LC1500

REV1.2-Revised May 2010

500mA, Wide Input Voltage, Low Consumption Linear Regulator

DESCRIPTION

LC1500 series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

LC1500 can provide output value in the range of 1.2V~6.0V every 0.1V step. It also can be customized on command.

LC1500 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

LC1500 has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within ±2%.

LC1500 is available in SOT23-5 or DFN2*2-8 packages which is lead free. It also can available in these packages with lead.

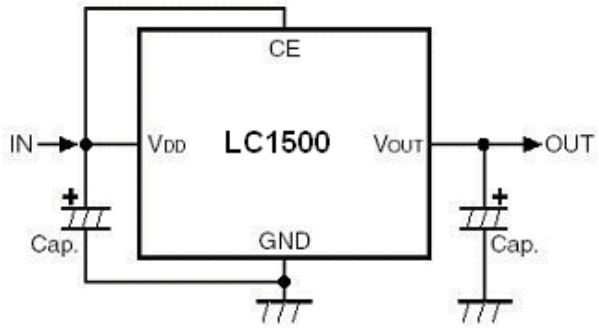
FEATURES

- Low Power Consumption: 75uA（Typ.）
- Low Output Noise (47uVRMS)
- Standby Mode: 0.1uA
- Low Dropout Voltage: 0.46V@500mA (Typ.)
- High Ripple Rejection: 66dB@100Hz (Typ.)
- Low Temperature Coefficient: ± 100ppm/°C
- Excellent Line Regulation: 0.05%/V
- Build-in Chip Enable and Discharge Circuit
- Output Voltage Range: 1.2V~6.0V (Customized on command every 0.1V step)
- Highly Accurate: ±2% (±1% customized)
- Output Current Limit

APPLICATIONS

- Power Source for cellular phones and various kind of PCSs
- Battery Powered equipment
- Power Management of MP3, PDA, DSC, Mouse, PS2 Games
- Reference Voltage Source
- Regulation after Switching Power

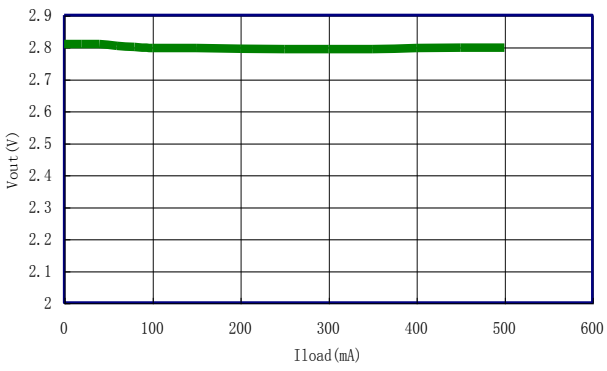
TYPICAL APPLICATION



NOTE: Input capacitor (Cin=1uF) and Output capacitor (Cout=1uF/2.2uF) are recommended in all application circuit.

ELECTRICAL CHARACTERISTICS

LC1500CC3TR28

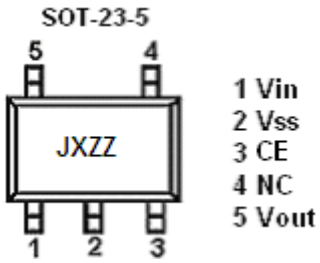


ORDERING INFORMATION

LC1500 1 2 3 4 5

Code	Description
1	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
2	Package type: B5:SOT-23-5 KB:DFN2*2-8
3	Packing type: TR:Tape&Reel (Standard)
4	Output voltage: e.g. 12=1.2V 18=1.8V 60=6.0V
5	Voltage accuracy: Blank(default)=±2%

