



79DXX

LINEAR INTEGRATED CIRCUIT

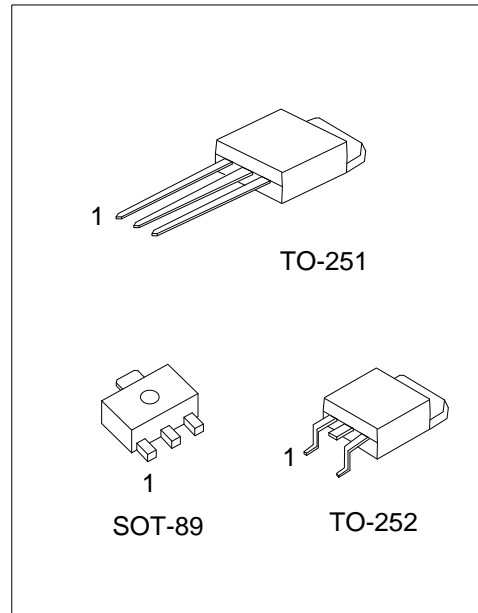
3 TERMINAL 0.5A NEGATIVE VOLTAGE REGULATOR

DESCRIPTION

The UTC 79DXX series of three-terminal negative regulators are available 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 0.5A
- * -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	
79DXXL-AB3-R	79DXXG-AB3-R	SOT-89	O	G	I	Tape Reel
79DXXL-AB3-T	79DXXG-AB3-T	TO-251	G	I	O	Tube
79DXXL-TM3-T	79DXXG-TM3-T	TO-251	G	I	O	Tube
79DXXL-TN3-T	79DXXG-TN3-T	TO-252	G	I	O	Tube
79DXXL-TN3-R	79DXXG-TN3-R	TO-252	G	I	O	Tape Reel

Notes: 1. xx: output voltage, refer to Marking Information
 2. Pin Code: I: Input G: GND O: Output

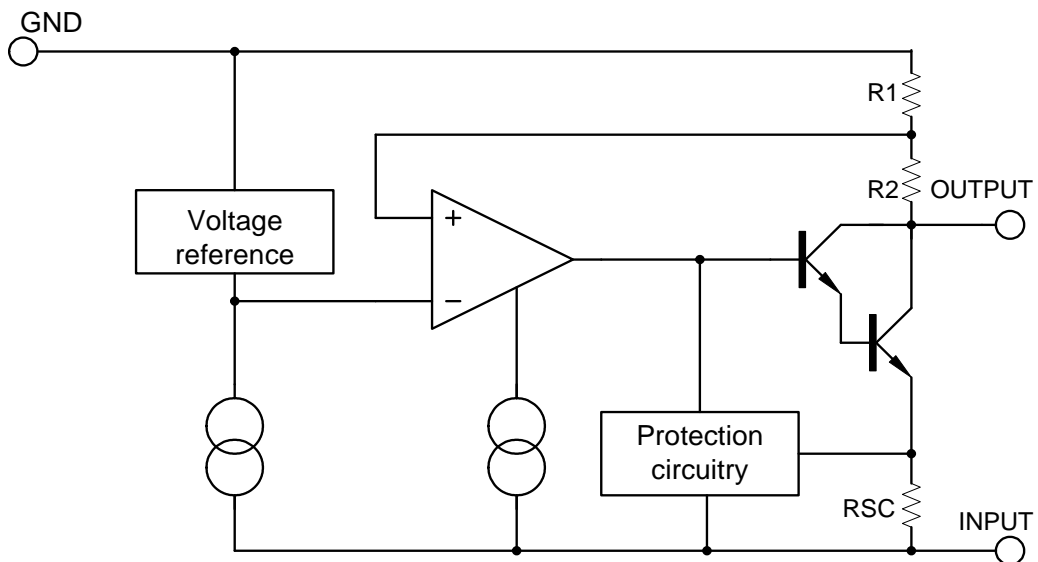
<p>79DXXG-AB3-R</p> <p>(1) Packing Type (2) Package Type (3) Green Package (4) Output Voltage Code</p>	<p>(1) R: Tape Reel, T: Tube (2) AB3: SOT-89, TM3: TO-251, TN3: TO-252 (3) G: Halogen Free and Lead Free, L: Lead Free (4) xx: refer to Marking Information</p>
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-251 TO-252	05 : -5V 06 : -6V 08 : -8V 09 : -9V	<p>UTC 79DXX Voltage Code L: Lead Free G: Halogen Free Date Code 1 2 3</p>
SOT-89	12 : -12V 15 : -15V 18 : -18V 24 : -24V	<p>Date Code Voltage Code Pin Code L: Lead Free G: Halogen Free 1 2 3</p>

