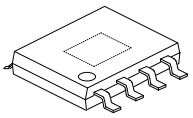
UR6515C

LINEAR INTEGRATED CIRCUIT

2A DDR BUS TERMINATION REGULATOR



HSOP-8

■ DESCRIPTION

The **UR6515C** is a linear regulator providing up to 2A transient peak current sourcing and sinking capability for DDR SDRAM bus terminator applications while regulating an output voltage to within 40mV. It contains a high speed operational amplifier which provides fast load transient response and only requires 10uF of ceramic output capacitance.

The **UR6515C** output termination voltage tracks the reference voltage applied at V_{REF} pin. A resistor divider connected to V_{IN}, GND and V_{REF} pins is used to force the reference voltage to V_{REF} pin. Additional features include current limiting protection and thermal shutdown protection.

■ FEATURES

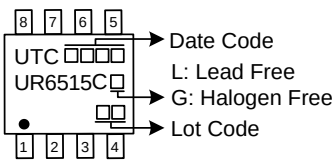
* DDR1/ DDR2/DDR3 termination voltage applications
* Sink and Source Current
  2A Contious Current
* Adjustable output voltage by external resistors
* Integrated power MOS devices
* Suspend to RAM(STR) functionality
* Current Limiting Protection
* Thermal Shutdown Protection
* Cost-effective and easy to use

■ ORDERING INFORMATION

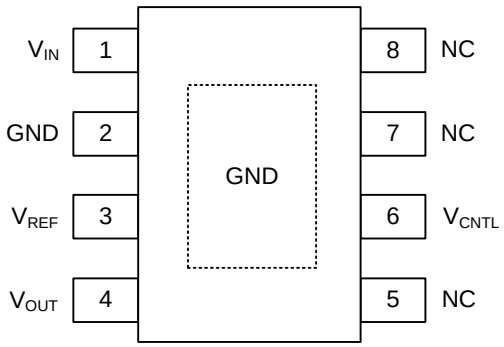
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UR6515CG-SH2-R	UR6515CG-SH2-R	HSOP-8	Tape Reel

UR6515CG-SH2-R
- (1)Packing Type — (1) R: Tape Reel
- (2)Package Type — (2) SH2: HSOP-8
- (3)Green Package — (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



