

150mA LDO REGULATOR

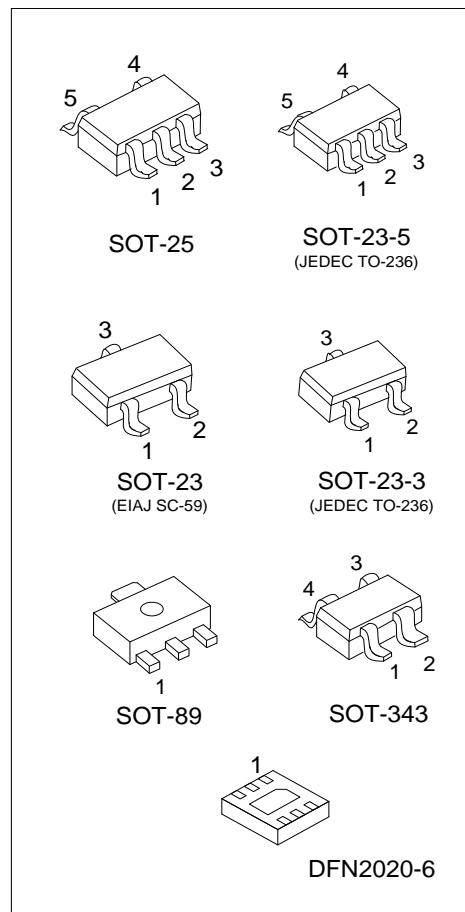
■ DESCRIPTION

The UTC **LR9280** is a typical LDO (linear regulator) with the features of high output voltage accuracy, low supply current, low ON-resistance. Internally, there're many functions of UTC **LR9280** which can be seen in the block figure. There are a voltage reference unit, an error amplifier, resistor-net for voltage setting, a current limit circuit, and a chip enable circuit in each UTC **LR9280**.

The output voltage of these ICs is fixed with high accuracy. B version has a chip enable pin, therefore low consumption current standby mode can be realized with the pin.

■ FEATURES

- * Output voltage accuracy ($\pm 2.0\%$)
- * Output voltage Range (1.2V~4.0V)
- * Dropout voltage (TYP=0.25V)($I_{OUT}=150mA$ 3.0V Output type)
- * Line regulation (TYP=0.05%/V)
- * Temperature-Drift Coefficient of Output Voltage (TYP= $\pm 100ppm/^{\circ}C$)
- * Ceramic capacitors are recommended to be used with this IC (1 μF)



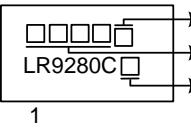
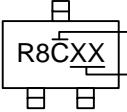
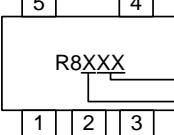
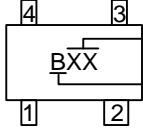
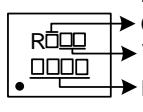
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
LR9280CL-xx-AB3-x-R	LR9280CG-xx-AB3-x-R	SOT-89	Tape Reel
LR9280CL-xx-AE2-R	LR9280CG-xx-AE2-R	SOT-23-3	Tape Reel
LR9280CL-xx-AE3-R	LR9280CG-xx-AE3-R	SOT-23	Tape Reel
LR9280xL-xx-AE5-R	LR9280xG-xx-AE5-R	SOT-23-5	Tape Reel
LR9280xL-xx-AF5-R	LR9280xG-xx-AF5-R	SOT-25	Tape Reel
LR9280BL-xx-AL4-R	LR9280BG-xx-AL4-R	SOT-343	Tape Reel
LR9280BL-xx-K06-2020-R	LR9280BG-xx-K06-2020-R	DFN2020-6	Tape Reel

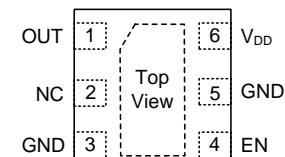
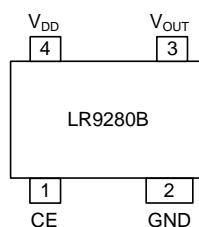
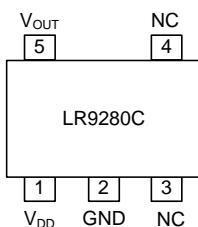
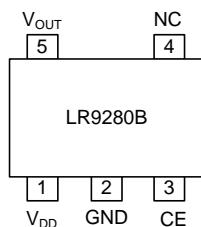
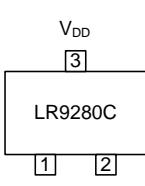
Note: xx: Output Voltage, refer to Marking Information.

