

## Low Voltage Detector With Built-in Delay Circuit

### DESCRIPTION

BL8518 is a series of high precision voltage detector with ultra-low current consumption (4.5uA typ. at  $V_{in}=3.0V$ ) and a built-in delay circuit. It can work at very low voltage, which makes it perfect for system reset.

BL8518 is composed of high precision voltage reference, comparator, delay circuit, output driver and resistor array. Internally preset detect voltage has a low temperature drift and requires no external trimming.

Two type of output, CMOS and N-channel open-drain are available.

BL8518 is available in small size SOT-23 package which is Pb free.

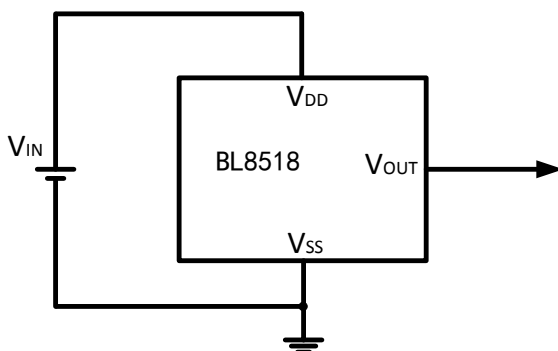
### FEATURES

- High-Precision Detection Voltage:  $\pm 3\%$
- Detection Voltage: 2.63V and 2.93V (customized other voltages)
- Built-in Power on Reset Delay time circuit: Refer to Selection Guide
- Operating Voltage Range: 1.2V~6V
- Ultra-low current consumption: 4.5uA typ. (at  $V_{in}=3.0V$ )
- Two Output Forms: CMOS (Active Low) and N-channel open-drain (Active Low)

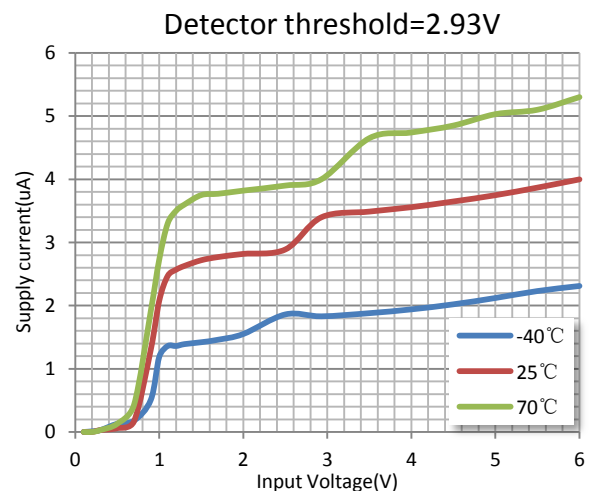
### APPLICATIONS

- Power monitor for portable equipment such as PDA, DSC, Mobile phone, Notebook, MP3
- CPU and Logic Circuit Reset
- Battery Checker
- Battery Back-up Circuit
- Power Failure Detector

### TYPICAL APPLICATION



### ELECTRICAL CHARACTERISTICS

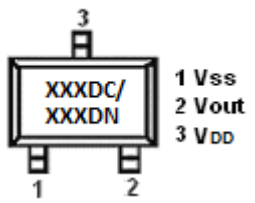
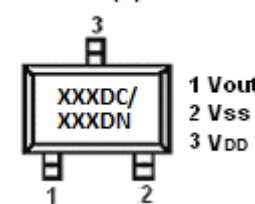


## ORDERING INFORMATION

BL8518 ①②③④⑤⑥

Code	Description
①	Temperature&Rohs: C:-40~85°C ,Pb Free Rohs Std.
②	Package type: B3:SOT-23(A) B3B:SOT-23(B)
③	Packing type: TR:Tape&Reel (Standard)
④	Detector Voltage: e.g. 263=2.63V 293=2.93V
⑤	Delay time: D:200mS
⑥	Output forms: C:CMOS N:Nch

## PIN CONFIGURATION

Product Classification		BL8518CB3TR□□□
Marking		SOT-23(A)
XXXDC/ XXXDN	XXX: Detector Voltage	
	D:Delay time D:200mS	
	C:CMOS N:Nch	
Product Classification		BL8518CB3BTR□□□
Marking		SOT-23(B)
XXXDC/ XXXDN	XXX: Detector Voltage	
	D:Delay time D:200mS	
	C:CMOS N:Nch	
Vss	Ground Pin	
VDD	Supply Voltage Input	
Vout	Voltage detection output pin	

## ABSOLUTE MAXIMUM RATING

Parameter	Value
Input Voltage	-0.3V-8V
Output Voltage range	-0.3V- 8V
Maximum Output current	70mA
Ambient Temperature(Ta)	-40°C -85°C
Power Dissipation	SOT-23 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	1.2		6	V
Ambient Temperature	-40	25	85	°C

## ELECTRICAL CHARACTERISTICS

BL8518CXXTR263DC/N(2.63V)

(T<sub>opt</sub> = 25 °C, Unless otherwise specified.)

