Micro-Power Voltage Detectors

General Description

The RT9809 is a micro-power voltage detector supervising the power supply voltage level for microprocessors (μP) or digital systems. It provides internally fixed threshold levels with 0.1V per step ranging from 1.5V to 5V, which covers most digital applications. It features low supply current of 3μA.

The RT9809 performs supervisory function by sending out a reset signal whenever the VDD voltage falls below a preset threshold level. This reset signal will last the whole period before VDD recovering. Reset signal will release after VDD is recovered and lasts for the whole period of Reset Active Time-out period.

RT9809 is CMOS, active-low output and is provided in SOT-23 package.

Ordering Information

RT9809-□□ □ □

- Package Type
  V : SOT-23
- Operating temperature range
  C: Commercial standard
- Reset Threshold
  15 : 1.5V
  16 : 1.6V
  :
  49 : 4.9V
  50 : 5.0V

Marking Information

For marking information, contact our sales representative directly or through a RichTek distributor located in your area, otherwise visit our website for detail.

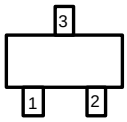
Features

- **Internally Fixed Threshold 1.5V to 5V in 0.1V Step**
- **±2% Accuracy**
- **Low Supply Current 3μA**
- **No External Components Required**
- **Quick Reset within 20μS**
- **Built-in Recovery Delay 200mS**
- **Low Functional Supply Voltage 0.9V**
- **Small 3-Pin SOT-23 Package**

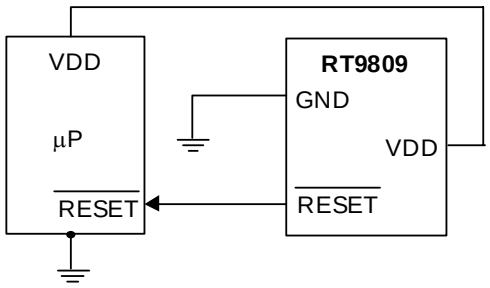
Applications

- Computers
- Controllers
- Intelligent Instruments
- Critical μP and μC Power Monitoring
- Portable/Battery-Powered Equipment

Pin Configurations

Part Number	Pin Configurations
RT9809-□□CV (SOT-23)	 TOP VIEW 1. GND 2. RESET 3. VDD

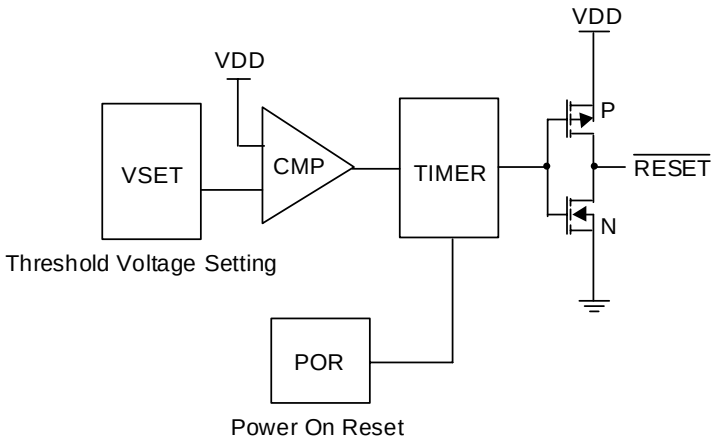
Typical Application Circuit



Pin Description

Pin Name	Pin Function
GND	Ground Pin
$\overline{\text{RESET}}$	Reset Pulse Output, Negative Pulse
VDD	Power Pin

Function Block Diagram



Absolute Maximum Ratings

- Terminal Voltage (with Respect to GND)
  - VDD ---------- -0.3V to 6.0V
  - All Other Inputs ---------- -0.3V to VDD+0.3V
- Input Current, VDD ---------- 20mA
- Output Current, $\overline{\text{RESET}}$ ---------- 20mA
- Power Dissipation, P_D @ T_A = 25°C
  - SOT-23 ---------- 0.25W
- Operating Junction Temperature Range ---------- -40°C ~ 125°C
- Storage Temperature Range ---------- -65°C ~ 125°C
- Package Thermal Resistance
  - SOT-23, θ_{JA} ---------- 250°C /W
- Lead Temperature (Soldering, 5sec.) ---------- 260°C

