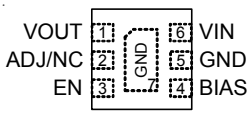
500mA, 5.5V, Ultra Low Dropout Linear Regulator

General Description

The RT9081A is a high performance positive voltage regulator with separated bias voltage (V_{BIAS}), designed for applications requiring low input voltage and ultra low dropout voltage, output current up to 500mA. The feature of ultra low dropout voltage is ideal for applications where output voltage is very close to input voltage. The input voltage can be as low as 0.8V and the output voltage is adjustable by an external resistive divider. The RT9081A features very low quiescent current consumption for portable applications. The device is available in the ZADFN-6L 1.2x1.2 package.

Pin Configuration

(TOP VIEW)



ZADFN-6L 1.2x1.2

Features

- **Input Voltage Range : 0.8V to 5.5V**
- **Bias Voltage Range : 2.4 V to 5.5 V**
- **Output Voltage Fixed and Adjustable Versions**
  - **0.9V to 1.8V (Fixed)**
  - **0.8V to 3.6V (Adjustable)**
- **1.5% Output Voltage Accuracy @ 25°C**
- **Ultra Low Dropout Voltage : 140mV at 500mA**
- **Low Bias Input Current**
- **80μA in Operating Mode**
- **0.5μA in Disable Mode**
- **Enable Control**
- **Output Active Discharge Function (Optional)**
- **Stable with a 1μF Output Ceramic Capacitor**
- **RoHS Compliant and Halogen Free**

Applications

- Battery Powered Systems
- Portable Electronic Device
- Digital Set Top Boxes

Ordering Information

Product No.	Nominal Output Voltage	Option	Package	Lead Plating System	Pin 1 Orientation
RT9081A-09GQZA(2)	0.90V	Output Active Discharge	ZADFN-6L 1.2x1.2 (Z-Type)	G : Green (Halogen Free and Pb Free)	(2): Quadrant 2 Follow EIA-481-D ***Empty means Pin1 orientation is Quadrant 1
RT9081A-10GQZA	1.00V				
RT9081A-1KGQZA	1.05V				
RT9081A-11GQZA	1.10V				
RT9081A-1AGQZA(2)	1.15V				
RT9081A-12GQZA	1.20V				
RT9081A-1BGQZA(2)	1.25V				
RT9081A-13GQZA(2)	1.30V				
RT9081A-15GQZA(2)	1.50V				
RT9081A-18GQZA(2)	1.80V				
RT9081AGQZA(2)	Adjustable				

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ZADFN-6L 1.2x1.2 package, the thermal resistance, θ_{JA}, is 136.5°C/W on a two-layer Richtek evaluation board. The maximum power dissipation at T_A = 25°C can be calculated as below :

$P_{D(MAX)}$ = (125°C − 25°C) / (136.5°C/W) = 0.73W for a ZADFN-6L 1.2x1.2 package.

The maximum power dissipation depends on the operating ambient temperature for the fixed $T_{J(MAX)}$ and the thermal resistance, θ_{JA}. The derating curves in Figure 1 allows the designer to see the effect of rising ambient temperature on the maximum power dissipation.

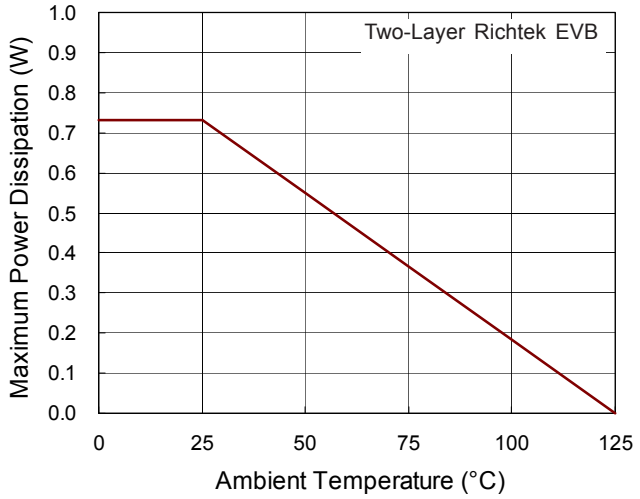

Figure 3. Derating Curve of Maximum Power Dissipation

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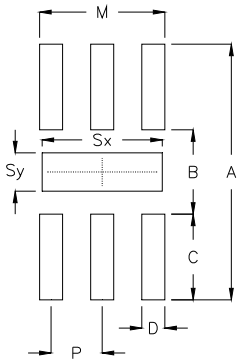
Footprint Information



Package	Number of Pin	Footprint Dimension (mm)								Tolerance
		P	A	B	C	D	Sx	Sy	M	
U/X/ZADFN1.2*1.2-6	6	0.400	2.000	0.760	0.620	0.180	1.015	0.375	0.980	±0.050

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