



DESCRIPTION

The A4810 series is a high-precision voltage detector optimized for ultra-low current consumption, achieving a typical supply current of 500nA at $V_{IN} = 3.0\text{ V}$. The detection voltage is internally trimmed and fixed with an accuracy of $\pm 2.0\%$. The A4810 provides two output configurations: N-channel open-drain and CMOS outputs. Its ultra-low power operation and compact package options make it suitable for portable and battery-powered applications.

A4810 is available in SOT-23, SOT-89 and SOT-25 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-23 SPQ: 3,000pcs/Reel	E3	A4810E3R-XXZ
		A4810E3VR-XXZ
SOT-25 SPQ: 3,000pcs/Reel	E5	A4810E5R-XXZ
		A4810E5VR-XXZ
SOT-89 SPQ: 1,000pcs/Reel	K3	A4810K3R-XXZ
		A4810K3VR-XXZ
Note	XX: Detect Voltage 09=0.9V, 33=3.3V 48=4.8V, 50=5.7V, 57=5.7V, 60=6.0V Z: N=N-ch, C=CMOS V: Halogen free Package R: Tape & Reel	
	AiT provides all RoHS products	

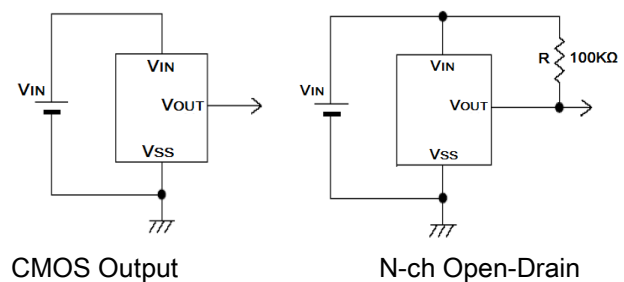
FEATURES

- Ultra-low current consumption 500nA typ. ($V_{IN}=3.0\text{V}$)
- High-precision detection voltage $\pm 2.0\%$
- Operating voltage range 0.7V to 10V
- Detection voltage 0.9V to 6.0V (0.1V step)
- Output form with N-ch open-drain or CMOS output
- Precise hysteresis : 4% typ.
- Available in SOT-23, SOT-25, and SOT-89 Package

APPLICATION

- Battery checkers
- Power failure detectors
- Power monitor for portable equipments such as pagers, calculators, electronic notebooks and remote controllers.
- Constant voltage power monitors for cameras, video equipments and communication devices.
- Power monitor for microcomputers and reset for CPUs.

TYPICAL APPLICATION





PIN DESCRIPTION

SOT23, E3 Top View			SOT-25, E5 Top View			SOT-89, K3 Top View		
Pin #			Symbol	Function				
SOT-23	SOT-25	SOT-89						
1	1	1	V _{OUT}	Output pin				
2	3	3	V _{SS}	GND pin				
3	2	2	V _{IN}	Voltage Input pin				
	4			NC				
	5			NC				



ABSOLUTE MAXIMUM RATINGS

T_A = 25°C

V _{IN} , V _{DD} Power Supply Voltage	0.3~12V
I _{OUT} , Output Current	70mA
V _{OUT} , Output Voltage	0.3~12V
P _D , Power Dissipation	Maximum 150mW
T _{OP} , Ambient work temperature	-40~+70°C
T _{OPR} , Operating Ambient Temperature	-40°C ~ +85°C

Stress beyond above listed "Absolute Maximum Ratings" may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

