

4-circuit High-side Power Switch Array – SLA2502M

Features

- Built-in diagnostic function to detect short and open circuiting of loads and output status signals
- Low saturation PNP transistor use ($V_{CE(sat)} \leq 0.5V$)
- Allows direct driving using LS-TTL and C-MOS logic levels
- Built-in overcurrent and thermal protection circuits
- Built-in protection against reverse connection of power supply
- $T_J = 150^\circ C$ guaranteed

Absolute Maximum Ratings

($T_a = 25^\circ C$)

Parameter	Symbol	Ratings	Unit	Conditions
Power supply voltage	V_B	-13 to +40	V	
Input terminal voltage	V_{IN}	-0.3 to +7.0	V	
DIAG output applied voltage	V_{DIAG}	-0.3 to +7.0	V	
DIAG output source current	I_{DIAG}	3	mA	
Output current	I_O	1.2	A	
Power Dissipation	P_D	4.8	W	Stand-alone operation without heatsink; all circuits operating
Junction temperature	T_J	-40 to +150	$^\circ C$	
Operating temperature	T_{OP}	-40 to +100	$^\circ C$	
Storage temperature	T_{stg}	-50 to +150	$^\circ C$	

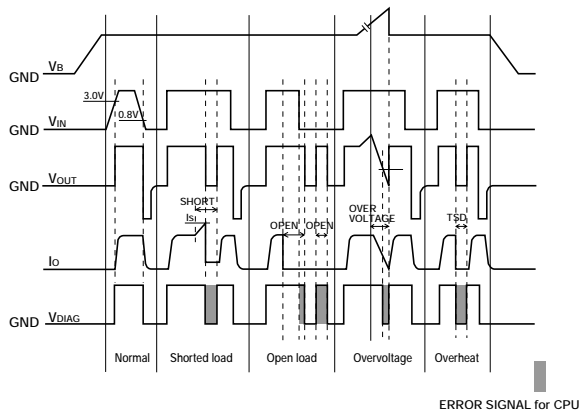
Electrical Characteristics

($V_{Bopr} = 14V, T_a = 25^\circ C$ unless otherwise specified)

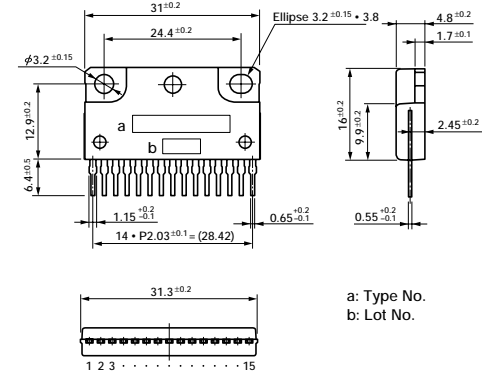
Parameter	Symbol	Ratings			Unit	Conditions
		min	typ	max		
Operating power supply voltage	V_{Bopr}	6.0		16	V	
Quiescent circuit current (per circuit)	I_q		5	12	mA	$V_{IN} = 0V$
Threshold input voltage	V_{INth}	0.8		3.0	V	
Input current	Hi output	I_{IN}		1.0	mA	$V_{IN} = 5V$
	Lo output	I_{IN}	0	100	μA	$V_{IN} = 0V$
Saturation voltage of output transistor	$V_{CE(sat)}$			0.5	V	$I_O \leq 1.0A, V_{Bopr} = 6$ to $16V$
Output terminal sink current	$I_{O(off)}$			2.0	mA	$V_O = 0V, V_{IN} = 0V$
Saturation voltage of DIAG output	V_{DL}			0.3	V	$I_{DIAG} = 3mA$
Leak current of DIAG output	I_{DGH}			100	μA	$V_{DIAG} = 5V$
Open load detection resistor	R_{open}			30	$k\Omega$	
Overcurrent protection starting current	I_S		1.6		A	$V_O = V_{Bopr} - 1.9V$
Output transfer time	T_{ON}		8	30	μs	$I_O = 1A$
	T_{OFF}		15	30	μs	$I_O = 1A$
DIAG output transfer time	T_{PLH}		10	30	μs	$I_O = 1A$
	T_{PHL}		15	30	μs	$I_O = 1A$

Note: * The rule of protection against reverse connection of power supply is $V_B = -13V$, one minute (all terminals except V_B and GND should be open).

