



278RXX

LINEAR INTEGRATED CIRCUIT

4 TERMINAL 2A OUTPUT LOW DROP VOLTAGE REGULATOR

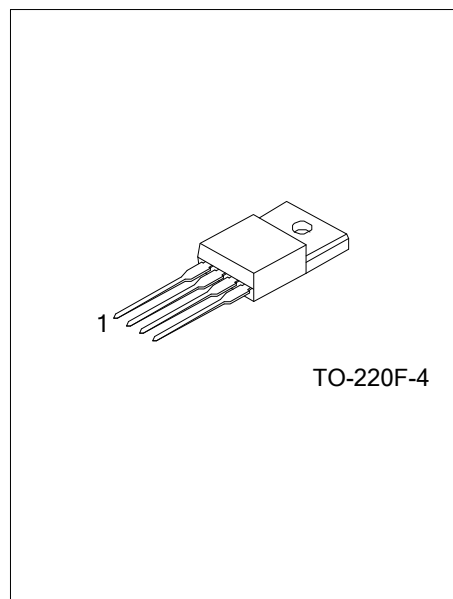
■ DESCRIPTION

The UTC **278RXX** Series are Low Drop Voltage Regulator suitable for various electronic equipments.

It provides constant voltage power source with TO-220F-4 terminal lead full molded PKG. The Regulator has multi function such as over current protection, overheat protection and ON/OFF control.

■ FEATURES

- * 2.0A Output Low Drop Voltage Regulator.
- * Built in ON/OFF Control Terminal.
- * Built in Over Current Protection, Over Heat Protection Function.



■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
278RXXL-TF4-T	278RXXG-TF4-T	TO-220F-4	Tube

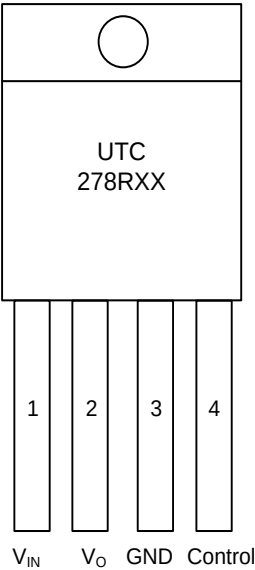
Note: xx: Output Voltage, refer to Marking Information.

278RXXG-TF4-T	(1)Packing Type (2)Package Type (3)Green Package (4)Voltage Code	(1) T: Tube (2) TF4: TO-220F-4 (3) G: Halogen Free and Lead Free, L: Lead Free (4) XX: Refer to Marking Information
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-220F-4	05: 5.0V 06: 6.0V 08: 8.0V 12: 12V 15: 15V 33: 3.3V	UTC 278RXX Voltage Code Lot Code L: Lead Free G: Halogen Free Date Code