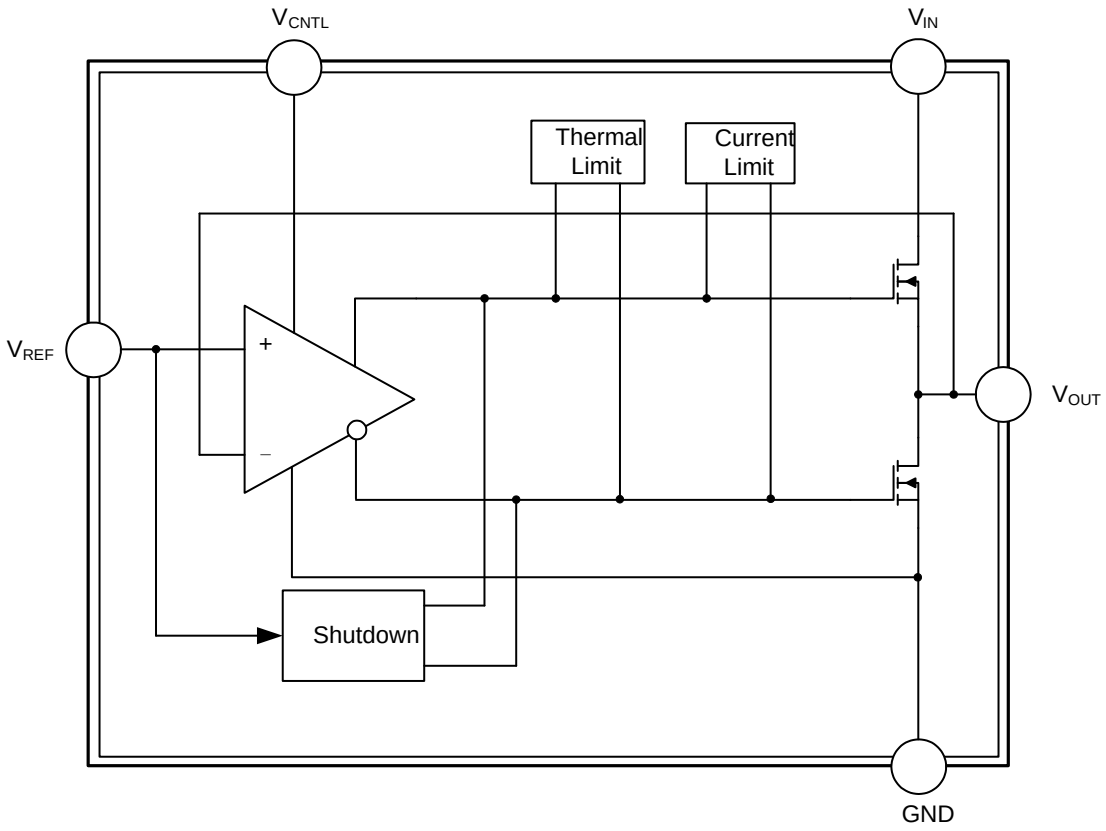
■ PIN CONFIGURATIONS



■ PIN DESCRIPTION

PIN NAME	PIN TYPE	PIN DESCRIPTION
V_{CNTL}	I	Power supply pin for the internal control circuits
GND	-	Ground pin
V_{IN}	I	Power supply pin for the V_{OUT} output
V_{REF}	I	Reference voltage input and active-low shutdown control pin
V_{OUT}	O	Output voltage pin

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
V_{CNTL} Control Voltage	V_{CNTL}	+6	V
V_{IN} Supply Voltage	V_{IN}	+6	V
Power Dissipation (T_A=25°C)	P_D	1.33	W
Junction Temperature	T_J	+125	°C
Storage Temperature	T_{STG}	-65 ~ +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 (Note 1)	θ_{JA}	75	°C/W
Junction to Case	θ_{JC}	28	°C/W

Note: θ_{JA} is measured in the natural convection at T_A = 25°C on a high effective thermal conductivity test board of JEDEC 51-7 thermal measurement standard.

■ RECOMMENDED OPERATING CONDITIONS (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
V_{CNTL} Control Voltage	V_{CNTL}	5 or 3.3±5%	V
V_{IN} Supply Voltage	V_{IN}	2.5 ~ 1.5±3%	V
V_{REF} Input Voltage	V_{REF}	1.25 ~ 0.75±3%	V
Junction Temperature	T_J	-40 ~ +125	°C

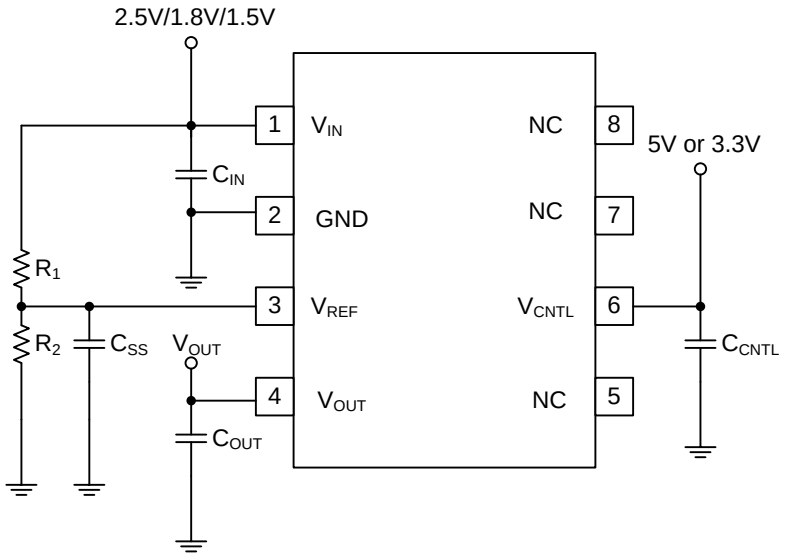
Notes: 1. All voltage values are with respect to the network ground terminal unless otherwise noted.
2. The V_{OUT} tracks the V_{REF} with additional voltage offset and load regulation.