Symbol	Parameter	Conditions	Reference data			Unit
			Min.	Typ.	Max.	
-VDET	Detector Threshold		2.551	2.63	2.709	V
ISS	Current consumption	VDD=4.63V		4.5	10	uA
VDDH	Maximum operating voltage				10	V
VDDL	Minimum Operating voltage			0.5		V
IOUT	Output current	Pch VDS=-2.1V, VDD=4.5V	1.0	2.0		mA

BL8518CXXTR293DC/N(2.93V)

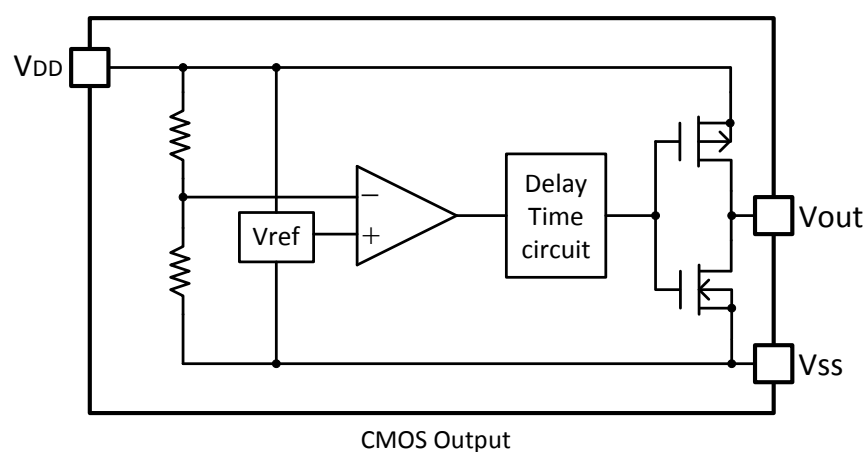
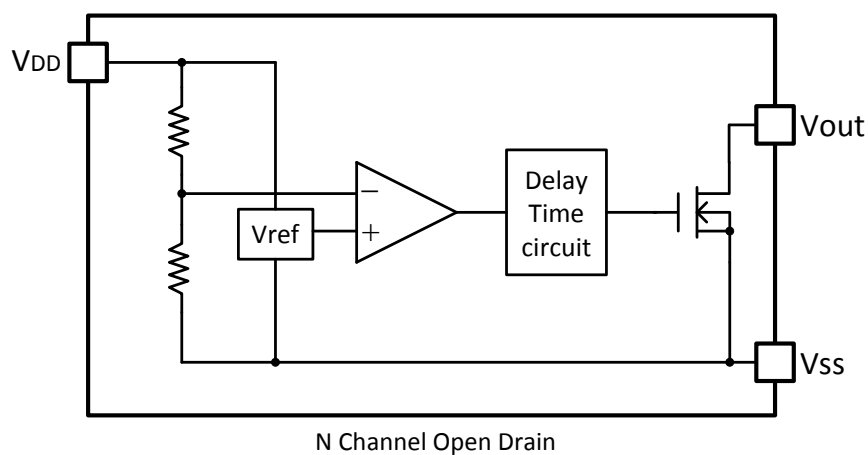
(T<sub>opt</sub> = 25 °C, Unless otherwise specified.)

Symbol	Parameter	Conditions	Reference data			Unit
			Min.	Typ.	Max.	
-VDET	Detector Threshold		2.842	2.93	3.018	V
ISS	Current consumption	VDD=4.93V		4.5	10	uA
VDDH	Maximum operating voltage				10	V
VDDL	Minimum Operating voltage			0.5		V
IOUT	Output current	Pch VDS=-2.1V, VDD=4.5V	1.0	2.0		mA

