RICHTEK®

RT5707/A

Ultra-Low Quiescent Current HCOT Buck Converter

1 General Description

The RT5707/A is a high-efficiency synchronous buck converter featuring a typical quiescent current of 360nA. It provides high efficiency at light loads, down to 10mA with the input voltage range from 2.2V to 5.5V.

The RT5707 provides eight programmable output voltages ranging from 1.2V to 3.3V, while delivering an output current of up to 600mA, peaking at 1A. The RT5707A provides eight programmable output voltages ranging from 0.7V to 3.1V, and it can deliver an output current of up to 400mA, with a peak at 0.5A. The Hysteretic Constant-On-Time (HCOT) operation with internal compensation allows the transient response to be optimized across a wide range of loads and output capacitors. The RT5707/A is available in a WL-CSP-8B 0.9x1.6 (BSC) package.

The recommended junction temperature range is –40°C to 125°C, and the ambient temperature range is –40°C to 85°C.

2 Ordering Information

RT5707/A□

Package Type(1)
WSC: WL-CSP-8B 0.9x1.6 (BSC)

Note 1.

Richtek products are Richtek Green Policy compliant and marked with (1) indicates compatible with the current requirements of IPC/JEDEC J-STD-020.

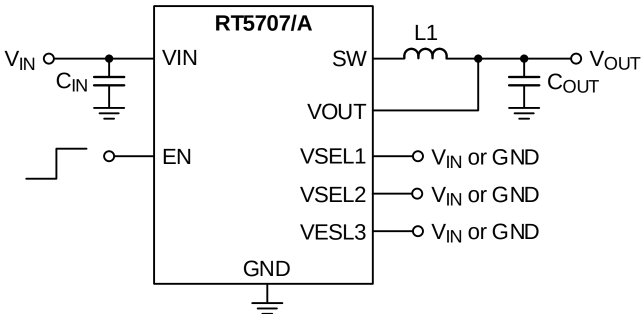
3 Features

- **Input Voltage Range: 2.2V to 5.5V**
- **Eight-Level Programmable Output Voltage**
  - **RT5707 1.2V to 3.3V**
  - **RT5707A 0.7V to 3.1V**
- **Typical 360nA Quiescent Current**
- **PSM Operation**
- **Up to 94% Efficiency**
- **Internal Compensation**
- **Output Voltage Discharge**
- **Overcurrent Protection**
- **Over-Temperature Protection**
- **Output Current:**
  - **RT5707 600mA, Peak to 1A**
  - **RT5707A 400mA, Peak to 0.5A**
- **Automatic Transition to 100% Duty Cycle Operation**

4 Applications

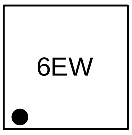
- Hand-Held Devices
- Portable Information
- Battery Powered Equipment
- Wearable Devices
- Internet of Things
- Smart Watches

5 Simplified Application Circuit



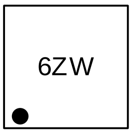
6 Marking Information

RT5707WSC



6E: Product Code
W: Date Code

RT5707AWSC



6Z: Product Code
W: Date Code

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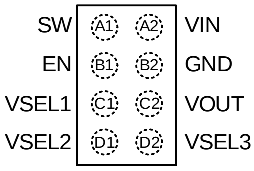
7 Pin Configuration

(TOP VIEW)

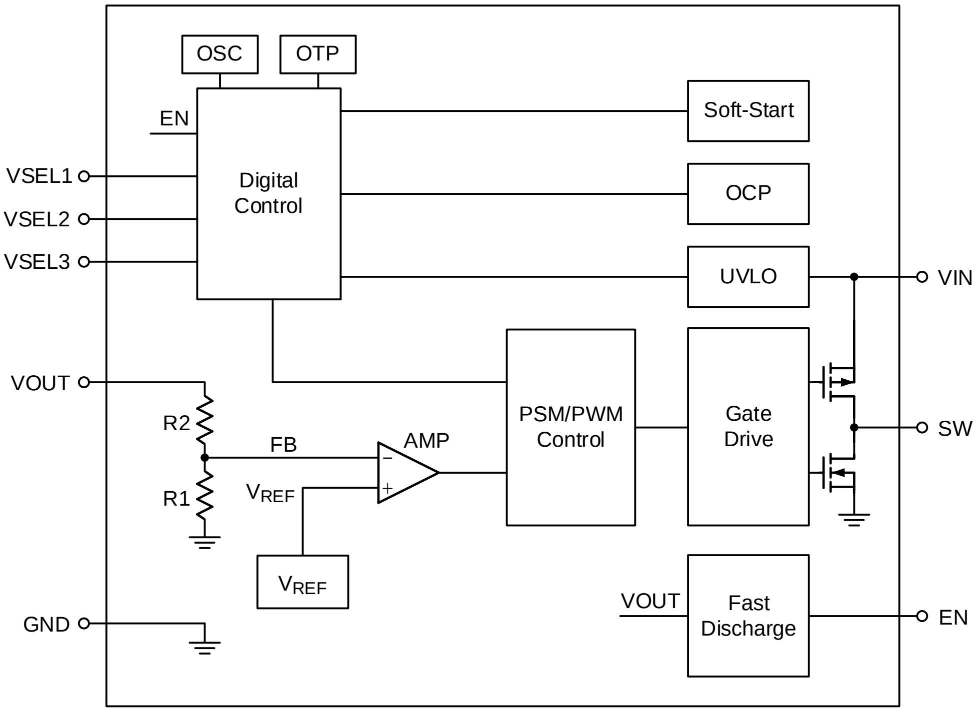


WL-CSP-8B 0.9x1.6 (BSC)

8 Functional Pin Description

Pin No.	Pin Name	Pin Function
A1	SW	This pin serves as the interface for the internal switches integrated within the IC and must be connected to an external inductor. It is imperative to connect the inductor to this pin using the shortest possible trace length to minimize parasitic inductances.
A2	VIN	Supply input. A minimum of a 10μF (for the RT5707) and a 4.7μF (for the RT5707A) ceramic capacitor must be connected to this pin using the shortest path.
B1	EN	Chip enable input pin. A high voltage level enables the device, while a low voltage level turns the device off. This pin must be properly terminated.
B2	GND	Device ground pin. This pin should be connected to input and output capacitors using the shortest path.
C1	VSEL1	Output voltage selection pin. This pin requires terminated.
C2	VOUT	Output voltage feedback pin. This pin should be connected close to the output capacitor terminal to achieve better voltage regulation. A minimum of a 10μF ceramic capacitor must be connected to this pin using the shortest path.
D1	VSEL2	Output voltage selection pin. This pin requires terminated.
D2	VSEL3	Output voltage selection pin. This pin requires terminated.

9 Functional Block Diagram



10 Absolute Maximum Ratings

(Note 2)

- VIN, SW, EN, VSEL1, VSEL2, VSEL3, VOUT --- –0.3V to 6.5V
- Power Dissipation, P_D @ T_A = 25°C
  WL-CSP-8B 0.9x1.6 (BSC) --- 0.84W
- Package Thermal Resistance (Note 3)
  WL-CSP-8B 0.9x1.6 (BSC), θ_{JA} -- 118.5°C/W
- Lead Temperature (Soldering, 10 sec.) --- 260°C
- Junction Temperature --- –40°C to 150°C
- Storage Temperature Range -- –65°C to 150°C
- ESD Susceptibility (Note 4)
  HBM (Human Body Model)-- 2kV

Note 2. Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and 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 may affect device reliability.

Note 3. θ_{JA} is measured under natural convection (still air) at T_A = 25°C with the component mounted on a high effective-thermal-conductivity four-layer test board on a JEDEC 51-7 thermal measurement standard.

Note 4. Devices are ESD sensitive. Handling precautions are recommended.