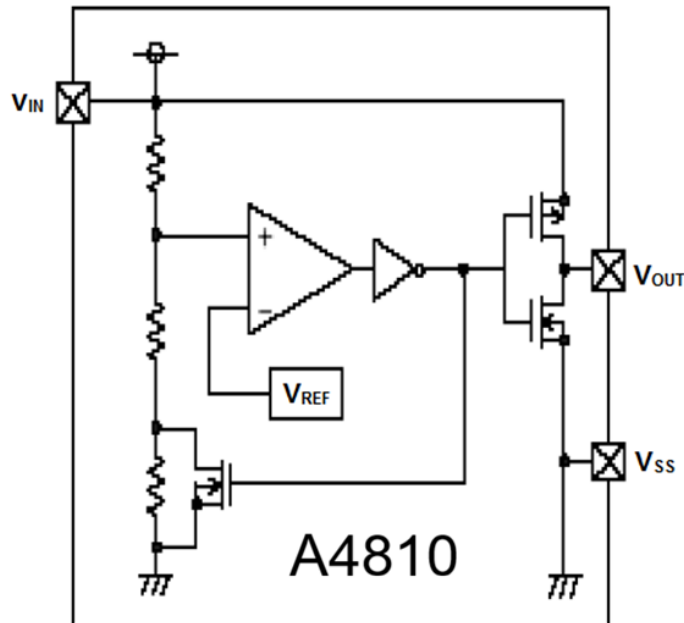
ELECTRICAL CHARACTERISTICS

V_{DF(T)} = 0.9 to 6.0V ±2% T_A = 25°C

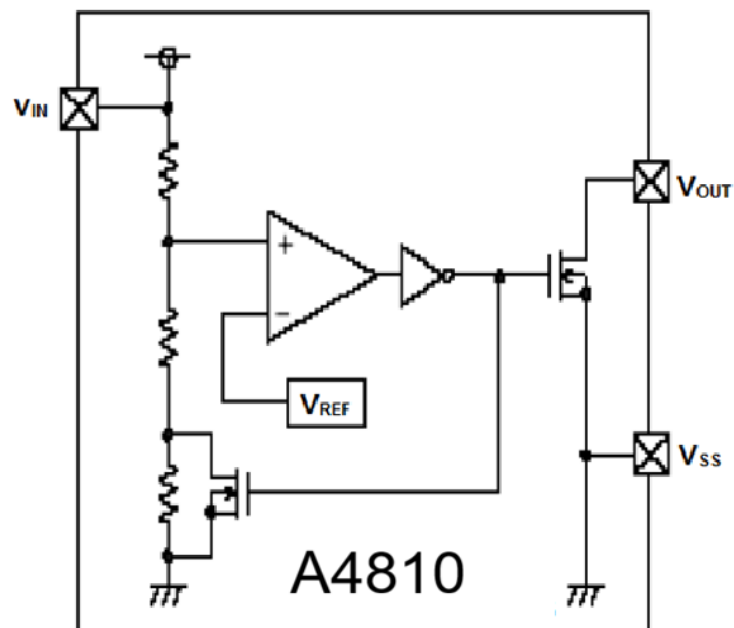
Parameter	Symbol	Conditions	Min	Typ.	Max	Unit
Operation Voltage	V _{IN}		0.5		10	V
Detection Voltage	V _{DF}		V _{DFX} 0.98	V _{DF}	V _{DFX} 1.02	V
Release Voltage	V _{HYS}		V _{DFX} 0.96	V _{DF}	V _{DFX} 1.04	V
Current Consumption	I _{SS}	V _{IN} = 2.9V	-	1.0	1.5	μA
		V _{IN} = 4.7V	-	0.5	1	
		V _{IN} = 5.0V	-	0.5	1	
		V _{IN} = 6.4V	-	0.5	1	
Operating voltage	V _{IN}	V _{DF} = 1.0 ~ 6.0V	0.7	-	8	V
Output Current	I _{OUT}	Nch V _{DS} = 0.05V, V _{IN} = 0.70V	0.01	0.05	-	mA
		Pch V _{DS} = -2.1, V _{IN} = 4.50V	1.0	2.0	-	
		Pch V _{DS} = -2.1, V _{IN} = 8.0V	1.5	3.0	-	
Output Delay Time	T _{PLH}		-		20	μs
Detector Threshold Temperature Coefficient	Δ-VDET/ ΔT _{ppm/°C}	-40 ≤ T _{op} ≤ 70°C	-	±100	-	ppm/°C



