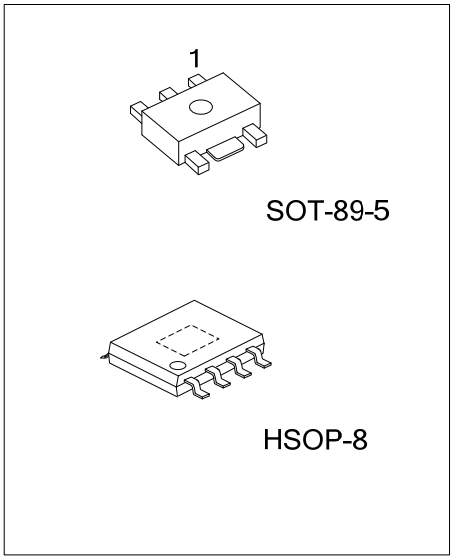
R1MX55

LINEAR INTEGRATED CIRCUIT

VOLTAGE REGULATOR



■ DESCRIPTION

As the UTC linear intergrated LDO, the **R1MX55** shows a high current, high accuracy, low-dropout voltage. The feature 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).

The **R1MX55** is stable with ceramic capacitors. It requires a 1μF or greater capacitor for stability.

■ 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		
R1MX55L-AB5-R	R1MX55G-AB5-R	SOT-89-5	Tape Reel
R1MX55L-SH2-R	R1MX55G-SH2-R	HSOP-8	Tape Reel
R1MX55L-SH2-T	R1MX55G-SH2-T	HSOP-8	Tube

R1MX55L-AB5-R

(1)Packing Type
(2)Package Type
(3)Lead Free

(1) R: Tape Reel, T: Tube
(2) AB5: SOT-89-5, SH2: HSOP-8
(3) G: Halogen Free, L: Lead Free

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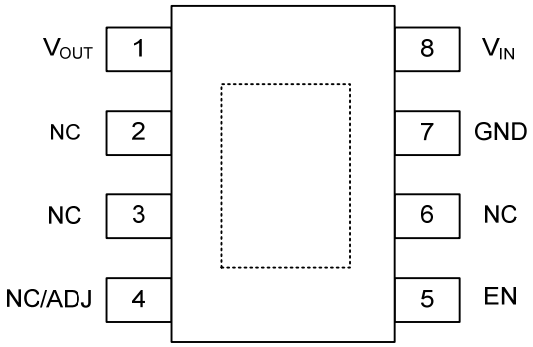
■ PIN CONFIGURATION



FOR HSOP-8

■ PIN DESCRIPTIONS

FOR SOT89-5 PACKAGE

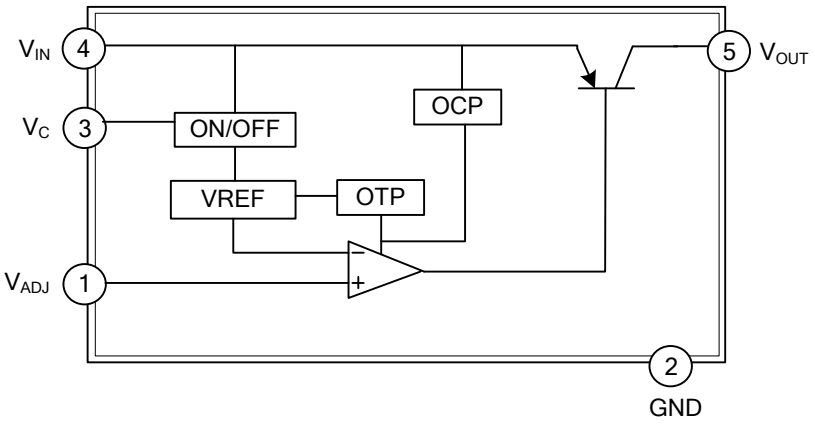
PIN NO.	PIN NAME	FUNCTION
1	V_{ADJ}	Output voltage adjustment
2	GND	Ground
3	V_C	ON/OFF control
4	V_{IN}	DC input
5	V_{OUT}	DC output

FOR HSOP-8 PACKAGE

PIN NO	PIN NAME	DESCRIPTION
1	V_{OUT}	DC output
2, 3, 6	NC	No Connection
4	NC/ADJ	Output voltage adjustment
5	EN	Enable pin, Logic Low=Shutdown; Logic High= Enable
7	GND	Ground
8	V_{IN}	DC input