PIN CONFIGURATION

Product Classification		LC1500CB5TR□□□
Marking		
JXZZ	J:Product Code X: Output Voltage ZZ:Data Code	
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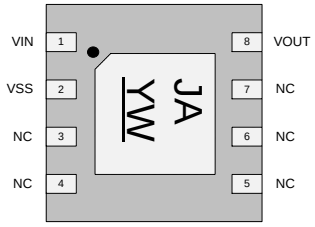
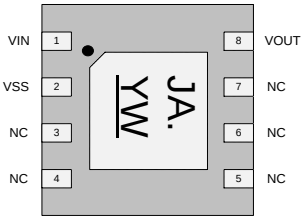
Marking		
JA YW	JA:Product Code Y:Data Code W: Data Code	

Product Classification		LC1500CKBTR50
Marking		
JA YW	JA:Product Code Y:Data Code W: Data Code	
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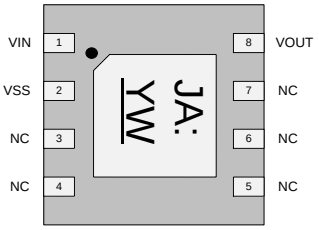
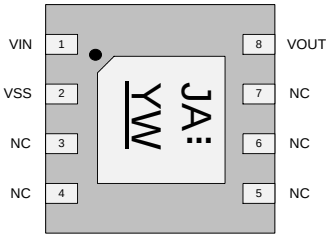
Marking		
JA YW	JA:Product Code Y:Data Code W: Data Code	
Product Classification		LC1500CKBTR60
Marking		
JA YW	JA:Product Code Y:Data Code W: Data Code	
Vss	Ground Pin	
Vin	Supply Voltage Input	
Vout	Output Voltage	

Z: The Year of manufacturing,"7" stands for year 2007,"8" stands for year 2008,and "$\overline{0}$" stands for year 2010.
Z: The week of manufacturing. "A" stands for week 1,"Z" stands for week 26,"$\overline{A}$" stands for week 27,"$\overline{Z}$" stands for week 52.

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		15V
Operating Junction Temperature(Tj)		125°C
Output Current		500mA
Ambient Temperature(Ta)		-40°C –85°C
Power Dissipation	SOT-23-5	250mW
Storage Temperature(Ts)		-40°C -150°C
Lead Temperature & Time		260°C,10S

Note:
Exceed these limits to damage to the device.
Exposure to absolute maximum rating conditions may affect device reliability.

RECOMMENDED WORK CONDITIONS

Item	Min	Recommended	Max.	Unit
Input Voltage Range			14	V
Ambient Temperature	-40		85	°C