11 Recommended Operating Conditions

(Note 5)

- Supply Input Voltage--- 2.2V to 5.5V
- RT5707 Output Current (5.5V ≥ VIN ≥ (V_{OUT_NOM} + 0.7V) ≥ 3V) --------------------------------- 0mA to 600mA
- RT5707A Output Current (5.5V ≥ VIN ≥ (V_{OUT_NOM} + 0.7V) ≥ 3V) ------------------------------- 0mA to 400mA
- Ambient Temperature Range-- –40°C to 85°C
- Junction Temperature Range-- –40°C to 125°C

Note 5. The device is not guaranteed to function outside its operating conditions.

12 Electrical Characteristics

(V_{IN} = 3.6V, C_{IN} = C_{OUT} = 10μF, L1 = 2.2μH, T_A = 25°C, unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
BUCK Regulator						
Undervoltage-Lockout Rising Threshold	V_{UVLO_R}	V_{IN} rising	--	2	2.15	V
Undervoltage-Lockout Hysteresis	V_{UVLO_HYS}		--	0.1	0.4	V
VOUT Voltage Accuracy	V_{OUT_ACC10}	V_{OUT} = 1.8V, I_{OUT} = 10mA	–2.5	--	2.5	%
	V_{OUT_ACC100}	V_{OUT} = 1.8V, I_{OUT} = 100mA	–2	--	2	%

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Input Quiescent Current	I_{Q_NSW}	V_{OUT} = 1.8V, I_{OUT} = 0A, EN = V_{IN}, non-switching		--	360	800	nA
	I_{Q_SW}	V_{OUT} = 1.8V, I_{OUT} = 0A, EN = V_{IN}, switching		--	460	1200	
Shutdown Current	I_{SHDN}	EN = GND		--	0.2	1	μA
Switching Frequency	f_{SW}	V_{OUT} = 1.8V, CCM mode		--	1.2	--	MHz
UGATE Current Limit	I_{LIM_H}	$3V \le V_{IN} \le 5.5V$	RT5707	1	1.2	1.4	A
			RT5707A	0.68	0.78	0.88	
LGATE Current Limit	I_{LIM_L}	$3V \le V_{IN} \le 5.5V$	RT5707	1	1.2	1.4	A
			RT5707A	0.55	0.68	0.8	
On-Resistance of High-Side MOSFET	R_{DSON_H}	I_{OUT} = 50mA		--	350	--	mΩ
On-Resistance of Low-Side MOSFET	R_{DSON_L}	I_{OUT} = 50mA		--	250	--	mΩ
Output Discharge Resistor	R_{DISCHG}	EN = GND, I_{OUT} = –10mA		--	10	--	Ω
VOUT Pin Input Leakage	I_{LK}	V_{OUT} = 2V, EN = V_{IN}		--	100	--	nA
VOUT Minimum Off-Time	t_{OFF_MIN}			--	80	--	ns
VOUT Minimum On-Time	t_{ON_MIN}	V_{OUT} = 1.8V, V_{IN} = 3.6V		--	420	--	ns
Line Regulation	V_{LINE_REG}	V_{OUT} = 1.8V, I_{OUT} = 100mA, V_{IN} = 2.2V to 5.5V		--	0.1	--	%/V
Load Regulation	V_{LOAD_REG}	V_{OUT} = 1.8V, including PFM operation		--	0.001	--	%/mA
		V_{OUT} = 1.8V, only CCM operation		--	0.0005	--	
Over-Temperature Protection	T_{OTP}			--	150	--	°C
Over-Temperature Protection Hysteresis	T_{OTP_HYS}			--	20	--	°C
Auto 100% Duty Cycle Leave Detection Threshold	V_{TH_100+}	Rising V_{IN}, 100% mode is left with $V_{IN} = V_{OUT} + V_{TH\_100+}$		150	250	350	mV
Auto 100% Duty Cycle Enter Detection Threshold	V_{TH_100-}	Falling V_{IN}, 100% mode is entered with $V_{IN} = V_{OUT} + V_{TH\_100-}$		85	200	290	mV
Timing							
Regulator Start-Up Delay Time	t_{DLY}	I_{OUT} = 0mA, EN = GND to V_{IN}, V_{OUT} starts rising		--	0.1	--	ms
Regulator Soft-Start Time	t_{SS}	V_{OUT} = 1.8V, I_{OUT} = 10mA, EN = V_{IN}		--	0.7	--	ms
Logic Input (EN, VSEL1, VSEL2, and VSEL3)							
Input High Threshold	V_{IH}	V_{IN} = 2.2V to 5.5V		1.2	--	--	V
Input Low Threshold	V_{IL}	V_{IN} = 2.2V to 5.5V		--	--	0.4	V
Input Pin Bias Current	I_{BIAS}			--	10	--	nA

13 Typical Application Circuit

13.1 For the RT5707

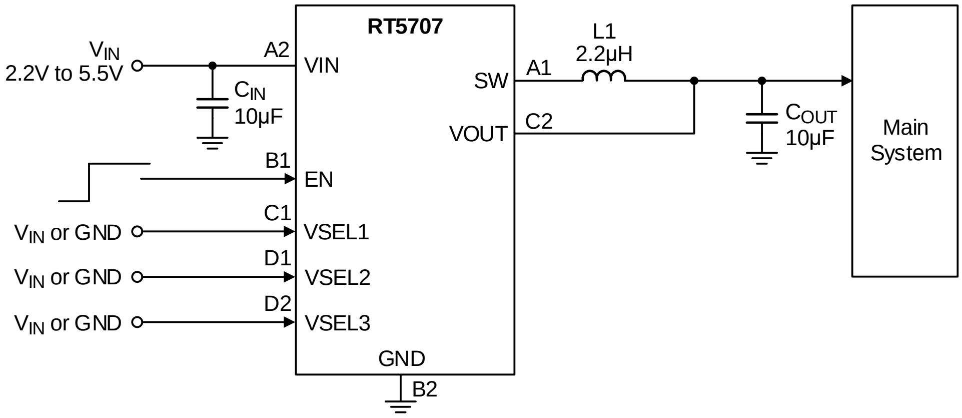


Table 1. Recommended Components Information

Reference	Part Number	Description	Package	Manufacturer
C_{IN}, C_{OUT}	GRM155R60J106ME15	10µF/6.3V/X5R	0402	Murata
L1	1239AS-H-2R2M	2.2µH	2520	Murata

