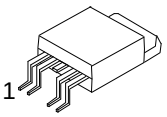
R070LD10

LINEAR INTEGRATED CIRCUIT

VOLTAGE REGULATOR



TO-252-4

■ DESCRIPTION

As the UTC linear integrated LDO, the UTC **R070LD10** shows a high current, high accuracy, low-dropout voltage which built in on/off function. The features are: low dropout voltage, very low ground current. Cause the series have been designed for high current loads, so they are also used in lower current, extremely low dropout-critical systems (in which their tiny dropout voltage and ground current values are important attributes).

■ FEATURES

* Built-in ON/OFF Function
* Over Current Protection Function
* Over Heat Protection Function
* Adjustable DC Output Voltage

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
R070LD10L-xx-TN4-R	R070LD10G-xx-TN4-R	TO-252-4	Tape Reel

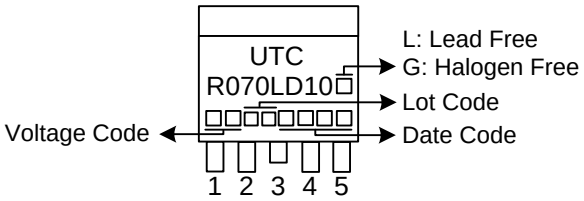
Note: xx: Output Voltage, Refer to Marking Information.

R070LD10G-xx-TN4-R

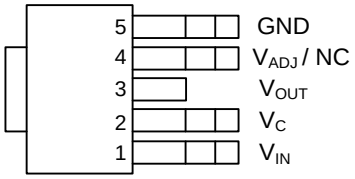
(1)Packing Type
(2)Package Type
(3)Output Voltage Code
(4)Green Package

(1) R: Tape Reel
(2) TN4: TO-252-4
(3) xx: Refer to Marking Information
(4) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
TO-252-4	18 :1.8V 25 :2.5V 50 :5.0V AD :ADJ	

■ PIN CONFIGURATION

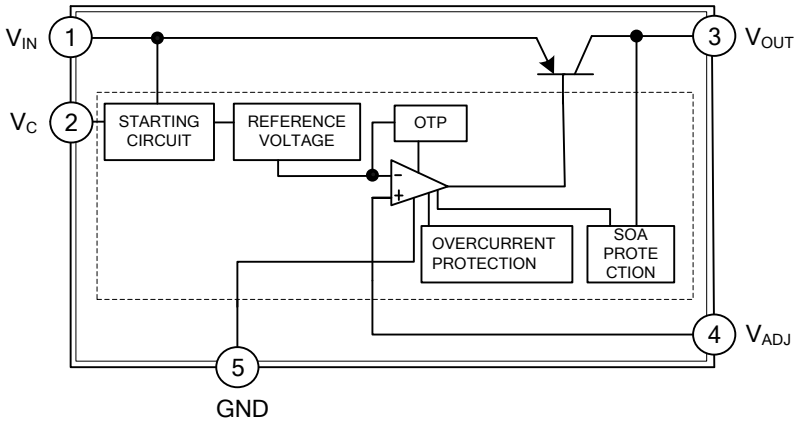


■ PIN DESCRIPTION

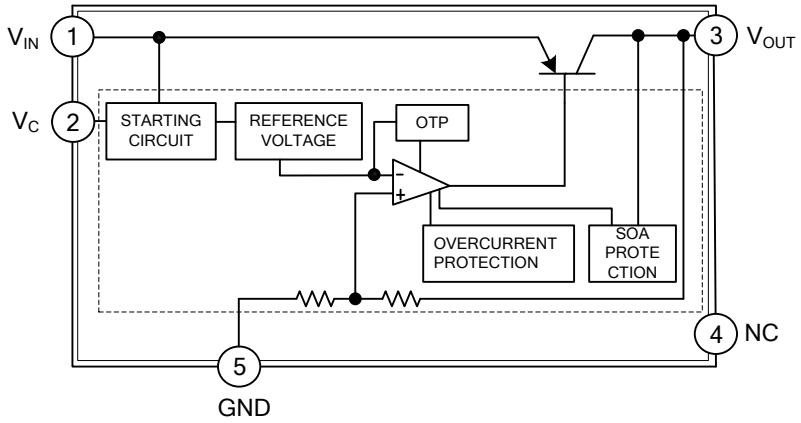
PIN NO.	PIN NAME	FUNCTION
1	V_{IN}	DC input
2	V_C	ON/OFF control
3	V_{OUT}	DC output
4	V_{ADJ}/NC	Output voltage adjustment / No Connection
5	GND	Ground