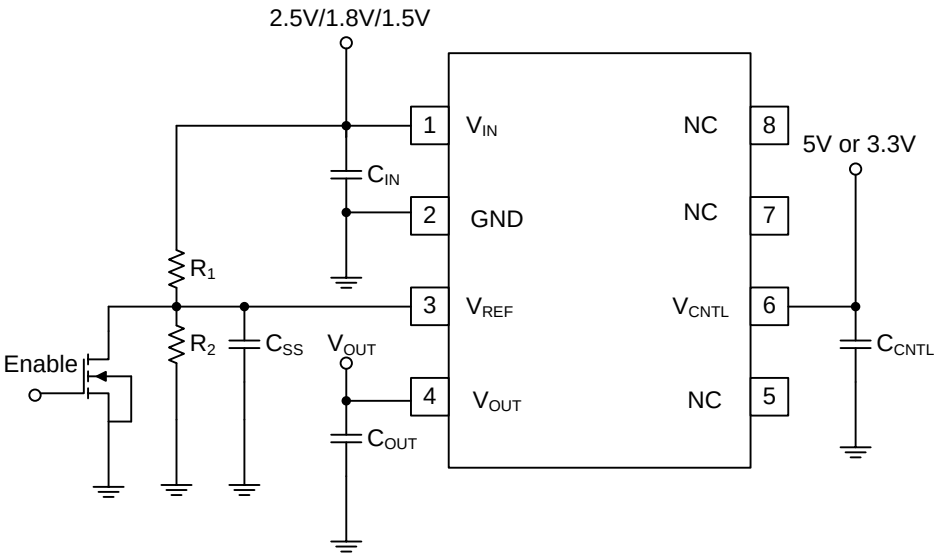
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

(V_{IN}=2.5V/1.8V/1.5V, V_{CNTL}=3.3V, V_{REF}=1.25V/0.9V/0.75V, C_{OUT} = 10µF (Ceramic))

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT CURRENT						
Operation Current of V_{CNTL}	I_{CNTL}	I_{OUT} =0A		1	2.5	mA
Standby Current	I_{STB}	V_{REF}<0.2V, R_{LOAD}=180Ω		50	90	µA
OUTPUT VOLTAGE (DDR/DDR II/DDR III)						
Output Voltage Offset (V_{REF}-V_{OUT})	V_{OS}	I_{OUT} =0A	-20		20	mV
Load Regulation	ΔV_{LOAD}	I_{OUT} =±2A	-20		20	mV
PROTECTION						
Current Limit	I_{LIMIT}	V_{IN}=2.5V/1.8V/1.5V	2.2			A
Thermal Shutdown Temperature	T_{SD}	V_{CNTL}=3.3V~5V	125	170		°C
Thermal Shutdown Hysteresis	ΔT_{SD}	V_{CNTL}=3.3V~5V		35		°C
V_{REF} Shutdown						
Shutdown Threshold	V_{IH}	Enable	0.6			V
	V_{IL}	Shutdown			0.2	V

■ TYPICAL APPLICATIONS CIRCUITS





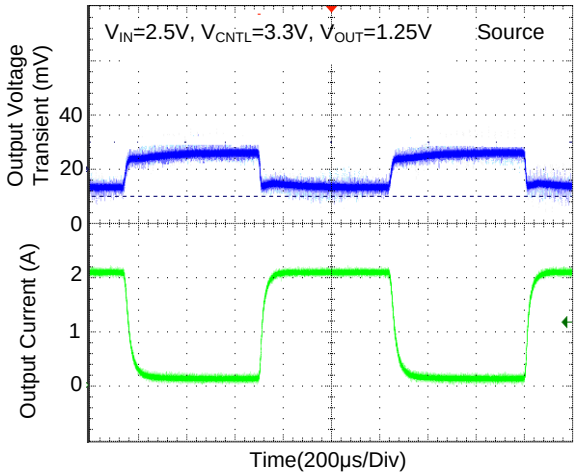
R_1=R_2=100KΩ, C_{OUT}=10μF(Ceramic)+1000μF under the worst case testing condition

