LC1458

500mA High PSRR, Fast Response Linear Regulator

DESCRIPTION

LC1458 series is a group of positive voltage output, low power consumption, low dropout voltage regulator.

LC1458 can provide output value in the range of 1.2V~4.5V every 0.1V step. It also can be customized on command.

LC1458 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

LC1458 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%.

LC1458 is available in SOT23-3, SOT23-5, SOT89-3, SOT89-5 and TO-92 packages which are 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:
  0.7V@Iout=500mA, Vout=2.8V (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~4.5V
  (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=4.7uF) are recommended in all application circuit.*

ELECTRICAL CHARACTERISTICS

Load Regulation
(Vout=3.3V)
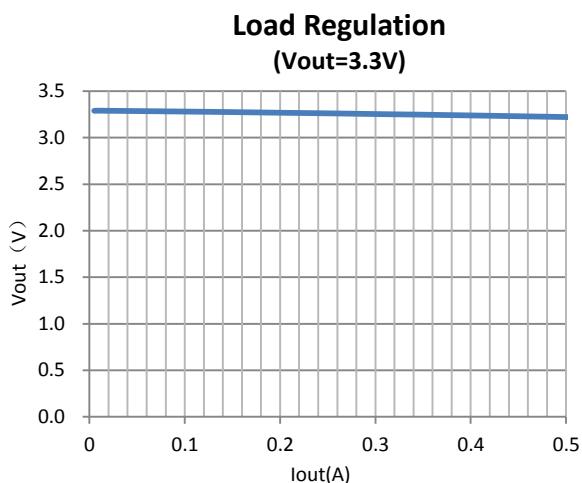
LC1458

ORDERING INFORMATION

LC1458 [1][2][3][4][5]

Code	Description
[1]	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
[2]	Package type: B3:SOT-23-3 B5:SOT-23-5 C3:SOT-89-3 C5:SOT89-5 H:TO-92
[3]	Packing type: TR:Tape&Reel (Standard) BG:Bag(TO-92)
[4]	Output voltage: e.g. 12=1.2V 18=1.8V 45=4.5V
[5]	Voltage accuracy: Blank(default)=±2%

MARKING DESCRIPTON

J: Product Code(SOT23-3&SOT23-5)
X: Output Voltage(SOT23-3&SOT23-5)

Vout	Code	Vout	Code	Vout	Code
1.2V	2	2.5V	$\overline{5}$	3.8V	$\underline{8}$
1.3V	3	2.6V	$\overline{6}$	3.9V	$\underline{9}$
1.4V	4	2.7V	$\overline{7}$	4.0V	$\underline{0}$
1.5V	5	2.8V	$\overline{8}$	4.1V	$\underline{1}$
1.6V	6	2.9V	$\overline{9}$	4.2V	$\underline{2}$
1.7V	7	3.0V	$\underline{0}$	4.3V	$\underline{\overline{3}}$
1.8V	8	3.1V	$\underline{1}$	4.4V	$\underline{\overline{4}}$
1.9V	9	3.2V	$\underline{2}$	4.5V	$\underline{\overline{5}}$
2.0V	$\overline{0}$	3.3V	$\underline{3}$		
2.1V	$\overline{1}$	3.4V	$\underline{4}$		
2.2V	$\overline{2}$	3.5V	$\underline{5}$		
2.3V	$\overline{3}$	3.6V	$\underline{6}$		
2.4V	$\overline{4}$	3.7V	$\underline{7}$		

Y: The Year of manufacturing,"1" stands for year 2011,"2" stands for year 2012, and "8" stands for year 2018.
W: 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.

