

3-channel, 8-bit D / A converter

BU3616K

The BU3616K, a CMOS IC, is a high-speed, low-power-consumption 3-channel 8-bit D / A converter. Its internal reference voltage source eliminates the need for an external reference voltage source.

●Applications

Video CDs, CD-V, CD karaoke

●Features

- 1) 8-bit resolution.
- 2) Current output.
- 3) Low power consumption (typically 75mW).
- 4) High-speed operation.
- 5) Internal reference voltage circuit.
- 6) TTL input.

●Absolute maximum ratings (Ta = 25°C)

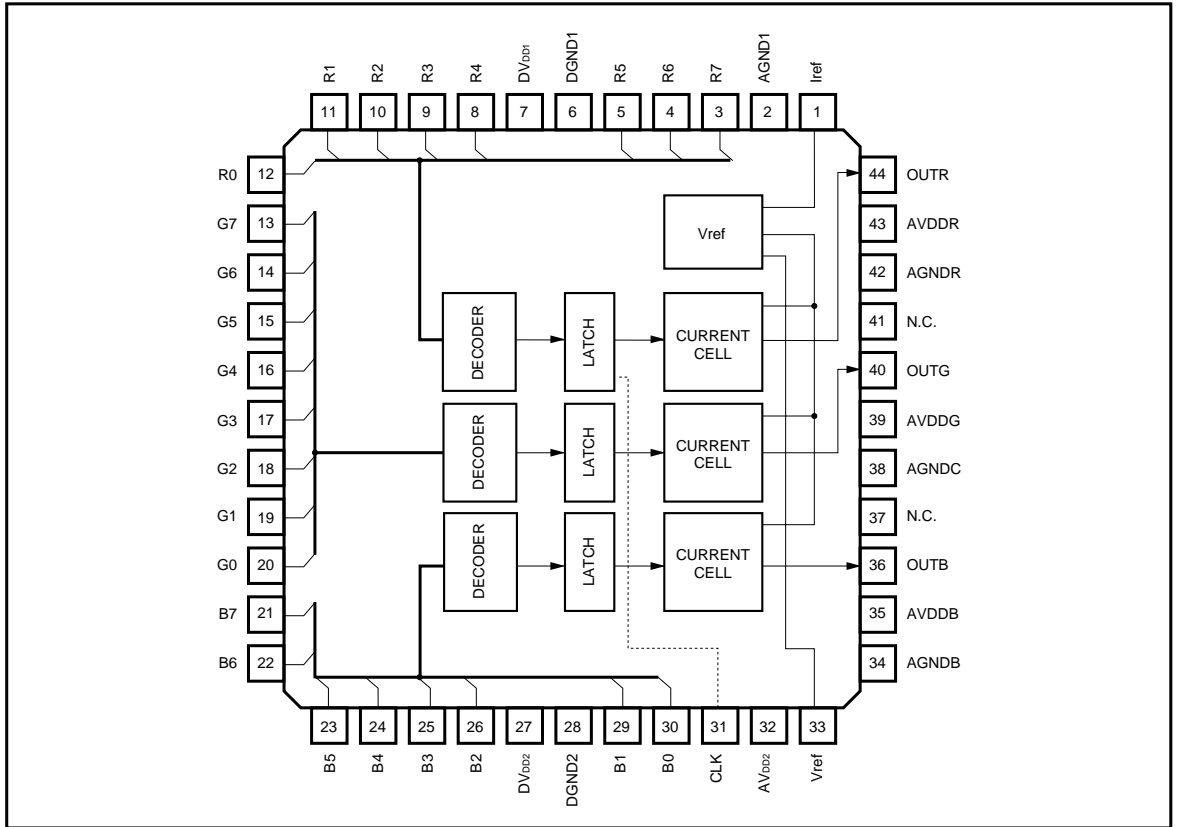
Parameter	Symbol	Limits	Unit
Power supply voltage	DV _{DD}	- 0.5 ~ + 7.0	V
Analog power supply voltage	AV _{DD}	DV _{DD} - 0.3 ~ DV _{DD} + 0.3	V
Input voltage	V _{IN}	- 0.5 ~ DV _{DD} + 0.5	V
Output voltage	V _{OUT}	- 0.5 ~ DV _{DD} + 0.5	V
Storage temperature	T _{stg}	- 55 ~ + 125	°C
Power dissipation*1	P _D	500	mW