 LR9280CG-xx-AB3-x-R	(1) R: Tape Reel
	(2) refer to Pin Assignment (for SOT-89)
	(3) AB3: SOT-89, AE2: SOT-23-3, AE3: SOT-23,
	AE5: SOT-23-5, AF5: SOT-25, AL4: SOT-343
	K06-2020: DFN2020-6
	(4) xx: refer to Marking Information
	(5) G: Halogen Free and Lead Free, L: Lead Free
	(6) B: Active high type, C: Without chip enable circuit

■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89		 <p>Pin Code Date Code L: Lead Free G: Halogen Free</p>
SOT-23-3 SOT-23	12: 1.2V 15: 1.5V 18: 1.8V 22: 2.2V 25: 2.5V 28: 2.8V 30: 3.0V 33: 3.3V 36: 3.6V 40: 4.0V	 <p>Without chip enable circuit Voltage Code</p>
SOT-23-5 SOT-25		 <p>Voltage Code B: Active high type C: Without chip enable circuit</p>
SOT-343		 <p>Output Voltage Active high type</p>
DFN2020-6		 <p>B: Active high type C: Without chip enable circuit Voltage Code Date Code</p>

■ PIN CONFIGURATION

SOT-23-3
SOT-23

SOT-23-5/SOT-25

SOT-343

DFN2020-6

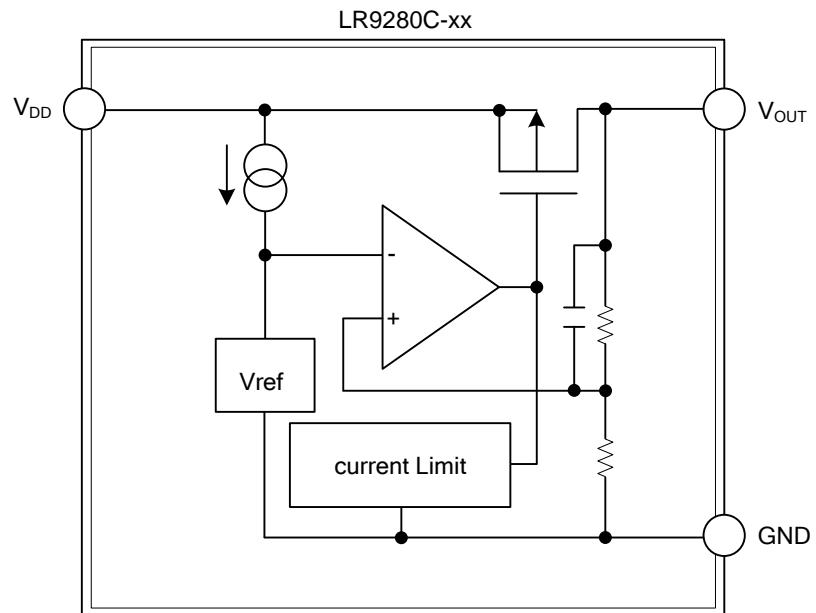
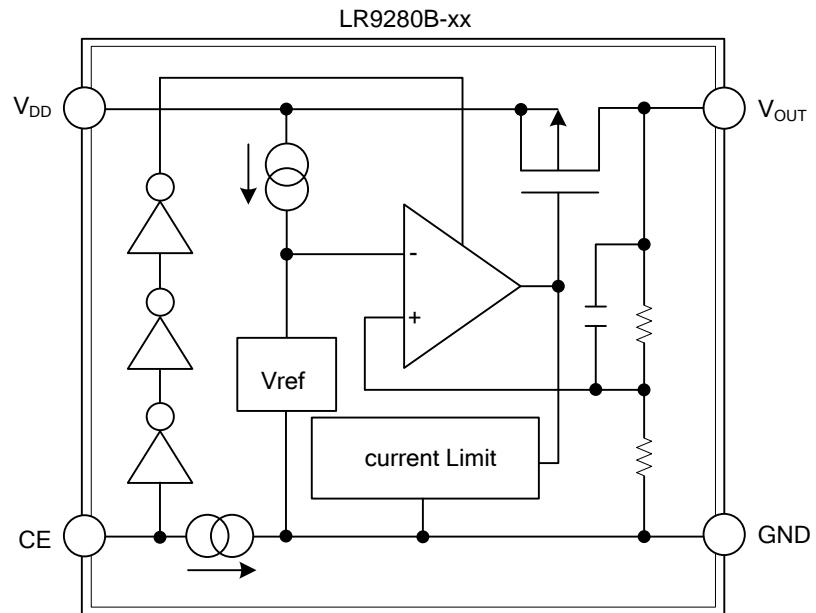
■ PIN DESCRIPTION

