PMIC line-up
for NXP i.MX series

Rev 1.0
10th, Jul,2018

ROHM PMIC line-up for i.MX6/7/8 series

ROHM PMIC	i.MX series							Technical Support for PMIC			
Base Product	6UL 6ULL	6SL 6SLL	7S	7D	7ULP	8MQ /QL/D	8M Mini	Data Sheet	Evaluation Board	Circuit Information	BOM List
BD71815AGW Production	○	○	○	●	○			Available	Available	Available	Available
BD70528MWV Under Development	○	○			●			Available (Tentative)	Available (Tentative)	Under Preparing	Under Preparing
BD71837MWV Sample Available						●	○	Available	Available	Available	Available
BD71847MWV Under Development							●	Available (Tentative)	Available (Tentative)	Available (Tentative)	Available (Tentative)

● : Target SoC
○ : Adaptable SoC

Circuit Information :
・Platform Design Guide
・Layout Data
・Schematic Data

Status of NXP EVK and Reference Boards

SoC series	ROHM PMIC	NXP's PMIC	NXP EVK	SoM Android Things etc.
i.MX6 SoloLite	BD71805MWV	PF0100 PF0200 PF3000	Mounteded with NXP own PMIC	i.MX6UL+PF3000 were mounted.
i.MX7 Dual, Solo	BD71815AGW	PF3000 PF3600	Mounteded with NXP own PMIC	i.MX7D + PF3000 were mounted.
i.MX8M Quad, Dual QuadLite	**BD71837MWV**	**No expert PMIC (allocating PF 4210 Power supply rail is not enough)**	PF4210 mounted. =>Schedule didn't match	**i.MX8MQ + BD71837 were mounted.**
i.MX8M mini	**BD71837MWV BD71847MWV**	**No expert PMIC (allocating PF 4210 Power supply rail is not enough)**	**BD71847MWV will be mounted**	**BD71847MWV will be mounted**

