

# On-screen display for camcorders

## BU2874FV/BU2874AFV/BU2858FV

The BU2874FV, BU2874AFV and BU2858FV are CMOS ICs for displaying character data on camcorder and television screens. The ICs are controlled by serial data from a microcomputer, and display patterns and data such as the date on the camcorder viewfinder. The characters are displayed in a 12 × 18 bit matrix, so Chinese characters can also be displayed. The display format is 12 lines × 24 characters. There is no space between characters, so two or more characters can be joined to form icons.

### ● Applications

Camcorders and televisions

### ● Features

- 1) 12 line × 24 character display.
- 2) 255 character types for the BU2874FV, BU2874AFV, and 127 for the BU2858FV.
- 3) Character size can be selected as 1H/dot or 2H/dot.
- 4) Three character output systems (one color, and two monochrome).
- 5) Screen selectable background: none, border, knockout or solid.
- 6) Character inversion (selectable for each character).
- 7) Character blinking (selectable for each character).

### ● Absolute maximum ratings (Ta=25°C)

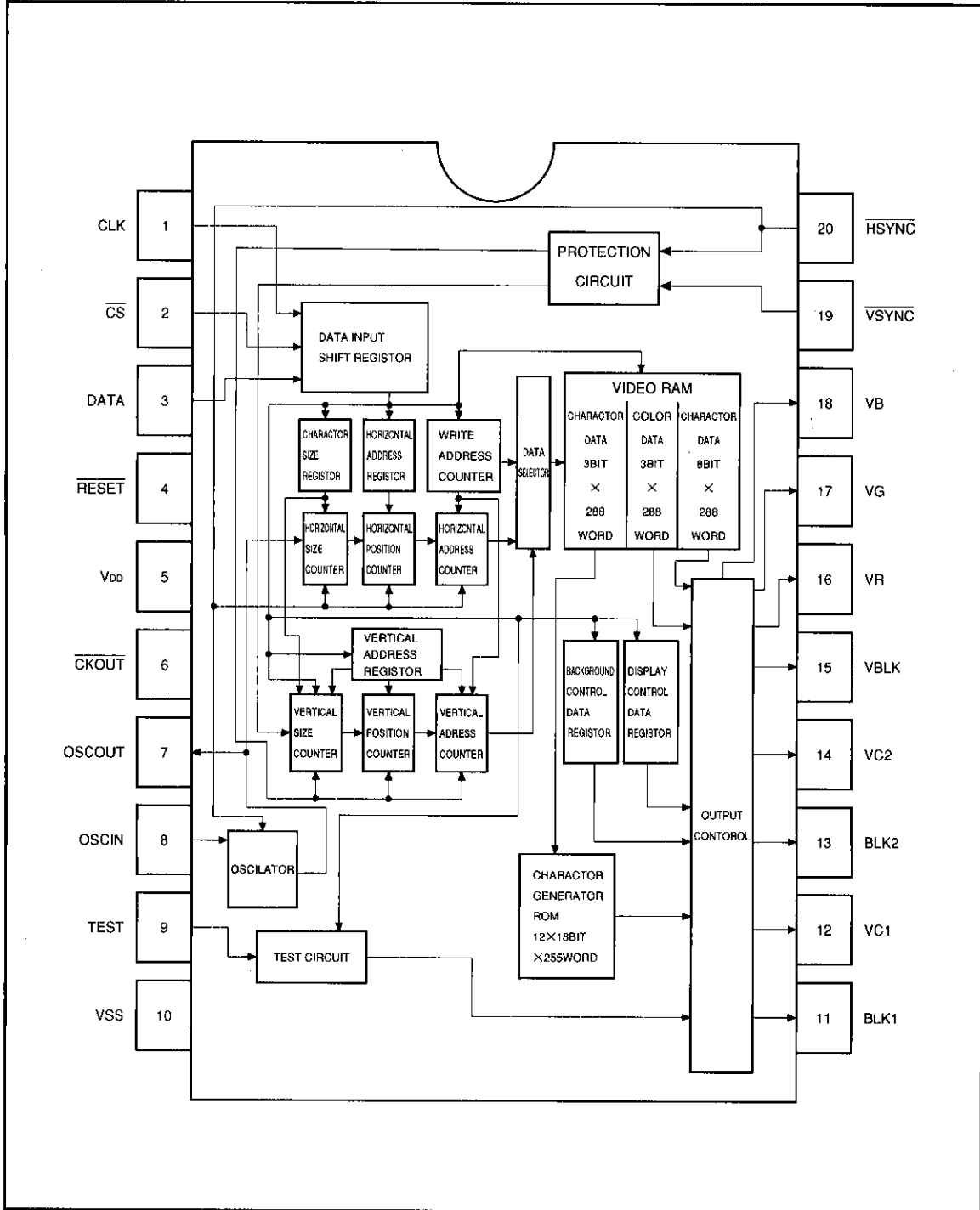
Parameter	Symbol	Limits	Unit
Power supply voltage	V <sub>CC</sub>	-0.3~7.0	V
Power dissipation	P <sub>d</sub>	500*	mW
Operating temperature	T <sub>opr</sub>	-20~75	°C
Storage temperature	T <sub>stg</sub>	-50~150	°C