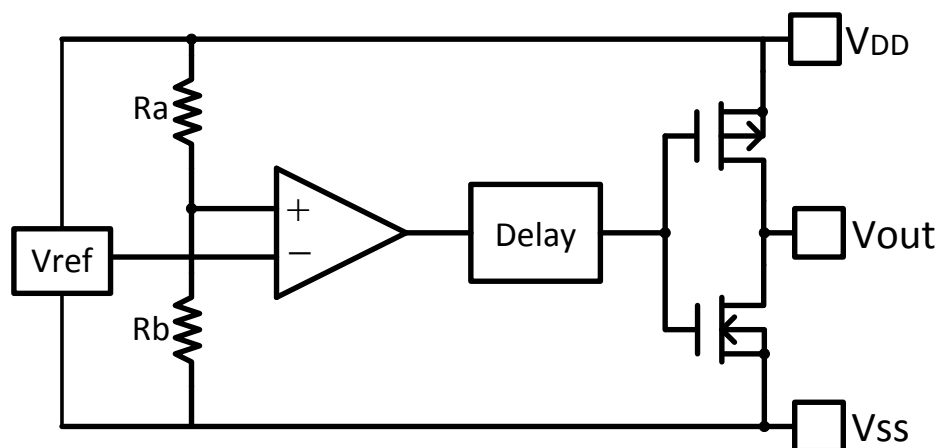
## ELECTRICAL CHARACTERISTICS BY OUTPUT DELAY TIME

Part Number	Test Condition	Output Delay Time			Unit
		Min.	Typ.	Max.	
BL8518CXXTRXXXDC/N	VDD=1.0V to Vdet+1.0V	140	200	300	ms

## BLOCK DIAGRAM

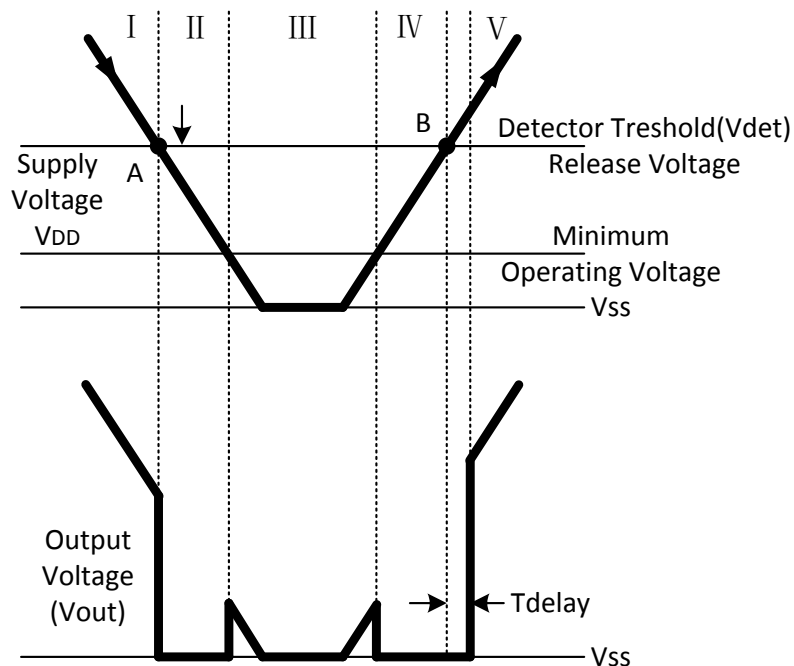


## FUNCTION DESCRIPTION



High precision low temperature co-efficiency reference voltage is applied to the negative input of a comparator. Input voltage, divided by resistor array of Ra and Rb, is applied to the positive input of the comparator. Output of the comparator passes a delay circuit and a series of buffer to drive the output CMOS pair.

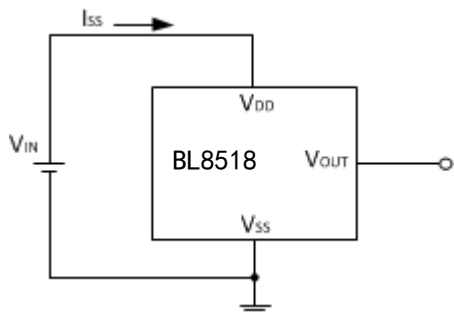
$$V_{DET} = V_{REF} * (1 + R_a/R_b)$$



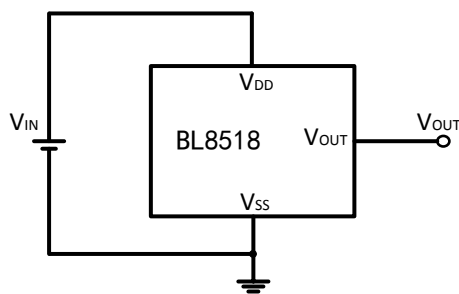
No.	Operation status	Output status
I	$V_{DD} > V_{det}$	Output voltage is equal to the supply voltage
II	$V_{DD}$ drops below $V_{det}$	Output voltage equals to GND level
III	$V_{DD}$ drops further below $V_{DDL}$	Output voltage is undefined
IV	$V_{DD}$ rises above $V_{DDL}$	Output voltage equals to GND level
V	$V_{DD}$ rises above $V_{det}$	Output voltage equals to supply voltage after $T_{delay}$