ROHM PMICs will be mounted on NXP's EVK and Reference boards

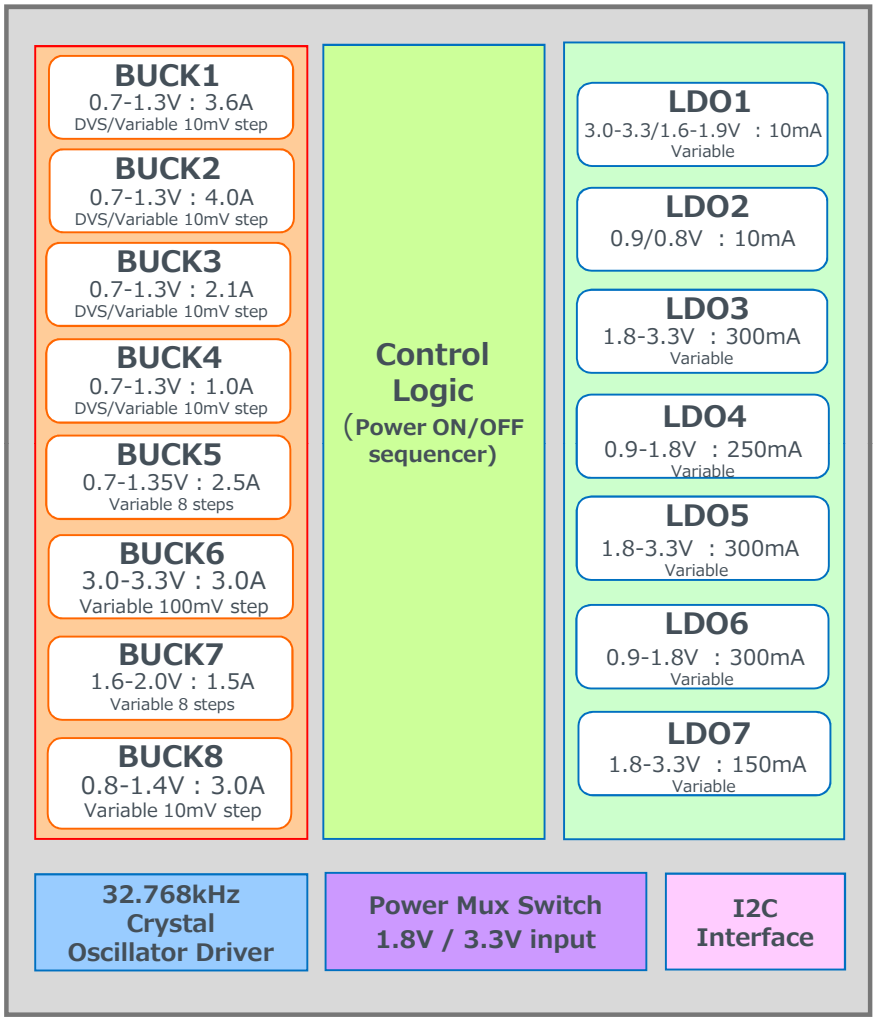
BD71837MWV

For NXP i.MX 8MQ/QL/D

BD71837MWV Over View

Under Development

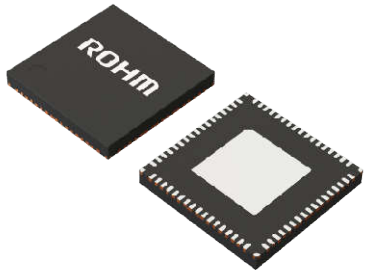
◆ IC Block Diagram



◆ Feature

- Vin = 2.7-5.5V
- 8 Buck Regulators
  Switching freq. : 2.0MHz(Buck1-5,7,8), 1.5MHz(Buck6)
- 7 general purpose LDOs
- Power Mux Switch (for SD card)
- 32.768kHz Crystal Oscillator Driver
- Power On key input
- Protection and monitoring: soft start, power rail fault detection, UVLO, OVP, OCP, TSD
- OTP for power sequencing and ramp voltage
- Interfaces:
  I2C: 100/400 kHz, 1 MHz

◆ Package



UQFN68CV8080
W(typ) =8.00mm
L(typ) =8.00mm
H(max)=1.00mm
0.4mm pitch

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Advantages with BD71837MWV

1. All power rails of i.MX8M Family can be covered with BD71837

- Buck Converter 8ch, LDO 7ch and Mux Switch integrated
- Various target applications with i.MX8M can be supported with input voltage=2.7V to 5.5V
- Power Modes of i.MX 8M can be supported with integrated sequencer function
- Support protection functions : Output voltage monitor, OCP, UVLO and TSD

2. Achieve optimized PCB design with BD71837 itself

- Optimized PCB size and layout with 8mm x 8mm 0.4mm pitch UQFN68 package
- Optimized Pin assign of BD71837MWV for i.MX 8M SOC.

3. PMIC setting can be adjustable by I2C or Customized OTP*1 for each applications

- Output voltage level, enable or disable of each power rail and protections
- Power modes of i.MX 8M (RUN, IDLE, SUSPEND, SNVS and OFF) can be supported

