Dual Push-Button Reset with Push-Button Controlled Output Delay

General Description

The RT9829 has two combined delayed reset inputs ($\overline{SR0}$, $\overline{SR1}$) with a user selectable delayed setup time (t_{SRC}) option of either 7.5s or 12.5s (typ.), selectable via the dual-state DSR input pin. When DSR is connected to ground, t_{SRC} = 7.5s (typ.); when connected to V_{CC}, t_{SRC} = 12.5s (typ.). There are two reset outputs which become active simultaneously after both of the reset inputs are held active for the selected t_{SRC} delay time. The outputs remain asserted until either or both inputs go to inactive logic level (for this device the output reset pulse duration is fully push-button controlled, meaning neither fixed nor minimum reset pulse width, nor power on reset pulse is implemented). The first reset output, $\overline{RST1}$, is active low, open drain; the second reset output, RST2, is active high, push-pull. The device fully operates over a broad V_{CC} range from 1.65V to 5.5V. Below 1.575V (typ.), the inputs are ignored and the outputs are de-asserted. The de-asserted reset output levels are then valid down to 1V.

The RT9829 is available in a tiny WDFN-8L 2x2 (COL) package.

Ordering Information

RT9829 □□

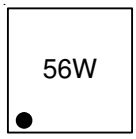
- Package Type
  QW : WDFN-8L 2x2 (COL)
- Lead Plating System
  G : Green (Halogen Free and Pb Free)

Note :

Richtek products are :

- RoHS compliant and compatible with the current requirements of IPC/JEDEC J-STD-020.
- Suitable for use in SnPb or Pb-free soldering processes.

Marking Information



56 : Product Code

W : Date Code

Features

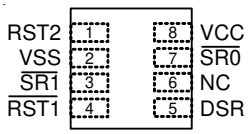
- **Dual Reset Push-Button Inputs**
  - **User Selectable Delay Setup Time : 7.5s and 12.5s (typ.)**
- **Push-Button Controlled Reset Pulse Duration**
  - **No Fixed nor Minimum Pulse Width Guaranteed**
- **No Power On Reset**
- **Dual Reset Outputs**
  - **$\overline{RST1}$: Active Low, Open-Drain**
  - **RST2 : Active High, Push-Pull**
- **Fixed Reset Input Logic Voltage Levels**
- **Broad Operating Voltage Range : 1.65V to 5.5V**
  - **Inactive Reset Output Levels Valid Down to 1V**
- **2μA Low Supply Current**
- **Operating Temperature : –40°C to 85°C**
- **Small Thermally Enhanced 8-Lead WDFN Package**
- **RoHS Compliant and Halogen Free**

Applications

- Mobile phones, Smartphones
- e-Books
- MP3 Players
- Games
- Portable Navigation Devices

Pin Configurations

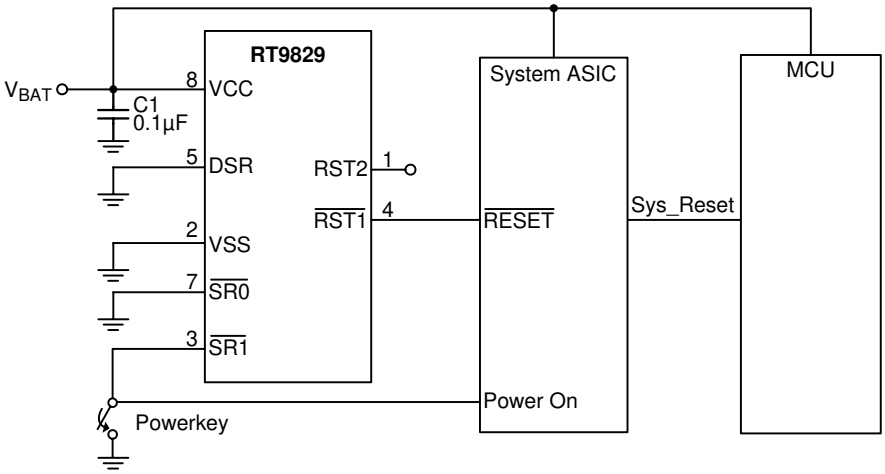
(TOP VIEW)



