

# 150V breakdown voltage half bridge pre-driver IC SPF6001 (Auxiliary power mounted)

## Features

- 150V breakdown voltage bootstrap circuit drive system
- Charge pump circuit/ Auxiliary power mounted
- Sanken original power surface mount
- Absolute maximum ratings

Item	Symbol	Ratings	Unit	Remark
DC input voltage	VBB	-0.6 ~ 35	V	40V T<40ms
VREG Power supply voltage for gate pin control	VREG	-0.6 ~ 18	V	
Power supply voltage for logic circuit	VDD	-0.3 ~ 6	V	
Input pin control voltage	HI,LO,EN	-0.3 ~ 6	V	
L/S LS pin breakdown voltage	LS	-4 ~ 4	V	
L/S GL pin breakdown voltage	GL	-4 ~ 18	V	
H/S S pin breakdown voltage	S	-4 ~ 110	V	
H/S GH pin breakdown voltage	GH	-4 ~ 110	V	
H/S C pin breakdown voltage	C	-0.3 ~ 110	V	
FLT pin breakdown voltage	VFLT	-0.3 ~ 6	V	
CP1 pin breakdown voltage	CP1	-0.3 ~ 18	V	
CP2 pin breakdown voltage	CP2	-0.3 ~ 18	V	
Power dissipation	PDI	18.6	W	With infinite heat sink
	PD2	2.97	W	*1
Junction temperature	Tj	-40 ~ 150		
Operating ambient temperature	Top	-40 ~ 105		
Storage temperature	Tstg	-40 ~ 150		
Thermal resistance (Junction to Case)	$\theta_{j-c}$	6.7	/W	
Thermal resistance (Junction to Ambient)	$\theta_{j-a}$	42	/W	

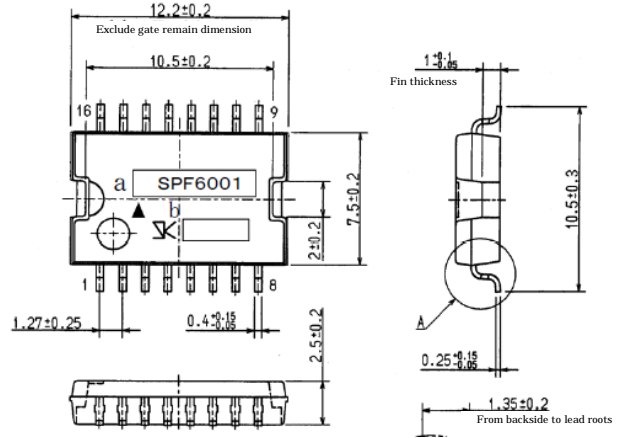
\*1 When use glass epoxy + copper foil board (Size: 5.0x7.4cm, t: glass epoxy=1.6mm, copper foil=18 $\mu$ m)

## Electrical characteristics (Tj=25 °C)

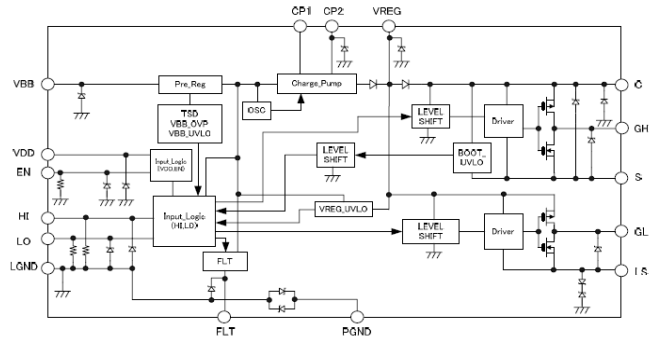
Tj=30~125°C, VBB=14V, VDD=EN=5V, Creg=10 $\mu$ F, f PWM=22.5KHz, CP=0.1 $\mu$ F, CBOOT=0.1 $\mu$ F, unless otherwise specified