*1 : One-time Programmable ROM

4. PMIC design guide, other technical documents/boards are available

- SoM (System on Module) is available by reference board vender

Advantage1

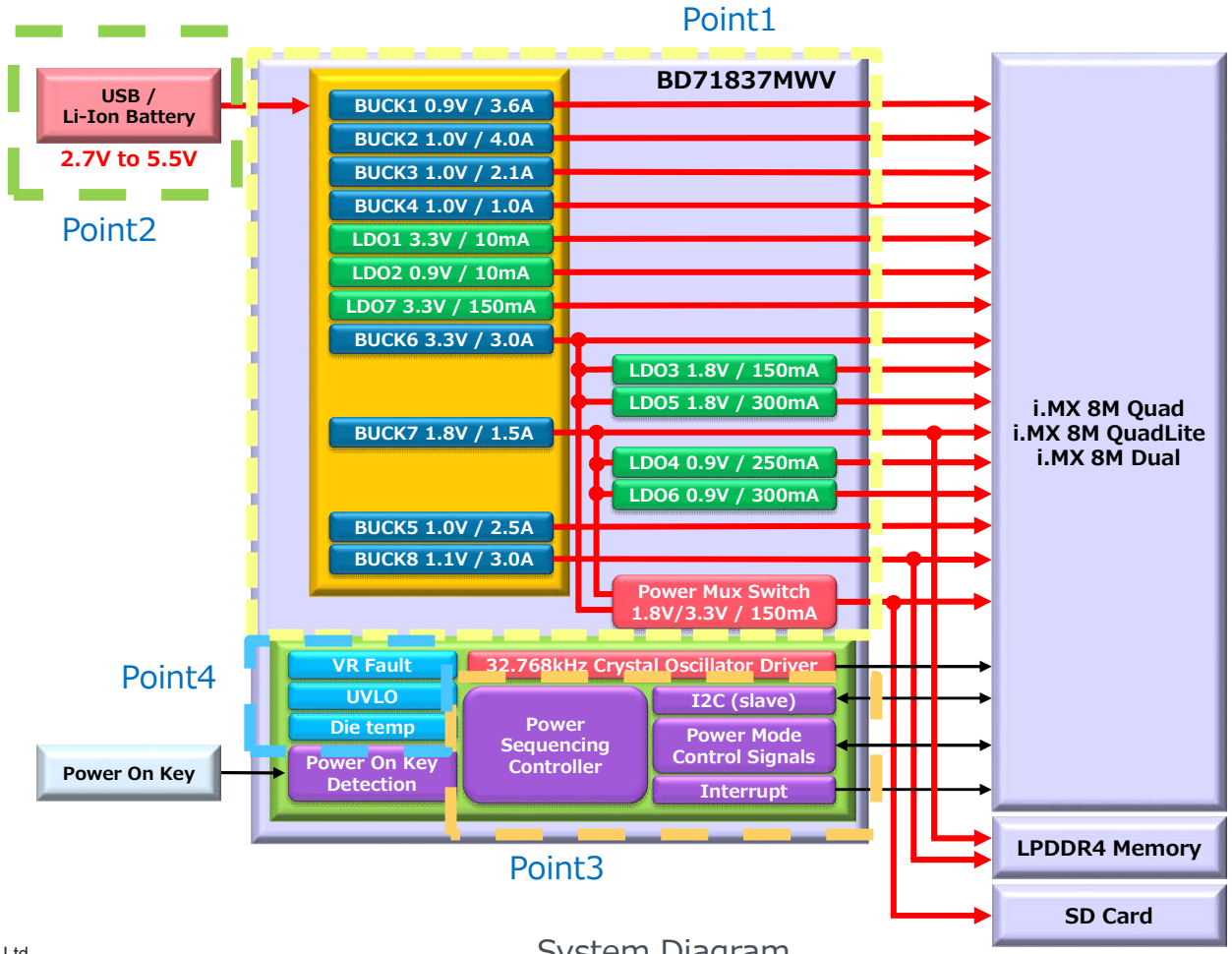
All power rails of i.MX8M Family can be covered with BD71837

Point1 : Buck Converter 8ch, LDO 7ch and Mux Switch integrated

Point2 : Various target applications with i.MX8 can be supported with input voltage=2.7V to 5.5V

Point3 : Power Modes of i.MX8 can be supported with integrated sequencer function

Point4 : Support various protection functions : Output voltage monitor, OCP, UVLO and TSD.

