



UR6512

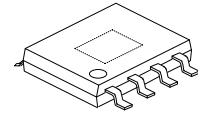
LINEAR INTEGRATED CIRCUIT

2A DDR BUS TERMINATION REGULATOR

DESCRIPTION

The **UR6512** is a linear regulator providing up to 2A for DDR 1/DDR 2 and 1.5A for DDR 3 transient peak current and has sourcing and sinking capability for DDR SDRAM bus terminator applications while regulating an output voltage to within 20mV. It contains a high speed operational amplifier which provides fast load transient response and only requires 10uF of ceramic output capacitance.

The **UR6512** 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.



HSOP-8

FEATURES

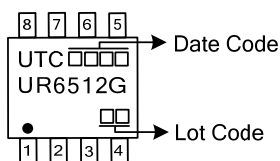
- * DDR1/ DDR2/DDR3 Termination Voltage Applications
- * Adjustable Output Voltage by External Resistors
- * Integrated Power MOS Devices
- * Suspend to RAM(STR) Functionality
- * Current Limiting Protection
- * Thermal Shutdown Protection
- * Cost-Effective and Easy to Use

ORDERING INFORMATION

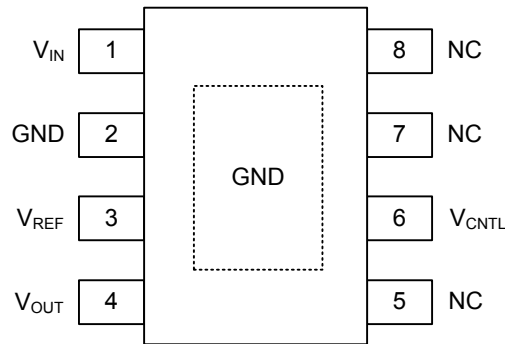
Ordering Number	Package	Packing
UR6512G-SH2-T	HSOP-8	Tube
UR6512G-SH2-R	HSOP-8	Tape Reel

<p>UR6512G-SH2-R</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) SH2: HSOP-8</p> <p>(3) G: Halogen Free and Lead Free</p>
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MARKING



