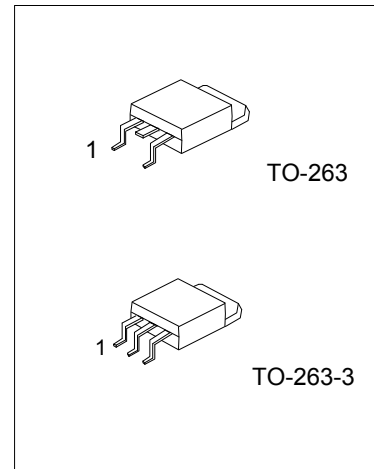




79TXXA

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

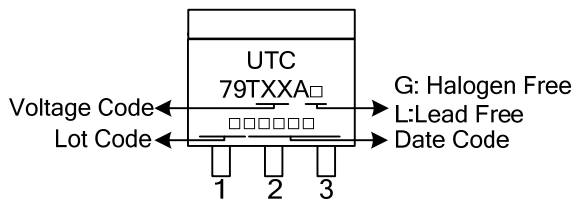
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
79TXXAL-TQ2-R	79TXXAG-TQ2-R	TO-263	G	I	O	Tape Reel
79TXXAL-TQ2-T	79TXXAG-TQ2-T	TO-263	G	I	O	Tube
79TXXAL-TQ3-R	79TXXAG-TQ3-R	TO-263-3	G	I	O	Tape Reel
79TXXAL-TQ3-T	79TXXAG-TQ3-T	TO-263-3	G	I	O	Tube

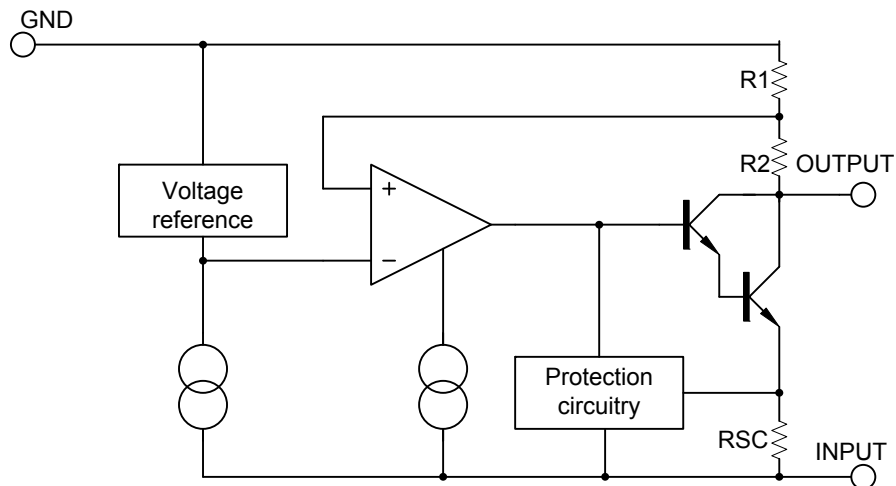
Note: Pin Code: I: Input G: GND O: Output

<p>79TXXAL-TQ2-R</p>	<p>(1) R: Tape Reel, T: Tube</p> <p>(2) TO-263: TQ2, TO-263-3: TQ3</p> <p>(3) G: Halogen Free, L: Lead Free</p> <p>(4) XX: refer to Marking Information</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-263 TO-263-3	05 :5.0V 06 :6.0V 08 :8.0V 09 :9.0V 12 :12V 15 :15V 18 :18V 24 :24V	 <p> UTC 79TXXA□ Voltage Code ← □□□□□□ → G: Halogen Free Lot Code ← □□□□□□ → L: Lead Free Date Code → □□□□□□ </p>

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	RATING	UNIT
Input voltage	V_{IN}	-35	V
Output Current	I_{OUT}	1	A
Power Dissipation	P_D	Internally Limited	W
Operating Temperature	T_{OPR}	0 ~ +125	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ_{JA}	65	$^\circ\text{C}/\text{W}$
Junction to Case	θ_{JC}	5	$^\circ\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS

(Refer to test circuits, $T_J=0^\circ\text{C}\sim 125^\circ\text{C}$, $I_{OUT}=500\text{mA}$, $C_O=1\mu\text{F}$, unless otherwise specified)