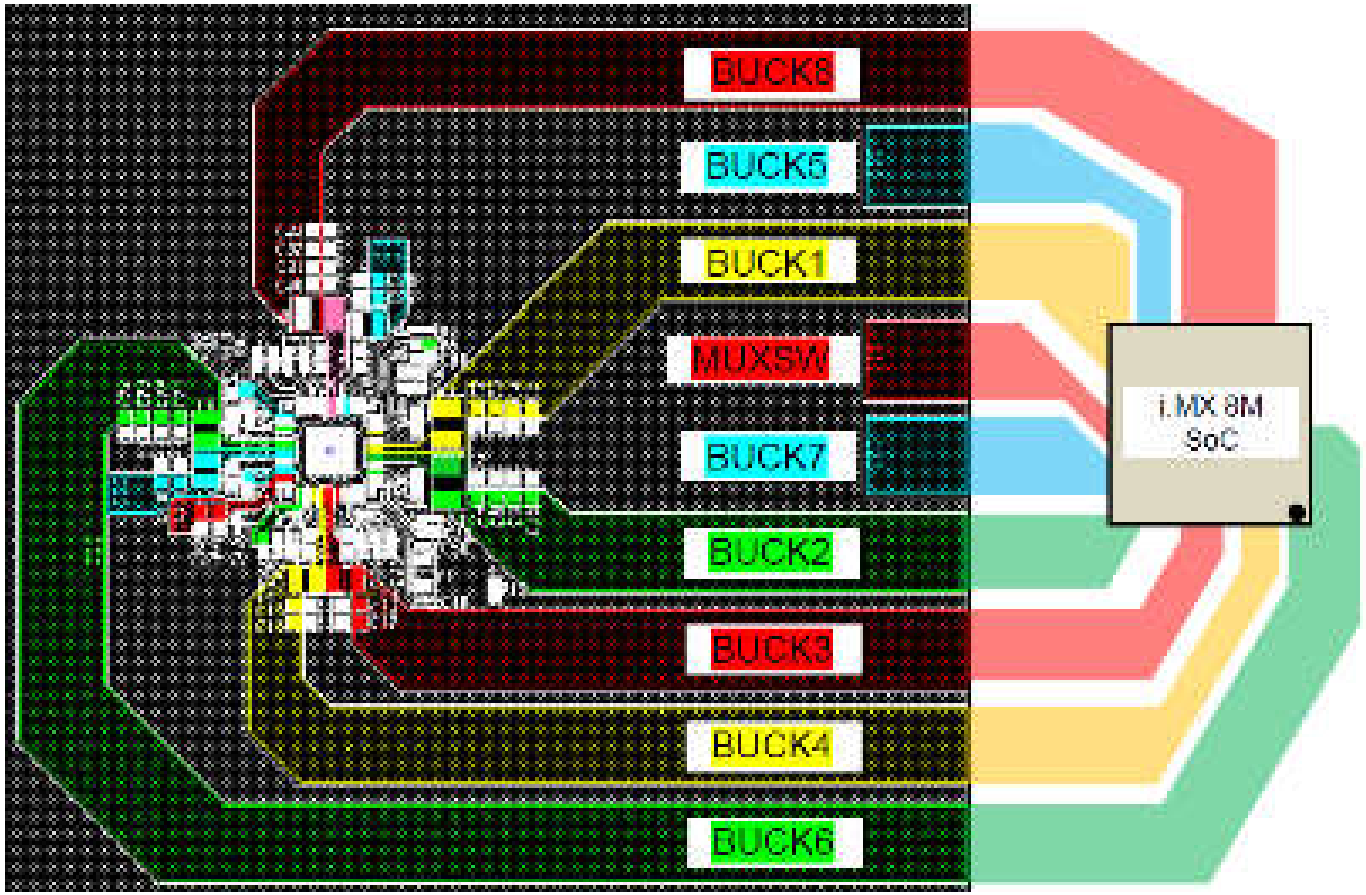


System Diagram

Advantage2
Optimized PCB design with BD71837

- Optimized PCB size and layout with 8mm x 8mm 0.4mm pitch UQFN68 package
- Optimized Pin assign of BD71837 for i.MX 8M

PCB layout design



Advantage3

PMIC setting can be adjustable by I2C/Customized OTP*1 for each applications

Point1 : Output voltage level, enable or disable of each power rail and protection functions can be adjustable by I2C/Customized OTP.