*1 Reduced by 5.0mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Power supply voltage	DV _{DD}	4.5	5.0	5.5	V	
Analog power supply voltage	AV _{DD}	4.5	5.0	5.5	V	
Transfer clock width	TCK	58.8	—	—	ns	
Transfer clock width, low level	TCKL	15	—	—	ns	
RGB setup time	TS	5	—	—	ns	
RGB hold time	TH	10	—	—	ns	
Input voltage, low level	V _{IL}	—	—	0.8	V	
Input voltage, high level	V _{IH}	2.2	—	—	V	
Operating temperature	T _{OPR}	- 10	—	70	°C	

●Block diagram



●Electrical characteristics (unless otherwise noted, Ta = 25°C, DV_{DD} = 5.0V, AV_{DD} = 5.0V, R_{REF} = 6.8kΩ, R_L = 470Ω, F_{CK} = 15MHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Current dissipation	I _{CC}	—	15	30	mA	
Differential linearity error	ED	-0.5	—	0.5	LSB	DV _{DD} = 5.0V AV _{DD} = 5.0V
Linearity error	EL	-1.0	—	1.0	LSB	R _{REF} = 6.8kΩ R _L = 470Ω
Full-scale voltage	FS	1.29	1.44	1.58	V	F _{CK} = 15MHz
RGB output voltage ratio	F _{SCR}	0	0.5	5.0	%	
Output delay time	T _D	—	30	—	ns	C _L = 15pF
Settling time	T _{SET}	—	40	—	ns	C _L = 15pF

●Pin descriptions

Pin No.	I / O	Pin name	Function
1	—	Iref	Output current adjustment resistor connection, Vref output
2	—	AGND 1	Analog ground 1
3	I	R7	RED data input (bit 7, MSB)
4	I	R6	RED data input (bit 6)
5	I	R5	RED data input (bit 5)
6	—	DGND1	Digital ground 1
7	—	DV _{DD} 1	Digital power supply 1
8	I	R4	RED data input (bit 4)
9	I	R3	RED data input (bit 3)
10	I	R2	RED data input (bit 2)
11	I	R1	RED data input (bit 1)
12	I	R0	RED data input (bit 0, LSB)
13	I	G7	GREEN data input (bit 7, MSB)
14	I	G6	GREEN data input (bit 6)
15	I	G5	GREEN data input (bit 5)
16	I	G4	GREEN data input (bit 4)
17	I	G3	GREEN data input (bit 3)
18	I	G2	GREEN data input (bit 2)
19	I	G1	GREEN data input (bit 1)
20	I	G0	GREEN data input (bit 0, LSB)
21	I	B7	BLUE data input (bit 7, MSB)
22	I	B6	BLUE data input (bit 6)
23	I	B5	BLUE data input (bit 5)
24	I	B4	BLUE data input (bit 4)
25	I	B3	BLUE data input (bit 3)
26	I	B2	BLUE data input (bit 2)
27	—	DV _{DD} 2	Digital power supply 2
28	—	DGND2	Digital ground 2
29	I	B1	BLUE data input (bit 1)
30	I	B0	BLUE data input (bit 0, LSB)
31	I	CLK	System lock
32	—	AV _{DD} 2	Analog power supply 2
33	O	Vref	Attached capacitance-adding pin (C = 0.1 μF)
34	—	AGNDB	Analog ground B
35	—	AV _{DD} B	Analog power supply B
36	O	OUTB	BLUE output
37	—	N.C.	—

Pin No.	I / O	Pin name	Function
38	—	AGNDG	Analog ground G
39	—	AVDDG	Analog power supply G
40	O	OUTG	GREEN output
41	—	N.C.	—
42	—	AGNDR	Analog ground R
43	—	AVDDR	Analog power supply R
44	O	OUTR	RED output

