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).
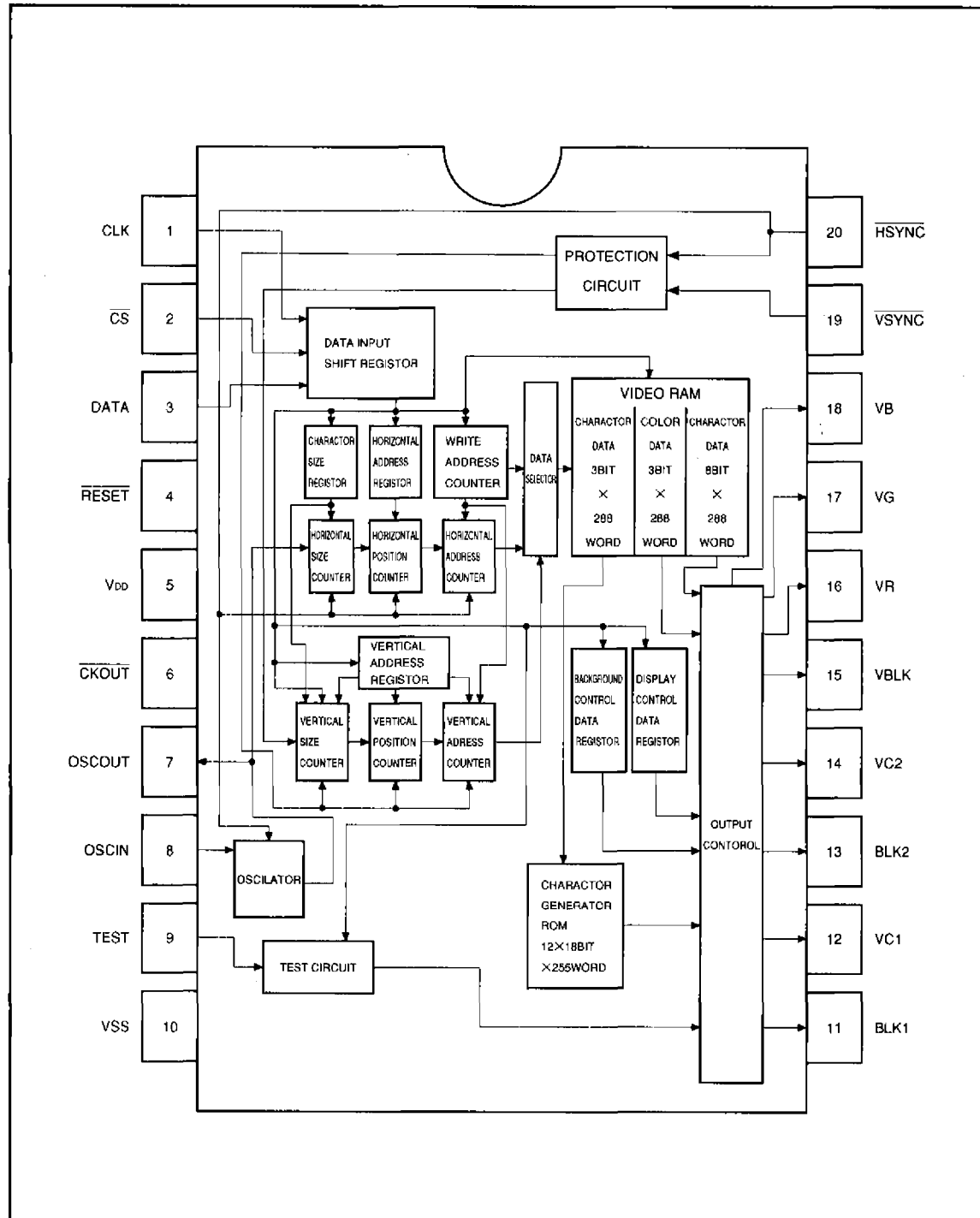
●Absolute maximum ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply voltage	Vcc	−0.3~7.0	V
Power dissipation	Pd	500*	mW
Operating temperature	Topr	−20~75	℃
Storage temperature	Tstg	−50~150	℃