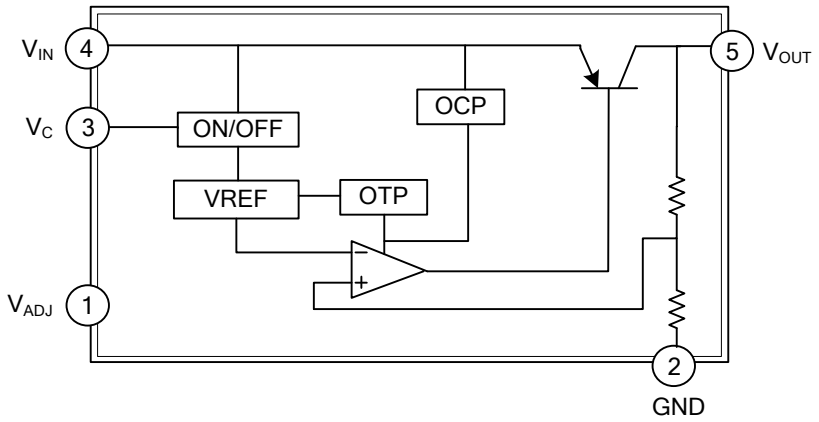
■ BLOCK DIAGRAM

Block For Adjustable Version



For SOT-89-5

Block For Fixed Version



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNITS
FOR SOT-89-5			
Input Voltage (Note 2)	V_{IN}	9	V
ON/OFF Control Voltage (Note 2)	V_C	9	V
Output Adiustment pin Voltage (Note 2)	V_{ADJ}	5	V
Output Current	I_{OUT}	500	mA
Power Dissipation	P_D	900	mW
Junction Temperature	T_J	150	°C
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C
FOR HSOP-8			
Input Voltage	V_{IN}	15	V
Enable Voltage	V_C	15	V
Power Dissipation	P_D	1100	mW
Junction Temperature	T_J	+125	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Note: 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 (T_A=25°C, unless otherwise specified)

FOR SOT-89-5 (V_{IN}=3.5V, V_{OUT}=2.44V (R_1=R_2=100KΩ), I_{OUT}=30mA, V_C=1.8V)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}		2.6		9.0	V
Output Voltage	V_{OUT}		1.3		5.0	V
Load Regulation	ΔV_{OUT}	I_{OUT}=5~500mA		10	100	mV
Line Regulation	ΔV_{OUT}	V_{IN}=3.5~8.5V		6	20	mV
Ripple Rejection	RR			55		dB
Dropout Voltage	V_D	I_{OUT}=500mA			0.7	V
Reference Voltage	V_{REF}		1.196	1.22	1.244	V
Temperature Coefficient of Output Voltage	T_CV_{OUT}	T_J=25 ~ 75°C, I_{OUT}=10mA		±0.1		mV/°C
Output Noise Voltage	$V_{NO(RMS)}$	$10H_Z$ < f < $100kH_Z$		100		μV
On-State Voltage for Control	$V_{C(ON)}$	(Note)	1.8			V
On-State Current for Control	$I_{C(ON)}$	V_C=1.8V		20	70	μA
Off-State Voltage for Control	$V_{C(OFF)}$				0.4	V
Quiescent Current	I_Q	I_{OUT}=0A		0.8	1.2	mA
Output Off-State Consumption Current	I_{QS}	V_C=0.2V			1	μA

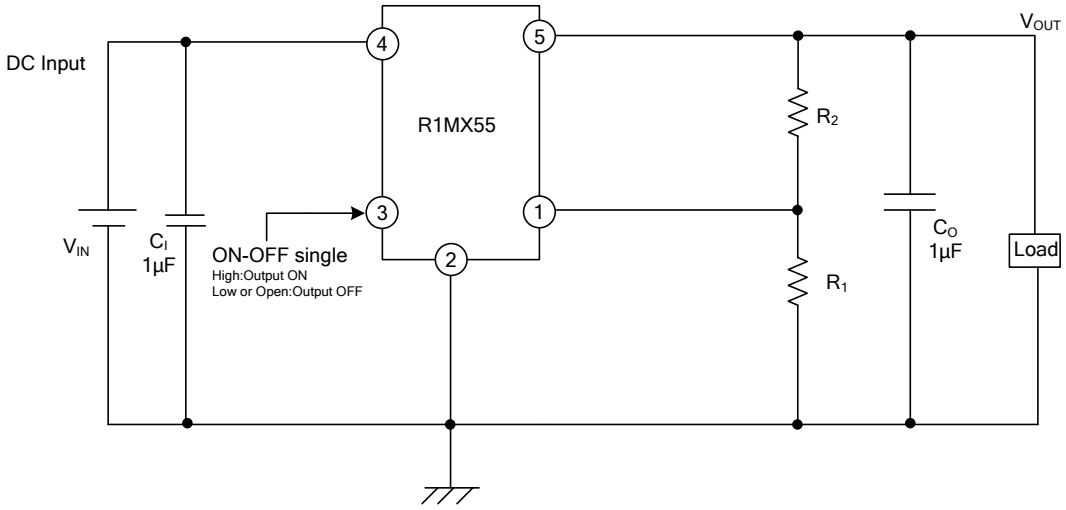
Note: In case that the control terminal (3th pin) is non-connection, output voltage should be OFF state.