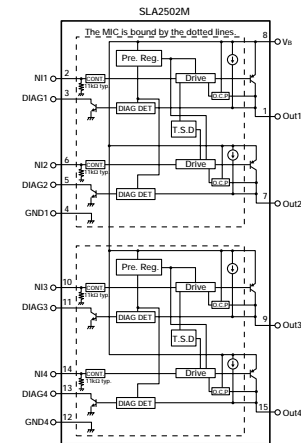
Diagnostic Function



External Dimensions (unit: mm)



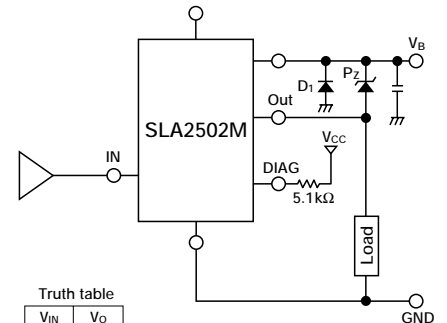
Equivalent Circuit Diagram



[Abbreviations]

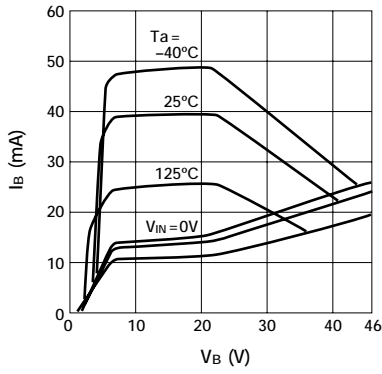
- Drive: Drive circuit
- CONT.: ON/OFF circuit
- Pre.Reg.: Pre-regulator
- DIAG.DET.: Diagnostic circuit
- O.C.P.: Overcurrent protection
- T.S.D.: Thermal protection

Standard Circuit Diagram

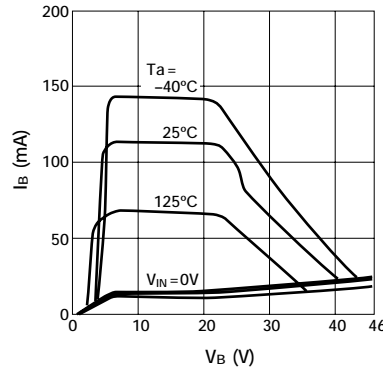


- Note 1: A pull-down resistor (11k Ω typ.) is connected to the IN terminal. V_{OUT} turns "L" when a high impedance is connected to the IN terminal in series.
- Note 2: Grounds GND1 and GND2 are not wired internally. They must be shorted at a pattern near the product.

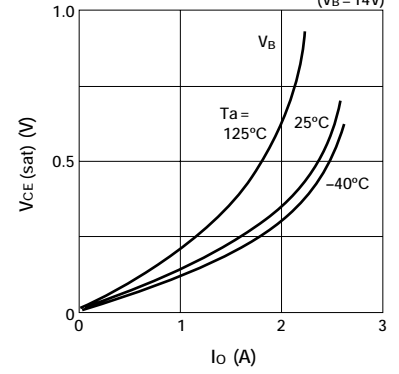
■ Circuit Current (single circuit)



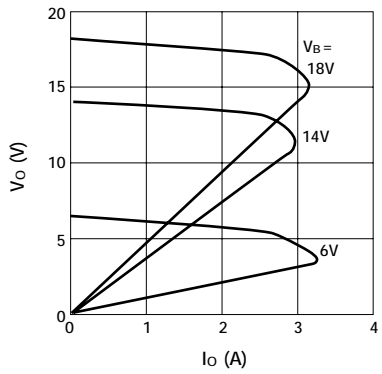
■ Circuit Current (4 circuits)



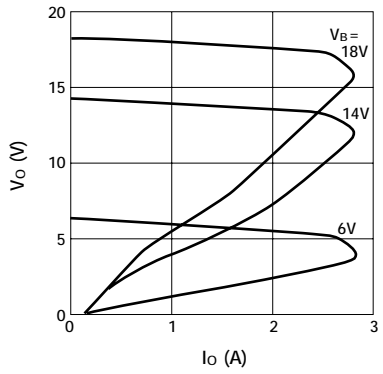
■ Saturation Voltage of Output Transistor (VB = 14V)



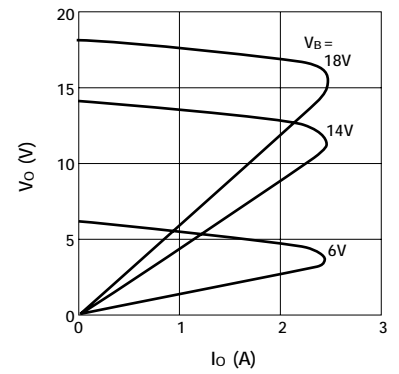
■ Overcurrent Protection Characteristics (Ta = -40°C)