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

●Recommended operating conditions (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	VDD	2.7	—	5.5	V

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BU2874FV/BU2874AFV/BU2858FV

● Block diagram

Pin	Signal
CLK	1
$\overline{CS}$	2
DATA	3
$\overline{RESET}$	4
V_{DD}	5
$\overline{CKOUT}$	6
OSCOUT	7
OSCIN	8
TEST	9
VSS	10

Pin	Signal
20	$\overline{HSYNC}$
19	$\overline{VSYNC}$
18	VB
17	VG
16	VR
15	VBLK
14	VC2
13	BLK2
12	VC1
11	BLK1

PROTECTION CIRCUIT

DATA INPUT SHIFT REGISTOR

CHARACTOR SIZE REGISTOR

HORIZONTAL ADDRESS REGISTOR

WRITE ADDRESS COUNTER

DATA REGISTOR

VIDEO RAM

CHARACTOR DATA 3BIT × 288 WORD

COLOR DATA 3BIT × 288 WORD

CHARACTOR DATA 8BIT × 288 WORD

HORIZONTAL SIZE COUNTER

HORIZONTAL POSITION COUNTER

HORIZONTAL ADDRESS COUNTER

VERTICAL ADDRESS REGISTOR

VERTICAL SIZE COUNTER

VERTICAL POSITION COUNTER

VERTICAL ADDRESS COUNTER

BACKGROUND CONTROL DATA REGISTOR

DISPLAY CONTROL DATA REGISTOR

OUTPUT CONTOROL

OSCILATOR

CHARACTOR GENERATOR ROM 12X18BIT X255WORD

TEST CIRCUIT

On-screen displays

Multimedia video

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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	$\overline{CS}$	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	$\overline{RESET}$	Input	Reset	Resets when low (pullup resistor attached).[1]
5	V$_{DD}$	—	Supply	Power supply (+5V).
6	$\overline{CKOUT}$	Output	Clock out	Inverted OSCOUT output (N-channel open drain). Use to check the oscillator frequency.
7 8	OSCOUT OSCIN	Output Input	Oscillator input/output	For connection of oscillator coil or capacitor.[2]
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	VC2 (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 17 18	VR VG VB	Output Output Output	Character signal output	Character data output. Selection by character of the three output pins is possible. Active high output.
19	$\overline{VSYNC}$	Input	Vertical synchronization signal input	Vertical synchronization signal input. Active low input.
20	$\overline{HSYNC}$	Input	Horizontal synchronization signal input	Horizontal synchronization signal input. Active low input.

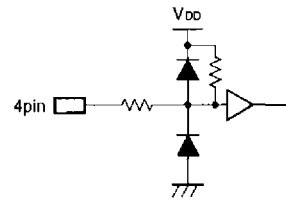[1] $\overline{RESET}$ clears the VRAM.
[2] Pin 8 of the BU2874AFV is the external clock input.

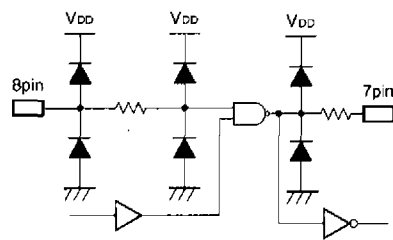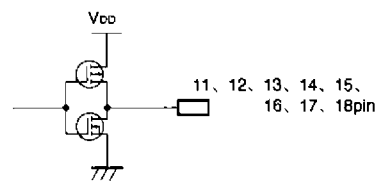**ROHM**

●Input / output circuits
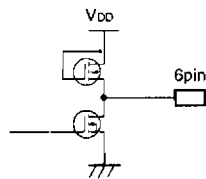
Input
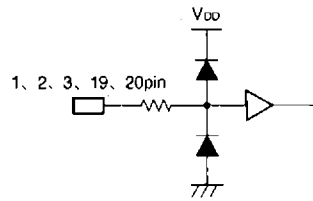
Input with pullup resistor

