STRUCTURE Silicon Monolithic Integrated Circuit

PRODUCT NAME TFT-LCD Bias Boost Converter
TYPE **BD8152FVM**
PHYSICAL DIMENSION MSOP8(Plastic Mold)

FUNCTIONS
1.Peak Current Mode PWM Boost converter
2.VCC Input Range : 2.5V～5.5V
3.0.25Ω Internal Power Switch
4.Switching Frequency : 600/1200 kHz ±10%
5.Feed Back Voltage : 1.245V ±1%
6.Protection Circuits : Under Voltage Lock Out
Thermal Shut Down
Over Current Protect
7.Thin package : MSOP8

● ABSOLUTE MAXIMUM RATING (Ta=25℃)

Parameter	Symbol	Rating	Unit
Supply Voltage	Vcc	7	V
Power Dissipation	Pd	588*	mW
Operating Temperature Range	Topr	-40～+85	℃
Storage Temperature Range	Tstg	-55～+150	℃
SW Pin Current	Isw	1.5**	A
SW Pin Voltage	Vsw	15	V
Junction Temperature	Tjmax	150	℃

* Derating in done 4.7mW/℃ for operating above Ta≧25℃(On 70.0mm×70.0mm×1.6mm board)
** Pd, ASO should not be exceeded

● RECOMMENDABLE OPERATION RANGE (Ta=25℃)

Parameter	Symbol	Limit			Unit
		Min	Typ	Max	
Supply Voltage	Vcc	2.5	3.3	5.5	V
SW Sink Current	Isw	—	—	1.4	A
SW Pin Voltage	Vsw	—	—	15	V

NOTE: The product described in this specification is a strategic product(and/or Service) subject to COCOM regulations. It should not be exported without Authorization from the appropriate government.

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 differences in translation version of this document, formal version takes priority.

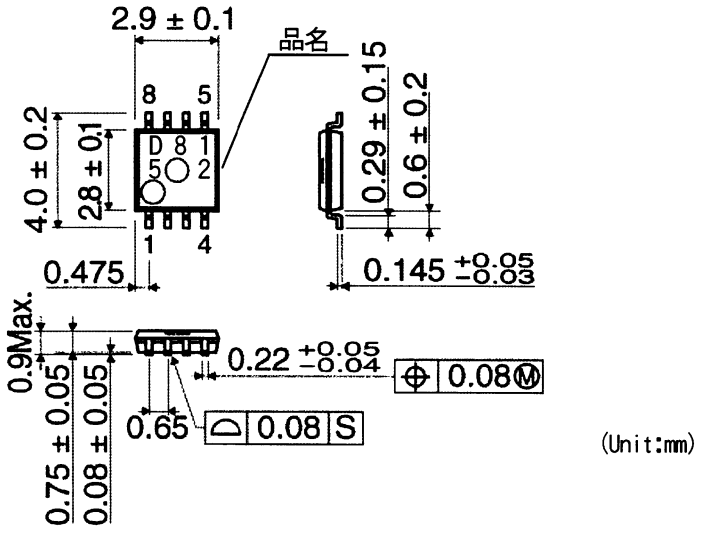
● Electrical Characteristics (Unless otherwise specified, Ta=25℃ Vcc=3.3V)

Parameter	Symbol	Limit			Unit	Condition
		Min	Typ	Max		
【OSCILLATION BLOCK】						
Oscillation Frequency 1	FOSC 1	540	600	660	kHz	FCLK=0V
Oscillation Frequency 2	FOSC 2	1.08	1.20	1.32	MHz	FCLK=Vcc
【OVER CURRENT PROTECT BLOCK】						
Switch Current Limit	ISW	—	2	—	A	※
【SOFT START BLOCK】						
SS Source Current	ISO	6	10	14	uA	Vss=0.5V
Clamp Voltage	Vcl	1.7	1.9	2.1	V	
【UNDER VOLTAGE LOCK OUT BLOCK】						
ON Threshold Voltage	VUTO N	2.0	2.1	2.2	V	
【ERROR AMPLIFIER BLOCK】						
Feed Back Voltage	VFB	1.232	1.245	1.258	V	Buffer
COMP Sink Current	IOI	40	70	130	uA	VFB=1.5V
COMP Source Current	IOO	40	70	130	uA	VFB=1.0V
【SW BLOCK】						
ON Resistance	RON	—	250	380	mΩ	※
Maximum duty Cycle	DMAX	72	80	88	%	RL=100Ω
【ENB BLOCK】						
ENB ON Voltage	VON	Vcc ×0.7	Vcc	—	V	
ENB OFF Voltage	VOFF	—	0	Vcc ×0.3	V	
【DEVICE】						
Stand-by Current	ISTB	—	0	10	uA	VENB=0V
Average Supply Current	ICC	—	1.2	2.4	mA	no switching