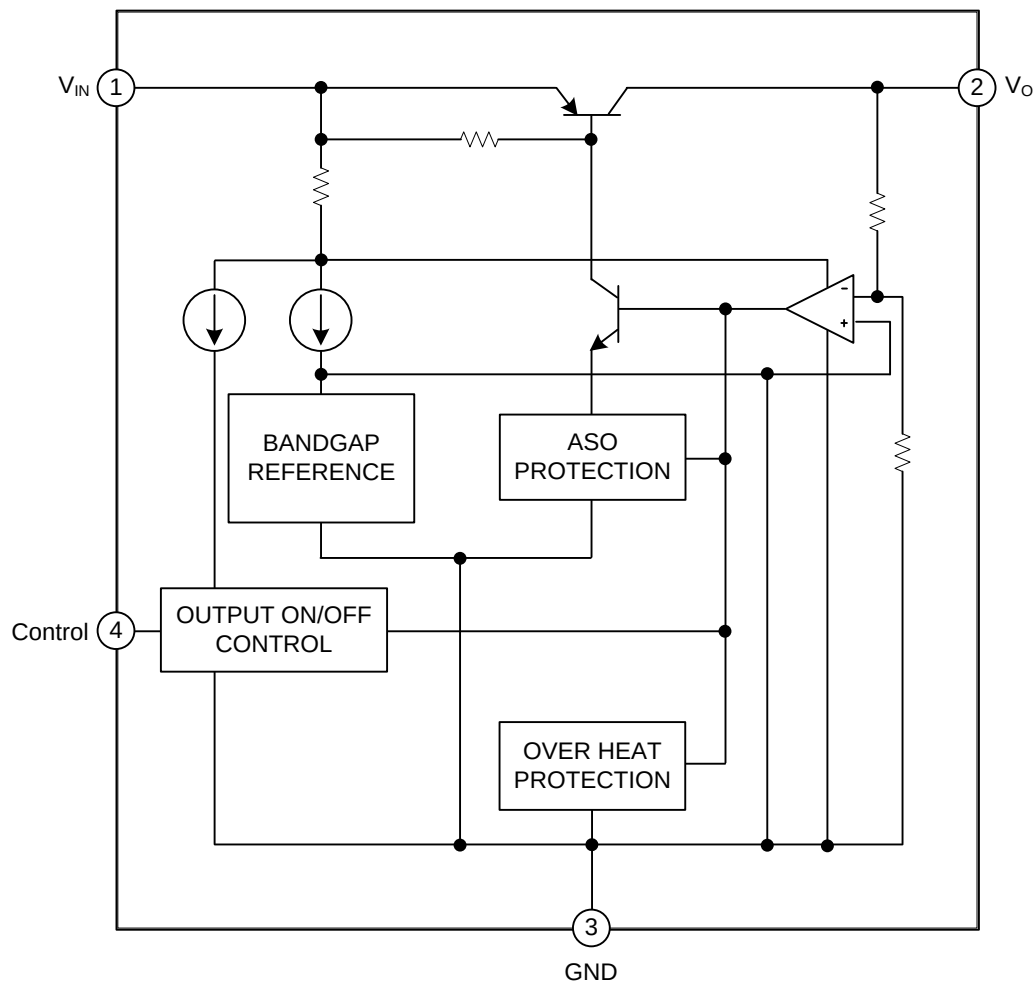
PIN CONFIGURATION



PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	V _{IN}	Input DC supply voltage
2	V _{OUT}	Output voltage pin
3	GND	Ground pin for the IC
4	Control	ON/OFF control pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	REMARK	RATINGS	UNIT
Input Voltage	V _{IN}		35	V
ON/OFF Control Voltage	V _C		35	V
Output Current	I _O		2	A
Power Dissipation 1	P _{D1}	No heatsink	1.5	W
Junction Temperature	T _J		+150	°C
Operating Temperature	T _{OPR}		-20 ~ +80	°C
Storage Temperature	T _{STG}		-30 ~ +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}	83	°C/W
Junction to Case	θ _{JC}	8	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, I_O=1.0A, unless otherwise specified)

For 278R05 (V_{IN}=7V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V _O		4.875	5.0	5.125	V
Load Regulation	Reg Load	I _O =5mA~2A		0.1	2.0	%
Line Regulation	Reg Line	V _{IN} =6~12V		0.5	2.5	%
Ripple Rejection	R • R		45	55		dB
Drop Out Voltage (Note)	V _D	I _O =2A			0.5	V
Output ON State for Control Voltage	V _{C(ON)}		2.0			V
Output ON State for Control Current	I _{C(ON)}	V _C =2.7V			20	μA
Output OFF State for Control Voltage	V _{C(OFF)}				0.8	V
Output OFF State for Control Current	I _{C(OFF)}	V _C =0.4V			0.4	mA
Quiescent Current	I _Q	I _O =0			10	mA

For 278R06 (V_{IN}=8V)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V _O		5.850	6.0	6.150	V
Load Regulation	Reg Load	I _O =5mA~2A		0.1	2.0	%
Line Regulation	Reg Line	V _{IN} =7~13V		0.5	2.5	%
Ripple Rejection	R • R		45	55		dB
Drop Out Voltage (Note)	V _D	I _O =2A			0.5	V
Output ON State for Control Voltage	V _{C(ON)}		2.0			V
Output ON State for Control Current	I _{C(ON)}	V _C =2.7V			20	μA
Output OFF State for Control Voltage	V _{C(OFF)}				0.8	V
Output OFF State for Control Current	I _{C(OFF)}	V _C =0.4V			0.4	mA
Quiescent Current	I _Q	I _O =0			10	mA

ELECTRICAL CHARACTERISTICS (Cont.)

