SMA6843MP/SLA6848MP Support for 3-shunt

■Features

- A package of 6 MOSFET units for 3-phase bridge and pre-drive (HVIC, LVIC)
- Best for driving fan motors and pumps
- High side drive of bootstrap method has been employed.
- Built-in undervoltage lock out (auto regression)
- Built-in overheat detection circuit (no stopping)
- Built-in fail signal output function (for when the overheat detection circuit and UVLO)
- Support for 3-shunt current detection

■Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Ratings		Unit	Conditions
		SMA6843MP	SLA6848MP		
MOSFET Output Withstand Voltage	VDSS	500	500	V	Vcc=15V,VIN=0V
Control Supply Voltage	V_{CC}	20	20	V	Between Vcc and COM
Control Supply Voltage (bootstrap)	V_{BS}	20	20	V	Between VB and HS (U, V, W)
Output Current (continuous)	I_o	2.5	2.5	A	
Output Current (pulse)	I_{op}	5	5	A	PW≤100µs, duty=1%
Input Voltage	V_{IN}	–0.5 to +7	–0.5 to +7	V	
Power Dissipation	P_D	28	31	W	Tc=25°C
Thermal Resistance (Junction to Case)	$\theta_{j\text{-}c}$	4.5	4	°C/W	When all elements operating
Thermal Resistance (Junction to Ambient Air)	$\theta_{j\text{-}a}$	28	31	°C/W	When all elements operating
Operating Case Temperature	T_{op}	–20 to +100	–20 to +100	°C	
Junction Temperature (Power part)	T_{ch}	+150	+150	°C	
Storage Temperature	T_{stg}	–40 to +150	–40 to +150	°C	

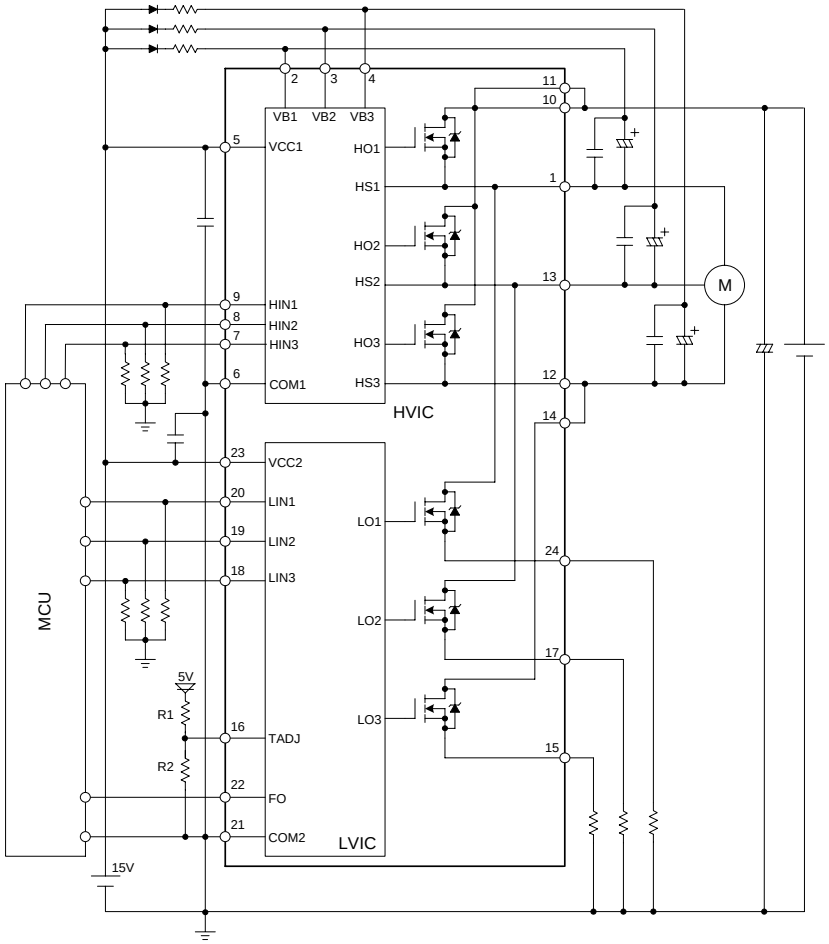
■Recommended Operating Conditions

Parameter	Symbol	Ratings						Unit	Conditions
		SMA6843MP			SLA6848MP				
		min.	typ.	max.	min.	typ.	max.		
Main Supply Voltage	Vss	–	280	400	–	280	400	V	Between V_{BB} and LS
Control Supply Voltage	Vcc	13.5	–	16.5	13.5	–	16.5	V	Between V_{CC} and COM
Input Signal Dead Time	tdead	1.5	–	–	1.5	–	–	µs	
Minimum Input Pulse Width	tw	0.5	–	–	0.5	–	–	µs	
Junction Temperature	Tj	–	–	125	–	–	125	°C	