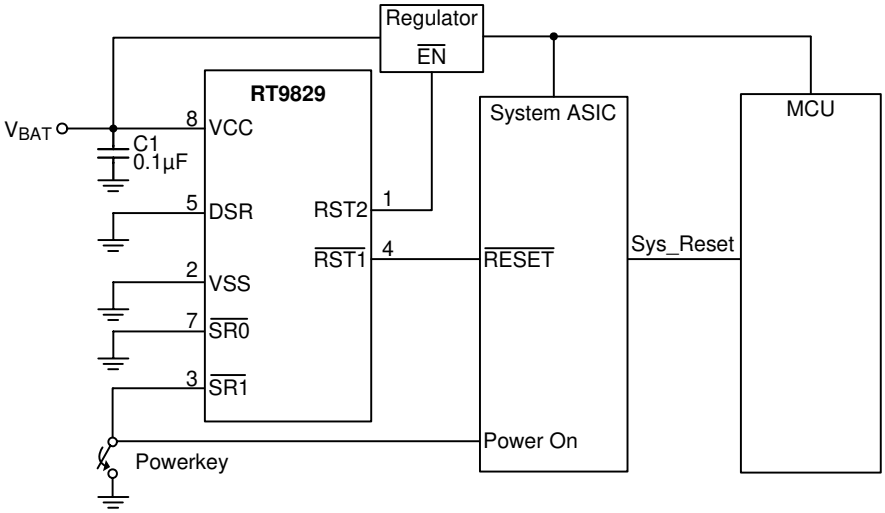
WDFN-8L 2x2 (COL)

Typical Application Circuit

Typical Operation :



Operation with Regulator :



