



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



STRUCTURE : Silicon Monolithic Integrated Circuit
 PRODUCT NAME : Synchronous rectification with built-in FET type DC/DC converter IC
 MODEL NAME : **BD8641EFV**

- FEATURES :
- Synchronous rectification with built-in FET type DC/DC converter
 - Reference voltage accuracy FB 0.8V±1%
 - Switching frequency 250kHz~2.3MHz (Synchronizable with external clock.)
 - Over current protection circuit
 - Thermal shutdown
 - Output voltage watch (VDET) function
 - Input low voltage detection (UVLO) function
 - Soft start / Start delay circuit

◎ABSOLUTE MAXIMUM RATING (Ta=25°C)

Parameter	Symbol	Limits	Unit
Input supply voltage	PV_{IN}, SV_{IN}	7	V
Input terminal voltage	V_{INP}^{*1}	V_{IN}	V
Output terminal voltage	V_{OUT}^{*2}	V_{IN}	V
Output current	I_{OUT}	4	A
Power dissipation	P_d	3.2^{*3}	W
Operating temperature	T_{opr}	-40 ~ 85	°C
Storage temperature	T_{stg}	-55 ~ 150	°C

*1 V_{INP} Application terminal : SYNCLK, EN, SS/DELAY, FB

*2 V_{OUT} Application terminal : SW, VDET, FC, RT

*3 (70mm×70mm, thickness 1.6mm, and four layer glass epoxy substrates)When mounting substrate and the package back exposure part are connected with solder.
 Operating at higher than Ta=25°C, 25.6mW shall be reduced per 1

◎Operation condition

Parameter	Symbol	MIN	TYP	MAX	Unit
Input supply voltage	V_{IN}	3.0	-	5.5	V
Output current	I_{OUT}	-	-	3	A

This product is not designed for protection against radioactive rays.

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.

Be careful to handle because the content of the description of this material might correspond to the labor (technology in the design, manufacturing, and use) in foreign country exchange and Foreign Trade Control Law.

◎Electrical characteristic

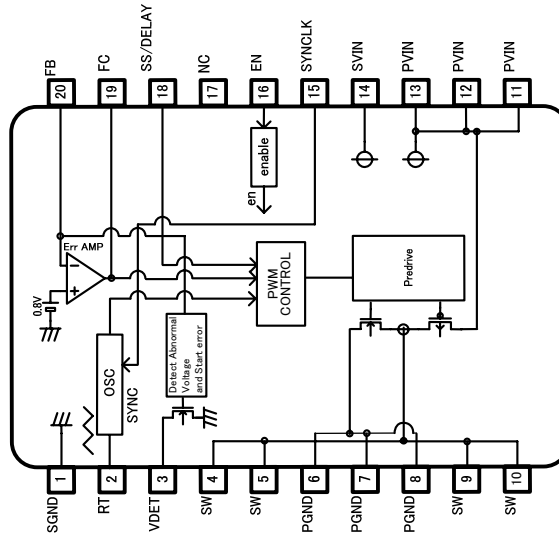
(Unless otherwise noted Ta=25°C, PV_{IN}, SV_{IN}=3.3V, GND=0V)

Parameter	Symbol	Specification value			UNIT	Condition
		MIN	TYP	MAX		
VIN supply current (operating)	I _{Q active}	-	380	570	μA	V _{FB} = 0.83V, V _{FC} = 1V
VIN supply current (standby)	I _{Q stby}	-	0	10	μA	V _{EN} = 0V
Reference voltage (VREF)	V _{REF}	0.792	0.8	0.808	V	
Output rise detection voltage	V _{OVP}	30	60	90	mV	Monitoring FB terminal
Output decrease detection voltage	V _{LVP}	-90	-60	-30	mV	Monitoring FB terminal
Terminal VDET output current	I _{VDET}	0.4	-	-	mA	V _{VDET} < 0.3V
Oscillation frequency	f _{OSC}	2.0	2.3	2.6	MHz	R _{RT} = 43kΩ
Pch FET ON resistance	R _{PFET}	-	75	110	mΩ	I _{SW} = 1A
Nch FET ON resistance	R _{NFET}	-	55	90	mΩ	I _{SW} = -1A
UVLO voltage	V _{UVLO}	2.35	2.50	2.65	V	
SW leak current	I _{LSW}	-	0	10	μA	V _{EN} = 0V, V _{IN} = 5.5V
EN terminal H threshold voltage	V _{ENH}	1.1	-	-	V	
EN terminal L threshold voltage	V _{ENL}	-	-	0.4	V	
FC sink current	I _{FCSI}	5	10	-	μA	
FC source current	I _{FCSO}	-	-10	-5	μA	
SS/DELAY terminal source current	I _{SSSO}	2	4	6	μA	

