

UTC 79TXXA LINEAR INTEGRATED CIRCUIT

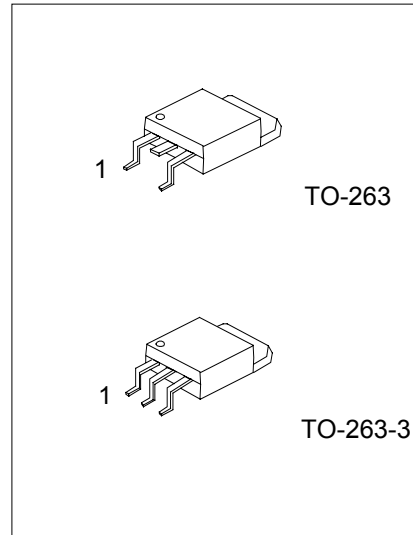
3 TERMINAL 1A NEGATIVE VOLTAGE REGULATOR

DESCRIPTION

The UTC 79TXXA series of three-terminal negative regulators are available in TO-263 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.

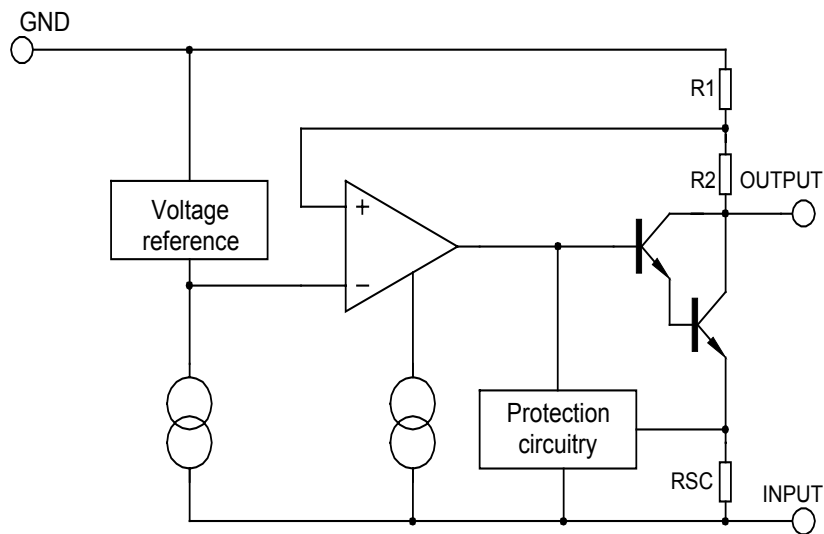
FEATURES

- *Output current up to 1A
- *-5V, -6V, -8V, -9V, -12V, -15V, -18V, -24V output voltage available
- *Thermal overload protection
- *Short circuit protection



1:GND 2:Input 3:Output

BLOCK DIAGRAM



UTC 79TXXA LINEAR INTEGRATED CIRCUIT

ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Input voltage	V _I	-35	V
Output Current	I _o	1	A
Power Dissipation	P _D	Internally Limited	W
Thermal Resistance Junction-Air	R _{θ JA}	65	°C/W
Thermal Resistance Junction-Cases	R _{θ JC}	5	°C/W
Operating Junction Temperature Range	T _{opr}	0 ~ +125	°C
Storage Temperature Range	T _{stg}	-65 ~ +150	°C

UTC79T05A ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<T_j<125°C, I_o=500mA, V_i=-10V, C_i=33uF, C_o=1uF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V _o	T _j =25°C	-4.80	-5.0	-5.20	V
		5.0mA<I _o <1.0A, P _o ≤ 15W V _i =-7V to -20V	-4.75		-5.25	V
Line regulation	ΔV _o	T _j =25°C, V _i =-7V to -25V		10	100	mV
		T _j =25°C, V _i =-8V to -12V				mV
Load regulation	ΔV _o	T _j =25°C, I _o =5.0mA to 1.0A		10	100	mV
		T _j =25°C, I _o =250mA to 750mA		3	50	mV
Quiescent current	I _q	T _j =25°C		3	6	mA
Quiescent current change	ΔI _q	I _o =5mA to 1.0A		0.05	0.5	mA
		V _i =-7V to -25V		0.1	1.3	mA
Output voltage drift	ΔV _o /ΔT	I _o =5mA		-0.4		mV/°C
Output noise voltage	V _N	f=10Hz to 100kHz, T _a =25°C		100		μV
Ripple rejection	RR	f=120Hz, V _i =-8V to -18V	54	60		dB
Dropout voltage	V _o	I _o =1.0A, T _j =25°C		2		V
Short circuit current	I _{sc}	V _i =-35V, T _a =25°C		300		mA
peak current	I _{pk}	T _j =25°C		2.2		A

