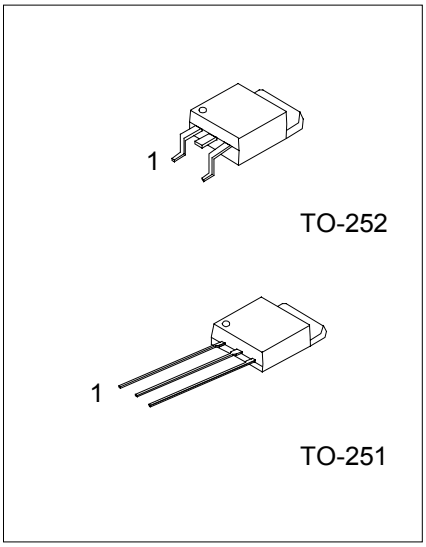
UTC 79DXX LINEAR INTEGRATED CIRCUIT

3 TERMINAL 0.5A NEGATIVE VOLTAGE REGULATOR



1: GND 2: Input 3: Output

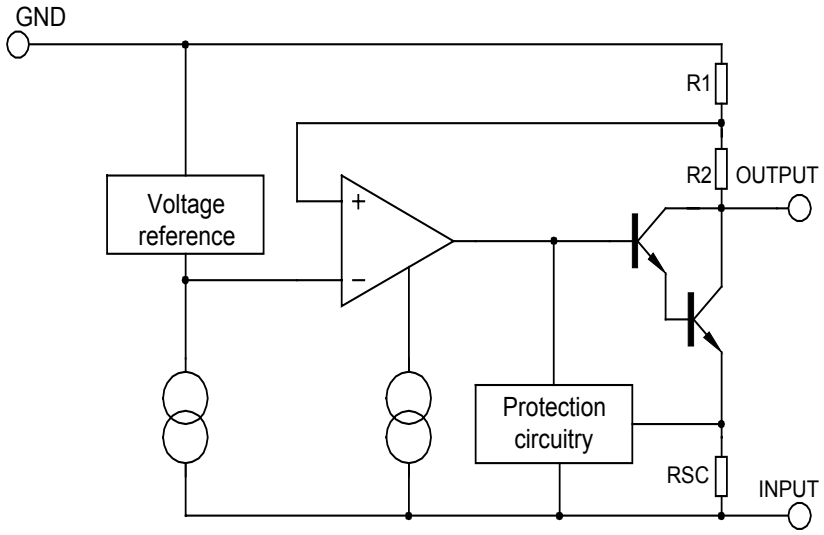
DESCRIPTION

The UTC 79DXX series of three-terminal negative regulators are available in TO-252 and TO-251 packages 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 0.5A
*-5V; -6V;-8V;-12V;-15V;-18V;-24V output voltage available
*Thermal overload protection
*Short circuit protection

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Input voltage (for Vo=–5 ~ –18V) (for Vo=–20 ~–24V)	Vi	-35 -40	V
Thermal resistance junction-air	$R_{\theta JA}$	65	°C /W
Thermal resistance junction-cases	$R_{\theta JC}$	5	°C /W
Operating Temperature	Topr	0 ~ +125	°C
Storage Temperature	Tstg	-65 ~ +150	°C

UTC 79D05 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	Vo	Tj=25°C	-4.80	-5.0	-5.20	V
		5.0mA<Io<0.5A,Po<15W Vi=-7V to -20V	-4.75		-5.25	V
Line regulation	ΔVo	Tj=25°C,Vi=-7V to -25V		10	100	mV
		Tj=25°C,Vi=-8V to -12V				mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		10	100	mV
		Tj=25°C,Io=5.0mA to 200mA		3	50	mV
Quiescent current	I_Q	Tj=25°C		4.3	8	mA
Quiescent current change	ΔI_Q	Io=5mA to 0.5A		0.05	0.5	mA
		Vi=-7V to -25V		0.1	1.3	mA
Output voltage drift	ΔVo/ΔT	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	Vd	Io=1.0A,Tj=25°C		2		V

UTC 79D06 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	Vo	Tj=25°C	-5.76	-6.0	-6.24	V
		5.0mA<Io<0.5A,Po<15W Vi=-8V to -21V	-5.70		-6.30	V
Line regulation	ΔVo	Tj=25°C,Vi=-8V to -25V		10	120	mV
		Tj=25°C,Vi=-9V to -13V		5	60	mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		10	120	mV
		Tj=25°C,Io=5.0mA to 200mA		3	60	mV
Quiescent current	I_Q	Tj=25°C		4.3	8	mA
Quiescent current change	ΔI_Q	Io=5mA to 0.5A			0.5	mA
		Vi=-8V to -25V			1.3	mA
Output voltage drift	ΔVo/ΔT	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	Vd	Io=0.5A, Tj=25°C		2		V