PIN CONFIGURATION

Product Classification		LC1458CB3TR□□□
Marking		SOT-23-3
JXYW	J:Product Code	
	X: Output Voltage	JXYW 1 Vss / 2 Vout / 3 Vin
	YW:Data Code	
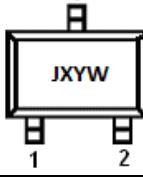
Product Classification		LC1458CB5TR□□□
Marking		SOT-23-5
JXYW	J:Product Code	
	X: Output Voltage	JXYW 1 Vin / 2 Vss / 3 CE / 4 NC / 5 Vout
	YW:Data Code	
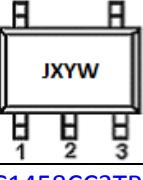
Product Classification		LC1458CC3TR□□□
Marking		SOT-89-3
JAXX LLBY W	JA:Product Code	
	XX: Output Voltage	JAXX LLBYW 1 Vss / 2 Vin / 3 Vout
	LL:Lot No.	
	B:Fab code	
	YW:Data Code	
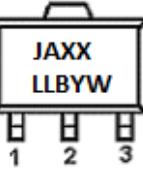
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Marking		SOT-89-5
JAXX B LLBY W	JA:Product Code	
	XX: Output Voltage	JAXXB LLBYW 1 NC / 2 Vss / 3 CE / 4 Vin / 5 Vout
	LL:Lot No.	
	B:Fab code	
	YW:Data Code	
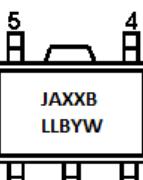
Product Classification		LC1458CHBG□□□
Marking		TO-92
JAXX LLBY W	JA:Product Code	
	XX: Output Voltage	JAXX LLBYW 1 Vin / 2 Vss / 3 Vout
	LL:Lot No.	
	B:Fab Code	
	YW:Data Code	
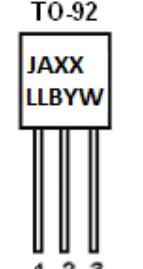
Vss	Ground Pin
Vin	Supply Voltage Input
Vout	Output Voltage
CE	Chip Enable
NC	No Connection

LC1458

ABSOLUTE MAXIMUM RATING

Parameter		Value
Max Input Voltage		12V
Operating Junction Temperature(Tj)		125°C
Output Current		500mA
Ambient Temperature(Ta)		-40°C –85°C
Power Dissipation	SOT23-3	250mW
	SOT23-5	250mW
	SOT89-3	500mW
	SOT89-5	500mW for normal application 800mW with 10mmx20mm heat dissipation coil
	TO-92	500mW
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			10	V
Ambient Temperature	-40		85	°C

ELECTRICAL CHARACTERISTICS

(Test Conditions: Cin=1uF,Cout=3.3uF,TA=25°C, unless otherwise specified.)
LC1458CB5TR12

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	1.17	1.2	1.23	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop1	Dropout Voltage	Iout=300mA		690	900	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	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

Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

Note: 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.

LC1458CB5TR15

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	1.47	1.5	1.53	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		600	750	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	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
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

LC1458CB5TR18

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	1.76	1.8	1.84	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		540	660	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	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
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

LC1458CB5TR27

| Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	2.64	2.7	2.76	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		400	500	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	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
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

LC1458CB5TR28

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	2.74	2.8	2.86	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		380	460	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	Output Voltage Temperature Coefficiency	Iout=30mA		±100		ppm/°C
PSRR	Ripple Rejection	F=100Hz, Ripple=0.5Vp-p		65		dB

		Vin=Set Vout+1V				
Ilim	Short Current Limit	Vout=0V		200		mA
Rpd	CE Pull down Resistance		2.0	5.0	10.0	MΩ
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

LC1458CB5TR30

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	2.94	3.0	3.06	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		350	425	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	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
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

LC1458CB5TR33

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	3.23	3.3	3.37	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		330	400	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	Output Voltage Temperature Coefficiency	Iout=30mA		±100		ppm/°C
PSRR	Ripple Rejection	F=100Hz,		65		dB

		Ripple=0.5Vp-p Vin=Set Vout+1V				
Ilim	Short Current Limit	Vout=0V		200		mA
Rpd	CE Pull down Resistance		2.0	5.0	10.0	MΩ
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

LC1458CB5TR45

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Vin	Input Voltage				10	V
Vout	Output Voltage	Vin=Set Vout+1V 1mA≤Iout≤30mA	4.41	4.5	4.59	V
Iout (Max.)	Maximun Output Current	Vin-Vout=1V	500			mA
Vdrop	Dropout Voltage	Iout=300mA		280	340	mV
$\dfrac{\Delta Vout}{\Delta Vin \cdot Vout}$	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=Vss		0.1	1.0	uA
$\dfrac{\Delta Vout}{\Delta T \cdot Vout}$	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
Vceh	CE Input Voltage "H"		1.5		Vin	V
Vcel	CE Input Voltage "L"		0		0.25	V