13.2 For the RT5707A

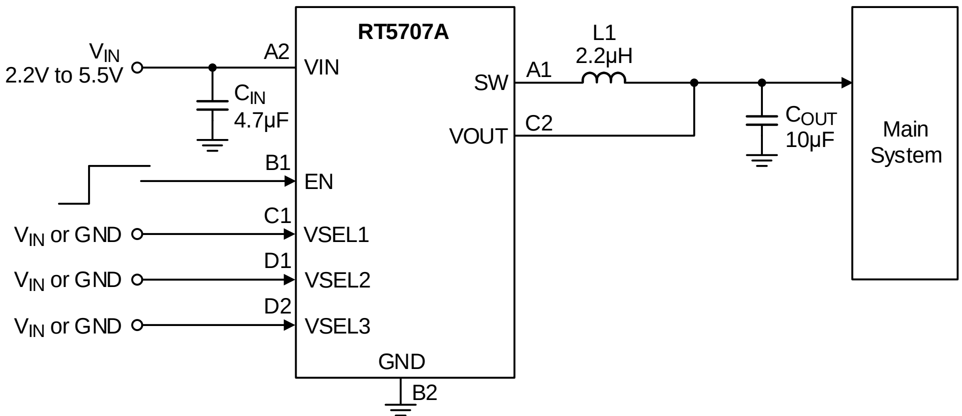
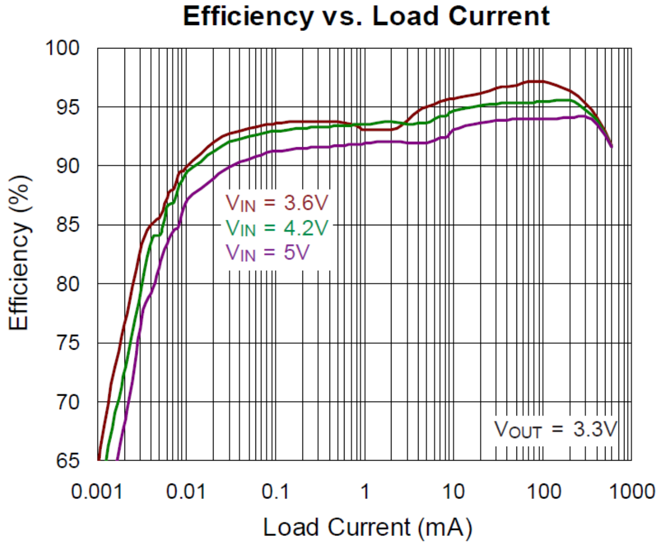
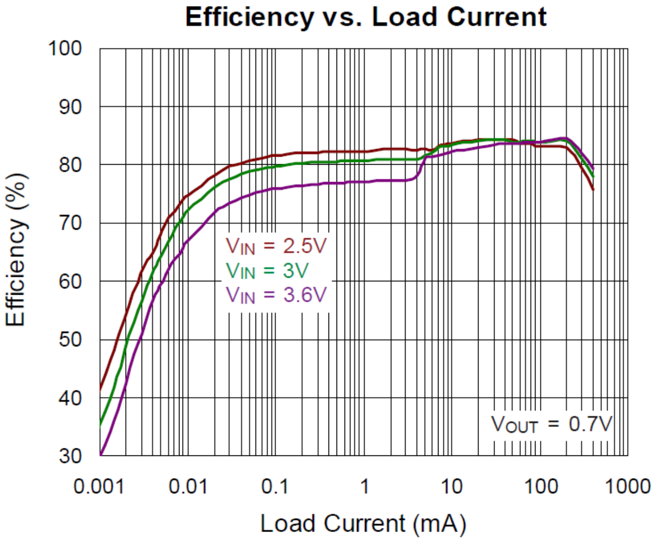


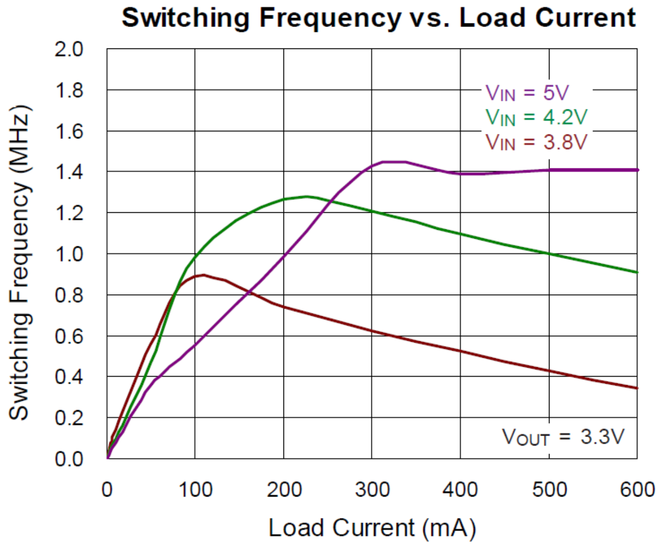
Table 2. Recommended Components Information

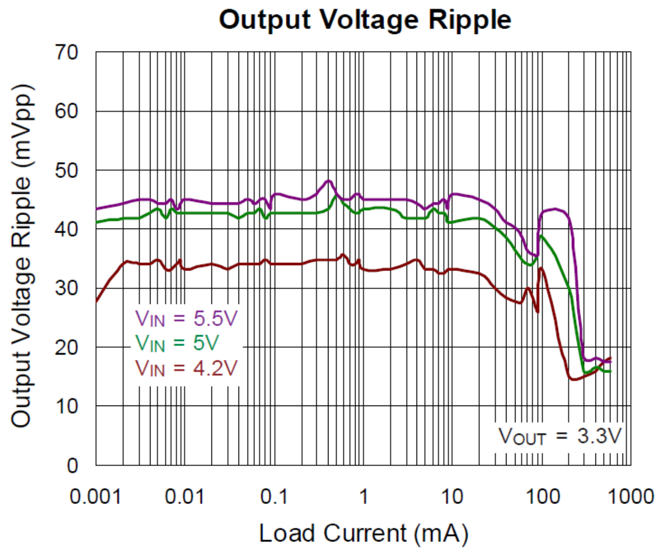
Reference	Part Number	Description	Package	Manufacturer
C_{IN}	GRM155R60J475ME47	4.7µF/6.3V/X5R	0402	Murata
C_{OUT}	GRM155R60J106ME15	10µF/6.3V/X5R	0402	Murata
L1	DFE201610E-2R2M=P2	2.2µH	2016	Murata