●V_{FB}:FB terminal voltage、V_{EN}:EN terminal voltage、V_{FC}:FC terminal voltage、V_{VDET}:VDET terminal voltage

●Current capability should not exceed Pd.

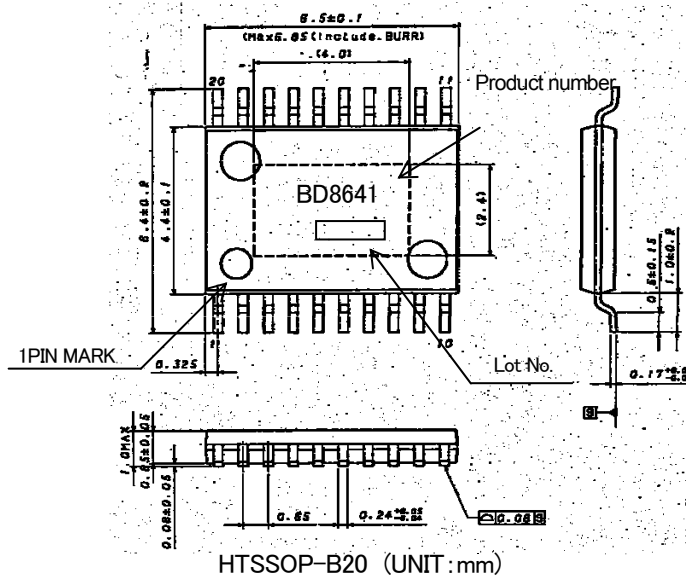
◎BLOCK DIAGRAM



◎PIN ASSIGNMENT

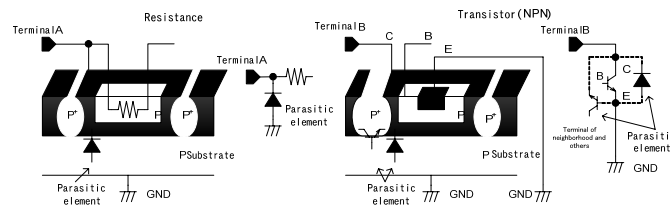
No.	Symbol	Description	No.	Symbol	Description
1	SGND	Signal GND terminal	11	PVIN	Power supply input terminal
2	RT	Frequency adjustment resistance connection terminal	12	PVIN	Power supply input terminal
3	VDET	Output abnormality detection terminal	13	PVIN	Power supply input terminal
4	SW	Switching output terminal	14	SVIN	Signal system power supply input terminal
5	SW	Switching output terminal	15	SYNCLK	Input terminal for external clock synchronization
6	PGND	Power GND terminal	16	EN	Enable input terminal
7	PGND	Power GND terminal	17	NC	-
8	PGND	Power GND terminal	18	SS/DELAY	Soft start adjustment capacity connection terminal
9	SW	Switching output terminal	19	FC	Phase amends terminal
10	SW	Switching output terminal	20	FB	Feedback terminal