PIN NO.		PIN NAME	DESCRIPTION	
SOT-23-3	SOT-89			
SOT-23	B C			
1	2	1	GND	Ground pin
2	1	3	V _{OUT}	Output pin
3	3	2	V _{DD}	Input pin

PIN NO.		PIN NAME	DESCRIPTION	
SOT-23-5/SOT-25	LR9280B			
LR9280C	LR9280C			
1	1	V _{DD}	Input pin	
2	2	GND	Ground pin	
3	-	CE	Chip Enable Pin	
4	3, 4	NC	No Connection	
5	5	V _{OUT}	Output pin	

PIN NO.		PIN NAME	DESCRIPTION	
SOT-343	DFN2020-6			
1	4	CE	Chip Enable Pin	
2	3, 5	GND	Ground pin	
3	1	V _{OUT}	Output pin	
4	6	V _{DD}	Input pin	
-	2	NC	No Connection	

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER		SYMBOL	RATINGS	UNIT
Input Voltage		V _{IN}	6.5	V
Input Voltage(CE Pin)		V _{CE}	6.5	V
Output Voltage		V _{OUT}	-0.3 ~ V _{IN} +0.3	V
Output Current		I _{OUT}	150	mA
Power Dissipation	SOT-23-3	P _D	300	mW
	SOT-23		380	mW
	SOT-23-5		500	mW
	SOT-25		250	mW
	SOT-89		460	mW
	SOT-343			
DFN2020-6				
Operating Temperature		T _{OPR}	-40 ~ +85	°C
Storage Temperature		T _{STG}	-55 ~ +125	°C

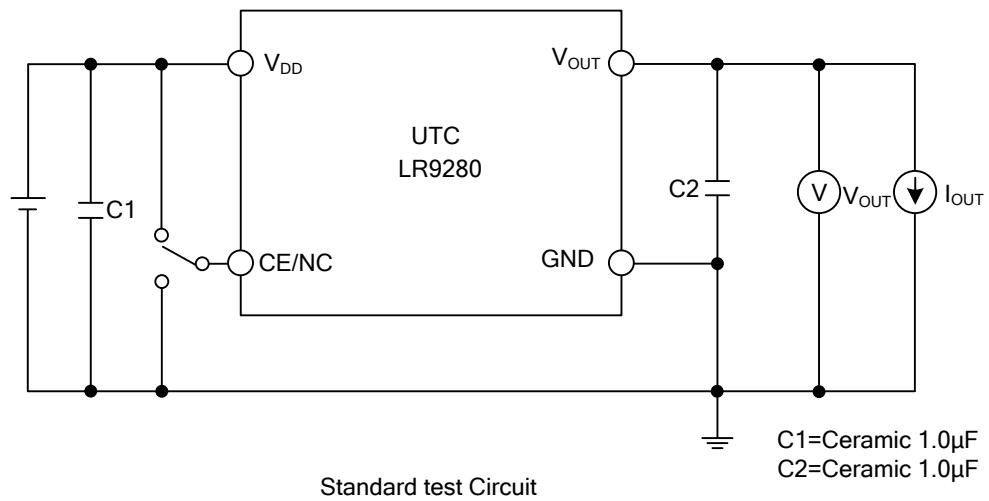
Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