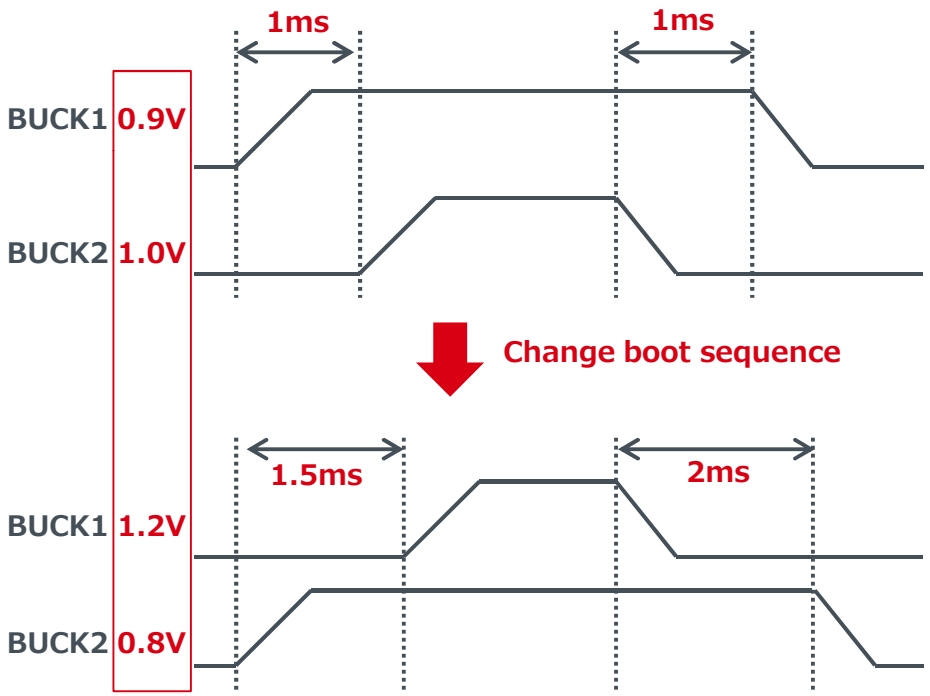
Point2 : Power modes of i.MX 8M (RUN, IDLE, SUSPEND, SNVS and OFF) can be supported.

Point3 : LPDDR4, DDR4 , DDR3L can be supported with OTP setting.

Power Mode vs Enable(ON)/Disable(OFF)

VR	RUN	IDLE	SUSPEND	SNVS	OFF
BUCK1	ON	ON	ON	OFF	OFF
BUCK2	ON	OFF	ON	OFF	OFF
BUCK3	ON/OFF	OFF	OFF	OFF	OFF
BUCK4	ON/OFF	OFF	OFF	OFF	OFF
BUCK5	ON	OFF	ON	OFF	OFF
BUCK6	ON	ON	ON	OFF	OFF
BUCK7	ON	ON	ON	OFF	OFF
BUCK8	ON	ON	ON	OFF	OFF
LDO1	ON	ON	ON	ON	OFF
LDO2	ON	ON	ON	ON	OFF
LDO3	ON	ON	ON	OFF	OFF
LDO4	ON	ON	ON	OFF	OFF
LDO5	ON	ON	ON	OFF	OFF
LDO6	ON	ON	ON	OFF	OFF
LDO7	ON	ON	ON	OFF	OFF

Sequence Example



Output voltage level can be adjustable by I2C/Customized OTP

Advantage3

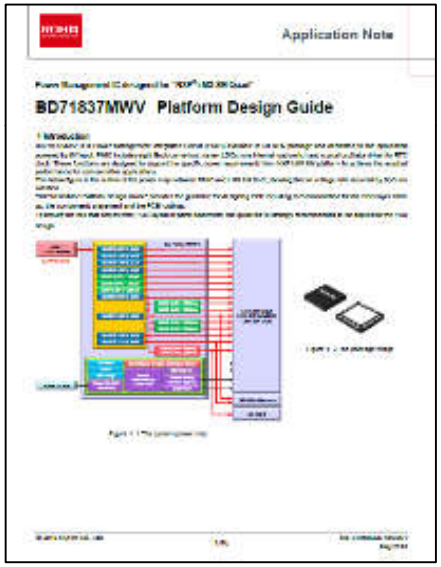
Product Line up (OTP modified) supporting each DDR memory

LPDDR4, DDR4 , DDR3L can be supported with OTP setting modified.

