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℃)

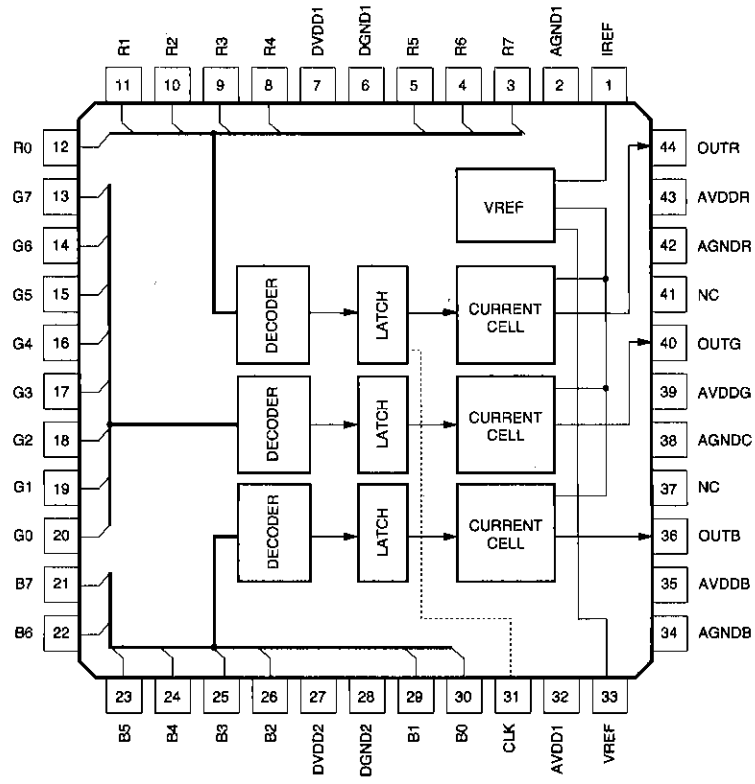
Parameter	Symbol	Limits	Unit
Power supply voltage	DV_{DD}	−0.5~7.0	V
Analog power supply voltage	AV_{DD}	DV_{DD}−0.3~DV_{DD}+0.3	V
Input voltage	V_{IN}	−0.5~DV_{DD}+0.5	V
Output voltage	V_{OUT}	−0.5~DV_{DD}+0.5	V
Storage temperature	Tstg	−55~125	℃
Power dissipation	P_D	500	mW

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

●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	℃	

●Block diagram



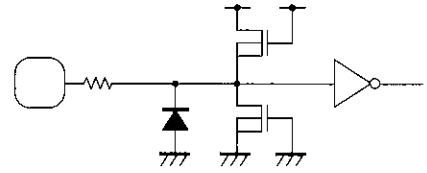
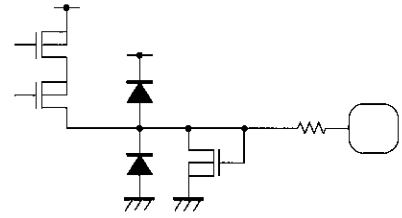
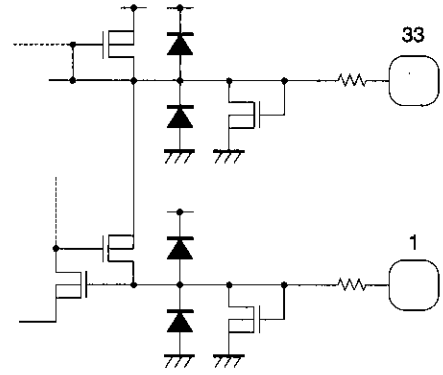
●Electrical characteristics (unless otherwise noted, Ta=25℃, DV_{DD}=5.0V, AV_{DD}=5.0V, R_{REF}=6.8kΩ, R_L=470Ω, F_{CK}=15MHz)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Current consumption	I_{CC}	—	15	30	mA	
Differential linearity error	ED	−0.5	—	0.5	LSB	DVDD=5.0V AVDD=5.0V
Linearity error	EL	−1.0	—	1.0	LSB	RREF=6.8kΩ RL=470Ω
Full-scale voltage	FS	1.29	1.44	1.58	V	FCK=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