FOR 79T05A ($V_{IN}=-10\text{V}$, $C_I=33\mu\text{F}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ\text{C}$	-4.80	-5.0	-5.20	V
		$I_{OUT}=5\text{mA} \sim 1\text{A}$, $P_D \leq 15\text{W}$, $V_{IN}=-7\text{V} \sim -20\text{V}$	-4.75		-5.25	V
Line Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $V_{IN}=-7\text{V} \sim -25\text{V}$		10	100	mV
		$T_J=25^\circ\text{C}$, $V_{IN}=-8\text{V} \sim -12\text{V}$				mV
Load Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $I_{OUT}=5\text{mA} \sim 1\text{A}$		10	100	mV
		$T_J=25^\circ\text{C}$, $I_{OUT}=250\text{mA} \sim 750\text{mA}$		3	50	mV
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5\text{mA} \sim 1\text{A}$		0.05	0.5	mA
		$V_{IN}=-7\text{V} \sim -25\text{V}$		0.1	1.3	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_{OUT}=5\text{mA}$		-0.4		mV/ $^\circ\text{C}$
Output Noise Voltage	eN	f=10Hz ~ 100kHz, $T_A=25^\circ\text{C}$		100		μV
Ripple Rejection	RR	f=120Hz, $V_{IN}=-8\text{V} \sim -18\text{V}$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=1.0\text{A}$, $T_J=25^\circ\text{C}$		2		V
Short-Circuit Current	I_{SC}	$V_{IN}=-35\text{V}$, $T_A=25^\circ\text{C}$		300		mA
Peak Output Current	I_{PEAK}	$T_J=25^\circ\text{C}$		2.2		A

FOR 79T06A ($V_{IN}=-11\text{V}$, $C_I=2.2\mu\text{F}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ\text{C}$	-5.76	-6.00	-6.24	V
		$I_{OUT}=5\text{mA} \sim 1\text{A}$, $P_D \leq 15\text{W}$, $V_{IN}=-8\text{V} \sim -21\text{V}$	-5.70		-6.30	V
Line Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $V_{IN}=-8\text{V} \sim -25\text{V}$		10	120	mV
		$T_J=25^\circ\text{C}$, $V_{IN}=-9\text{V} \sim -13\text{V}$		5	60	mV
Load Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $I_{OUT}=5\text{mA} \sim 1\text{A}$		10	120	mV
		$T_J=25^\circ\text{C}$, $I_{OUT}=250\text{mA} \sim 750\text{mA}$		3	60	mV
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5\text{mA} \sim 1\text{A}$			0.5	mA
		$V_{IN}=-8\text{V} \sim -25\text{V}$			1.3	mA
Temperature coefficient of V_O	$\Delta V_O/\Delta T$	$I_{OUT}=5\text{mA}$		-0.5		mV/ $^\circ\text{C}$
Output Noise Voltage	eN	f=10Hz ~ 100kHz, $T_A=25^\circ\text{C}$		130		μV
Ripple Rejection	RR	f=120Hz, $V_{IN}=-9\text{V} \sim -19\text{V}$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=1.0\text{A}$, $T_J=25^\circ\text{C}$		2		V
Short-Circuit Current	I_{SC}	$V_{IN}=-35\text{V}$, $T_A=25^\circ\text{C}$		300		mA
Peak Output Current	I_{PEAK}	$T_J=25^\circ\text{C}$		2.2		A

■ ELECTRICAL CHARACTERISTICS(Cont.)

FOR 79T08A ($V_{IN} = -14V$, $C_I = 2.2\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J = 25^\circ C$	-7.68	-8.0	-8.32	V
		$I_{OUT} = 5mA \sim 1A$, $P_D \leq 15W$, $V_{IN} = -10.5V \sim -23V$	-7.60		-8.40	V
Line Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $V_{IN} = -10.5V \sim -25V$		10	100	mV
		$T_J = 25^\circ C$, $V_{IN} = -11.5V \sim -17V$		5	80	mV
Load Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $I_{OUT} = 5mA \sim 1A$		12	160	mV
		$T_J = 25^\circ C$, $I_{OUT} = 250mA \sim 750mA$		4	80	mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT} = 5mA \sim 1A$		0.05	0.5	mA
		$V_{IN} = -11.5V \sim -25V$		0.1	1.0	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_{OUT} = 5mA$		-0.6		mV/ $^\circ C$
Output Noise Voltage	eN	$f = 10Hz \sim 100kHz$, $T_A = 25^\circ C$		175		μV
Ripple Rejection	RR	$f = 120Hz$, $V_{IN} = -11.5V \sim -21.5V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT} = 1.0A$, $T_J = 25^\circ C$		2		V
Short-Circuit Current	I_{SC}	$V_{IN} = -35V$, $T_A = 25^\circ C$		300		mA
Peak Output Current	I_{PEAK}	$T_J = 25^\circ C$		2.2		A