Electrical Characteristics

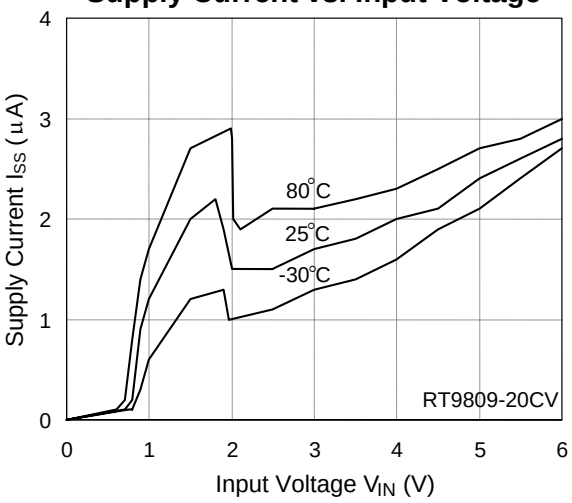
(VDD = 3.0V, unless specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Operating VDD (V_{OUT}) Range	V_{DD}		0.9	--	6	V
Supply Current	I_{DD}	V_{DD} = 1.5V ~ 3.5V, I_{OUT} = 0	--	--	3	μA
		V_{DD} = 3.5V ~ 5V, I_{OUT} = 0	--	--	3.3	
Reset Threshold	V_{TH}	T_A = 27°C	--	Note1	--	V
Threshold Voltage Accuracy	ΔV_{TH}	T_A = 27°C	--	--	2	%
V_{CC} Drop to Reset Delay	t_{RD}	Drop = -125mV	--	--	20	μS
Reset Active Time Out Period	t_{RP}	$V_{DD} \geq 1.02 \times V_{TH}$	--	200	--	mS
$\overline{\text{RESET}}$ Output Voltage	V_{OH}	$V_{DD} > V_{TH}$, I_{SOURCE} = 1mA	--	0.8V_{DD}	--	V
	V_{OL}	$2 < V_{DD} < V_{TH}$, I_{SINK} = 3.5mA	--	0.4	--	

