

RPG 100 EVALUATION BOARD

RPG100-TB(MB)

User's manual

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FDK
FDK CORPORATION

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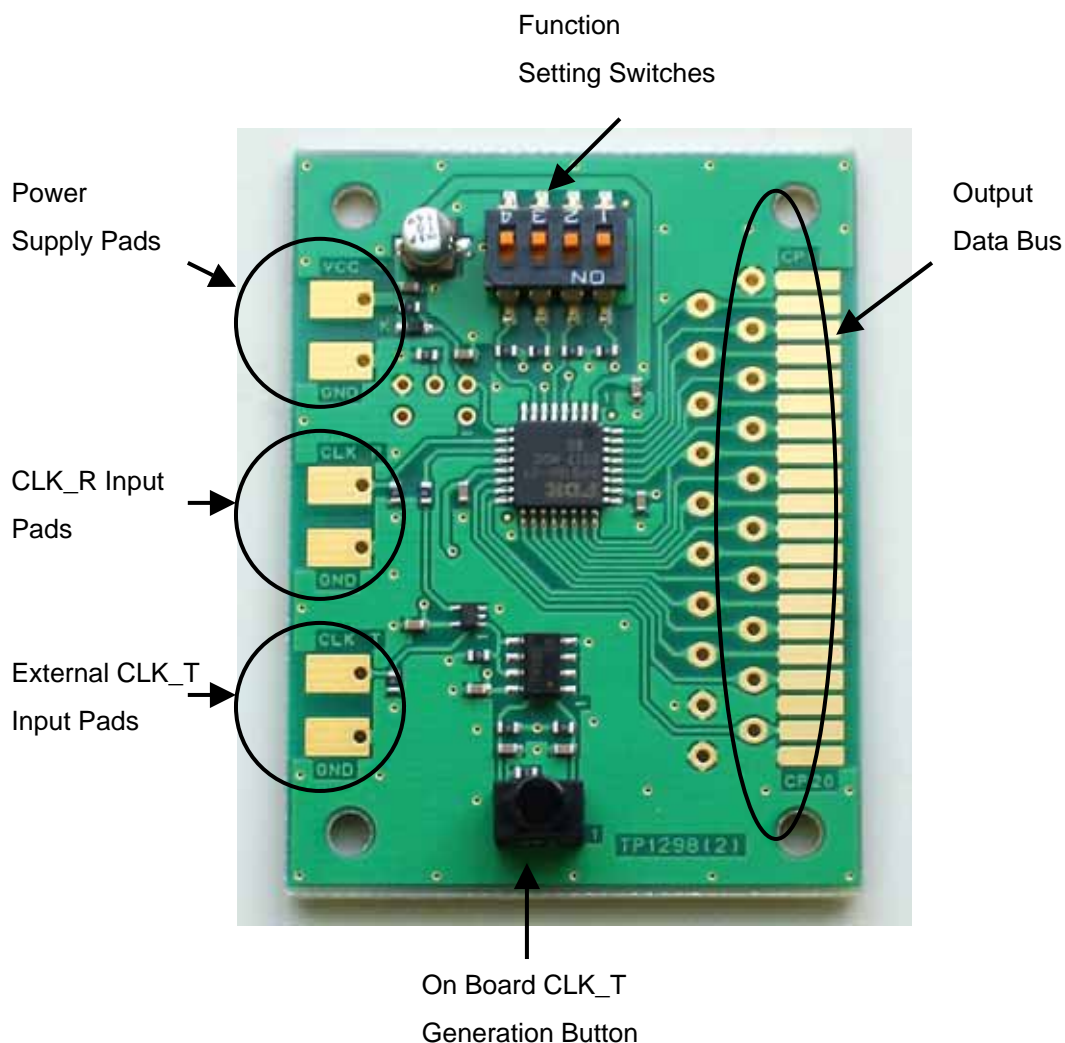
1. RPG100 Evaluation Boards Composition

RPG100-TB and RPG100-MB are the two test board models to evaluate the random number generation chip. In the model RPG100-TB, all the components are mounted where as RPG100-MB is the model excluding the chip. If you wish to use RPG100-MB you will need to get the chip separately and mount on to the board by yourself. It is strongly advice you to mount the chip in a static free environment.



RPG100-TB Top View

2. Descriptions Of Parts And Ports



2-1. Vcc Power Supply Pad

This pad is for supplying power to RPG100 (Should be set to 3.3Vdc).

2-2. CLK_R Input Pad

This pad is for inputting random number generation clock to RPG100 (Typical value 250kHz with 50% duty).

2-3. CLK_T External Input Pad

This pad is used to input a clock signal that is used to generate new 16 bits random number output, to start random number test and to select random number test data.

2-4. Functions Setting Switches

This dipswitch is used to select different functions that RPG100 perform.

