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Features

Evaluation Module

- Evaluation platform for RPY-1.5Q step-down LED Driver Module
- Thermal design considerations included
- CISPR25 Class 5 EMI filter
- Easy evaluation of output current selection, PWM dimming and fault indication functions

RECOM
Evaluation Module

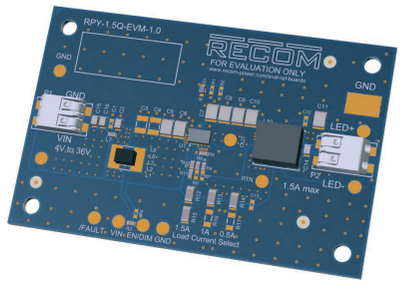
RPY-1.5Q-EVM-1

Description

The RPY-1.5Q-EVM-1 generates a constant output current selectable from 0.5A, 1A, or 1.5A from a DC input in the range of 4 – 36VDC. It has a maximum continuous output current of 1.5A.

All the functions of the RPY-1.5Q such as output current selection, control, and fault indication can be readily evaluated. Also the behavior in overload or over-temperature can be evaluated easily before it is designed in.

The evaluation board also contains the filter components to meet EMC Class 5 levels. Alternate component positions are included to allow experimentation to optimize the EMC performance depending on operating conditions and budget.



Selection Guide

Part Number	Input Voltage Range [VDC]	Output Voltage (1) [VDC]	Output Current max. [A]
RPY-1.5Q-EVM-1	4 - 36	V_{IN} x D_{max}	0.5A, 1A, 1.5A

Notes:

Note1: refer to SAFE OPERATING AREA of RPY-1.5Q datasheet

Quick Start Guide

1. Connect P_1 to power supply (observe correct polarity!)
2. Connect P_2 to the load (observe correct polarity!)
3. The evaluation module is preset to 1.5A I_{OUT}. The output current can be selected with values of 0.5A, 1A, or 1.5A by shorting two zero-ohm resistors to the respective places as seen in the schematic and board silk screen (See section I_{OUT} Selection).
4. The device is preset as normally on. It can be disabled by pulling the CTRL pad to GND. Short R_4 to disable the device.



Caution:
ESD sensitive. Always follow ESD preventative procedures when handling the product!

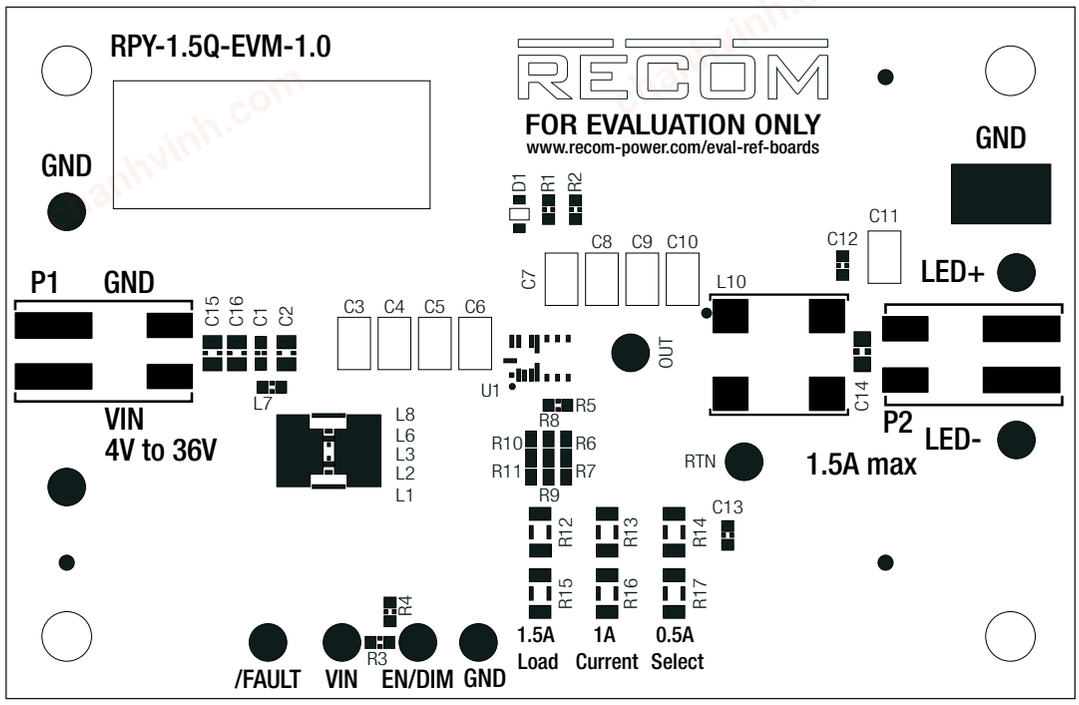
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RPY-1.5Q-EVM-1

Evaluation Module

Specifications (measured @ Ta= 25°C, full load and after warm-up unless otherwise stated)

Component Placement



Connector Description

P1

Pin	Name	Description
1-2	GND	Common GND
3-4	VIN	Positive Input Voltage (observe correct polarity!)

