

Structure

Silicon Monolithic Integrated Circuit

Product Name

Power supply for CCD camera / White LED driver / RGB LED driver

of mobile phone

Type

BD6026GU

Features

A system power supply for the CCD camera module

Built-in white LED driver for the LCD back light and RGB LED driver

○Absolute Maximum Ratings (Ta=25 °C)

Parameter	Symbol	Rating	Unit	Condition
Maximum Applied Voltage 1	VMAX1	20(*1)	V	
Maximum Applied Voltage 2	VMAX2	16(*2)	V	
Maximum Applied Voltage 3	VMAX3	15(*3)	V	
Maximum Applied Voltage 4	VMAX4	-13.5(*4)	V	
Maximum Applied Voltage 5	VMAX5	6(*5)	V	
Power Dissipation	Pd	2500(*6)	mW	
Operating Temperature Range	Topr	-30 to 85	°C	
Storage Temperature Range	Tstg	-55 to 150	°C	

(*1) VPLUS11, VPLUS12, VPLUS2 pin (*2) CAMP pin

(*3) LEDR, LEDG, LEDB, BKLED, FLED1, FLED2 pin

(*4) VNEG11, VNEG12, CAMN pin (*5) Except *1~ *4 pin

(*6) Power dissipation deleting is 20mW/°C, when it's used in over 25 °C. It's deleting is on the board that is ROHM's standard.

oRecommended operating conditions (Ta=-30 to 85 °C)

Parameter	Symbol	Rating			Limit	O I'ii'
		Min.	Тур.	Max.	Unit	Condition
VBAT power supply voltage	VBAT	2.7	3.6	4.5	V	
VIO power supply voltage	VIO	1.62	3.0	3.3	V	

This product isn't designed to protect itself 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.

Application example

ROHM cannot provide adequate confirmation of patents.

The product described in this specification is 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 this product 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,

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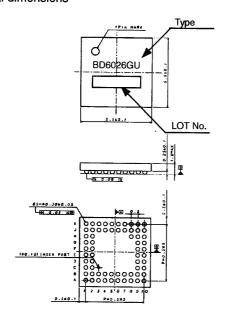
o Electrical Characteristics

Unless otherwise specified, Ta=25 °C, VBAT=3.6V, VIO=1.8V/3.0V, VCC=2.45V

Parameter Syml		Snoo			<u> </u>			
Parameter	Symbol	Min.		Unit	Condition			
Circuit Current								
VBAT Circuit current 1	IQ1	-	0.5	3.0	μΑ	RSTB=0V		
VBAT Circuit current 2	IQ2	-	0.1	3.0	μА	RSTB=0V, VIO=0V		
VBAT Circuit current 3	IQ3	-	6.2	9.3	μΑ	REGVCC ON (Energy save mode)		
VBAT Circuit current 5	IQ5	-	11	16	μΑ	REGVCC ON (Energy save mode) REG1 ON (Energy save mode) REG2 ON (Energy save mode)		
VBAT Circuit current 8	IQ8	-	26	39	mA	REGVCC ON (Normal Mode) SWREG1 ON (Vo=14V, Io=1mA) SWREG3 ON (Vo=-10V, Io=1mA) (Add 30h=01h, Add 80h=01h) REGCP ON, REGCN ON		
SWREG1 (DC/DC for whi	te LED and		pply for C	amera)				
FLED1 drive current 3	I _{FLED13}	27.0	30.0	33.0	mA	Add=80h Data=1Eh		
FLED2 drive current 3	I _{FLED23}	27.0	30.0	33.0	mA	Add=80h Data=3Eh		
BKLED drive current 3	I _{BKLED3}	27.0	30.0	33.0	mA	Add=90h Data=1Eh		
SWREG2 (DC/DC for RGE	3 LED)							
LEDR Drive current (Large current 2)	I _{LEDR32}	178	210	242	mA	Add=A0h Data=0Ch Add=50h Data=1Eh Add=B0h Data=02h		
LEDG Drive current (Large current 2)	I _{LEDG32}	178	210	242	mA	Add=A0h Data=0Ah Add=60h Data=1Eh Add=B0h Data=02h		
LEDB Drive current (Large current 2)	I _{LEDB32}	178	210	242	mA	Add=A0h Data=09h Add=70h Data=1Eh Add=B0h Data=02h		
REGCP (15V/13V LDO)								
Output voltage 1	VO151	14.5	15.0	15.5	V	Io=60mA, REGCPVSEL=0, VPLUS12=16V		
Output voltage 2	VO152	12.5	13.0	13.5	V	Io=60mA, REGCPVSEL=1, VPLUS12=14V		
REGCN (-8V/-7.5/-7V LD	O)							
Output voltage 1	VO81	-8.4	-8.0	-7.6	V	lo=100mA, VNEG12=-10V REGCNVSEL1=0, REGCNVSEL2=0		
Output voltage 2	VO82	-7.9	-7.5	-7.1	٧	lo=100mA, VNEG12=-10V REGCNVSEL1=1/0, REGCNVSEL2=1		
Output voltage 3	VO83	-7.4	-7.0	-6.6	V	lo=100mA, VNEG12=-9V REGCNVSEL1=1, REGCNVSEL2=0		
Constant current drive								
CURSENS pin control voltage 3	I _{CUR3}	0.57	0.60	0.63	V	Add=E0h, Data=FFh		
REG1 (3.0V/3.1V LDO)								
Output voltage 1	VO11	2.94	3.00	3.06	V	lo=150mA, REG1VSEL=0, REG1MD=1		
Output voltage 2	VO12	3.04	3.10	3.16	V	lo=150mA, REG1VSEL=1, REG1MD=1		
Output voltage (Energy save mode) 1	VO13	2.85	3.00	3.15	٧	lo=100μA, REG1VSEL=0, REG1MD=0		
Output voltage (Energy save mode) 2	VO14	2.945	3.100	3.255	٧	lo=100µA, REG1VSEL=1, REG1MD=0		
REG2 (1.8V/2.5V LDO)								
Output voltage 1	VO21	1.74	1.80	1.86	V	lo=100mA, REG2VSEL=L, REG2MD=1		
Output voltage 2	VO22	2.45	2.50	2.55	v	lo=100mA, REG2VSEL=H, REG2MD=1		
Output voltage (Energy save mode) 1	VO23	1.70	1.80	1.90	V	Io=100μA, REG2VSEL=L, REG2MD=0		
Output voltage (Energy save mode) 2	VO24	2.375	2.500	2.625	٧	lo=100μA, REG2VSEL=H,, REG2MD=0		