BLOCK DIAGRAM



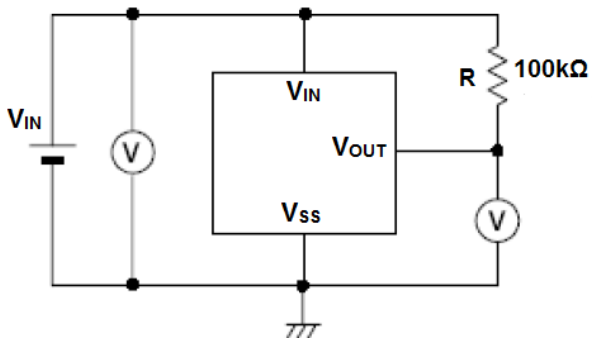
CMOS Output Products



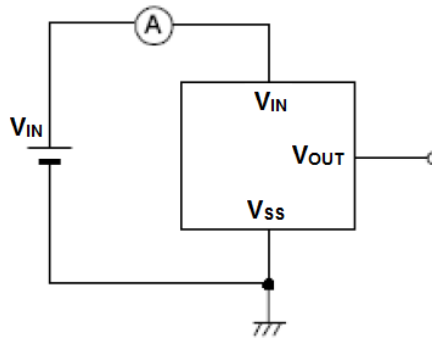
Nch Open-drain Output Products



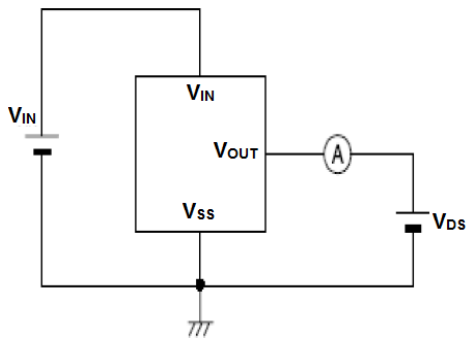
Test Circuit



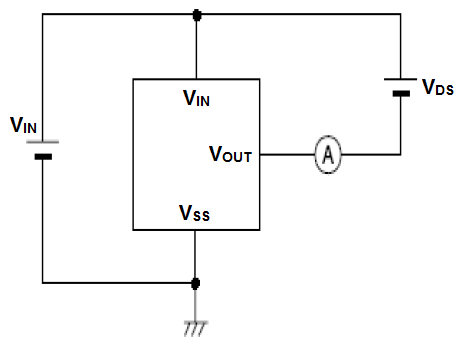
a. NCH Driver Output Current Test Circuit



b. PCH Drive Output Current Test Circuit



c. Supply current test circuit



d. Detector threshold test circuit



TYPICAL PERFORMANCE CHARACTERISTICS :

1. Detector Threshold ($T_C=25^\circ\text{C}$)

Fig1. $V_{DF}=0.9\text{V}$

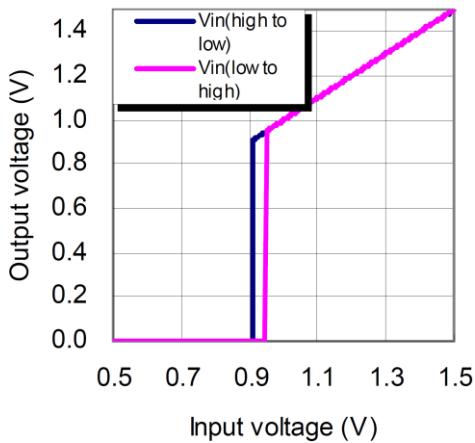


Fig2. $V_{DF}=2.7\text{V}$

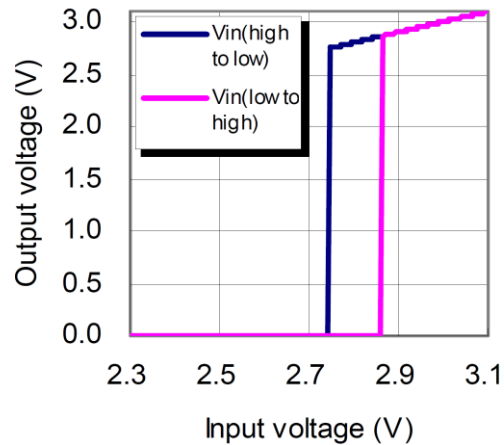


Fig3. $V_{DF}=3.0\text{V}$

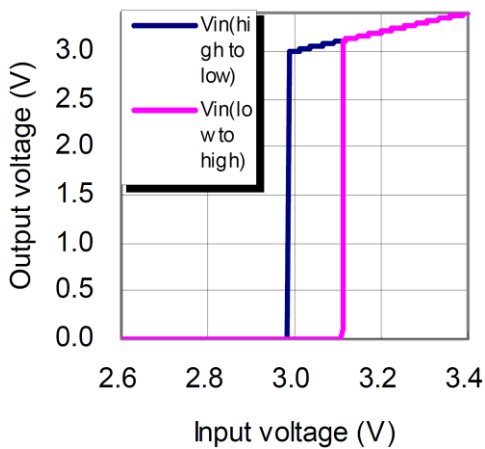
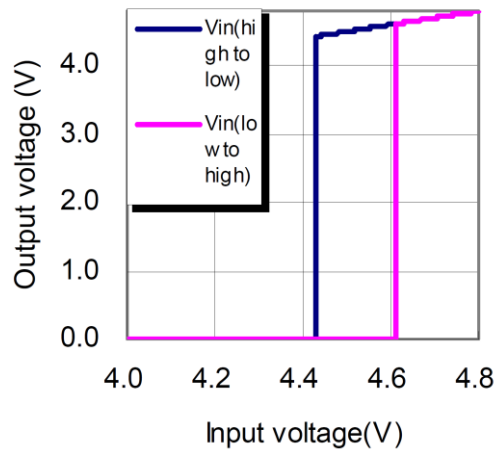