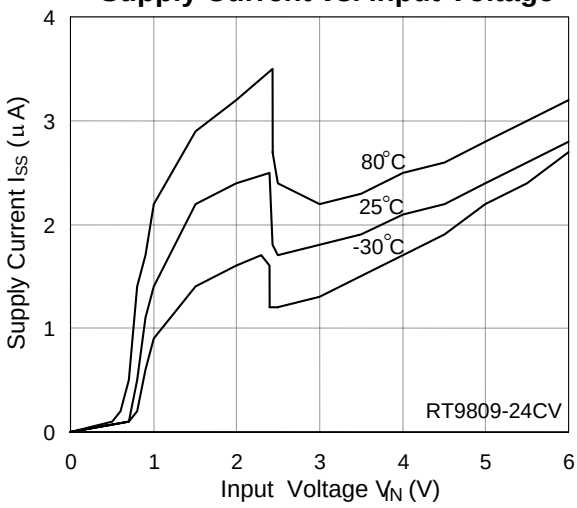
Note1: 1.5V ~ 5V, step 0.1V

Typical Operating Characteristics

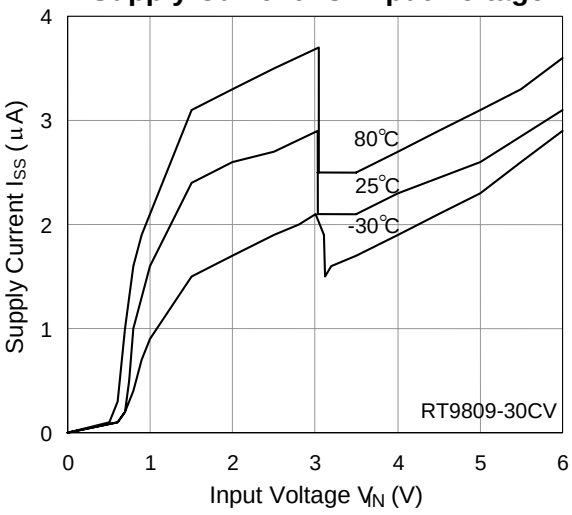
Supply Current vs. Input Voltage



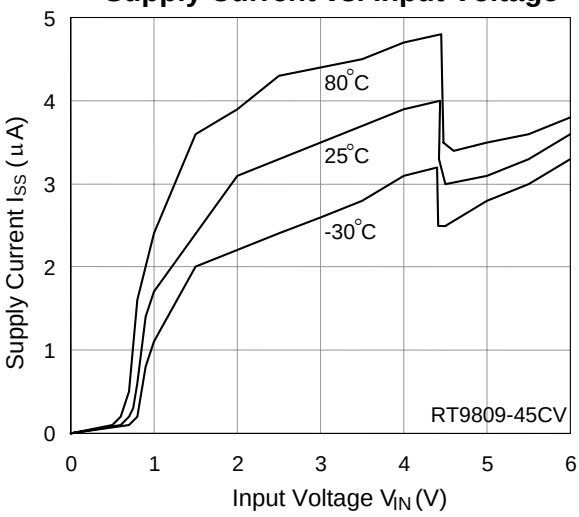
Supply Current vs. Input Voltage



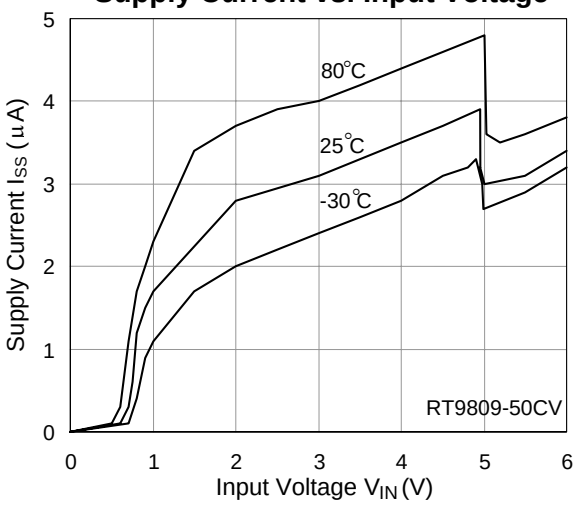
Supply Current vs. Input Voltage



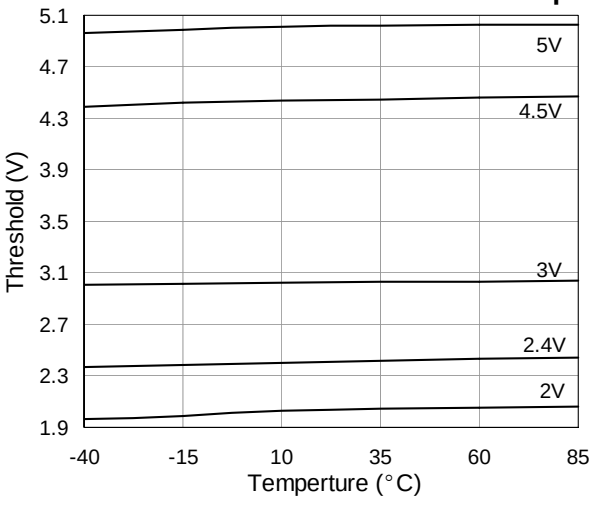
Supply Current vs. Input Voltage



