

Intelligent Power Device

IPD Evaluation Board EV-IPD263 User Guide

Introduction

This user guide describes the configuration and usage of the EV-IPD263 evaluation board for IPD products in TO-263 package.

The EV-IPD263 board is designed for quick evaluation of Renesas IPDs and is not intended to evaluate or guarantee all the characteristics of the IPD products it is equipped with.



Target Device

Renesas Electronics IPD High Current Operation series

RAJ2800024H11HPF, RAJ2800024H12HPF, RAJ2800034H12HPF, RAJ2800044H12HPF

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1. EV-IPD263 Evaluation Board overview

EV-IPD263 is a board for quick evaluation of Renesas' IPD products in TO-263 package. The boards are equipped with the necessary connectors and jumpers for evaluation, allowing customers to start evaluation early, before developing their own boards for target products. The IPD products mounted on this evaluation board are working samples and its quality is not guaranteed.

1.1 Board Name

The board name is marked on the board to identify the device it is equipped with.

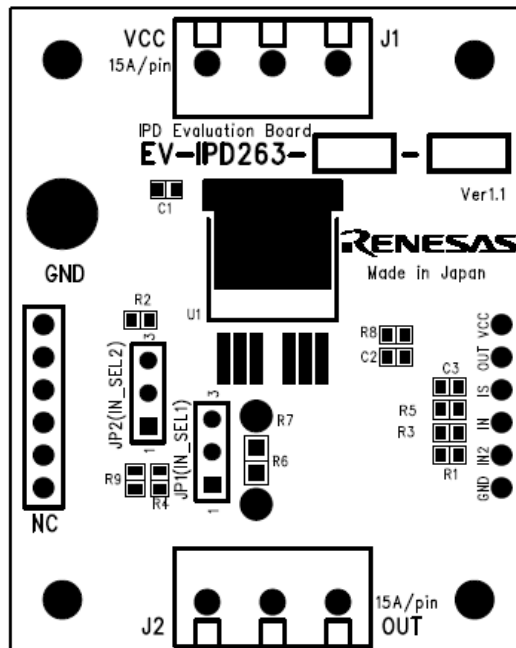
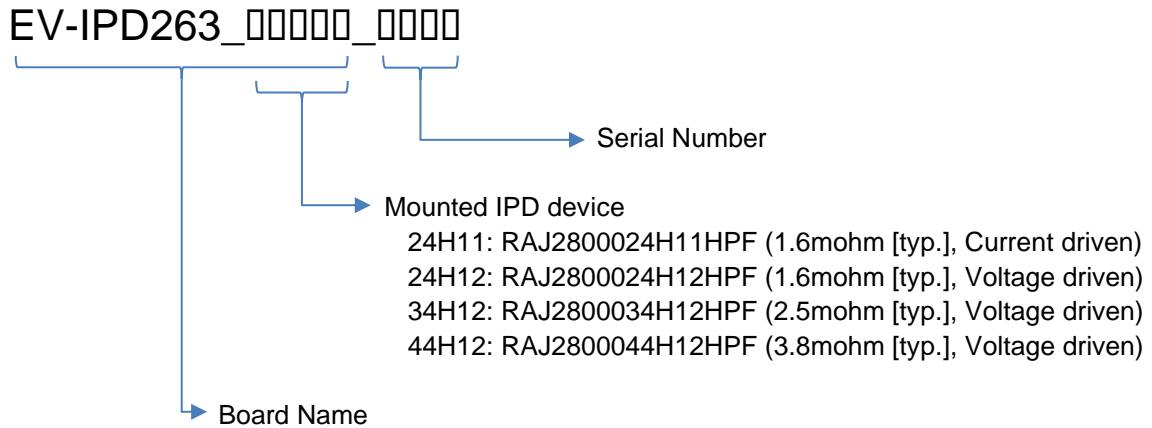


Figure 1. Layout of EV-IPD263 board

2. PCB specification

EV-IPD263 uses an automotive grade PCB. The board size and number of layers are as below.

Parameter	Value
Board size	50.0 mm x 40.0 mm
Thickness of Cu layer	35 μ m
Cu layer numbers	2
Board material	FR4

Table 1. PCB specification

3. Connections

EV-IPD263 is equipped with a connector and test pins to evaluate the on-board IPD. Please refer to the following table for the description of each and precautions for use.

