Structure : Silicon Monolithic Integrated Circuit

Product name : Piezo Electric Transformer Inverter Control IC

Type : **BD9825FV**

Features :

1) Supports configuration of a highly efficient piezoelectric transformer type inverter system.
2) Uses full bridge drive circuit.
3) Built-in standby circuit and burst dimmer circuit
4) Built-in chopper type efficiency loss prevention circuit
5) Built-in timer latch-equipped load discharge protection circuit
6) Built-in VCC voltage loss protection circuit and thermal shut-down circuit
7) Lamp current adjustment is enabled by external setting of integrator's reference voltage.
8) Compact SSOP-B20 package

○Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Supply voltage	VCC	30	V
Power dissipation	Pd	650 *1	mW
Operating temperature	Topr	-20 ～ +85	℃
Storage temperature	Tstg	-55 ～ +150	℃

*1 Deratings is done at 5.2mW/℃ above Ta=25℃
(When mounted on a 70mm × 70mm × 1.6mm PCB board).

○Operating Range (Ta=25℃)

Parameter	Symbol	Limits	Unit
Supply voltage	VCC	4 ～ 25	V
Oscillation frequency	FOSCH	10 ～ 170	kHz
	FOSCL	50 ～ 1000	Hz
Output load capacitance	CL	0 ～ 1500	pF

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

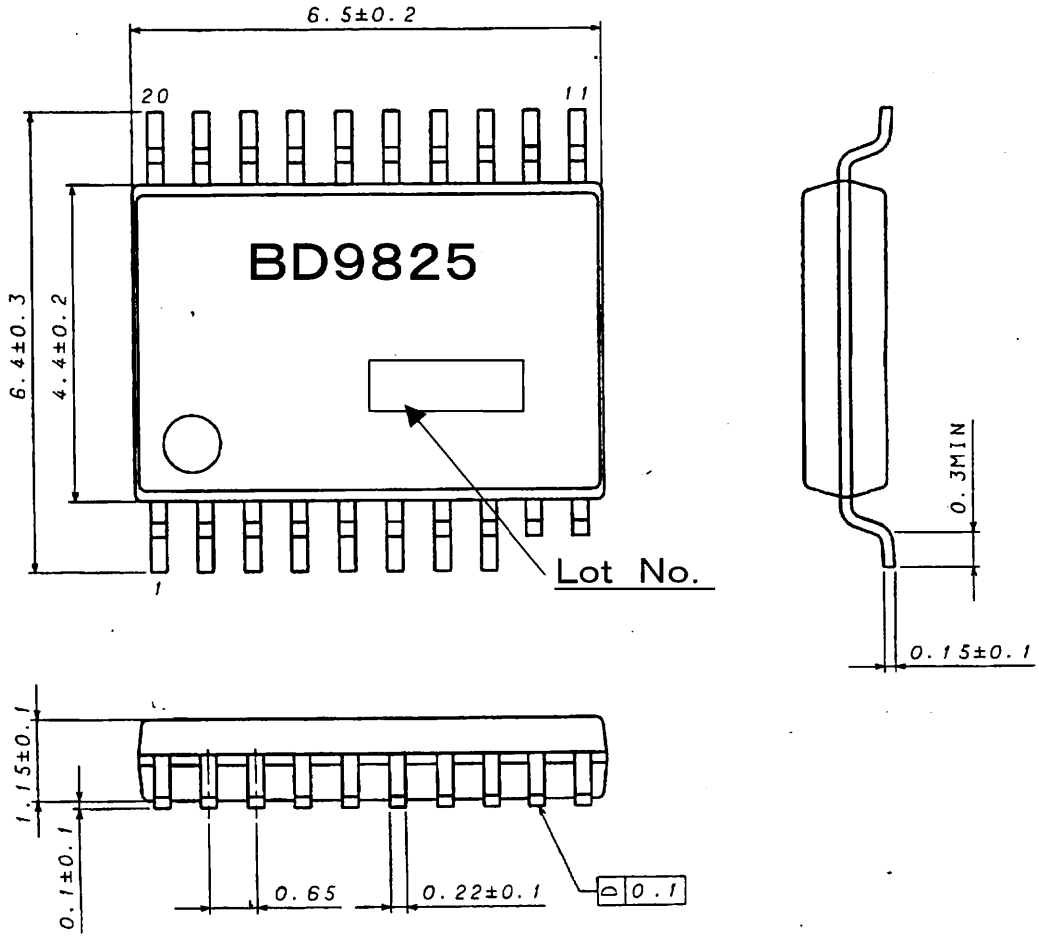
Application example

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 or 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.

