STRUCTURE Silicon Monolithic Integrated Circuit

TYPE **BU2099FV**

FUNCTION 12bit Serial IN / Parallel Out Driver

FEATURES 1) Nch open drain,capable of driving a maximum of 25mA

2) 25V high voltage output can be used.

3) This product can be operated on low voltage. (2.7V)

● ABSOLUTE MAXIMUM RATINGS (Ta=25℃)

Parameter	Symbol	Limit	Unit
Power Supply Voltage	V_{DD}	7.0	V
Power Dissipation1	Pd1	400	mW
Power Dissipation2	Pd2	650※	mW
Operating Temperature Range	T_{opr}	-40～+85	℃
Storage Temperature Range	T_{stg}	-55～+125	℃
Input Voltage	V_{IN}	-0.3～VDD+0.3	V

* Output (Q0～Q11) are 25V (Max.)

* 70mm×70mm×1.6mm glass epoxy.

・Status of this document

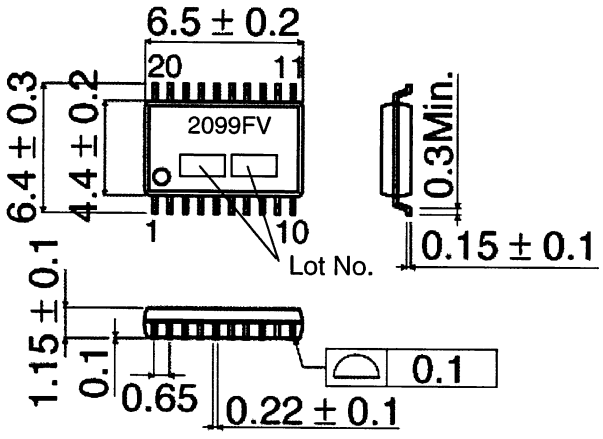
The Japanese version of this document is the formal specification. A customer may use this translation version only for a reference to help reading the formal version. If there are any difference in translation version of this document, formal version takes priority.

● ELECTRICAL CHARACTERISTICS (unless otherwise noted, Ta=25℃,VDD=5.0V)

Parameter	Symbol	Standard Value			Unit	Condition
		MIN	TYP	MAX		
Power Supply Voltage range	V_{DD}	2.7	-	5.5	V	VDD pin
Output Voltage range	V_o	0	-	25.0	V	
Supply current1	I_{DD1}	-	-	5.0	μA	Vin=VSS or VDD ,Output=OPEN,VDD=5V
Supply current2	I_{DD2}	-	-	3.0	μA	Vin=VSS or VDD ,Output=OPEN,VDD=3V
Input "H" voltage1	V_{IH1}	3.5	-	-	V	VDD=5V
Input "H" voltage2	V_{IH2}	2.5	-	-	V	VDD=3V
Input "L" voltage1	V_{IL1}	-	-	1.5	V	VDD=5V
Input "L" voltage2	V_{IL2}	-	-	0.4	V	VDD=3V
Output "L" voltage1	V_{OL1}	-	-	2.0	V	VDD=5V,20mA
Output "L" voltage2	V_{OL2}	-	-	1.0	V	VDD=3V,5mA
Output Leakage current1	I_{IH}	-	-	10.0	μA	External resistance 10kΩ,Vout=25V
Output Leakage current2	I_{IL}	-	-	-5.0	μA	External resistance 10kΩ,Vout=0V
Data Minimum set up time1	t_{su1}	200	-	-	n S	VDD=5V
Data Minimum set up time2	t_{su2}	400	-	-	n S	VDD=3V
Data hold time1	t_{h1}	200	-	-	nS	VDD=5V
Data hold time2	t_{h2}	400	-	-	nS	VDD=3V
Minimum shift pulse width1	t_{w1}	500	-	-	nS	VDD=5V
Minimum shift pulse width2	t_{w2}	1000	-	-	nS	VDD=3V

This product is not assessed whether to be strategic materials in foreign exchange and trade law or not, so please confirm at trading. This product is not deigned against radioactive ray.