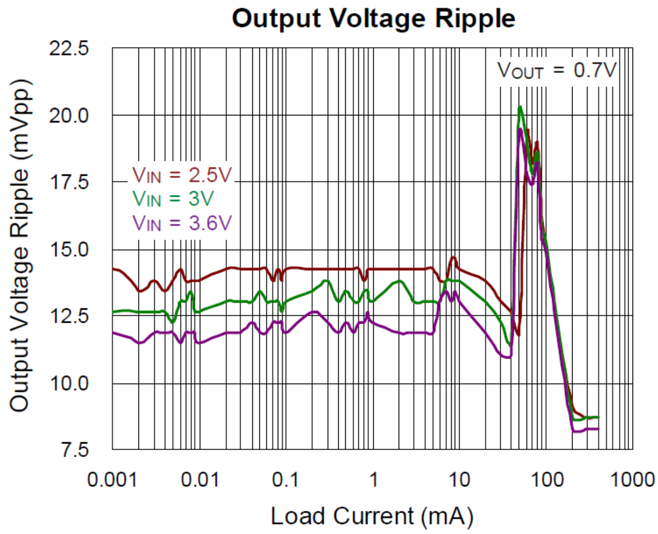
14 Typical Operating Characteristics

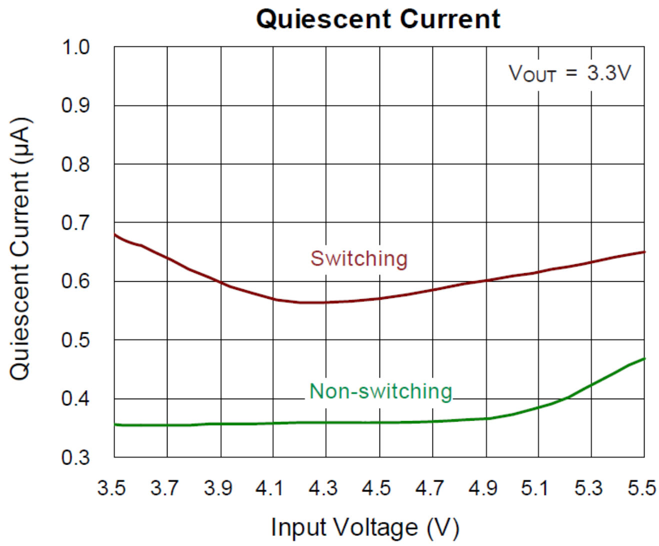


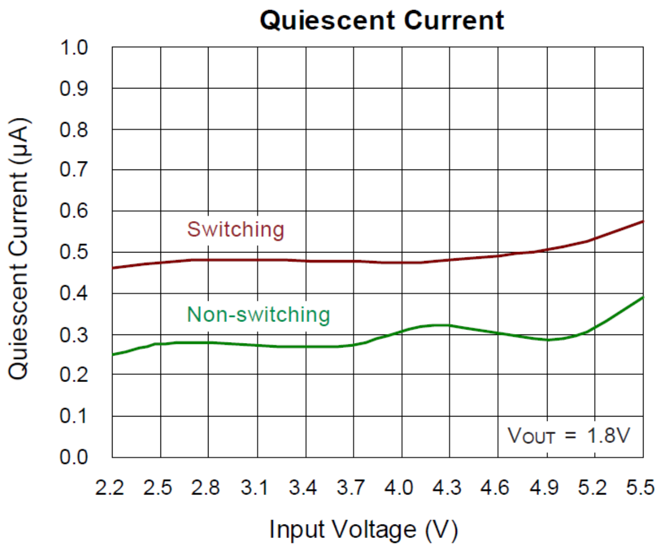


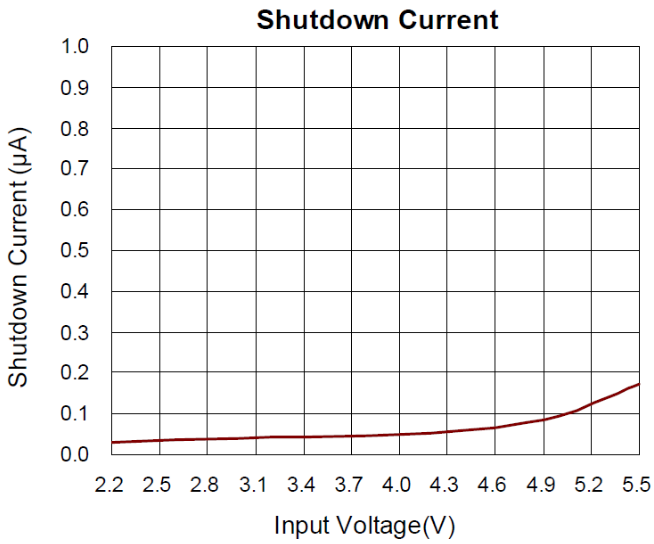


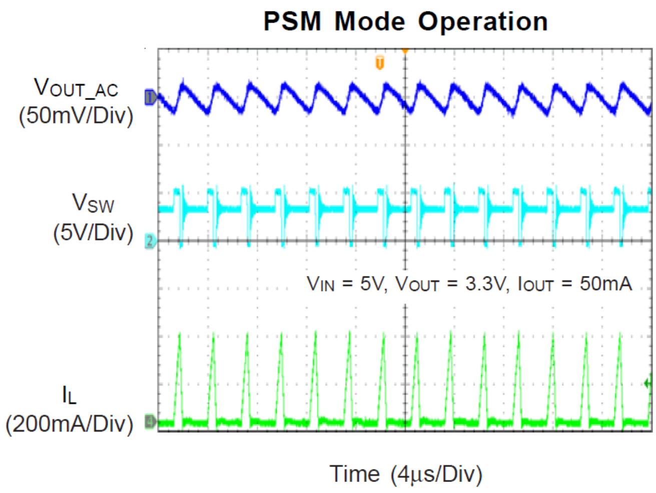


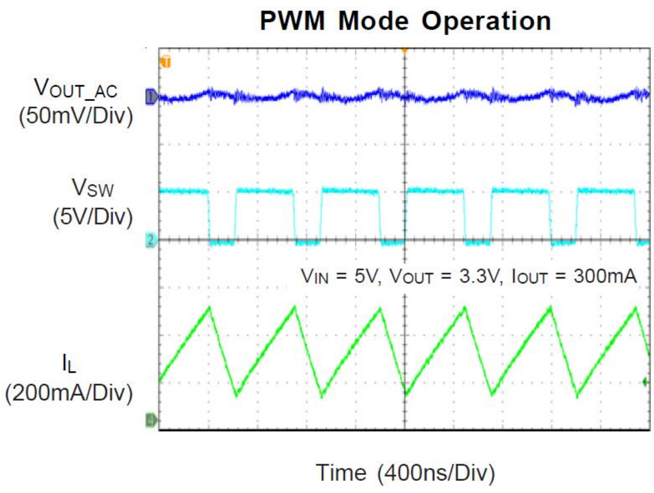


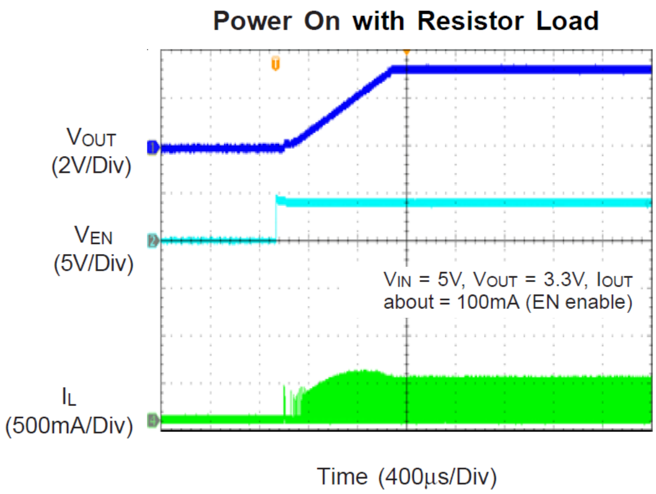


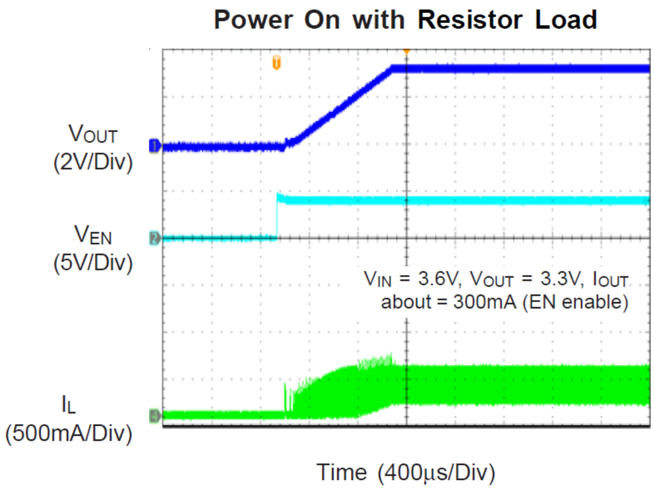

Quiescent Current
Quiescent Current (μA)
Switching
Non-switching
VOUT = 1.8V
Input Voltage (V)

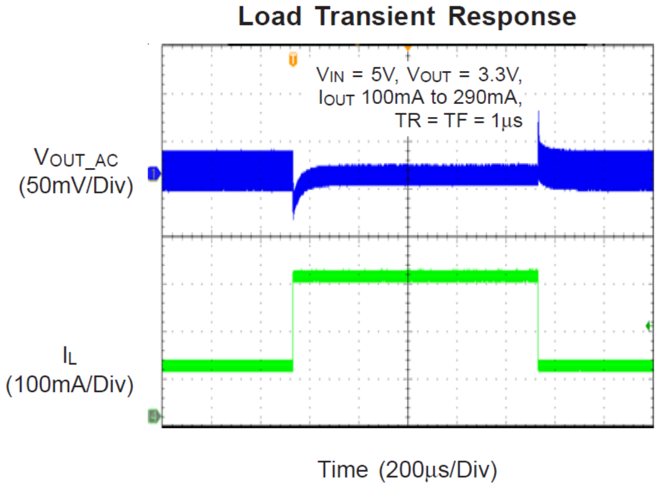

Shutdown Current
Shutdown Current (μA)
Input Voltage(V)