■ BLOCK DIAGRAM

For Adjustable Version



For Fixed Version



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNITS
Input Voltage (Note 2)	V_{IN}	10	V
ON/OFF Control Voltage (Note 2)	V_C	10	V
Output Adjustment pin Voltage (Note 2)	V_{ADJ}	5	V
Output Current	I_{OUT}	1	A
Power Dissipation	P_D	8	W
Junction Temperature	T_J	150	°C
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-40 ~ +150	°C

Notes: 1. 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.
2. All are open except GND and applicable terminals.

■ ELECTRICAL CHARACTERISTICS

For Adjustable Version

(V_{IN}=5V, V_{OUT}=3.3V (R_1=1KΩ), I_{OUT}=500mA, V_C=2.7V, T_a=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}		2.35		10.0	V
Output Voltage	V_{OUT}		1.5		7.0	V
Load Regulation	ΔV_{OUT}	I_{OUT}=5mA~1A		0.2	1	%
Line Regulation	ΔV_{OUT}	V_{IN}=4~ 8V, I_{OUT}=5mA		0.2	1	%
Ripple Rejection	RR			60		dB
Dropout Voltage	V_D	I_{OUT}=500mA			0.5	V
Reference Voltage	V_{REF}		1.206	1.23	1.254	V
Temperature Coefficient of Reference Voltage	T_CV_{REF}	T_J=0 ~125°C, I_{OUT}=5mA		±1.0		%
ON-State Voltage for Control	$V_{C(ON)}$	(Note)	2.0			V
ON-State Current for Control	$I_{C(ON)}$				200	μA
OFF-State Voltage for Control	$V_{C(OFF)}$	I_{OUT}=0A			0.6	V
OFF-State Current for Control	$I_{C(OFF)}$	I_{OUT}=0A, V_C=0.4V			5	μA
Quiescent Current	I_Q	I_{OUT}=0A		1	2	mA
Output Off-State Consumption Current	I_{QS}	V_C=0.4V			5	μA

Note: In case that the control terminal (2th pin) is non-connection, output voltage should be OFF state.