Fig4. $V_{DF}=4.4\text{V}$



2. Supply Current vs. Input Voltage

Fig 5. $V_{DF}=0.9\text{V}$

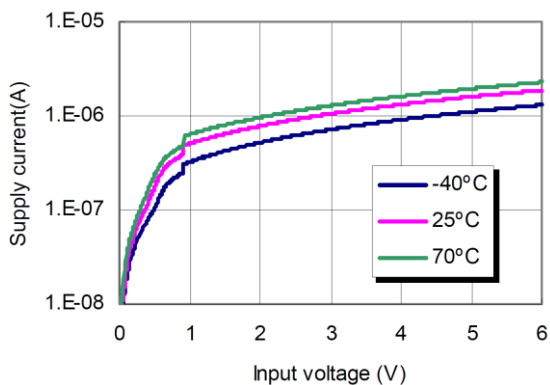


Fig6. $V_{DF}=2.7\text{V}$

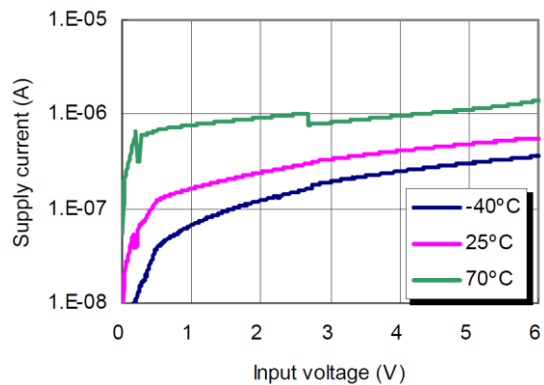




Fig7. $V_{DF}=3.0V$

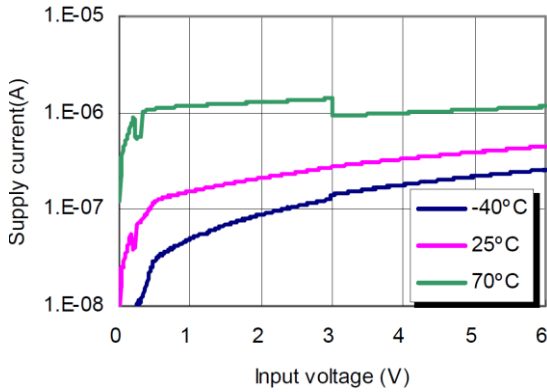
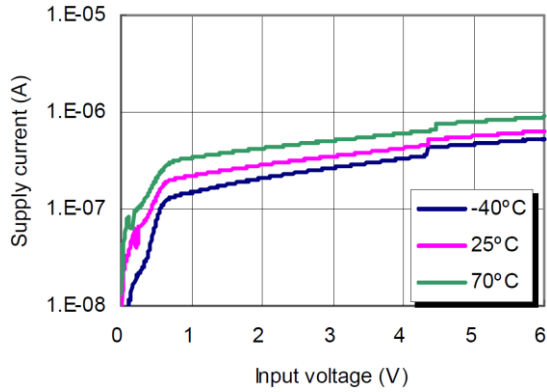