Oscillator

Output

Output

●Electrical characteristics 1 (Ta=25℃ and V_{DD}=4.0V to 5.5V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
"L" input voltage	V_{IL2}	0	—	$0.3V_{DD}$	V	For CMOS input	Fig.3
"H" input voltage	V_{IH2}	$0.7V_{DD}$	—	V_{DD}	V	For CMOS input	Fig.3
"L" output voltage	V_{OL1}	—	—	$0.1V_{DD}$	V	For OSC, $I_{OL} \leqq 0.5$mA	Fig.1
"H" output voltage	V_{OH1}	$0.9V_{DD}$	—	—	V	For OSC, $I_{OH} \leqq 0.5$mA	Fig.2
"L" output voltage	V_{OL2}	—	—	$0.1V_{DD}$	V	$I_{OL} \leqq 1$mA	Fig.1
"H" output voltage	V_{OH2}	$0.9V_{DD}$	—	—	V	$I_{OH} \leqq 1$mA	Fig.2
Pullup resistor	I_{IR}	12	28	70	kΩ	Pullup input	Fig.3
Operating current	I_{DD}	—	6.5	—	mA	*1	Fig.4
Oscillator output "L" voltage	V_{OL3}	—	—	$0.1V_{DD}$	V		—

*1 All characters displayed with fosc = 7MHz.
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●Electrical characteristics 2 (Ta=25℃ and VDD=2.7V to 4.0V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions	Measurement Circuit
"L" input voltage	V_{IL2}	0	—	$0.1V_{DD}$	V	For CMOS input	Fig.3
"H" input voltage	V_{IH2}	$0.9V_{DD}$	—	V_{DD}	V	For CMOS input	Fig.3
"L" output voltage	V_{OL1}	—	—	$0.1V_{DD}$	V	For OSC, $I_{OL} \leqq 0.2mA$	Fig.1
"H" output voltage	V_{OH1}	$0.9V_{DD}$	—	—	V	For OSC, $I_{OH} \leqq 0.2mA$	Fig.2
"L" output voltage	V_{OL2}	—	—	$0.1V_{DD}$	V	$I_{OL} \leqq 0.5mA$	Fig 1
"H" output voltage	V_{OH2}	$0.9V_{DD}$	—	—	V	$I_{OH} \leqq 0.5mA$	Fig.2
Pullup resistor	I_R	12	28	70	kΩ	Pullup input	Fig.3
Operating current	I_{DD}	—	3.0	—	mA	*1	Fig.4
Oscillator output "L" voltage	V_{OL3}	—	—	$0.1V_{DD}$	V		—

*1 All characters displayed with fosc = 7MHz.
◎Not designed for radiation resistance.

●Measurement circuit

Set data for "L" output
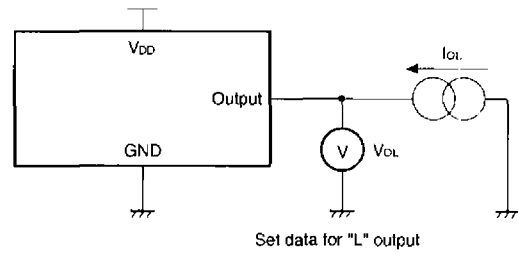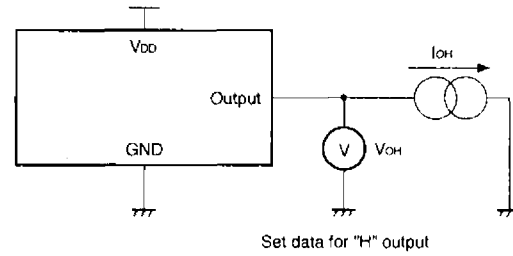
Fig. 1 "L" output voltage measurement circuit