FOR 79T09A ($V_{IN} = -15V$, $C_I = 2.2\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J = 25^\circ C$	-8.64	-9.0	-9.36	V
		$I_{OUT} = 5mA \sim 1A$, $P_D \leq 15W$, $V_{IN} = -11.5V \sim -23V$	-8.55		-9.45	V
Line Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $V_{IN} = -11.5V \sim -26V$		10	180	mV
		$T_J = 25^\circ C$, $V_{IN} = -12V \sim -18V$		5	90	mV
Load Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $I_{OUT} = 5mA \sim 1A$		12	180	mV
		$T_J = 25^\circ C$, $I_{OUT} = 0.25A \sim 0.75A$		4	90	mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT} = 5mA \sim 1A$		0.05	0.5	mA
		$V_{IN} = -11.5V \sim -26V$		0.1	1.0	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_{OUT} = 5mA$		-0.6		mV/ $^\circ C$
Output Noise Voltage	eN	$f = 10Hz \sim 100kHz$, $T_A = 25^\circ C$		175		μV
Ripple Rejection	RR	$f = 120Hz$, $T_J = 25^\circ C$, $V_{IN} = -12.5V \sim -22.5V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT} = 1.0A$, $T_J = 25^\circ C$		2.0		V
Short-Circuit Current	I_{SC}	$V_{IN} = -35V$, $T_A = 25^\circ C$		300		mA
Peak Output Current	I_{PEAK}	$T_J = 25^\circ C$		2.2		A

■ ELECTRICAL CHARACTERISTICS(Cont.)

FOR 79T12A ($V_{IN} = -18V$, $C_I = 2.2\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J = 25^\circ C$	-11.52	-12.0	-12.48	V
		$I_{OUT} = 5mA \sim 1A$, $P_D \leq 15W$, $V_{IN} = -14.5V \sim -27V$	-11.40		-12.60	V
Line Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $V_{IN} = -14.5V \sim -30V$		12	240	mV
		$T_J = 25^\circ C$, $V_{IN} = -16V \sim -22V$		6	120	mV
Load Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $I_{OUT} = 5mA \sim 1A$		12	240	mV
		$T_J = 25^\circ C$, $I_{OUT} = 250mA \sim 750mA$		4	120	mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT} = 5mA \sim 1A$		0.05	0.5	mA
		$V_{IN} = -14.5V \sim -30V$		0.1	1.0	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_{OUT} = 5mA$		-0.8		mV/ $^\circ C$
Output Noise Voltage	eN	$f = 10 Hz \sim 100kHz$, $T_A = 25^\circ C$		200		μV
Ripple Rejection	RR	$f = 120Hz$, $V_{IN} = -15V \sim -25V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT} = 1.0A$, $T_J = 25^\circ C$		2		V
Short-Circuit Current	I_{SC}	$V_{IN} = -35V$, $T_A = 25^\circ C$		300		mA
Peak Output Current	I_{PEAK}	$T_J = 25^\circ C$		2.2		A

FOR 79T15A ($V_{IN} = -23V$, $C_I = 2.2\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J = 25^\circ C$	-14.40	-15.0	-15.60	V
		$I_{OUT} = 5mA \sim 1A$, $P_D \leq 15W$, $V_{IN} = -17.5V \sim -30V$	-14.25		-15.75	V
Line Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $V_{IN} = -17.5V$ to $-30V$		12	300	mV
		$T_J = 25^\circ C$, $V_{IN} = -20V$ to $-26V$		6	150	mV
Load Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $I_{OUT} = 5mA \sim 1A$		12	300	mV
		$T_J = 25^\circ C$, $I_{OUT} = 250mA \sim 750mA$		4	150	mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT} = 5mA \sim 1A$		0.05	0.5	mA
		$V_{IN} = -17.5V$ to $-30.5V$		0.1	1.0	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_{OUT} = 5mA$		-0.9		mV/ $^\circ C$
Output Noise Voltage	eN	$f = 10 Hz \sim 100kHz$, $T_A = 25^\circ C$		250		μV
Ripple Rejection	RR	$f = 120Hz$, $V_{IN} = -18.5V$ to $-28.5V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT} = 1.0A$, $T_J = 25^\circ C$		2		V
Short-Circuit Current	I_{SC}	$V_{IN} = -35V$, $T_A = 25^\circ C$		300		mA
Peak Output Current	I_{PEAK}	$T_J = 25^\circ C$		2.2		A

■ ELECTRICAL CHARACTERISTICS(Cont.)

