, Tj=25°C	38	43		dB
Dropout Voltage	Vd	Tj=25°C		1.7		V

UTC78L12 ELECTRICAL CHARACTERISTICS

(VI=19V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	11.5	15	15.6	V
		14.5V≤Vi≤27V, Io=1mA~40mA	11.4		12.6	V
		14.5V≤Vi≤VMAX, Io=1mA~70mA	11.4		12.6	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		25	150	mV
		Tj=25°C, Io=1mA~40mA		12	75	mV
Line regulation	ΔVo	14.5V≤Vi≤27V, Tj=25°C		25	300	mV
		16V≤Vi≤27V, Tj=25°C		20	250	mV
Quiescent Current	Iq			2.0	6.0	mA
Quiescent Current Change	ΔIq	16V≤Vi≤27V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		80		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-1.0		mV/°C
Ripple Rejection	RR	15V≤Vi≤25V, f=120Hz, Tj=25°C	37	65		dB
Dropout Voltage	Vd	Tj=25°C		1.7		V

UTC78L15 ELECTRICAL CHARACTERISTICS

(VI=23V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	14.4	15	15.6	V
		17.5V≤Vi≤30V, Io=1mA~40mA	14.25		15.75	V
		17.5V≤Vi≤VMAX, Io=1mA~70mA	14.25		15.75	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		20	150	mV
		Tj=25°C, Io=1mA~70mA		25	150	mV
Line regulation	ΔVo	17.5V≤Vi≤30V, Tj=25°C		25	150	mV
		20V≤Vi≤30V, Tj=25°C		15	75	mV
Quiescent Current	Iq			2.2	6.5	mA
Quiescent Current Change	ΔIq	20V≤Vi≤30V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		90		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-1.3		mV/°C
Ripple Rejection	RR	18.5V≤Vi≤28.5V, f=120Hz, Tj=25°C	34	63		dB
Dropout Voltage	Vd	Tj=25°C		1.7		V

UTC78L18 ELECTRICAL CHARACTERISTICS

(VI=27V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	17.3	18	18.7	V
		21V≤Vi≤33V, Io=1mA~40mA	17.1		18.9	V
		21V≤Vi≤VMAX, Io=1mA~70mA	17.1		18.9	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		30	170	mV
		Tj=25°C, Io=1mA~40mA		15	85	mV
Line regulation	ΔVo	21V≤Vi≤33V, Tj=25°C		145	300	mV
		22V≤Vi≤33V, Tj=25°C		135	250	mV
Quiescent Current	Iq			2.0	6.0	mA
Quiescent Current Change	ΔIq	21V≤Vi≤33V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		150		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-1.8		mV/°C
Ripple Rejection	RR	23V≤Vi≤33V, f=120Hz, Tj=25°C	34	48		dB
Dropout Voltage	Vd	Tj=250°C		1.7		V

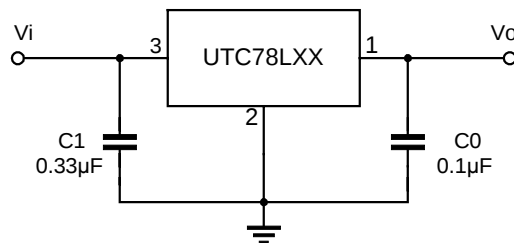
UTC78L24 ELECTRICAL CHARACTERISTICS

(VI=33V, Io=40mA, 0<Tj<125°C, C1=0.33μF, Co=0.1μF, unless otherwise specified)(Note 1)

Characteristic	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	23	24	25	V
		27V≤Vi≤38V, Io=1mA~40mA	22.8		25.2	V
		27V≤Vi≤VMAX, Io=1mA~70mA	22.8		25.2	V (note 2)
Load Regulation	ΔVo	Tj=25°C, Io=1mA~100mA		40	200	mV
		Tj=25°C, Io=1mA~40mA		20	100	mV
Line regulation	ΔVo	27V≤Vi≤38V, Tj=25°C		160	300	mV
		28V≤Vi≤38V, Tj=25°C		150	250	mV
Quiescent Current	Iq			2.2	6.0	mA
Quiescent Current Change	ΔIq	27V≤Vi≤38V			1.5	mA
	ΔIq	1mA≤Vi≤40mA			0.1	mA
Output Noise Voltage	VN	10Hz≤f≤100kHz		200		μV
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-2.0		mV/°C
Ripple Rejection	RR	27V≤Vi≤38V, f=120Hz, Tj=25°C	34	45		dB
Dropout Voltage	Vd	Tj=25°C		1.7		V

Note 1: The Maximum steady state usable output current and input voltage are very dependent on the heating sinking and/or lead temperature length of the package. The data above represent pulse test conditions with junction temperatures as indicated at the initiation of test.

Note 2: Power dissipation<0.75W

TYPICAL APPLICATION

Note 1: To specify an output voltage, substitute voltage value for "XX".

Note 2: Bypass capacitors are recommended for optimum stability and transient response and should be located as close as possible to the regulators.