



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 1 μ F or greater capacitor for stability.

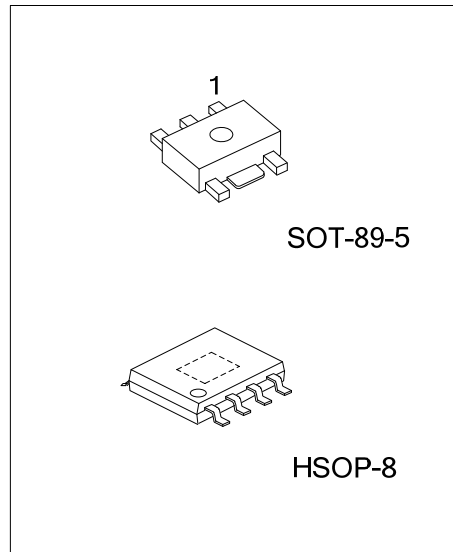
■ FEATURES

- * Available and fixed output versions 1.5V, 1.8V, 2.5V, 3.3V, 5V
- * Built-in ON/OFF function
- * Over current protection function
- * Over heat protection function
- * Adjustable DC output voltage

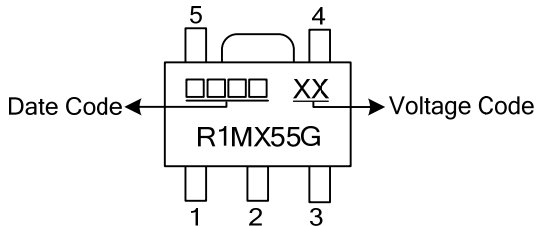
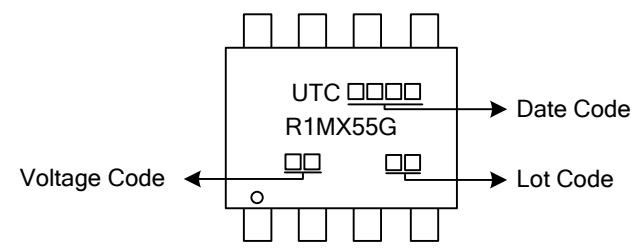
■ ORDERING INFORMATION

Ordering Number	Package	Packing
R1MX55G-xx-AB5-R	SOT-89-5	Tape Reel
R1MX55G-xx-SH2-R	HSOP-8	Tape Reel

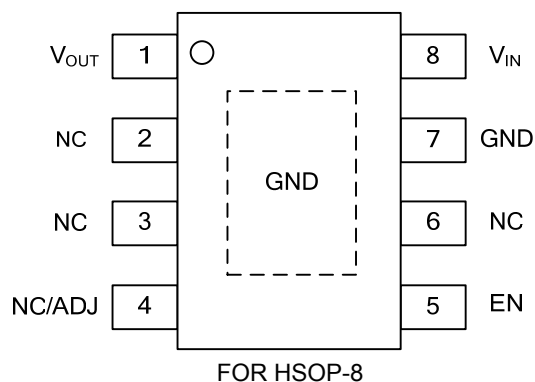
R1MX55G-xx-AB5-R (1) Packing Type (2) Package Type (3) Output Voltage Code (4) Green Package	(1) R: Tape Reel (2) AB5: SOT-89-5, SH2: HSOP-8 (3) xx: refer to Marking Information (4) G: Halogen Free and Lead Free
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MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89-5	15: 1.5V 18: 1.8V 25: 2.5V	 The diagram shows a SOT-89-5 package with pins 1, 2, 3, 4, and 5. The marking 'R1MX55G' is in the center. To the left of the part number is a date code '□□□□' with an arrow pointing to it labeled 'Date Code'. To the right is a voltage code 'XX' with an arrow pointing to it labeled 'Voltage Code'.
HSOP-8	33: 3.3V 50: 5.0V AD: ADJ	 The diagram shows an HSOP-8 package with pins 1 through 8. The marking 'R1MX55G' is in the center. Above it is 'UTC' followed by a date code '□□□□' with an arrow pointing to it labeled 'Date Code'. Below the part number is a voltage code '□□' with an arrow pointing to it labeled 'Voltage Code'. To the right of the part number is a lot code '□□' with an arrow pointing to it labeled 'Lot Code'.

