

SLA2601M/SLA2602M H Bridge, Enable Pin, Built-in Thermal Shutdown Circuit

Features

- Full-bridge MOSFETs and a pre-drive IC are integrated into a single package
- Supports CMOS (3.3 and 5 V) input levels
- Built-in undervoltage lock out (UVLO) circuit (auto regression)
- Built-in thermal shutdown (TSD) circuit
- Built-in dead time function
- SIP power package

Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Ratings		Unit	Conditions
		SLA2601M	SLA2602M		
MOSFET Breakdown Voltage	V _{DSS}	250		V	I _D =100μA
Control Supply Voltage	V _{CC}	20		V	Between V _{CC} and COM
Control Supply Voltage	V _{BS}	20		V	Between V _B and VM1, VM2
Output Current (continuous)	I _O	14	7	A	T _C =25°C
Output Current (pulse)	I _{OP}	21	10.5	A	PW≤100μs, duty=1%
FO Output Current	I _{FO}	8		mA	
Input Voltage	V _{IN}	-0.5 to +7		V	EN, IN, FO
Power Dissipation	P _D	41.6		W	T _C =25°C, all elements operating
Thermal Resistance (Junction to Ambient Air)	θ _{J-A}	3.0		°C/W	All elements operating
Operating Case Temperature	T _{OP}	-20 to +100		°C	
Junction Temperature (Power part)	T _J	150		°C	
Storage Temperature	T _{stg}	-40 to +150		°C	

Recommended Operating Conditions

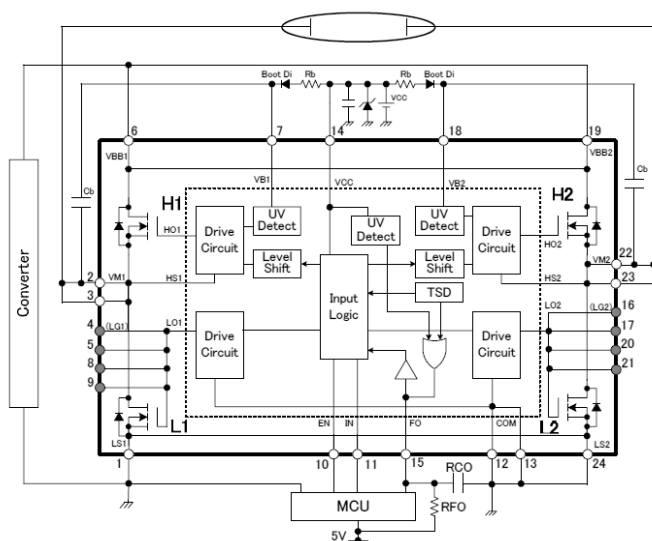
Parameter	Symbol	Ratings				Unit	Conditions
		SLA2601M		SLA2602M			
		min.	max.	min.	max.		
Main Supply Voltage	V _{BB}	—	200	—	200	V	Between V _{BB} and LS/COM
Control Supply Voltage	V _{CC}	13.5	17.5	13.5	17.5	V	Between V _{CC} and COM
Boot Strap Capacitor Capacity	C _{boot}	10	—	10	—	uF	
FO Pull-up Resistance	R _{FO}	0.68	10	0.68	10	kΩ	
FO Capacitor Capacity	C _{FO}	0.001	0.01	0.001	0.01	uF	
IN Pin Frequency	F _{IN}	—	150	—	150	kHz	
Junction Temperature	T _j	—	125	—	125	°C	

Electrical Characteristics

(T_a=25°C)