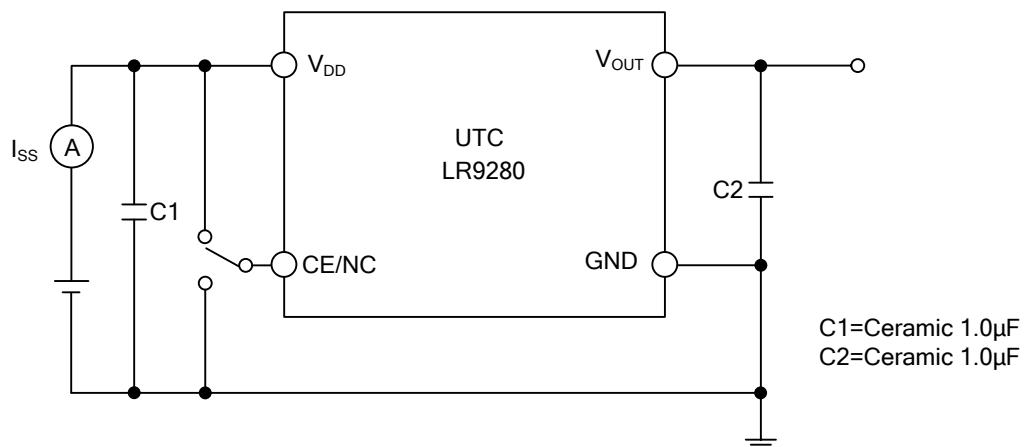
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	V _{OUT}	V _{IN} =Set V _{OUT} +1V, 1μA ≤ I _{OUT} ≤30mA	x0.980		x1.020	V	
Dropout Voltage	V _{DIF}		1.2≤V _{OUT} <1.3	0.85	1.20	V	
			1.3≤V _{OUT} <1.4	0.75	1.10	V	
			1.4≤V _{OUT} <1.5	0.65	1.00	V	
			1.5≤V _{OUT} <1.7	0.60	0.90	V	
			1.7≤V _{OUT} <1.9	0.50	0.75	V	
			1.9≤V _{OUT} <2.1	0.40	0.65	V	
			2.1≤V _{OUT} <2.8	0.35	0.55	V	
			2.8≤V _{OUT} ≤3.6	0.25	0.40	V	
			3.6≤V _{OUT} ≤4.0	0.20	0.35	V	
Input Voltage	V _{IN}				6.0	V	
Supply Current	I _{SS}	V _{IN} -V _{OUT} =1.0V, I _{OUT} =0mA		0.7	1.5	μA	
Standby Current	I _{STB}	V _{IN} -V _{OUT} =1.0V, V _{CE} =GND		0.1	1.0	μA	
Load Regulation	ΔV _{OUT} /ΔI _{OUT}	V _{IN} -V _{OUT} =1.0V(V _{OUT} ≥1.5V) V _{IN} =2.4V(V _{OUT} <1.5V) 1μA ≤I _{OUT} ≤150mA		20	40	mV	
Line Regulation	ΔV _{OUT} /ΔV _{IN}	I _{OUT} =30mA V _{OUT} +0.5V≤V _{IN} ≤6.0V (V _{OUT} ≥1.5V), 2.0V≤V _{IN} ≤6.0V (1.2V≤V _{OUT} ≤1.4V)		0.05	0.20	%/V	
Output Voltage Temperature Coefficient	ΔV _{OUT} /ΔT _{OPT}	I _{OUT} =30mA, -40°C≤T _{OPT} ≤85°C		±100		ppm/°C	
Short Current Limit	I _{SC}	V _{OUT} =0V		50		mA	
CE Pull-down Constant Current	I _{PD}	LR9280B		0.35		μA	
CE Input Voltage "H"	V _{CEH}	LR9280B	1.2		6.0	V	
CE Input Voltage "L"	V _{CEL}	LR9280B	0.0		0.3	V	

