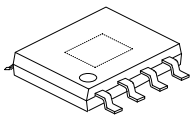
3A DDR BUS TERMINATION REGULATOR



HSOP-8

■ DESCRIPTION

The **UR6515D** is a linear regulator sourcing or sinking continuous 2A or up to 3A transient peak current while regulating an output voltage to within 40mV in the DDR SDRAM bus terminator applications. It contains a high speed operational amplifier which provides fast load transient response.

The **UR6515D** 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

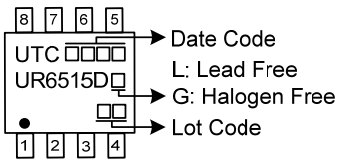
* DDR1/ DDR2/DDR3 termination voltage applications
* Sink and Source Current
  -2A Continues Current
  -Peak 3A for DDR1&DDR2
  -Peak 2.5A for DDR3
* Low output voltage offset within 20mV
* Source and sink 3A peak current
* Adjustable output voltage by external resistors
* Integrated power MOS devices
* Suspend to RAM(STR) functionality
* Current Limiting Protection
* Thermal Shutdown Protection

■ ORDERING INFORMATION

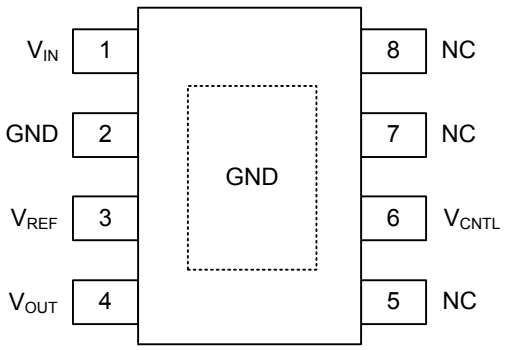
Ordering Number		Package	Packing
Lead Free	Halogen Free		
UR6515DG-SH2-R	UR6515DG-SH2-R	HSOP-8	Tape Reel

UR6515DG-SH2-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) SH2: HSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