For Fixed Version

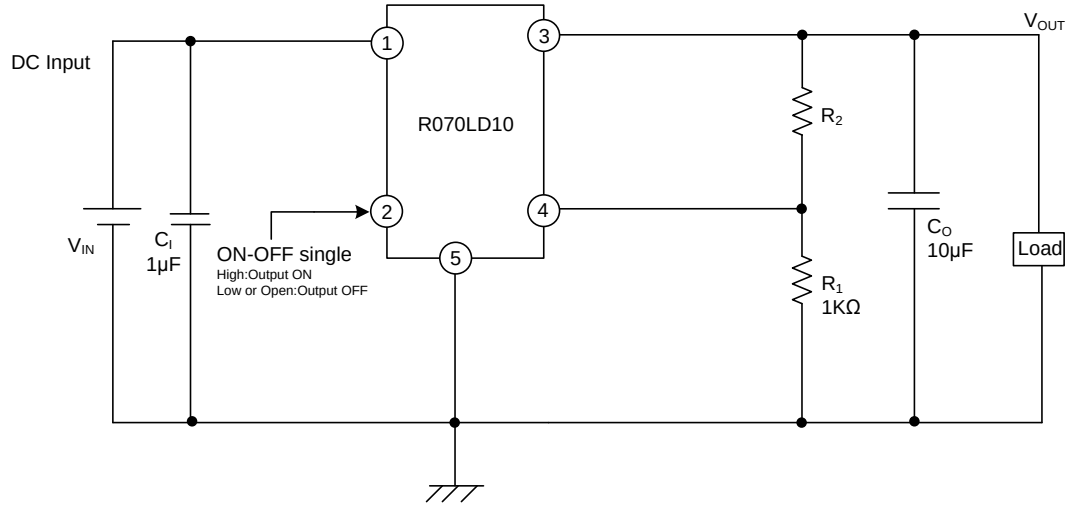
(V_{IN}=V_{OUT}+1V, I_{OUT}=500mA, V_C=2.0V, T_a=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}				10.0	V
Output Voltage	V_{OUT}		V_{OUT} ×0.98	V_{OUT}	V_{OUT} ×1.02	V
Load Regulation	ΔV_{OUT}	I_{OUT}=5mA~1A		0.2	1	%
Line Regulation	ΔV_{OUT}	V_{IN}=V_{OUT}+0.5V~ 8V, I_{OUT}=5mA		0.2	1	%
Ripple Rejection	RR			60		dB
Dropout Voltage	V_D	I_{OUT}=500mA			0.5	V
Temperature Coefficient of Reference Voltage	T_CV_{REF}	T_J=0 ~125°C, I_{OUT}=5mA		±1.0		%
ON-State Voltage for Control	$V_{C(ON)}$	(Note)	2.0			V
ON-State Current for Control	$I_{C(ON)}$				200	μA
OFF-State Voltage for Control	$V_{C(OFF)}$	I_{OUT}=0A			0.6	V
OFF-State Current for Control	$I_{C(OFF)}$	I_{OUT}=0A, V_C=0.4V			5	μA
Quiescent Current	I_Q	I_{OUT}=0A		1	2	mA
Output Off-State Consumption Current	I_{QS}	V_C=0.4V			5	μA

Note: In case that the control terminal (2th pin) is non-connection, output voltage should be OFF state.

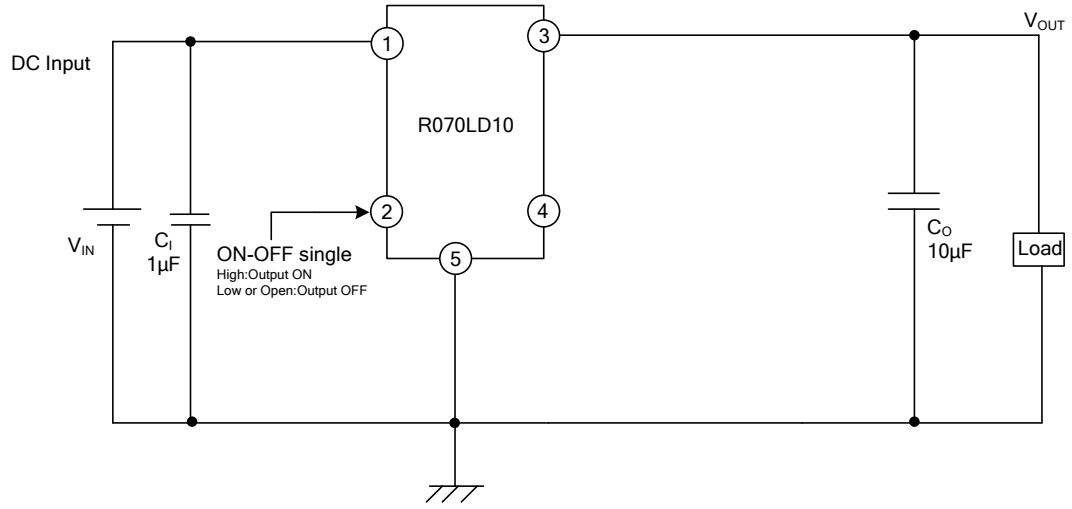
■ TYPICAL APPLICATION CIRCUITS

Adjustable Voltage:



Note: There is no oscillation when both C_{IN} and C_{OUT} are removed, if applications are properly matched.