For 278R08 ($V_{IN}=10V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_O		7.800	8.0	8.200	V
Load Regulation	Reg Load	$I_O=5mA\sim 2A$		0.1	2.0	%
Line Regulation	Reg Line	$V_{IN}=9\sim 15V$		0.5	2.5	%
Ripple Rejection	$R \cdot R$		45	55		dB
Drop Out Voltage (Note)	V_D	$I_O=2A$			0.5	V
Output ON State for Control Voltage	$V_{C(ON)}$		2.0			V
Output ON State for Control Current	$I_{C(ON)}$	$V_C=2.7V$			20	μA
Output OFF State for Control Voltage	$V_{C(OFF)}$				0.8	V
Output OFF State for Control Current	$I_{C(OFF)}$	$V_C=0.4V$			0.4	mA
Quiescent Current	I_Q	$I_O=0$			10	mA

For 278R12 ($V_{IN}=18V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_O		11.70	12.0	12.30	V
Load Regulation	Reg Load	$I_O=5mA\sim 2A$		0.1	2.0	%
Line Regulation	Reg Line	$V_{IN}=13\sim 29V$		0.5	2.5	%
Ripple Rejection	$R \cdot R$		45	55		dB
Drop Out Voltage (Note)	V_D	$I_O=2A$			0.5	V
Output ON State for Control Voltage	$V_{C(ON)}$		2.0			V
Output ON State for Control Current	$I_{C(ON)}$	$V_C=2.7V$			20	μA
Output OFF State for Control Voltage	$V_{C(OFF)}$				0.8	V
Output OFF State for Control Current	$I_{C(OFF)}$	$V_C=0.4V$			0.4	mA
Quiescent Current	I_Q	$I_O=0$			10	mA

For 278R15 ($V_{IN}=21V$)

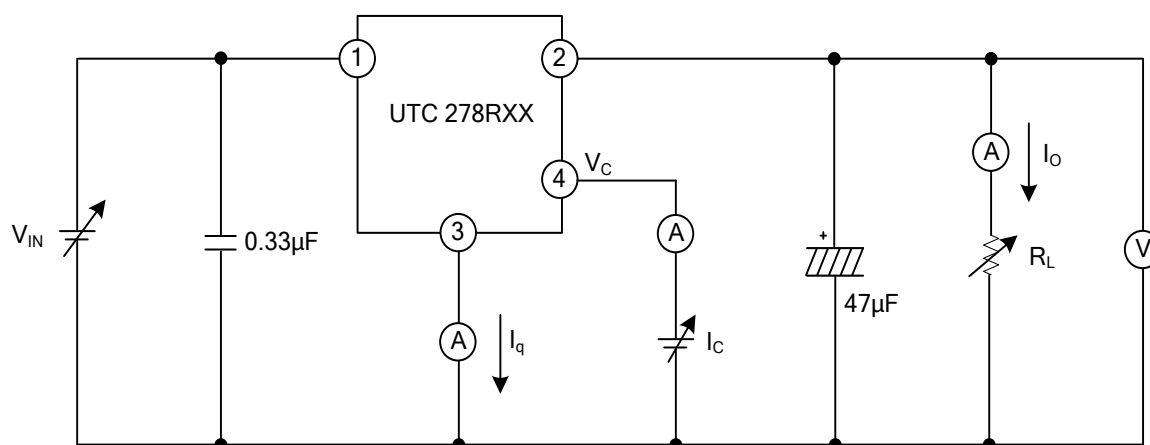
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_O		14.70	15.0	15.30	V
Load Regulation	Reg Load	$I_O=5mA\sim 2A$		0.1	2.0	%
Line Regulation	Reg Line	$V_{IN}=16\sim 32V$		0.5	2.5	%
Ripple Rejection	$R \cdot R$		45	55		dB
Drop Out Voltage (Note)	V_D	$I_O=2A$			0.8	V
Output ON State for Control Voltage	$V_{C(ON)}$		2.0			V
Output ON State for Control Current	$I_{C(ON)}$	$V_C=2.7V$			20	μA
Output OFF State for Control Voltage	$V_{C(OFF)}$				0.8	V
Output OFF State for Control Current	$I_{C(OFF)}$	$V_C=0.4V$			0.4	mA
Quiescent Current	I_Q	$I_O=0$			10	mA

For 278R33 ($V_{IN}=5V$)

