



79DXXA

LINEAR INTEGRATED CIRCUIT

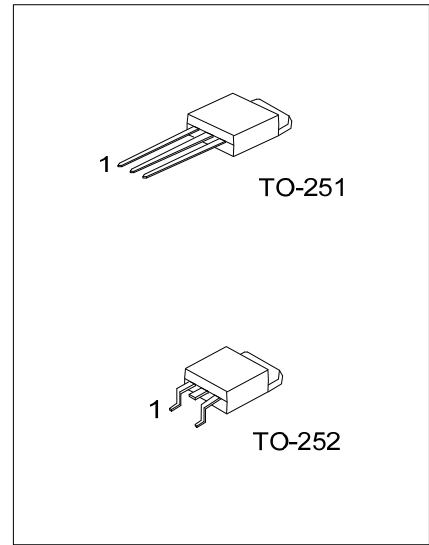
3 TERMINAL 1A NEGATIVE VOLTAGE REGULATOR

DESCRIPTION

The UTC **79DXXA** series of three-terminal negative regulators is available several fixed output voltage, making them useful in a wide range of application. Each type employs internal current limiting, thermal shut-down, making it essentially indestructible.

FEATURES

- * Output current up to 1A
- * -5V, -6V, -7V, -8V, -9V,-12V, -15V, -18V, -24V output voltage available
- * Thermal overload protection



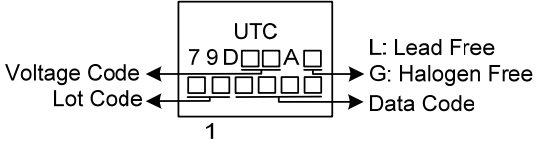
NORDERING INFORMATIO

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
79DXXAL-TM3-T	79DXXAG-TM3-T	TO-251	G	I	O	Tube
79DXXAL-TN3-T	79DXXAG-TN3-T	TO-252	G	I	O	Tube
79DXXAL-TN3-R	79DXXAG-TN3-R	TO-252	G	I	O	Tape Reel

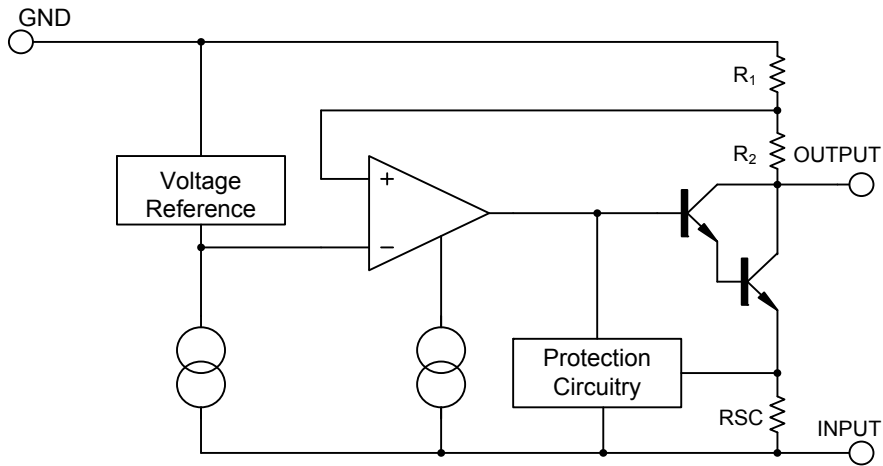
Note: Pin Assignment: G: GND I: Input O: Output

<p>79DXXAG-TM3-T</p> <p>(1)Packing Type (2)Package Type (3)Lead Plating (4)Output Voltage Code</p>	<p>(1) T: Tube, R: Tape Reel (2) 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 07: -7V 08: -8V 09: -9V 12: -12V 15: -15V 18: -18V 24: -24V	 <p>UTC 7 9 D □ □ A □ Voltage Code ← → L: Lead Free Lot Code ← → G: Halogen Free Data Code</p>

BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Input Voltage	V _{IN}	-35	V
Output Current	I _{OUT}	1	A
Power Dissipation	P _D	0.89	W
Operating Temperature	T _{OPR}	0 ~ +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	RATING	UNIT
Junction to Ambient	θ _{JA}	112	°C/W
Junction to Case	θ _{JC}	12.5	°C/W