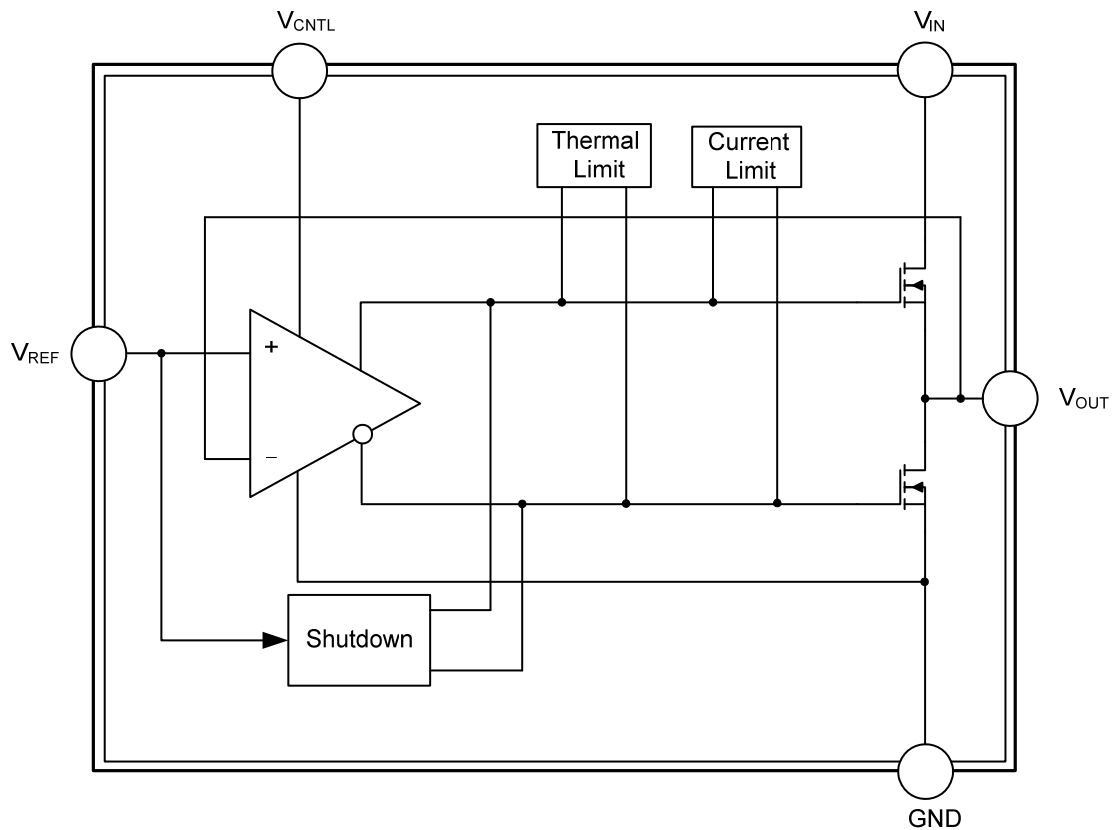
■ PIN CONFIGURATIONS



■ PIN DESCRIPTION

PIN NO	PIN NAME	PIN TYPE	PIN DESCRIPTION
1	V _{IN}	I	Power supply pin for the V _{OUT} output
2	GND	O	Ground pin
3	V _{REF}	I	Reference voltage input and active-low shutdown control pin
4	V _{OUT}	O	Output voltage pin
6	V _{CNTL}	I	Power supply pin for the internal control circuits
5,7,8	NC	--	No connect

■ BLOCK DIAGRAM



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

PARAMETER	SYMBOL	RATINGS	UNIT
V_{CNTL} Control Voltage	V_{CNTL}	6	V
V_{IN} Supply Voltage	V_{IN}	6	V
Power Dissipation ($T_A=25^{\circ}\text{C}$)	P_D	1.176	W
Junction Temperature	T_J	125	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-65 ~ +150	$^{\circ}\text{C}$

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)	θ_{JA}	86	$^{\circ}\text{C}/\text{W}$
Junction to Case	θ_{JC}	15	$^{\circ}\text{C}/\text{W}$

■ RECOMMENDED OPERATING CONDITIONS (Note 1)

PARAMETER	SYMBOL	RATINGS	UNIT
V_{CNTL} Control Voltage	V_{CNTL}	(3.3 or 5) $\pm 5\%$	V
V_{IN} Supply Voltage	V_{IN}	(1.5 ~ 2.5) $\pm 3\%$	V
V_{REF} Input Voltage	V_{REF}	(0.75 ~ 1.25) $\pm 3\%$	V
Junction Temperature	T_J	-40~+125	$^{\circ}\text{C}$

Notes: 1. All voltage values are with respect to the network ground terminal unless otherwise noted.