ELECTRICAL CHARACTERISTICS

（Test Conditions: Cin=1uF,Cout=3.4uF,TA=25°C, unless otherwise specified.）

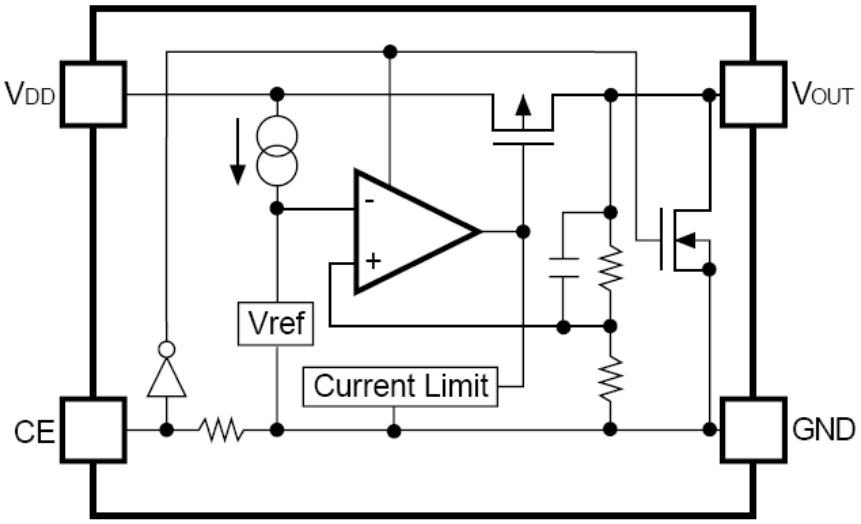
LC1500, For Arbitrary Output Voltage

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				15	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	Vout x0.98	Vout1	Vout X1.02	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop[1]	Dropout Voltage,Vout≥2.8V	Iout=100mA		88	120	mV
		Iout=300mA		270	350	mV
		Iout=500mA		460	600	mV
$\frac{\Delta Vout}{\Delta Vin \cdot Vout}$	Line Regulation	Iout=40mA 2.8V≤Vin≤8V		0.05	0.2	%/V
$\Delta Vout / \Delta Iout$	Load Regulation	Vin=Set Vout+1V 1mA≤Iout≤500mA		20	40	mV
Iss	Supply Current	Vin=Set Vout+1V		75	90	uA
Istandby	Supply Current (Srandby)	Vin=Set Vout+1V Vce=GND		0.1	1.0	uA

$\frac{\Delta Vout}{\Delta T \cdot Vout}$	Output Voltage Temperature Coefficiency	Iout=30mA		±100		ppm/°C
PSRR	Ripple Rejection	F=100Hz, Ripple=0.5Vp-p Vin=Set Vout+1V		65		dB
Ilim	Short Current Limit	Vout=0V		200		mA
Rpd	CE Pull down Resistance		2.0	5.0	10.0	MΩ

NOTE1:
*Vdrop=Vin1-(Vout2*0.98) Vout2 is the output voltage when Vin=Vout1+1.0V and Iout=500mA.*
Vin1 is the input voltage at which the output voltage becomes 98% of Vout1 after gradually decreasing the input voltage.

BLOCK DIAGRAM



Explanation

LC1500 series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

LC1500 can provide output value in the range of 1.2V~6.0V every 0.1V step. It also can be customized on command.

LC1500 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

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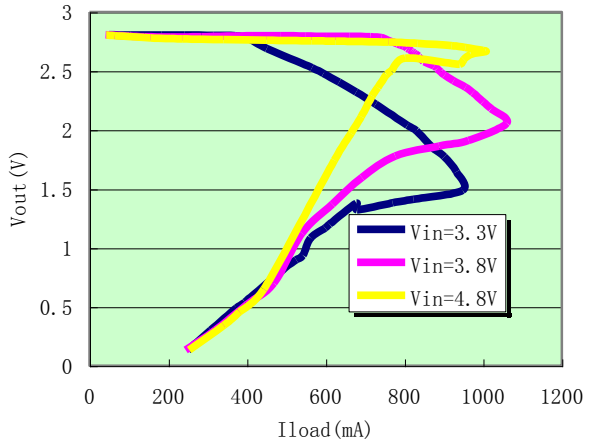
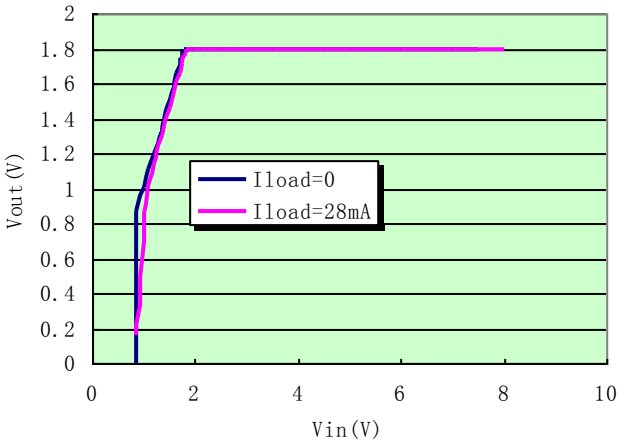
TYPICAL PERFORMANCE CHARACTERISTICS

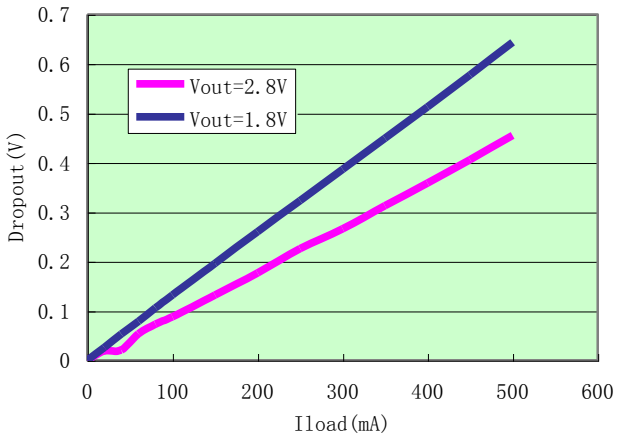
1) Output Voltage vs. Output Current (With Output Short Protection)



