

UTC LM79XX LINEAR INTEGRATED CIRCUIT

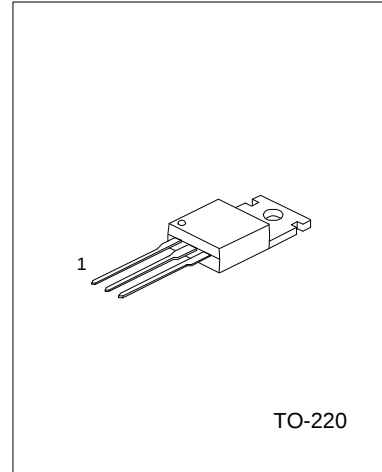
3 TERMINAL 1A NEGATIVE VOLTAGE REGULATOR

DESCRIPTION

The UTC LM79XX series of three-terminal negative regulators are available in TO-220 package and with several fixed output voltage, making them useful in a wide range of application. Each type employs internal current limiting, thermal shut-down and safe area protection, making it essentially indestructible.

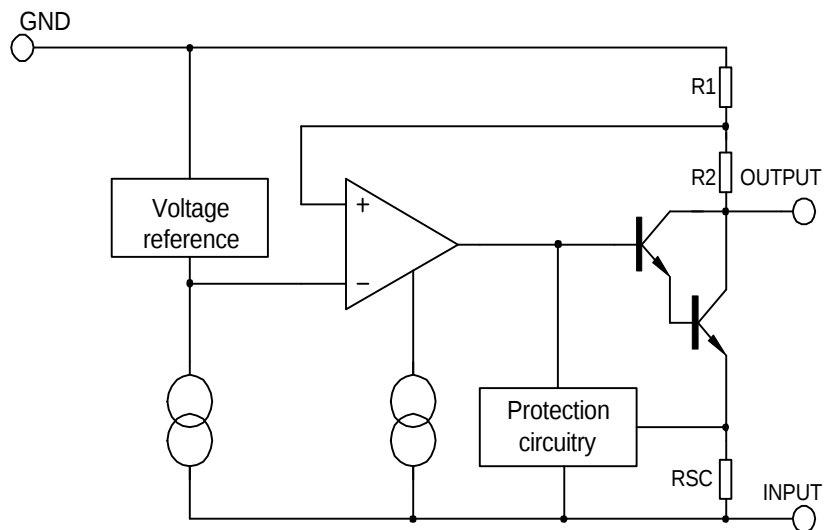
FEATURES

- *Output current up to 1A
- *-5V; -6V; -8V; -12V; -15V; -18V; -24V output voltage available
- *Thermal overload protection
- *Short circuit protection



1:GND 2:Input 3:Output

BLOCK DIAGRAM



UTC LM79XX LINEAR INTEGRATED CIRCUIT

ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Input voltage	V_i	-35	V
Thermal resistance junction-air	$R_{\theta JA}$	65	°C /W
Thermal resistance junction-cases	$R_{\theta JC}$	5	°C /W
Operating Temperature	T_{opr}	0 ~ +125	°C
Storage Temperature	T_{stg}	-65 ~ +150	°C

UTC7905 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C, Io=500mA, Vi=-10V, Ci=33uF, Co=1uF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	Tj=25°C	-4.8	-5.0	-5.2	V
		5.0mA<Io<1.0A, Po<15W Vi=-7V to -20V	-4.75	-5.00	-5.25	V
Line regulation	ΔV_o	Tj=25°C, Vi=-7V to -25V		10	100	mV
		Tj=25°C, Vi=-8V to -12V				mV
Load regulation	ΔV_o	Tj=25°C, Io=5.0mA to 1.5A		10	100	mV
		Tj=25°C, Io=250mA to 750mA		3	50	mV
Quiescent current	I_Q	Tj=25°C		3	6	mA
Quiescent current change	ΔI_Q	Io=5mA to 1.0A		0.05	0.5	mA
		Vi=-7V to -25V		0.1	1.3	mA
Output voltage drift	$\Delta V_o/\Delta T$	Io=5mA		-0.4		mV/°C
Output noise voltage	V_N	f=10Hz to 100kHz, Ta=25°C		100		μV
Ripple rejection	RR	f=120Hz, Vi=-8V to -18V	54	60		dB
Dropout voltage	V_o	Io=1.0A, Tj=25°C		2		V
Short circuit current	Isc	Vi=-35V, Ta=25°C		300		mA
peak current	Ipk	Tj=25°C		2.2		A