UTC79T06A ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<T_j<125°C, I_o=500mA, V_i=-11V, C_i=2.2uF, C_o=1uF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	V _o	T _j =25°C	-5.76	-6.00	-6.24	V
		5.0mA<I _o <1.0A, P _o ≤ 15W V _i =-8V to -21V	-5.70		-6.30	V
Line regulation	ΔV _o	T _j =25°C, V _i =-8V to -25V		10	120	mV
		T _j =25°C, V _i =-9V to -13V		5	60	mV
Load regulation	ΔV _o	T _j =25°C, I _o =5.0mA to 1.0A		10	120	mV
		T _j =25°C, I _o =250mA to 750mA		3	60	mV
Quiescent current	I _q	T _j =25°C		3	6	mA
Quiescent current change	ΔI _q	I _o =5mA to 1.0A			0.5	mA
		V _i =-8V to -25V			1.3	mA
Output voltage drift	ΔV _o /ΔT	I _o =5mA		-0.5		mV/°C
Output noise voltage	V _N	f=10Hz to 100kHz, T _a =25°C		130		μV
Ripple rejection	RR	f=120Hz, V _i =-9V to -19V	54	60		dB
Dropout voltage	V _o	I _o =1.0A, T _j =25°C		2		V
Short circuit current	I _{sc}	V _i =-35V, T _a =25°C		300		mA
peak current	I _{pk}	T _j =25°C		2.2		A

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UTC79T08A 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	$T_j = 25^\circ\text{C}$	-7.68	-8.0	-8.32	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o \leq 15\text{W}$ $V_i = -10.5\text{V}$ to -23V	-7.60		-8.40	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 1.0A		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

UTC 79T09A ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $0 < T_j < 125^\circ\text{C}$, $I_o = 500\text{mA}$, $V_i = -15\text{V}$, $C_i = 2.2\mu\text{F}$, $C_o = 1\mu\text{F}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_o	$T_j = 25^\circ\text{C}$	-8.64	-9.0	-9.36	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_d \leq 15\text{W}$ $V_i = -11.5\text{V}$ to -23V	-8.55		-9.45	V
Line regulation	ΔV_o	$T_j = 25^\circ\text{C}$, $V_i = -11.5\text{V}$ to -26V		10	180	mV
		$T_j = 25^\circ\text{C}$, $V_i = -12\text{V}$ to -18V		5	90	mV
Load Regulation	ΔV_o	$T_j = 25^\circ\text{C}$, $I_o = 5\text{mA} - 1.0\text{A}$		12	180	mV
		$T_j = 25^\circ\text{C}$, $I_o = 0.25\text{A} - 0.75\text{A}$		4	90	mV
Quiescent Current	I_q	$T_j = 25^\circ\text{C}$		3	6	mA
Quiescent Current Change	ΔI_q	$I_o = 5\text{mA} - 1.0\text{A}$		0.05	0.5	mA
		$V_i = -11.5\text{V}$ to -26V		0.1	1.0	mA
Temperature coefficient of V_o	$\Delta V_o / \Delta T$	$I_o = 5\text{mA}$		-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	$f = 120\text{Hz}$, $T_j = 25^\circ\text{C}$, $V_i = -12.5\text{V}$ to -22.5V	54	60		dB
Dropout Voltage	V_d	$I_o = 1.0\text{A}$, $T_j = 25^\circ\text{C}$		2.0		V
Short-Circuit Current	I_{sc}	$V_i = -35\text{V}$, $T_a = 25^\circ\text{C}$		300		mA
Peak Output Current	I_{pk}	$T_j = 25^\circ\text{C}$		2.2		A

UTC79T12A 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	$T_j = 25^\circ\text{C}$	-11.52	-12.0	-12.48	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o \leq 15\text{W}$ $V_i = -14.5\text{V}$ to -27V	-11.40		-12.60	V
Line regulation	ΔV_o	$T_j = 25^\circ\text{C}$, $V_i = -14.5\text{V}$ to -30V		12	240	mV

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PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Load regulation	ΔV_o	$T_j=25^\circ\text{C}, V_i=-16\text{V to }-22\text{V}$		6	120	mV
		$T_j=25^\circ\text{C}, I_o=5.0\text{mA to }1.0\text{A}$		12	240	mV
		$T_j=25^\circ\text{C}, I_o=250\text{mA to }750\text{mA}$		4	120	mV
Quiescent current	I_q	$T_j=25^\circ\text{C}$		3	6	mA
Quiescent current change	ΔI_q	$I_o=5\text{mA to }1.0\text{A}$		0.05	0.5	mA
		$V_i=-14.5\text{V to }-30\text{V}$		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	$f=10\text{Hz to }100\text{kHz}, T_a=25^\circ\text{C}$		200		μV
Ripple rejection	RR	$f=120\text{Hz}, V_i=-15\text{V to }-25\text{V}$	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