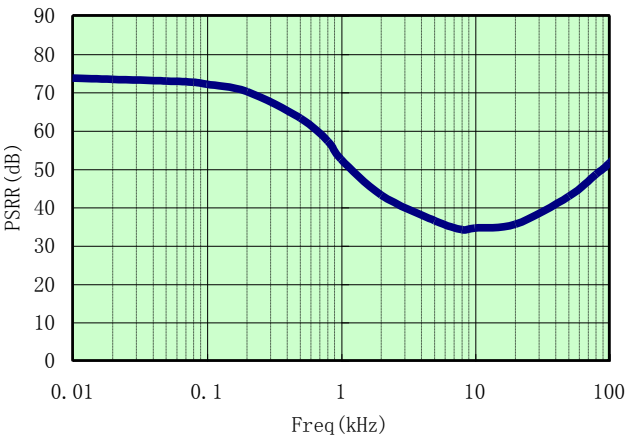
2) Output Voltage vs. Input Voltage



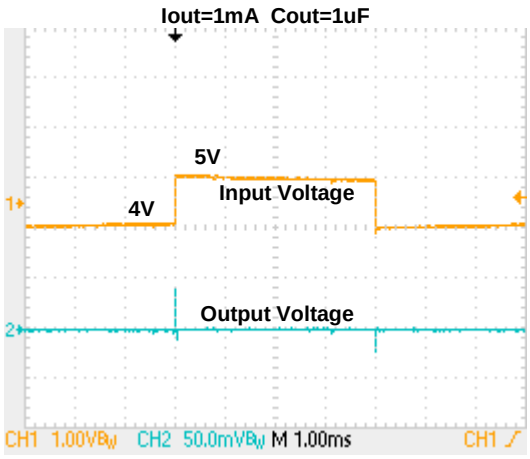
3) Dropout Voltage vs. Output Current

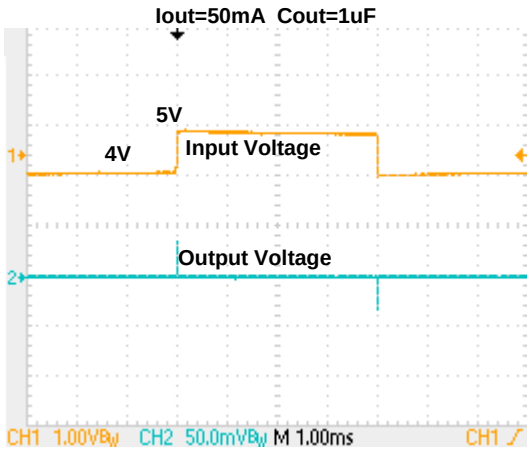