BLOCK DIAGRAM



FLYING 飛翔國際有限公司

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

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage	$V_{OUT}=-5 \sim -18\text{V}$	V_{IN}	-35	V
	$V_{OUT}=-20 \sim -24\text{V}$		-40	V
Operating Temperature		T_{OPR}	-40 ~ +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
Thermal Resistance Junction-Air	SOT-89	θ_{JA}	180	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		112	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-Cases	SOT-89	θ_{JC}	50	$^\circ\text{C}/\text{W}$
	TO-251/TO-252		12.5	$^\circ\text{C}/\text{W}$

■ **ELECTRICAL CHARACTERISTICS** ($0 < T_J < 125^\circ\text{C}$, unless otherwise specified)

For 79D05 ($V_{IN}=-10\text{V}$, $I_{OUT}=500\text{mA}$, $C_I=33\mu\text{F}$, $C_O=1\mu\text{F}$)

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
		$5.0\text{mA} < I_{OUT} < 0.5\text{A}$ $V_{IN}=-7\text{V} \sim -20\text{V}$	-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
		$T_J=25^\circ\text{C}$, $V_{IN}=-8\text{V} \sim -12\text{V}$		5	60	mV
Load Regulation	ΔV_{OUT}	$T_J=25^\circ\text{C}$, $I_{OUT}=5.0\text{mA} \sim 0.5\text{A}$		10	100	mV
		$T_J=25^\circ\text{C}$, $I_{OUT}=5.0\text{mA} \sim 200\text{mA}$		3	50	mV
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5\text{mA} \sim 0.5\text{A}$		0.05	0.5	mA
		$V_{IN}=-7\text{V} \sim -25\text{V}$		0.1	1.3	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5\text{mA}$		-0.4		mV/ $^\circ\text{C}$
Output Noise Voltage	V_N	$f=10\text{Hz} \sim 100\text{kHz}$, $T_A=25^\circ\text{C}$		100		μV
Ripple Rejection	RR	$f=120\text{Hz}$, $V_{IN}=-8\text{V} \sim -18\text{V}$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=1.0\text{A}$, $T_J=25^\circ\text{C}$		2		V

For 79D06 ($V_{IN}=-11\text{V}$, $I_{OUT}=500\text{mA}$, $C_I=2.2\mu\text{F}$, $C_O=1\mu\text{F}$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ\text{C}$	-5.76	-6.0	-6.24	V
		$5.0\text{mA} < I_{OUT} < 0.5\text{A}$, $V_{IN}=-8\text{V} \sim -21\text{V}$	-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}	$T_J=25^\circ\text{C}$, $I_{OUT}=5.0\text{mA} \sim 0.5\text{A}$		10	120	mV
		$T_J=25^\circ\text{C}$, $I_{OUT}=5.0\text{mA} \sim 200\text{mA}$		3	60	mV
Quiescent Current	I_Q	$T_J=25^\circ\text{C}$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5\text{mA} \sim 0.5\text{A}$			0.5	mA
		$V_{IN}=-8\text{V} \sim -25\text{V}$			1.3	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5\text{mA}$		-0.5		mV/ $^\circ\text{C}$
Output Noise Voltage	eN	$F=10\text{Hz} \sim 100\text{kHz}$, $T_A=25^\circ\text{C}$		130		μV
Ripple Rejection	RR	$F=120\text{Hz}$, $V_{IN}=-9\text{V} \sim -19\text{V}$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=0.5\text{A}$, $T_J=25^\circ\text{C}$		2		V

■ ELECTRICAL CHARACTERISTICS (Cont.)