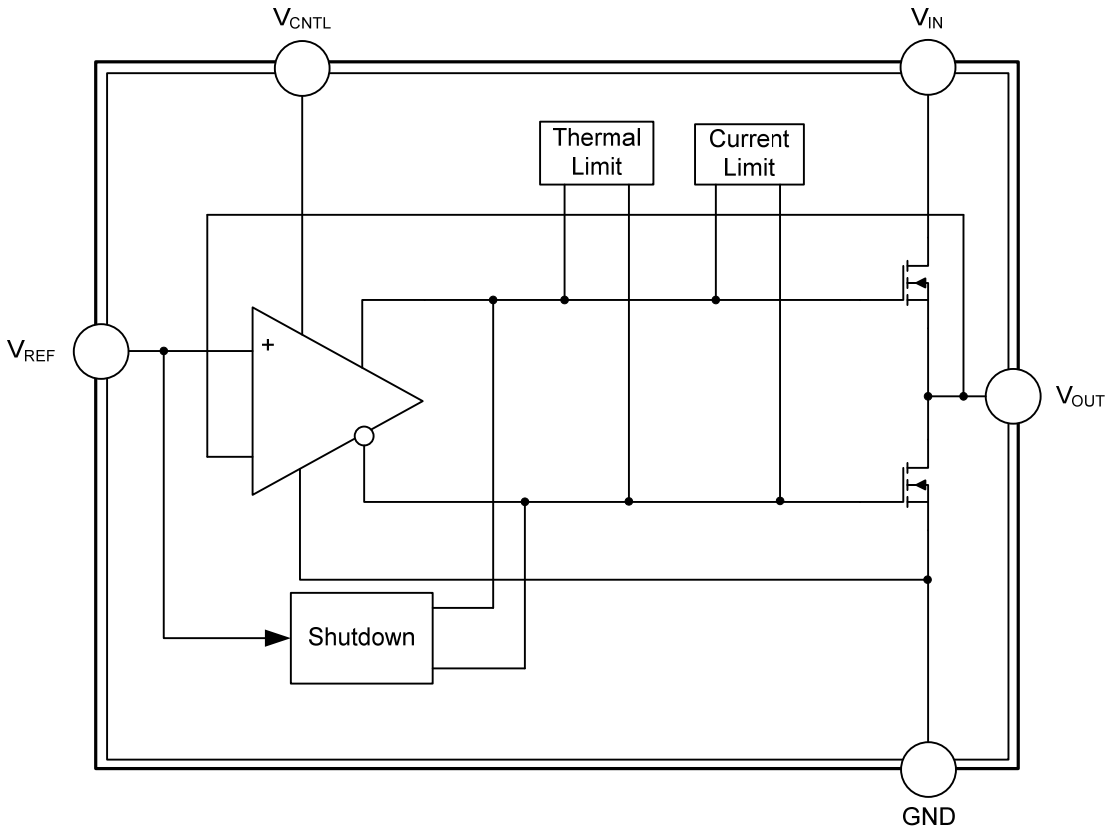
■ PIN CONFIGURATIONS



■ PIN DESCRIPTION

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

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (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°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	MIN	TYP	MAX	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)

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

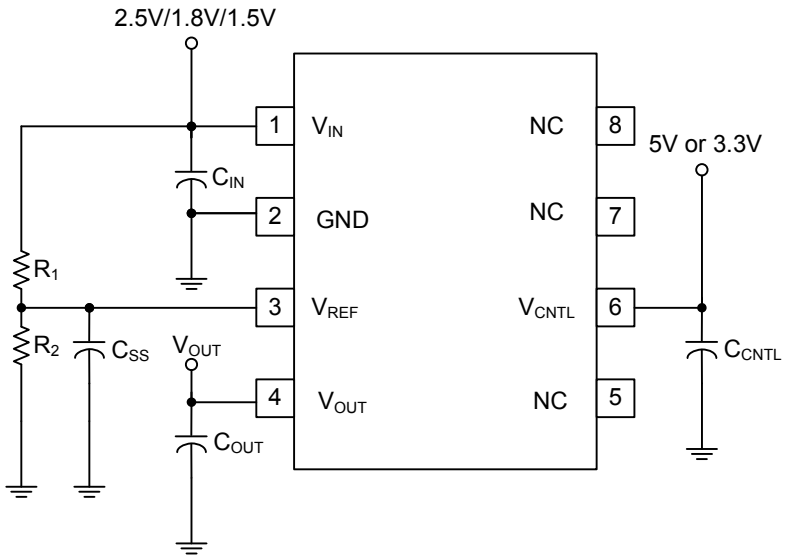
Note: All voltage values are with respect to the network ground terminal unless otherwise noted.

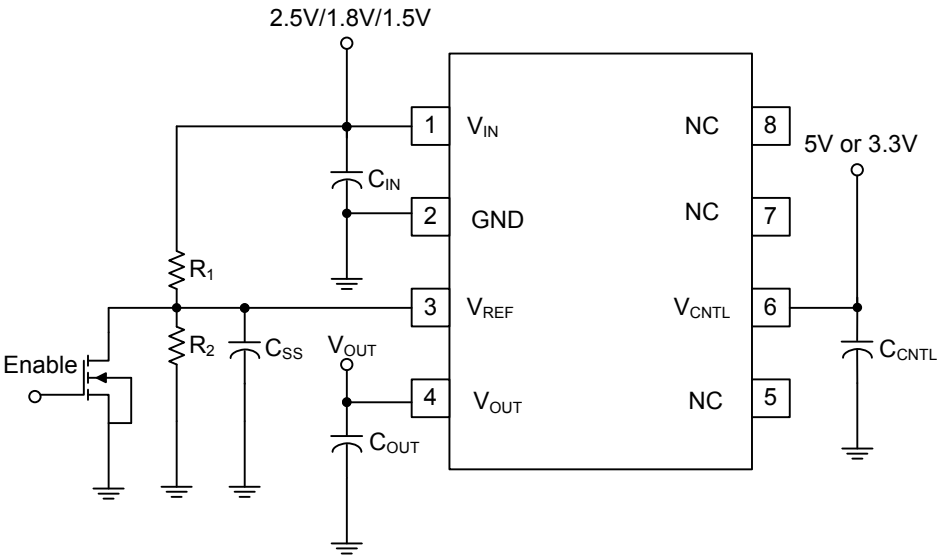
■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