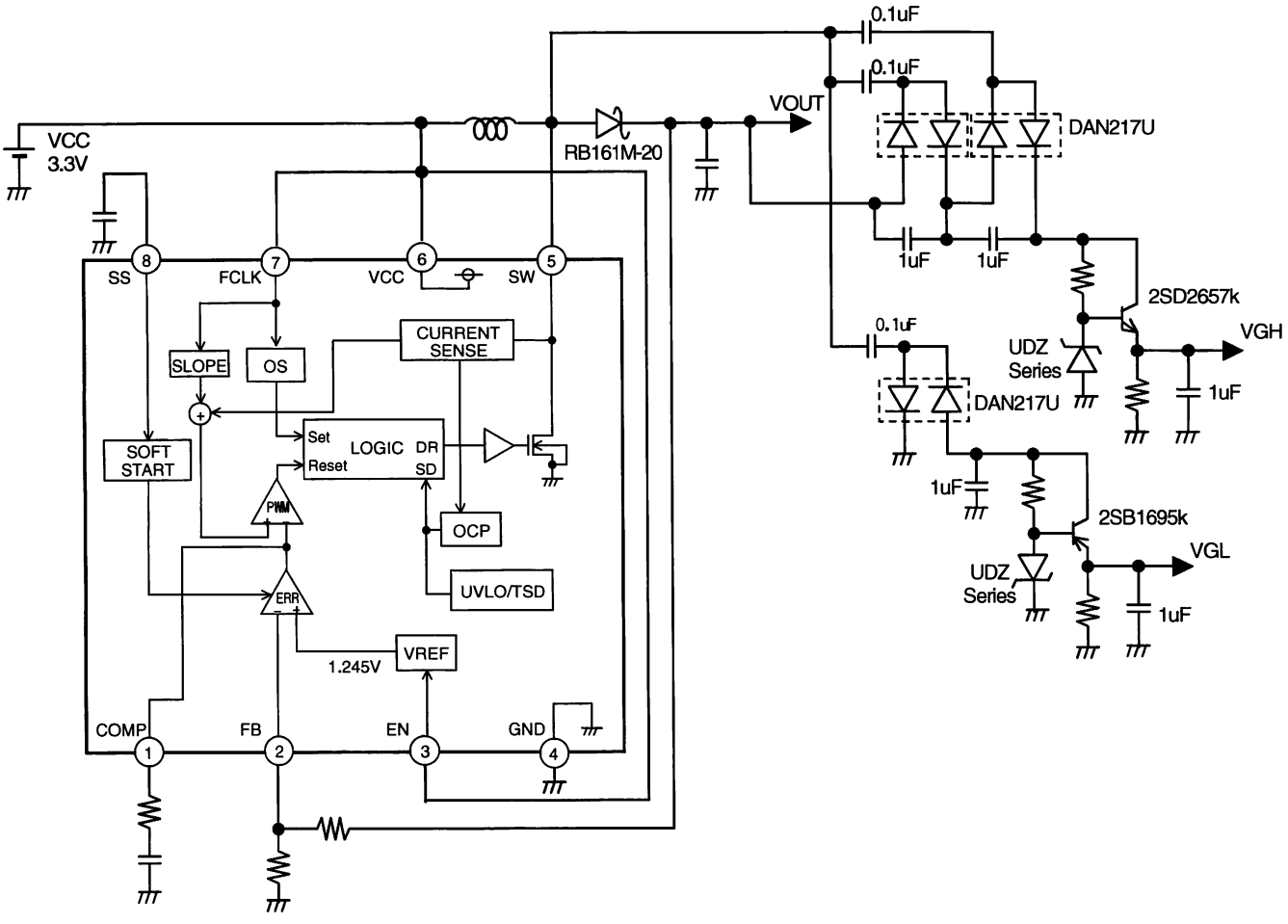
○ This product is not designed for protection against radioactive rays.