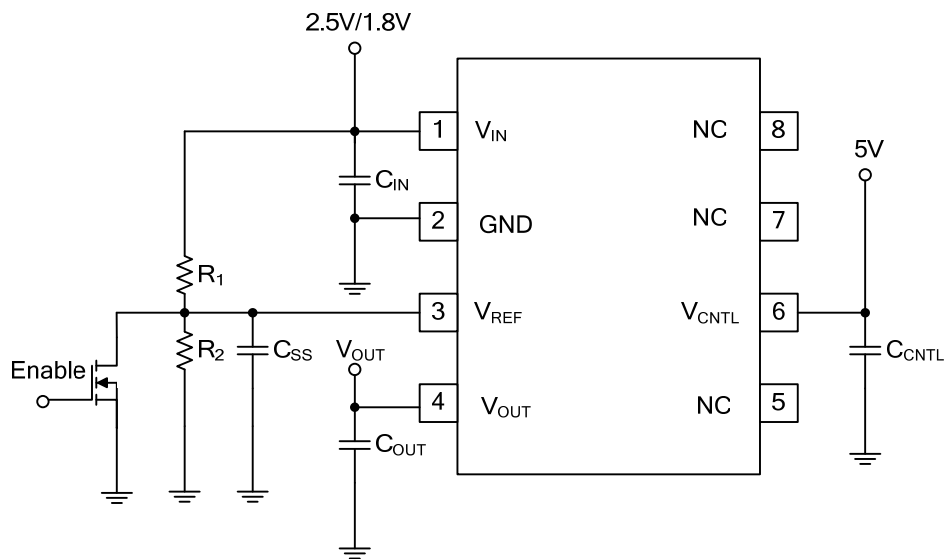
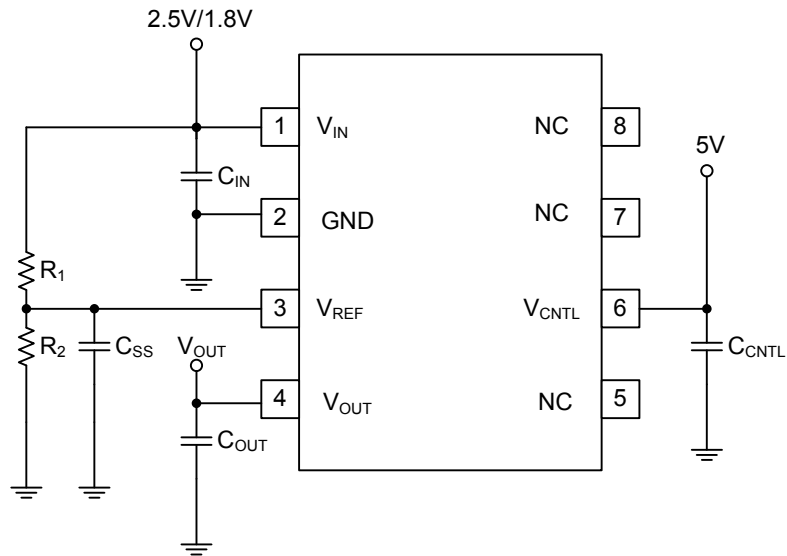
2. The V_{OUT} tracks the V_{REF} with additional voltage offset and load regulation.

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

($V_{\text{IN}}=1.8\text{V}$, $V_{\text{CNTL}}=5\text{V}$, $V_{\text{REF}}=0.9\text{V}$, $C_{\text{OUT}} = 10\mu\text{F}$ (Ceramic))

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
INPUT CURRENT						
Operation Current of V_{CNTL}	I_{CNTL}	$I_{\text{OUT}}=0\text{A}$		1	2.5	mA
Standby Current	I_{STB}	$V_{\text{REF}}<0.2\text{V}$, $R_{\text{LOAD}}=180\Omega$		2	90	μA
OUTPUT VOLTAGE (DDR/DDR II/DDR III)						
Output Voltage Offset ($V_{\text{REF}}-V_{\text{OUT}}$)	V_{OS}	$I_{\text{OUT}}=0\text{A}$	-20		20	mV
Load Regulation	ΔV_{LOAD}	DDR1/DDR2: $I_{\text{OUT}}=\pm 1.8\text{A}$	-20		20	mV
		DDR3: $I_{\text{OUT}}=\pm 1.5\text{A}$	-20		20	mV
PROTECTION						
Current Limit	I_{LIMIT}	$V_{\text{IN}}=2.5\text{V}/1.8\text{V}$	2			A
		$V_{\text{IN}}=1.5\text{V}$	1.5			A
Thermal Shutdown Temperature	T_{SD}	$V_{\text{CNTL}}=5\text{V}$	125	170		$^{\circ}\text{C}$
Thermal Shutdown Hysteresis	ΔT_{SD}	$V_{\text{CNTL}}=5\text{V}$		35		$^{\circ}\text{C}$
V_{REF} Shutdown						
Shutdown Threshold	V_{IH}	Enable	0.6			V
	V_{IL}	Shutdown			0.15	V