C_{SS}=1μF, C_{IN}=470μF(Low ESR), C_{CNTL}=47μF

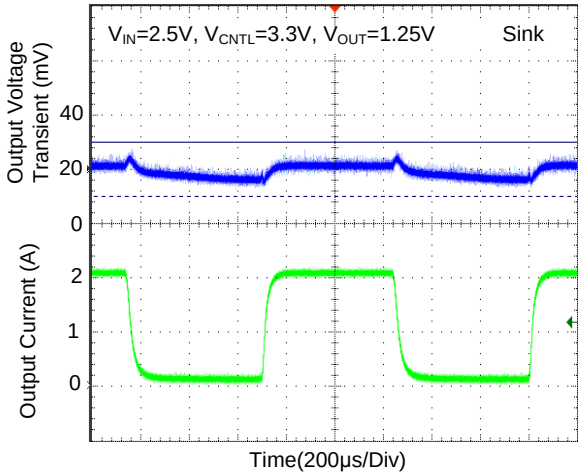
$V_{REF} = \frac{R_2}{R_1+R_2} V_{IN}(V)$, V_{OUT} track V_{REF}

■ TYPICAL CHARACTERISTICS

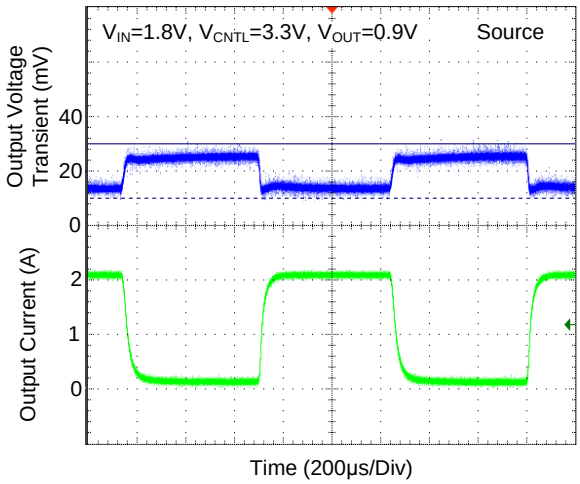
1.25 V_{TT}@2A Transient Response



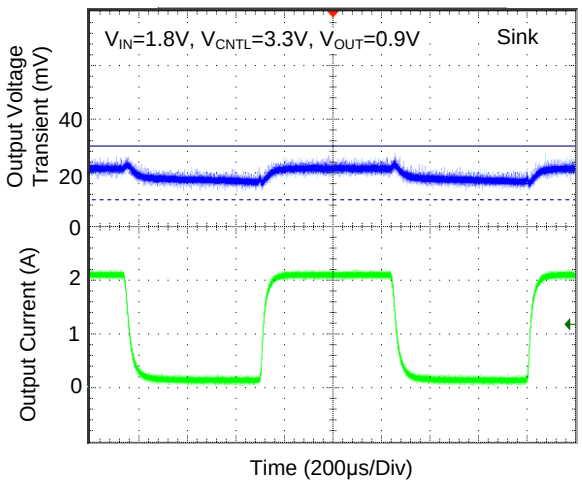
1.25 V_{TT}@2A Transient Response



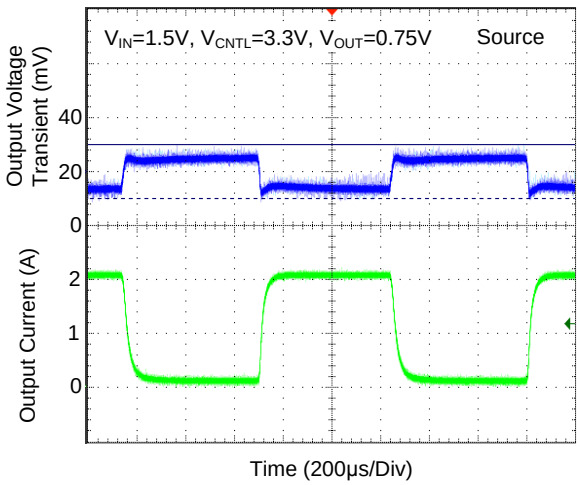
0.9 V_{TT}@2A Transient Response



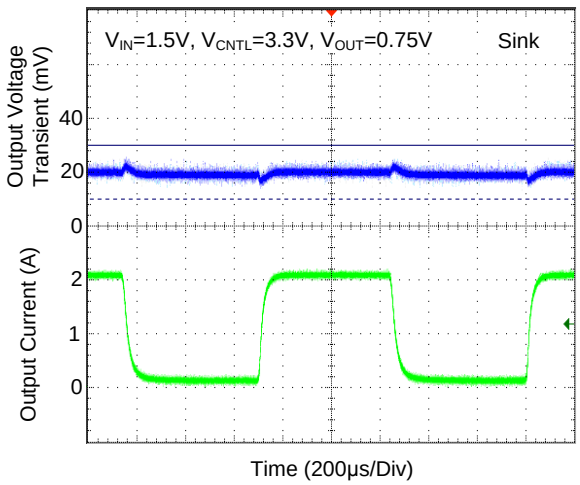