P2

Pin	Name	Description
3-4	LED+	Connection to the Anode of LED
1-2	LED-	Connection to the Cathode of LED

Pads Direct Connection

Name	Description
GND	Common Ground (GND)
VIN	Positive Input Voltage
FAULT	Fault indicator
EN/DIM	EN/DIM Pad (leave open if not used)
LED+	Connected to positive terminal of LED
LED-	Connected to negative terminal of LED

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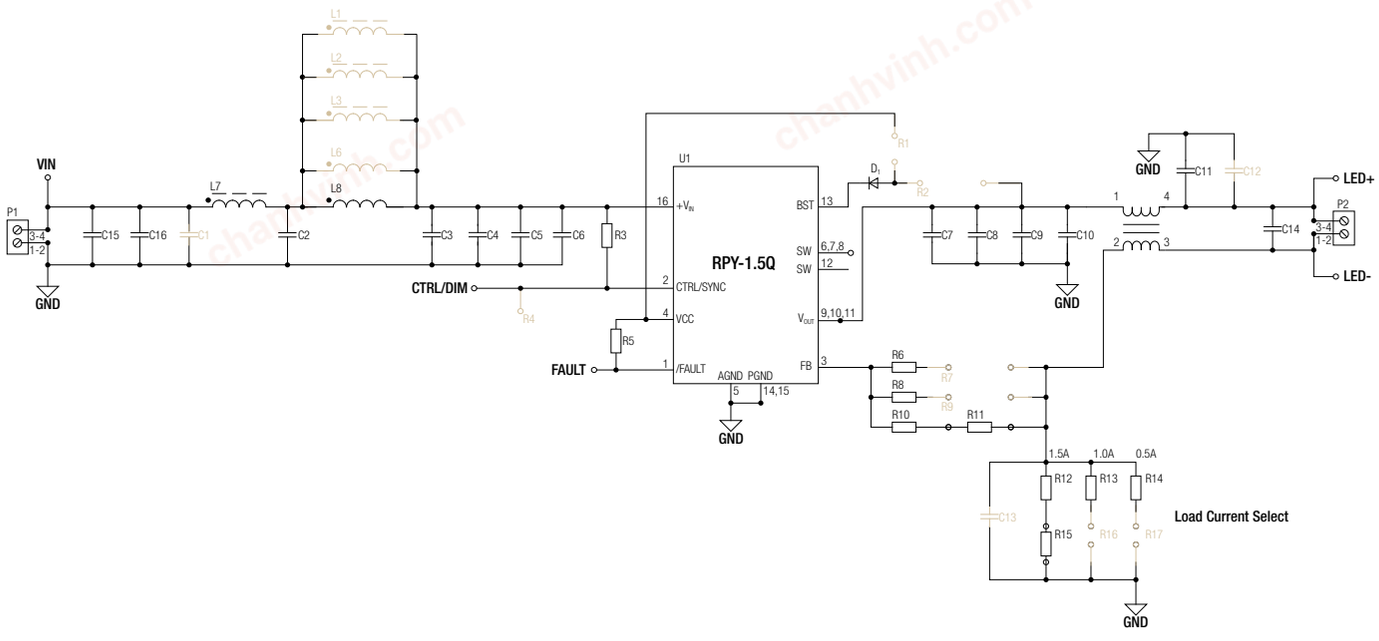
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Evaluation Module

RPY-1.5Q-EVM-1

Specifications (measured @ Ta= 25°C, full load and after warm-up unless otherwise stated)

Schematic



Notes:

Note2: Grey colored components are not mounted

Description

U_1: RPY-1.5Q power module.

C_1,C_2,L_1,L_2,L_3,L_6,L_7,L_8,C_3,C_4,C_5,C_6,C_{15},C_{16}: allow placement of various sized components to test input filter design. The populated filter is designed to meet CISPR25 Class 5.

C_7,C_8,C_9,C_{10},L_{10},C_{11},C_{12}: allow placement of various sized components to test output filter design. The populated filter is designed to meet CISPR25 Class 5.