\* Reduced by 4mW for each increase in Ta of 1°C over 25°C.

### ● Recommended operating conditions (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V <sub>DD</sub>	2.7	—	5.5	V

●Block diagram



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## ● Pin descriptions

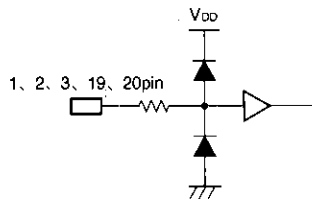
Pin No.	Symbol	Input/output	Pin name	Function
1	CLK	Input	Clock input	Data read clock input. Data on the DATA pin is read on the rising edge of the clock.
2	$\overline{\text{CS}}$	Input	Chip select	When low, serial data transmission is possible.
3	DATA	Input	Serial data input	Control data input. Read in synchronous with the clock signal to the CLK pin.
4	$\overline{\text{RESET}}$	Input	Reset	Resets when low (pullup resistor attached).*1
5	V <sub>DD</sub>	—	Supply	Power supply (+5V).
6	$\overline{\text{CKOUT}}$	Output	Clock out	Inverted OSCOUT output (N-channel open drain). Use to check the oscillator frequency.
7	OSCOUT	Output	Oscillator input/output	For connection of oscillator coil or capacitor.*2
8	OSCIN	Input		
9	TEST	Input	Test	IC test. Normally connected to GND.
10	VSS	—	Ground	System GND.
11	BLK1	Output	Blanking signal output terminal 1	Blanking signal output to cut the video signal. Corresponds to the VC1 output. Active high signal.
12	VC1	Output	Character signal output terminal 1	Character signal output (active high).
13	BLK2 (RBLK)	Output	Blanking signal output signal 2 (blanking R)	Blanking signal output to cut the video signal. Corresponds to the VC2 output. Active high signal. (Outputs a blanking signal corresponding to the VR output (active high))
14	VC2 (GBLK)	Output	Character signal output signal 2 (blanking G)	Character signal output (active high). (Outputs a blanking signal corresponding to the VG output (active high))
15	VBLK (BBLK)	Output	Blanking signal output signal (blanking B)	Blanking signal output to cut the video signal. Corresponds to the VR, VG, and VB outputs. Active high signal. (Outputs a blanking signal corresponding to the VB output (active high))
16	VR	Output	Character signal output	Character data output. Selection by character of the three output pins is possible. Active high output.
17	VG	Output		
18	VB	Output		
19	$\overline{\text{VSYNC}}$	Input	Vertical synchronization signal input	Vertical synchronization signal input. Active low input.
20	$\overline{\text{HSYNC}}$	Input	Horizontal synchronization signal input	Horizontal synchronization signal input. Active low input.

\*1 RESET clears the VRAM.

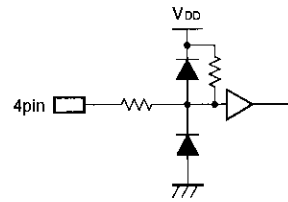
\*2 Pin 8 of the BU2874AFV is the external clock input.