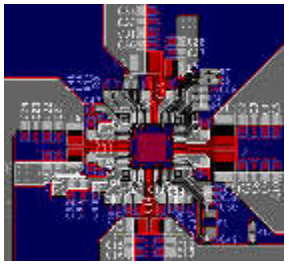
Base Product	Product Name	SoC	DDR Memory	Status
BD71837MWV	BD71837MWV	i.MX8MQ/QL/D	LPDDR4	Sample Available
	BD71837S01		DDR4	Under Planning
	BD71837T01		DDR3L	Under Planning
	BD71840MWV	i.MX8MMini	LPDDR4	Under Development
	BD71840S01		DDR4	Under Planning
	BD71840T01		DDR3L	Under Planning
BD71847MWV	BD71847MWV	i.MX8MMini	LPDDR4	Under Development
	BD71847S01		DDR4	Under Planning
	BD71847T01		DDR3L	Under Planning

Advantage4
Technical documents and reference boards

PMIC datasheet, design guide, other technical documents can be downloaded on ROHM Web site.

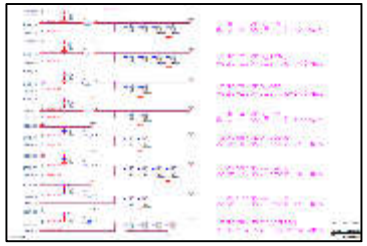


Platform Design Guide

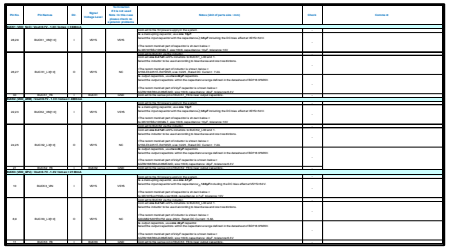


Reference Layout

Reference BOM List



Reference Schematic

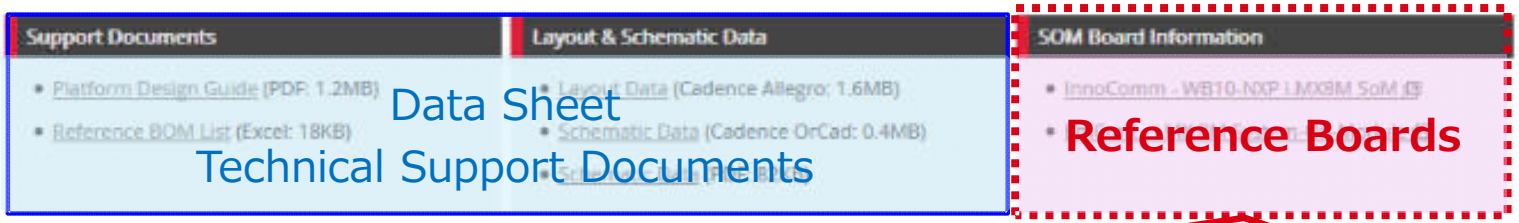


Schematic Check List

[As of Jul 4th, BD71837MWV on ROHM web site]
https://www.rohm.co.jp/products/power-management/power-management-ic-for-system/industrial-consumer-applications/nxp-imx/bd71837mwv-product/documents

Advantage4
Reference Boards

i.MX 8M Quad reference board* with BD71837MWV are available.
*designed by innocomm, EmCraft and TechNexion