PIN CONFIGURATION



PIN DESCRIPTIONS

FOR ADJUSTABLE VERSION

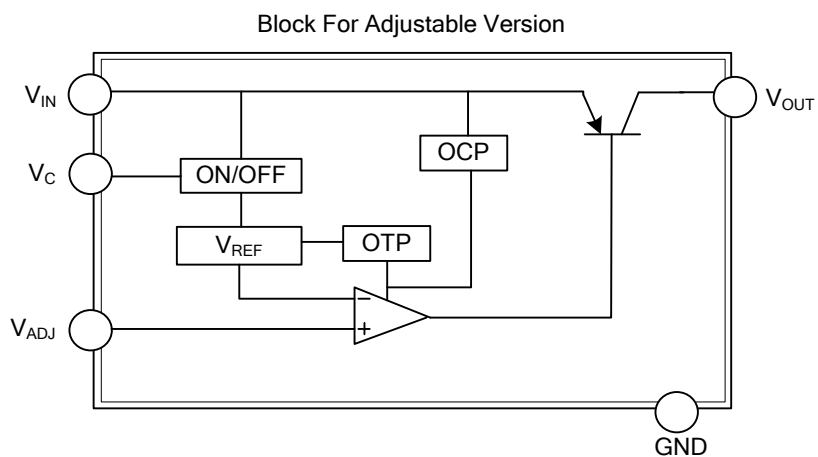
PIN NO.	PIN NAME	FUNCTION
SOT89-5 PACKAGE		
1	V_{ADJ}	Output voltage adjustment
2	GND	Ground
3	V_C	ON/OFF control
4	V_{IN}	DC input
5	V_{OUT}	DC output
HSOP-8 PACKAGE		
1	V_{OUT}	DC output
2, 3, 6	NC	No Connection
4	ADJ	Output voltage adjustment
5	EN	Enable pin, Logic Low=Shutdown; Logic High= Enable
7	GND	Ground
8	V_{IN}	DC input

FOR FIXED VERSION

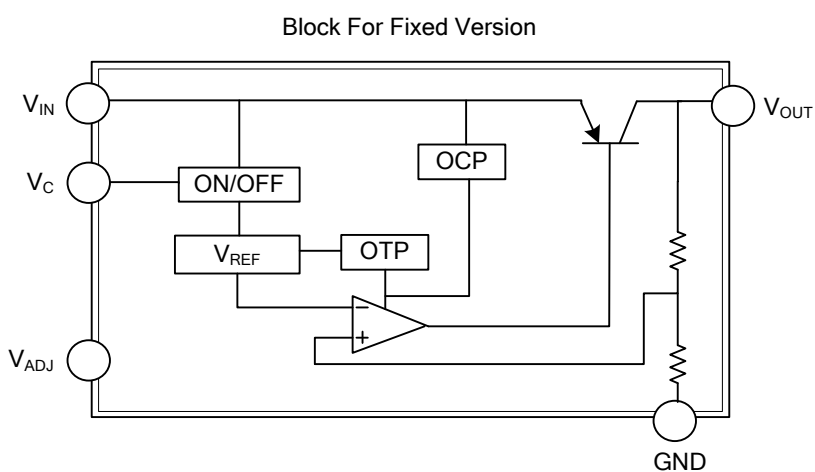
PIN NO	PIN NAME	DESCRIPTION
SOT89-5 PACKAGE		
1	NC	No Connection
2	GND	Ground
3	V_C	ON/OFF control
4	V_{IN}	DC input
5	V_{OUT}	DC output
HSOP-8 PACKAGE		
1	V_{OUT}	DC output
2, 3, 6	NC	No Connection
4	NC	No Connection
5	EN	Enable pin, Logic Low=Shutdown; Logic High= Enable
7	GND	Ground
8	V_{IN}	DC input