Timing Diagrams

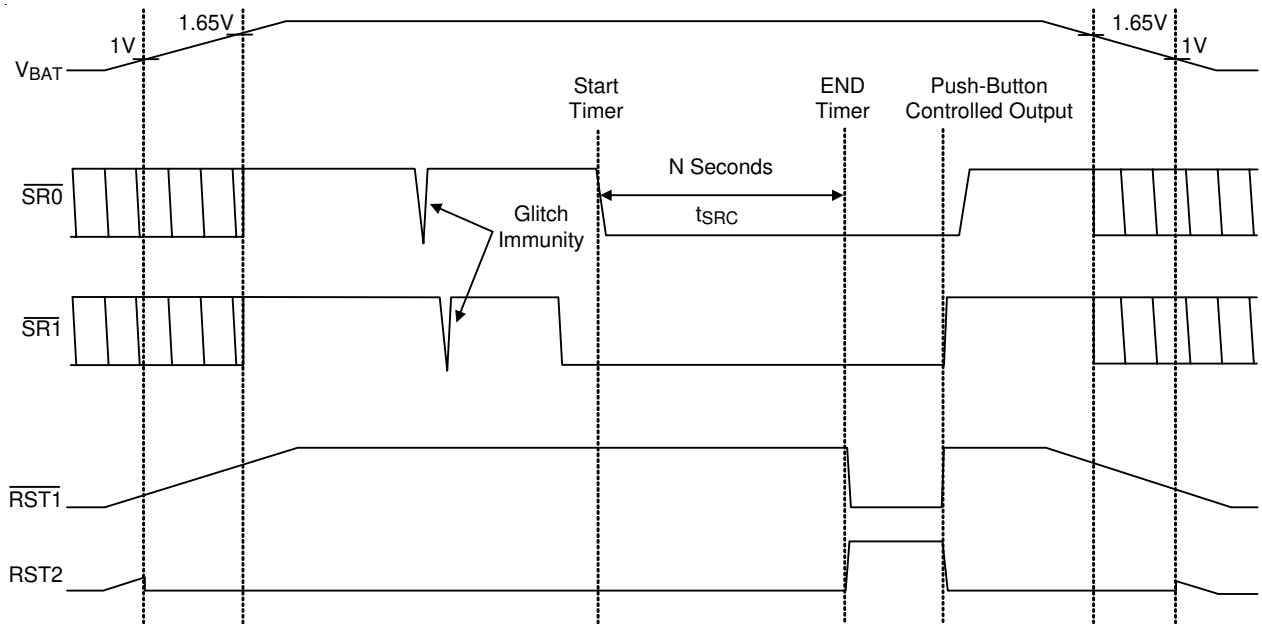


Figure 1. Timing Diagram

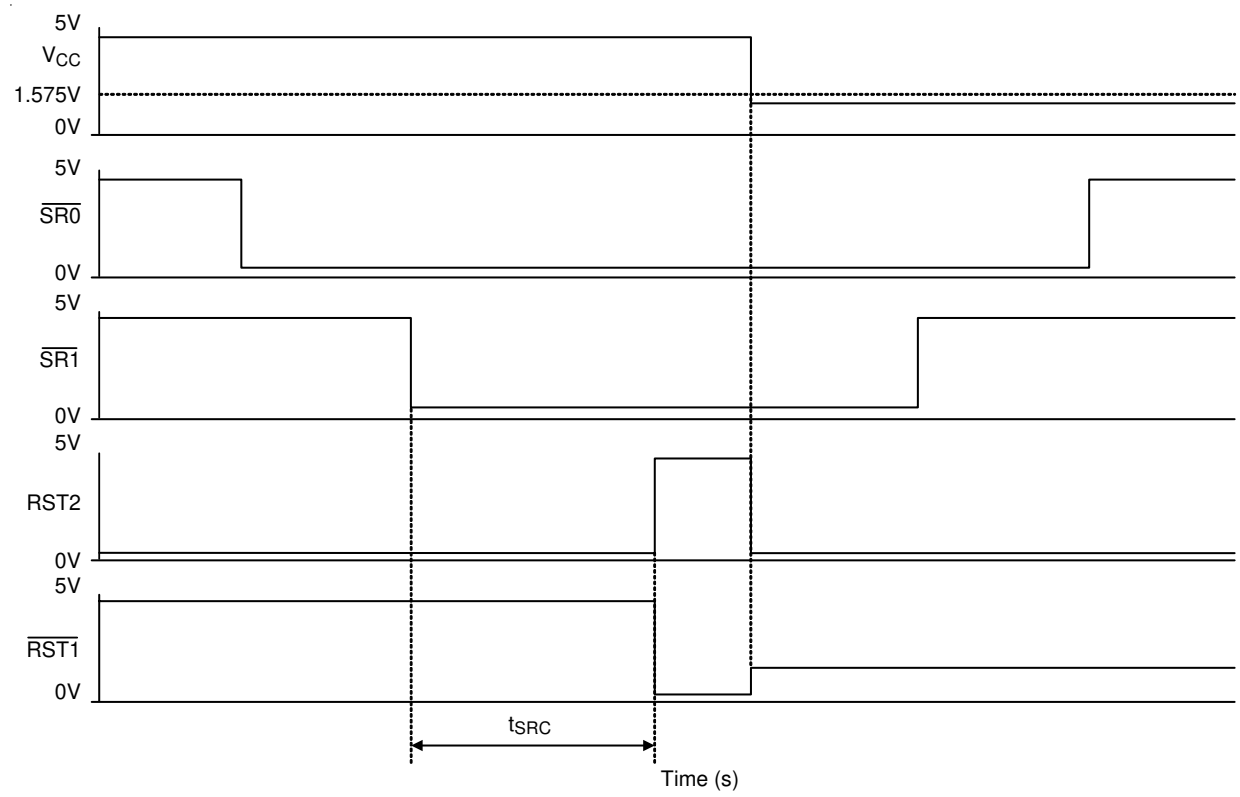
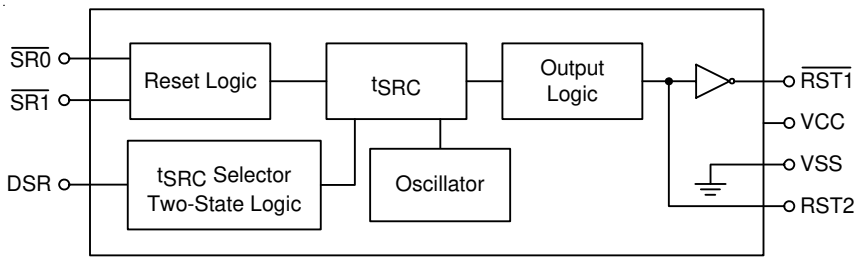