Characteristic	Symbol	Limits			Unit	Test Conditions
		MIN	TYP	MAX		
Input power supply voltage	VBB	7	14	18	V	-
	VDD	4.5	5	5.5	V	-
VBB input current	IBB1	-	3	-	mA	VDD=EN=0V, HI=LO=0V with steady state (No load)
	IBB5	-	4	-	mA	HI=LO=0V with steady state (No load)
VDD input current	IDD	-	1.0	5.0	mA	HI=LO=0V with steady state (No load)
C/GH S/LGND current	ICL	-	-	-	$\mu$ A	C=GH=S=50V
VREG output voltage	VREG1	10	12	18	V	VV<VBB<8V
	VREG2	12	15	18	V	8V<VBB
EN pin · Input control voltage	VENH	2.0	-	-	V	HI=5V, S=L=LGND
	VENL	-	-	0.8	V	After input E, LO=0V→5V (GL monitor)
	AVEN	-	0.15	-	V	
	VinH	2.0	-	-	V	
	VinL	-	-	0.8	V	LO=5V, S=L=LGND
HI,LO pin · Input control voltage	$\Delta$ ViH	-	0.15	-	V	After input EN, HI=0V→5V (GH monitor)
	ViOH	2.0	-	-	V	
	ViOL	-	-	0.8	V	HI=5V, S=L=LGND
	$\Delta$ ViL	-	0.15	-	V	After input EN, LO=0V→5V (GL monitor)
EN pin · Input control current	IENH	-	100	500	$\mu$ A	EN=5V
	IENL	-100	-	-	$\mu$ A	EN=0V
HI,LO pin · Input control current	IiH	-100	-	-	$\mu$ A	HI=5V
	IiOL	-100	-	-	$\mu$ A	LO=5V
	IiOH	-	100	500	$\mu$ A	LO=0V
	IiOL	-100	-	-	$\mu$ A	LO=0V
FLT pin · output saturation voltage	VFLT	-	-	0.4	V	IiFL=1mA
Boot Strap Di Vth	BDiVth	0.4	1.2	1.7	V	-
GH pin · Source RDS(ON)	RDSsGH	6	9	15	$\Omega$	HI=5V, LO=0V, S=L=LGND, Cs=10V, VREG>10V
GH pin · Sink RDS(ON)	RDSsGL	4	6	10	$\Omega$	HI=5V, LO=0V, S=L=LGND, Cs=10V, VREG>10V
GH pin · start-up time	t rGH	10	50	100	nS	VGH=20%~80%, Ciss=3300pF
GH pin · falling time	t fGH	10	50	100	nS	VGH=80%~20%, Ciss=3300pF
GL pin · Source RDS(ON)	RDSsGL	6	9	15	$\Omega$	HI=0V, LO=5V, S=L=LGND, Cs=10V, VREG>10V
GL pin · Sink RDS(ON)	RDSsGL	4	6	10	$\Omega$	HI=0V, LO=5V, S=L=LGND, Cs=10V, VREG>10V
GL pin · start-up time	t rGL	10	50	100	nS	VGL=20%~80%, Ciss=3300pF
GL pin · falling time	t fGL	10	50	100	nS	VGL=80%~20%, Ciss=3300pF
Output delay time	t onH	150	250	420	nS	VHiH=VGH=10%, Ciss=3300pF
	t offH	150	250	410	nS	VHiL=VGH=90%, Ciss=3300pF
	t onL	150	250	420	nS	VLoH=VGL=10%, Ciss=3300pF
	t offL	150	250	410	nS	VLoL=VGL=90%, Ciss=3300pF
VDD UVLO releasing voltage	VuvdH	3.5	4.0	4.5	V	
VDD UVLO activating voltage	VuvdL	3.3	3.8	4.3	V	(GH, GL, FLT monitor)
VDD UVLO hysteresis	$\Delta$ Vuvd	-	200	-	mV	
VBB OVP releasing voltage	VovbbH	24	28	32	V	
VBB OVP activating voltage	VovbbL	22	25	31	V	(GH, GL, FLT monitor)
VBB OVP hysteresis	$\Delta$ Vovbb	-	3	-	V	
VBB UVLO releasing voltage	VuvbbH	6.0	6.5	7.0	V	
VBB UVLO activating voltage	VuvbbL	5.5	6.1	6.6	V	(GH, GL, FLT monitor)
VBB UVLO hysteresis	$\Delta$ Vuvbb	-	400	-	mV	

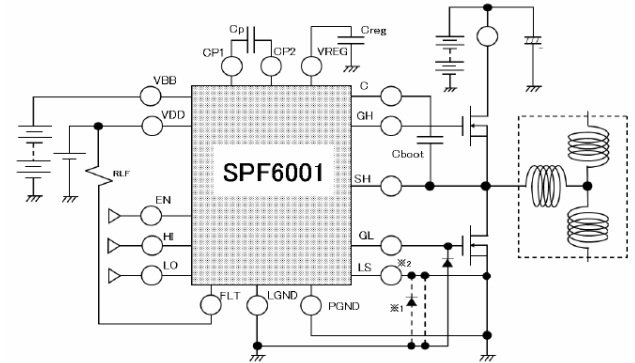
## Package



## Circuit block diagram



## Typical connection diagram



## Timing chart