4) Ripple Rejection vs. Frequency

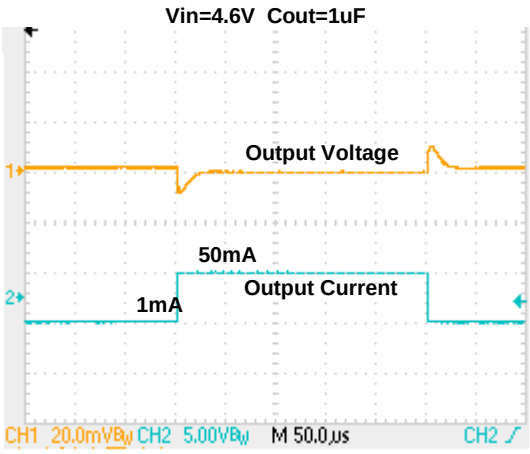


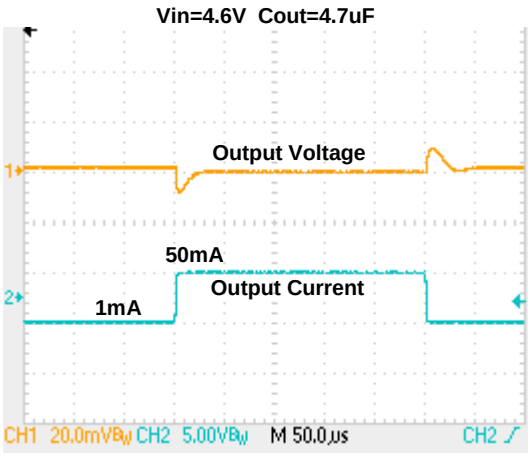
5) Line transient response

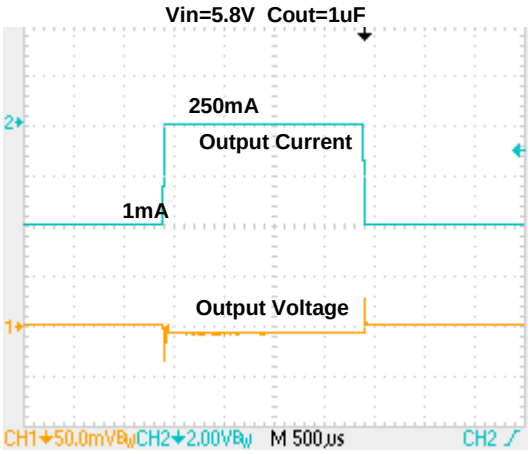


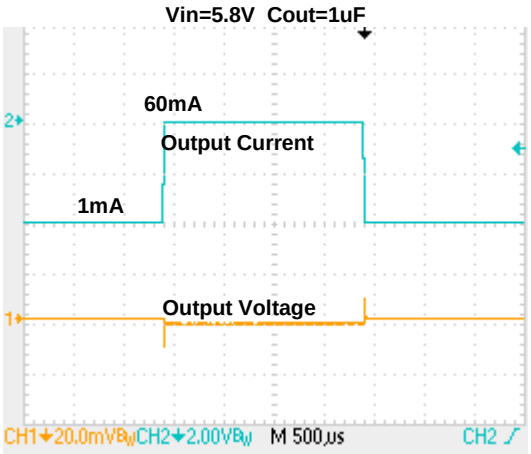