● Input / output circuits

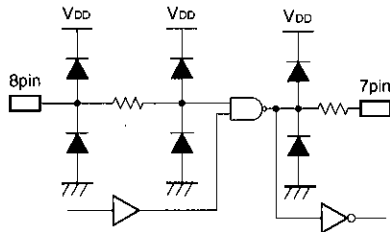
Input



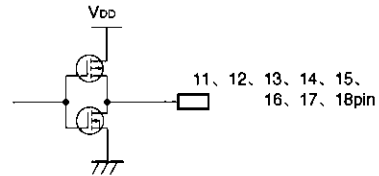
Input with pullup resistor



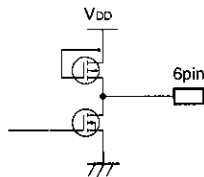
Oscillator



Output



Output



● Electrical characteristics 1 (Ta=25°C and VDD=4.0V to 5.5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
"L" input voltage	V <sub>IL2</sub>	0	—	0.3V <sub>DD</sub>	V	For CMOS input	Fig.3
"H" input voltage	V <sub>IH2</sub>	0.7V <sub>DD</sub>	—	V <sub>DD</sub>	V	For CMOS input	Fig.3
"L" output voltage	V <sub>OL1</sub>	—	—	0.1V <sub>DD</sub>	V	For OSC, I <sub>OL</sub> ≤ 0.5mA	Fig.1
"H" output voltage	V <sub>OH1</sub>	0.9V <sub>DD</sub>	—	—	V	For OSC, I <sub>OH</sub> ≤ 0.5mA	Fig.2
"L" output voltage	V <sub>OL2</sub>	—	—	0.1V <sub>DD</sub>	V	I <sub>OL</sub> ≤ 1mA	Fig.1
"H" output voltage	V <sub>OH2</sub>	0.9V <sub>DD</sub>	—	—	V	I <sub>OH</sub> ≤ 1mA	Fig.2
Pullup resistor	I <sub>R</sub>	12	28	70	kΩ	Pullup input	Fig.3
Operating current	I <sub>DD</sub>	—	6.5	—	mA	*1	Fig.4
Oscillator output "L" voltage	V <sub>OL3</sub>	—	—	0.1V <sub>DD</sub>	V		—

\*1 All characters displayed with f<sub>osc</sub> = 7MHz.  
 ©Not designed for radiation resistance.

●Electrical characteristics 2 (Ta=25°C and V<sub>DD</sub>=2.7V to 4.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
"L" input voltage	V <sub>IL2</sub>	0	—	0.1V <sub>DD</sub>	V	For CMOS input	Fig.3
"H" input voltage	V <sub>IH2</sub>	0.9V <sub>DD</sub>	—	V <sub>DD</sub>	V	For CMOS input	Fig.3
"L" output voltage	V <sub>OL1</sub>	—	—	0.1V <sub>DD</sub>	V	For OSC, I <sub>OL</sub> ≤ 0.2mA	Fig.1
"H" output voltage	V <sub>OH1</sub>	0.9V <sub>DD</sub>	—	—	V	For OSC, I <sub>OH</sub> ≤ 0.2mA	Fig.2
"L" output voltage	V <sub>OL2</sub>	—	—	0.1V <sub>DD</sub>	V	I <sub>OL</sub> ≤ 0.5mA	Fig.1
"H" output voltage	V <sub>OH2</sub>	0.9V <sub>DD</sub>	—	—	V	I <sub>OH</sub> ≤ 0.5mA	Fig.2
Pullup resistor	I <sub>IR</sub>	12	28	70	kΩ	Pullup input	Fig.3
Operating current	I <sub>DD</sub>	—	3.0	—	mA	*1	Fig.4
Oscillator output "L" voltage	V <sub>OL3</sub>	—	—	0.1V <sub>DD</sub>	V		—

\*1 All characters displayed with f<sub>osc</sub> = 7MHz.  
 ○ Not designed for radiation resistance.