■ ELECTRICAL CHARACTERISTICS

(I_{OUT}=0.5A, T_J=0°C~125°C, C_I=2.2μF, C_O=1μF, unless otherwise specified)

For UTC 79D05A (V_{IN}=-10V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V _{OUT}	T _J =25°C	-4.80	-5.0	-5.20	V
		V _{IN} =-7V~-20V, I _{OUT} =5mA~1A	-4.75		-5.25	V
Dropout Voltage	V _D	I _{OUT} =1A, T _J =25°C		2		V
Line Regulation	ΔV _{OUT}	V _{IN} =-7V~-25V, T _J =25°C		10	100	mV
		V _{IN} =-8V~-12V, T _J =25°C		5	60	mV
Load Regulation	ΔV _{OUT}	I _{OUT} =5mA~1A, T _J =25°C		10	100	mV
		I _{OUT} =250mA~750mA, T _J =25°C		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
Output Noise Voltage	e _N	f=10Hz~100kHz, T _A =25°C		100		μV
Output Voltage Drift	ΔV _{OUT} /ΔT	I _{OUT} =5mA		-0.4		mV/°C
Ripple Rejection	RR	V _{IN} =-8V~-18V, f=120Hz	54	60		dB
Peak Current	I _{PEAK}	T _J =25°C		2.2		A

For UTC 79D06A (V_{IN}=-11V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V _{OUT}	T _J =25°C	-5.76	-6.00	-6.24	V
		V _{IN} =-8V~-21V, I _{OUT} =5mA~1A	-5.70		-6.30	V
Dropout Voltage	V _D	I _{OUT} =1.0A, T _J =25°C		2		V
Line Regulation	ΔV _{OUT}	V _{IN} =-8V~-25V, T _J =25°C		10	120	mV
		V _{IN} =-9V~-13V, T _J =25°C		5	60	mV
Load Regulation	ΔV _{OUT}	I _{OUT} =5mA~1A, T _J =25°C		10	120	mV
		I _{OUT} =250mA~750mA, T _J =25°C		3	60	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} =-8V~-25V		0.1	1.3	mA
Output Noise Voltage	e _N	f=10Hz~100kHz, T _A =25°C		130		μV
Output Voltage Drift	ΔV _{OUT} /ΔT	I _{OUT} =5mA		-0.5		mV/°C
Ripple Rejection	RR	V _{IN} =-9V~-19V, f=120Hz	54	60		dB
Peak Current	I _{PEAK}	T _J =25°C		2.2		A

■ ELECTRICAL CHARACTERISTICS(Cont.)

For UTC 79D07A ($V_{IN}=-13V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-6.72	-7.0	-7.28	V
		$V_{IN}=-10.5V\sim-23V, I_{OUT}=5mA\sim 1A$	-6.65		-7.35	V
Dropout Voltage	V_D	$I_{OUT}=1A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-10.5V\sim-25V, T_J=25^{\circ}C$		10	140	mV
		$V_{IN}=-11.5V\sim-17V, T_J=25^{\circ}C$		5	70	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		12		mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		4		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	1.3	mA
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		175		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.6		mV/ $^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-11.5V\sim-21.5V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

For UTC 79D08A ($V_{IN}=-14V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-7.68	-8.0	-8.32	V
		$V_{IN}=-10.5V\sim-23V, I_{OUT}=5mA\sim 1A$	-7.60		-8.40	V
Dropout Voltage	V_D	$I_{OUT}=1A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-10.5V\sim-25V, T_J=25^{\circ}C$		10	160	mV
		$V_{IN}=-11.5V\sim-17V, T_J=25^{\circ}C$		5	80	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		12	160	mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		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
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		175		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.6		mV/ $^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-11.5V\sim-21.5V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

For UTC 79D09A ($V_{IN}=-15V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-8.64	-9.0	-9.36	V
		$V_{IN}=-11.5V\sim-23V, I_{OUT}=5mA\sim 1A$	-8.55		-9.45	V
Dropout Voltage	V_D	$I_{OUT}=1A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-11.5V\sim-26V, T_J=25^{\circ}C$		10	180	mV
		$V_{IN}=-12V\sim-18V, T_J=25^{\circ}C$		5	90	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		12	180	mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		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
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		175		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.6		mV/ $^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-12.5V\sim-22.5V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

■ ELECTRICAL CHARACTERISTICS(Cont.)