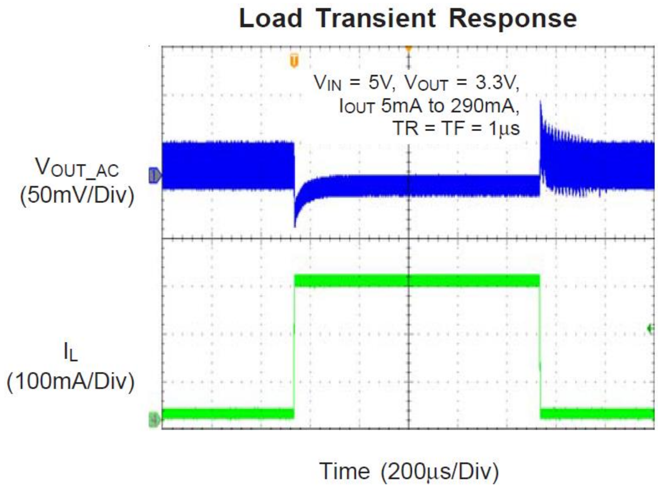

PSM Mode Operation
VOUT_AC (50mV/Div)
VSW (5V/Div)
VIN = 5V, VOUT = 3.3V, IOUT = 50mA
IL (200mA/Div)
Time (4μs/Div)

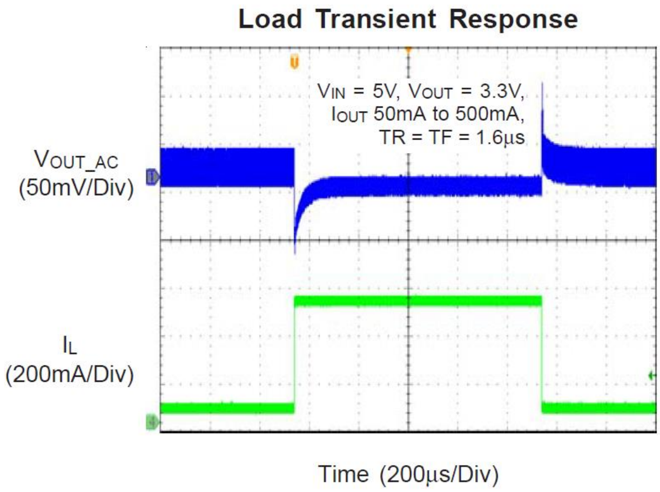

PWM Mode Operation
VOUT_AC (50mV/Div)
VSW (5V/Div)
VIN = 5V, VOUT = 3.3V, IOUT = 300mA
IL (200mA/Div)
Time (400ns/Div)

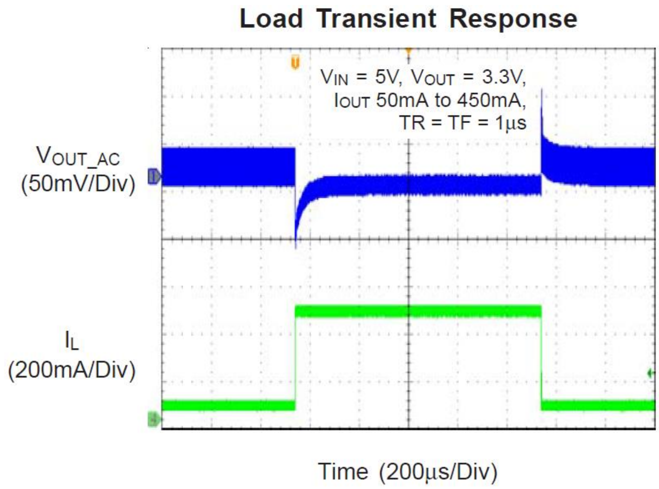

Power On with Resistor Load
VOUT (2V/Div)
VEN (5V/Div)
VIN = 5V, VOUT = 3.3V, IOUT about = 100mA (EN enable)
IL (500mA/Div)
Time (400μs/Div)

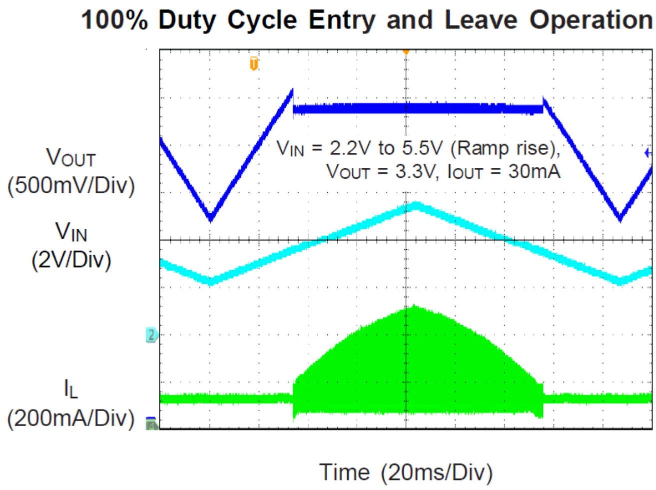

Power On with Resistor Load
VOUT (2V/Div)
VEN (5V/Div)
VIN = 3.6V, VOUT = 3.3V, IOUT about = 300mA (EN enable)
IL (500mA/Div)
Time (400μs/Div)


Load Transient Response
V_{IN} = 5V, V_{OUT} = 3.3V,
I_{OUT} 100mA to 290mA,
TR = TF = 1μs
V_{OUT_AC} (50mV/Div)
I_L (100mA/Div)
Time (200μs/Div)


Load Transient Response
V_{IN} = 5V, V_{OUT} = 3.3V,
I_{OUT} 5mA to 290mA,
TR = TF = 1μs
V_{OUT_AC} (50mV/Div)
I_L (100mA/Div)
Time (200μs/Div)


Load Transient Response
V_{IN} = 5V, V_{OUT} = 3.3V,
I_{OUT} 50mA to 500mA,
TR = TF = 1.6μs
V_{OUT_AC} (50mV/Div)
I_L (200mA/Div)
Time (200μs/Div)


Load Transient Response
V_{IN} = 5V, V_{OUT} = 3.3V,
I_{OUT} 50mA to 450mA,
TR = TF = 1μs
V_{OUT_AC} (50mV/Div)
I_L (200mA/Div)
Time (200μs/Div)


100% Duty Cycle Entry and Leave Operation
V_{IN} = 2.2V to 5.5V (Ramp rise),
V_{OUT} = 3.3V, I_{OUT} = 30mA
V_{OUT} (500mV/Div)
V_{IN} (2V/Div)
I_L (200mA/Div)
Time (20ms/Div)

15 Operation

The RT5707/A is a hysteretic constant on-time (HCOT) switching buck converter. It features Over-Temperature Protection (OTP) and Overcurrent Protection (OCP) mechanisms to prevent the device against damage from abnormal operating conditions. When the EN pin voltage is at a logic low level, the IC enters shutdown mode, drawing a low input supply current of less than 1μA.

15.1 Enable

The device can be enabled or disabled via the EN pin. When the voltage on the EN pin exceeds the logic-high threshold, the IC enters normal operation. A transition of the EN pin from high to low causes the converter to enter shutdown mode, halting switching activity, powering down internal control circuitry, and initiating the discharge function.

That discharge function will deactivate after approximately 10ms.

If the system requires toggling of the EN pin, the duration of the EN pin being turned off must be greater than 100μs to allow sufficient time for the internal circuitry to reset.

15.2 UVLO Protection

To protect the IC from operating under insufficient supply voltage conditions, a UVLO feature is implemented. If the input voltage is lower than the UVLO threshold, the device enters a lockout state, preventing operation until the voltage is restored above the threshold.

15.3 100% Duty Cycle Operation

When the input voltage drops, making the difference between input and output less than V_{TH_100-}, the converter operates at a 100% duty cycle. In this mode, the output voltage is the input voltage minus losses in the P-MOSFET and inductor. If the input voltage rises above V_{TH_100+}, the converter switches back to its regular mode. Refer to Figure 1.