■ TYPICAL APPLICATIONS CIRCUIT



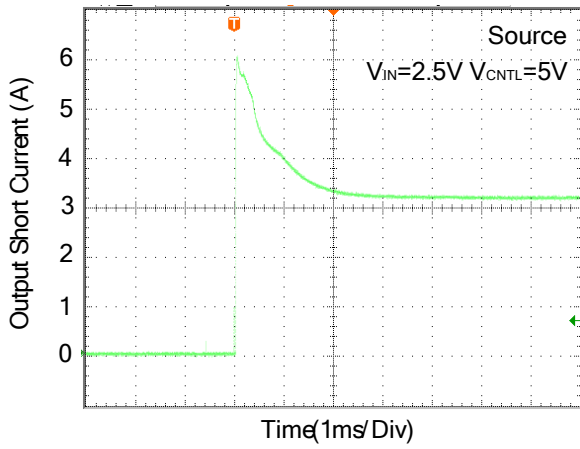
$R_1=R_2=100\text{K}\Omega$, $C_{\text{OUT}}=10\mu\text{F}(\text{Ceramic})+1000\mu\text{F}$ under the worst case testing condition

$C_{\text{SS}}=1\mu\text{F}$, $C_{\text{IN}}=470\mu\text{F}(\text{Low ESR})$, $C_{\text{CNTRL}}=47\mu\text{F}$

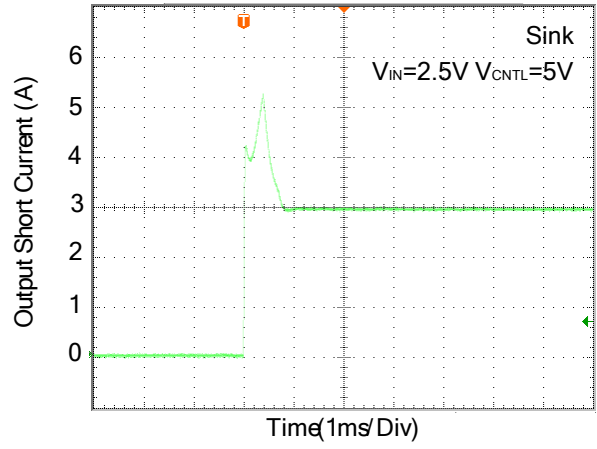
$$V_{\text{REF}} = \frac{R_2}{R_1 + R_2} V_{\text{IN}}(\text{V}), V_{\text{OUT}} \text{ track } V_{\text{REF}}$$