Fig8. $V_{DF}=4.4V$



3. Detector Threshold Hysteresis vs.. Temperature

Fig9. $V_{DF}=0.9V$

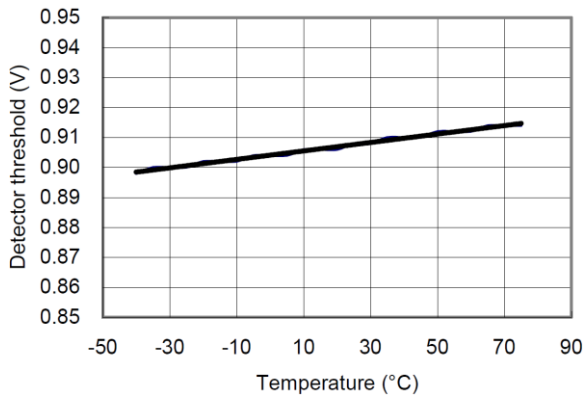


Fig10. $V_{DF}=2.7V$

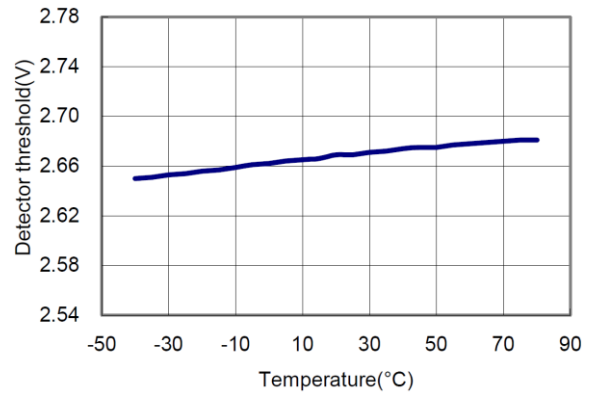


Fig11. $V_{DF}=3.0V$

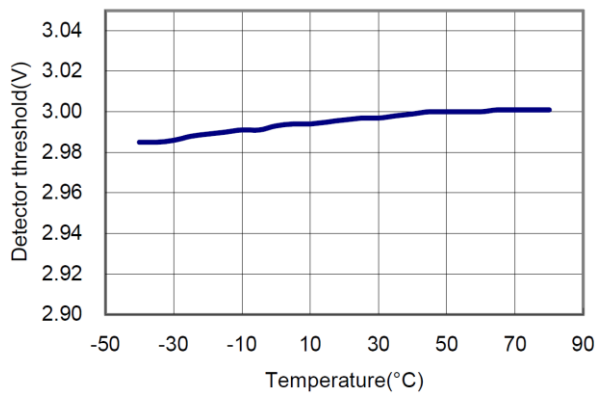
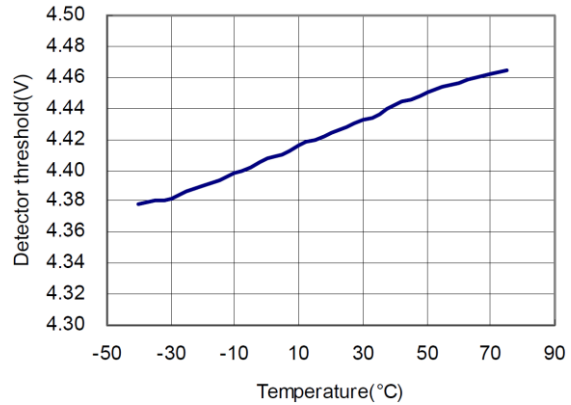


Fig12. $V_{DF}=4.4V$





4. Nch Driver Output Current vs. V_{DS}

Fig13. $V_{DF}=0.9V$

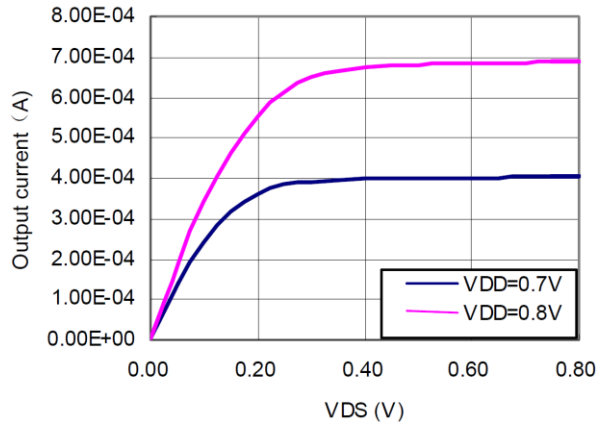


Fig14. $V_{DF}=2.7V$

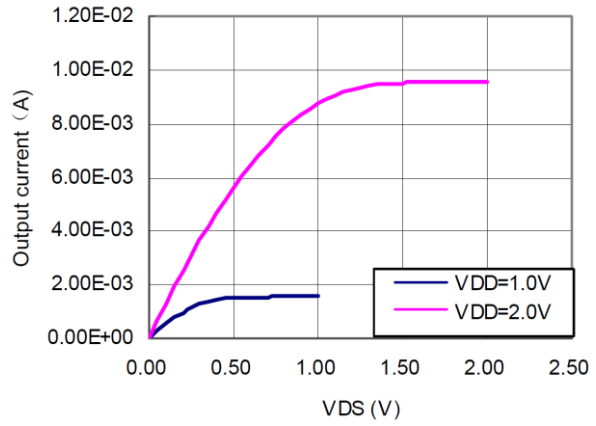


Fig15. $V_{DF}=3.0V$

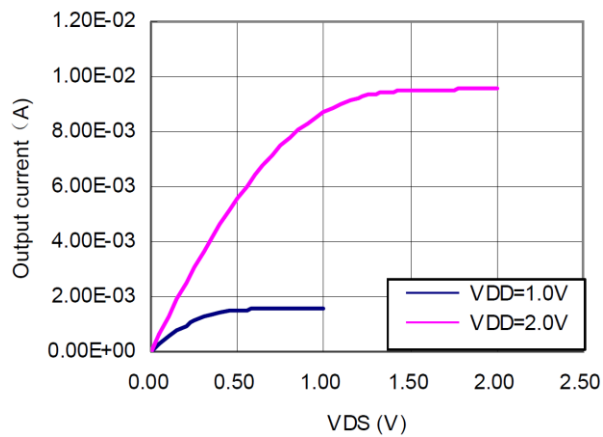
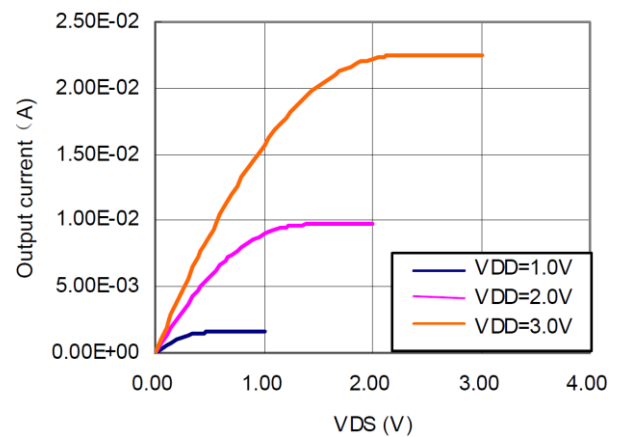