UTC 79D08 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C,Io=500mA,Vi=-14V,Ci=2.2uF,Co=1uF,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	Vo	Tj=25°C	-7.68	-8.0	-8.32	V
		5.0mA<Io<0.5A,Po<15W Vi=-10.5V to -23V	-7.60		-8.40	V
Line regulation	ΔVo	Tj=25°C,Vi=-10.5V to -25V		10	100	mV
		Tj=25°C,Vi=-11.5V to -17V		5	80	mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		12	160	mV
		Tj=25°C,Io=5.0mA to 200mA		4	80	mV
Quiescent current	I_Q	Tj=25°C		4.3	8	mA
Quiescent current change	ΔI_Q	Io=5mA to 0.5A		0.05	0.5	mA
		Vi=-11.5V to -25V		0.1	1.0	mA
Output voltage drift	ΔVo/ΔT	Io=5mA		-0.6		mV/°C
Output noise voltage	V_N	f=10Hz to 100kHz,Ta=25°C		175		μV
Ripple rejection	RR	f=120Hz, Vi=-11.5V to -21.5V	54	60		dB
Dropout voltage	Vd	Io=0.5A,Tj=25°C		2		V

UTC 79D09 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C,Io=500mA,Vi=-15V,Ci=2.2uF,Co=1uF,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	Vo	Tj=25°C	-8.64	-9.0	-9.36	V
		5.0mA<Io<0.5A,Po<15W V_I =-11.5V to - 24V	-8.55		-9.45	V
Line regulation	ΔVo	Tj=25°C,V_I =-11.5V to - 25 V		10	180	mV
		Tj=25°C,V_I =-12.5V to - 18V		5	90	mV
Load Regulation	ΔVo	Tj=25°C,I_O=5.0mA - 0.5A		12	180	mV
		Tj=25°C,I_O=5.0mA - 200mA		4	90	mV
Quiescent Current	IQ	Tj=25°C		4.3	8	mA
Quiescent Current Change	ΔIQ	I_O=5mA to 0.5A		0.05	0.5	mA
		V_I =-11.5V to -26V		0.1	1.0	mA
Temperature coefficient of Vo	ΔVo/ΔT	Io=5mA		-0.6		mV/°C
Output Noise Voltage	V_N	f=10Hz to 100kHz,Ta=25°C		175		μV
Ripple Rejection	RR	f=120Hz V_I =-12.5V to -22.5V	54	60		dB
Dropout Voltage	Vd	Io=0.5A,Tj=25°C		2		V

UTC 79D12 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C,Io=500mA,Vi=-18V,Ci=2.2uF,Co=1uF,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	Vo	Tj=25°C	-11.52	-12.0	-12.48	V
		5.0mA<Io<0.5A,Po<15W Vi=-14.5V to -27V	-11.40		-12.60	V
Line regulation	ΔVo	Tj=25°C,Vi=-14.5V to -30V		12	240	mV
		Tj=25°C,Vi=-16V to -22V		6	120	mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		12	240	mV
		Tj=25°C,Io=5.0mA to 200mA		4	120	mV
Quiescent current	I_Q	Tj=25°C		4.3	8	mA
Quiescent current change	ΔI_Q	Io=5mA to 0.5A		0.05	0.5	mA
		Vi=-14.5V to -30V		0.1	1.0	mA
Output voltage drift	ΔVo/ΔT	Io=5mA		-0.8		mV/°C
Output noise voltage	V_N	f=10Hz to 100kHz,Ta=25°C		200		μV
Ripple rejection	RR	f=120Hz, Vi=-15V to -25V	54	60		dB
Dropout voltage	Vd	Io=0.5A,Tj=25°C		2		V

UTC 79D15 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C, Io=500mA,Vi=-23V,Ci=2.2uF,Co=1uF,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	Vo	Tj=25°C	-14.40	-15.0	-15.60	V
		5.0mA<Io<0.5A,Po<15W Vi=-17.5V to -30V	-14.25		-15.75	V
Line regulation	ΔVo	Tj=25°C,Vi=-17.5V to -30V		12	300	mV
		Tj=25°C,Vi=-20V to -26V		6	150	mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		12	300	mV
		Tj=25°C,Io=5.0mA to 200mA		4	150	mV
Quiescent current	I_Q	Tj=25°C		4.3	8	mA
Quiescent current change	ΔI_Q	Io=5mA to 0.5A		0.05	0.5	mA
		Vi=-17.5V to -30.5V		0.1	1.0	MA
Output voltage drift	ΔVo/ΔT	Io=5mA		-0.9		mV/°C
Output noise voltage	V_N	f=10Hz to 100kHz,Ta=25°C		250		μV
Ripple rejection	RR	f=120Hz, Vi=-18.5V to -28.5V	54	60		DB
Dropout voltage	Vd	Io=0.5A,Tj=25°C		2		V

