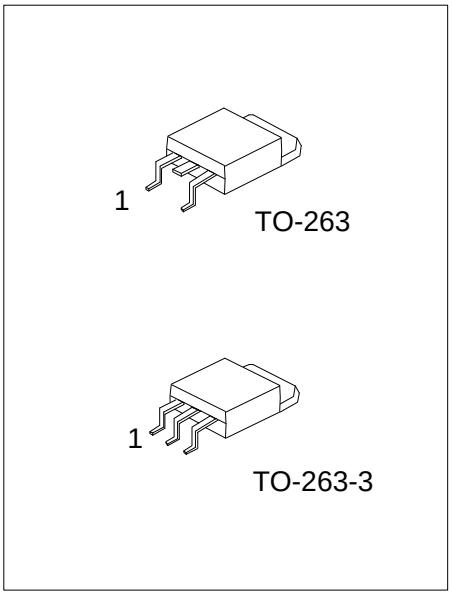
79TXXA

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

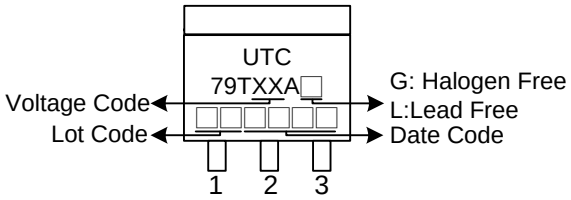
■ ORDERING INFORMATION

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

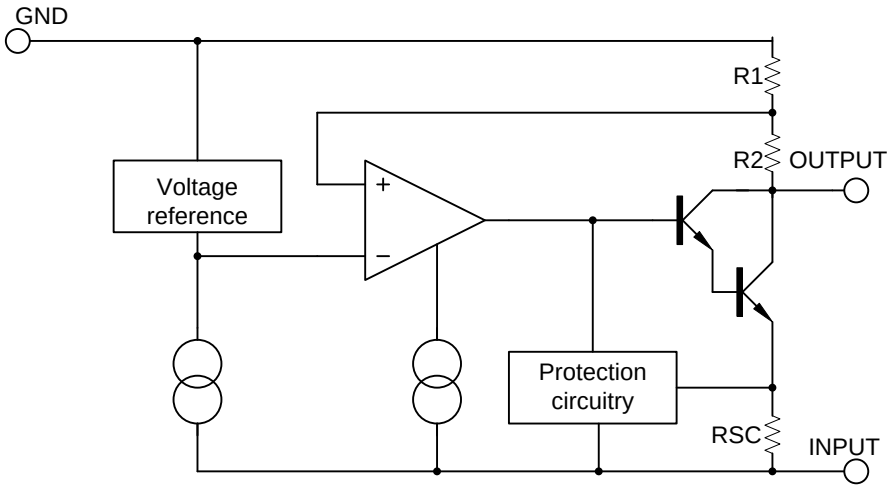
Note: Pin Code: I: Input G: GND O: Output

79TXXAG-TQ2-R (1)Packing Type (2)Package Type (3)Lead Free (4)Output Voltage Code	(1) R: Tape Reel, T: Tube (2) TO-263: TQ2, TO-263-3: TQ3 (3) G: Halogen Free and Lead Free, L: Lead Free (4) XX: refer to Marking Information

■ 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	

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°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}	-40 ~ +125	°C
Storage Temperature	T_{STG}	-65 ~ +150	°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	°C/W
Junction to Case	θ_{JC}	5	°C/W

■ ELECTRICAL CHARACTERISTICS

(Refer to test circuits, T_J=-40°C-125°C, I_{OUT} =500mA, C_O=1uF, unless otherwise specified)

FOR 79T05A (V_{IN} =-10V, C_I =33uF)

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

FOR 79T06A (V_{IN} =-11V, C_I =2.2uF)

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

■ ELECTRICAL CHARACTERISTICS(Cont.)

FOR 79T08A (V_{IN} =-14V, C_I =2.2uF)

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

FOR 79T09A (V_{IN} =-15V, C_I =2.2uF)

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

FOR 79T12A (V_{IN} =-18V, C_I =2.2uF)

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

■ ELECTRICAL CHARACTERISTICS(Cont.)

FOR 79T15A (V_{IN} =-23V, C_I =2.2uF)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	T_J=25°C	-14.40	-15.0	-15.60	V
		I_{OUT} =5mA~1A, $P_D \leqq$15W, V_{IN}=-17.5V~ -30V	-14.25		-15.75	V
Line Regulation	ΔV_{OUT}	T_J=25°C, V_{IN} =-17.5V to -30V		12	300	mV
		T_J=25°C, V_{IN} =-20V to -26V		6	150	mV
Load Regulation	ΔV_{OUT}	T_J=25°C, I_{OUT} =5mA ~ 1A		12	300	mV
		T_J=25°C, I_{OUT} =250mA ~ 750mA		4	150	mV
Quiescent Current	I_Q	T_J=25°C		3	6	mA
Quiescent Current Change	ΔI_Q	I_{OUT} =5mA ~ 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/°C
Output Noise Voltage	eN	f=10 Hz ~ 100kHz,T_A=25°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°C		2		V
Short-Circuit Current	I_{SC}	V_{IN} =-35V, T_A=25°C		300		mA
Peak Output Current	I_{PEAK}	T_J=25°C		2.2		A

FOR 79T18A (V_{IN} =-27V, C_I =2.2uF)

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

FOR 79T24A (V_{IN} =-33V, C_I =2.2uF)

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

■ APPLICATION CIRCUITS

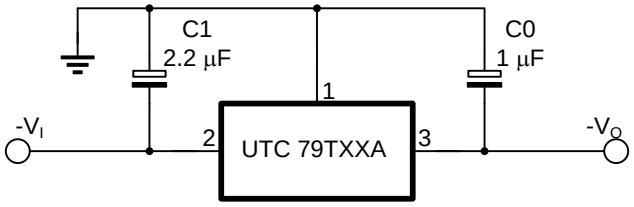


Fig.1 Fixed output regulator

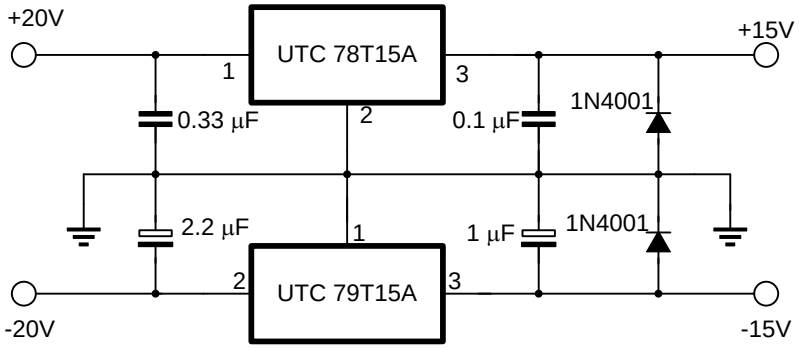


Fig.2 Split power supply (+-15V, 1A)

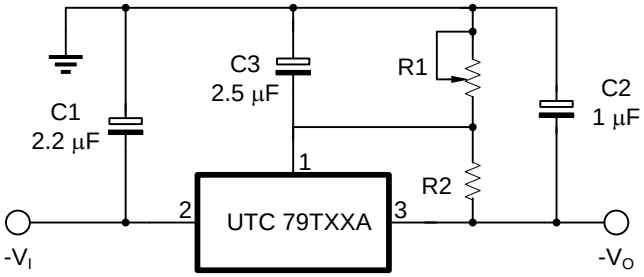


Fig.3 Circuit for increasing output voltage