0.9 V_{TT}@2A Transient Response



0.75 V_{TT}@2A Transient Response

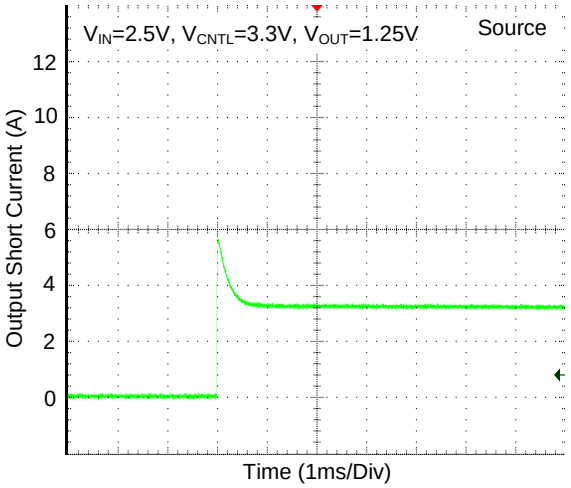


0.75 V_{TT}@2A Transient Response

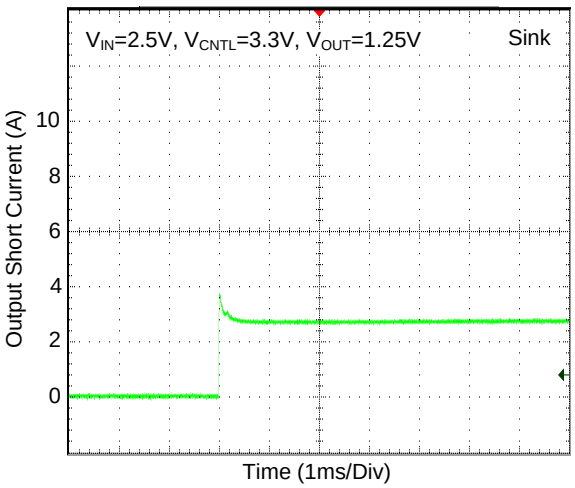


■ TYPICAL CHARACTERISTICS (Cont.)

Output Short Circuit Protection



Output Short Circuit Protection



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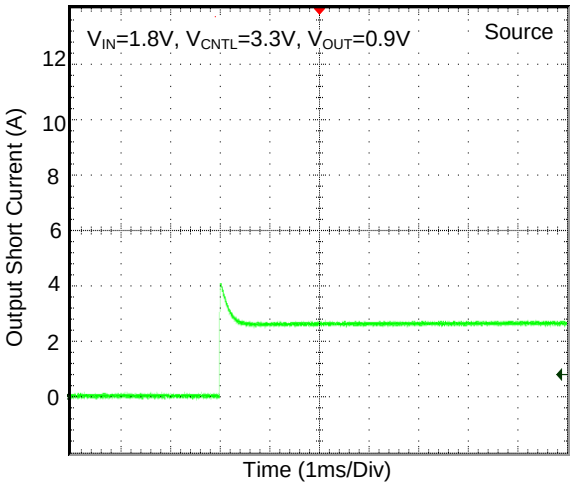

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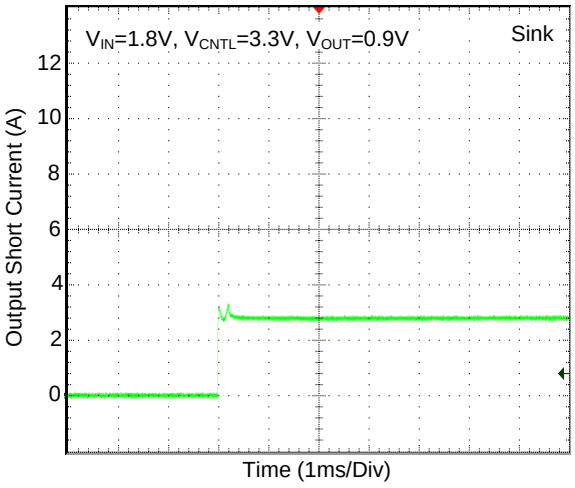