●Measurement circuit

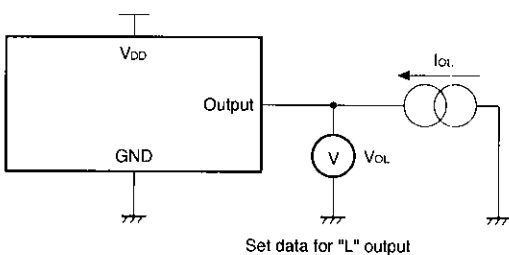


Fig. 1 "L" output voltage measurement circuit

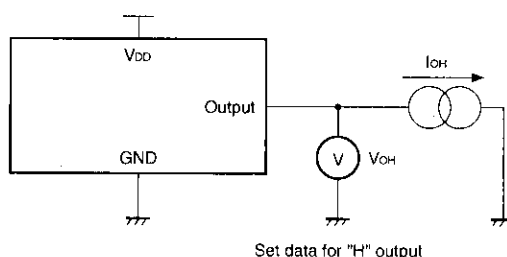


Fig. 2 "H" output voltage measurement circuit

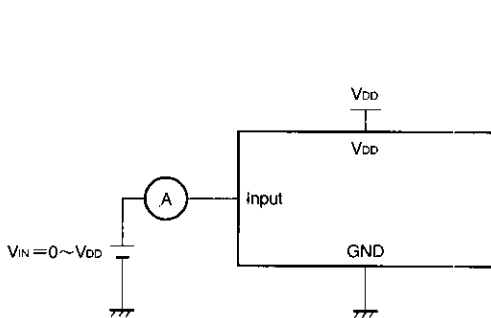


Fig. 3 Input leakage current, input voltage measurement circuit

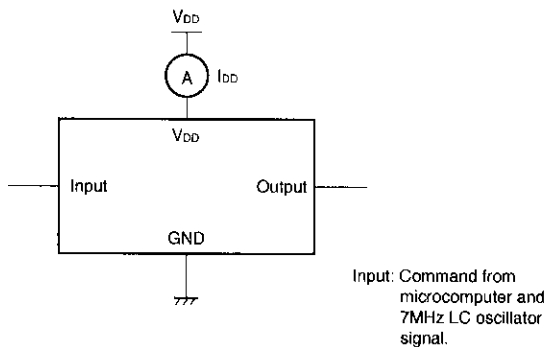


Fig. 4 Operating current measurement circuit

●Application example

(BU2874FV, BU2858FV)