Figure 2. Under Voltage Condition

Functional Pin Description

Pin No.	Pin Name	Pin Function
1	RST2	Second Reset Output (Active High, Push-Pull).
2	VSS	Ground.
3	$\overline{SR1}$	Secondary Push-Button Reset Input (Active Low).
4	$\overline{RST1}$	First Reset Output (Active Low, Open-Drain).
5	DSR	Dual-State Reset Input Delay Selection Pin. When connected to ground, t_{SRC} = 7.5s (typ.); when connected to VCC, t_{SRC} = 12.5s (typ.). DSR is a DC-type input, intended to be either permanently grounded or permanently connected to VCC.
6	NC	No Internal Connection. Not bonded and should be connected to VSS.
7	$\overline{SR0}$	Primary Push-Button Reset Input (Active Low).
8	VCC	Positive Supply Input. A 0.1μF decoupling ceramic capacitor is recommended to be connected between VCC and VSS pins.

Function Block Diagram



Absolute Maximum Ratings (Note 1)

- Supply Input Voltage, V_{CC} to V_{SS} ---------- –0.3V to 6V
- Other Pins to V_{SS} ---------- –0.3V to 6V
- Power Dissipation, P_D @ T_A = 25°C
  WDFN-8L 2x2 (COL) ---------- 0.606W
- Package Thermal Resistance (Note 2)
  WDFN-8L 2x2 (COL), θ_{JA} ---------- 165°C/W
- Junction Temperature ---------- 150°C
- Lead Temperature (Soldering, 10 sec.) ---------- 260°C
- Storage Temperature Range ---------- –65°C to 150°C
- ESD Susceptibility (Note 3)
  HBM (Human Body Mode) ---------- 2kV
  MM (Machine Mode) ---------- 200V

Recommended Operating Conditions (Note 4)

- Supply Input Voltage, V_{CC} (Note 5) ---------- 1.65V to 5.5V
- Junction Temperature Range ---------- –40°C to 125°C
- Ambient Temperature Range ---------- –40°C to 85°C

Electrical Characteristics

(V_{CC} = 3.3V, T_A = 25°C, unless otherwise specified)

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Input Power Supply							
Supply Current		I_{CC}	V_{CC} = 5V	--	2	3	μA
Reset Output Voltage Low		V_{OL}	$V_{CC} \geq$ 4.5V, I_{SINK} = 3.2mA	--	--	0.3	V
			$V_{CC} \geq$ 3.3V, I_{SINK} = 2.5mA	--	--	0.3	
			$V_{CC} \geq$ 1.65V, I_{SINK} = 1mA	--	--	0.3	
Reset Output Voltage High, RST2		V_{OH}	$V_{CC} \geq$ 4.5V, I_{SOURCE} = 0.8mA	0.8 x V_{CC}	--	--	V
			$V_{CC} \geq$ 2.7V, I_{SOURCE} = 0.5mA	0.8 x V_{CC}	--	--	
			$V_{CC} \geq$ 1.65V, I_{SOURCE} = 0.25mA	0.8 x V_{CC}	--	--	
Output Leakage Current, $\overline{RST1}$		I_{LO}	Open-Drain, $V_{\overline{RST1}}$ = 5.5V	–0.1	--	0.1	μA
Reset							
Reset Delay		t_{SRC}	DSR = VSS	6	7.5	9	s
			DSR = VCC	10	12.5	15	
$\overline{SR0}$, $\overline{SR1}$ Input Threshold Voltage	Logic-Low	V_{IL}		V_{SS} – 0.3	--	0.3	V
	Logic-High	V_{IH}		1.1	--	5.5	
Input Leakage Current ($\overline{SR0}$, $\overline{SR1}$, DSR Pins)		I_{LI}		–1	--	1	μA