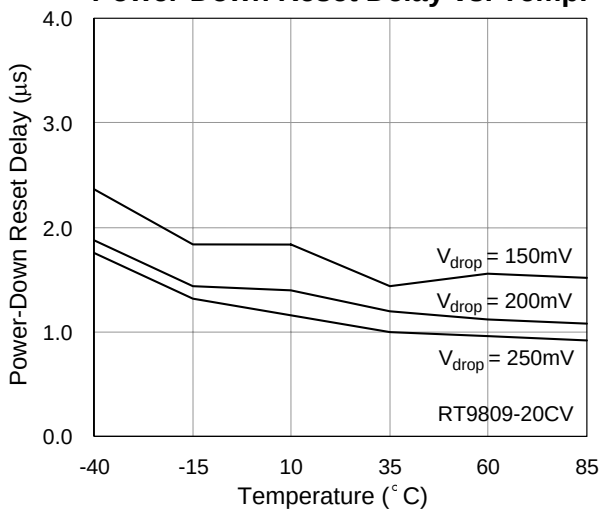
Supply Current vs. Input Voltage



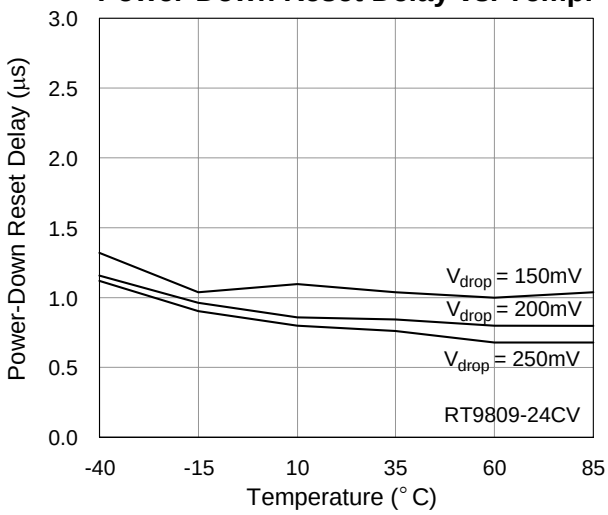
Reset Threshold Deviation vs. Temp.



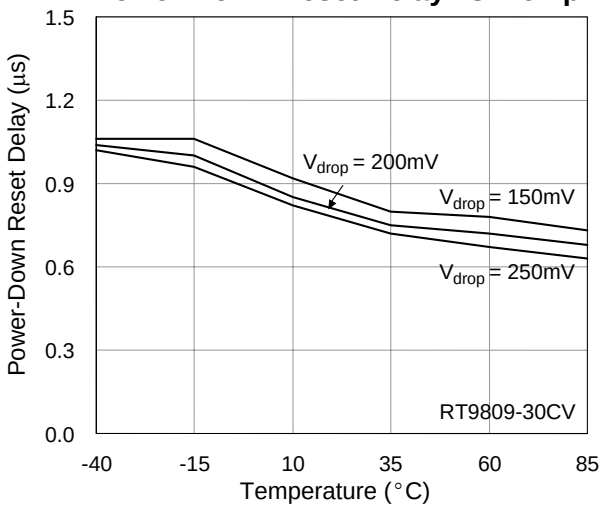
Power-Down Reset Delay vs. Temp.



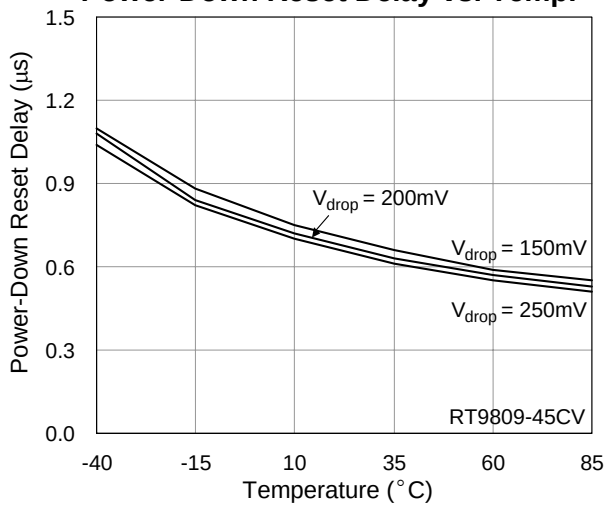
Power-Down Reset Delay vs. Temp.



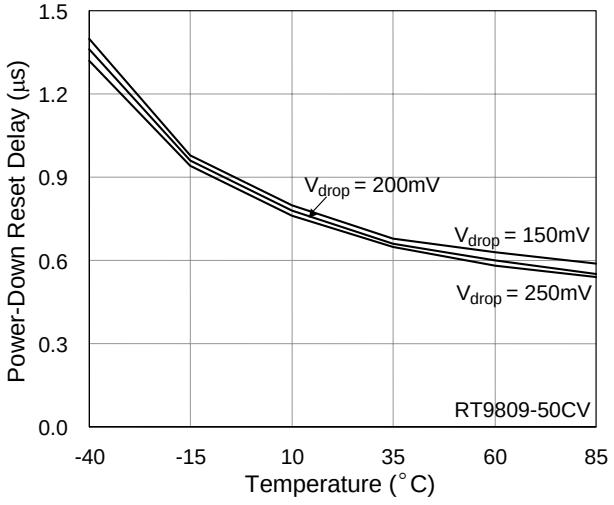
Power-Down Reset Delay vs. Temp.