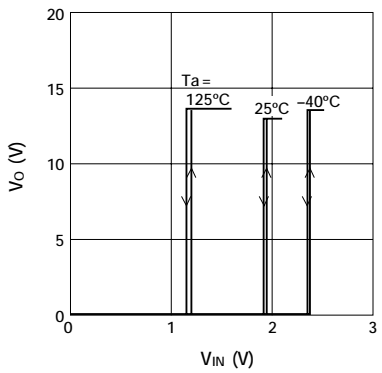
■ Overcurrent Protection Characteristics (Ta = 25°C)



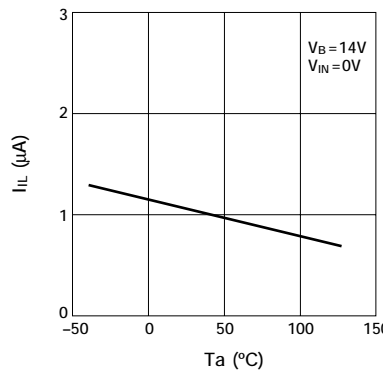
■ Overcurrent Protection Characteristics (Ta = 125°C)



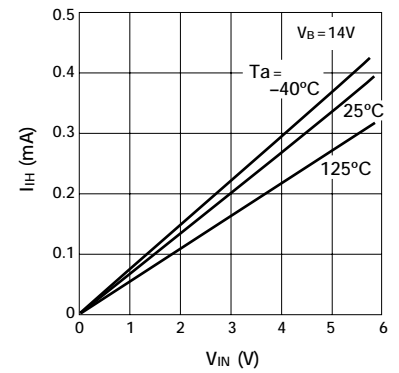
■ Threshold Input Voltage



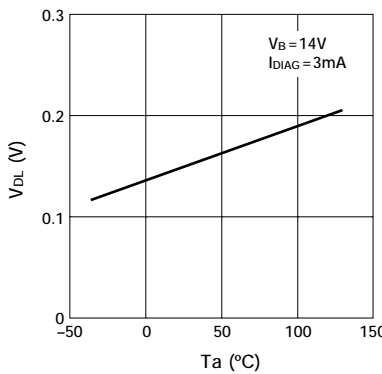
■ Input Current (Output OFF)



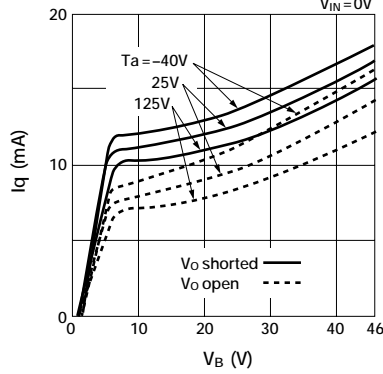
■ Input Sink Current (Output HI)



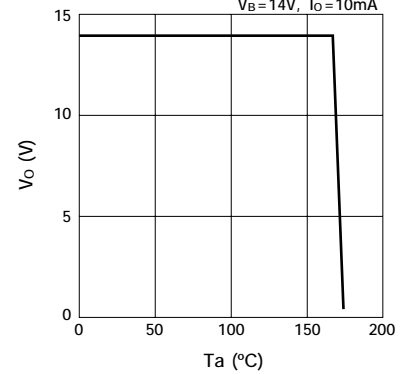
■ Saturation Voltage of DIAG Output



■ Quiescent Circuit Current (dual circuit)

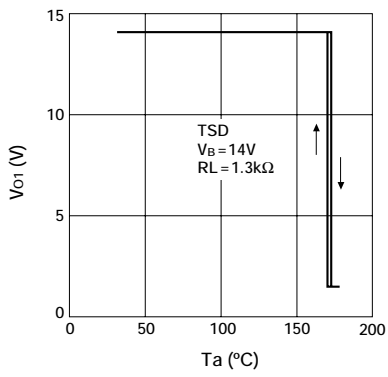


■ Thermal Protection Characteristics

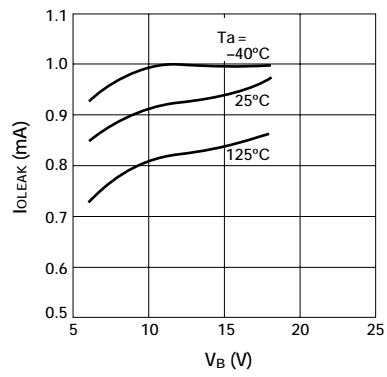


4-circuit High-side Power Switch Array SLA2502M

■ Thermal Protection Characteristics



■ Output Terminal Leak Current ($V_o = 0V$)



■ Open Load Detection Resistor