Connector	Pin count	Function
J1*1	1-3	J1 is the VCC power supply pin; one pin can handle a 15A current, so connect the appropriate number of wires according to the evaluation conditions. It is designed to handle currents up to 45A with maximum three wires connections.
J2*1	1-3	J2 is the OUTPUT pin; one pin can handle a 15A current, so connect the appropriate number of wires according to the evaluation conditions. It is designed to handle currents up to 45A with maximum three wires connections.
TP-GND	1	This pin is used to monitor GND.
TP-IN2	1	This pin is used to control the IN pin that controls the state of the mounted IPD from an external MCU board or power supply.
TP-IN	1	The usage of the IN and IN2 pins changes depending on the driven type of the mounted IPD. The board configuration is explained in Chapter 4.
TP-IS	1	This test pin is connected to the IS pin of IPD. It allows to know the sense current and protection/diagnostic results.
TP-OUT	1	This pin is used for monitoring the OUT signal. This test pin is for checking, so do not connect any load to this pin.
TP-VCC	1	This pin is for monitoring VCC. Please do not use this test pin as a power supply input for VCC.
TP- NC	1-7	Not connected
GND pad	1	GND is connected by a wire, winding it up and tightening it with an M3 bolt and nut.

Note1: The jumpers on the board should be operated when the power to the EV-IPD263 board is turned off.

Table 2. PCB specification

4. Jumper pin setting for each IPD

The pin assignment differs depending on the mounted IPD. EV-IPD263 is designed to allow evaluation of different pin out product with jumper settings. For voltage driven IPDs, it is also possible to generate control signals on the board from the VCC supply voltage.

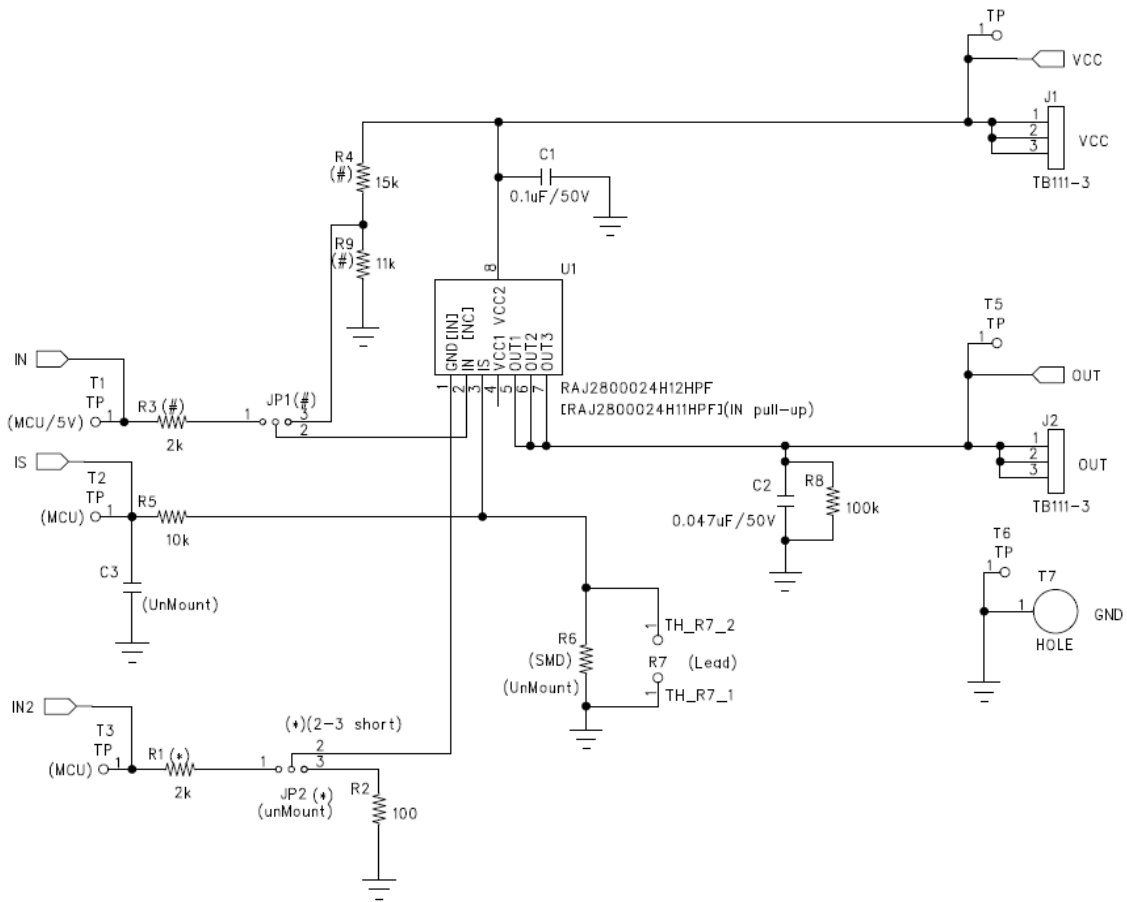
Mounted IPD	JP1 setting	JP2 setting	Description
RAJ2800024H11HPF (Current driven)	Open	1-2(*1)	In a current-driven IPD, pin 1 is the IN pin and pin 2 is not connected. The IN pin of the IPD is connected to TP-IN2 according to the JP2 setting. It is possible to turn on/off the IPD externally by connecting its control signal through TO-IN2.
RAJ2800024H12HPF, RAJ2800034H12HPF, RAJ2800044H12HPF (Voltage driven)	1-2	2-3	By connecting an external power supply or MCU board to TO-IN, it is possible to control ON/OFF of the on-board IPD from outside.
	2-3		Jumper setting to set the IN pin to high level from the power supplied to VCC. This setting is used when this board is used by itself without external control signals.
	Open		By setting JP1 to the open state, IPD stops outputting. This setting is used when this board is used by itself without external control signals.