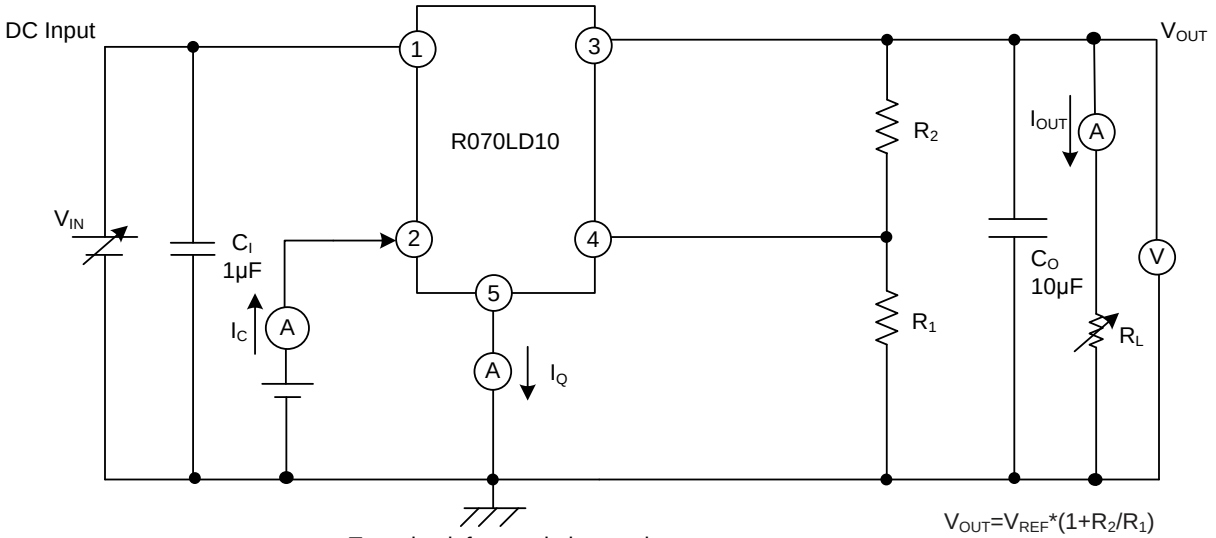
Fixed Voltage:



Note: There is no oscillation when both C_{IN} and C_{OUT} are removed, if applications are properly matched.

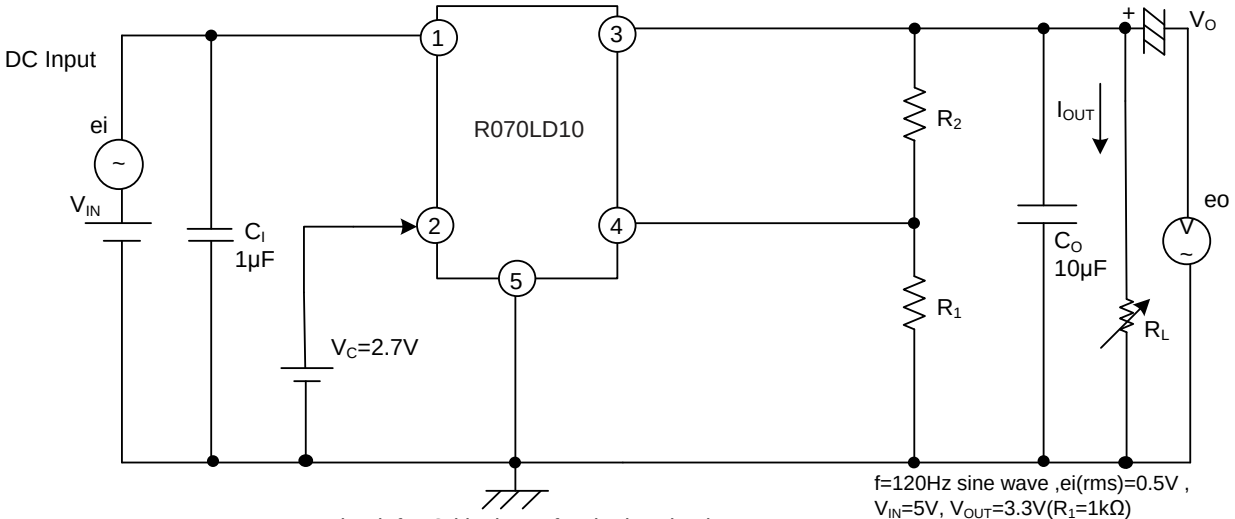
■ ELECTRICAL CHARACTERISTICS MEASURING CIRCUITS