◎PACKAGE OUTLINE



◎NOTE ON USE

1. About the absolute maximum rating
Attention is brushed off enough to the quality control, it is likely to destroy when the absolute maximum rating such as impressed voltages (VCC_IN,DCIN) and ranges (Topr) of the operating temperature as it is exceeded, the mode of breakings of the short or the opening, etc. cannot be specified, and examine it in this IC to give physical measures for safety such as fuses when a special mode that exceeds the absolute maximum rating is assumed.
2. About the reverse-connection of the power supply connector
IC might destroy it by reversely connecting the power supply connector. Give measures such as putting the diode between power supply terminals of power supply and IC outside for the reverse-touching destruction protection.
3. Power supply line
Please do measures such as putting the bypass capacitor in power supply-GND nearest pin of this IC as the route of the resurrection current to cause the return of the current in which it resurrected it by the counter electromotive force of the coil.
Please confirm the characteristic of the electrolytic capacitor enough as the capacity omission etc. at the low temperature never happen, and decide it.
4. About grand potential
Any state of operation must become the lowest potential about the potential of the terminal GND. Moreover, confirm whether there is terminal that is actually the voltage of GND or less including transients.
5. About the heat design
Think about permissible loss (Pd) in an actual state of use, and do the heat design with the margin enough.
6. About the short and the miss-installation between terminals
Note the direction and the miss-registration of IC enough when you install it in the set substrate. IC might destroy it as well as reversely connecting the power supply connector when installing it by mistake. Moreover, there is fear of destruction when the foreign body enters between terminals, the terminal, the power supply, and grandeur and it is short-circuited.
7. About operation in strong electromagnetic field
In use in strong electromagnetic field, note that there is a possibility of malfunctioning.
8. About the capacitor during output-GND
The current charged the capacitor with when VCC is 0V or is GND and is short-circuited when a big capacitor is connected between GND output by some factors flows into the output and it is likely to destroy it. Give the capacitor between GND output to 0.1μF or less.
9. About the inspection by the set substrate
It is likely to suffer stress to IC and discharge electricity every one process when you connect the capacitor with the pin with low impedance when inspecting it in the set substrate. Moreover, detach it after connecting after the power supply is turned off without fail when detaching it to G in the inspection process, inspecting, and turning off the power supply. In addition, be give the earth to the assembly process as a static electricity measures, and careful enough when it transports and you preserve it.
10. About each input terminal
This IC is a monolithic IC which has a P⁺ isolations and P substrate to isolate elements each other.
This P layer and an N layer in each element form a PN junction to construct various parasitic elements.
For instance, the potential difference operates in resistance as shown in the figure below when resistance and the transistor connect it with the terminal and the playground (GND) >(terminal B) joint of PN operates as a parasitic diode in playground (GND) >(terminal A) transistor (NPN). In addition, the NPN transistor of parasitism works with N layer of the element of the above-mentioned parasitic diode and the neighborhood and others in transistor (NPN). A parasitic element in IC composition is inevitably formed because of the potential relation.
A parasitic element can operate, the interference with the circuit operation be caused, it malfunction, and, consequently, it cause destruction. Therefore, do not do the usage that a parasitic element operates as a voltage that is lower than the playground (GND;P substrate) is impressed to the input terminal enough. Moreover, do not impress the voltage to the input terminal when you do not impress the power-supply voltage to IC. Give each input terminal to me the voltage below the power-supply voltage or in the guarantee value of an electric characteristic when you similarly impress the power-supply voltage.



Example of IC of simple structure

11. Earth wiring pattern
If small signal GND and large current GND exist, disperse their pattern. In addition, for voltage change by pattern wiring impedance and large current not to change voltage of small signal GND, each ground terminal of IC must be connected at the one point on the set circuit board. As for GND of external parts, it is similar to the above-mentioned.
12. Thermal Shut-Down
When a thermal shutdown operates, the DC/DC converter controller of all Ch is turned off. When a thermal shutdown is released, the DC/DC converter controller of all Ch becomes an operation beginning from turning off.

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM CO.,LTD.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

Thank you for your accessing to ROHM product informations.

More detail product informations and catalogs are available, please contact your nearest sales office.

ROHM Customer Support System

THE AMERICAS / EUROPE / ASIA / JAPAN

www.rohm.com

Contact us : webmaster@rohm.co.jp