Note 1. Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2. θ_{JA} is measured in natural convection at T_A = 25°C on a high effective thermal conductivity four-layer test board of JEDEC 51-7 thermal measurement standard.

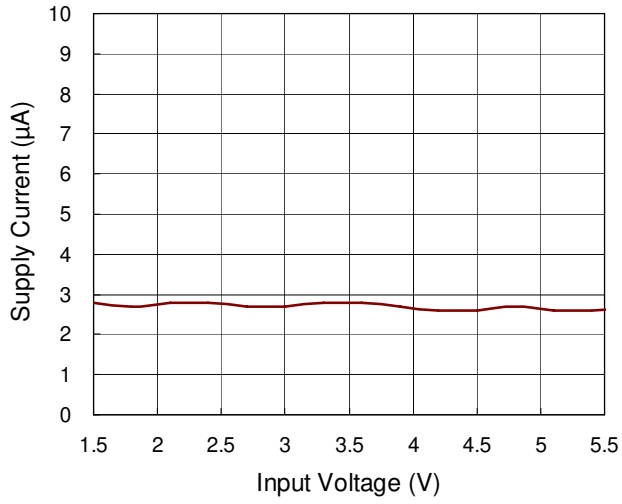
Note 3. Devices are ESD sensitive. Handling precaution is recommended.

Note 4. The device is not guaranteed to function outside its operating conditions.

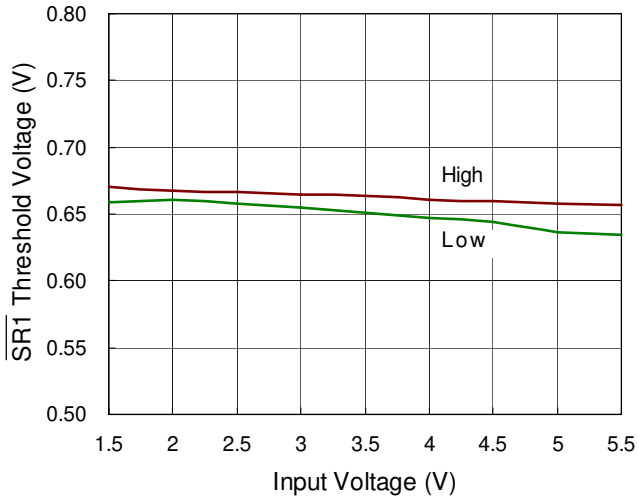
Note 5. Reset outputs are de-asserted below 1.575V (typ.) and remain de-asserted down to V_{CC} = 1V.