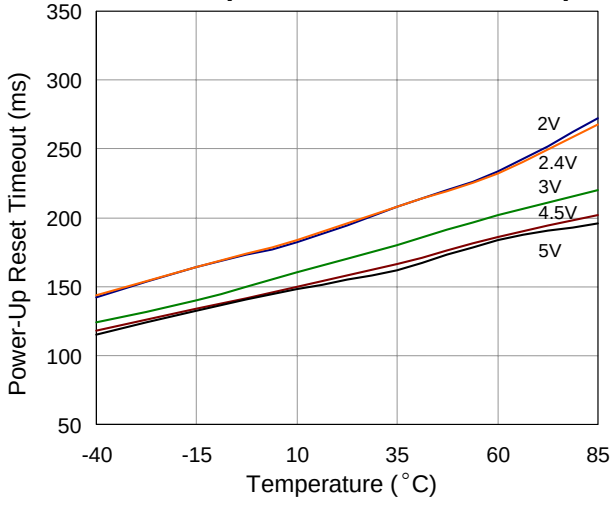
Power-Down Reset Delay vs. Temp.



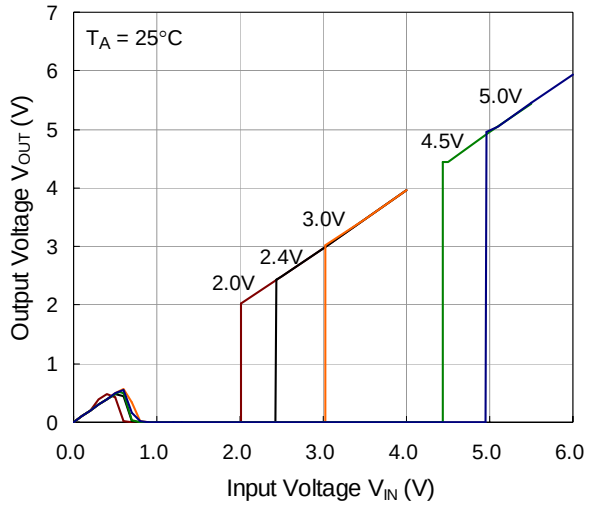
Power-Down Reset Delay vs. Temp.



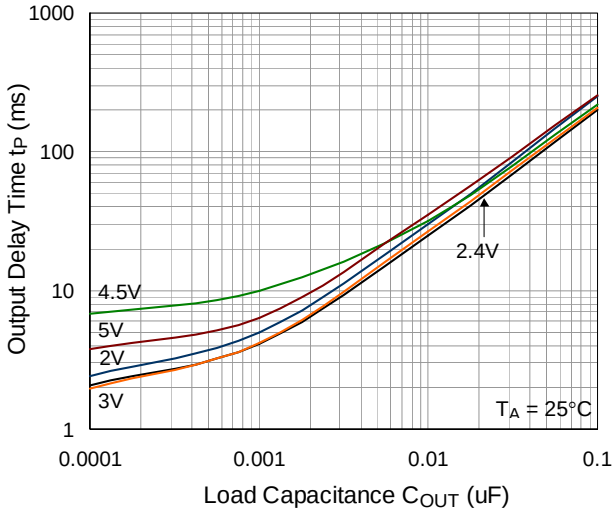
Power-Up reset Timeout vs. Temp.