2-5. 20 Bits Output Data Bus

The Data Bus is used to output 16 bits random numbers, operational status, random number test status and random number test data. The following table explains CP connector pad (or pin) names and their functions.

Pad Name	PRG100 Pin	Functions
CP1	GND	
CP2 ~ CP17	RND_D(0)~ RND_D(15)	Output 16 bits random numbers, status of operation, random number test status and random number test data.
CP18	GND	
CP19	RNDS	Output random bits
CP20	GND	

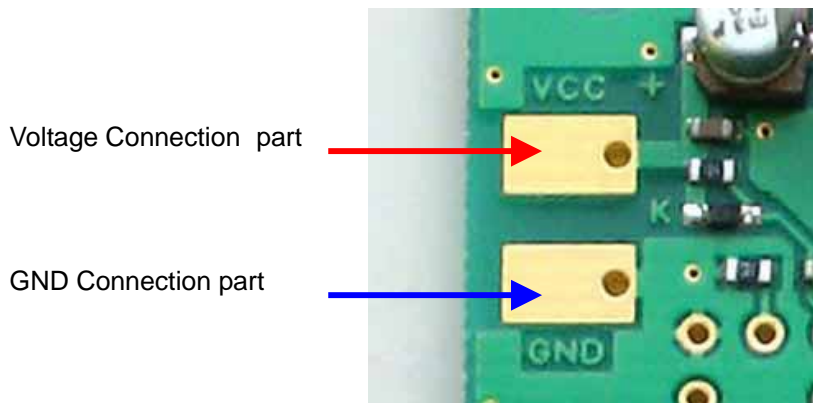
2-6. On Board CLK_T Generation Button

In each button press generates a clock signal that is used to generate new 16 bits random number output, to start random number test and to select random number test data.

3. How To Connect And Use

3-1. Connecting The Power Supply

Connect the power supply to RPG100-TB(MB) as shown in the diagram below. When connecting to pads; the wires soldering directly into the pads is preferred.



3-2. Setting the Function Switch

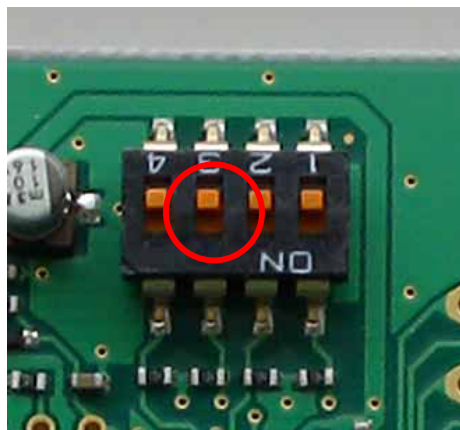
The following table shows the functions setup of RPG100.

SW No.		Function	Setting
1	A0	LSB of functions selection address.	LOW when it's OFF.
2	A1	MSB of functions selection address.	LOW when it's OFF.
3	PSV	Power saving.	Power saving when it's ON.
4	OE	Data bus output control.	Data is present in the data bus when it's OFF.

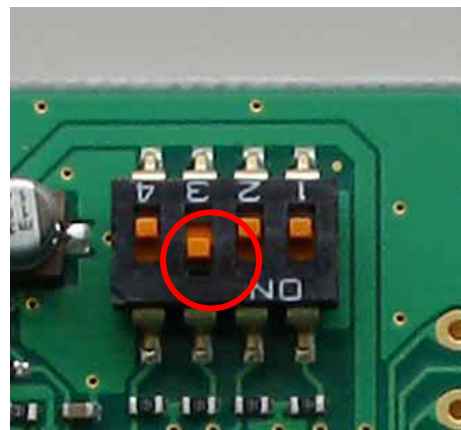
3-3. Outputting Random Bits

Making PSV -> OFF and inputting CLK_R, random bits are output from the CP19 terminal of the data bus with each and every rising edge of CLK_R. However the settings of A0, A1 and OE are not influenced to the random bits output. If PSV is ON and internally stored random numbers maintain in maximum then there is no random bits output and the CP19 terminal is fixed to low.

Note:- Refer clauses 4 and 7-1 of RPG100 data sheet for more details.