(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	3			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



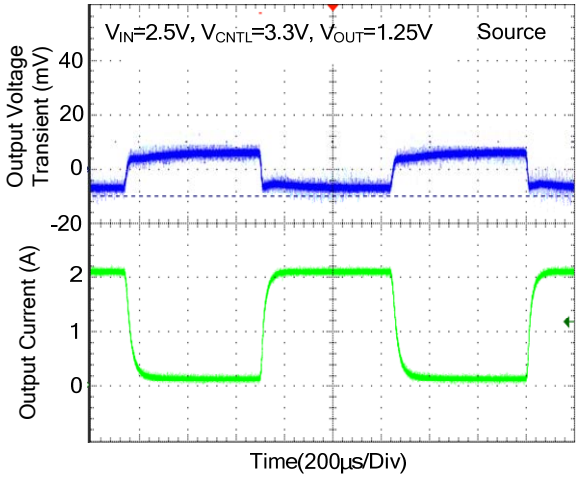


R_1=R_2=100KΩ, C_{OUT}=10μF(Ceramic)+1000μF under the worst case testing condition
C_{SS}=1μF, C_{IN}=470μF(Low ESR), C_{CNTL}=47μF

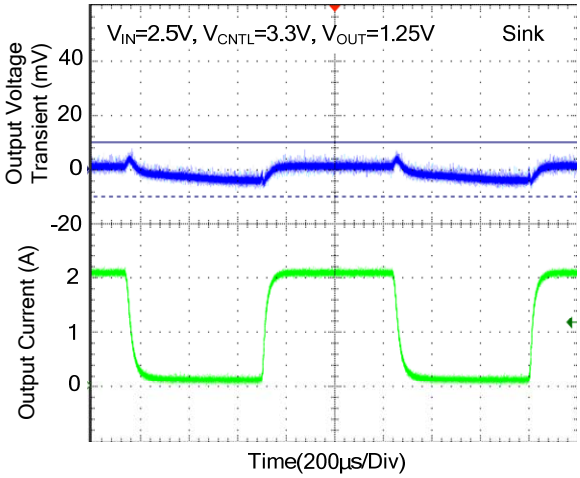
$$V_{REF} = \frac{R_2}{R_1 + R_2} V_{IN}(V)$$, V_{OUT} track V_{REF}