■ BLOCK DIAGRAM

For Adjustable Version



For Fixed Version



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNITS
FOR SOT-89-5			
Input Voltage (Note 2)	V_{IN}	15	V
ON/OFF Control Voltage (Note 2)	V_C	15	V
Output Adjustment pin Voltage (Note 2)	V_{ADJ}	15	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

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 ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

For Fixed Voltage (Unless otherwise specified, $V_{IN}=3.0\text{V}$, $I_O=30\text{mA}$, $V_C=1.8\text{V}$, $T_A=25^{\circ}\text{C}$ (1.5V, 1.8V))

(Unless otherwise specified, $V_{IN}=V_{O(TYP.)}+1.0\text{V}$, $I_O=30\text{mA}$, $V_C=1.8\text{V}$, $T_A=25^{\circ}\text{C}$ (2.5V, 3.3V, 5V))

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_O		1.44	1.5	1.56	V
			1.74	1.8	1.86	
			2.440	2.5	2.560	
			3.234	3.3	3.366	
			4.900	5.0	5.100	
Load Regulation	REG_{LOAD}	$I_O=5\text{mA}\sim 500\text{mA}$		60	200	mV
Line Regulation	REG_{LINE}	$V_{IN}=3.0\text{V}\sim 7.5\text{V}$		3.0	20	mV
		$V_{IN}=3.0\text{V}\sim 7.8\text{V}$				
		$V_{IN}=V_{O(TYP.)}+1\text{V}$ to $V_{O(TYP.)}+6\text{V}$ (MAX9V)				
Temperature coefficient of output voltage	$T_C V_O$	10kHz < f < 100kHz, $C_N=0.1\mu\text{F}$, $I_O=30\text{mA}$		0.1		mV/°C
Ripple rejection	RR	Refer to Fig below		65		dB
Output noise voltage	$V_{NO(RMS)}$			30		μV
Dropout Voltage	V_{DROP}	$I_{OUT}=500\text{mA}$		400	700	mV
ON-state voltage for control	$V_{C(ON)}$		1.8			V
ON-state current for control	$I_{C(ON)}$	$V_C=1.8\text{V}$		20	70	μA
OFF-state voltage for control	$V_{C(OFF)}$				0.4	V
Quiescent Current	I_Q	$I_O=0\text{mA}$		0.6	1	mA
Output OFF-state dissipation current	I_{QS}	$V_C=0.2\text{V}$			1	μA

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

■ ELECTRICAL CHARACTERISTICS (Cont.)

For SOT-89-5 ADJ ($V_{IN}=3.5V$, $V_{OUT}=2.44V$ ($R_1=R_2=100K\Omega$), $I_{OUT}=30mA$, $V_C=1.8V$)