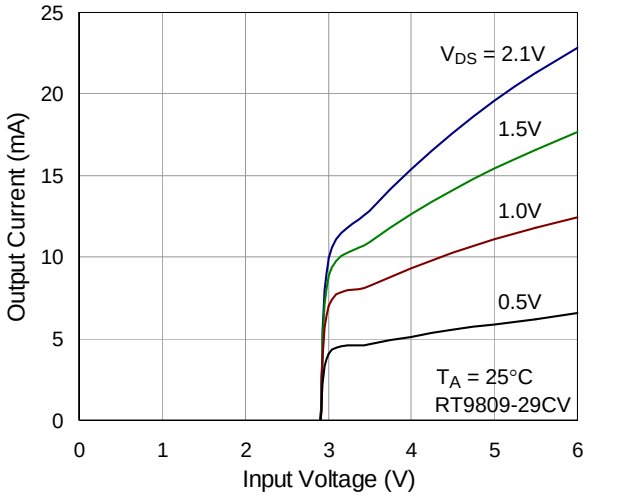
Output Voltage vs. Input Voltage



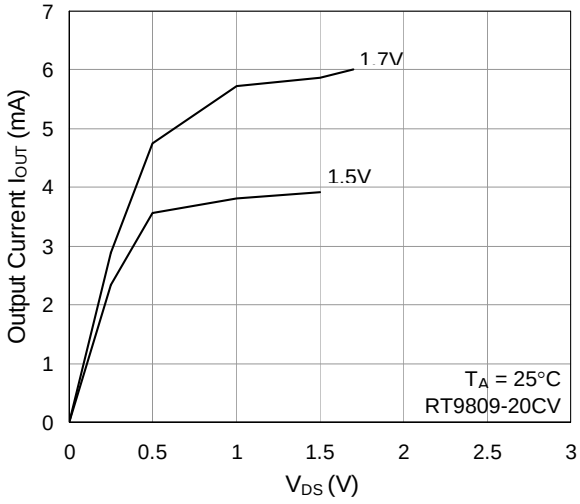
Output Delay Time vs. Load Capacitance



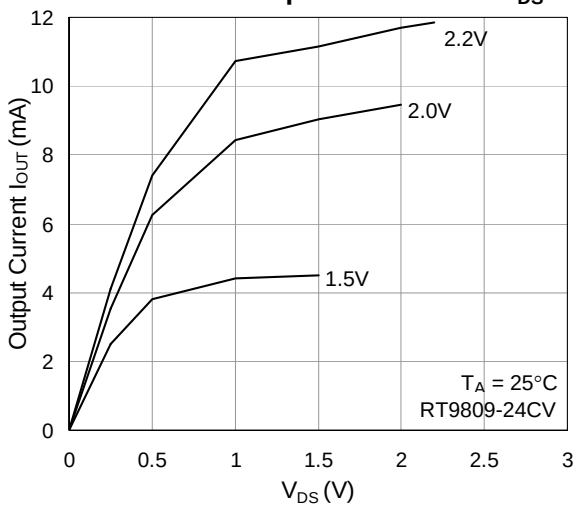
Pch Driver Output Current vs. Input Voltage



