

SPI-6631M

■ Features

- Power supply voltages, V_{BB} : 13 V to 33 V
- Signal power supply configuration
- Output current I_{out} : 3 A (max)... repetitive current (normal-operation current)
- Built-in current recirculation diode
- Built-in UVLO, TSD and OCP protection
- Built-in dead time function that prevents through current upon phase switching
- Built-in error sense flag output
- HSOP16-pin package

■ Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Main Supply Voltage	V_{BB}	35	V	
MOSFET Output Breakdown Voltage	V_{DSS}	35	V	DutyCycle=100%*
Output Current	I_{out}	±3	A	
Input Voltage	V_{IN}	−0.3 to 6.5	V	
S Terminal Voltage	V_{SEN}	−2 to 2	V	
Alarm Terminal Voltage	V_{ALARM}	6.5	V	
Alarm Input Current	I_{ALARM}	1	mA	
Power Dissipation	P_D	2.6	W	When using a Sanken evaluation board
Junction Temperature	T_J	150	°C	
Storage Temperature	T_{STG}	−30 to 150	°C	
Operating Ambient Temperature	T_A	−20 to 85	°C	

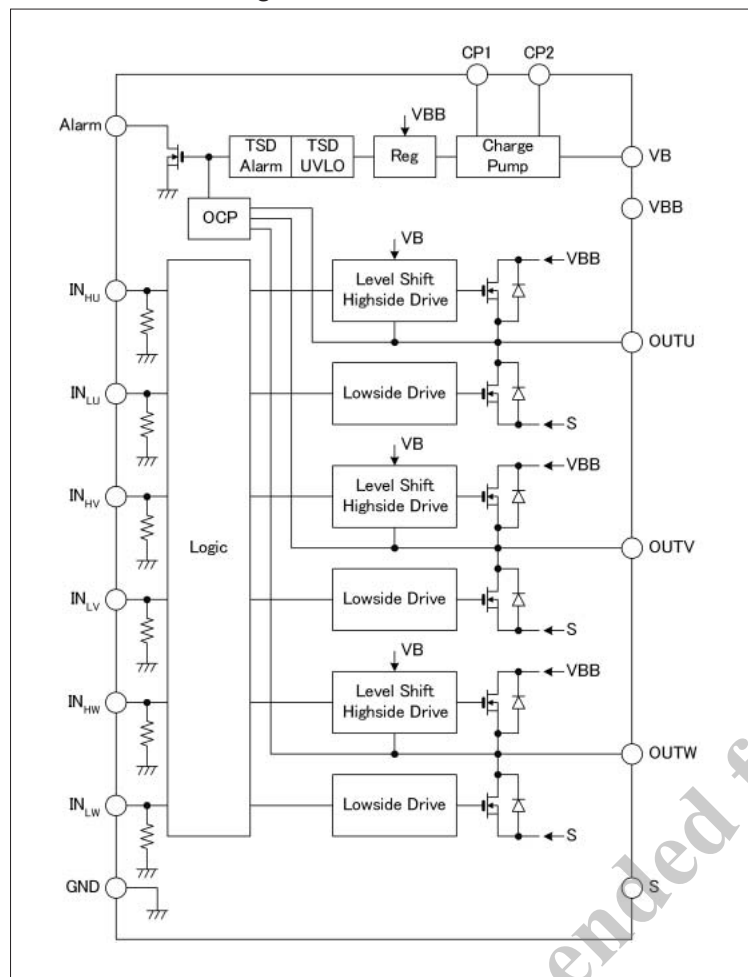
*: Output current value may be limited, depending on the duty ratio, ambient temperature, and heating conditions. Do not exceed the rated current or maximum junction temperature ($T_J = 150^\circ\text{C}$).