■ ELECTRICAL CHARACTERISTICS(Cont.)

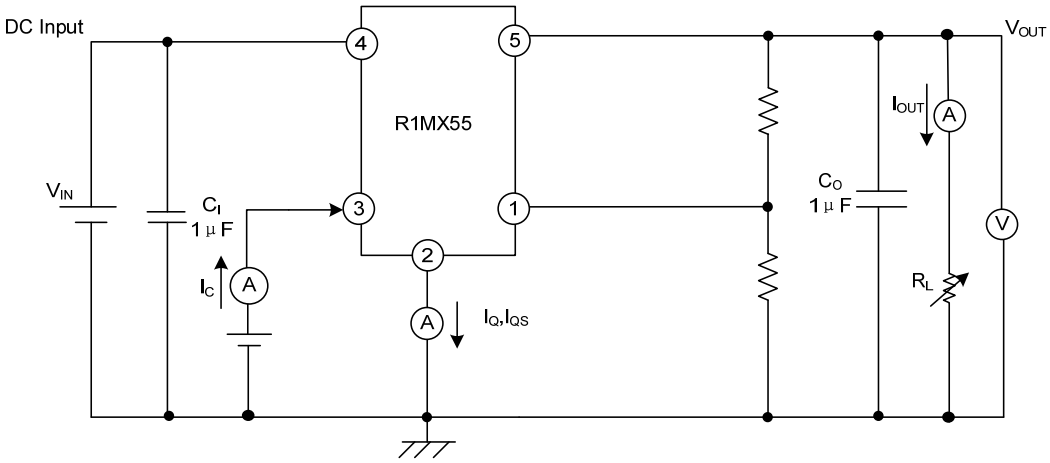
FOR HSOP-8 (V_{IN}= V_O +2.5V, V_{OUT}=1.8V, V_{EN}= V_{IN}, T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Input Voltage	V_{IN}		2.6		15	V
Output Voltage Accuracy	V_{OUT}		-2		+2	%
Quiescent Current	I_Q	I_{OUT}=0.1mA		0.85		mA
		I_{OUT}=50mA		1.26		
		I_{OUT}=100mA		1.67		
		I_{OUT}=150mA		2.05	5	
Reference Voltage	V_{REF}		-2%	1.2	+2%	V
Line Regulation	REG_{LINE}	V_{OUT}+2.5V<V_{IN}<15V,I_{OUT}=1mA		0.5		%
Load Regulation	REG_{LOAD}	0.1mA<I_{OUT}<150mA		0.5	1	%
Dropout Voltage	V_{DROP}	I_{OUT}=0.1mA		10	100	mV
		I_{OUT}=50mA		40	100	
		I_{OUT}=100mA		70	150	
		I_{OUT}=150mA		100	200	
Maximum Output Current	$I_{O(MAX)}$	V_{IN} =V_{OUT} +2.5V	250			mA
PROTECTION						
Over Temperature Shutdown	OTS			140		°C
Over Temperature Shutdown Hysteresis				30		°C
SHUTDOWN						
Input High Voltage	V_{EN}		2.0			V
Input Low Voltage					0.4	
Shutdown Supply Current	$I_{Q(SHDN)}$	EN=Low, V_{IN}=15V		0.1	10	μA