■ TYPICAL CHARACTERISTICS

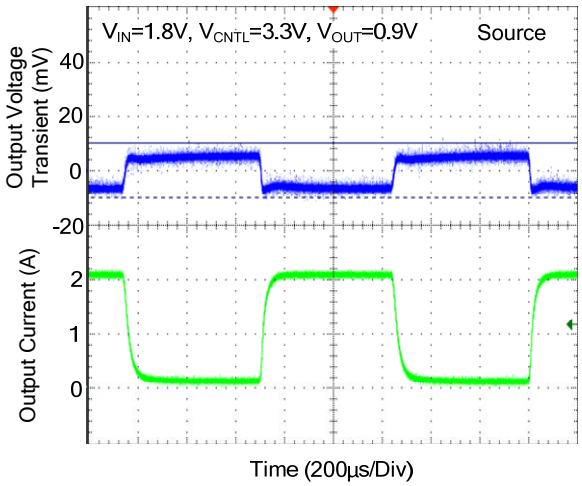
1.25 V_{TT}@2A Transient Response



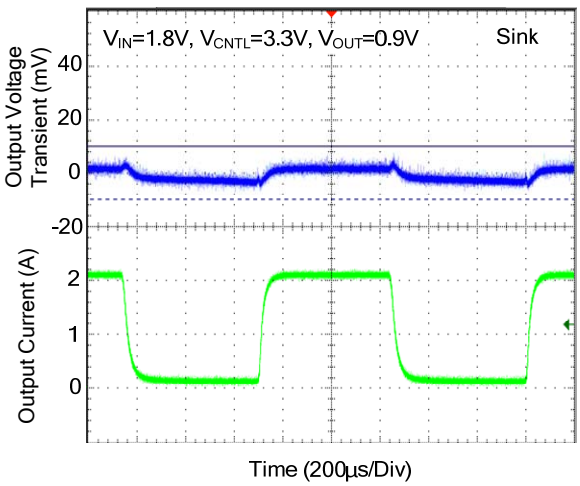
1.25 V_{TT}@2A Transient Response



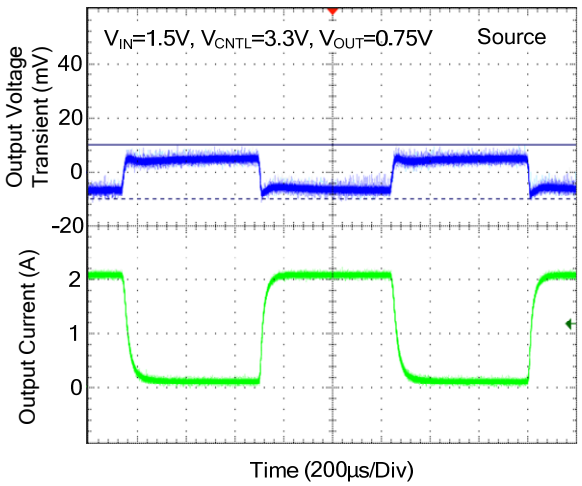
0.9 V_{TT}@2A Transient Response



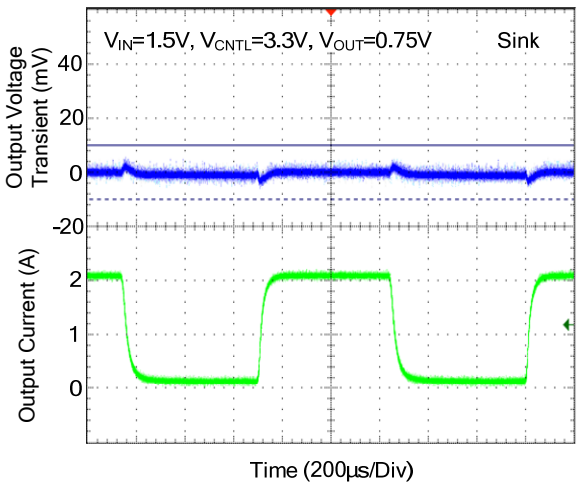
0.9 V_{TT}@2A Transient Response



0.75 V_{TT}@2A Transient Response

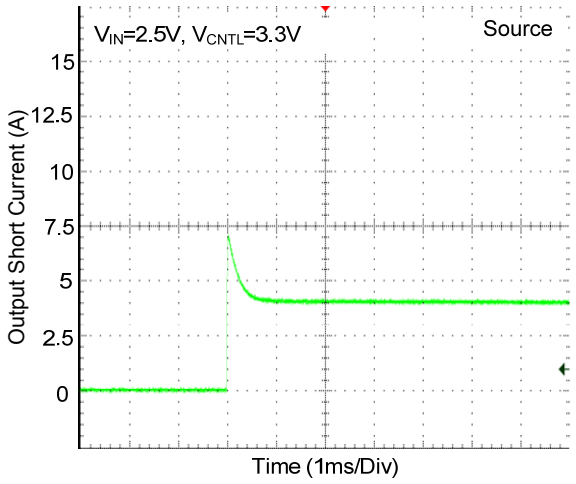


0.75 V_{TT}@2A Transient Response

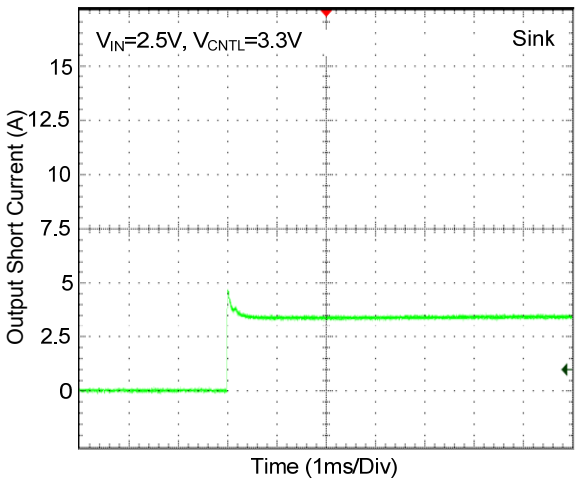


■ TYPICAL CHARACTERISTICS (Cont.)