※ Designed Guaranteed. (outgoing inspection is not done on all products)

●PHYSICAL DIMENSION・MARKING (MSOP8)



●BLOCK DIAGRAM



●PIN NO. & FUNCTION TABLE

Pin No.	Pin Name	Function
1	COMP	Error Amp Output
2	FB	Feed Back Input
3	ENB	Chip Enable Input
4	GND	Ground
5	SW	Nch FET Power Switch Drain Output
6	Vcc	Power Input
7	FCLK	Frequency Change Input
8	SS	Soft Start Current Output

● Operation Notes

1) Absolute maximum ratings
Use of the IC in excess of absolute maximum ratings such as the applied voltage or operating temperature range may result in IC damage. Assumptions should not be made regarding the state of the IC (short mode or open mode) when such damage is suffered. A physical safety measure such as a fuse should be implemented when use of the IC in a special mode where the absolute maximum ratings may be exceeded is anticipated.

2) GND potential
Ensure a minimum GND pin potential in all operating conditions.

3) Setting of heat
Use a thermal design that allows for a sufficient margin in light of the power dissipation (Pd) in actual operating conditions.

4) Pin short and mistake fitting
Use caution when orienting and positioning the IC for mounting on an application board. Improper mounting may result in damage to the IC. Shorts between output pins or between output pins and the power supply and GND pins caused by the presence of a foreign object may result in damage to the IC.

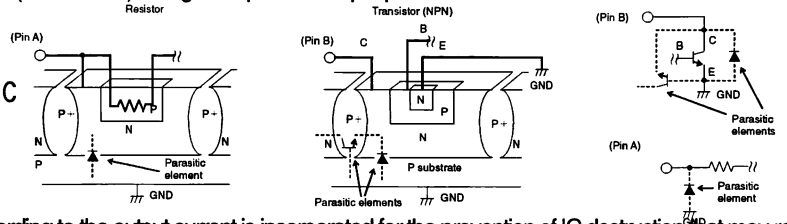
5) Actions in strong magnetic field
Use caution when using the IC in the presence of a strong magnetic field as doing so may cause the IC to malfunction.

6) Testing on application boards
When testing the IC on an application board, connecting a capacitor to a pin with low impedance subjects the IC to stress. Always discharge capacitors after each process or step. Ground the IC during assembly steps as an antistatic measure, and use similar caution when transporting or storing the IC. Always turn the IC's power supply off before connecting it to or removing it from a jig or fixture during the inspection process.

7) Ground wiring patterns
When using both small signal and large current GND patterns, it is recommended to isolate the two ground patterns, placing a single ground point at the application's reference point so that the pattern wiring resistance and voltage variations caused by large currents do not cause variations in the small signal ground voltage. Be careful not to change the GND wiring patterns of any external components.

8) This monolithic IC contains P+ isolation and P substrate layers between adjacent elements in order to keep them isolated. P/N junctions are formed at the intersection of these P layers with the N layers of other elements to create a variety of parasitic elements.
For example, when the resistors and transistors are connected to the pins as shown in below figure, a parasitic diode or a transistor operates by inversing the pin voltage and GND voltage.
The formation of parasitic elements as a result of the relationships of the potentials of different pins is an inevitable result of the IC's architecture. The operation of parasitic elements can cause interference with circuit operation as well as IC malfunction and damage. For these reasons, it is necessary to use caution so that the IC is not used in a way that will trigger the operation of parasitic elements, such as the application of voltages lower than the GND (P substrate) voltage to input and output pins.

Example of a Simple Monolithic IC Architecture



9) Overcurrent protection circuits
An overcurrent protection circuit designed according to the output current is incorporated for the prevention of IC destruction that may result in the event of load shorting. This protection circuit is effective in preventing damage due to sudden and unexpected accidents. However, the IC should not be used in applications characterized by the continuous operation or transitioning of the protection circuits. At the time of thermal designing, keep in mind that the current capacity has negative characteristics to temperatures.

10) COMP Terminal
The COMP terminal is for phase margin of the DC/DC system. A capacitor and a resistor or an only capacitor placed between the COMP terminal. The values of the capacitor and the resistor shall be adjusted according to the output current and the output capacitor value. The output may be oscillating if the value of capacitor is not sufficient, also the transient response may become insufficient if the value is too large. Therefore, the value of the capacitor and the resistor shall be adequately set up based on the condition of the t

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