Note1: It may be shorted on the board instead of a switchable jumper.

Table 3. Jumper setting

5. Schematics

The EV-IPD263 board schematic is shown below; the N.C. test pins are not described in the schematic.



RAJ2800024H12HPF (*):UnMount
 [RAJ2800024H11HPF] (#):UnMount

Figure 2. EV-IPD263 schematics

6. Parts list

The following is a list of the components mounted on the EV-IPD263. Some of the mounted components have lower heat resistance than the operating temperature range of IPD. If evaluated in high temperature, remove the parts as necessary.

Symbol	Parts name	Part number	Vendor	Note
U1	Target IPD	RAJ28000xxH1xHPF	Renesas	
C1	Multilayer ceramic capacitor	GCM188L81H104KA57D	Murata	
C2	Multilayer ceramic capacitor	GCM188L81H473KA55D	Murata	
C3	Multilayer ceramic capacitor	Not mount	-	
JP1	Jumper	XJ8D-0311	OMRON	<105°C
JP2	Jumper	XJ8D-0311	OMRON	<105°C
J1	Terminal block	TB111-2-3-U-1-1	Alphaplus	<115°C
J2	Terminal block	TB111-2-3-U-1-1	Alphaplus	<115°C
R1	SMT chip resistor	Not mount	-	
R2	SMT chip resistor	RMC1/16-101J TP	Kamaya elec.	
R3	SMT chip resistor	RMC1/16-202J TP	Kamaya elec.	
R4	SMT chip resistor	RMC1/16K153F TP	Kamaya elec.	
R5	SMT chip resistor	RMC1/16K103F TP	Kamaya elec.	
R6	SMT chip resistor	Not mount	-	
R7(socket)		RI-1S/O-SG/7.43 5.1K ohm resistor is mounted on this socket	Useconn	
R8	SMT chip resistor	RMC1/16-104J TP	Kamaya elec.	
R9	SMT chip resistor	RMC1/16-113J TP	Kamaya elec.	

Table 4. EV-IPD26 parts list

7. Reference document

For the specifications of the IPDs supported by the EV-IPD263 board, please refer to the following datasheet.

Part number	Datasheet document number
RAJ2800024H11HPF	R07DS1394EJ0100
RAJ2800024H12HPF	R07DS1395EJ0100
RAJ2800034H12HPF	R07DS1396EJ0100
RAJ2800044H12HPF	R07DS1397EJ0100

Table 5. IPD datasheets

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Apr. 15, 2024	-	First Issue

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