■Electrical Characteristics

Parameter	Symbol	Ratings						Unit	Conditions
		SMA6843MP			SLA6848MP				
		min.	typ.	max.	min.	typ.	max.		
Control Supply Voltage	Vcc	13.5	15	16.5	13.5	15	16.5	V	Between V_{CC} and COM
Control Supply Current	Icc	–	4	6	–	4	6	mA	Vcc=15V
Input VoltageV_{IH}	V_{IH}	–	2	2.5	–	2	2.5	V	Vcc=15V, Output:ON
	V_{IL}	1	1.5	–	1	1.5	–		Vcc=15V, Output:OFF
Input Voltage Hysteresis Width	VH	–	0.5	–	–	0.5	–	V	Vcc=15V
Input Current	I_{IH}	–	50	100	–	50	100	µA	Vcc=15V, VIN=5V
	I_{IL}	–	–	2	–	–	2		Vcc=15V, VIN=0V
Undervoltage Lock Out (high side)	UVHL	9.0	10.0	11.0	9.0	10.0	11.0	V	Between VB and U (V, W)
	UVHH	9.5	10.5	11.5	9.5	10.5	11.5		
	Uvhys	–	0.5	–	–	0.5	–		
Undervoltage Lock Out (low side)	UVHL	10.0	11.0	12.0	10.0	11.0	12.0	V	Between V_{CC} and COM
	UVHH	10.5	11.5	12.5	10.5	11.5	12.5		
	Uvhys	–	0.5	–	–	0.5	–		
FO Pin Output Voltage	VFOL	0	–	1.0	0	–	1.0	V	Vcc=15V
	VFOH	4.0	–	5.5	4.0	–	5.5		
Overheat Detection Threshold	TDH	135	150	165	135	150	165	°C	Vcc=15V
Overheat Detection Release Threshold	TDL	105	120	135	105	120	135		
MOSFET Output Withstand Voltage	V_{DSS}	500	–	–	500	–	–	V	Vcc=15V, ID=100µA, VIN=0V
MOSFET Output Leakage Current	I_{DSS}	–	–	100	–	–	100	µA	Vcc=15V, VIN=0V
MOSFET DC On Resistance	$R_{DS(ON)}$	–	2.0	2.4	–	2.0	2.4	Ω	Vcc=15V, VIN=0V
Diode Forward Voltage	VSD	–	1.0	1.5	–	1.0	1.5	V	Vcc=15V, VIN=0V
Diode Reverse Recovery Time	trr		75			75		ns	di/dt=100A/µs
High Side Switching Time	td(on)	–	420	–	–	420	–	ns	VBB=280V, Vcc=15V, VIN=0⇔5V, ID=2.5A
	tr	–	60	–	–	60	–		
	td(off)	–	440	–	–	440	–		
	tf	–	40	–	–	40	–		
Low Side Switching Time	td(on)	–	420	–	–	420	–	ns	
	tr	–	70	–	–	70	–		
	td(off)	–	380	–	–	380	–		
	tf	–	30	–	–	30	–		

■Typical Connection Diagram



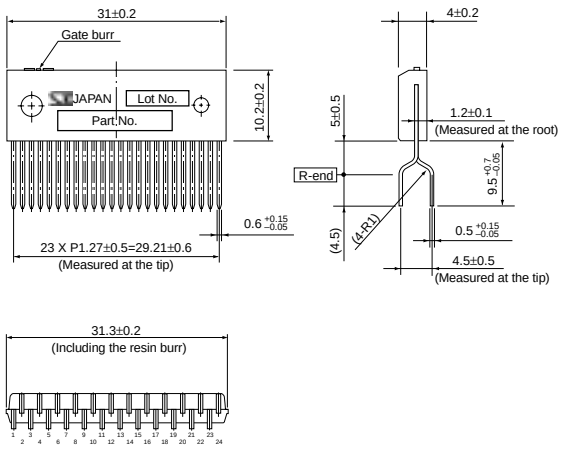
The input pulldown resistor is built in IC (about 100 kΩ). However, if the input is expected to be unstable or very fluctuant, it needs to be reinforced with external resistor.

The overheat detection threshold can be variable by externally attaching R1 and R2.

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

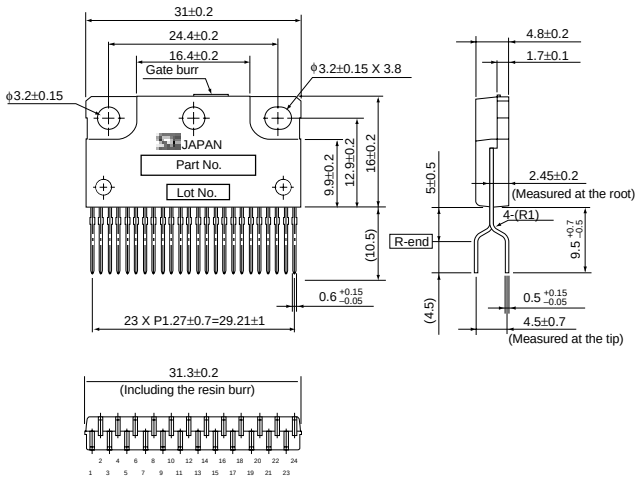
■External Dimensions (ZIP24 [SMA24Pin]/ZIP24 with Fin [SLA24Pin])

SMA6843MP



Forming No. 2452
Product Mass: Approx. 3.9 g

SLA6848MP



Forming No. 2171
Product Mass: Approx. 6.2 g