Typical Operating Characteristics

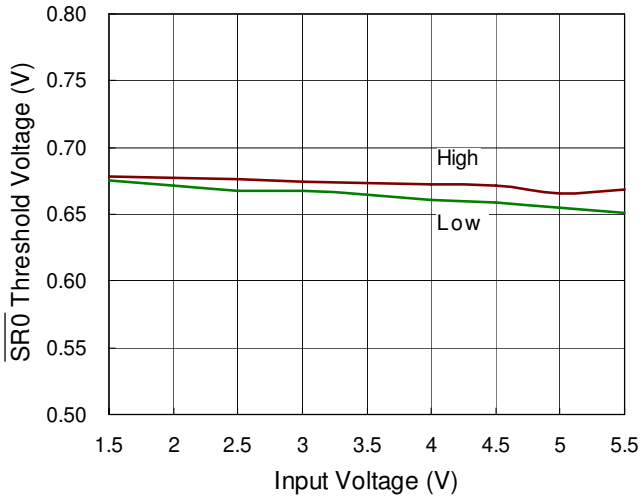
Supply Current vs. Input Voltage



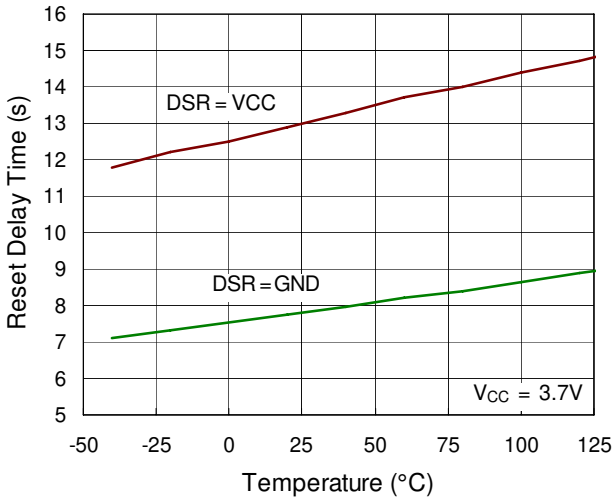
$\overline{SR1}$ Threshold Voltage vs. Input Voltage



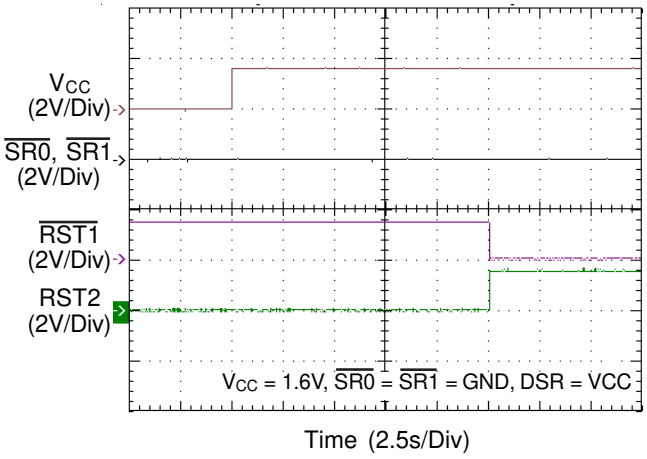
$\overline{SR0}$ Threshold Voltage vs. Input Voltage