For 79D08 ($V_{IN}=-14V$, $I_{OUT}=500mA$, $C_I=2.2\mu F$, $C_O=1\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ C$	-7.68	-8.0	-8.32	V
		$5.0mA < I_{OUT} < 0.5A$ $V_{IN}=-10.5V \sim -23V$	-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}	$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 0.5A$		12	160	mV
		$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 200mA$		4	80	mV
Quiescent Current	I_Q	$T_J=25^\circ C$		4.3	8	mA
Quiescent Current change	ΔI_Q	$I_{OUT}=5mA \sim 0.5A$		0.05	0.5	mA
		$V_{IN}=-11.5V \sim -25V$		0.1	1.0	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-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	$I_{OUT}=0.5A$, $T_J=25^\circ C$		2		V

For 79D09 ($V_{IN}=-15V$, $I_{OUT}=500mA$, $C_I=2.2\mu F$, $C_O=1\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ C$	-8.64	-9.0	-9.36	V
		$5.0mA < I_{OUT} < 0.5A$ $V_{IN}=-11.5V \sim -24V$	-8.55		-9.45	V
Line regulation	ΔV_{OUT}	$T_J=25^\circ C$, $V_{IN}=-11.5V \sim -25V$		10	180	mV
		$T_J=25^\circ C$, $V_{IN}=-12.5V \sim -18V$		5	90	mV
Load Regulation	ΔV_{OUT}	$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 0.5A$		12	180	mV
		$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 200mA$		4	90	mV
Quiescent Current	I_Q	$T_J=25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA \sim 0.5A$		0.05	0.5	mA
		$V_{IN}=-11.5V \sim -26V$		0.1	1.0	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.6		mV/ $^\circ C$
Output Noise Voltage	eN	$f=10Hz \sim 100kHz$, $T_a=25^\circ C$		175		μV
Ripple Rejection	RR	$f=120Hz$, $V_{IN}=-12.5V \sim -22.5V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=0.5A$, $T_J=25^\circ C$		2		V

For 79D12 ($V_{IN}=-18V$, $I_{OUT}=500mA$, $C_I=2.2\mu F$, $C_O=1\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ C$	-11.52	-12.0	-12.48	V
		$5.0mA < I_{OUT} < 0.5A$ $V_{IN}=-14.5V \sim -27V$	-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}	$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 0.5A$		12	240	mV
		$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 200mA$		4	120	mV
Quiescent Current	I_Q	$T_J=25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA \sim 0.5A$		0.05	0.5	mA
		$V_{IN}=-14.5V \sim -30V$		0.1	1.0	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.8		mV/ $^\circ C$
Output Noise Voltage	eN	$f=10Hz \sim 100kHz$, $T_a=25^\circ C$		200		μV
Ripple Rejection	RR	$f=120Hz$, $V_{IN}=-15V \sim -25V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=0.5A$, $T_J=25^\circ C$		2		V

■ ELECTRICAL CHARACTERISTICS (Cont.)

For 79D15 ($V_{IN}=-23V$, $I_{OUT}=500mA$, $C_I=2.2\mu F$, $C_O=1\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ C$	-14.40	-15.0	-15.60	V
		$5.0mA < I_{OUT} < 0.5A$ $V_{I}=-17.5V \sim -30V$	-14.25		-15.75	V
Line Regulation	ΔV_{OUT}	$T_J=25^\circ C$, $V_{IN}=-17.5V \sim -30V$		12	300	mV
		$T_J=25^\circ C$, $V_{IN}=-20V \sim -26V$		6	150	mV
Load Regulation	ΔV_{OUT}	$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 0.5A$		12	300	mV
		$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 200mA$		4	150	mV
Quiescent Current	I_Q	$T_J=25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA \sim 0.5A$		0.05	0.5	mA
		$V_{IN}=-17.5V \sim -30.5V$		0.1	1.0	MA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.9		mV/ $^\circ C$
Output Noise Voltage	eN	$f=10Hz \sim 100kHz$, $T_a=25^\circ C$		250		μV
Ripple Rejection	RR	$f=120Hz$, $V_{IN}=-18.5V \sim -28.5V$	54	60		dB
Dropout Voltage	V_d	$I_{OUT}=0.5A$, $T_J=25^\circ C$		2		V