Adjustable Voltage:



Test circuit for regulation portion

$V_{OUT}=V_{REF}*(1+R_2/R_1)$
R_1=1kΩ, V_{REF}≈1.23V

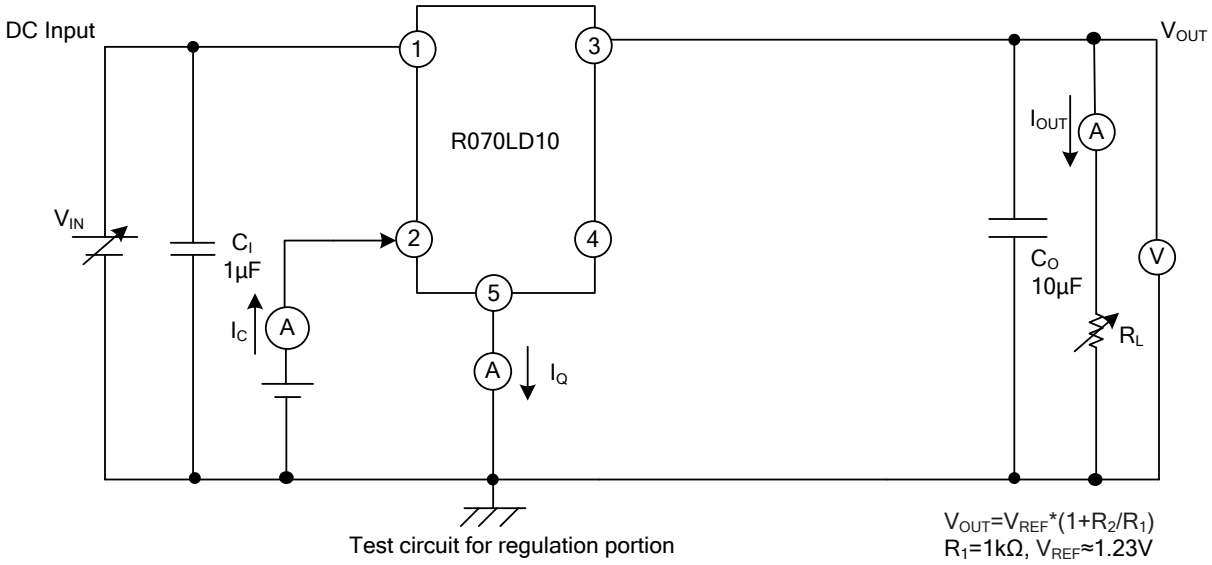


Test circuit for Critical rate for ripple rejection

f=120Hz sine wave ,ei(rms)=0.5V ,
V_{IN}=5V, V_{OUT}=3.3V(R_1=1kΩ)
I_{OUT}=0.3A, RR=20log{ei(rms)/eo(rms)}

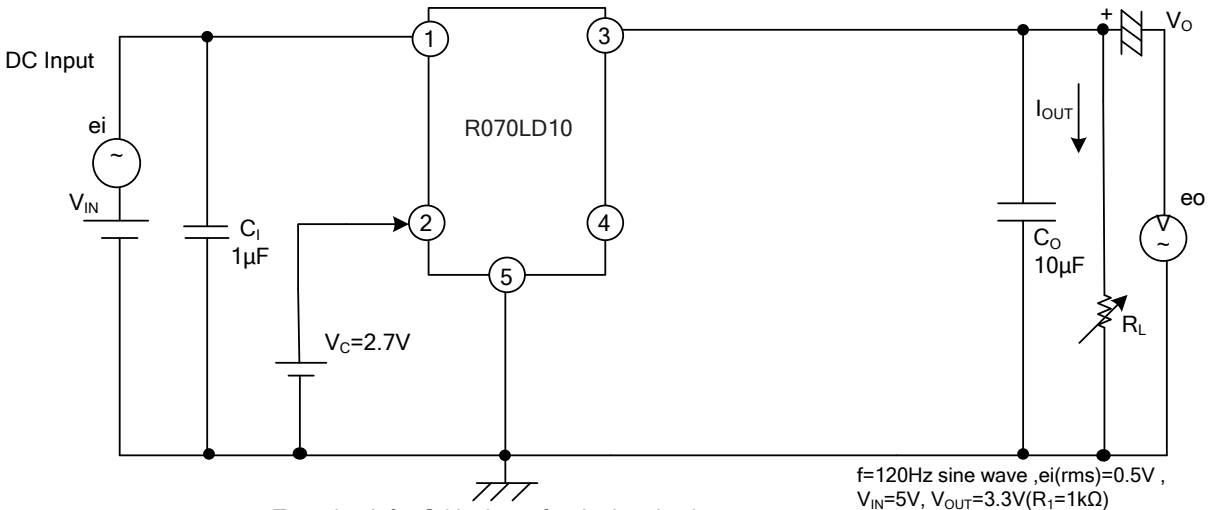
■ ELECTRICAL CHARACTERISTICS MEASURING CIRCUITS (Cont.)

