Structure	Silicon Monolithic IC
Products	High side switch IC
Type	**BD2062FJ**
Features	Low on resistance 80mΩ MOSFET Switch
	1A Continuous current load
	Active “Low” control logic
	Soft start circuit
	Over current detection
	Thermal shutdown
	Under voltage lockout
	Open drain error flag output
	Reverse-current protection when power switch off
	ESD protection

◇Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Supply voltage	V_{IN}	-0.3 ~ 6.0	V
/EN voltage	$V_{/EN}$	-0.3 ~ 6.0	V
/OC voltage	$V_{/OC}$	-0.3 ~ 6.0	V
/OC sink current	$IS_{/OC}$	~ 5	mA
OUT voltage	V_{OUT}	-0.3 ~ 6.0	V
Storage temperature	T_{STG}	-55 ~ 150	°C
Power dissipation	PD	675 *1	mW

*1 Mounted on 70mm*70mm*1.6mm glass-epoxy PCB. Derating : 5.4mW/°C above Ta=25°C.
* This product is not designed for protection against radioactive rays.

◇Operating conditions

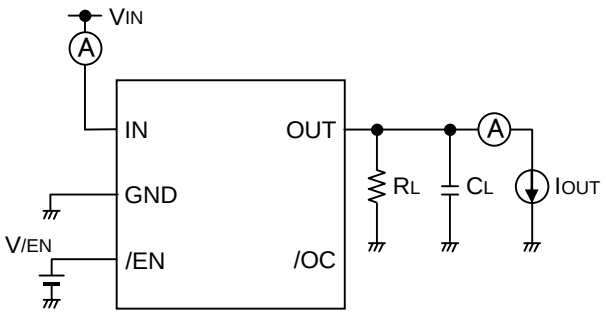
Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating voltage	V_{IN}	2.7	-	5.5	V
Operating temperature	T_{OPR}	-40	-	85	°C
Continuous output current	I_{OUT}	0.0	-	1.0	A

◇Electric characteristics

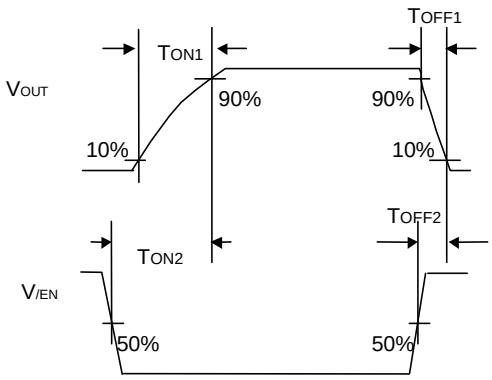
Unless otherwise specified V_{IN} = 5.0V, Ta = 25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Current consumption						
Operating Current	I_{DD}	-	130	180	μA	$V_{/EN}$ = 0V, OUT = OPEN
Standby Current	I_{STB}	-	0.01	1	μA	$V_{/EN}$ = 5V, OUT = OPEN
I/O						
/EN input voltage	$V_{/EN}$	2.0	-	-	V	High input
	$V_{/EN}$	-	-	0.8	V	Low input
/EN input current	$I_{/EN}$	-1.0	0.01	1.0	μA	$V_{/EN}$ = 0V or 5V
/OC output LOW voltage	$V_{/OCL}$	-	-	0.5	V	$I_{/OC}$ = 0.5mA
/OC output leak current	$IL_{/OC}$	-	0.01	1	μA	$V_{/OC}$ = 5V
/OC delay time	$T_{/OC}$	10	15	20	ms	
Power switch						
ON resistance	R_{ON}	-	80	125	mΩ	I_{OUT} = 500mA
Current Limit Threshold	I_{TH}	1.5	2.4	3.0	A	
Short-circuit current	I_{SC}	1.1	1.5	2.1	A	V_{OUT} = 0V, C_L = 47μF RMS
Output rise time	T_{ON1}	-	0.8	10	ms	R_L = 10Ω
Output rise delay time	T_{ON2}	-	1.1	20	ms	R_L = 10Ω
Output fall time	T_{OFF1}	-	5	20	μs	R_L = 10Ω
Output fall delay time	T_{OFF2}	-	10	40	μs	R_L = 10Ω
Switch leak current	IL_{SW}	-	-	1.0	μA	$V_{/EN}$ = 5V, V_{OUT} = 0V
Reverse leak current	IL_{REV}	-	-	1.0	μA	V_{OUT} = 5.5V, V_{IN} = 0V
UVLO						
UVLO Threshold	V_{TUVH}	2.1	2.3	2.5	V	Increasing V_{IN}
	V_{TUVL}	2.0	2.2	2.4	V	Decreasing V_{IN}