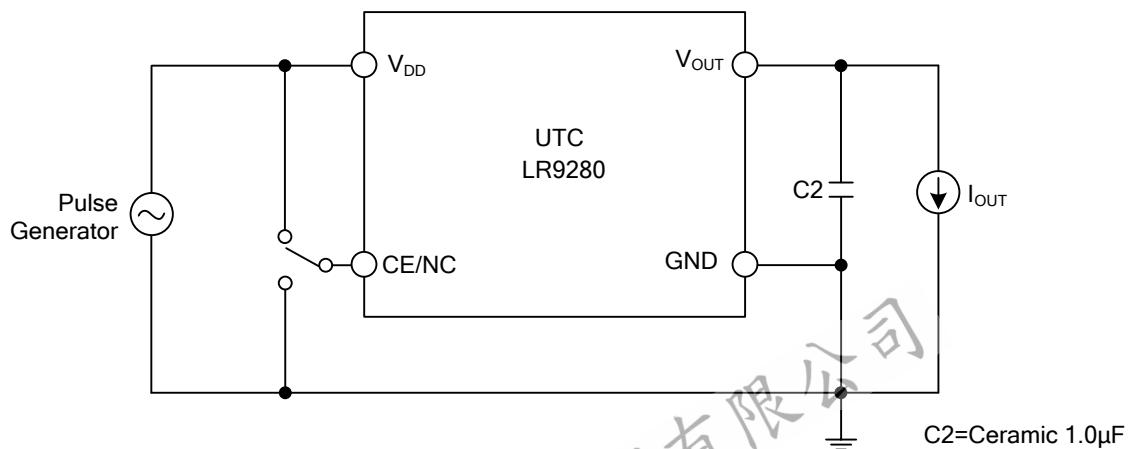
■ TEST CIRCUITS



Standard test Circuit

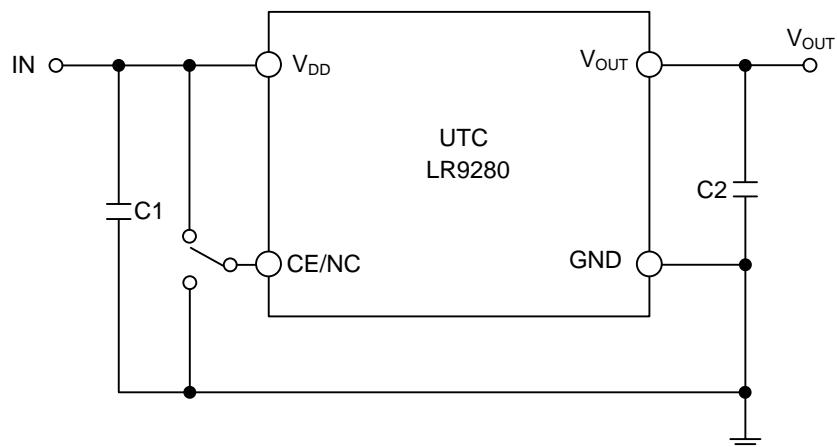


Supply Current Test Circuit



Ripple Rejection, Line Transient Response Test Circuit

■ TYPICAL APPLICATION CIRCUIT

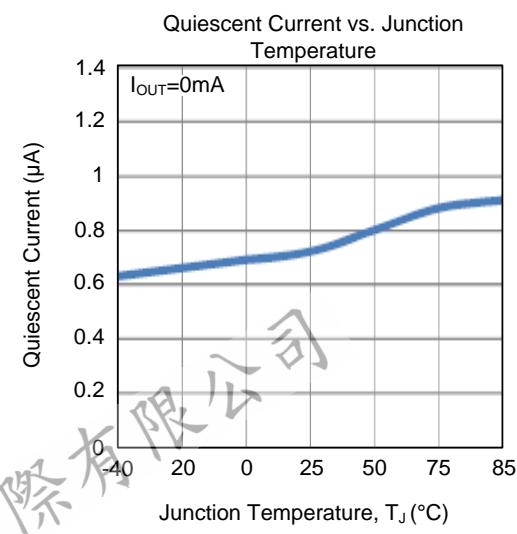
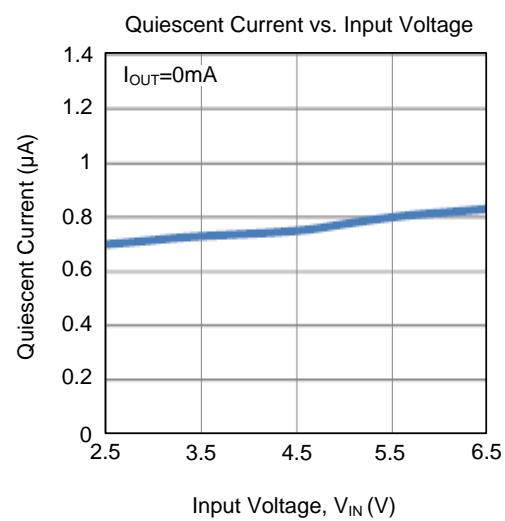
