High Voltage Full Bridge Drive ICs SLA2402MS

■Features

●One Package Full Bridge Driver Consisted of High Voltage IC and Power MOSFETs(4 pieces)

●High Voltage Driver which accepts direct connection to the input sgnal line

●External components such as high voltage diodes and capacitors are not required

■External Dimensions (unit:mm)

■Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit	Conditions
Power source voltage *	V_M	500	V	
Input voltage	V_{IN}	15	V	
Output voltage	V_O	500	V	
Output current	I_O	15	A	$P_W \leqq 250\mu s$
Power dissipation	P_D	5 (Ta=25ºC)	W	Without heatsink
Storage temperature	Tstg	−40 to +125	ºC	
Operation temperature	Topr	−40 to +105	ºC	

* Power GND (D terminal) to -HV (-HV terminal) voltage.

■Block Diagram

* Dotted Line: Outside Connection

■Electrical Characteristics

| Parameter	Symbol	Ratings min	Ratings typ	Ratings max	Unit	Conditions
Power MOS FET output breakdown voltage	BV_{OUT}	500			V	I_O=100μA
Power MOS FET output leakage voltage	$I_{OUT(off)}$			100	μA	V_O=500V
High-side Power MOS FET output on-state voltage	$V_{OUT(on)}1$	0.28	0.4	0.52	V	I_O=0.4A, V_{IN}=10V
	$V_{OUT(on)}2$	1.4	2.0	2.6	V	I_O=2A, V_{IN}=10V
Low-side Power MOS FET output on-state voltage	$V_{OUT(on)}1$	0.28	0.4	0.52	V	I_O=0.4A, V_{GL}=10V
	$V_{OUT(on)}2$	1.4	2.0	2.6	V	I_O=2A, V_{GL}=10V
Quiescent circuit current	$I_{CC}1$			3.0	mA	V_{CC}=4.5 to 15V
	$I_{CC}2$			4.0	mA	V_{CC}=10V, V_M=400V
Operating circuit current	$I_{CC}3$			4.0	mA	V_{CC}=10V, V_M=400V
Input voltage (High level)	V_{IH}	0.8V_{CC}			V	V_{CC}=4.5 to 15V
Input voltage (Low level)	V_{IL}			0.2V_{CC}	V	V_{CC}=4.5 to 15V
Delay time *	$t_{d(on)}$		1.4		μs	V_{CC}=10A, V_{IN}=10V, V_M=85A, I_O=0.41A
	$t_{d(off)}$		3.3		μs	
	Δt			2.5	μs	
Operating voltage	V_{CC}			15	V	−40 to +105ºC