○Electrical characteristics (Unless otherwise noted, Ta= 25℃, Vcc=12V)

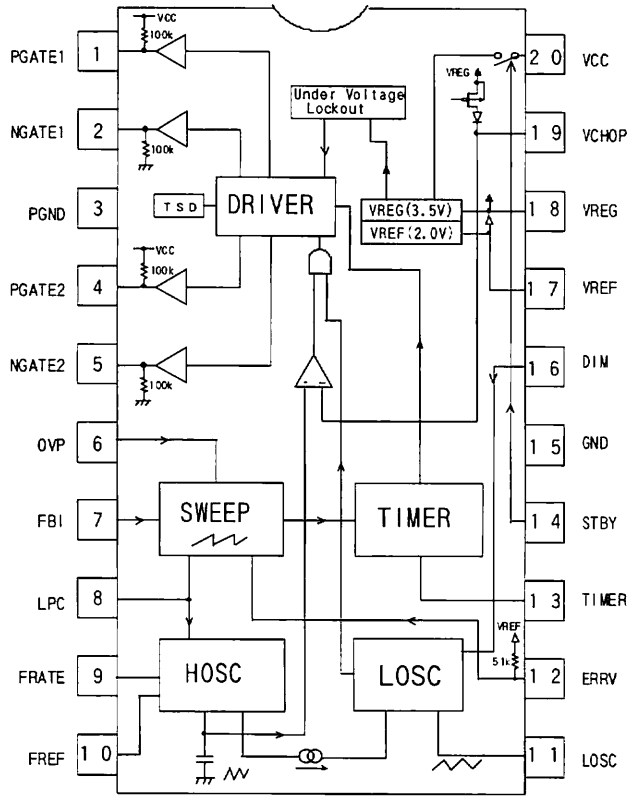
Parameter		Symbol	Min.	Typ.	Max.	Unit	Conditions	
Circuit current when operating		ICC	5.0	7.5	10.0	mA	DIM=2.5V	
Circuit current during standby		IOFF	—	0	5	μA	STBY=open	
Regulator voltage		VREG	3.3	3.5	3.7	V	Io=0mA	
Reference voltage		VREF	1.94	2.00	2.06	V	Io=0mA	
Oscillation frequency 1		FOSCH1	69	74	79	kHz	LPC=0.6V, TIMER=0V, FREF=36kΩ, FRATE=100kΩ	
Oscillation frequency 2		FOSCH2	53	57	61	kHz	LPC=1.8V, TIMER=0V, FREF=36kΩ, FRATE=100kΩ	
Oscillation frequency for burst dimming		FOSCL	182.4	192.0	201.6	Hz	LOSC=0.018μF, FREF=36kΩ	
Burst -dimming	DUTY= 0%	VB1	-0.1	-	0.4	V		
	DUTY= 50%	VB2	1.05	1.25	1.45	V		
	DUTY=100%	VB3	2.2	-	15.0	V		
Standby Control voltage	Operating	VSTBH	2.0	-	25.0	V		
	Not operating	VSTBL	-0.1	-	0.8	V		
OVP threshold voltage		VOVP	1.85	2.00	2.15	V	OVP	
Under voltage lockout threshold	Operating start	VUVLO	3.25	3.45	3.65	V	VCC=down	
TIMER	Output current	ITIM	0.75	1.00	1.25	μA	TIMER=0.5V	
	Threshold voltage	VTIM	1.70	1.80	1.90	V	TIMER	
FBI threshold voltage		VFBI	1.85	2.00	2.15	V	ERRV=open	
LPC threshold voltage		VLPC	0.63	0.70	0.77	V	LPC	
Pch output voltage	High level	VOPH	-1.5	-	-	V	VCC=9V	VCC ref. Load current=10mA
	Low level	VOPL	-	-	+1.2	V	VCC=9V	GND ref. Load current=10mA
	Clamp level	VOPC	-12	-10	-8	V	VCC=25V	VCC ref.
Nch output voltage	High level	VONH	-2.0	-	-	V	VCC=9V	VCC ref. Load current =10mA
	Low level	VONL	-	-	+1.4	V	VCC=9V	GND ref. Load current =10mA
	Clamp level	VONC	+8	+10	+12	V	VCC=25V	GND ref.
Pch	Tr	Trp	-	110	-	nsec	CL=1000pF,Vo=10%→90%	
	Tf	Tfp	-	225	-	nsec	CL=1000pF,Vo=90%→10%	
Nch	Tr	Trn	-	240	-	nsec	CL=1000pF,Vo=10%→90%	
	Tf	Tfn	-	75	-	nsec	CL=1000pF,Vo=90%→10%	
Thermal shut-down		TSD	-	150	-	℃		

○Outer dimensions



SSOP-B20 (Unit:mm)

○Block diagram



○Pin number and pin name

Pin No.	Pin name
1	PGATE1
2	NGATE1
3	PGND
4	PGATE2
5	NGATE2
6	OVP
7	FBI
8	LPC
9	FRATE
10	FREF
11	LOSC
12	ERRV
13	TIMER
14	STBY
15	GND
16	DIM
17	VREF
18	VREG
19	VCHOP
20	VCC

○Cautions on use

(1) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI
may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.

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

(3) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.

(4) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

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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

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