●Input / output circuits

Pin No.	Pin name	Equivalent circuit
3 ~ 5 8 ~ 26 29 ~ 31	R0 ~ R7, G0 ~ G7 B0 ~ B7, CLK	
36, 40, 44	OUTR, OUTG OUTB	
1, 33	Iref, Vref	

●Application example

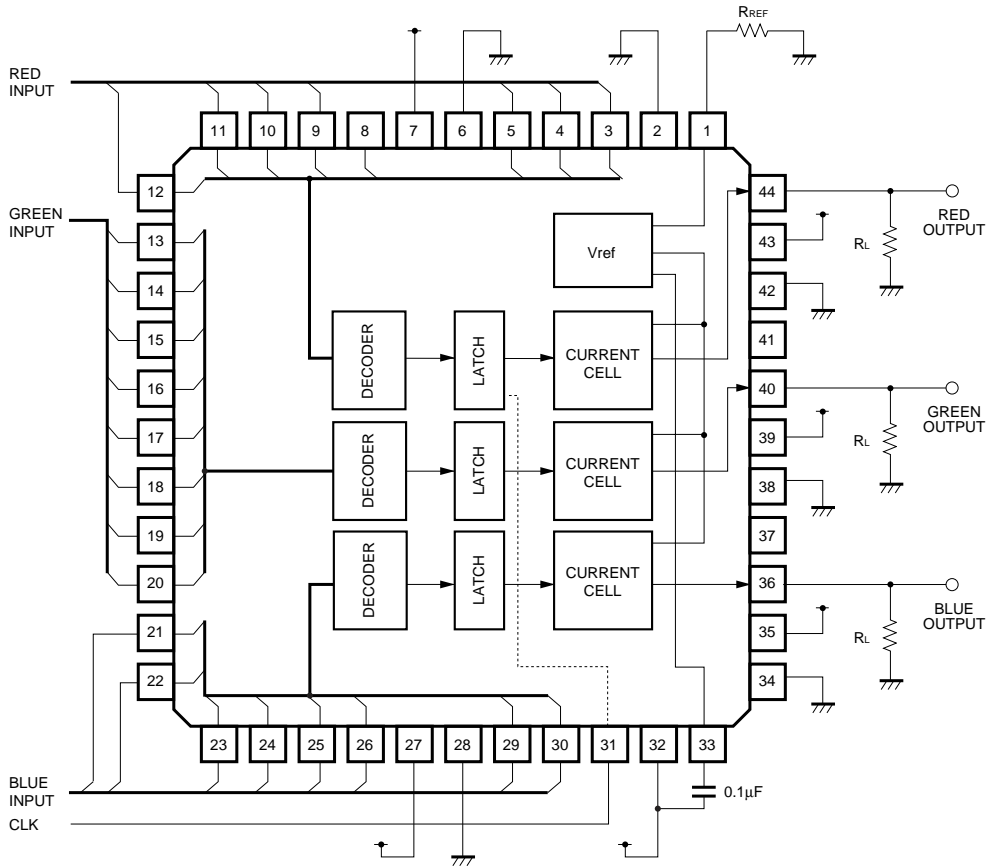
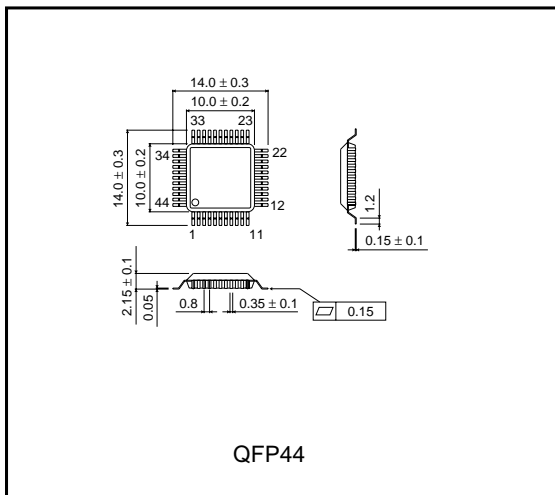


Fig.1

●External dimensions (Units: mm)



Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document use silicon as a basic material.
Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.

In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.