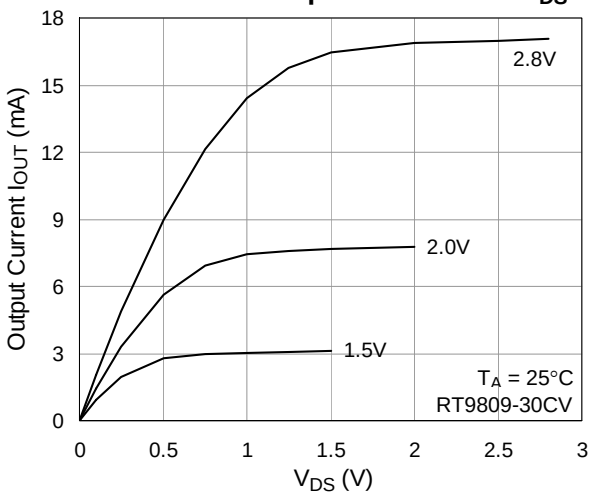
Nch Driver Output Current vs. V_{DS}



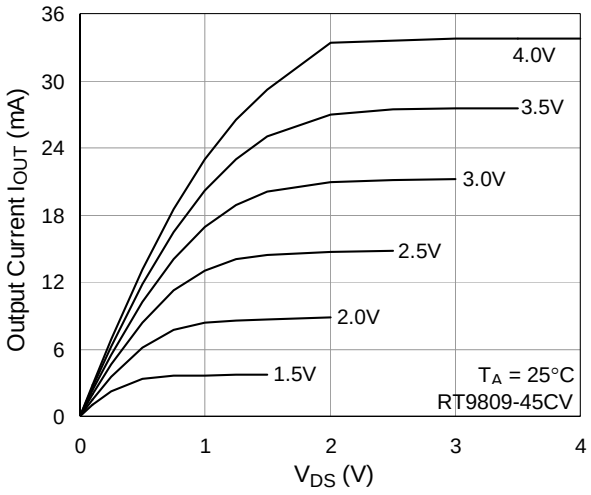
Nch Driver Output Current vs. V_{DS}



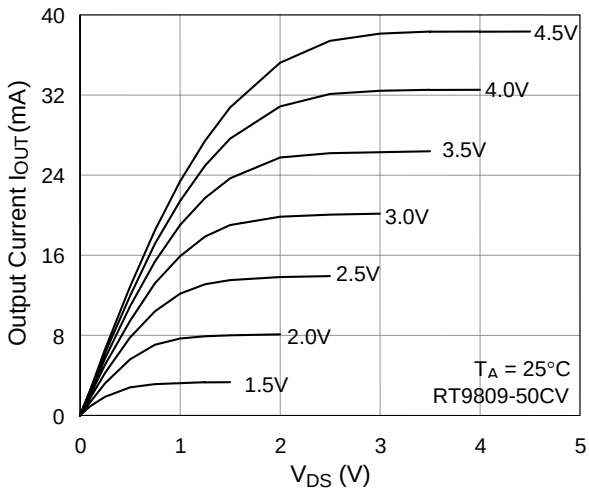
Nch Driver Output Current vs. V_{DS}



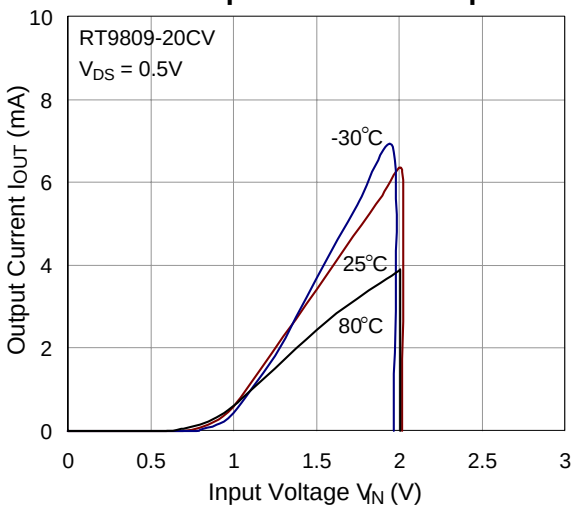
Nch Driver Output Current vs. V_{DS}



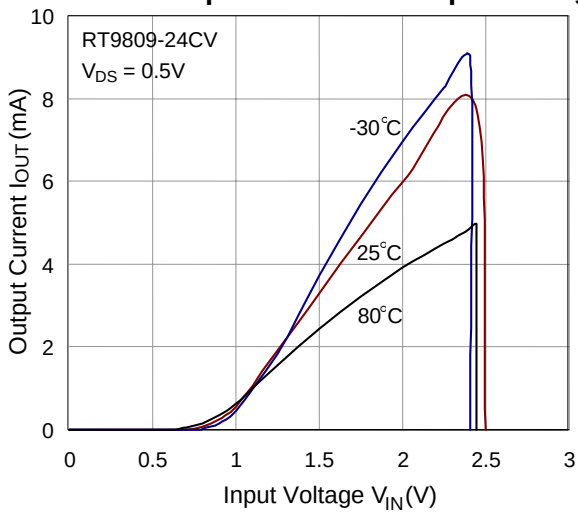
Nch Driver Output Current vs. V_{DS}



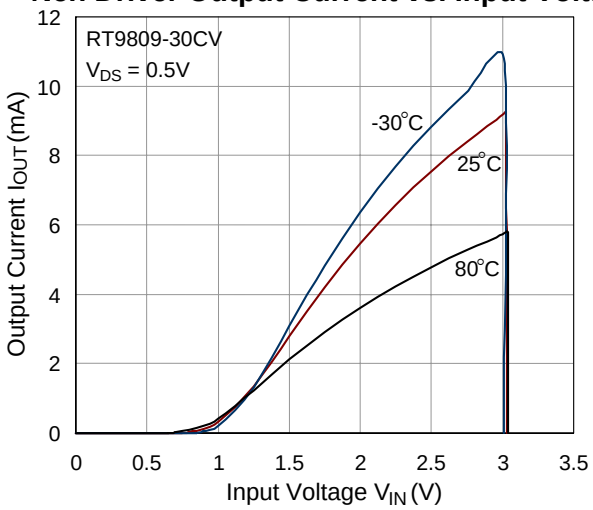
Nch Driver Output Current vs. Input Voltage