## TEST CIRCUITS

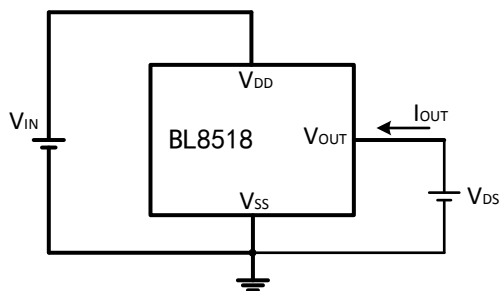
(1) Supply current test circuit



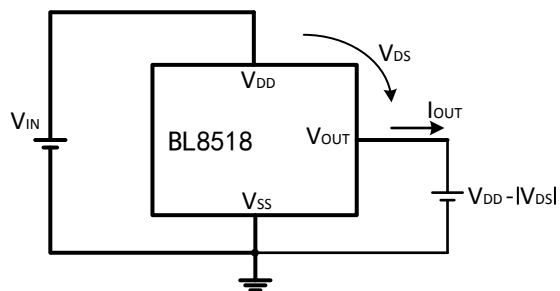
(2) Detector threshold test circuit



(3) NCH Drive Output Current Test Circuit



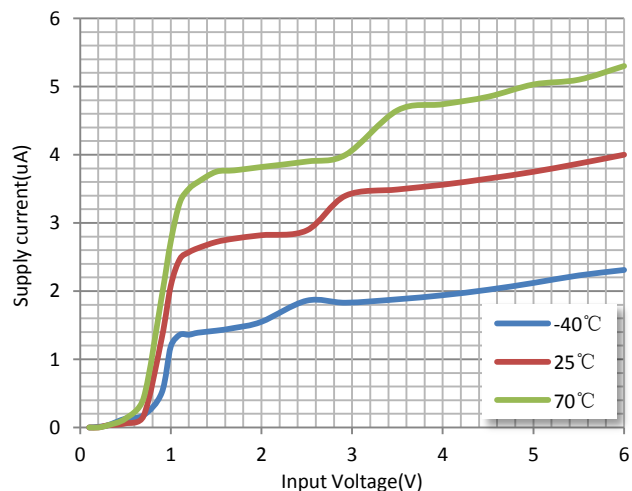
(4) PCH Drive Output Current Test Circuit