* About delay time

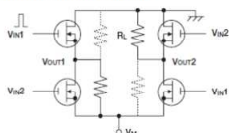Signal input waveform vs output waveform

① Highside switch turn-on, turn-off
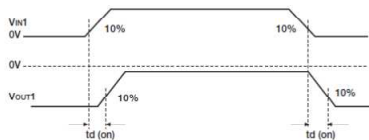
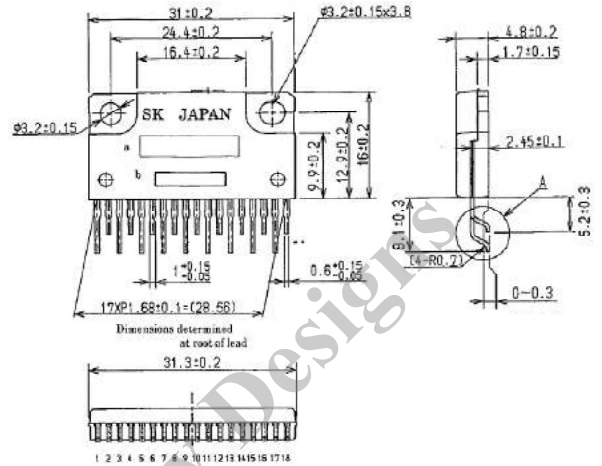② Lowside switch turn-on, turn-off
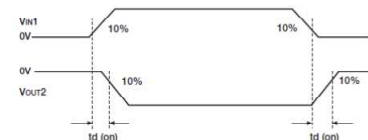
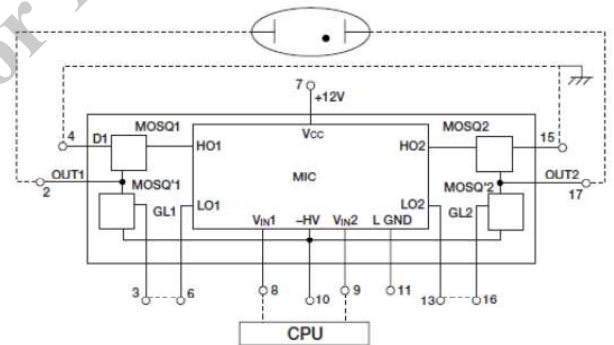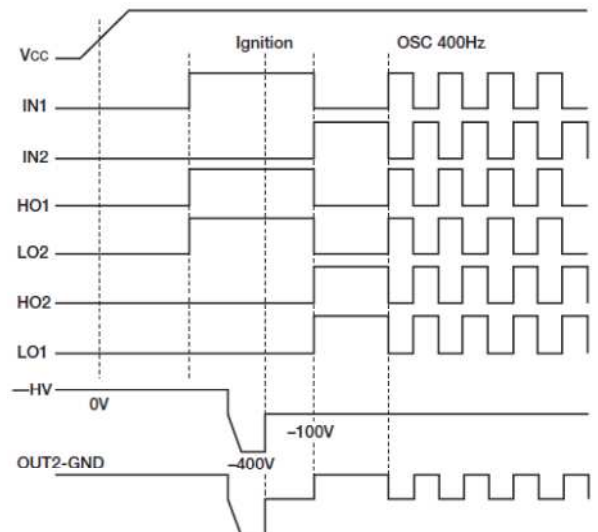* Δt: Δt = td (on) − td (off)

Measurement Circuit

Conditions
V_{CC}=10V, V_{IN}=10V (pulse)
V_M=85V
I_O=0.41A (R_L=207Ω)

* When pulse signal is inputted to V_{IN1}, R_L on solid line is ON and dotted line R_L is off.
On the contrary, when pulse signal is inputted to V_{IN2}, R_L on dotted line is ON and dotted line R_L is off.

■Timing Chart

Electrical Characteristics

Quiescent circuit current
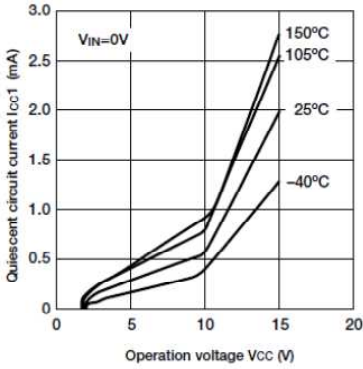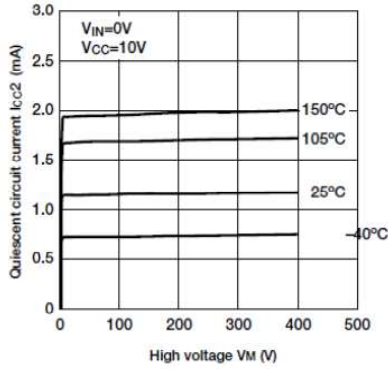
$V_{IN}=0V$