For UTC 79D12A ($V_{IN}=-18V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-11.52	-12.0	-12.48	V
		$V_{IN}=-14.5V\sim-27V, I_{OUT}=5mA\sim 1A$	-11.40		-12.60	V
Dropout Voltage	V_D	$I_{OUT}=1A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-14.5V\sim-30V, T_J=25^{\circ}C$		12	240	mV
		$V_{IN}=-16V\sim-22V, T_J=25^{\circ}C$		6	120	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		12	240	mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		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
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		200		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.8		$mV/^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-15V\sim-25V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

For UTC 79D15A ($V_{IN}=-23V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-14.40	-15.0	-15.60	V
		$V_{IN}=-17.5V\sim-30V, I_{OUT}=5mA\sim 1A$	-14.25		-15.75	V
Dropout Voltage	V_D	$I_{OUT}=1A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-17.5V\sim-30V, T_J=25^{\circ}C$		12	300	mV
		$V_{IN}=-20V\sim-26V, T_J=25^{\circ}C$		6	150	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		12	300	mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		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
		$V_{IN}=-17.5V\sim-30.5V$		0.1	1.0	mA
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		250		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-0.9		$mV/^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-18.5V\sim-28.5V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

■ ELECTRICAL CHARACTERISTICS(Cont.)

For UTC 79D18A ($V_{IN}=-27V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-17.28	-18.0	-18.72	V
		$V_{IN}=-21V\sim-33V, I_{OUT}=5mA\sim 1A$	-17.10		-18.90	V
Dropout Voltage	V_D	$I_{OUT}=1A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-21V\sim-33V, T_J=25^{\circ}C$		15	360	mV
		$V_{IN}=-24V\sim-30V, T_J=25^{\circ}C$		8	180	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		15	360	mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		5.0	180	mV
Quiescent Current	I_Q	$T_J=25^{\circ}C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA\sim 1A$		0.05	0.5	mA
		$V_{IN}=-21V\sim-32V$		0.1	1.0	mA
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		300		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1		$mV/^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-22V\sim-32V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

For UTC 79D24A ($V_{IN}=-33V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$T_J=25^{\circ}C$	-23.04	-24	-24.96	V
		$V_{IN}=-27V\sim-38V, I_{OUT}=5mA\sim 1A$	-22.80		-25.20	V
Dropout Voltage	V_D	$I_{OUT}=1.0A, T_J=25^{\circ}C$		2		V
Line Regulation	ΔV_{OUT}	$V_{IN}=-27V\sim-38V, T_J=25^{\circ}C$		15	480	mV
		$V_{IN}=-30V\sim-36V, T_J=25^{\circ}C$		8	240	mV
Load Regulation	ΔV_{OUT}	$I_{OUT}=5mA\sim 1A, T_J=25^{\circ}C$		15	480	mV
		$I_{OUT}=250mA\sim 750mA, T_J=25^{\circ}C$		5.0	240	mV
Quiescent Current	I_Q	$T_J=25^{\circ}C$		3	6	mA
Quiescent Current Change	ΔI_Q	$I_{OUT}=5mA\sim 1A$		0.05	0.5	mA
		$V_{IN}=-27V\sim-38V$		0.1	1.0	mA
Output Noise Voltage	eN	$f=10Hz\sim 100kHz, T_A=25^{\circ}C$		400		μV
Output Voltage Drift	$\Delta V_{OUT}/\Delta T$	$I_{OUT}=5mA$		-1		$mV/^{\circ}C$
Ripple Rejection	RR	$V_{IN}=-28V\sim-38V, f=120Hz$	54	60		dB
Peak Current	I_{PEAK}	$T_J=25^{\circ}C$		2.2		A

Note: 1. Thermal resistance test board.