## TYPICAL PERFORMANCE CHARACTERISTICS

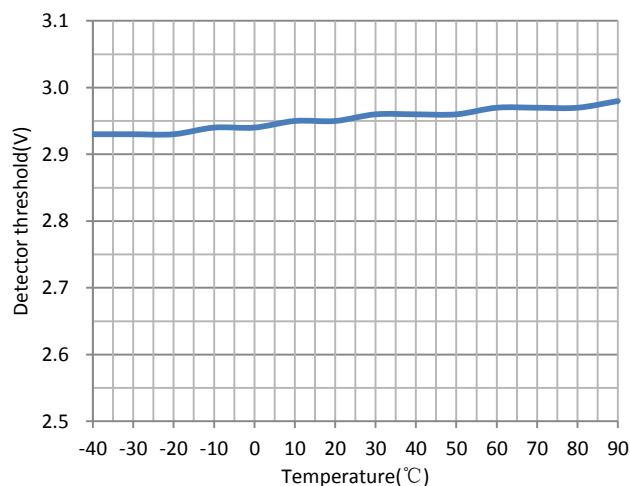
1) Supply current VS. Input voltage

Detector threshold=2.93V



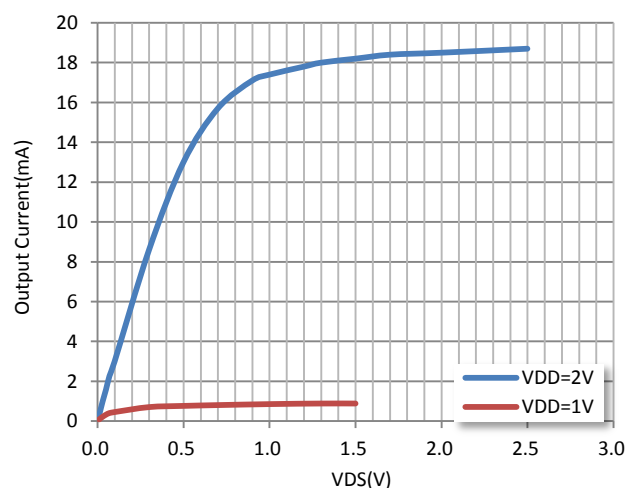
2) Detector Threshold VS. Temperature

Detector threshold=2.93V



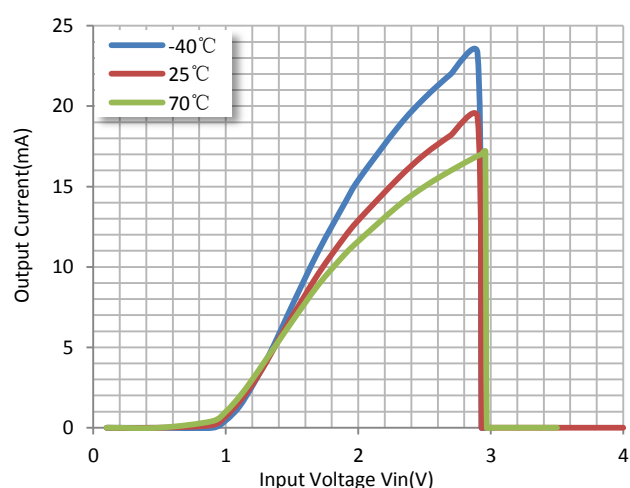
3) Nch Driver Output Current VS. VDS

Detector threshold=2.93V



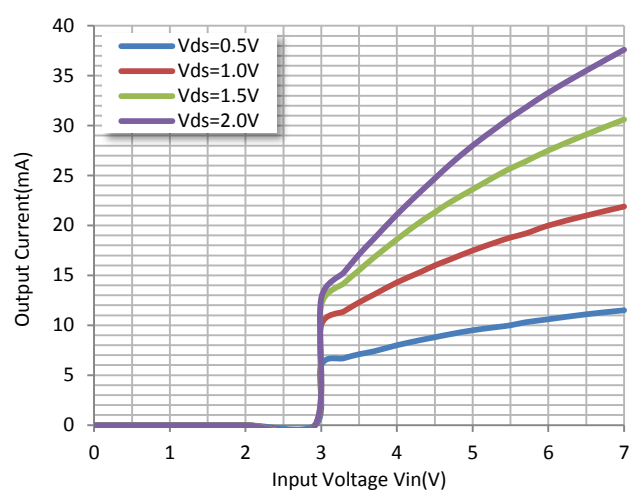
4) NCH Driver Output Current vs. Input Voltage

Detector threshold=2.93V



5) PCH Driver Output Current vs. Input Current

Detector threshold=2.93V



## PACKAGE LINE

Package	SOT-23	Devices per reel	3000Pcs	Unit	mm
<p>Package dimension:</p> <p>The technical drawing illustrates the BL8518 SOT-23 package with the following dimensions:</p> <ul style="list-style-type: none"> <li><b>Top View:</b> Total width is <math>2.400 \pm 0.05</math> mm. The distance between the two leads is <math>1.900 \pm 0.05</math> mm. The lead width is <math>0.400 \pm 0.03</math> mm. The lead length is <math>0.550 \pm 0.05</math> mm. The lead tip radius is <math>4 \times R0.1</math> MAX. The distance from the lead tip to the center of the package is <math>1.300 \pm 0.05</math> mm.</li> <li><b>Side View:</b> Total length is <math>2.900 \pm 0.05</math> mm. The lead length is <math>1.000 \pm 0.05</math> mm. The lead tip radius is <math>4 \times R0.1</math> MAX. The distance from the lead tip to the center of the package is <math>2.400 \pm 0.05</math> mm.</li> <li><b>Cross-sectional View:</b> The lead thickness is <math>0.080 \pm 0.02</math> mm. The lead width is <math>0.2</math> mm. The lead tip radius is <math>R0.08</math>. The distance from the lead tip to the center of the package is <math>0.100 \pm 0.01</math> mm. The distance from the lead tip to the center of the package is <math>0.2</math> mm. The lead tip radius is <math>4 \times R0.1</math> MAX.</li> </ul>					

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