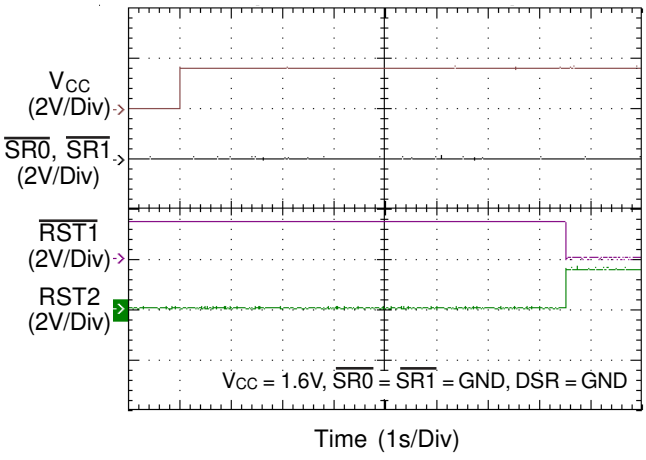
Reset Delay Time vs. Temperature



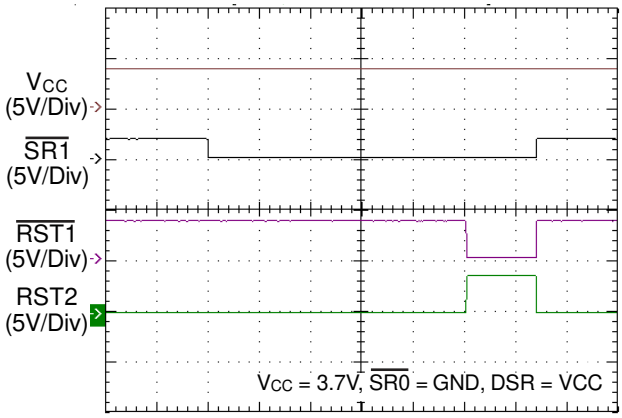
Power On



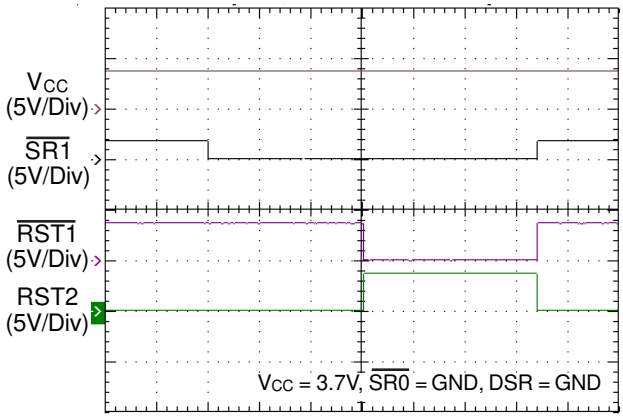
Power On



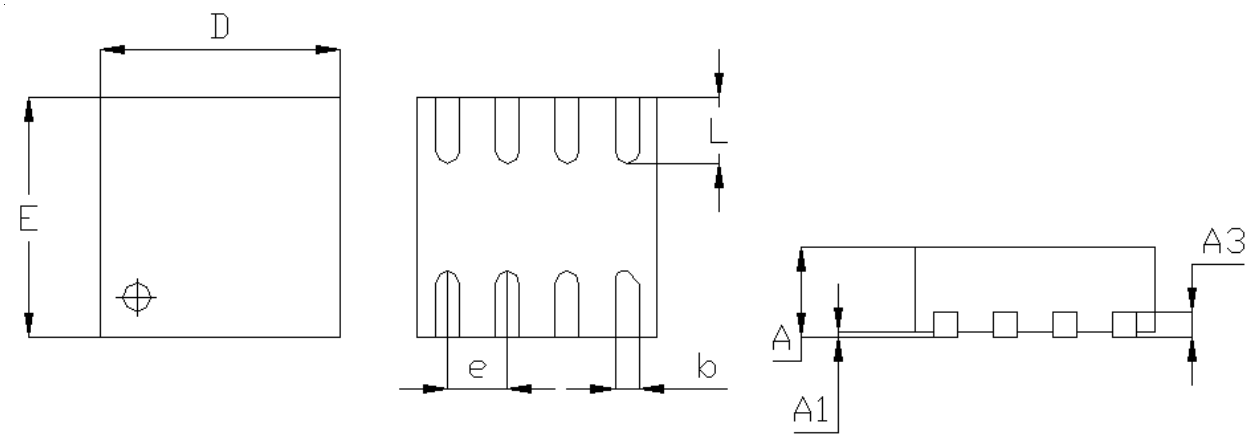
Reset Delay



Reset Delay



Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.700	0.800	0.028	0.031
A1	0.000	0.050	0.000	0.002
A3	0.175	0.250	0.007	0.010
b	0.150	0.250	0.006	0.010
D	1.900	2.100	0.075	0.083
E	1.900	2.100	0.075	0.083
e	0.500		0.020	
L	0.500	0.600	0.020	0.024

W-Type 8L DFN 2x2 (COL) Package

Richtek Technology Corporation
Headquarter
5F, No. 20, Taiyuen Street, Chupei City
Hsinchu, Taiwan, R.O.C.
Tel: (8863)5526789 Fax: (8863)5526611

Richtek Technology Corporation
Taipei Office (Marketing)
5F, No. 95, Minchiuan Road, Hsintien City
Taipei County, Taiwan, R.O.C.
Tel: (8862)86672399 Fax: (8862)86672377
Email: marketing@richtek.com