● PHYSICAL DIMENSIONS

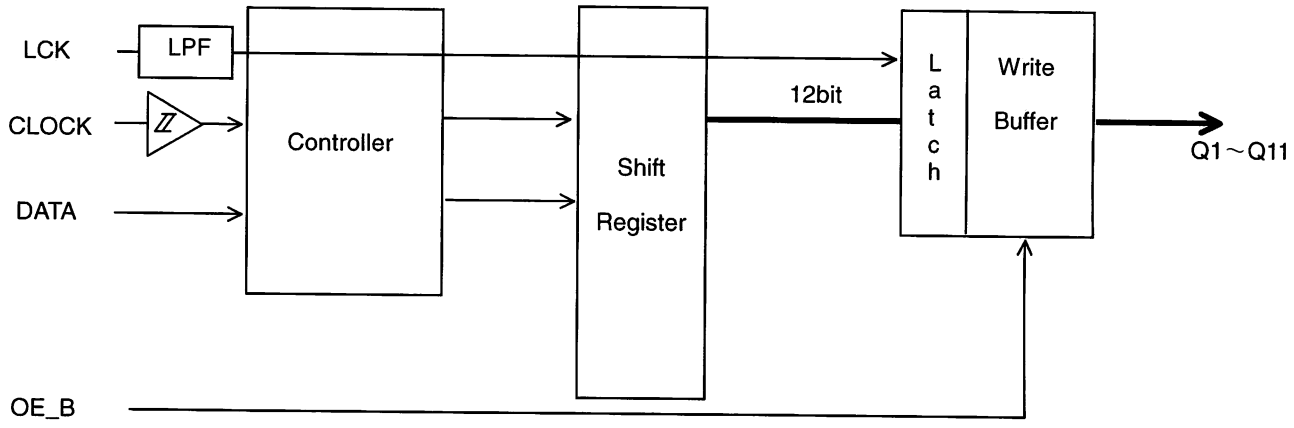


SSOP-B20 (UNIT : mm)

● Pin Description

Pin. No	Terminal	Symbol	Function
4	CLOCK	C	Shift pulse for shift register
3	DATA	S_I	Data input for shift register, data is set at rising edge of shift pulse
5	LCK	L_{CK}	Strobe signal input, output is renewable at "1" and reserved at "0".
19	OE_B	O_{EB}	Enable signal input, output is enabled at "0".
18	SO	S_O	Data output for shift register, which is outputted at the rising edge of shift pulse.
6	Q0	O_0	1st bit output, it becomes "1" when data in register is "1"
7	Q1	O_1	2nd bit output, it becomes "1" when data in register is "1"
8	Q2	O_2	3rd bit output, it becomes "1" when data in register is "1"
9	Q3	O_3	4th bit output, it becomes "1" when data in register is "1"
10	Q4	O_4	5th bit output, it becomes "1" when data in register is "1"
11	Q5	O_5	6th bit output, it becomes "1" when data in register is "1"
12	Q6	O_6	7th bit output, it becomes "1" when data in register is "1"
13	Q7	O_7	8th bit output, it becomes "1" when data in register is "1"
14	Q8	O_8	9th bit output, it becomes "1" when data in register is "1"
15	Q9	O_9	10th bit output, it becomes "1" when data in register is "1"
16	Q10	O_{10}	11th bit output, it becomes "1" when data in register is "1"
17	Q11	O_{11}	12th bit output, it becomes "1" when data in register is "1"
1	VSS	GND	GND
2	NC	NC	NC pin
20	VDD	VDD	Power supply

● BLOCK DIAGRAM



● NOTES FOR USE

(1) Absolute maximum ratings
Exceeding the absolute maximum ratings, including applied voltage and operating temperature range, may damage or destroy the IC. Since the cause of the damage cannot be conclusively identified (as, for example, a short or open mode), be sure to take appropriate physical safety measures, such as incorporating fuses, whenever a special mode anticipated to exceed absolute maximum ratings is employed.

(2) Ground Potential
Make sure the potential for the GND pin is always kept lower than the potentials of all other pins, regardless of the operating mode.

(3) Thermal design
Provide sufficient margin in the thermal design to account for the allowable power dissipation (Pd) expected in actual use.

(4) Electromagnetic fields
Use in strong electromagnetic fields may cause malfunctions. Be careful operating in electromagnetic fields.

(5) Ground wiring pattern
When both a small-signal GND and high current GND are present, single-point grounding (at the set standard point) is recommended, in order to separate the small-signal and high current patterns, and to be sure the voltage change stemming from the wiring resistance and high current does not cause any voltage change in the small-signal GND. In the same way, care must be taken to avoid wiring pattern fluctuations in any connected external component GND.

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As of 18th. April 2005