R_1: Populate 0Ω resistor to supply the internal bootstrap circuit from VCC.

R_2: Populate 0Ω resistor to supply the internal bootstrap circuit from Vout.

R_3 and R_4: Configure CTRL. R_3 is populated to enable the RPY-1.5Q. Short R_4 in order to disable the RPY-1.5Q.

UNDERVOLTAGE LOCKOUT

The UVLO is set internally to 3.5VDC as rising threshold and 3.1VDC as falling threshold. It can be changed by populating an external resistor divider at the place of R_3 and R_4 (Please refer to the UVLO Setting of RPY-1.5Q datasheet).

EXTERNAL SYNCHRONIZATION

The efficiency of the module RPY-1.5Q module can be improve under these following conditions. Duty cycle should be higher than 65% and supply voltage for the internal bootstrap circuit is between 2.5VDC and 5VDC. V_{CC} or V_{OUT} is recommended for this purpose. Short R_1 or R_2 with a 0Ω resistor to select V_{CC} or V_{OUT} as the supply voltage for the internal bootstrap circuit.

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Evaluation Module

RPY-1.5Q-EVM-1

Specifications (measured @ Ta= 25°C, full load and after warm-up unless otherwise stated)

IOUT SELECTION

The output current can be selected with values of 0.5A, 1A, or 1.5A by shorting two 0Ω resistor to the respective places as seen in the schematic and board silk screen. For example, short R_{11} & R_{15} for 1.5A output current, Short R_9 & R_{16} for 1A output current, and short R_7 & R_{17} for 0.5A output current. For selecting output current higher than 0.5A, use thick coper wire or solder paste instead of 0Ω resistor.

PWM DIMMING

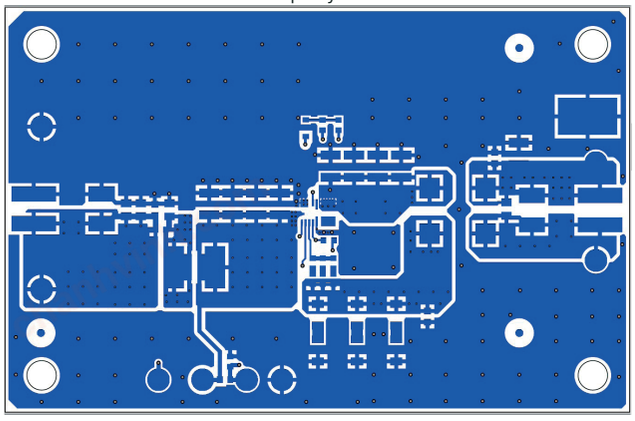
PWM dimming can be accomplished by adding an external 100Hz to 2kHz PWM signal to CTRL/DIM pad. The PWM duty cycle is proportional to the average LED current (please refer to the PWM Dimming section of RPY-1.5Q datasheet).

DIMENSION AND PHYSICAL CHARACTERISTICS

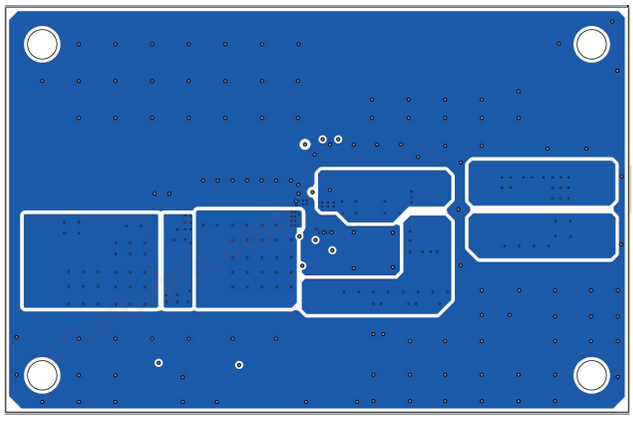
Parameter	Type	Value
Dimension (LxWxH)		85.0 x 55.0 x 6.5mm
Weight		22g