BLOCK DIAGRAM
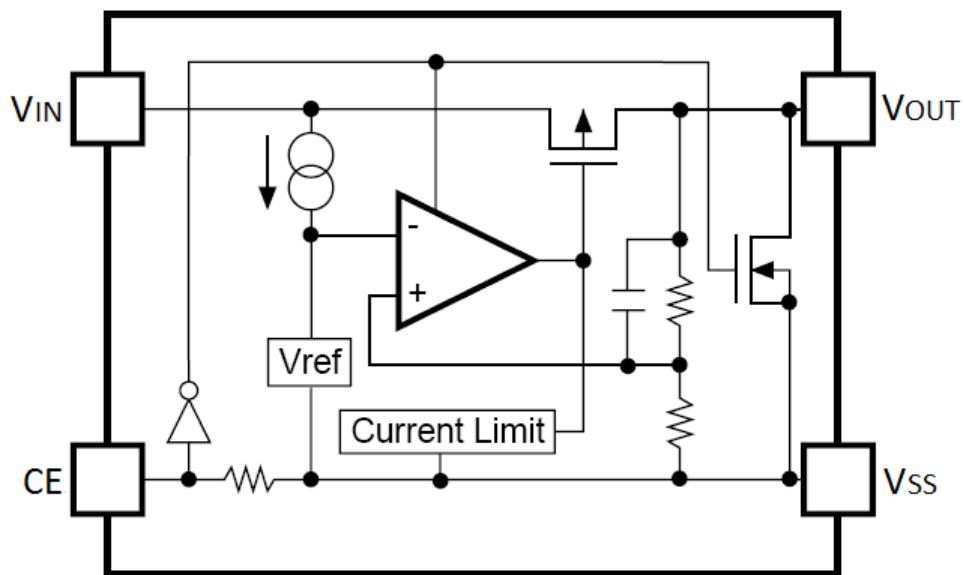
EXPLANATION

LC1458 series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

LC1458 can provide output value in the range of 1.2V~4.5V every 0.1V step. It also can be customized on command.

LC1458 includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

LC1458 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%.

TYPICAL PERFORMANCE CHARACTERISTICS

Tested under TA=25°C, unless otherwise specified.
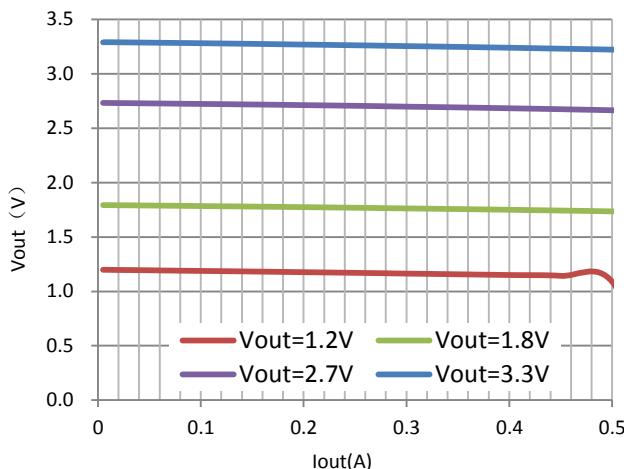
Load Regulation

