



System LSI for Event Data Recorder BU1511KV2

●Outline

BU1511KV2 is a system LSI for Event Data Recorder(EDR) which can record/play Audio/Video event data, and can make developing the EDR easier at low cost

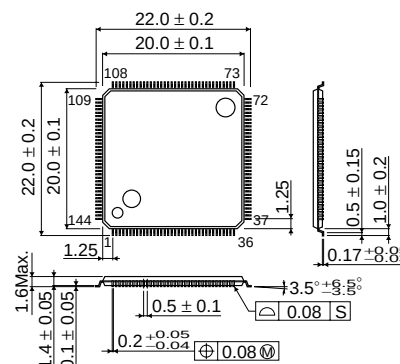
Basic functions for EDR (Camera I/F, JPEG codec, PCM ADPCM codec, SD card controller and 4ch AD converter) are implemented as hardware to reduce internal ARM9's software loads. So the EDR gives safety-drive/economic-drive aided functions of a product.

BU1511KV2 gives the EDR product concept of low cost, safety-drive/economic-drive aided product and its usages without PC

●Features

- 1) ARM946E-S is built-in
- 2) Camera I/F, JPEG/PCM(ADPCM) codec, SD card controller are built-in
And each function block is implemented as hardware block
- 3) TV-encoder is built-in to play the event
- 4) 4ch AD converter is built-in for a 3-axis accelerometer
- 5) Program upload function to internal I-TCM(64KB) from external serial FLASH

●Dimensions (Unit: mm)



VQFP-T144

●Applications

Event Data Recorder(EDR) which can record/play Audio/Video event data

●Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit	Parameter	Symbol	Rating	Unit
Power supply voltage 1 (DAC)	DAVDD	-0.3~+4.2	V	Input voltage(ADC)	VIN1	-0.3~ADVDD+0.3	V
Power supply voltage 2 (ADC)	ADVDD	-0.3~+4.2	V	Input voltage(I2C-1)	VIN2	-0.3~I1VDD+0.3	V
Power supply voltage 3 (I2C-1)	I1VDD	-0.3~+4.2	V	Input voltage(I2C-2)	VIN3	-0.3~I2VDD+0.3	V
Power supply voltage 4 (I2C-2)	I2VDD	-0.3~+4.2	V	Input voltage(SD-CARD)	VIN4	-0.3~SDVDD+0.3	V
Power supply voltage 5 (SD-CARD)	SDVDD	-0.3~+4.2	V	Input voltage(CAMERA)	VIN5	-0.3~CAVDD+0.3	V
Power supply voltage 6(CAMERA)	CAVDD	-0.3~+4.2	V	Input voltage(Other IO)	VIN6	-0.3~IOVDD+0.3	V
Power supply voltage 7(Other IO)	IOVDD	-0.3~+4.2	V	Storage temperature range	Tstg	-40~+150	°C
Power supply voltage 8(Digital CORE)	DVDD	-0.3~+2.1	V	Power dissipation	PD	1200*1, 1700*2	mW

*1 IC only. In the case of exceeding 25°C, 12.0 mW should be reduced at the rating 1°C.

*2 When packaging a glass epoxy board of 270x70x1.6mm. If exceeding 25°C, 17mW should be reduced at the rating 1°C.

* Has not been designed to withstand radiation.

●Recommended Operating Range (Ta=25°C unless otherwise noted)

Parameter	Symbol	Min	Typ	Max	Unit
Power supply voltage 1 (DAC)	DAVDD	3.00	3.30	3.60	V
Power supply voltage 2 (ADC)	ADVDD	3.00	3.30	3.60	V
Power supply voltage 3 (I2C-1)	I1VDD	2.40	3.30	3.60	V
Power supply voltage 4 (I2C-2)	I2VDD	2.40	3.30	3.60	V
Power supply voltage 5 (SD-CARD)	SDVDD	2.70	3.30	3.60	V
Power supply voltage 6 (CAMERA)	CAVDD	2.30	2.85	3.30	V
Power supply voltage 7 (Other IO)	IOVDD	1.70	3.30	3.60	V
Power supply voltage 8 (Digital CORE)	DVDD	1.45	1.50	1.55	V
Operating temperature range	Topr	-40	-	85	°C

* Please supply power source in order of CORE(DVDD) → IO(IOVDD,CAVDD,SDVDD,I1VDD,I2VDD,ADVDD,DAVDD)