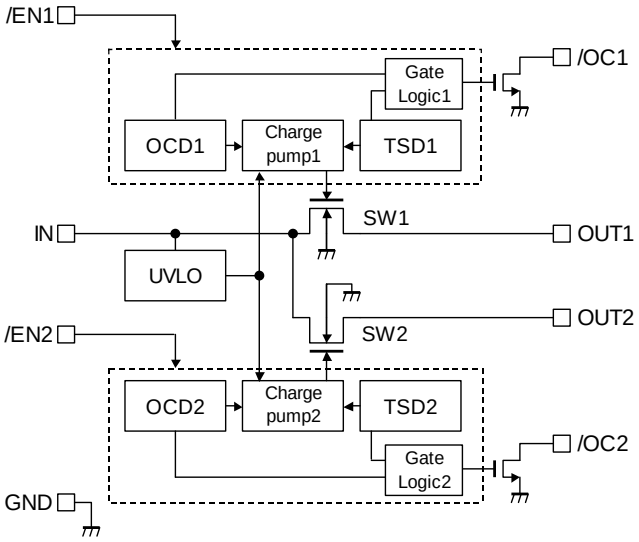
◇Measurement circuit



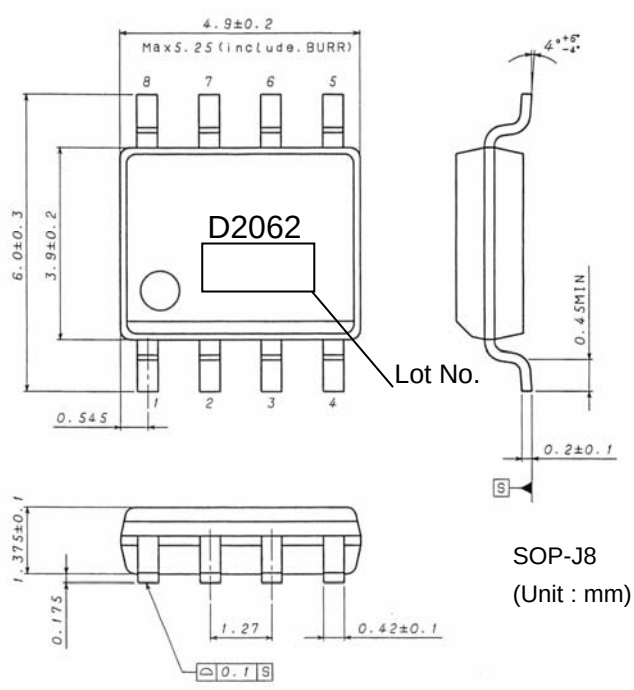
◇Timing chart at output rise / fall time



◇Block diagram



◇Package



◇Pin description

Pin No.	Pin Name	Function
1	GND	Ground.
2	IN	Power supply input. Input terminal to the power switch and power supply input terminal of the internal circuit.
3	/EN1	Enable input 1. Power switch 1 on at Low level.
4	/EN2	Enable input 2 Power switch 2 on at Low level.
5	/OC2	Over current output 2. Low at over current, over-temperature detection. Open drain output.
6	OUT2	Power switch output 2.
7	OUT1	Power switch output 1.
8	/OC1	Over current output 1. Low at over current, over-temperature detection. Open drain output.

●Cautions on use

(1) Absolute Maximum Ratings

An excess in the absolute maximum ratings, such as supply voltage, temperature range of operating conditions, etc., can break down devices, thus making impossible to identify breaking mode such as a short circuit or an open circuit. If any special mode exceeding the absolute maximum ratings is assumed, consideration should be given to take physical safety measures including the use of fuses, etc.

(2) Power supply and GND line

Design PCB pattern to provide low impedance for the wiring between the power supply and the GND lines. Pay attention to the interference by common impedance of layout pattern when there are plural power supplies and GND lines. Especially, when there are GND pattern for small signal and GND pattern for large current included the external circuits, separate each GND pattern. Furthermore, for all power supply terminals to ICs, mount a capacitor between the power supply and the GND terminal. At the same time, in order to use a capacitor, thoroughly check to be sure the characteristics of the capacitor to be used present no problem including the occurrence of capacity dropout at a low temperature, thus determining the constant.

(3) GND voltage

Make setting of the potential of the GND terminal so that it will be maintained at the minimum in any operating state. Furthermore, check to be sure no terminals are at a potential lower than the GND voltage including an actual electric transient.

(4) Short circuit between terminals and erroneous mounting

In order to mount ICs on a set PCB, pay thorough attention to the direction and offset of the ICs. Erroneous mounting can break down the ICs. Furthermore, if a short circuit occurs due to foreign matters entering between terminals or between the terminal and the power supply or the GND terminal, the ICs can break down.

(5) Operation in strong electromagnetic field

Be noted that using ICs in the strong electromagnetic field can malfunction them.

(6) Input terminals

In terms of the construction of IC, parasitic elements are inevitably formed in relation to potential. The operation of the parasitic element can cause interference with circuit operation, thus resulting in a malfunction and then breakdown of the input terminal. Therefore, pay thorough attention not to handle the input terminals, such as to apply to the input terminals a voltage lower than the GND respectively, so that any parasitic element will operate. Furthermore, do not apply a voltage to the input terminals when no power supply voltage is applied to the IC. In addition, even if the power supply voltage is applied, apply to the input terminals a voltage lower than the power supply voltage or within the guaranteed value of electrical characteristics.

(7) External capacitor

In order to use a ceramic capacitor as the external capacitor, determine the constant with consideration given to a degradation in the nominal capacitance due to DC bias and changes in the capacitance due to temperature, etc.

(8) Thermal shutdown circuit (TSD)

When junction temperatures become 170°C (typ) or higher, the thermal shutdown circuit operates and turns a switch OFF. The thermal shutdown circuit, which is aimed at isolating the LSI from thermal runaway as much as possible, is not aimed at the protection or guarantee of the LSI. Therefore, do not continuously use the LSI with this circuit operating or use the LSI assuming its operation.

(9) Thermal design

Perform thermal design in which there are adequate margins by taking into account the power dissipation (Pd) in actual states of use.

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