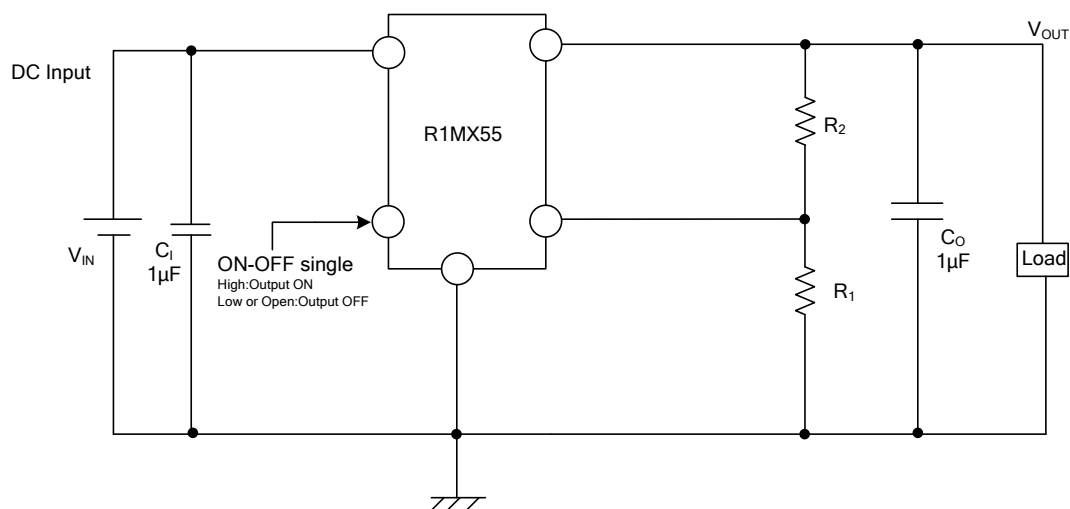
PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Input Voltage	V_{IN}		2.6		9.0	V
Output Voltage	V_{OUT}		1.3		5.0	V
Load Regulation	ΔV_{OUT}	$I_{OUT}=5\sim 500mA$		10	100	mV
Line Regulation	ΔV_{OUT}	$V_{IN}=3.5\sim 8.5V$		6	20	mV
Ripple Rejection	RR			55		dB
Dropout Voltage	V_D	$I_{OUT}=500mA$			0.7	V
Reference Voltage	V_{REF}		1.196	1.22	1.244	V
Temperature Coefficient of Output Voltage	$T_C V_{OUT}$	$T_J=25\sim 75^\circ C$, $I_{OUT}=10mA$		± 0.1		mV/ $^\circ C$
Output Noise Voltage	$V_{NO(RMS)}$	$10Hz < f < 100kHz$		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.

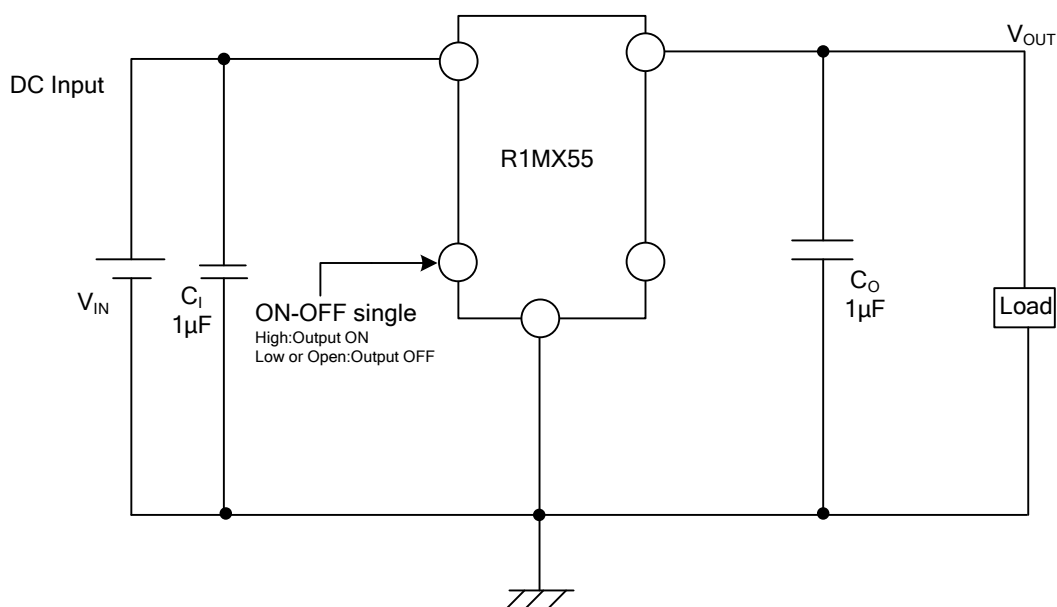
For HSOP-8 ADJ ($V_{IN}=V_O+2.5V$, $V_{OUT}=1.8V$, $V_{EN}=V_{IN}$, $T_A=25^\circ C$, unless otherwise specified)