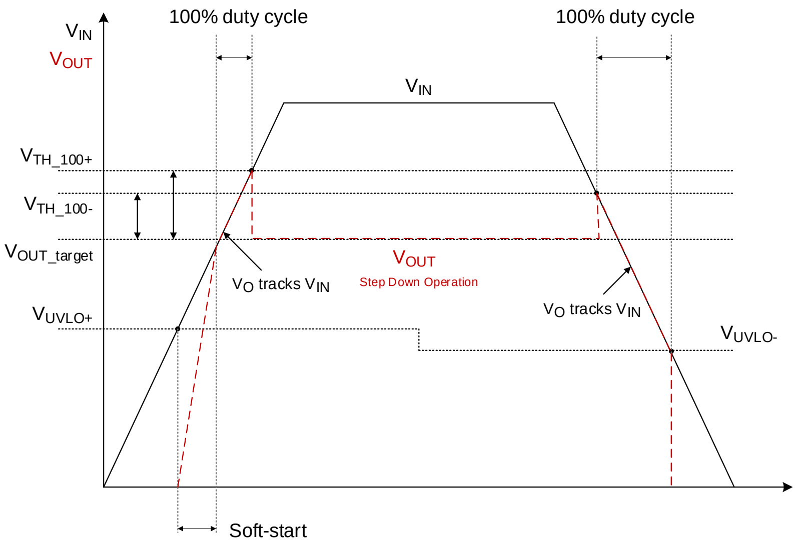


Figure 1. Automatic Transition into 100% Duty Cycle

15.4 Over-Temperature Protection

When the junction temperature exceeds the OTP threshold value, the IC will shut down the switching operation. Once the junction temperature cools down and falls below the OTP lower threshold, the converter will automatically resume switching.

15.5 Overcurrent Protection

The OCP functions are implemented by the high-side MOSFET and low-side MOSFET. When the inductor current reaches the UGATE current limit threshold, the high-side MOSFET is turned off. Subsequently, the low-side MOSFET is turned on to discharge the inductor current until it falls below the LGATE current limit threshold. Once the UGATE current limit is activated, the maximum inductor current is determined by the rate of increase of the inductor current and the response delay time of the internal circuitry.

During an OCP event, if the output voltage falls below the preset threshold (0.4V typical), the current limit value is reduced. This action decreases the device's power loss, mitigates heat generation, and prevents further damage to the device.

15.6 Output Voltage Selection

The RT5707/A provides eight levels of output voltages, which can be programmed via the voltage select pins VSEL1, VSEL2, and VSEL3. Table 3 indicates the settings for each output voltage.

Table 3. Output Voltage Setting

Device	V_{OUT} (V)	VSEL3	VSEL2	VSEL1
RT5707	1.2	0	0	0
	1.5	0	0	1
	1.8	0	1	0
	2.1 (Note 6)	0	1	1
	2.5	1	0	0
	2.8	1	0	1
	3	1	1	0
	3.3 (Note 6)	1	1	1
RT5707A	0.7	0	0	0
	1	0	0	1
	1.3	0	1	0
	1.6 (Note 6)	0	1	1
	1.9	1	0	0
	2	1	0	1
	2.9	1	1	0
	3.1 (Note 6)	1	1	1

Note 6. Connect a 100kΩ resistor in series to the VSEL1 pin from the EN pin.

16 Application Information

(Note 7)

The RT5707/A is a synchronous low voltage buck converter that supports an input voltage range of 2.2V to 5.5V. It can deliver an output current of up to 600mA with a peak capability of 1A for the RT5707, or 400mA with a peak of 0.5A for the RT5707A. Integrated internal compensation minimizes the need for external components. The device includes several protection features, such as overcurrent protection, undervoltage protection, and over-temperature protection.

16.1 Inductor Selection

The recommended power inductor is 2.2μH. The inductor's saturation current rating should be selected based on overcurrent protection design considerations. For optimal performance and efficiency, it is crucial to choose an inductor with a low Direct Current Resistance (DCR).

16.2 C_{IN} and C_{OUT} Selection

The input capacitance, C_{IN}, is required to filter the trapezoidal current present at the source terminal of the top MOSFET. To mitigate large voltage ripples, it is advisable to use a low ESR input capacitor rated for the maximum RMS current.

$$I_{RMS} = I_{OUT(MAX)} \times \frac{V_{OUT}}{V_{IN}} \times \sqrt{\frac{V_{IN}}{V_{OUT}} - 1}$$

This formula reaches its maximum when $V_{IN} = 2V_{OUT}$, at which $I_{RMS} = I_{OUT} / 2$. This worst-case scenario is commonly used for design considerations because significant deviations from this condition typically do not provide substantial improvements. It is advisable to select a capacitor with a higher temperature rating than necessary, and multiple capacitors can be connected in parallel to satisfy the size or height requirements of the design.

The choice of C_{OUT} is influenced by the Effective Series Resistance (ESR) needed to reduce voltage ripple and load step transients, as well as by the required bulk capacitance to maintain control loop stability. Loop stability can be assessed by analyzing the load transient response, which will be discussed in a subsequent section.

The output ripple, ΔV_{OUT}, is determined by:

$$\Delta V_{OUT} \le \Delta I_L \left[ESR + \frac{1}{8 \times f_{SW} \times C_{OUT}} \right]$$

16.3 Thermal Considerations

The junction temperature should never exceed the absolute maximum junction temperature $T_{J(MAX)}$, listed under Absolute Maximum Ratings, to avoid permanent damage to the device. The maximum allowable power dissipation depends on the thermal resistance of the IC package, the PCB layout, the rate of surrounding airflow, and the difference between the junction and ambient temperatures. The maximum power dissipation can be calculated using the following formula:

$P_{D(MAX)} = (T_{J(MAX)} - T_A) / \theta_{JA}$

where $T_{J(MAX)}$ is the maximum junction temperature, T_A is the ambient temperature, and θ_{JA} is the junction-to-ambient thermal resistance.

For continuous operation, the maximum operating junction temperature indicated under Recommended Operating Conditions is 125°C. The junction-to-ambient thermal resistance, θ_{JA}, is highly package dependent. For a WL-CSP-8B 0.9x1.6 (BSC) package, the thermal resistance, θ_{JA}, is 118.5°C/W on a standard JEDEC 51-7 high effective-thermal-conductivity four-layer test board. The maximum power dissipation at T_A = 25°C can be calculated as follows:

$P_{D(MAX)}$ = (125°C − 25°C) / (118.5°C/W) = 0.84W for a WL-CSP-8B 0.9x1.6 (BSC) 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 curve in Figure 2 allows the designer to see the effect of rising ambient temperature on the maximum power dissipation.

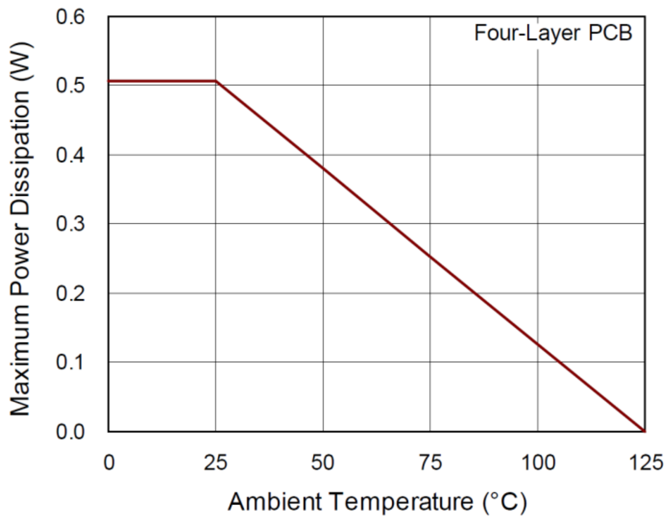


Figure 2. Derating Curve of Maximum Power Dissipation

16.4 Layout Considerations

For high-frequency switching power supplies, optimal PCB layout is crucial for achieving good regulation, high efficiency, and stability. The following descriptions are the guidelines for better PCB layout.