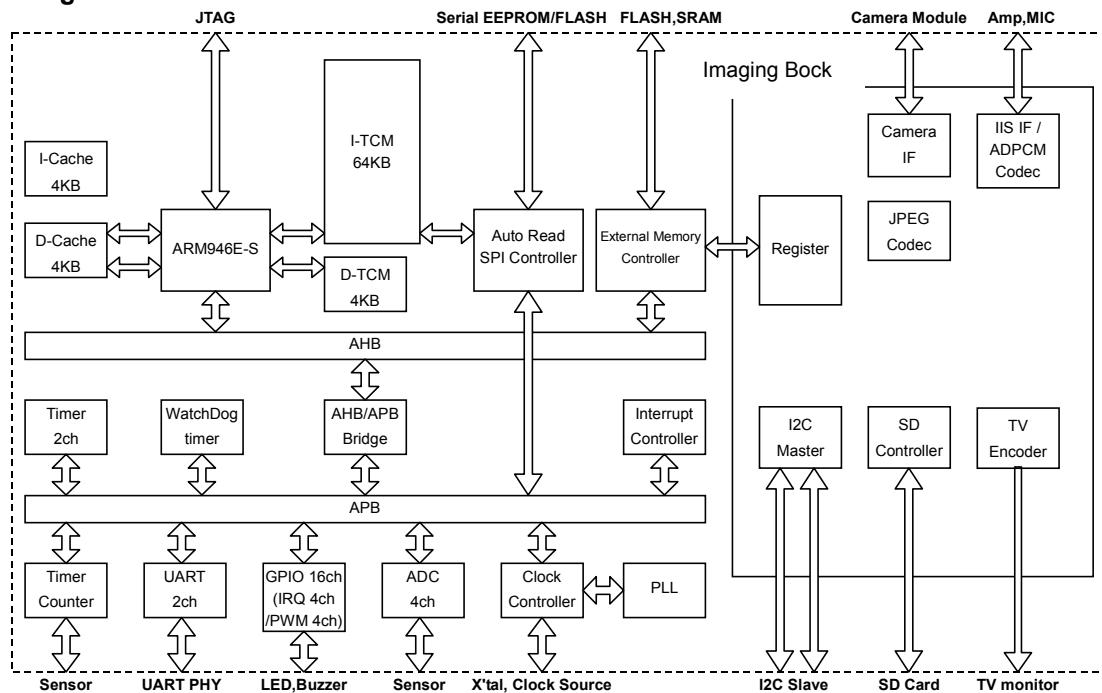
* Please keep RESETB terminal is LOW, until power supply is stable.

●Electrical Characteristics

(Unless otherwise specified, DVDD=1.50V, DAVDD=ADVDD=1VDD=I2VDD=SDVDD=IOVDD=3.30V, CAVDD=2.85V, DAVSS=ADVSS=DVSS=0.0V, Ta=25°C, fXIN=13.5MHz, fAXIN=16.384MHz, fSYS=41.0MHz(Internal Clock with PLL) IOPWR is a generic name of I1VDD,I2VDD,SDVDD,CAVDD,IOVDD.)

Parameter	Symbol	Specification		Unit	Conditions
		Min	Max		
Common					
Input frequency 1	fXIN	5.0	30.0	MHz	XIN (Duty 50±10%), When PLL is ON.
Input frequency 2	fAXIN	8.284	32.768	MHz	AXIN(Duty 50±10%)
Internal clock frequency 1	fSYS	-	41.0	MHz	When PLL is ON, Except I2S Audio Block
Internal clock frequency 2	fAUD	-	32.768	MHz	I2S Audio Block
Static consumption current	IDDST	-	200	μA	When all clock stop
Logic Block					
Input "H" voltage 1	VIH1	IOPWR×0.8	IOPWR+0.3	V	Normal Input
Input "L" voltage 1	VIL1	-0.3	IOPWR×0.2	V	Normal Input
Input "H" voltage 2	VIH2	IOPWR×0.85	IOPWR+0.3	V	Hysteresis input pin (TIM_TRIG,NTRST,RESETB,BIT_SEL, TCM_SEL,AUTO_READ)
Input "L" voltage 12	VIL2	-0.3	IOPWR×0.15	V	
Output "H" voltage 1	VOH1	IOPWR-0.4	IOPWR	V	IOH=-2.0mA(DC), Output except SD_CLK, When CAVDD=3.3V
Output "L" voltage 1	VOL1	0.0	0.4	V	IOL=2.0mA(DC), Output except SD_CLK, When CAVDD=3.3V.
Output "H" voltage 2	VOH2	IOPWR-0.4	IOPWR	V	IOH=-4.0mA(DC), SD_CLK
Output "L" voltage 2	VOL2	0.0	0.4	V	IOL=4.0mA(DC), SD_CLK
DACBlock					
DAC Bit Width	RES_DA	-	10	bits	
DAC Operating current	IDDDA	32	42	mA	R _L =37.5Ω, R _{REF} =2.4kΩ, DAVDD Pin current
DAC Static consumption current	IDDSTDA	-	5	uA	R _L =37.5Ω, R _{REF} =2.4kΩ, DAVDD Pin current
Integral Non-linearity	INL_DA	-8.0	+8.0	LSB	R _L =37.5Ω, R _{REF} =2.4kΩ
Differential Non-linearity	DNL_DA	-2.0	+2.0	LSB	R _L =37.5Ω, R _{REF} =2.4kΩ
Full scale voltage	VFS_DA	1.1	1.4	V	R _L =37.5Ω, R _{REF} =2.4kΩ
ADCBlock					
ADC Bit Width	RES_AD	-	8	bits	
Input voltage (Upper Limit)	VIN_AD_T	ADVDD×0.85	ADVDD×0.95	V	
Input voltage (Lower Limit)	VIN_AD_B	ADVDD×0.05	ADVDD×0.15	V	
Integral Non-linearity	INL_AD	-2.0	+2.0	LSB	
Differential Non-linearity	DNL_AD	-2.0	+2.0	LSB	
Change Standard clock cycle	fADC	4.0	16.0	MHz	
Change cycle	fsps	30.8K	123K	sps	Sample per second Need 130*ADC_CLK for conversion by sweeping

●Block Diagram



09061EAW01

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request. Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage. The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information. If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

The content specified in this document is correct as of MAY 7, 2009.

ROHM Co.,Ltd.

21 Saini Mizosaki-cho, Ukyo-ku,
Kyoto 615-8585 Japan
TEL : +81-75-311-2121
FAX : +81-75-315-0172
www.rohm.com