Quiescent circuit current supplied high voltage

$V_{IN}=0V$
$V_{CC}=10V$

Operating circuit current

$V_{CC}=V_{IN1}(2)=10V$

Quiescent circuit current supplied high voltage

$V_{IN}=0V$
$V_M=400V$

Quiescent circuit current

$Ta=25°C$

$V_{CC}=$
15V
12V
10V
9V
4.5V

Operating circuit current

$Ta=25°C$

$V_{CC}=$
15V
12V
10V
9V
4.5V

Output on-state voltage

$V_{CC}=V_{IN}=10V$

Gate drive voltage

$V_{CC}=10V$

Gate drive voltage

$Ta=25°C$

$V_{CC}=15V$
$V_{CC}=9V$
$V_{CC}=4.5V$

Output on-state voltage

$V_{CC}=V_{IN}=10V$

$I_O=2A$
$I_O=0.4A$
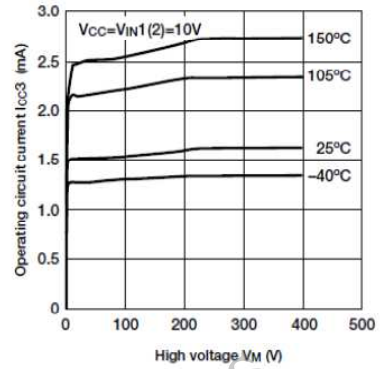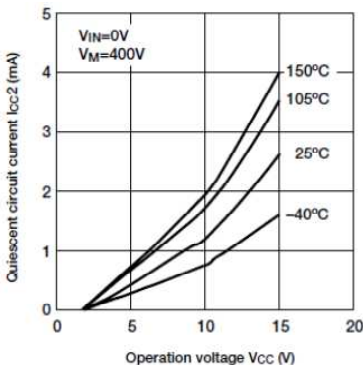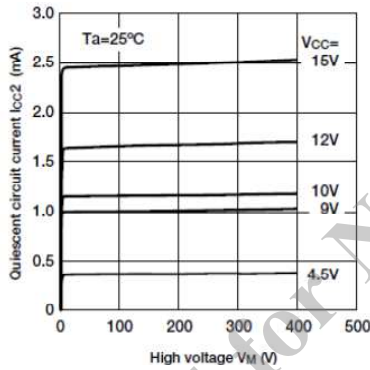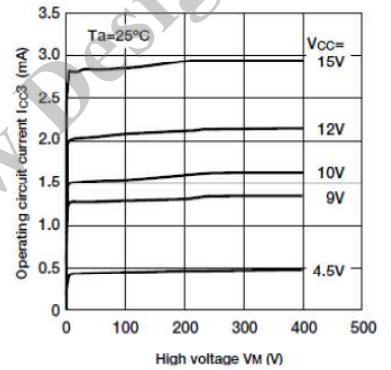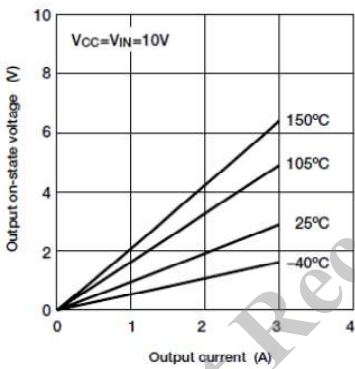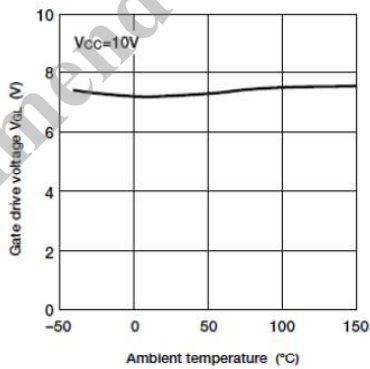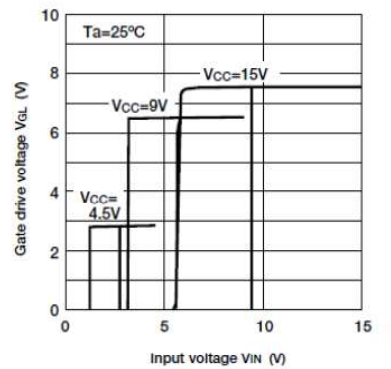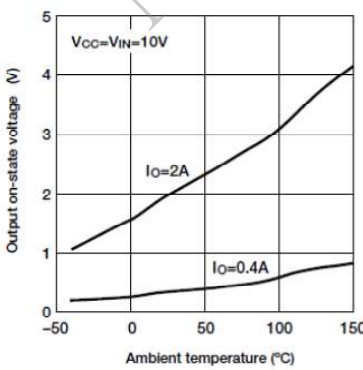
Input threshold voltage