- To ensure good regulation, position the power components as close together as possible. Additionally, traces should be both wide and short, particularly for the high-current loop, to optimize the performance.
- Minimize the length of the SW node trace and increase its width for the optimal performance.

Table 4. Protection Trigger Condition and Behavior

Protection Type		Threshold Refer to Electrical Spec.	Protection Method	Reset Method
RT5707	UGATE Current Limit	I_{SW} > 1.2A (Typical)	Turn off UG MOS	I_{SW} < 1.2A (Typical)
	LGATE Current Limit	I_{SW} > 1.2A (Typical)	Turn on LG MOS	I_{SW} < 1.2A (Typical)
RT5707A	UGATE Current Limit	I_{SW} > 0.78A (Typical)	Turn off UG MOS	I_{SW} < 0.78A (Typical)
	LGATE Current Limit	I_{SW} > 0.68A (Typical)	Turn on LG MOS	I_{SW} < 0.68A (Typical)
UVLO		V_{UVLOF} < 1.9V (Typical)	Shutdown	V_{UVLOR} > 2V (Typical)
OTP		Temperature > 150°C (Typical)	Shutdown	Temperature < 130°C (Typical)

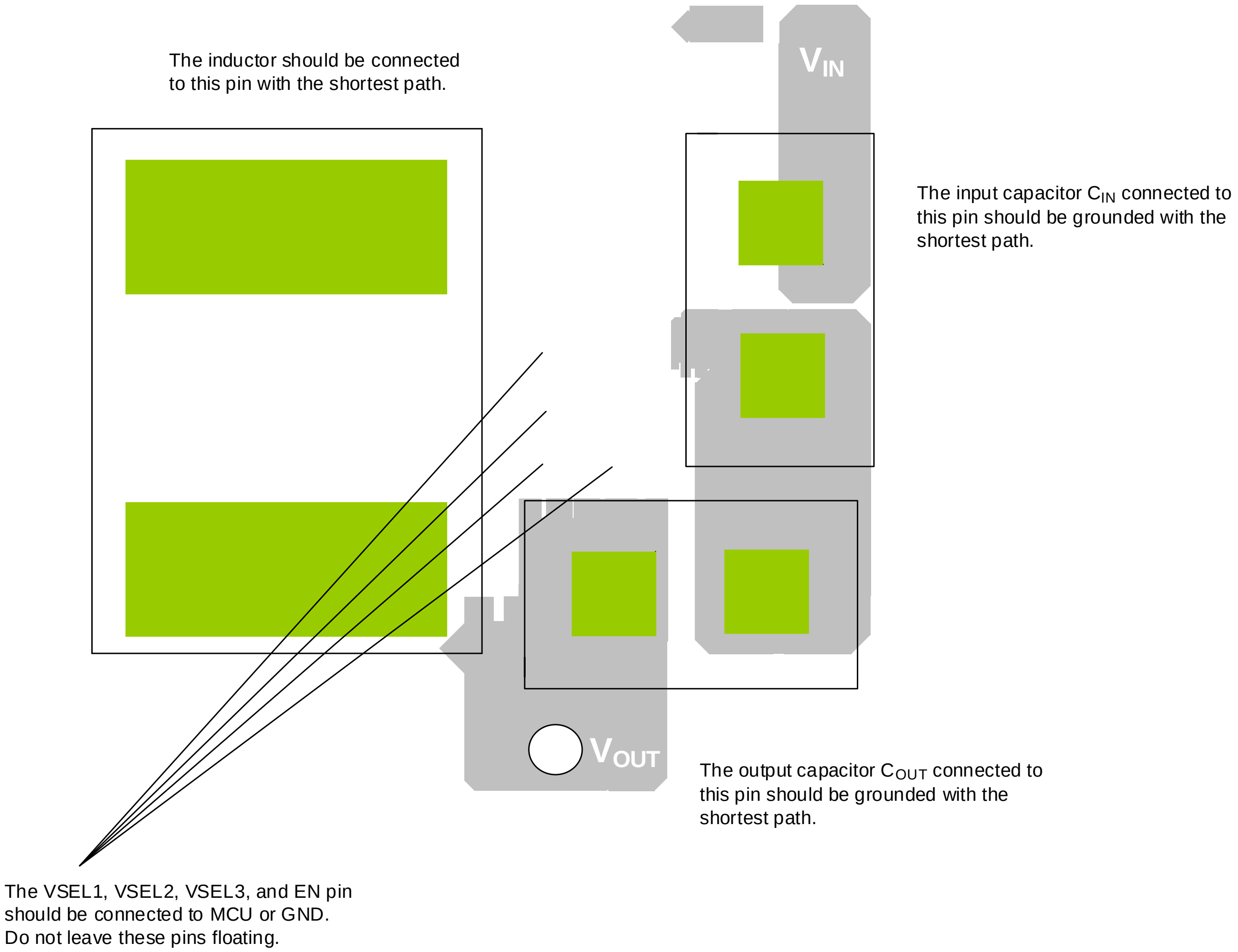


Figure 3. PCB Layout Guide for the RT5707

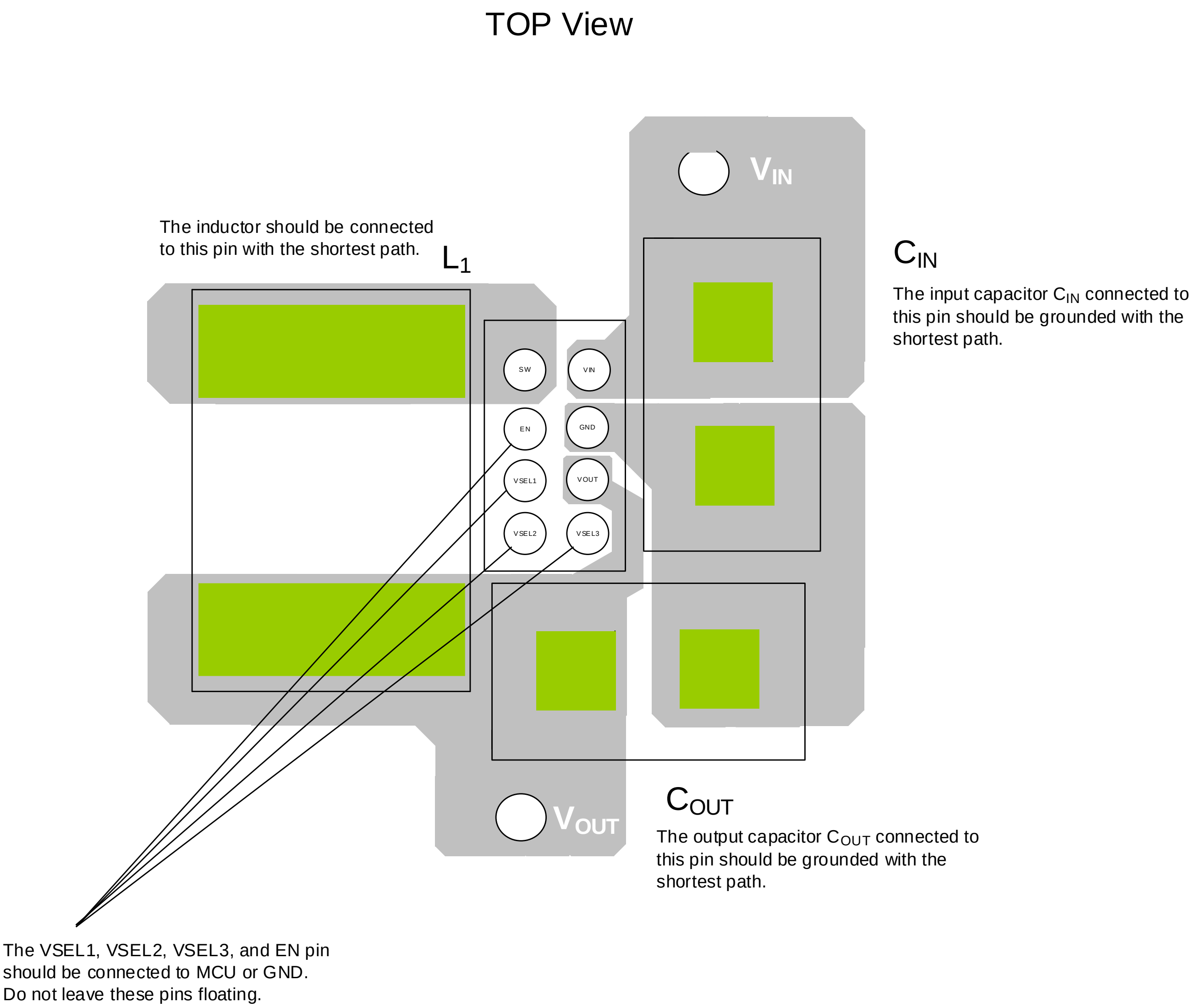
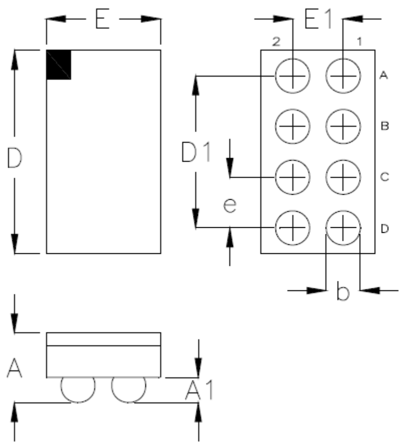