Fixed Voltage:



Test circuit for regulation portion

$V_{OUT}=V_{REF}*(1+R_2/R_1)$
R_1=1kΩ, V_{REF}≈1.23V

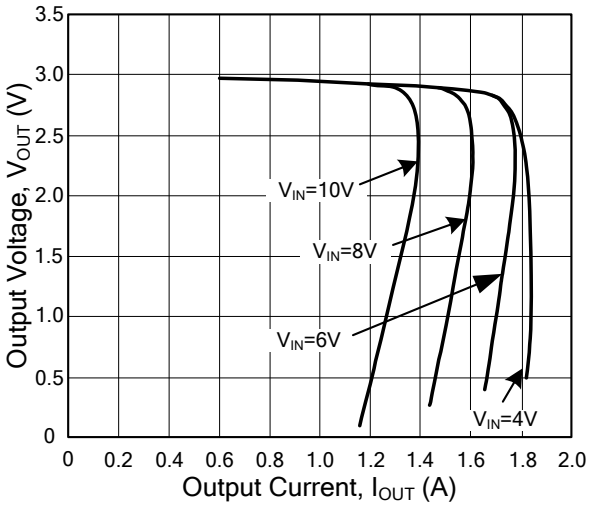


Test circuit for Critical rate for ripple rejection

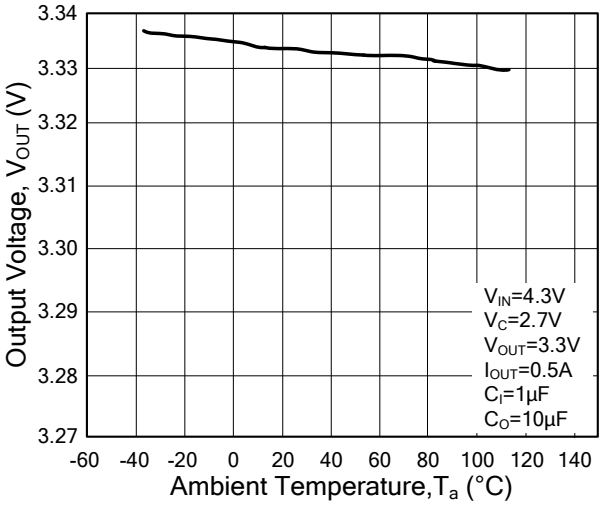
f=120Hz sine wave ,ei(rms)=0.5V ,
V_{IN}=5V, V_{OUT}=3.3V(R_1=1kΩ)
I_{OUT}=0.3A, RR=20log{ei(rms)/eo(rms)}