$V_{CC}=10V$

V_{IH}
V_{IL}
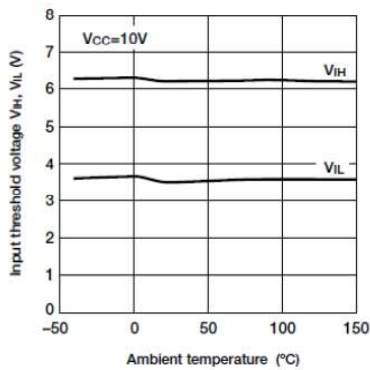
Electrical Characteristics

■ High side switch turn-on, off
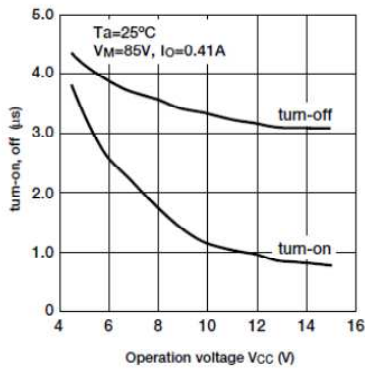
Ta=25°C
VM=85V, IO=0.41A

turn-off
turn-on

turn-on, off (µs)
Operation voltage Vcc (V)

■ High side switch turn-on, off

VM=85V, IO=0.41A
VCC=10V

turn-off
turn-on

turn-on, off (µs)
Ambient temperature (°C)

■ Low side switch turn-on, off

Ta=25°C
VM=85V, IO=0.41A

turn-off
turn-on

turn-on, off (µs)
Operation voltage Vcc (V)

■ Low side switch turn-on, off

VM=85V, IO=0.41A
VCC=10V
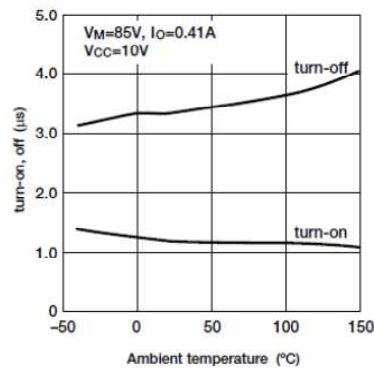
turn-off
turn-on
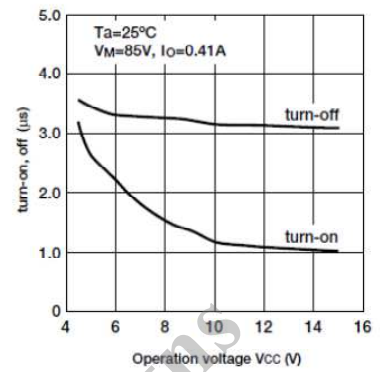
turn-on, off (µs)
Ambient temperature (°C)
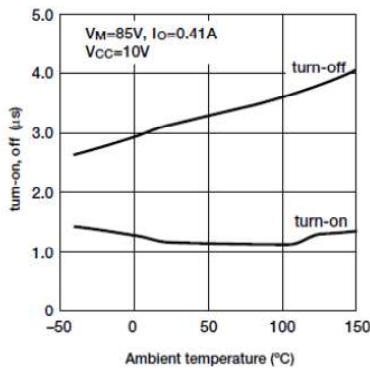
■ Transient thermal resistance characteristics

Ta=25°C
Single pulse

Transient thermal resistance (°C/W)
Power time (s)
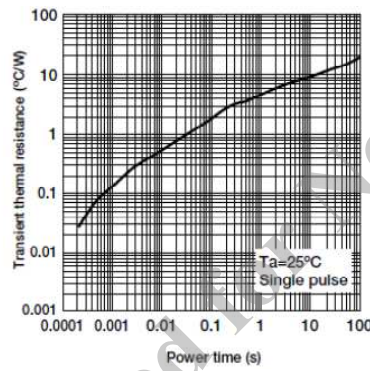
■ Safe operating area (Power MOS FET)

RDS (on) limited
100µs
1ms
10ms

Ta=25°C
Single pulse

Drain current (A)
Drain to source voltage (V)

■ Power derating curve

without heatsink

Power dissipation (W)
Ambient temperature (°C)