Line Regulation (Vout=1.2V)
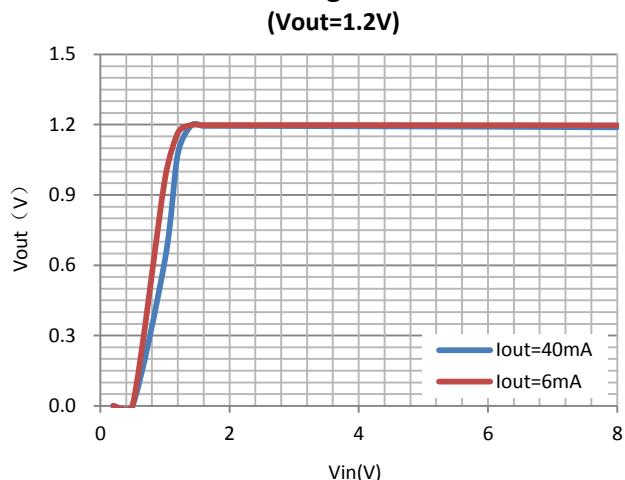
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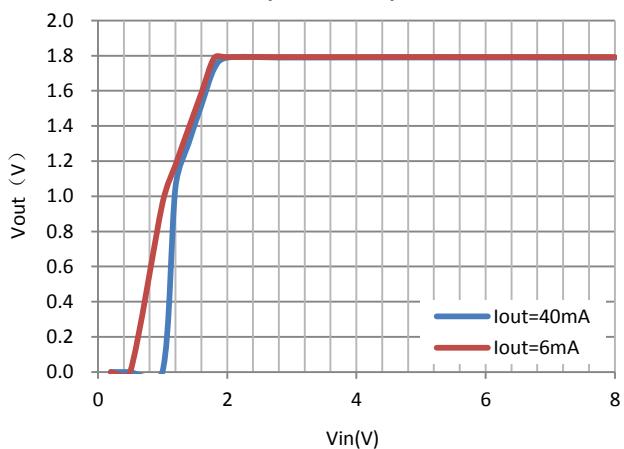
Line Regulation (Vout=2.7V)
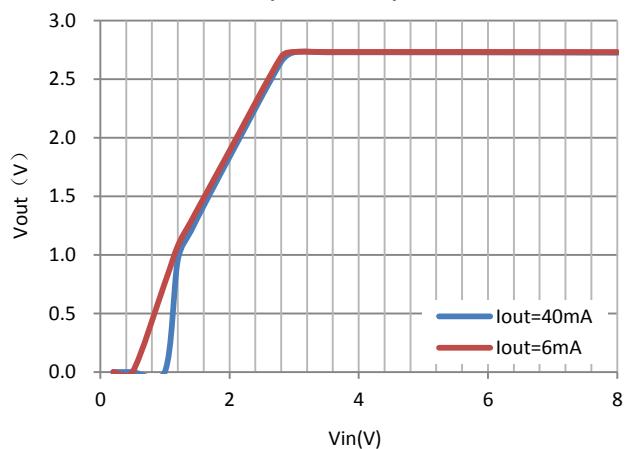
Line Regulation (Vout=3.3V)
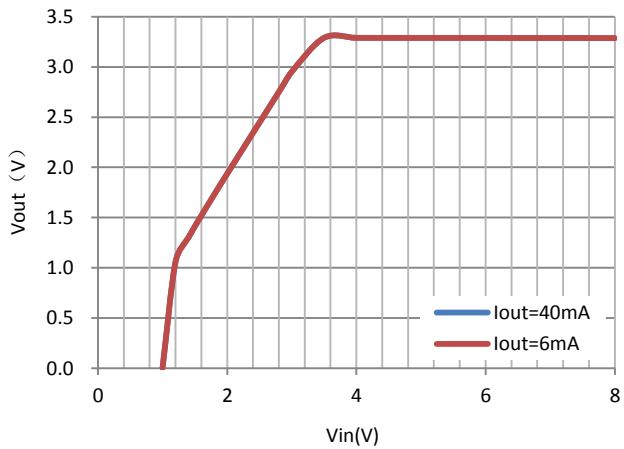
Dropout Voltage
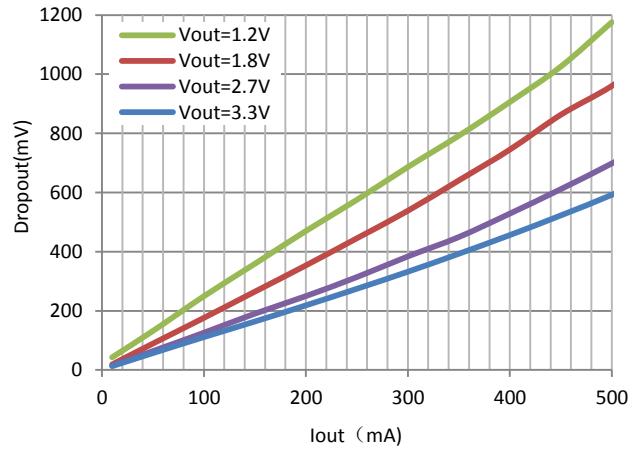
LC1458