6) Load transient response

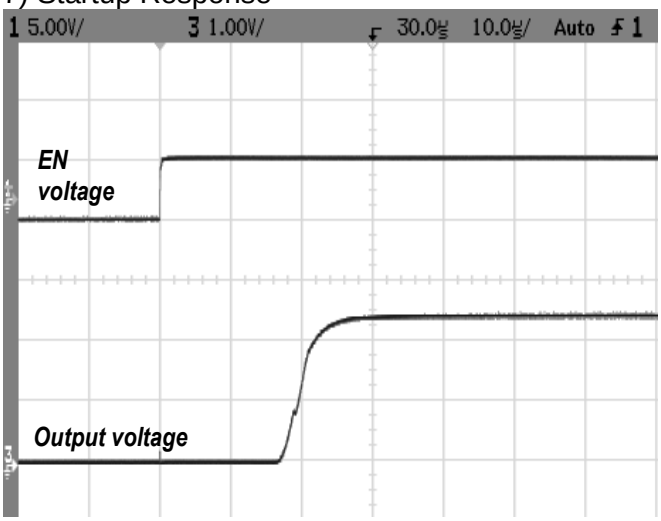




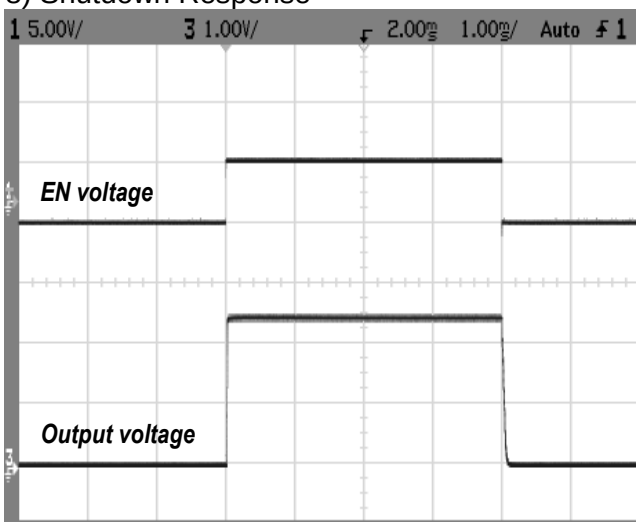




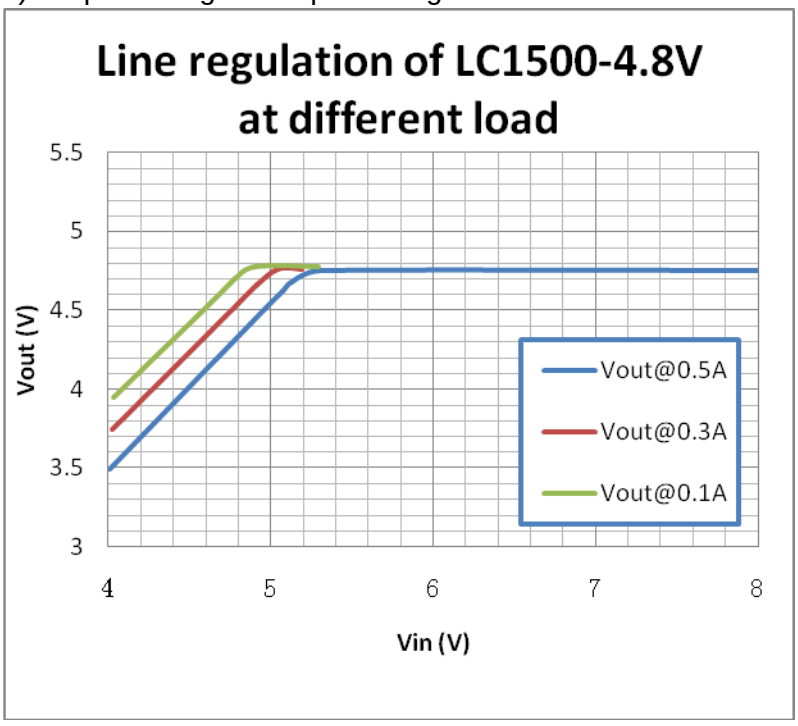
7) Startup Response



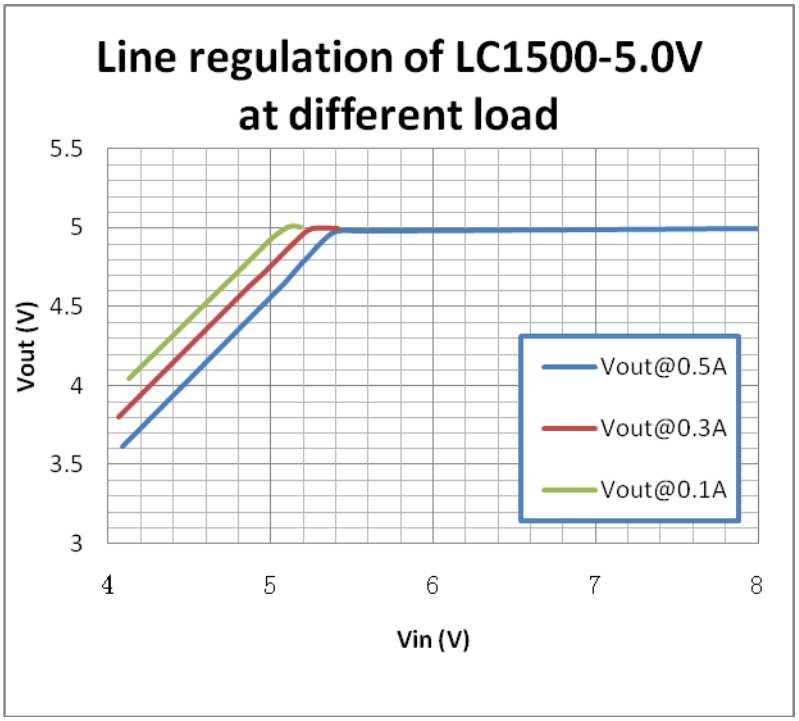
