

STRUCTURE Silicon Monolithic Integrated Circuit
PRODUCT NAME TFT-LCD Bias Boost Converter
TYPE **B D 8 1 5 2 F V M**
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°C)

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

* Derating is done 4.7mW/°C for operating above Ta≥25°C (On 70.0mm×70.0mm×1.6mm board)

** Pd, ASO should not be exceeded

● RECOMMENDABLE OPERATION RANGE (Ta=25°C)

| 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.

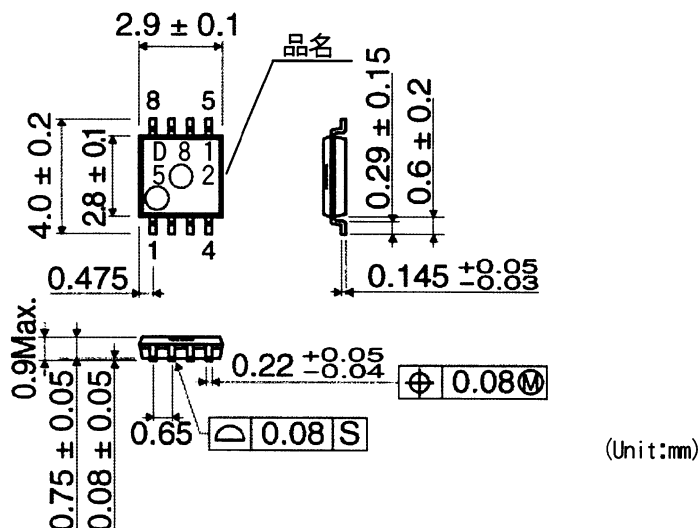
● Electrical Characteristics (Unless otherwise specified, Ta=25°C Vcc=3.3V)

| 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 |

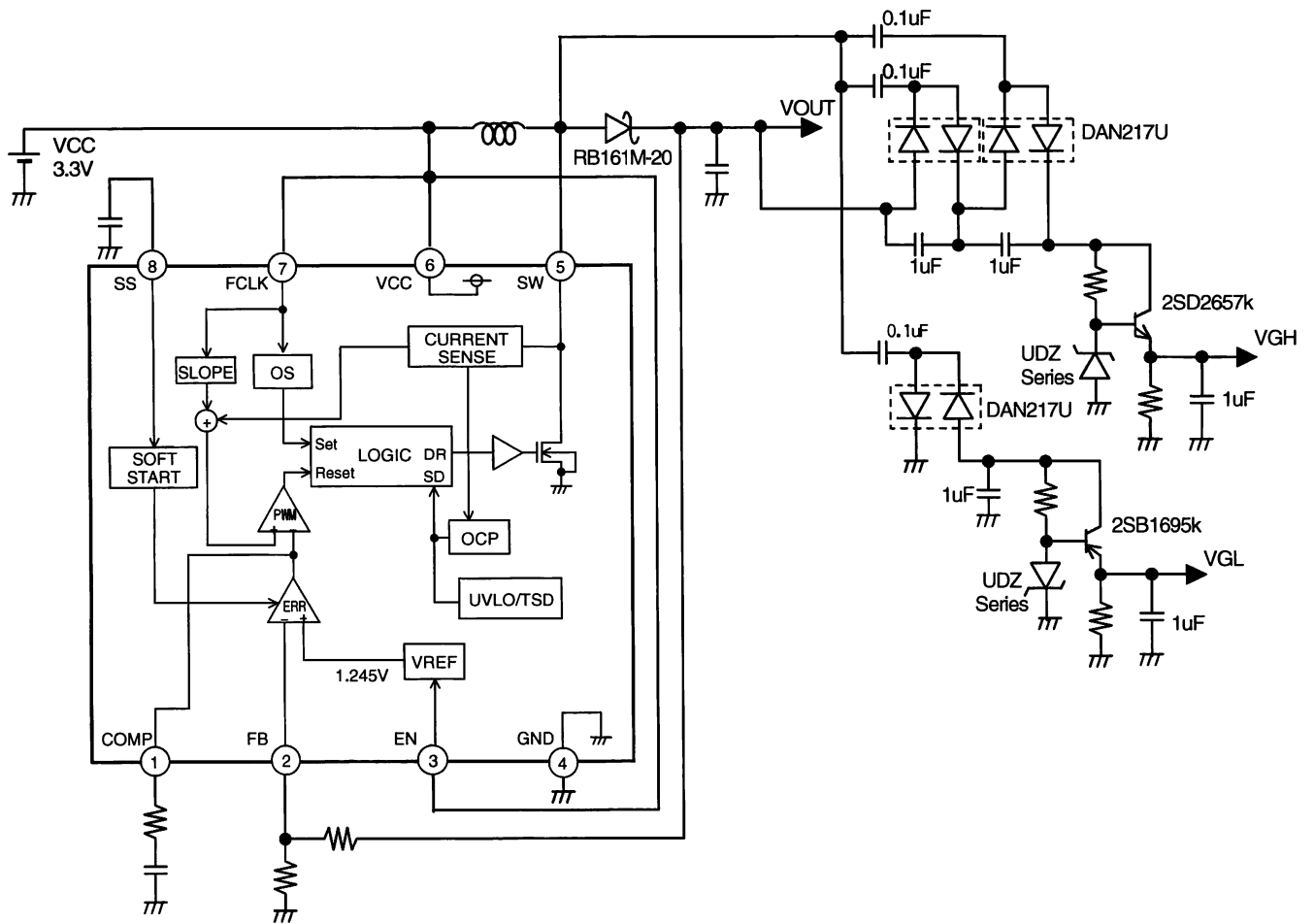
○ This product is not designed for protection against radioactive rays.