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oExternal dimensions

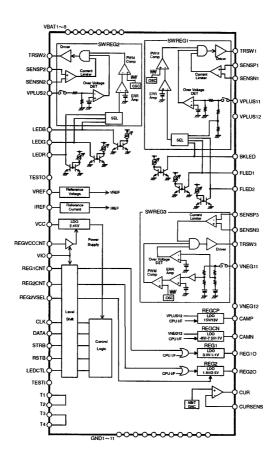


VCSP85H5 (65pins) (Unit: mm)

∘Terminals

PIN	PIN Name	PIN	PIN Name PIN		PIN Name
A1	T1	C9	TESTO	H10	TRSW3
A2	GND2	C10	REG2O	J1	VIO
А3	VBAT1	D1	REGIONT	J2	TESTI
A4	LEDR	D2	REG2CNT	J3	REG2VSEL
A5	GND3	D9	VBAT3	J4	vcc
A6	LEDB	D10	VBAT4	J5	FLED2
A7	CAMN	E1	CUR	J6	FLED1
A8	GND5	E2	CURSENS	J7	TRSW1
A9	CAMP	E9	IREF	J8	SENSP1
A10	T2	E10	REG10	J9	SENSN1
B1	VPLUS2	F1	LEDCTL	J10	GND8
B2	GND1	F2	REGVCCCNT	K1	T4
ВЗ	VBAT2	F9	SENSP3	K2	GND11
B4	TRSW2	F10	VREF	КЗ	VBAT8
B5	LEDG	G1	RSTB	K4	BKLED
B6	GND4	G2	CLK	K5	GND10
B7	VNEG12	G9	VBAT5	К6	VBAT7
B8	GND6	G10	VBAT6	K 7	GND9
B9	GND7	H1	DATA	К8	VPLUS11
B10	VPLUS12	H2	STRB	К9	SENSN3
C1	SENSN2	Н8	NC	K10	Т3
C2	SENSP2	H9	VNEG11	-	+

oBlock diagram





oCautions 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, please 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)

This LSI builds in a thermal shutdown (TSD) circuit. When junction temperatures become detection temperature 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 permissible dissipation (Pd) in actual states of use.

(10) LDO

Use each output of LDO by the independence. Don't use under the condition that each output is short-circuited because it has the possibility that a operation becomes unstable.

(11) DC/DC converter

Please select the low DCR inductors to decrease power loss for DC/DC converter.

(12) Other cautions on use

Please consult supplementary documents such as function description of this LSI.

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