Fig16. $V_{DF}=4.4V$



5. NCH Driver Output Current vs. Input Voltage

Fig17. $V_{DF}=2.7V$

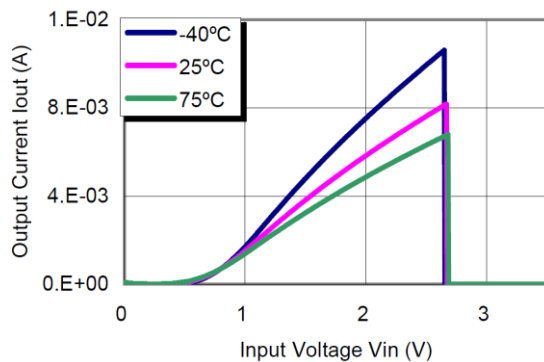
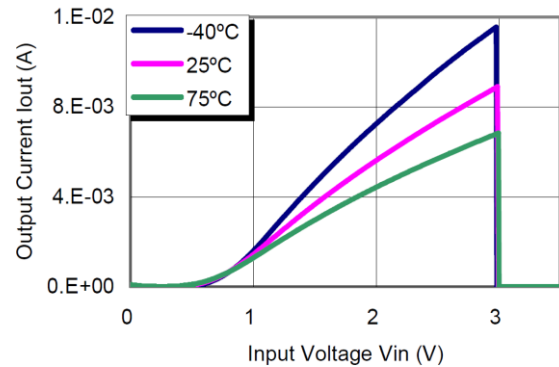


Fig18. $V_{DF}=3.0V$





6. PCH Driver Output Current vs. Input Current

Fig19. $V_{DF}=0.9V$

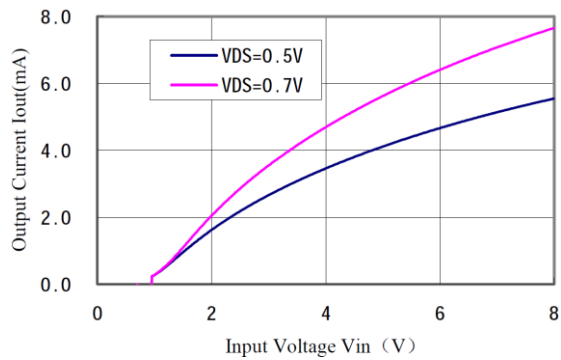


Fig20. $V_{DF}=2.7V$

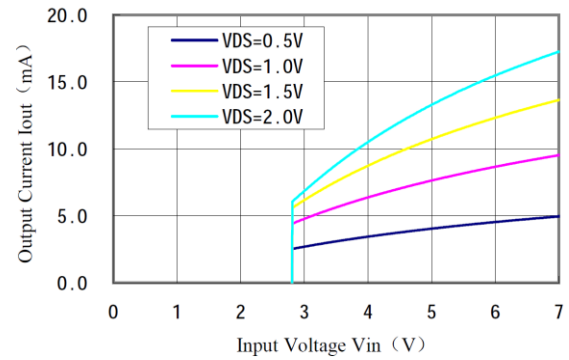
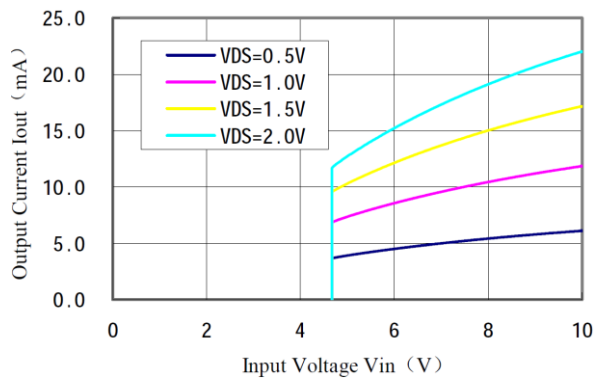