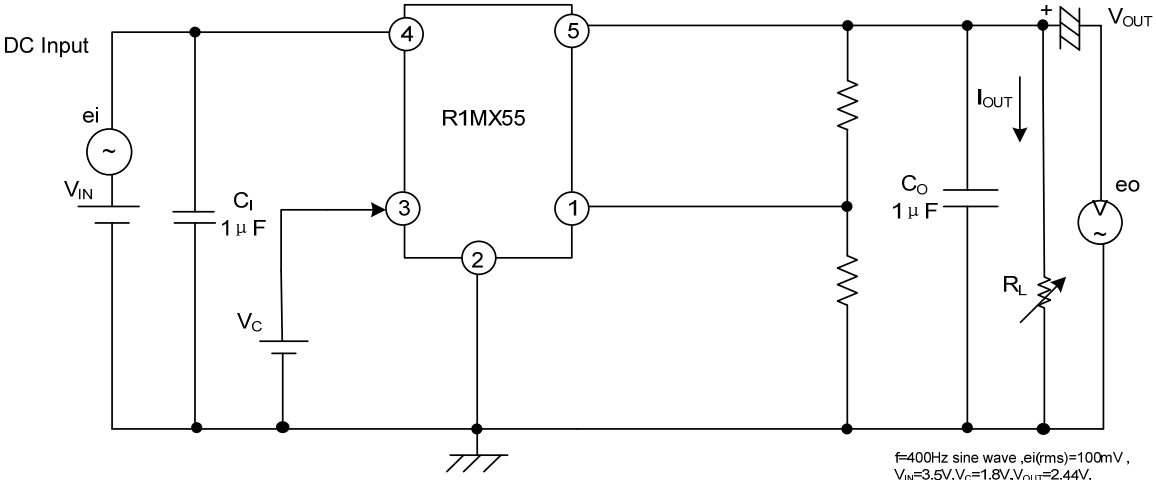
■ TYPICAL APPLICATION CIRCUIT



■ ELECTRICAL CHARACTERISTICS MEASURING CIRCUIT(FOR SOT-89-5)



Test circuit for regulation portion

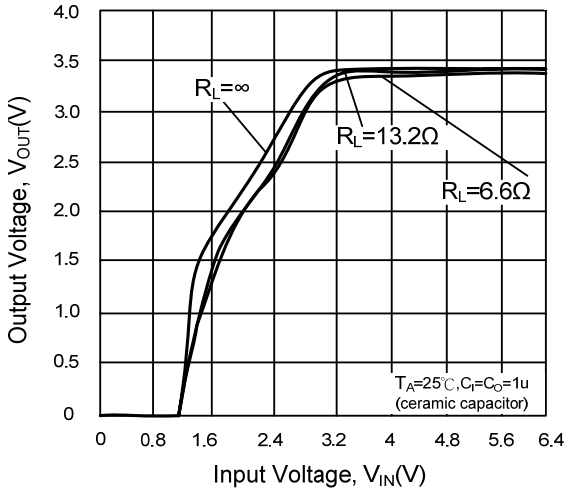


Test circuit for Critical rate for ripple rejection

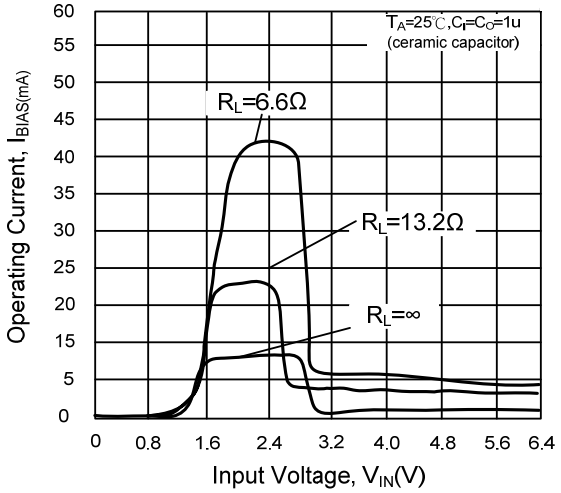
f=400Hz sine wave ,ei(rms)=100mV ,
V_{IN}=3.5V,V_C=1.8V,V_{OUT}=2.44V,
I_{OUT}=0.03A,RR=20log{ei(rms)/eo(rms)}

■ TYPICAL CHARACTERISTICS(FOR SOT-89-5)

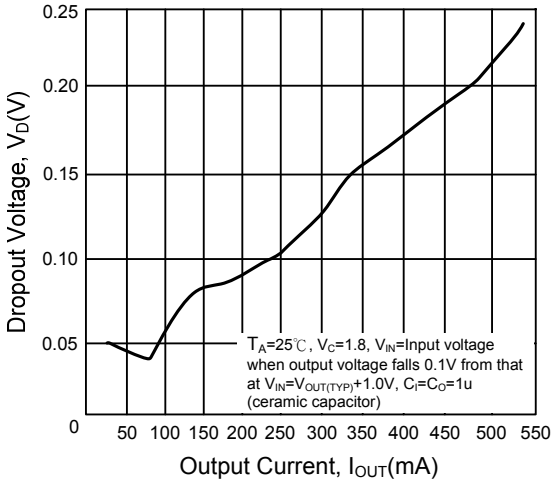
Output Voltage vs.
Input Voltage (Typical Values)



