Multimedia ICs

On-screen display for VCRs BU2875/BU2875F/BU2857/BU2857F

The BU2875, BU2875F, BU2857 and BU2857F are character generator ICs for VCRs and televisions. The display RAM can store is 12 lines \times 24 characters, and the on-chip character data ROM can store either 127 or 255 different characters. The characters are displayed in a 12 \times 18 bit matrix, with no space between characters, so two or more characters can be joined to form icons or patterns.

Applications

VCRs

Features

1)Compatible with NTSC, PAL, PAL-M, and PAL-N. A non-interlace mode is also provided.

2)Compatible with composite and S-VHS.

- 3)127 character types (BU2875 and BU2875F) or 255 character types (BU2857 and BU2857F).
- 4)Color can be specified for each character. Reverse video display, blinking display, and "aluminum option" can be selected.

5)Built-in sync-tip clamp circuit.

6)Built-in synchronization decision circuit.

●Absolute maximum ratings (Ta=25℃)

Para	meter	Symbol	Limits	Unit	
Power supply voltage		Vcc	-0.3~7.0	V	
	BU2875/BU2857		700 (DIP28) ^{*1}	mW	
Power dissipation	BU2875F/BU2857F	Pd	550 (SOP28) ^{*2}		
Operating temperature		Topr	-20~75	°C	
Storage temperature		Tstg	Tstg -50~150		
Pin voltages		—	-0.3~Vcc+0.3	V	

*1 Reduced by 7mW for each increase in Ta of 1°C over 25°C. *2 Reduced by 5.5mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta=25℃)

Parameter	Symbol	Min.	Тур.	Max.	Unit	
Power supply voltage	Vcc	4.5	5.0	5.5	V	
Input voltage	Vin	0	_	Vcc	v	



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Block diagram

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Pin description

Pin No.	Input/output	Pin Name	Function				
1	Input	ĀC	"L" input resets all registers and clears the RAM. Pullup resistor on input.				
2	Input	SCK	Clock input for reading data. Data on the DATA pin is read on the rising edge of the clock. Each block of 8 bits is loaded into the register as a command.				
3	Input	ĊŚ	Serial interface chip select. Data effective when "L".				
4	Input	DATA	Control data input. Data is read synchronously with the rising edge of the signal on the CLK pin.				
5	Output	SYDET	The synchronizing signal is used to determine the presence or absence of a video signal, and the result is output on this pin (sync detect). Normally "L", the output goes "H" when no signal is detected.				
6	-	DVDD	+5V power supply pin (digital circuit).				
7 8	Output Input	OSC OUT OSC IN	For connection of capacitor and coil for the VCO. Also used as the OSD character output dot clock. The oscillator frequency is 480fH (fH: horizontal synchronization frequency).				
9	Output	FDOUT	AFC circuit phase comparator output.				
10	_	DGND	Connect to system ground (digital GND).				
11	Output	VB*	B character data output of digital RGB output.				
12	Output	VG*	G character data output of digital RGB output.				
13	Output	VR*	R character data output of digital RGB output.				
14	Output	VBLK	Background data digital output.				
15	Input	TEST	Open during normal operation. When "H", the LC oscillator clock is output on pin 11, and the X'tal oscillator clock is output on pin 12. This is used to for checking the oscillation frequencies.				
16	Input	YVSEL	For setting the mode of the video signal input/output pins. Set to "L" for separated Y/C, and "H" for composite video.				
17	-	AVDD	+5V power supply pin (analog circuit).				
18	Input	SYIN	Input for the video signal for the synchronous separation circuit.				
19	Input	CIN	C signal input pin for Y/C separation input/output. Leave open when not used (select the mode using pin 16).				
20	Input	YIN / VIN	Y signal pin for Y/C separation input/output or composite video signal input (select the mode using pin 16). Use an input level of 2VP-P.				
21	-	AGND	Connect to system ground (analog GND).				
22	Output	YOUT / VOUT	Y signal pin for Y/C separation input/output or composite video signal output (select the mode using pin 16).				
23	Output	COUT	C signal output pin for Y/C separation input/output. Leave open when not used (select the mode using pin 16).				
24	Input	VSEPC	Input for external vertical synchronization signal. (open when not used). Logical sum of this and the internally separated vertical synchronization signal is taken.				
25	Output	CSYNCOUT	Output for composite synchronization signal (slicer output).				
26	Input	CSYNCIN	Input for composite synchronization signal. This is input to the AFC phase comparator and vertical synchronization signal separation circuit. Normally connected to pin 25.				
27 28	Output Input	X'tal OUT X'tal IN	For connection of a capacitor for oscillation, or a crystal. For generation of internal video signal. Use a crystal oscillator with a frequency of 4fsc.				

* For superimposition, the VR, VG, and VB outputs display in monochrome.

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•Function of the AC pin ;

When the AC pin is set to "L", all registers are cleared, and character code FFH is written to all RAM addresses (RAM clear function). For this reason, do not send commands until writing of data to the RAM is complete. The time requires to write the data to the RAM is

3 / fosc×288 [sec]

(fosc: the LC oscillator frequency.)

Input / output circuits



Input with pulldown resistors







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Input with pullup resistors





●YVSEL setting

YVSEL	YIN / VIN YOUT / VOUT	CIN COUT	
L	Y signal input/output	C signal input/output	
н	Composite video signal input/output	Unused (open)	

SYIN

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Input / output circuits

Y/V IN



CIN



Y/V OUT, COUT







Outputs



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●Electrical characteristics (Unless otherwise specified: Ta=25°C and VDD=5V)

Parameter	Symbol	Min.	Тур.	Max.	Unit	Conditions	Measuremen Circuit
"L" input voltage	ViL2	0		1.5	V	For CMOS input	Fig.3
"H" input voltage	ViH2	3.5	-	VDD	V	For CMOS input	Fig.3
"L" output voltage	Vol1	-		0.4	V	For OSC *1	Fig.1
"H" output voltage	VOH1	4.6		—	V	For OSC ^{*1}	Fig.2
"L" output voltage	Vol2	1		0.4	V	lo∟ ≦2mA (CMOS output)	Fig.1
"H" output voltage	Vонг	4.6		-	V	$loh \leq 1mA$ (CMOS output)	Fig.2
Video signal input level	Vvi	-	2.0		Vp.p	Pins 18 and 20 (when white peak)*2	
Video signal output level	Vvo	_	1.85	-	Vp.p	Pin 22 (when white peak)*3	Fig.5
C signal input level	Vci	ļ	1.4	3.0	Vp.p	19pin *2	-
C signal output level	Vco	_	1.4	_	Vp.p	23pin *3	Fig.5
LC oscillator frequency	fosc	_	480fн	-	MHz	fil: horizontal synchronization signal frequency	<u> </u>
Input pullup resistance	: lin	_	28	_	kΩ	Pullup input	Fig.3
Operating current	los	-	_	25	mA	*4	Fig.4

*1 When an external clock is connected to the oscillator pin (50% duty cycle).
*2 Signal level of the externally input signal in external synchronization mode (superimpose).
*3 Signal level of the internally generated signal in internal synchronization mode.
*4 All characters displayed with fosc = 7.55MHz.
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Measurement circuits



Fig. 1 "L" output voltage measurement circuit



Fig. 2 "H" output voltage measurement circuit



Fig. 3 Input voltage measurement circuit











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Application example



Fig. 6

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External dimensions (Units: mm)



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Notes

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