APPLICATION CIRCUITS

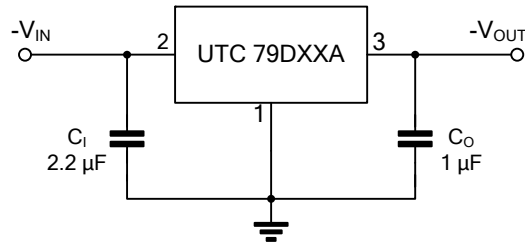


Fig.1 Fixed output regulator

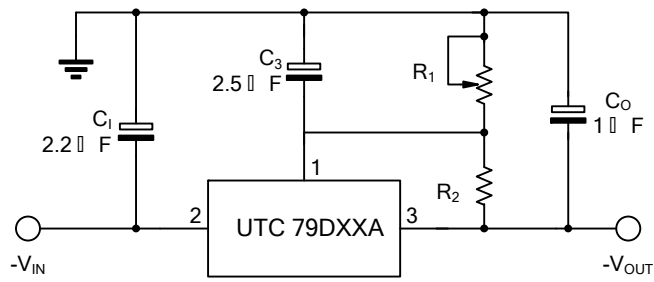
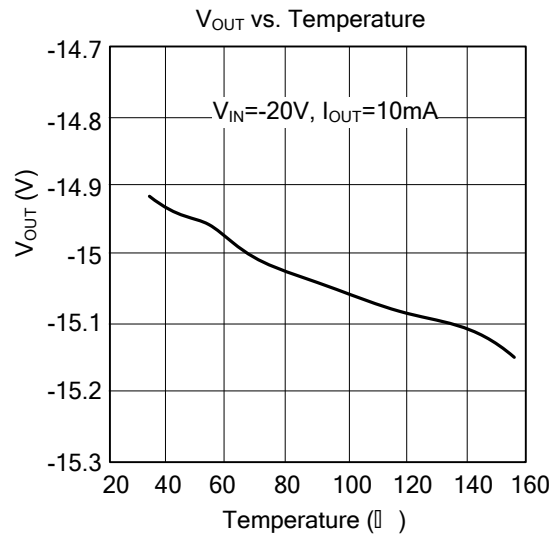
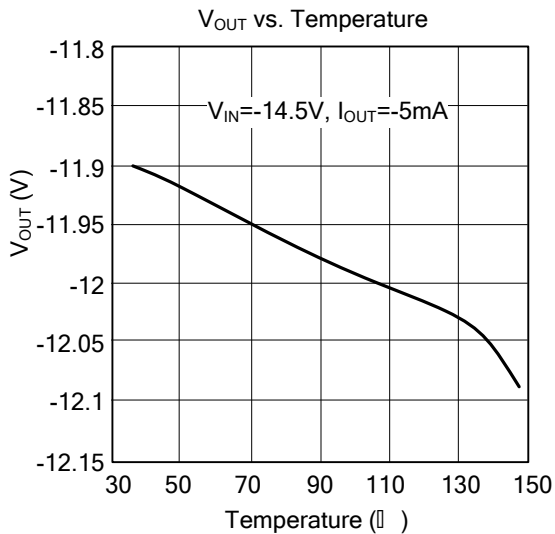
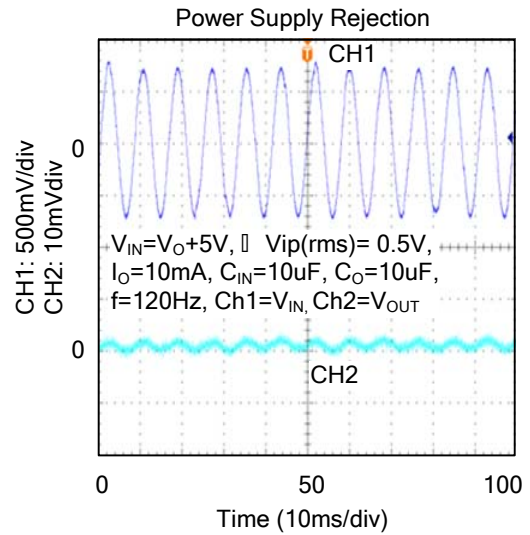
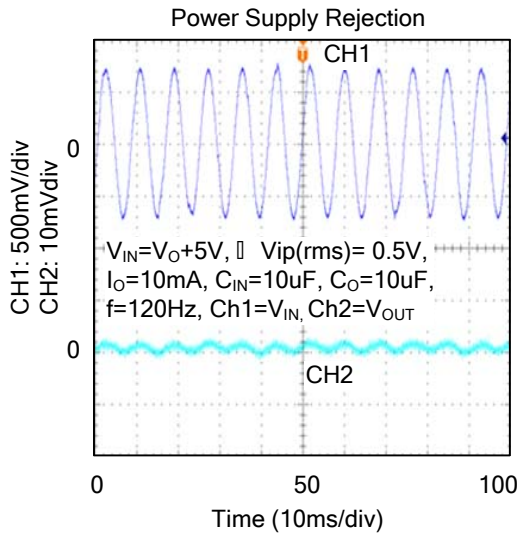