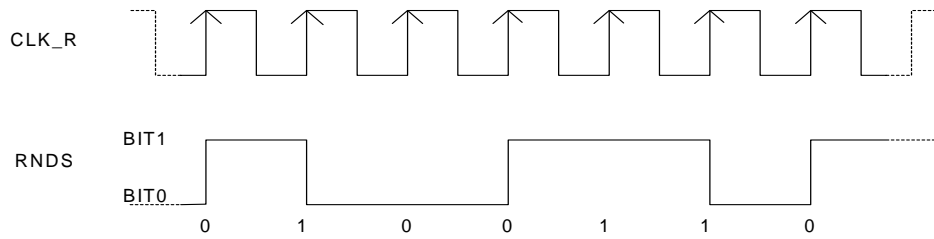


PSV -> OFF
Random Bits Are Output



PSV -> ON
No Random Bits Are Output

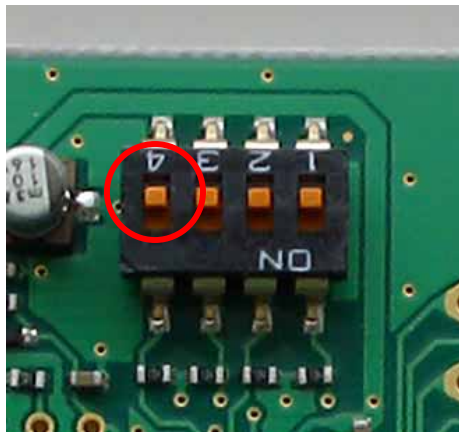
The following timing diagram explains the timing of random bits generation.



3-4. Outputting A 16 Bits Random Number

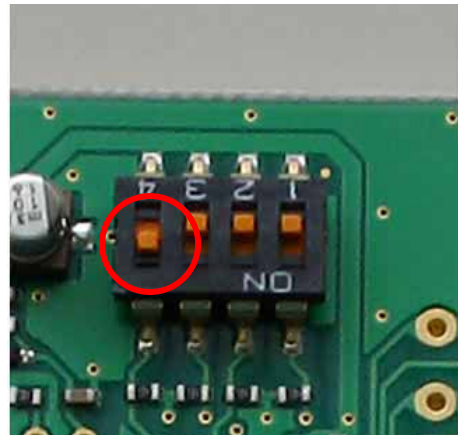
RPG 100 converts serial random bits into 16 bits parallel and stores them internally only presence of CLK_R (maximum storage 32 X 16 bits). Making A0 -> OFF, A1 -> OFF, and OE -> OFF a 16 bits random number is output to data bus (CP2 ~ CP17) with the CLK_T pulse that is generated from on board press button or from external clock source input through external CLK_T input pads. When making OE -> ON the data bus becomes high impedance.

Note:- Refer clauses 4 and 7-2 of RPG100 data sheet for more details.



OE -> OFF

A 16bit Random Number Is
Presence In The Data Bus



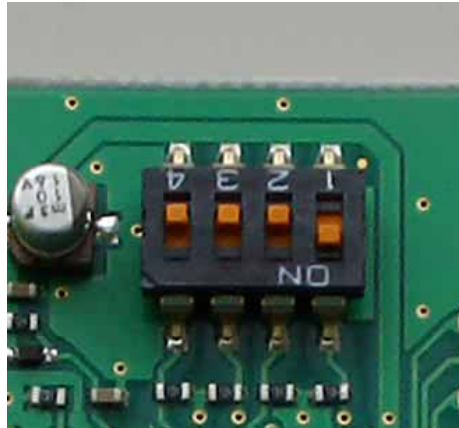
OE -> ON

The Data Bus Maintains At
High Impedance

3-5. Outputting the Operational Status Data

The number of random numbers exit in the storage and validness of those number can be read from the data bus (CP2~CP17) by setting A0 -> ON and A1 -> OFF, OE -> OFF and no clocks are needed.

Note:- Refer clauses 4 and 5-2 of RPG100 data sheet for more details.

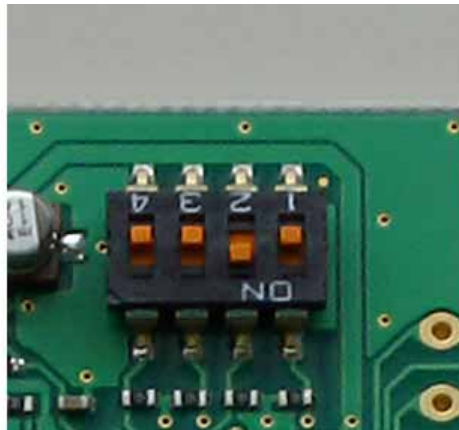


Enabled The Operational Status
Data Out

3-6. Starting Random Number Test And Outputting The Test Status

It is necessary to start the random number test to validate the random numbers that the RPG100 generates. The random number test can be started by Setting A1 -> ON and A0 -> OFF, PSV -> OFF, OE -> OFF and with the help of a single CLK_T pulse that is generated from on board press switch or from an external clock source input through external input CLK_T pads. The test status data can be monitored from the data bus (CP2 ~ CP17).

Note:- Refer clause 4 and 5-3 of RPG100 data sheet for more details.