Startup Response
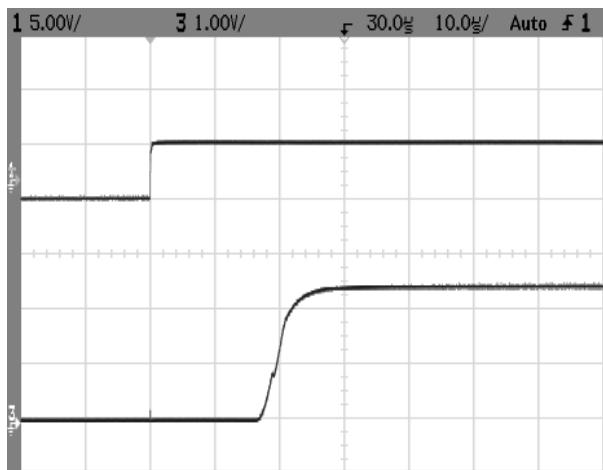
Shutdown Response

Line transient response

Iout=1mA Cout=4.7uF

5V

4V

Input Voltage

Output Voltage

CH1 1.00VBw CH2 50.0mVBw M 1.00ms   CH1 ∫

Load transient response

Vin=4.6V Cout=4.7uF

Output Voltage

50mA

Output Current

1mA

CH1 20.0mVBw CH2 5.00VBw   M 50.0 µs   CH2 ∫
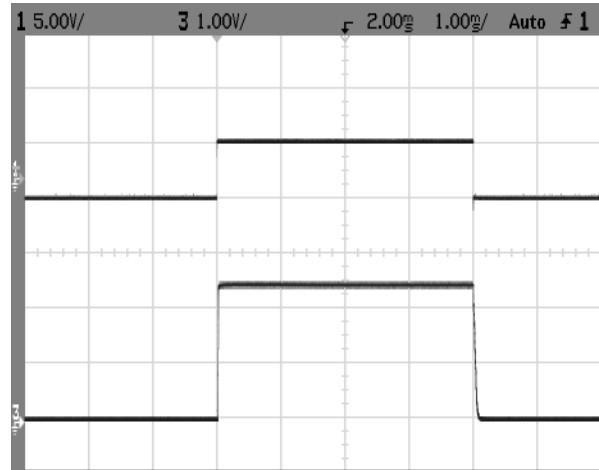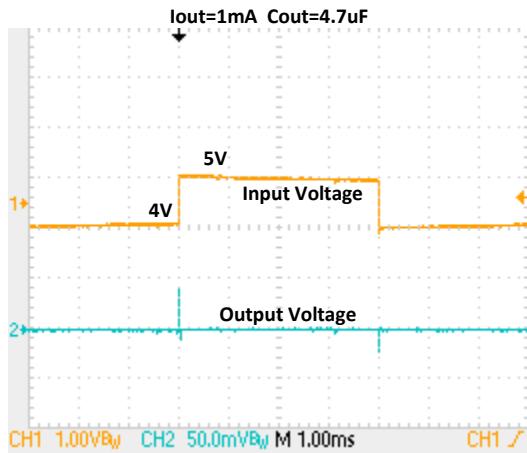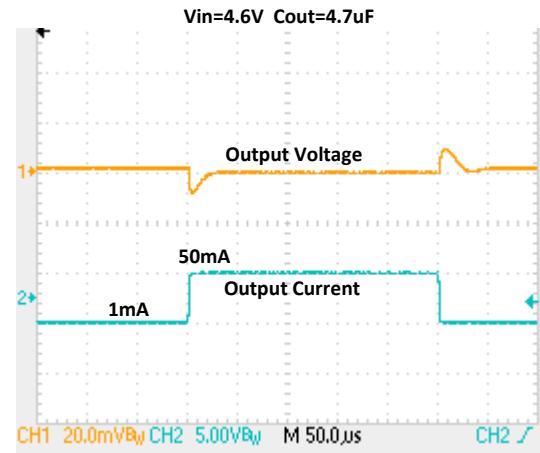
PACKAGE LINE

Package	SOT-23-3	Devices per reel	3000Pcs	Unit	mm

Package dimension：

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

Package Dimension:

Package	SOT-89-3	Devices per reel	1000Pcs	Unit	mm

Package Dimension:

Package	SOT89-5	Devices per reel	1000Pcs	Unit	mm

Package Dimension:

Package	TO-92	Devices per Bag	1000Pcs	Unit	mm

Package Dimension:

TO-92