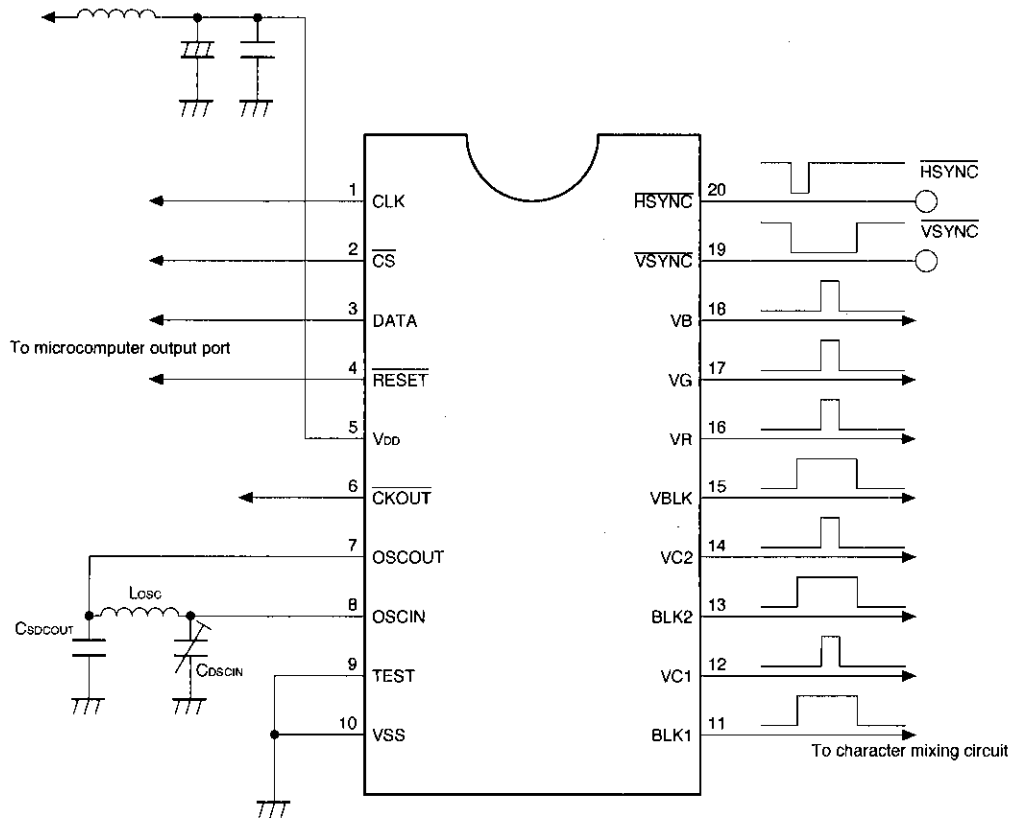


Fig. 5

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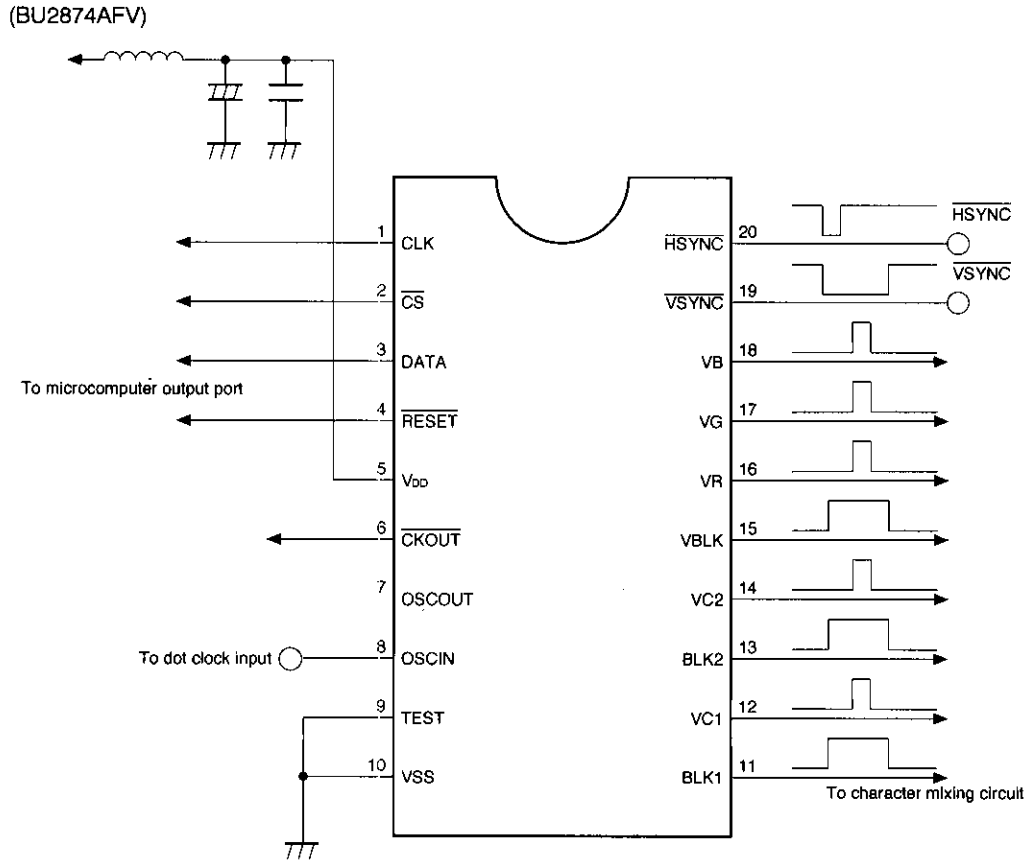
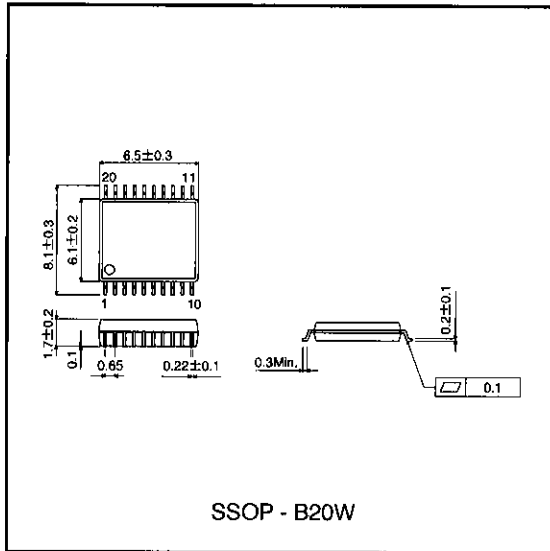


Fig. 6

● External dimensions (Units: mm)



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