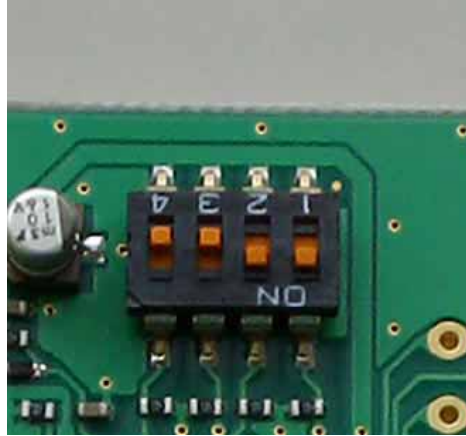


Enabled Random Number Test Start
And Test Status Data Output

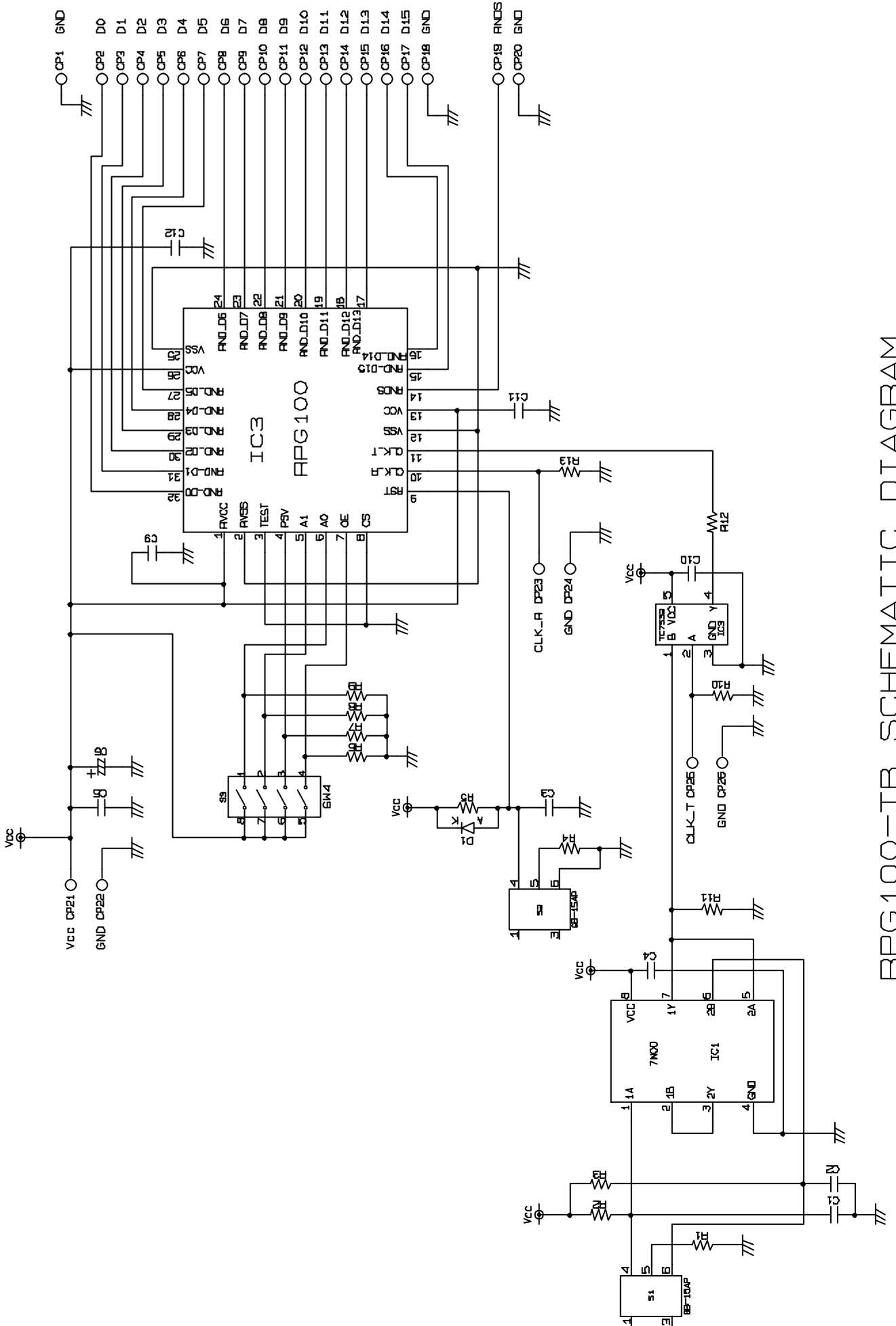
3-7. Outputting Random Number Test Data

The random number test data can be output to data bus (CP2 ~ CP17) by setting A0 -> ON, A1 -> ON, OE -> OFF and with the CLK_T rising edge. The CLK_T can be generated from the on board push switch or from an external clock source input through external CLK_T input pads.

Note:- Refer clauses 4, 5-4 and 7-4 of RPG100 data sheet for more details.



Enabled Random Number Test Data Output



RPFG100-TB SCHEMATIC DIAGRAM