UTC7906 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C, Io=500mA, Vi=-11V, Ci=2.2uF, Co=1uF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	Tj=25°C	-5.75	-6.00	-6.25	V
		5.0mA<Io<1.0A, Po<15W Vi=-8V to -21V	-5.7	-6.0	-6.3	V
Line regulation	ΔV_o	Tj=25°C, Vi=-8V to -25V		10	120	mV
		Tj=25°C, Vi=-9V to -13V		5	60	mV
Load regulation	ΔV_o	Tj=25°C, Io=5.0mA to 1.5A		10	120	mV
		Tj=25°C, Io=250mA to 750mA		3	60	mV
Quiescent current	I_Q	Tj=25°C		3	6	mA
Quiescent current change	ΔI_Q	Io=5mA to 1.0A			0.5	mA
		Vi=-8V to -25V			1.3	mA
Output voltage drift	$\Delta V_o/\Delta T$	Io=5mA		-0.5		mV/°C
Output noise voltage	V_N	f=10Hz to 100kHz, Ta=25°C		130		μV
Ripple rejection	RR	f=120Hz, Vi=-9V to -19V	54	60		dB
Dropout voltage	V_o	Io=1.0A, Tj=25°C		2		V
Short circuit current	Isc	Vi=-35V, Ta=25°C		300		mA
peak current	Ipk	Tj=25°C		2.2		A

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UTC7908 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^{\circ}\text{C}$, $I_o = 500\text{mA}$, $V_i = -14\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	$T_j = 25^{\circ}\text{C}$	-7.7	-8.0	-8.3	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o < 15\text{W}$ $V_i = -10.5\text{V}$ to -23V	-7.6	-8.0	-8.4	V
Line regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $V_i = -10.5\text{V}$ to -25V		10	100	mV
		$T_j = 25^{\circ}\text{C}$, $V_i = -11.5\text{V}$ to -17V		5	80	mV
Load regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $I_o = 5.0\text{mA}$ to 1.5A		12	160	mV
		$T_j = 25^{\circ}\text{C}$, $I_o = 250\text{mA}$ to 750mA		4	80	mV
Quiescent current	I_Q	$T_j = 25^{\circ}\text{C}$		3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA}$ to 1.0A		0.05	0.5	mA
		$V_i = -11.5\text{V}$ to -25V		0.1	1.0	mA
Output voltage drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-0.6		mV/ $^{\circ}\text{C}$
Output noise voltage	V_N	$f = 10\text{Hz}$ to 100kHz , $T_a = 25^{\circ}\text{C}$		175		μV
Ripple rejection	RR	$f = 120\text{Hz}$, $V_i = -11.5\text{V}$ to -21.5V	54	60		dB
Dropout voltage	V_o	$I_o = 1.0\text{A}$, $T_j = 25^{\circ}\text{C}$		2		V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_a = 25^{\circ}\text{C}$		300		mA
peak current	I_{pk}	$T_j = 25^{\circ}\text{C}$		2.2		A