Layout

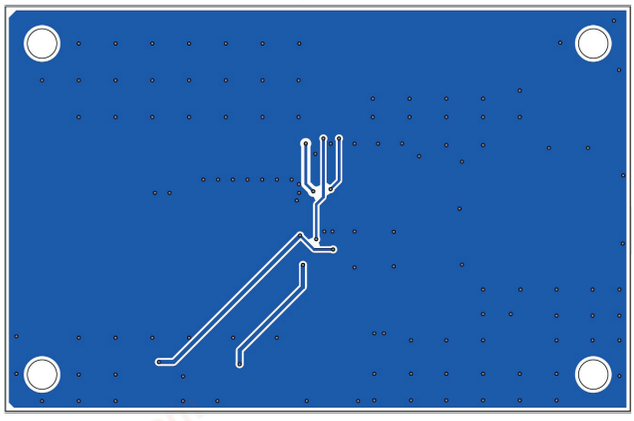
Top Layer



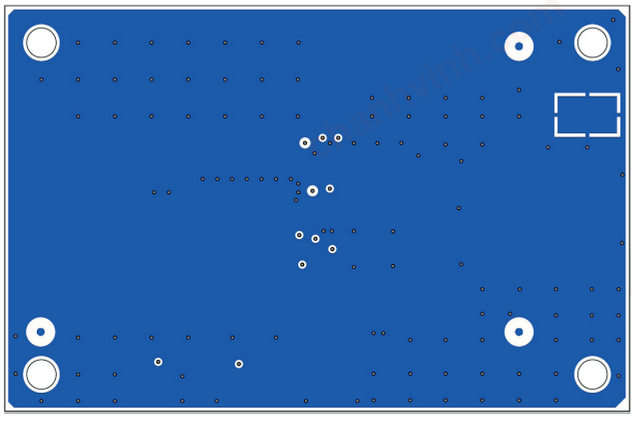
Layer 2



Layer 3



Bottom Layer



Notes:

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Evaluation Module

RPY-1.5Q-EVM-1

Specifications (measured @ Ta= 25°C, full load and after warm-up unless otherwise stated)

BOM

Comp.	Description	Manufacturer Part Number	Manufacturer	Remarks
C1, C12	CAP 0603	CL10B102KB8SFNC	Samsung Electro-Mechanics	not mounted
C2	1uF 50V X7R 0805	CL21B105KBFNNNF	Samsung Electro-Mechanics	
C3, C4, C5, C6, C7, C8, C9, C10, C11	10uF 50V X7R 1210	CL32B106KBJNNWE	Samsung Electro-Mechanics	
C14, C15, C16	4.7uF 50V X7R 0805	CGA4J1X7R1H475K125AE	TDK	
D1	DIODE 75V 150MA SOD323	1N4148WS-7-F	DIODES INCORPORATED	
L1, L2, L3, L6	FERRITE BEAD			not mounted
L7	FERRITE BEAD 33Ω 3A 0603	BLM18PG330SN1D	MURATA	
L8	FIXED IND 3.9UH 1.32A 140mΩ	RLS-397	RECOM	
L10	COMMON MODE CHOKE 9uH 3.5A	744273801	WURTH	
P1, P2	CONNECTOR	2060-452_998-404	WAGO	
R1, R2, R4, R7, R9, R16, R17	RES 0603			not mounted
R3	1MΩ 0.1W 0603	RC0603FR-071ML	YAGEO	
R5	100kΩ 0.1W 0603	RC0603FR-07100KL	YAGEO	
R6	200kΩ 0.1W 0603	RC0603FR-07200KL	YAGEO	
R8	150kΩ 0.1W 0603	RC0603FR-07150KL	YAGEO	
R10	100kΩ 0.1W 0603	RC0603FR-07100KL	YAGEO	
R11	0Ω 0.1W 0603	RC0603JR-070RL	YAGEO	
R12	133mΩ 0.5W 1206	PT1206FR-7W0R133L	YAGEO	
R13	200mΩ 0.5W 1206	PE1206FRF070R2L	YAGEO	
R14	400mΩ 0.5W 1206	RL1206FR-070R4L	YAGEO	
R15	0Ω 0.5W 1206	RC01206JR-7W0RL	YAGEO	
U1	RPY-1.5Q LED DRIVER	RPY-1.5Q	RECOM	

PACKAGING INFORMATION

Parameter	Type	Value
Packaging Dimension (LxWxH)		114.0 x 60.0 x 28.0mm
Packaging Quantity		1pc

Contents

- RPY-1.5Q-EVM-1 Evaluation Module
- Terms and Conditions

The product information and specifications may be subject to changes even without prior written notice.The product has been designed for various applications; its suitability lies in the responsibility of each customer. The products are not authorized for use in safety-critical applications without RECOM's explicit written consent. A safety-critical application is an application where a failure may reasonably be expected to endanger or cause loss of life, inflict bodily harm or damage property. The applicant shall indemnify and hold harmless RECOM, its affiliated companies and its representatives against any damage claims in connection with the unauthorized use of RECOM products in such safety-critical applications.