UTC79T15A 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	$T_j=25^\circ\text{C}$	-14.40	-15.0	-15.60	V
		$5.0\text{mA} < I_o < 1.0\text{A}, P_o \leq 15\text{W}$ $V_i=-17.5\text{V to }-30\text{V}$	-14.25		-15.75	V
Line regulation	ΔV_o	$T_j=25^\circ\text{C}, V_i=-17.5\text{V to }-30\text{V}$		12	300	mV
		$T_j=25^\circ\text{C}, V_i=-20\text{V to }-26\text{V}$		6	150	mV
Load regulation	ΔV_o	$T_j=25^\circ\text{C}, I_o=5.0\text{mA to }1.0\text{A}$		12	300	mV
		$T_j=25^\circ\text{C}, I_o=250\text{mA to }750\text{mA}$		4	150	mV
Quiescent current	I_q	$T_j=25^\circ\text{C}$		3	6	mA
Quiescent current change	ΔI_q	$I_o=5\text{mA to }1.0\text{A}$		0.05	0.5	mA
		$V_i=-17.5\text{V to }-30.5\text{V}$		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	$f=10\text{Hz to }100\text{kHz}, T_a=25^\circ\text{C}$		250		μV
Ripple rejection	RR	$f=120\text{Hz}, V_i=-18.5\text{V to }-28.5\text{V}$	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

UTC79T18A 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	$T_j=25^\circ\text{C}$	-17.28	-18.0	-18.72	V
		$5.0\text{mA} < I_o < 1.0\text{A}, P_o \leq 15\text{W}$ $V_i=-21\text{V to }-33\text{V}$	-17.10		-18.90	V
Line regulation	ΔV_o	$T_j=25^\circ\text{C}, V_i=-21\text{V to }-33\text{V}$		15	360	mV
		$T_j=25^\circ\text{C}, V_i=-24\text{V to }-30\text{V}$		8	180	mV
Load regulation	ΔV_o	$T_j=25^\circ\text{C}, I_o=5.0\text{mA to }1.0\text{A}$		15	360	mV
		$T_j=25^\circ\text{C}, I_o=250\text{mA to }750\text{mA}$		5.0	180	mV
Quiescent current	I_q	$T_j=25^\circ\text{C}$		3	6	mA
Quiescent current change	ΔI_q	$I_o=5\text{mA to }1.0\text{A}$			0.5	mA
		$V_i=-21\text{V to }-32\text{V}$			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	$f=10\text{Hz to }100\text{kHz}, T_a=25^\circ\text{C}$		300		μV
Ripple rejection	RR	$f=120\text{Hz}, V_i=-22\text{V to }-32\text{V}$	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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UTC79T24A 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	$T_j = 25^\circ\text{C}$	-23.04	-24	-24.96	V
		$5.0\text{mA} < I_o < 1.0\text{A}$, $P_o \leq 15\text{W}$ $V_i = -27\text{V}$ to -38V	-22.80		-25.20	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 1.0A		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

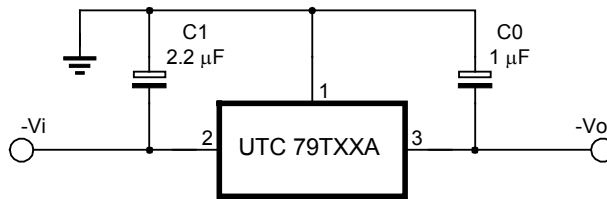


Fig.1 Fixed output regulator

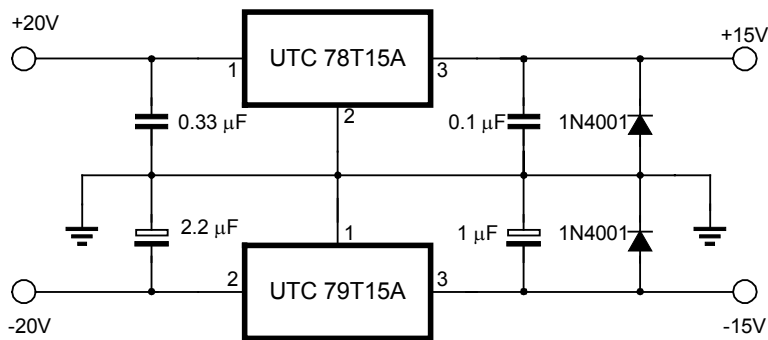


Fig.2 Split power supply(+15V, 1A)

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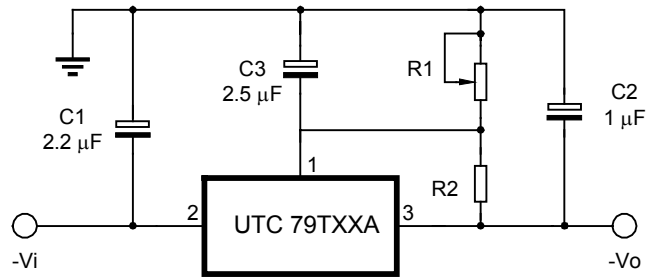


Fig.3 Circuit for increasing output voltage

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