FOR 79T18A ($V_{IN} = -27V$, $C_I = 2.2\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J = 25^\circ C$	-17.28	-18.0	-18.72	V
		$I_{OUT} = 5mA \sim 1A$, $P_D \leq 15W$, $V_{IN} = -21V \sim -33V$	-17.10		-18.90	V
Line Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $V_{IN} = -21V \sim -33V$		15	360	mV
		$T_J = 25^\circ C$, $V_{IN} = -24V \sim -30V$		8	180	mV
Load Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $I_{OUT} = 5mA \sim 1A$		15	360	mV
		$T_J = 25^\circ C$, $I_O = 250mA \sim 750mA$		5.0	180	mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT} = 5mA \sim 1A$			0.5	mA
		$V_{IN} = -21V \sim -32V$			1.0	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_O = 5mA$		-1		mV/ $^\circ C$
Output Noise Voltage	eN	$f = 10Hz \sim 100kHz$, $T_A = 25^\circ C$		300		μV
Ripple Rejection	RR	$f = 120Hz$, $V_{IN} = -22V \sim -32V$	54	60		dB
Dropout Voltage	V_D	$I_O = 1.0A$, $T_J = 25^\circ C$		2		V
Short-Circuit Current	I_{SC}	$V_{IN} = -35V$, $T_A = 25^\circ C$		300		mA
Peak Output Current	I_{PEAK}	$T_J = 25^\circ C$		2.2		A

FOR 79T24A ($V_{IN} = -33V$, $C_I = 2.2\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J = 25^\circ C$	-23.04	-24	-24.96	V
		$I_{OUT} = 5mA \sim 1A$, $P_D \leq 15W$, $V_{IN} = -27V \sim -38V$	-22.80		-25.20	V
Line Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $V_{IN} = -27V \sim -38V$		15	480	mV
		$T_J = 25^\circ C$, $V_{IN} = -30V \sim -36V$		8	240	mV
Load Regulation	ΔV_{OUT}	$T_J = 25^\circ C$, $I_{OUT} = 5mA \sim 1A$		15	480	mV
		$T_J = 25^\circ C$, $I_{OUT} = 250mA \sim 750mA$		5.0	240	mV
Quiescent Current	I_Q	$T_J = 25^\circ C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT} = 5mA \sim 1A$			0.5	mA
		$V_{IN} = -27V \sim -38V$			1.0	mA
Temperature coefficient of V_O	$\Delta V_O / \Delta T$	$I_{OUT} = 5mA$		-1		mV/ $^\circ C$
Output Noise Voltage	eN	$f = 10Hz \sim 100kHz$, $T_A = 25^\circ C$		400		μV
Ripple Rejection	RR	$f = 120Hz$, $V_{IN} = -28V \sim -38V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT} = 1.0A$, $T_J = 25^\circ C$		2		V
Short-Circuit Current	I_{SC}	$V_{IN} = -35V$, $T_A = 25^\circ C$		300		mA
Peak Output Current	I_{PEAK}	$T_J = 25^\circ C$		2.2		A

APPLICATION CIRCUITS

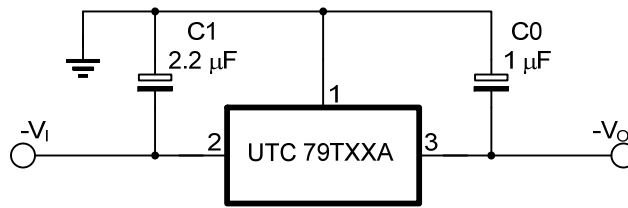


Fig.1 Fixed output regulator

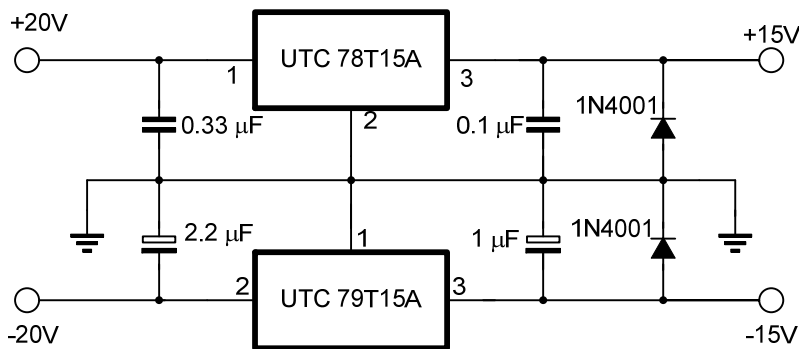


Fig.2 Split power supply (+-15V, 1A)

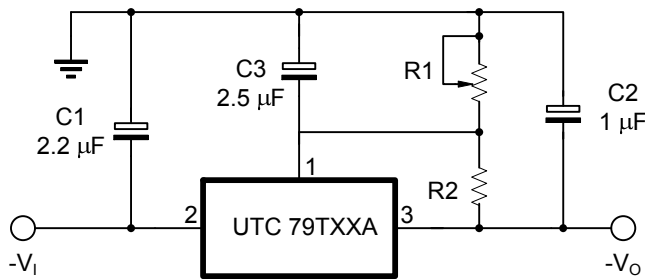


Fig.3 Circuit for increasing output voltage

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