※ 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.

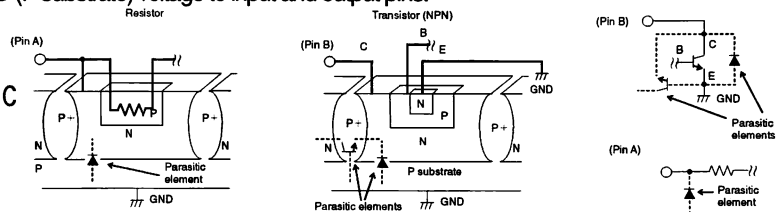
7) Ground wiring patterns

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 inverting 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

Notes

- No technical content pages of this document may be reproduced in any form or transmitted by any means without prior permission of ROHM CO.,LTD.
- The contents described herein are subject to change without notice. The specifications for the product described in this document are for reference only. Upon actual use, therefore, please request that specifications to be separately delivered.
- Application circuit diagrams and circuit constants contained herein are shown as examples of standard use and operation. Please pay careful attention to the peripheral conditions when designing circuits and deciding upon circuit constants in the set.
- Any data, including, but not limited to application circuit diagrams information, described herein are intended only as illustrations of such devices and not as the specifications for such devices. ROHM CO.,LTD. disclaims any warranty that any use of such devices shall be free from infringement of any third party's intellectual property rights or other proprietary rights, and further, assumes no liability of whatsoever nature in the event of any such infringement, or arising from or connected with or related to the use of such devices.
- Upon the sale of any such devices, other than for buyer's right to use such devices itself, resell or otherwise dispose of the same, no express or implied right or license to practice or commercially exploit any intellectual property rights or other proprietary rights owned or controlled by
- ROHM CO., LTD. is granted to any such buyer.
- Products listed in this document are no antiradiation design.

The products listed in this document are designed to be used with ordinary electronic equipment or devices (such as audio visual equipment, office-automation equipment, communications devices, electrical appliances and electronic toys).

Should you intend to use these products with equipment or devices which require an extremely high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), please be sure to consult with our sales representative in advance.

About Export Control Order in Japan

Products described herein are the objects of controlled goods in Annex 1 (Item 16) of Export Trade Control Order in Japan.

In case of export from Japan, please confirm if it applies to "objective" criteria or an "informed" (by MITI clause) on the basis of "catch all controls for Non-Proliferation of Weapons of Mass Destruction.

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available,
please contact your nearest sales office.

Please contact our sales offices for details ;

| | | |
|-------------------------|---------------------------|----------------------------|
| U.S.A / San Diego | TEL : +1(858)625-3630 | FAX : +1(858)625-3670 |
| Atlanta | TEL : +1(770)754-5972 | FAX : +1(770)754-0691 |
| Dallas | TEL : +1(972)312-8818 | FAX : +1(972)312-0330 |
| Germany / Dusseldorf | TEL : +49(2154)9210 | FAX : +49(2154)921400 |
| United Kingdom / London | TEL : +44(1)908-282-666 | FAX : +44(1)908-282-528 |
| France / Paris | TEL : +33(0)1 56 97 30 60 | FAX : +33(0) 1 56 97 30 80 |
| China / Hong Kong | TEL : +852(2)740-6262 | FAX : +852(2)375-8971 |
| Shanghai | TEL : +86(21)6279-2727 | FAX : +86(21)6247-2066 |
| Dilian | TEL : +86(411)8230-8549 | FAX : +86(411)8230-8537 |
| Beijing | TEL : +86(10)8525-2483 | FAX : +86(10)8525-2489 |
| Taiwan / Taipei | TEL : +866(2)2500-6956 | FAX : +866(2)2503-2869 |
| Korea / Seoul | TEL : +82(2)8182-700 | FAX : +82(2)8182-715 |
| Singapore | TEL : +65-6332-2322 | FAX : +65-6332-5662 |
| Malaysia / Kuala Lumpur | TEL : +60(3)7958-8355 | FAX : +60(3)7958-8377 |
| Philippines / Manila | TEL : +63(2)807-6872 | FAX : +63(2)809-1422 |
| Thailand / Bangkok | TEL : +66(2)254-4890 | FAX : +66(2)256-6334 |

Japan /
(Internal Sales)

| | | | |
|----------|--|-----------------------|-----------------------|
| Tokyo | 2-1-1, Yaesu, Chuo-ku, Tokyo 104-0082 | TEL : +81(3)5203-0321 | FAX : +81(3)5203-0300 |
| Yokohama | 2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575 | TEL : +81(45)476-2131 | FAX : +81(45)476-2128 |
| Nagoya | Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya, Aichi 450-0002 | TEL : +81(52)581-8521 | FAX : +81(52)561-2173 |
| Kyoto | 579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku, Kyoto 600-8216 | TEL : +81(75)311-2121 | FAX : +81(75)314-6559 |

(Contact address for overseas customers in Japan)

| | | |
|----------|-----------------------|------------------------|
| Yokohama | TEL : +81(45)476-9270 | FAX : +81(045)476-9271 |
|----------|-----------------------|------------------------|