8) Shutdown Response



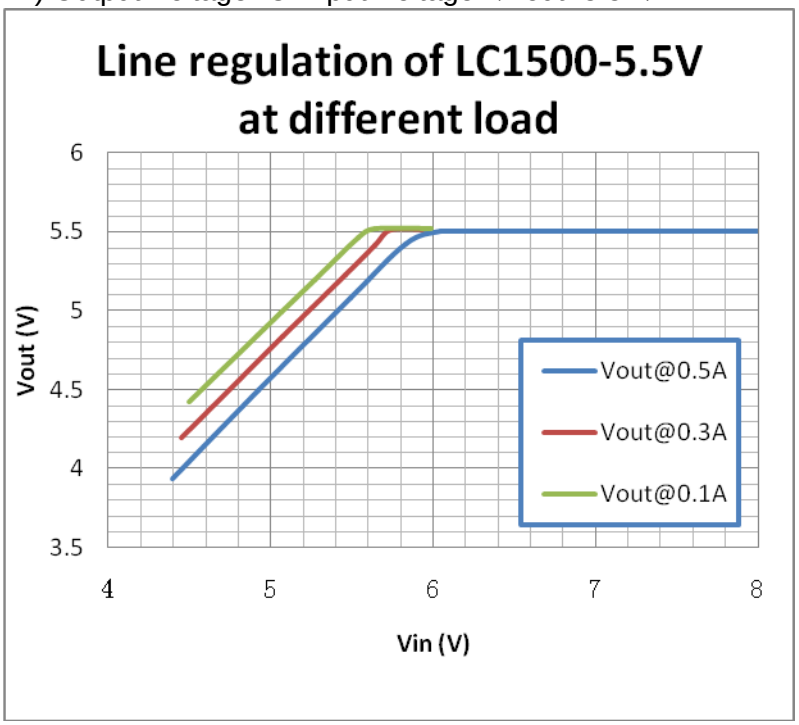
9) Output Voltage vs. Input Voltage（Vout=4.8V）



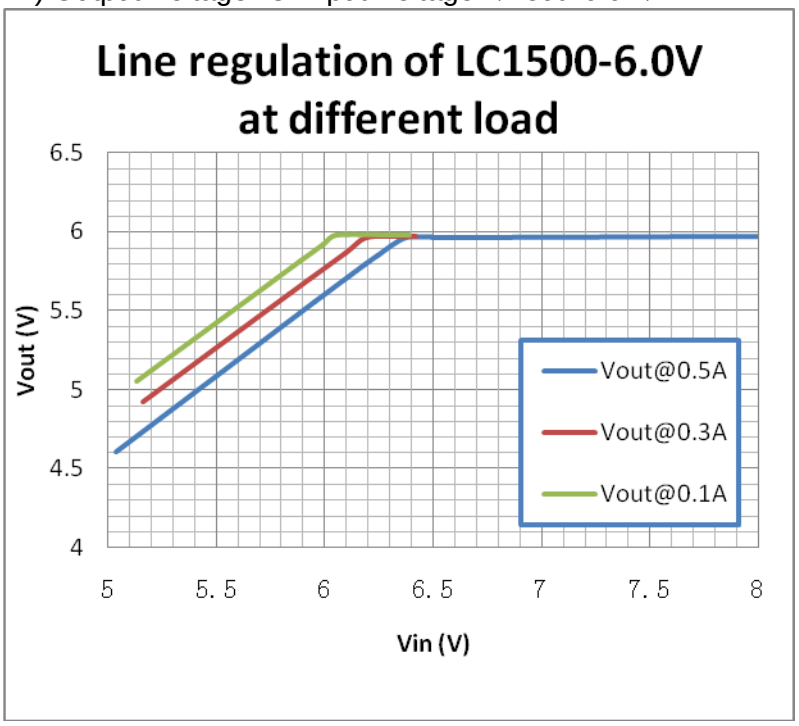
10) Output Voltage vs. Input Voltage（Vout=5.0V）