Set data for "H" output

Fig. 2 "H" output voltage measurement circuit
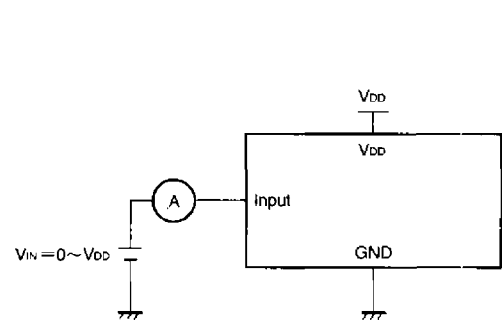
Fig. 3 Input leakage current, input voltage measurement circuit

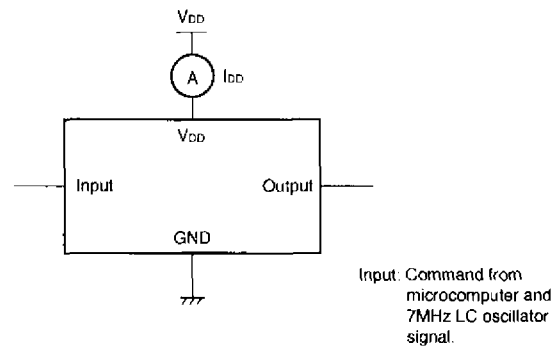Input: Command from microcomputer and 7MHz LC oscillator signal.

Fig. 4 Operating current measurement circuit

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●Application example

(BU2874FV, BU2858FV)

Fig. 5

On-screen displays

Multimedia video

(BU2874AFV)

Fig. 6

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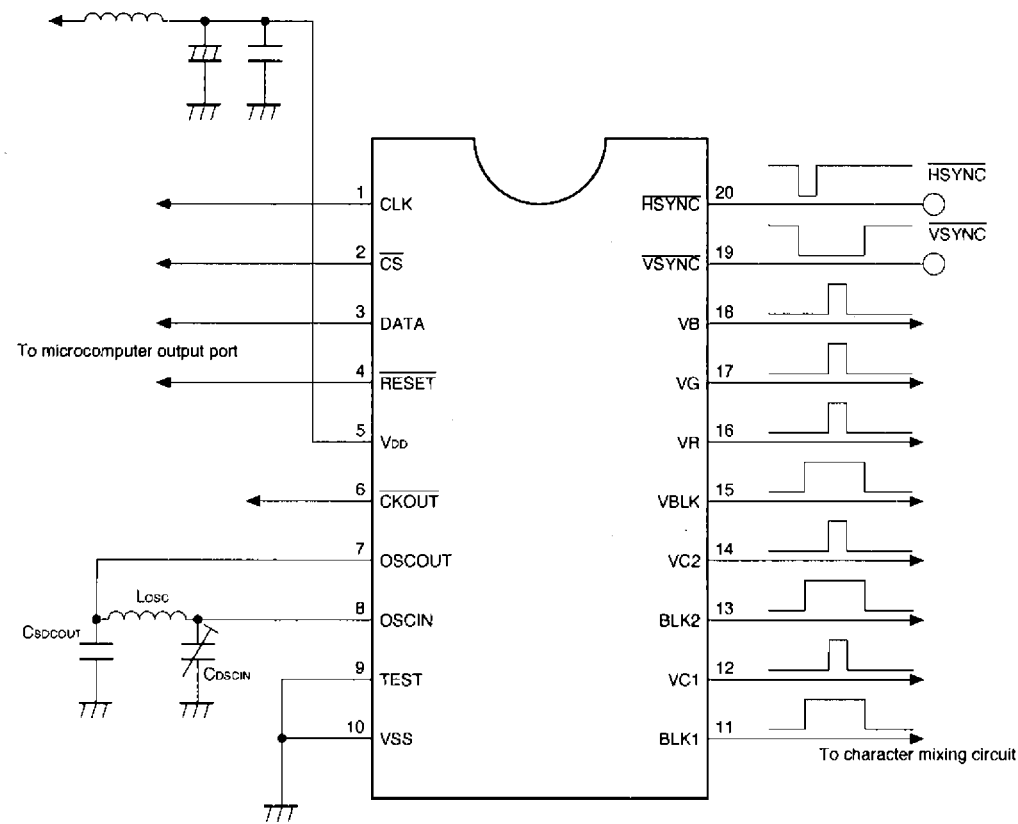
●External dimensions (Units: mm)