UTC7912 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^{\circ}\text{C}$, $I_o = 500\text{mA}$, $V_i = -18\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	$T_j = 25^{\circ}\text{C}$	-11.5	-12.0	-12.5	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o < 15\text{W}$ $V_i = -14.5\text{V}$ to -27V	-11.4	-12	-12.6	V
Line regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $V_i = -14.5\text{V}$ to -30V		12	240	mV
		$T_j = 25^{\circ}\text{C}$, $V_i = -16\text{V}$ to -22V		6	120	mV
Load regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $I_o = 5.0\text{mA}$ to 1.5A		12	240	mV
		$T_j = 25^{\circ}\text{C}$, $I_o = 250\text{mA}$ to 750mA		4	120	mV
Quiescent current	I_Q	$T_j = 25^{\circ}\text{C}$		3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA}$ to 1.0A		0.05	0.5	mA
		$V_i = -14.5\text{V}$ to -30V		0.1	1.0	mA
Output voltage drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-0.8		mV/ $^{\circ}\text{C}$
Output noise voltage	V_N	$f = 10\text{Hz}$ to 100kHz , $T_a = 25^{\circ}\text{C}$		200		μV
Ripple rejection	RR	$f = 120\text{Hz}$, $V_i = -15\text{V}$ to -25V	54	60		dB
Dropout voltage	V_o	$I_o = 1.0\text{A}$, $T_j = 25^{\circ}\text{C}$		2		V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_a = 25^{\circ}\text{C}$		300		mA
peak current	I_{pk}	$T_j = 25^{\circ}\text{C}$		2.2		A

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UTC7915 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^{\circ}\text{C}$, $I_o = 500\text{mA}$, $V_i = -23\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	$T_j = 25^{\circ}\text{C}$	-14.4	-15.0	-15.6	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o < 15\text{W}$ $V_i = -17.5\text{V}$ to -30V	-14.25	-15	-15.75	V
Line regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $V_i = -17.5\text{V}$ to -30V		12	300	mV
Load regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $V_i = -20\text{V}$ to -26V		6	150	mV
		$T_j = 25^{\circ}\text{C}$, $I_o = 5.0\text{mA}$ to 1.5A		12	300	mV
Quiescent current	I_Q	$T_j = 25^{\circ}\text{C}$		3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA}$ to 1.0A		0.05	0.5	mA
		$V_i = -17.5\text{V}$ to -30.5V		0.1	1.0	mA
Output voltage drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-0.9		mV/ $^{\circ}\text{C}$
Output noise voltage	V_N	$f = 10\text{Hz}$ to 100kHz , $T_a = 25^{\circ}\text{C}$		250		μV
Ripple rejection	RR	$f = 120\text{Hz}$, $V_i = -18.5\text{V}$ to -28.5V	54	60		dB
Dropout voltage	V_o	$I_o = 1.0\text{A}$, $T_j = 25^{\circ}\text{C}$		2		V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_a = 25^{\circ}\text{C}$		300		mA
peak current	I_{pk}	$T_j = 25^{\circ}\text{C}$		2.2		A

UTC7918 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^{\circ}\text{C}$, $I_o = 500\text{mA}$, $V_i = -27\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	$T_j = 25^{\circ}\text{C}$	-17.3	-18.0	-18.7	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o < 15\text{W}$ $V_i = -21\text{V}$ to -33V	-17.1	-18	-18.9	V
Line regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $V_i = -21\text{V}$ to -33V		15	360	mV
Load regulation	ΔV_o	$T_j = 25^{\circ}\text{C}$, $V_i = -24\text{V}$ to -30V		8	180	mV
		$T_j = 25^{\circ}\text{C}$, $I_o = 5.0\text{mA}$ to 1.5A		15	360	mV
Quiescent current	I_Q	$T_j = 25^{\circ}\text{C}$		3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA}$ to 1.0A			0.5	mA
		$V_i = -21\text{V}$ to -32V			1.0	mA
Output voltage drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-1		mV/ $^{\circ}\text{C}$
Output noise voltage	V_N	$f = 10\text{Hz}$ to 100kHz , $T_a = 25^{\circ}\text{C}$		300		μV
Ripple rejection	RR	$f = 120\text{Hz}$, $V_i = -22\text{V}$ to -32V	54	60		dB
Dropout voltage	V_o	$I_o = 1.0\text{A}$, $T_j = 25^{\circ}\text{C}$		2		V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_a = 25^{\circ}\text{C}$		300		mA
peak current	I_{pk}	$T_j = 25^{\circ}\text{C}$		2.2		A