■ TYPICAL CHARACTERISTICS

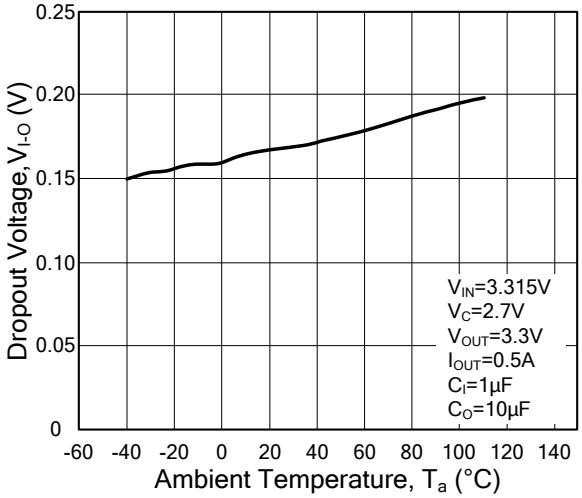
Overcurrent Protection Characteristics



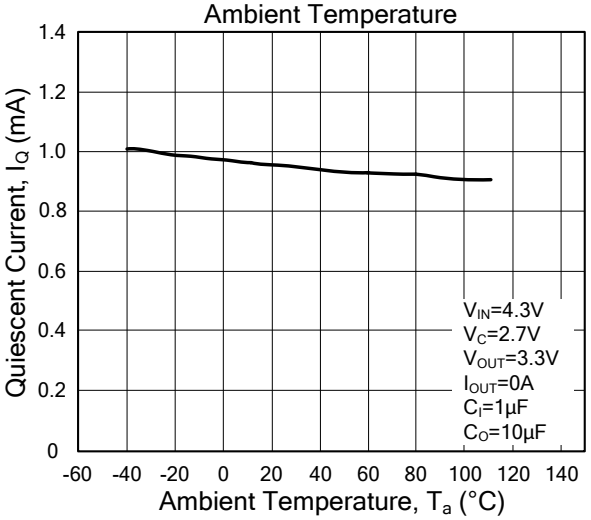
Output Voltage vs Ambient Temperature



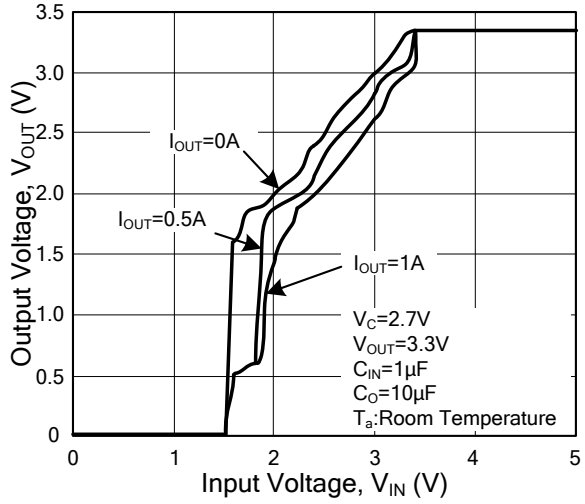
Dropout Voltage vs Ambient Temperature



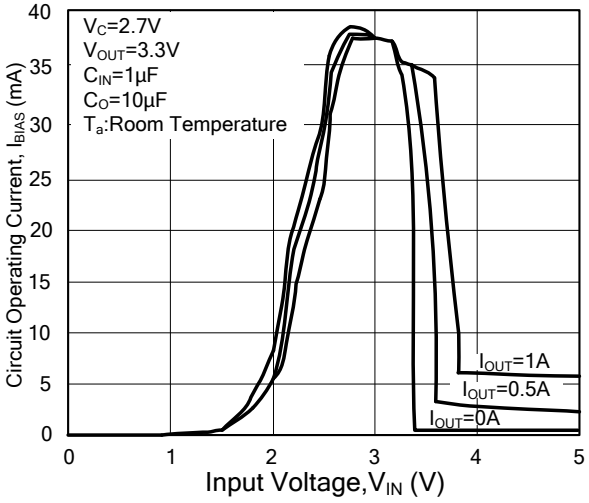
Quiescent Current vs Ambient Temperature