Parameter	Symbol	Ratings						Unit	Conditions
		SLA2601M			SLA2602M				
		min.	typ.	max.	min.	typ.	max.		
Control Supply Current	I _{CC}	—	2	—	—	2	—	mA	V _{CC} =15V, F _O =OPEN
Boot Supply Current	I _B	—	135	—	—	135	—	μA	V _B =15V
Input Voltage (EN, IN, FO)	V _{IH}	—	2	2.5	—	2	2.5	V	V _{CC} =15V
	V _{IL}	1	1.5	—	1	1.5	—		V _{CC} =15V
Input Current (EN, IN)	I _{IH}	—	230	500	—	230	500	μA	V _{CC} =15V, EN,IN=5V
Undervoltage Lock Out (VB)	V _{UVHL}	9	—	11	9	—	11	V	Between V _B and VM1, VM2
	V _{UVHH}	9.5	—	11.5	9.5	—	11.5		
Undervoltage Lock Out (V _{CC})	V _{UVLL}	10	—	12	10	—	12	V	Between V _{CC} and COM
	V _{UVLH}	10.5	—	12.5	10.5	—	12.5		
FO Pin Output Voltage	V _{FO(L)}	0	—	1	0	—	1	V	V _{CC} =15V, F _O =OPEN
	V _{FO(H)}	3.6	—	5	3.6	—	5		
Thermal Protection and Release Threshold	T _{DH}	135	150	165	135	150	165	°C	V _{CC} =15V
	T _{DL}	105	120	135	105	120	135		
Internal Dead Time	T _{dead}	—	430	—	—	430	—	ns	V _{CC} =15V
MOSFET Output Breakdown Voltage	V _{DSS}	250	—	—	250	—	—	V	I _D =100μA
MOSFET Output Leakage Current	I _{DSS}	—	—	100	—	—	100	μA	V _{DSS} =250V
MOSFET DC ON Resistance	R _{DS(on)}	—	0.11	0.14	—	0.14	0.185	Ω	V _{CC} =15V, I _D =7A (3.5A for the SLA2602M),EN=5V
MOSFET Diode Forward Voltage	V _{SD}	—	1	1.5	—	1	1.5	V	I _{SD} =7A (3.5A for the SLA2602M)
High Side Switching Time	td(on)	—	1290	—	—	1260	—	ns	V _{BB} =200V, V _{CC} =15V, I _D =7A (3.5A for the SLA2602M), EN=5V, R load
	tr	—	100	—	—	40	—		
	td(off)	—	900	—	—	850	—		
	tf	—	30	—	—	15	—		
Low Side Switching Time	td(on)	—	1270	—	—	1240	—	ns	V _{BB} =200V, V _{CC} =15V, I _D =7A (3.5A for the SLA2602M), EN=5V, R load
	tr	—	80	—	—	40	—		
	td(off)	—	880	—	—	830	—		
	tf	—	30	—	—	25	—		

Typical Connection Diagram



The input pull-down resistor is built in IC (about 22 kΩ). However, if the input is expected to be unstable or to fluctuate greatly, it needs to be reinforced using an external resistor.

Attach capacitors near the IC. Attach a ceramic capacitor in parallel with the electrolytic capacitor if too much noise is generated.

When inserting a current sense resistor between LS1/LS2 and COM, make sure to specify the resistance so that the voltage between LS1/LS2 and COM is 1 V or less.

Pin Assignment

Pin No.	Symbol	Function
1	LS1	MOSFET L1 source pin/MOSFET L2 source pin
2	VM1	MOSFET H1 source pin/MOSFET L1 drain pin
3	VM1	Same as above
4	(LG1)	Cut pin (MOSFET L1 gate pin)
5	(LG1)	Same as above
6	VBB1	MOSFET H1 drain pin/MOSFET H2 drain pin
7	VB1	High side floating power supply pin 1
8	(LG1)	Cut pin (MOSFET L1 gate pin)
9	(LG1)	Same as above
10	EN	Input pin for enabling output
11	IN	Input pin for switching output
12	COM	Pre-drive IC ground pin
13	COM	Same as above
14	VCC	Pre-drive IC power supply pin
15	FO	Fo signal output pin
16	(LG2)	Cut pin (MOSFET L2 gate drive pin)
17	(LG2)	Same as above
18	VB2	High side floating power supply pin 2
19	VBB2	MOSFET H1 drain pin/MOSFET H2 drain pin
20	(LG2)	Cut pin (L2 gate drive pin)
21	(LG2)	Same as above
22	VM2	MOSFET H2 source pin/MOSFET L2 drain pin
23	VM2	Same as above
24	LS2	MOSFET L1 source pin/MOSFET L2 source pin

Truth Table

EN	IN	FO	H1	H2	L1	L2
L	X	X	OFF	OFF	OFF	OFF
X	X	H	OFF	OFF	OFF	OFF
H	H	L	ON	OFF	OFF	ON
H	L	L	OFF	ON	ON	OFF

External Dimensions (ZIP24 with Fin [SLA24Pin])

(Unit : mm)