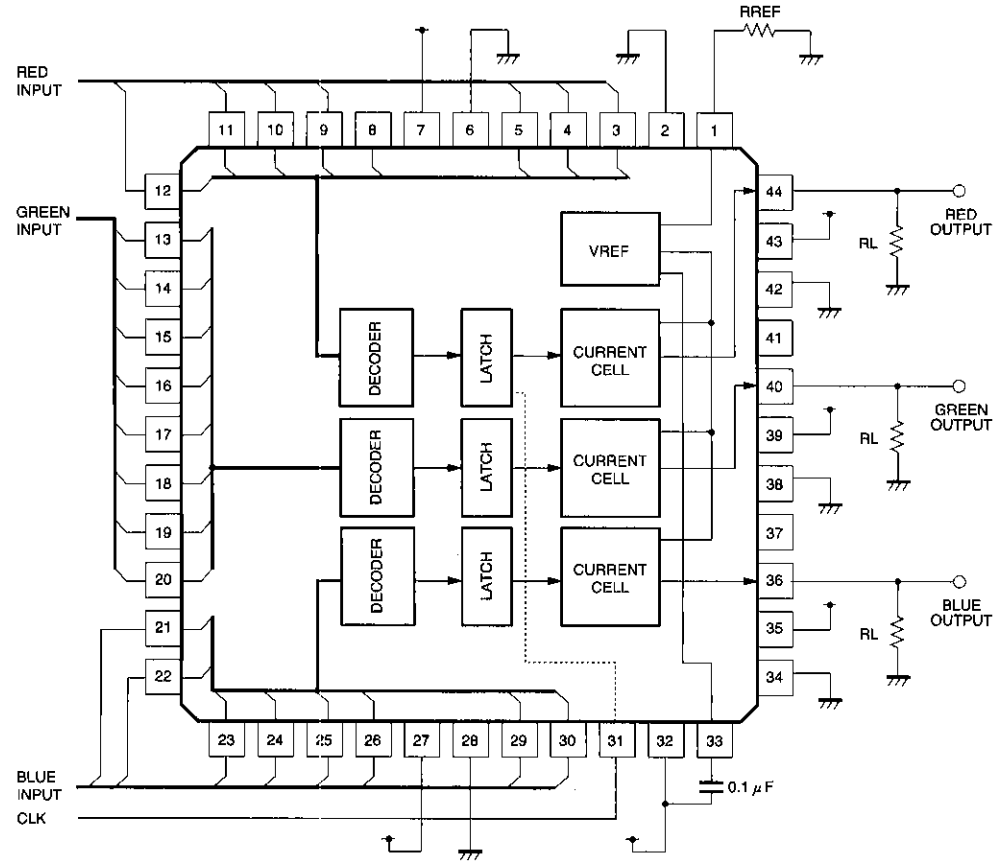
●Pin description

Pin No.	I/O	Pin name	Function
1	—	IREF	Output current adjustment resistor connection, VREF output
2	—	AGND 1	Analog ground
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	—	DGND 1	Digital ground 1
7	—	DVDD 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	—	DVDD 2	Digital power supply 2
28	—	DGND 2	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	—	AVDD 2	Analog power supply 2
33	O	VREF	Attached capacitance-adding pin (C= 0.1 μF)
34	—	AGNDB	Analog ground B
35	—	AVDDB	Analog power supply B
36	O	OUTB	BLUE output
37	—	NC	
38	—	AGNDG	Analog ground G
39	—	AVDDG	Analog power supply G
40	O	OUTG	GREEN output
41	—	NC	
42	—	AGNDR	Analog ground R
43	—	AVDDR	Analog power supply R
44	O	OUTR	RED output

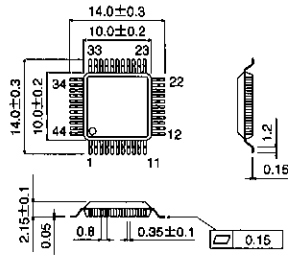
●Input/output circuits

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 circuit



●External dimensions (Units: mm)



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