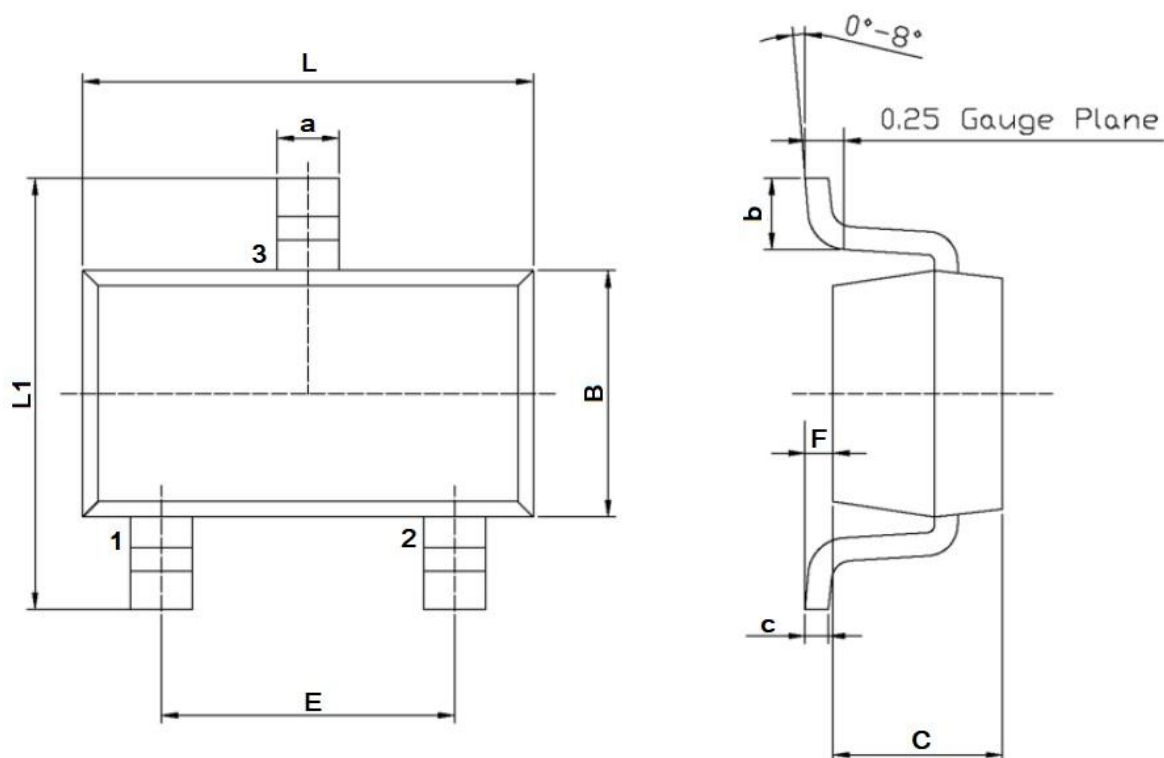
Fig 21. $V_{DF}=4.4V$





PACKAGE INFORMATION

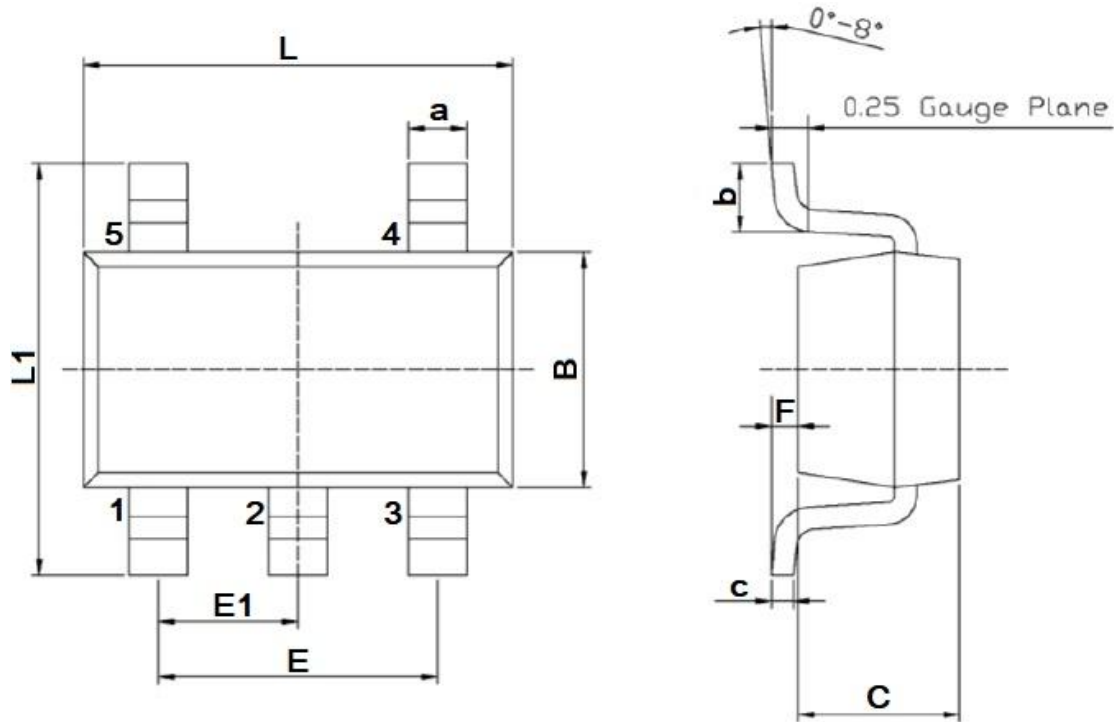
Dimension in SOT-23 (Unit: mm)