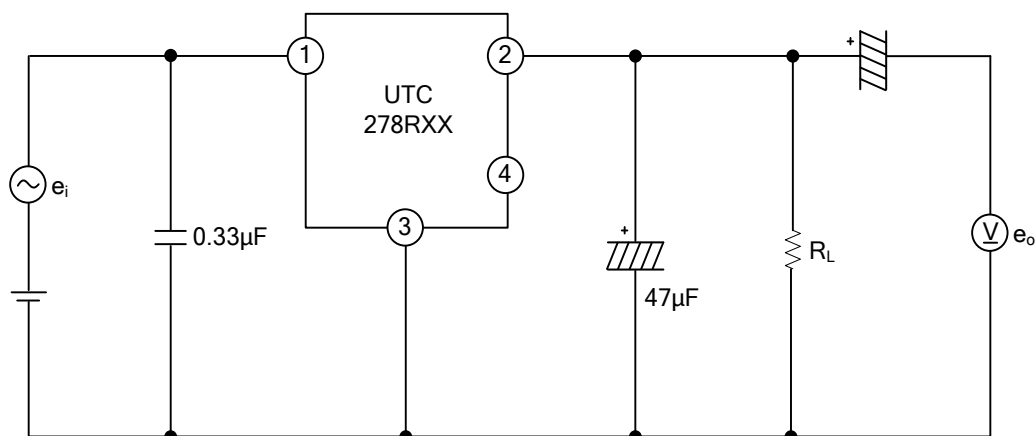
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_O		3.218	3.3	3.383	V
Load Regulation	Reg Load	$I_O=5mA\sim 2A$		0.1	2.0	%
Line Regulation	Reg Line	$V_{IN}=6\sim 12V$		0.5	2.5	%
Ripple Rejection	$R \cdot R$		45	55		dB
Drop Out Voltage (Note)	V_D	$I_O=2A$			0.5	V
Output ON State for Control Voltage	$V_{C(ON)}$		2.0			V
Output ON State for Control Current	$I_{C(ON)}$	$V_C=2.7V$			20	μA
Output OFF State for Control Voltage	$V_{C(OFF)}$				0.8	V
Output OFF State for Control Current	$I_{C(OFF)}$	$V_C=0.4V$			0.4	mA
Quiescent Current	I_Q	$I_O=0$			10	mA

Note: Input voltage shall be the value when output voltage is 95% in comparison with the initial value.

■ TEST CIRCUIT



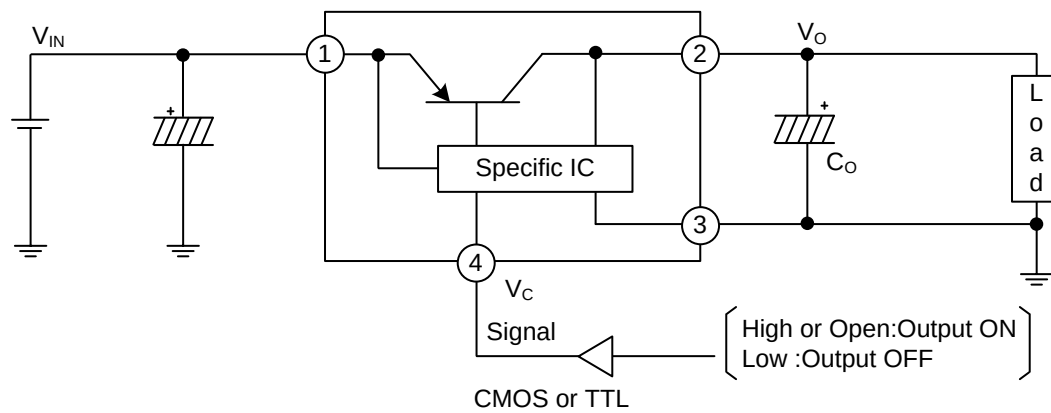
Standard Test Circuit



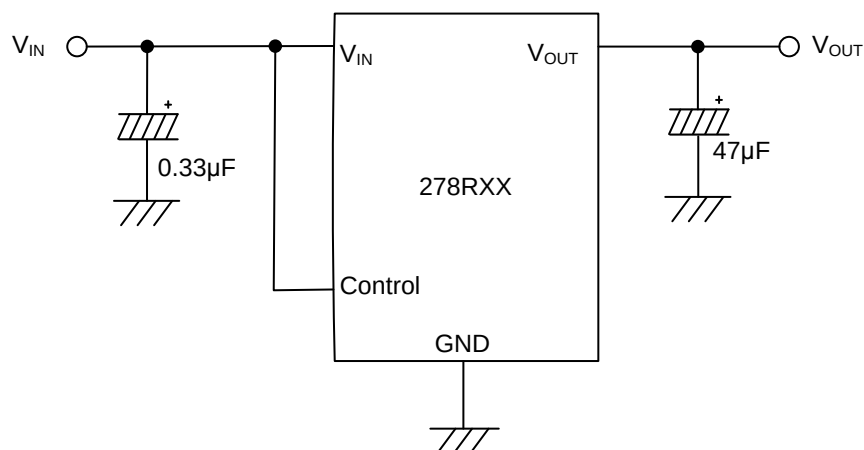
$f=120\text{Hz}$ (sine wave)
 $e_i=0.5\text{Vrms}$
 $RR=20\log(e_i/e_o)$