UTC 79D18 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C,Io=500mA,Vi=-27V,Ci=2.2uF,Co=1uF,unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	Vo	Tj=25°C	-17.28	-18.0	-18.72	V
		5.0mA<Io<0.5A,Po<15W Vi=-21V to –33V	-17.10		-18.90	V
Line regulation	ΔVo	Tj=25°C,Vi=-21V to -33V		15	360	mV
		Tj=25°C,Vi=-24V to -30V		8	180	mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		15	360	mV
		Tj=25°C,Io=5.0mA to 200mA		5.0	180	mV
Quiescent current	I_Q	Tj=25°C		4.3	8	mA
Quiescent current change	ΔI_Q	Io=5mA to 0.5A			0.5	mA
		Vi=-21V to –32V			1.0	mA
Output voltage drift	ΔVo/ΔT	Io=5mA		-1		mV/°C
Output noise voltage	V_N	f=10Hz to 100kHz,Ta=25°C		300		μV
Ripple rejection	RR	f=120Hz, Vi=-22V to -32V	54	60		dB
Dropout voltage	Vd	Io=0.5A,Tj=25°C		2		V

UTC 79D24 ELECTRICAL CHARACTERISTICS

(Refer to test circuits, 0<Tj<125°C, Io=500mA, Vi=-33V, Ci=2.2uF, Co=1uF, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output voltage	Vo	Tj=25°C	-23.04	-24.0	-24.96	V
		5.0mA<Io<0.5A,Po<15W Vi=-27V to –38V	-22.80		-25.20	V
Line regulation	ΔVo	Tj=25°C,Vi=-27V to -38V		15	480	mV
		Tj=25°C,Vi=-30V to -36V		8	240	mV
Load regulation	ΔVo	Tj=25°C,Io=5.0mA to 0.5A		15	480	mV
		Tj=25°C,Io=5.0mA to 200mA		5.0	240	mV
Quiescent current	IQ	Tj=25°C		4.3	8	mA
Quiescent current change	ΔIQ	Io=5mA to 0.5A			0.5	mA
		Vi=-27V to –38V			1.0	mA
Output voltage drift	ΔVo/ΔT	Io=5mA		-1		mV/°C
Output noise voltage	VN	f=10Hz to 100kHz,Ta=25°C		400		μV
Ripple rejection	RR	f=120Hz, Vi=-28V to -38V	54	60		dB
Dropout voltage	Vd	Io=0.5A,Tj=25°C		2		V

APPLICATION CIRCUITS

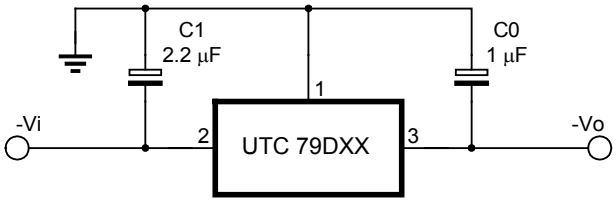


Fig.1 Fixed output regulator

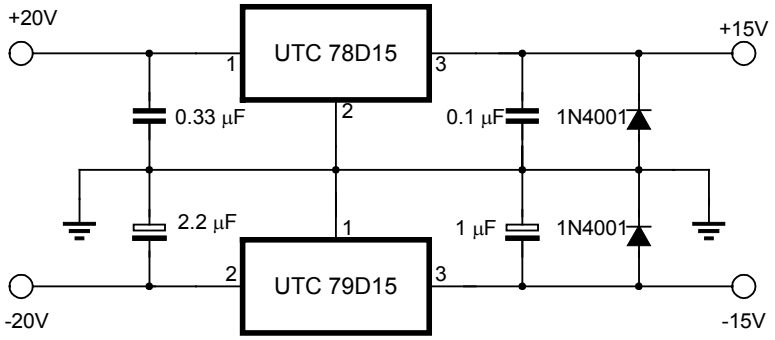


Fig.2 Split power supply (+-15V, 0.5A)

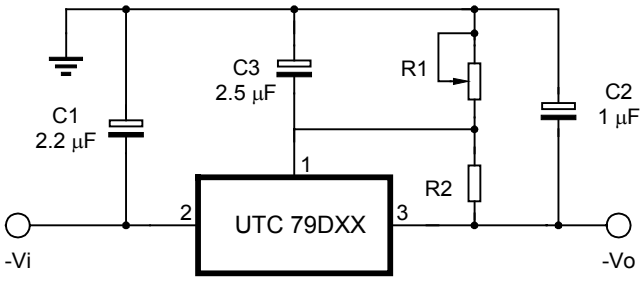


Fig.3 Circuit for increasing output voltage

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