SSOP - B20W

On-screen displays

Multimedia video
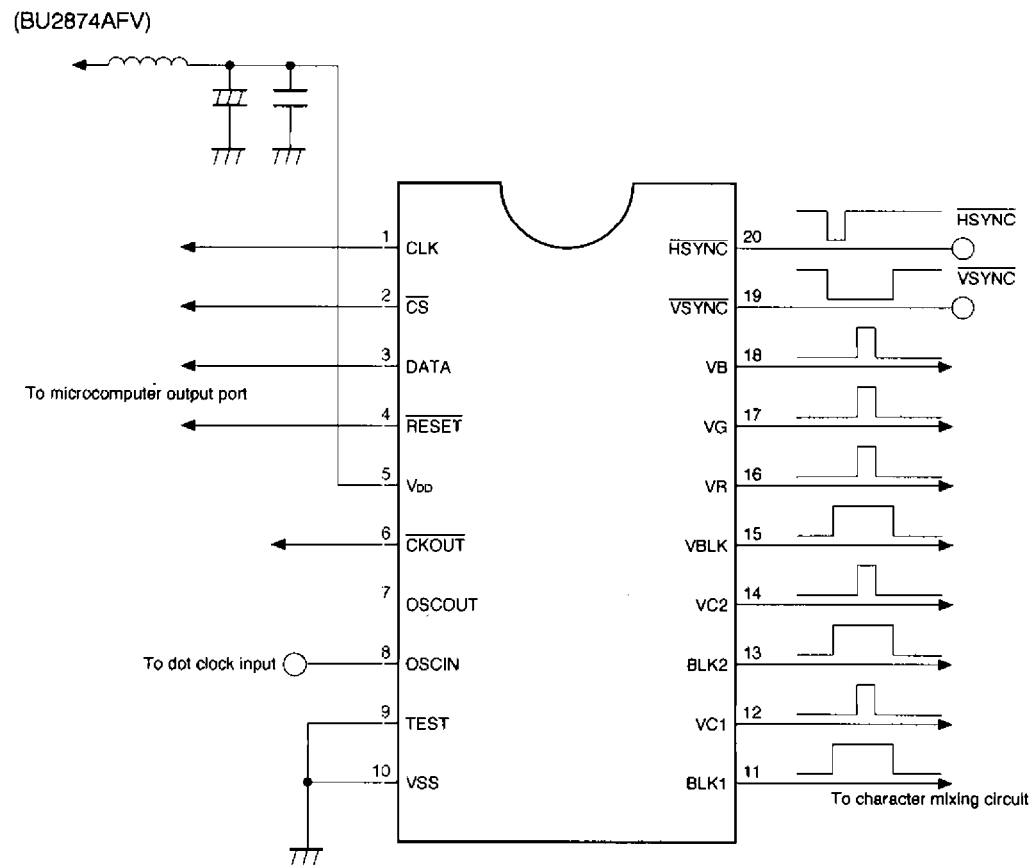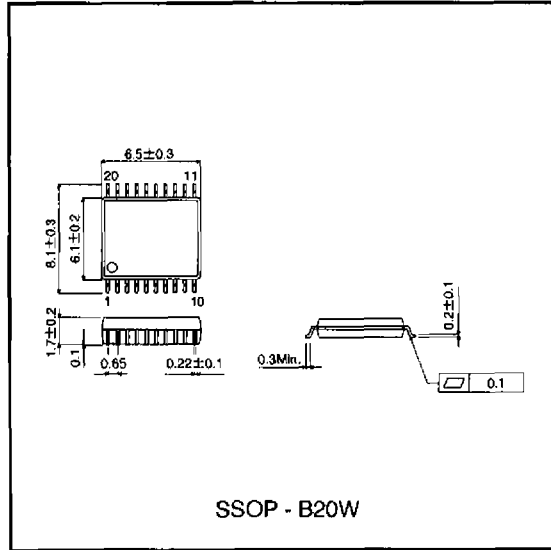
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