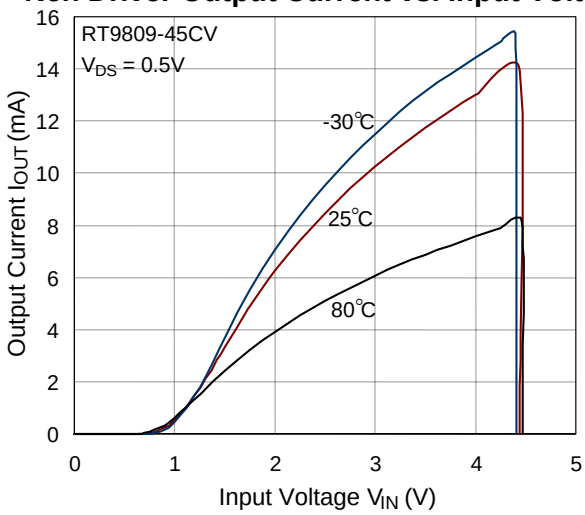
Nch Driver Output Current vs. Input Voltage



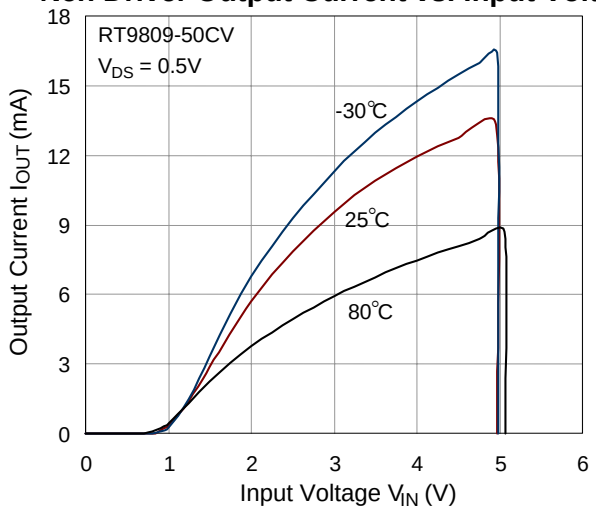
Nch Driver Output Current vs. Input Voltage



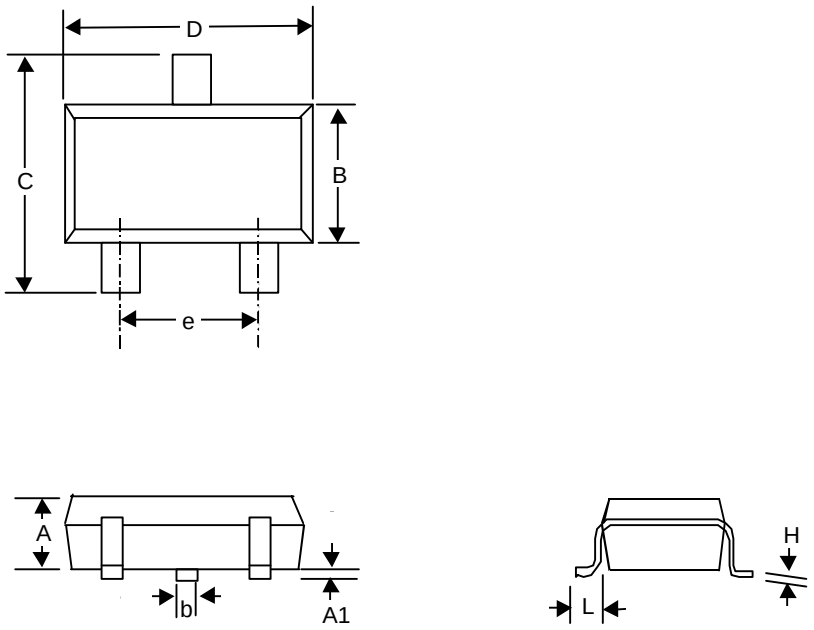
Nch Driver Output Current vs. Input Voltage



Nch Driver Output Current vs. Input Voltage



Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.035	0.051
A1	--	0.152	--	0.006
B	1.397	1.803	0.055	0.071
b	0.356	0.508	0.014	0.020
C	2.591	2.997	0.102	0.118
D	2.692	3.099	0.106	0.122
e	1.803	2.007	0.071	0.079
H	0.102	0.254	0.004	0.010
L	0.356	0.610	0.014	0.024

SOT-23 Plastic Surface Mount

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