Symbol	Min.	Max.
a	0.350	0.500
B	1.500	1.700
b	0.350	0.550
C	0.900	1.300
c	0.100	0.200
E	1.800	2.000
F	0.000	0.150
L	2.820	3.020
L1	2.600	3.000



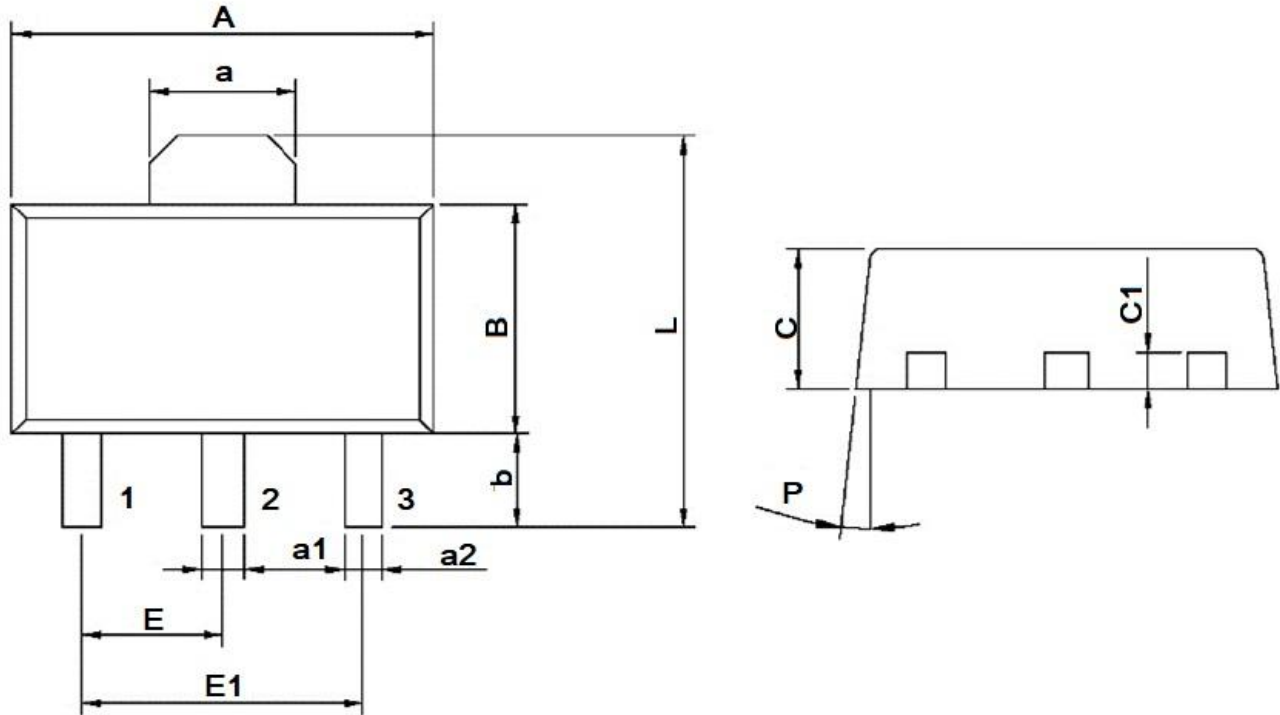
Dimension in SOT-25 (Unit: mm)



Symbol	Min.	Max.
A	2.820	3.020
B	1.50	1.700
B	0.350	0.550
C	0.900	1.300
C	0.100	0.200
E	1.800	2.000
E1	0.850	1.050
F	0.000	0.15
L	2.820	3.020
L1	2.600	3.000



Dimension in SOT89-3 (Unit: mm)



Symbol	Min.	Max.
A	4.400	4.700
a	1.450	1.650
a1	0.360	0.560
a2	0.300	0.500
B	2.350	2.650
b	0.800	1.200
C	1.400	1.700
c1	0.50	0.500
E	1.400	1.600
E1	2.800	3.200
L	3.878	4.478
P	6°	



IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or server property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.