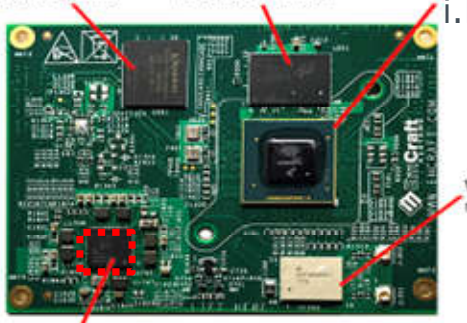
innocomm

NXP i.MX8M

BD71837MWV

http://www.innocomm.com/product_inner.aspx?num=2194

EmCraft systems

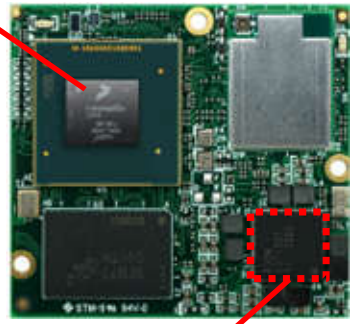


NXP i.MX8M

BD71837MWV

https://www.emcraft.com/products/868

TechNexion
INNOVATORS OF TECHNOLOGY



BD71837MWV

https://www.technexion.com/products/system-on-modules/pico/pico-compute-modules/detail/PICO-IMX8M