11) Output Voltage vs. Input Voltage（Vout=5.5V）



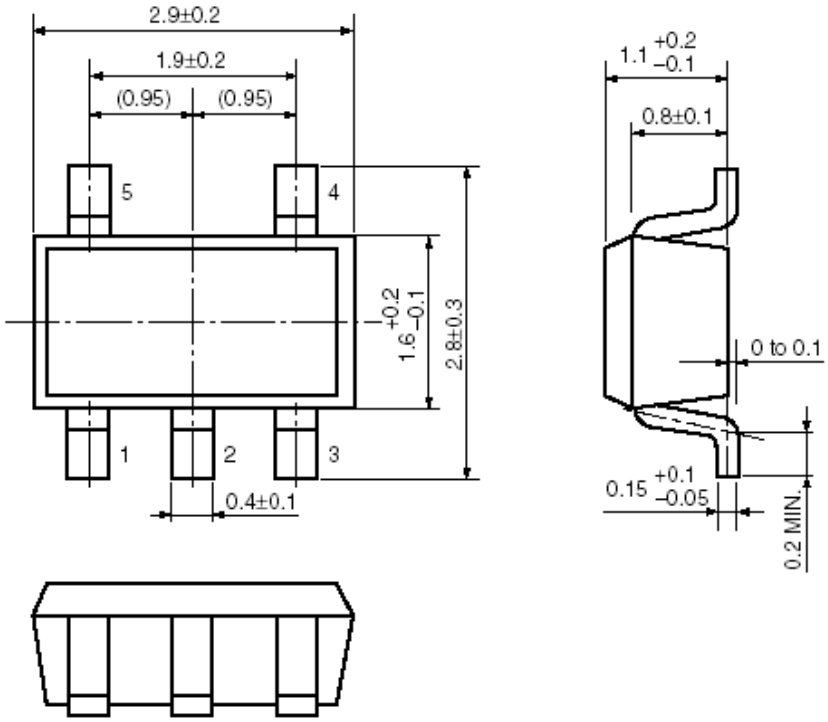
12) Output Voltage vs. Input Voltage（Vout=6.0V）



PACKAGE LINE

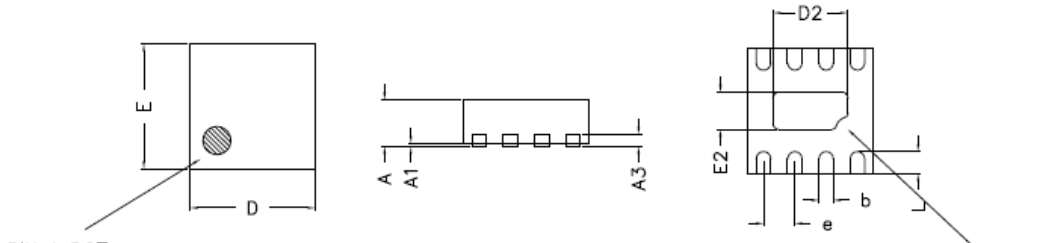
Package	SOT-23-5	Devices per reel	3000Pcs	Unit	mm

Package Dimension:



Package	DFN2*2-8	Devices per reel	3000Pcs	Unit	mm

Package Dimension:



COMMON DIMENSIONS(MM)			
PKG.	W: VERY VERY THIN		
REF.	MIN.	NOM.	MAX
A	0.70	0.75	0.80
A1	0.00	–	0.05
A3	0.2 REF.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
b	0.18	0.23	0.30
L	0.25	0.35	0.45
D2	1.05	1.20	1.30
E2	0.45	0.60	0.70
e	0.50 BSC		