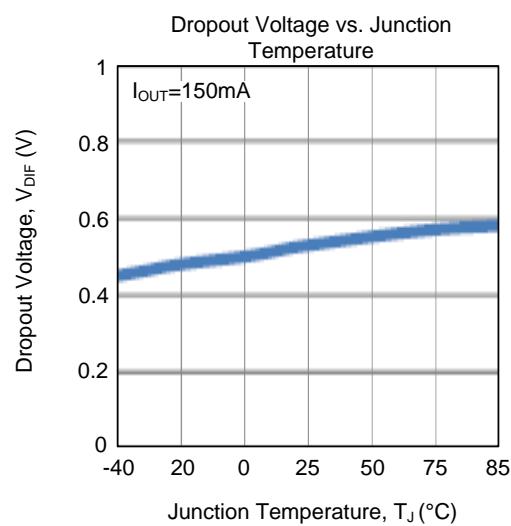
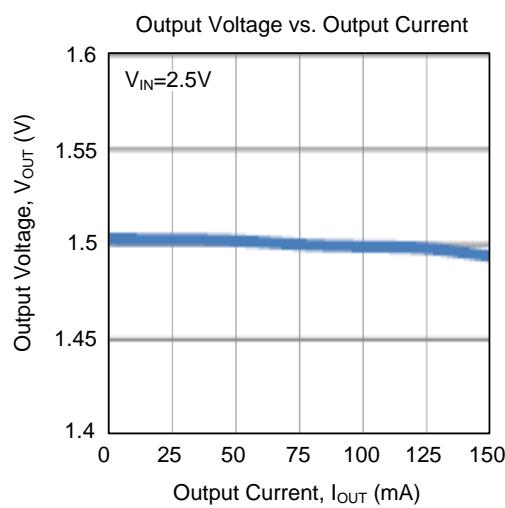
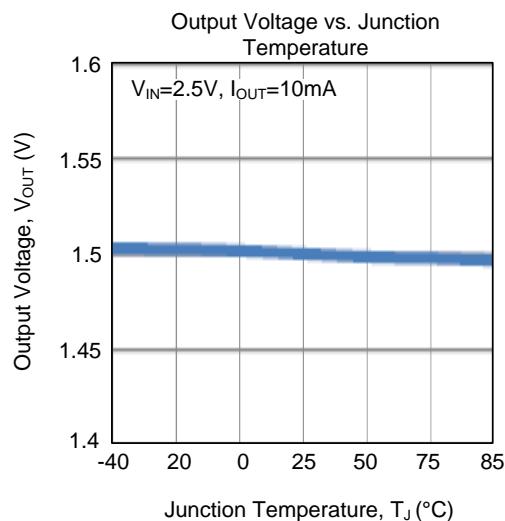
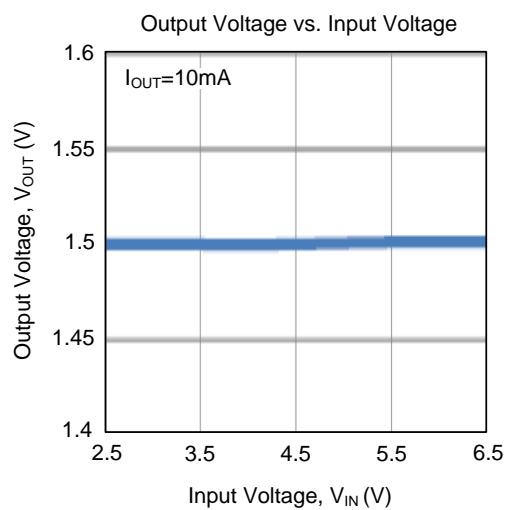


(External Components)

Output Capacitor

Ceramic Capacitor 1μF

■ TYPICAL CHARACTERISTICS



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