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UTC7924 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^\circ\text{C}$, $I_o = 500\text{mA}$, $V_i = -33\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V_o	$T_j = 25^\circ\text{C}$	-23	-24	-25	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o < 15\text{W}$ $V_i = -27\text{V}$ to -38V	-22.8	-24	-25.2	V
Line regulation	ΔV_o	$T_j = 25^\circ\text{C}$, $V_i = -27\text{V}$ to -38V		15	480	mV
		$T_j = 25^\circ\text{C}$, $V_i = -30\text{V}$ to -36V		8	240	mV
Load regulation	ΔV_o	$T_j = 25^\circ\text{C}$, $I_o = 5.0\text{mA}$ to 1.5A		15	480	mV
		$T_j = 25^\circ\text{C}$, $I_o = 250\text{mA}$ to 750mA		5.0	240	mV
Quiescent current	I_Q	$T_j = 25^\circ\text{C}$		3	6	mA
Quiescent current change	ΔI_Q	$I_o = 5\text{mA}$ to 1.0A			0.5	mA
		$V_i = -27\text{V}$ to -38V			1.0	mA
Output voltage drift	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-1		mV/ $^\circ\text{C}$
Output noise voltage	V_N	$f = 10\text{Hz}$ to 100kHz , $T_a = 25^\circ\text{C}$		400		μV
Ripple rejection	RR	$f = 120\text{Hz}$, $V_i = -28\text{V}$ to -38V	54	60		dB
Dropout voltage	V_o	$I_o = 1.0\text{A}$, $T_j = 25^\circ\text{C}$		2		V
Short circuit current	I_{sc}	$V_i = -35\text{V}$, $T_a = 25^\circ\text{C}$		300		mA
peak current	I_{pk}	$T_j = 25^\circ\text{C}$		2.2		A

APPLICATION CIRCUITS

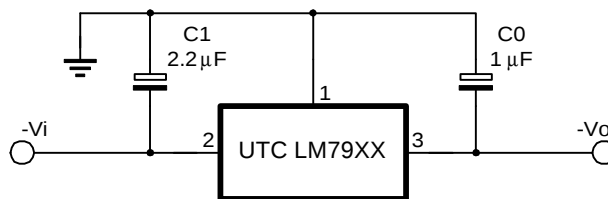


Fig.1 Fixed output regulator

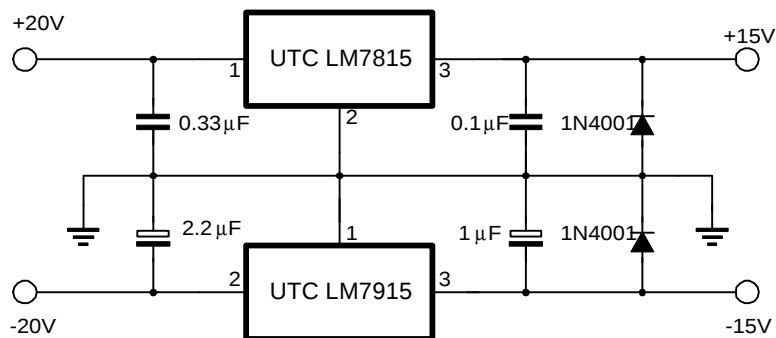


Fig.2 Split power supply(+15V,1A)

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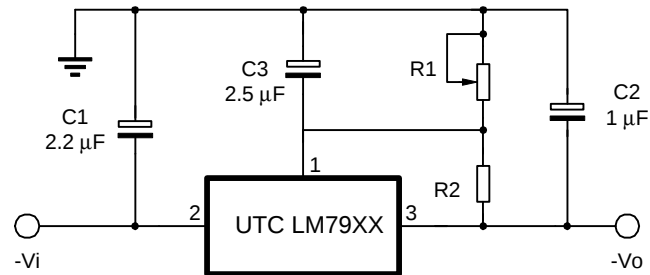


Fig.3 Circuit for increasing output voltage