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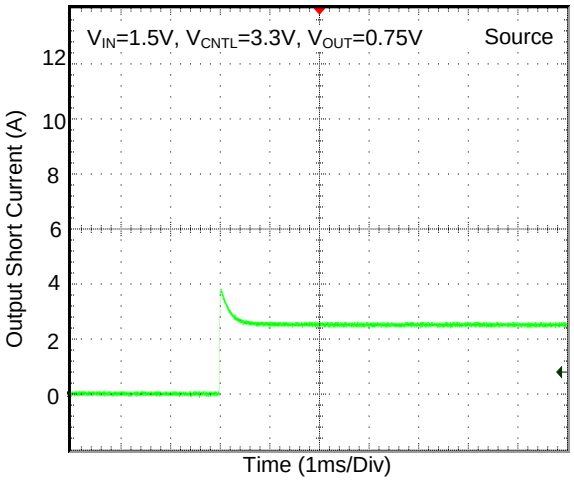

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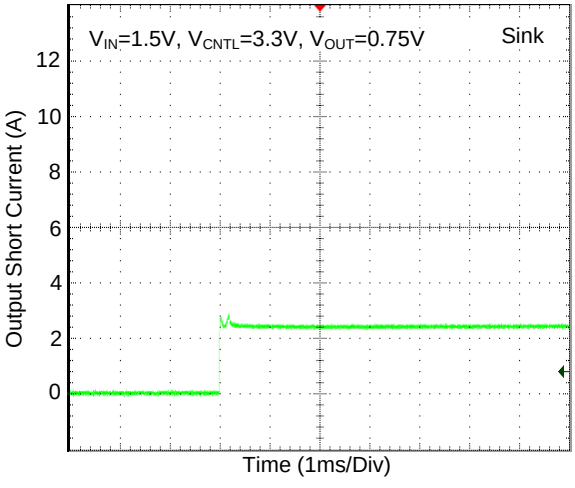
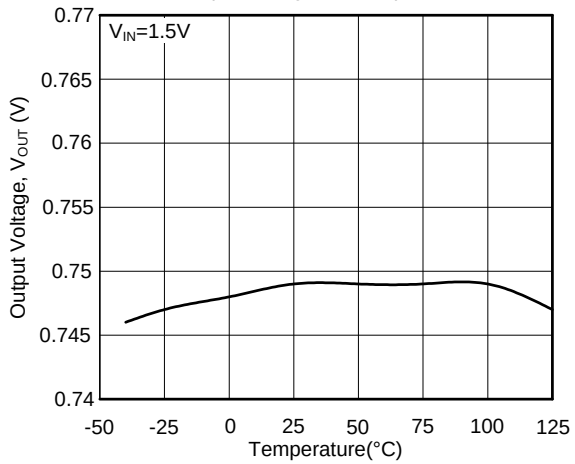
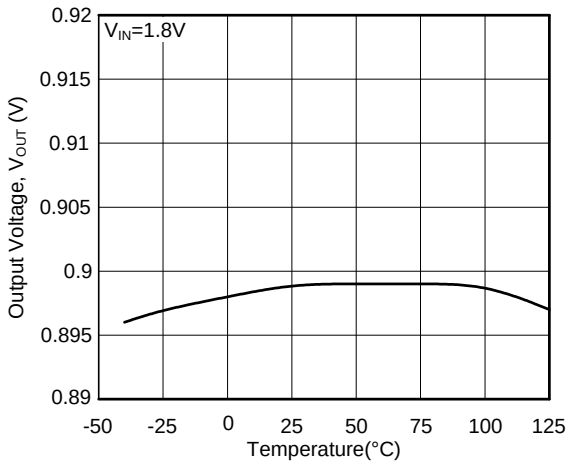


■ TYPICAL CHARACTERISTICS (Cont.)

Output Voltage vs. Temperature



Output Voltage vs. Temperature



Output Voltage vs. Temperature