Ripple Rejection Test Circuit

■ TYPICAL APPLICATION CIRCUIT



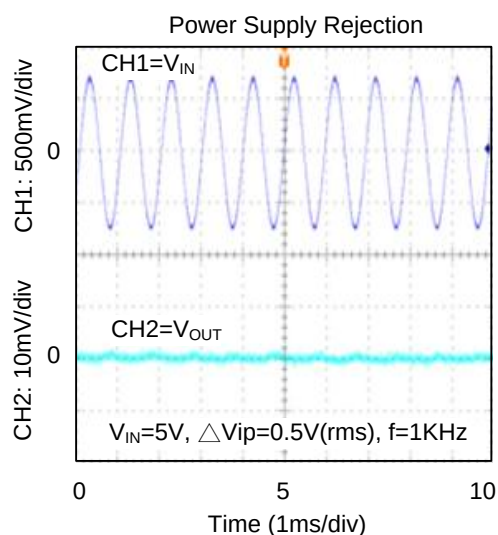
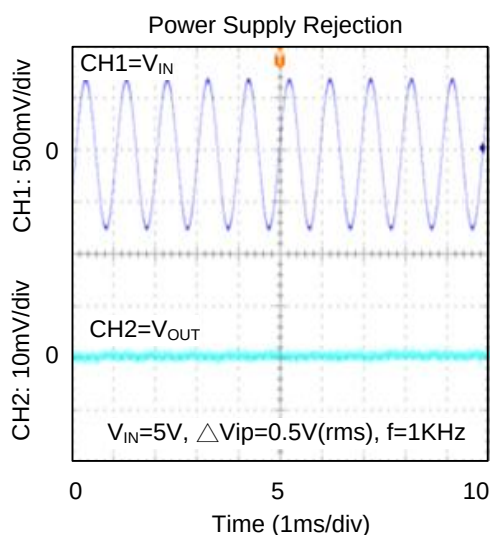
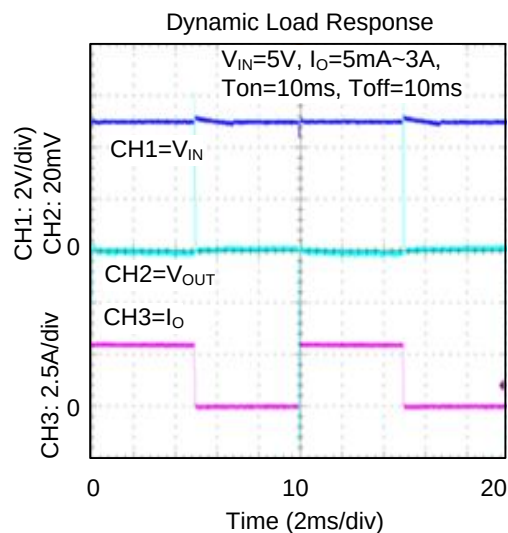
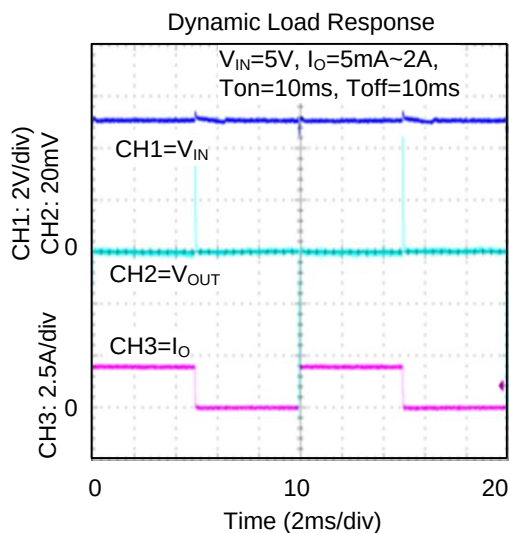
Application Circuit Standard



Note: Connect control pin to V_{IN} pin.

In the case where ON/OFF Control is not required

■ TYPICAL CHARACTERISTICS



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