■ Electrical Characteristics

($T_A = 25^\circ\text{C}$, $V_{BB} = 24\text{V}$, unless otherwise specified)

Parameter	Symbol	Ratings			Unit	Conditions
		min.	typ.	max.		
Main Supply Voltage	V_{BB}	13	—	33	V	In operation
Main Supply Current	I_{BB}	—	—	23	mA	
Maximum Clock Pulse Width	t_W	—	—	3	μs	
Input Voltage	V_{IL}	—	—	0.8	V	
	V_{IH}	2.0	—	—	V	
Input Current	I_{IL}	—	±8	—	μA	$V_{IN(0)}$, $V_{IN} = 0.8\text{V}$
	I_{IH}	—	±20	—	μA	$V_{IN(1)}$, $V_{IN} = 2.0\text{V}$
Crossover Dead Time	T_{delay}	100	500	1200	ns	
VB Terminal Breakdown Voltage	V_B	—	$V_{BB} + 5$	—	V	Breakdown voltage between VB and GND
VB-OUT Breakdown Voltage	V_{B-OUT}	—	5	—	V	
VB Terminal Current	I_B	—	—	3	mA	$V_{B-OUT} = 5\text{V}$
Output Leakage Current	I_{DSS}	—	—	800	μA	$V_{OUT} = V_{BB} = 35\text{V}$
		−800	—	—	μA	$V_{OUT} = 0\text{V}$
MOSFET ON Resistance	$R_{DS(ON)}$	—	0.4	0.7	Ω	$I_{OUT} = 1\text{A}$, Between V_{BB} and OUT $I_{OUT} = 1\text{A}$, Between OUT and S
MOSFET Diode Forward Voltage	V_{SD}	—	—	2.2	V	$I_{SD} = 1\text{A}$
Overcurrent Sense Current	I_{OCP}	7	—	—	A	Short between Out and Out
Overcurrent Protection Blank Time	t_{blank}	0.7	1.2	4	μs	
Overcurrent Protection Delay Time	t_{ocp}	0.5	1	2.2	ms	
Thermal Protection Operation Temperature	T_J	—	170	—	°C	
Thermal Protection Hysteresis	ΔT_J	—	15	—	°C	
Low Voltage Protection Operation Voltage	$UVLO$	4.0	4.5	5.0	V	V_{BB} voltage
Low Voltage Protection Hysteresis	$\Delta UVLO$	0.4	0.45	0.5	V	
Alarm Output Voltage	V_{ALARM}	—	—	0.5	V	$I = 1\text{mA}$

Internal Block Diagram

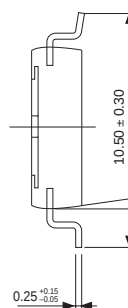
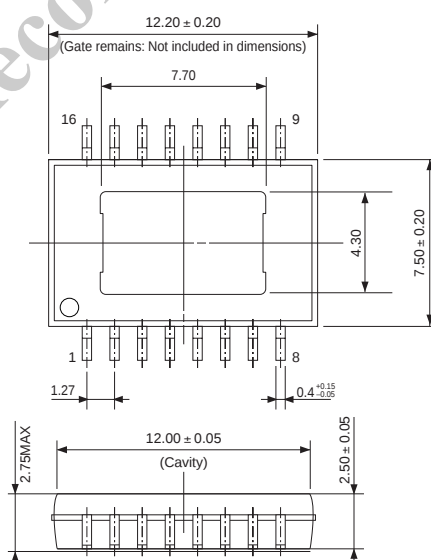


Pin Assignment

Pin No.	Symbol	Function
1	CP2	Capacitor terminal for charge pump 2
2	CP1	Capacitor terminal for charge pump 1
3	OUTU	DMOSFET phase U output
4	S	Sense terminal (lower arm source output)
5	OUTV	DMOSFET phase V output
6	OUTW	DMOSFET phase W output
7	Alarm	Alarm output
8	GND	Ground
9	IN _{LW}	Phase W lower arm input
10	IN _{HW}	Phase W upper arm input
11	IN _{LV}	Phase V lower arm input
12	IN _{HV}	Phase V upper arm input
13	VBB	Driver supply terminal
14	IN _{LU}	Phase U lower arm input
15	IN _{HU}	Phase U upper arm input
16	VB	Capacitor terminal for charging up charge pump

External Dimensions (HSOP16)

(Unit : mm)



Product Mass : Approx.0.56g