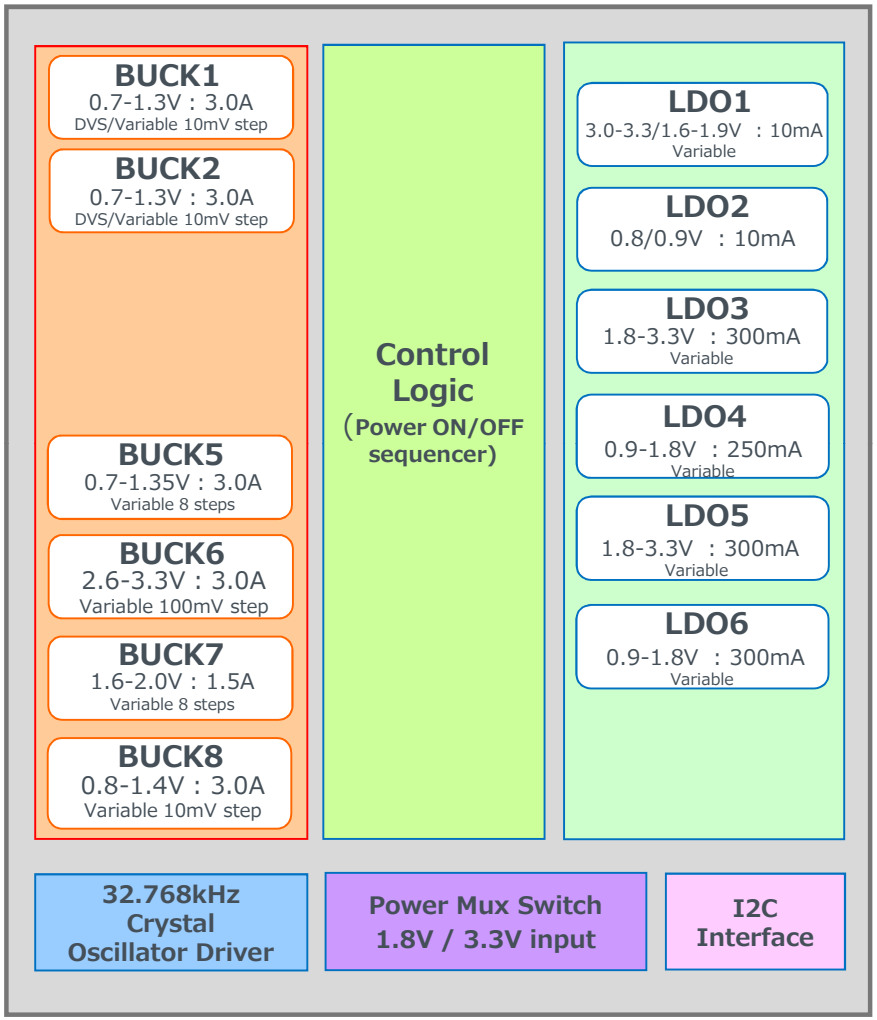
BD71847MWV

For NXP i.MX 8M Mini

BD71847MWV Over View

Under Development

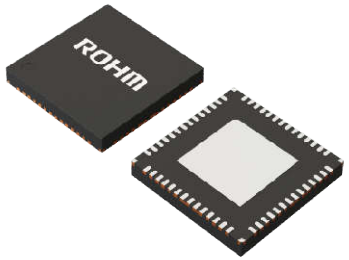
◆ IC Block Diagram



◆ Feature

- Vin = 2.7-5.5V
- 6 Buck Regulators
  Switching freq. : 2.0MHz(Buck1,2,5,7,8), 1.5MHz(Buck6)
- 6 general purpose LDOs
- Power Mux Switch (for SD card)
- 32.768kHz Crystal Oscillator Driver
- Power On key input
- Protection and monitoring: soft start, power rail fault detection, UVLO, OVP, OCP, TSD
- OTP for power sequencing and ramp voltage
- Interfaces:
  I2C: 100/400 kHz, 1 MHz

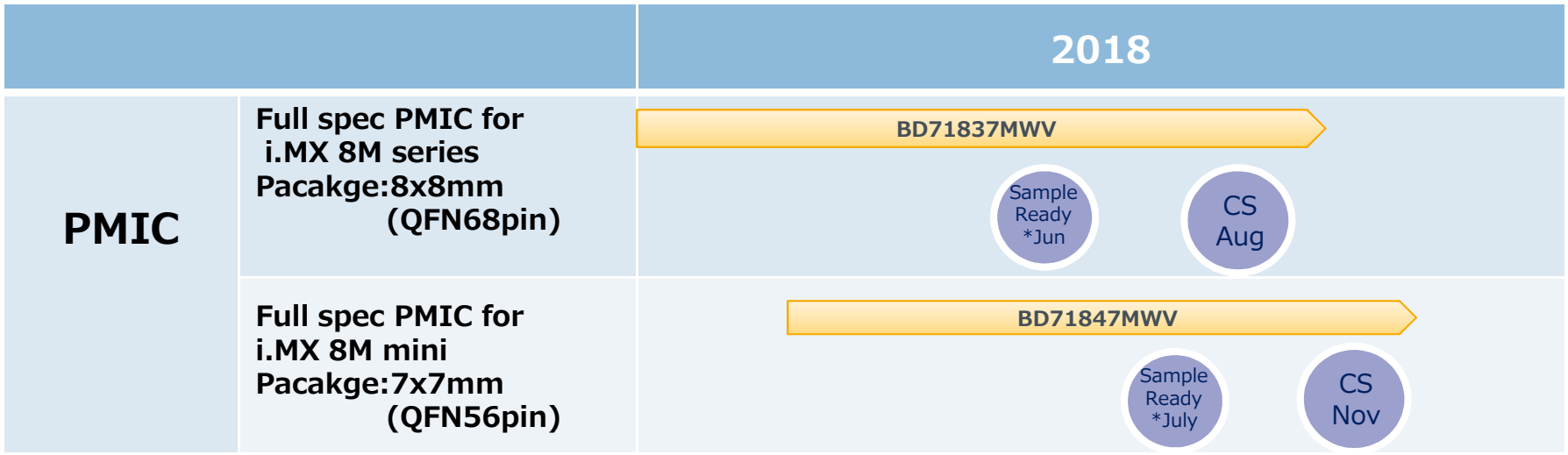
◆ Package



UQFN56BV7070
W(typ) =7.00mm
L(typ) =7.00mm
H(max)=1.00mm
0.4mm pitch

Confidential

PMIC development timeline for i.MX8M series



BD71837MWV

- 8 BUCK converters
- 5 general purpose LDOs
- 2 LDO for Secure Non Volatile Storage (SNVS)
- Mux switch for SD card
- Power Button
- 32kHz crystal Oscillator Buffer
- Flexible Power Sequencer
- I2C interface

BD71847MWV

Modifies from BD71837

① Marge of the VDD_GPU and VPU and DRAM
8buck converters => 6buck converters

②VR-Iomax
Buck1 : 3.6A=>3.0A
Buck2 : 4.0A=>3.0A

③MUX-SW(SD CARD) ON resistor
1.8V-SW : 200mΩ=>500mΩ
3.3V-SW : 280mΩ=>500mΩ

④Package:7 x 7 mm(QFN56pin)

ROHM Co.,Ltd.