DC REGULATOR ADS (V _{IN} = V _O + 2.5V, V _{OUT} = 1.5V, V _{EN} = V _{IN} , I _A = 20 mA, 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 _{O(SHDN)}	EN=Low, V _{IN} =15V		0.1	10	µA

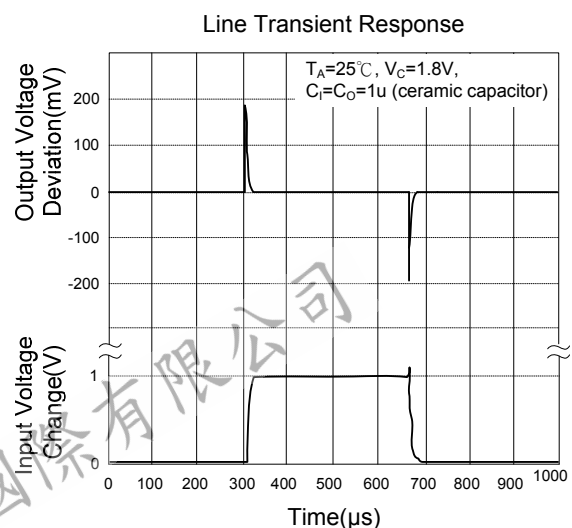
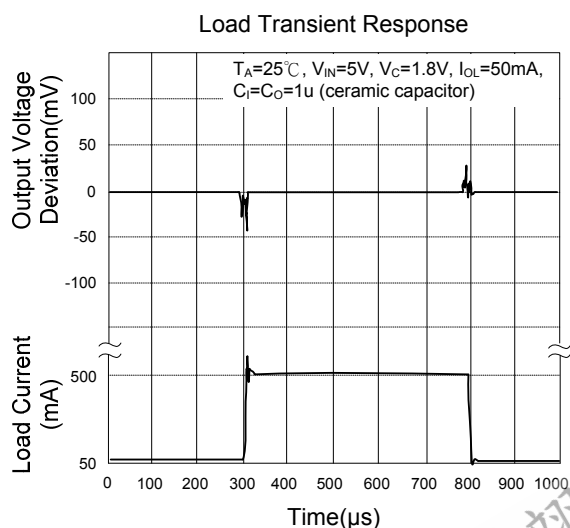
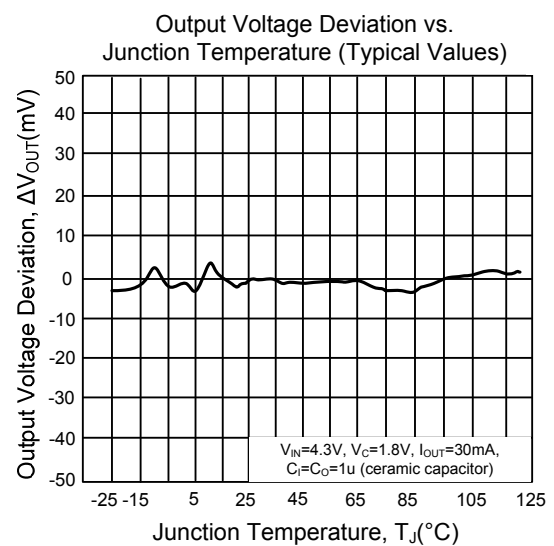
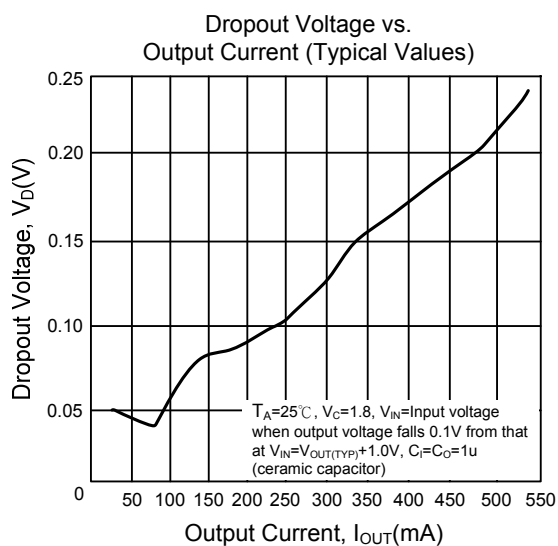
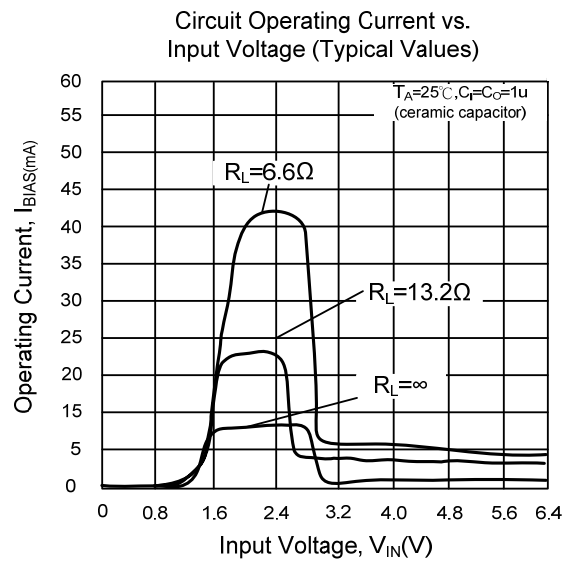
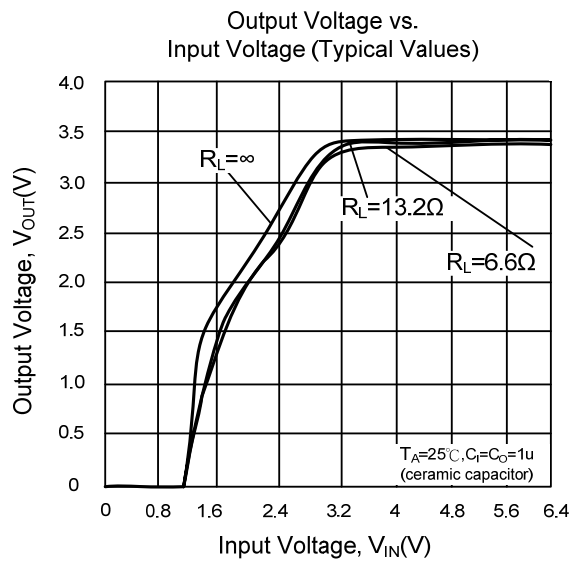
■ TYPICAL APPLICATION CIRCUIT