■ TYPICAL CHARACTERISTICS

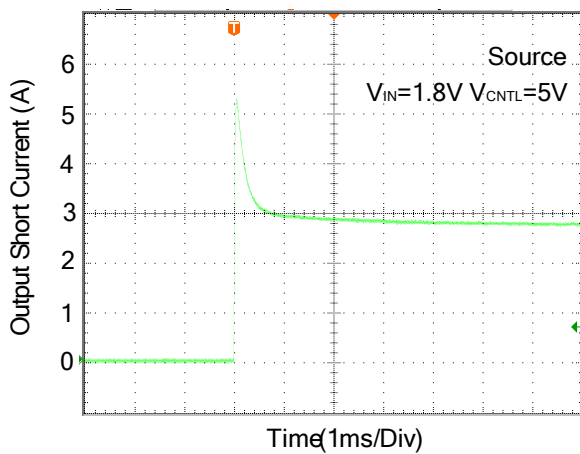
Output Short Circuit Protection



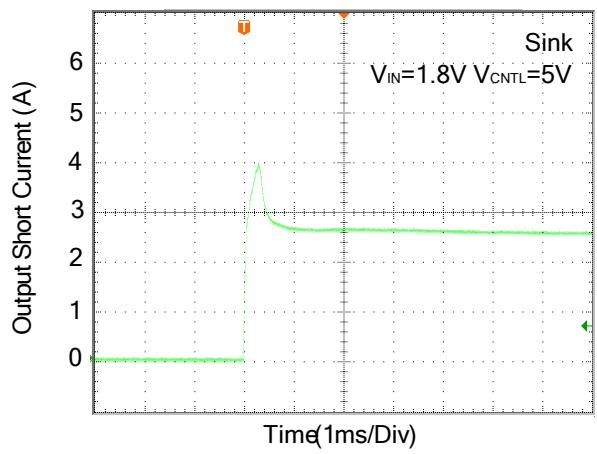
Output Short Circuit Protection



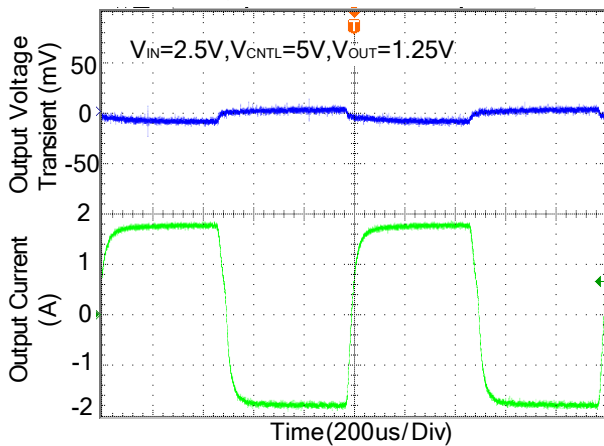
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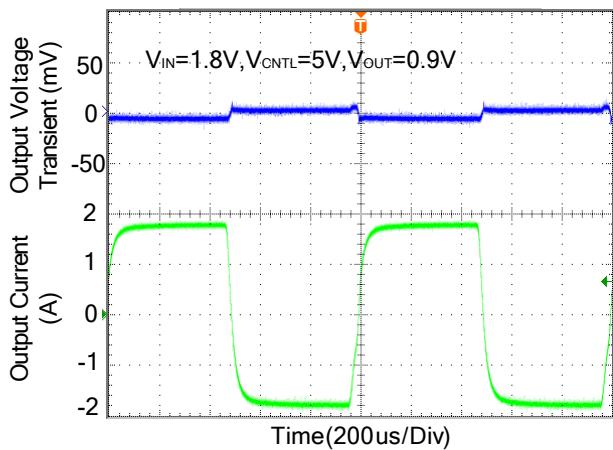
Output Short Circuit Protection



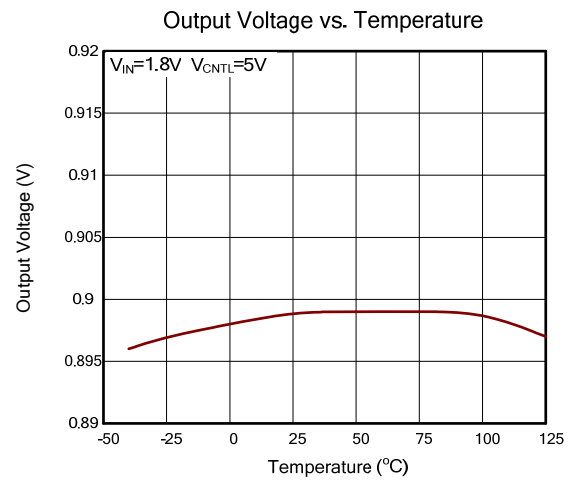
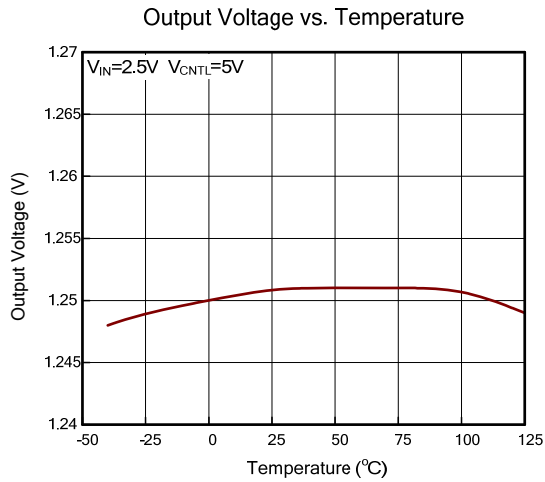
1.25V_{TT}@1.8A Transient Response



0.9V_{TT}@1.8A Transient Response



■ TYPICAL CHARACTERISTICS(Cont.)



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