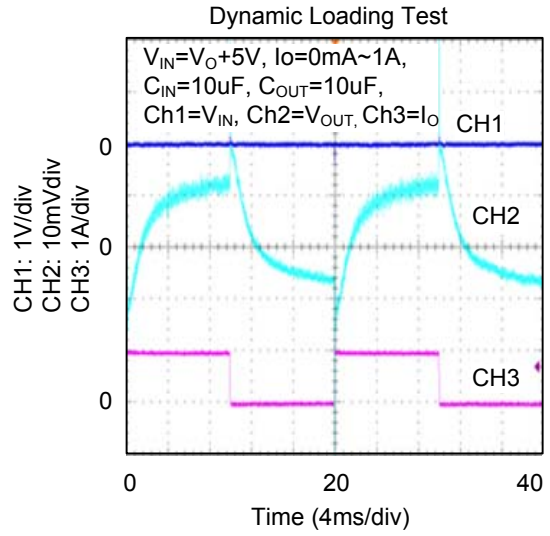
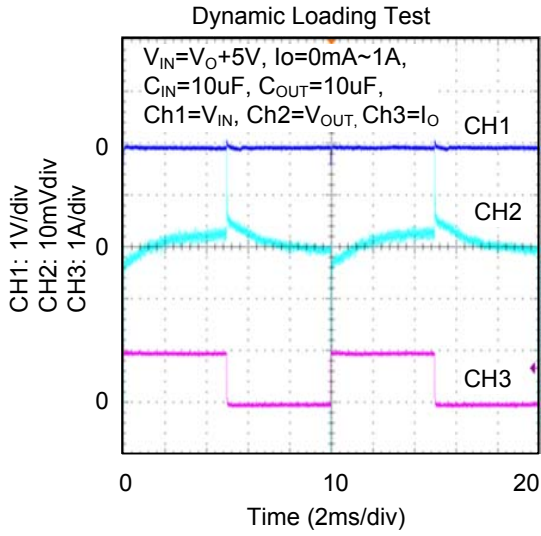
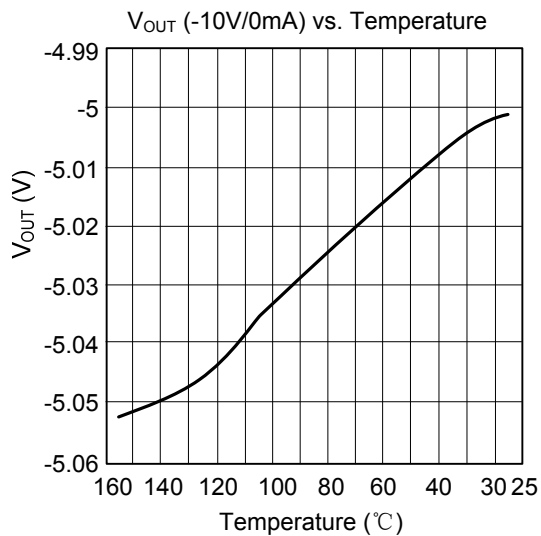


Fig.2 Circuit for increasing output voltage

■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS



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