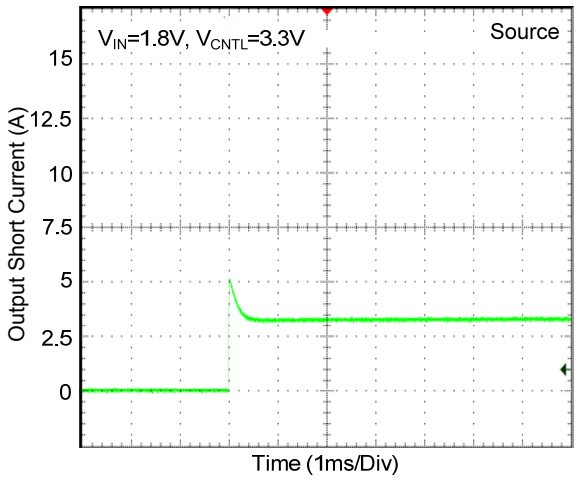
Output Short Circuit Protection



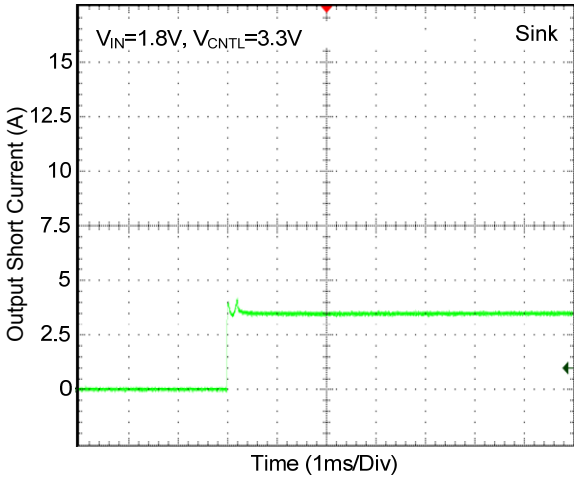
Output Short Circuit Protection



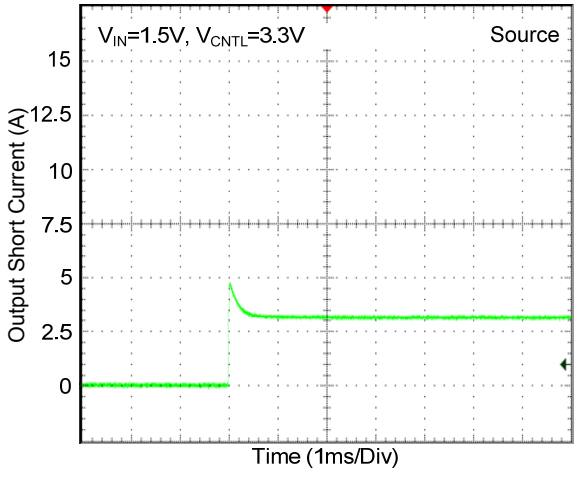
Output Short Circuit Protection



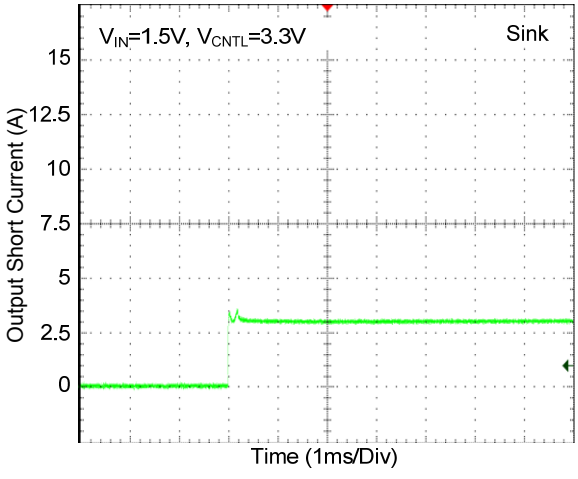
Output Short Circuit Protection



Output Short Circuit Protection



Output Short Circuit Protection



■ TYPICAL CHARACTERISTICS (Cont.)