Figure 4. PCB Layout Guide for the RT5707A

Note 7. The information provided in this section is for reference only. The customer is solely responsible for designing, validating, and testing any applications incorporating Richtek's product(s). The customer is also responsible for applicable standards and any safety, security, or other requirements.

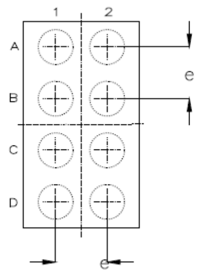
17 Outline Dimension

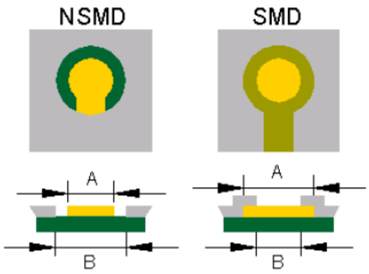


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.500	0.600	0.020	0.024
A1	0.170	0.230	0.007	0.009
b	0.240	0.300	0.009	0.012
D	1.560	1.640	0.061	0.065
D1	1.200		0.047	
E	0.860	0.940	0.034	0.037
E1	0.400		0.016	
e	0.400		0.016	

8B WL-CSP 0.9x1.6 Package (BSC)

18 Footprint Information

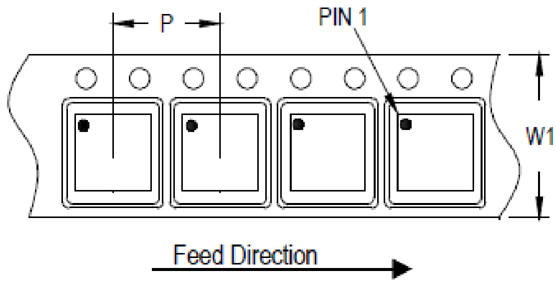


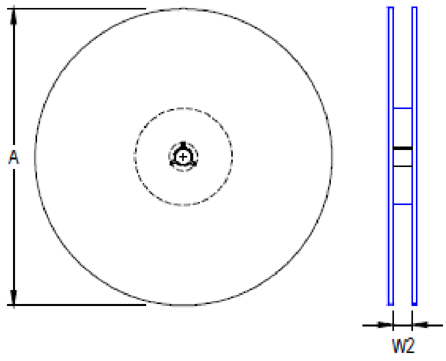


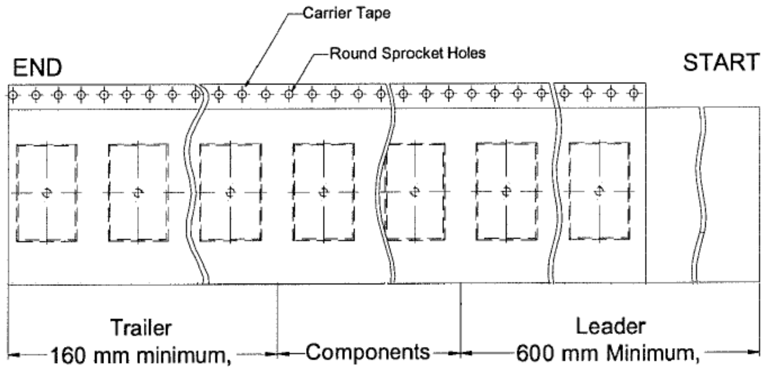
Package	Number of Pin	Type	Footprint Dimension (mm)			Tolerance
			e	A	B	
WL-CSP0.9x1.6-8(BSC)	8	NSMD	0.400	0.240	0.340	±0.025
		SMD		0.270	0.240	

19 Packing Information

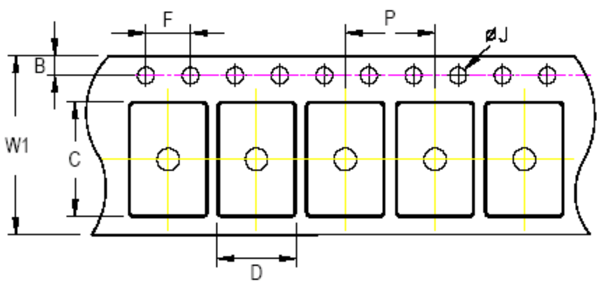
19.1 Tape and Reel Data

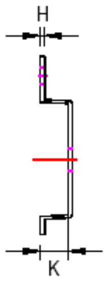






Package Type	Tape Size (W1) (mm)	Pocket Pitch (P) (mm)	Reel Size (A)		Units per Reel	Trailer (mm)	Leader (mm)	Reel Width (W2) Min/Max (mm)
			(mm)	(in)				
WL-CSP 0.9x1.6	8	4	180	7	3,000	160	600	8.4/9.9





C, D, and K are determined by component size. The clearance between the components and the cavity is as follows:

- For 8mm carrier tape: 0.5mm max.

Tape Size	W1	P		B		F		ØJ		H
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Max
8mm	8.3mm	3.9mm	4.1mm	1.65mm	1.85mm	3.9mm	4.1mm	1.5mm	1.6mm	0.6mm

19.2 Tape and Reel Packing

Step	Photo/Description	Step	Photo/Description
1	 Reel 7”	4	 12 inner boxes per outer box
2	 Packing by Anti-Static Bag	5	 Outer box **Carton A**
3	 3 reels per inner box **Box A**	6	

Container / Package	Reel		Box			Carton		
	Size	Units	Item	Reels	Units	Item	Boxes	Unit
WL-CSP 0.9x1.6	7”	3,000	Box A	3	9,000	Carton A	12	108,000
			Box E	1	3,000	For Combined or Partial Reel.		

20.1 Packing Material Anti-ESD Property

Surface Resistance	Aluminum Bag	Reel	Cover tape	Carrier tape	Tube	Protection Band
Ω/cm^2	**10^4 to 10^{11}**	**10^4 to 10^{11}**	**10^4 to 10^{11}**	**10^4 to 10^{11}**	**10^4 to 10^{11}**	**10^4 to 10^{11}**

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21 Datasheet Revision History

Version	Date	Description	Item
05	2025/1/7	Modify	*General Description on page 1* - Added description of temperature *Ordering Information on page 1* - Added note *Electrical Characteristics on page 6, 7* - Modified symbol *Packing Information on page 20, 21, 22* -Added packing information