For 79D18 ($V_{IN}=-27V$, $I_{OUT}=500mA$, $C_I=2.2\mu F$, $C_O=1\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ C$	-17.28	-18.0	-18.72	V
		$5.0mA < I_{OUT} < 0.5A$ $V_{IN}=-21V \sim -33V$	-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}	$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 0.5A$		15	360	mV
		$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 200mA$		5.0	180	mV
Quiescent Current	I_Q	$T_J=25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA \sim 0.5A$			0.5	mA
		$V_{IN}=-21V \sim -32V$			1.0	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-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	$I_{OUT}=0.5A$, $T_J=25^\circ C$		2		V

For 79D24 ($V_{IN}=-33V$, $I_{OUT}=500mA$, $C_I=2.2\mu F$, $C_O=1\mu F$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^\circ C$	-23.04	-24.0	-24.96	V
		$5.0mA < I_{OUT} < 0.5A$ $V_{IN}=-27V \sim -38V$	-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}	$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 0.5A$		15	480	mV
		$T_J=25^\circ C$, $I_{OUT}=5.0mA \sim 200mA$		5.0	240	mV
Quiescent Current	I_Q	$T_J=25^\circ C$		4.3	8	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA \sim 0.5A$			0.5	mA
		$V_{IN}=-27V \sim -38V$			1.0	mA
Temperature Coefficient of V_{OUT}	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1		mV/ $^\circ C$
Output Noise Voltage	eN	$f=10Hz \sim 100kHz$, $T_a=25^\circ C$		400		μV
Ripple Rejection	RR	$f=120Hz$, $V_{IN}=-28V$ to $-38V$	54	60		dB
Dropout Voltage	V_D	$I_{OUT}=0.5A$, $T_J=25^\circ C$		2		V

APPLICATION CIRCUITS

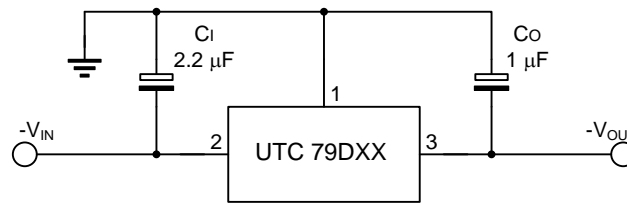


Fig.1 Fixed output regulator

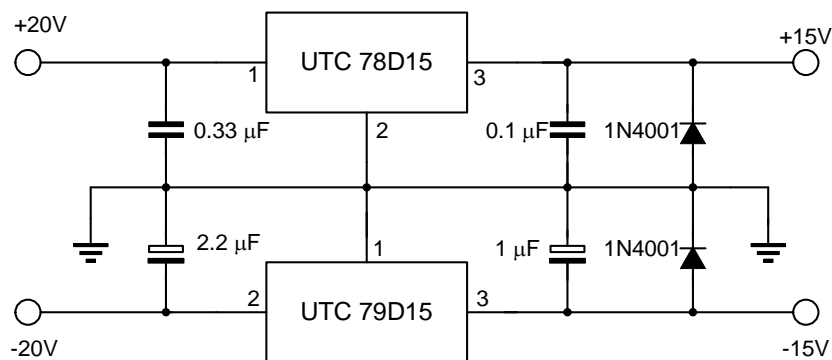


Fig.2 Split power supply ($\pm 15V$, 0.5A)

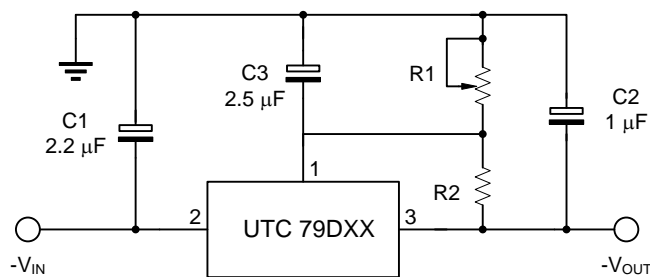


Fig.3 Circuit for increasing output voltage

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