Output Voltage vs Input Voltage

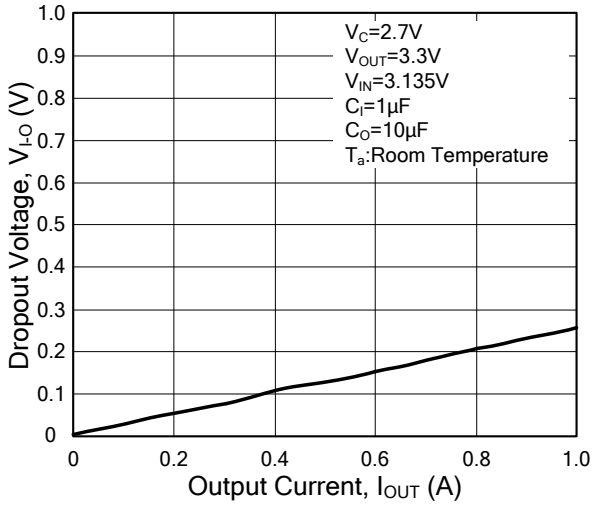


Circuit Operating Current vs Input Voltage

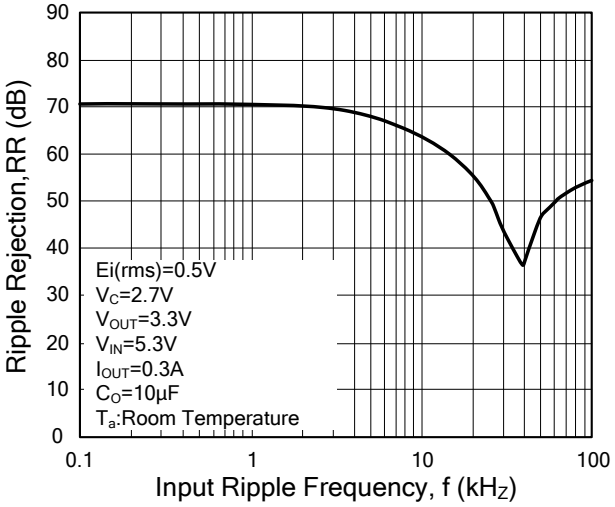


■ TYPICAL CHARACTERISTICS (Cont.)

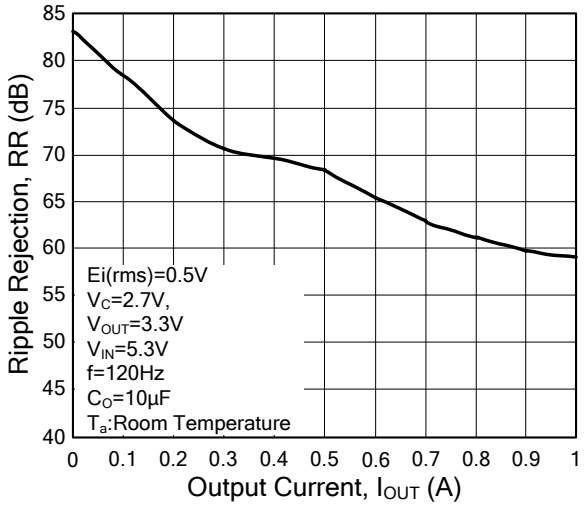
Dropout Voltage vs Output Current



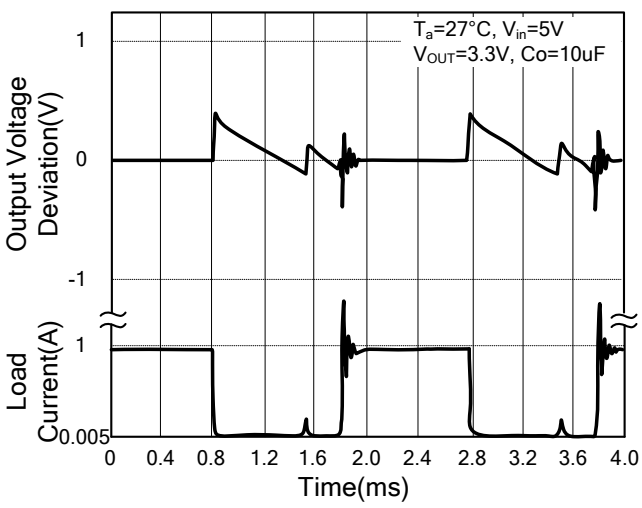
Ripple Rejection vs Input Ripple Frequency



Ripple Rejection vs Output Current



Load Transient Response



Line Transient Response