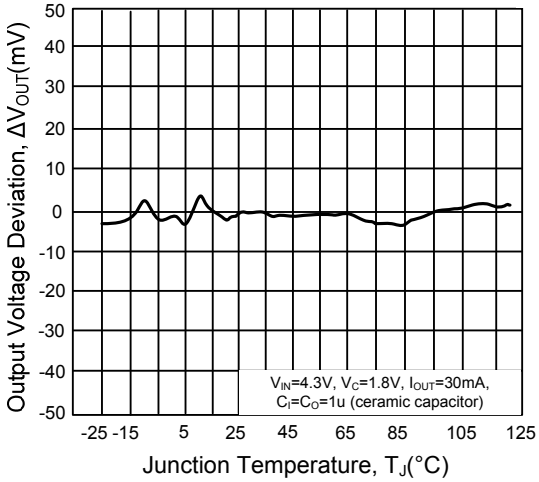
Circuit Operating Current vs.
Input Voltage (Typical Values)



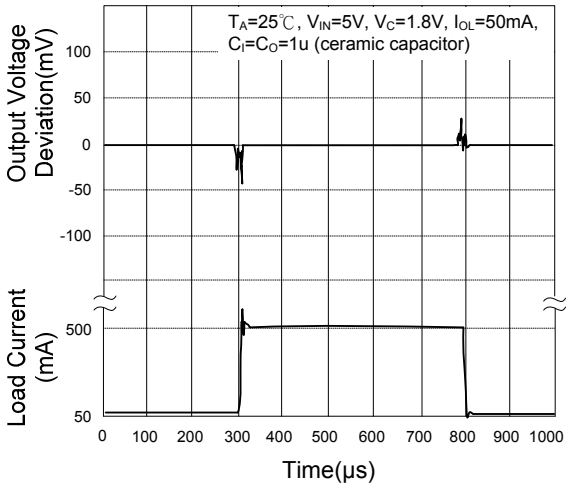
Dropout Voltage vs.
Output Current (Typical Values)



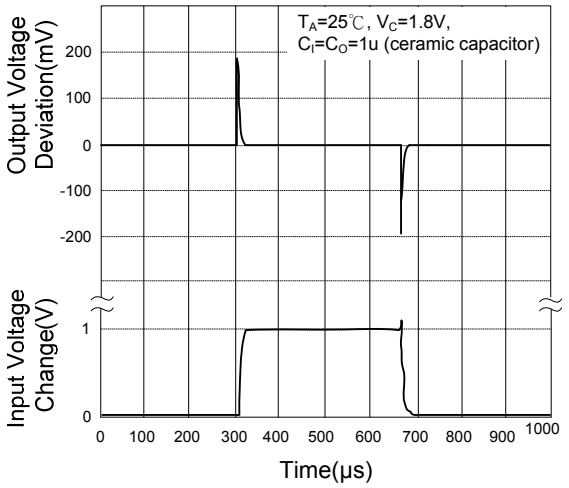
Output Voltage Deviation vs.
Junction Temperature (Typical Values)



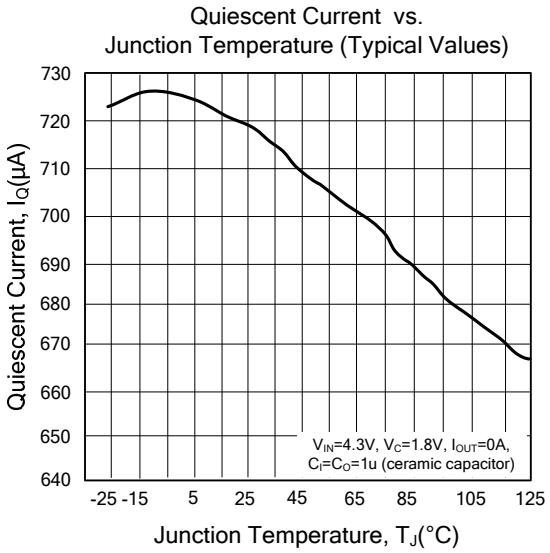
Load Transient Response



Line Transient Response



■ TYPICAL CHARACTERISTICS(Cont.)



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