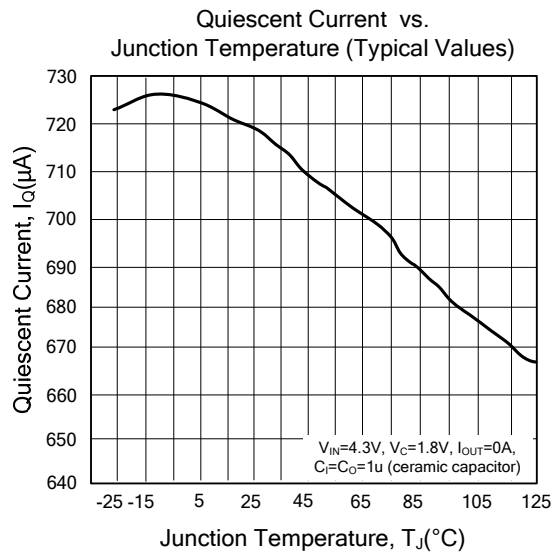
Note: 1. Customers can select the appropriate according to the actual needs of R_1 , R_2 ; can take $R_1 = 100k\Omega$, R_2 based on the output voltage needs to select the appropriate resistance.
2. $V_{OUT} = (R_1 + R_2) / R_1 \times V_{REF}$



TYPICAL CHARACTERISTICS(FOR SOT-89-5)



■ TYPICAL CHARACTERISTICS(Cont.)



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