

500V breakdown voltage Full bridge driver IC SMA2404M (Negative drive system)

■ Features

- 500V breakdown voltage negative power supply drive system
- Encapsulate MOSFET (4pieces) and a control MIC
- Sanken original ZIP package
- Suitable for inverter element for HID ballast unit

■ Absolute maximum ratings

| No. | Item | Symbol | Unit | Rating | Conditions |
|-----|-------------------------|----------|------|------------|--|
| 1 | Power Source Voltage | VM | V | 480 | between Power GND and -HV Tj=-40 ~ -20°C |
| | | | | 500 | between Power GND and -HV Tj=-20 ~ +150°C |
| 2 | Input Voltage | VIN | V | 15 | Tj=-40 ~ +150°C |
| 3 | Operating Voltage | Vcc | V | 15 | Tj=-40 ~ +150°C |
| 4 | Output Voltage | VOUT | V | 500 | Ta=25°C |
| 5 | Output Current | IOUT(DC) | A | 7 | Ta=25°C |
| 6 | Total Power Dissipation | PD | W | 4 | Ta=25°C |
| | | | | 20 | Tc=25°C |
| 7 | Operation Temperature | Topr | °C | -40 ~ +150 | 35W HID Lamps Driver |
| 8 | Storage Temperature | Tstg | °C | -40 ~ +150 | |
| 9 | Junction Temperature | Tj | °C | 150 | |

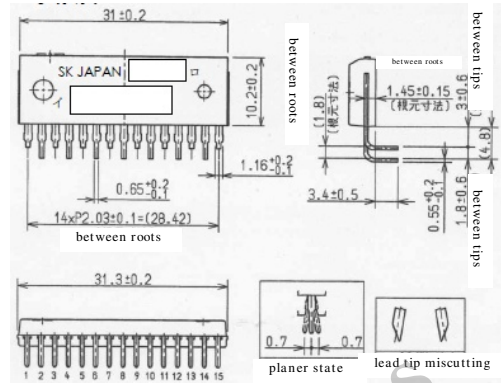
■ Electrical characteristics (Tj=25°C)

| No. | Item | Symbol | Unit | Value | | | Conditions |
|-----|---------------------------------------|-----------|------|-----------|-----------|------|---------------------------------------|
| | | | | Min. | Typ. | Max. | |
| 1 | Power MOSFET Output Breakdown Voltage | BVOUT | V | 500 | | | IOUT=100μ A |
| 2 | Power MOSFET Output Leakage Current | IOUT(off) | μ A | | | 100 | VOUT=500V |
| 3 | Power MOSFET Output On-State Voltage | VOUT(on) | V | 0.28 | 0.40 | 0.52 | IOUT=0.4A, VIN(or VGL)=10V |
| | | | | 1.4 | 2.0 | 2.6 | IOUT=2.0A, VIN(or VGL)=10V |
| 4 | Quiescent Circuit Current | Icc1 | mA | | | 3.0 | Vcc=10V, VM=VIN=0V |
| | | Icc2 | mA | | | 4.0 | Vcc=10V, VM=400V, VIN=0V |
| 5 | Operating Circuit Current | Icc3 | mA | | | 4.0 | Vcc=10V, VM=400V VIN1(or VIN2)=10V |
| 6 | Input Threshold Voltage | VIH | V | 0.8 · Vcc | | | Vcc=7 ~ 15V |
| | | VIL | V | | 0.2 · Vcc | | |
| 7 | Low side MOSFET Gate Drive Voltage | VGL | V | 0.7 · Vcc | | 8.0 | Vcc=7 ~ 15V |
| 8 | Delay time | td(on) | μ s | | 1.5 | | Vcc=VIN=10V, VM=85V IO=0.41A |
| | | td(off) | μ s | | 2.0 | | |
| | | Δtd | μ s | | 2.5 | | Δtd=td(off)-td(on) |
| 9 | Power MOSFET On-State Resistance | RDS(on) | Ω | 0.7 | 1.0 | 1.3 | ID=0.4A, VGS=10V |
| 10 | Power MOSFET Input Capacitance | Ciss | pF | | 860 | | VDS=10V, f=1MHz VGS=0V |
| 11 | Diode Reverse Recovery Time | trr | ns | | 300 | | ISD=± 100mA |

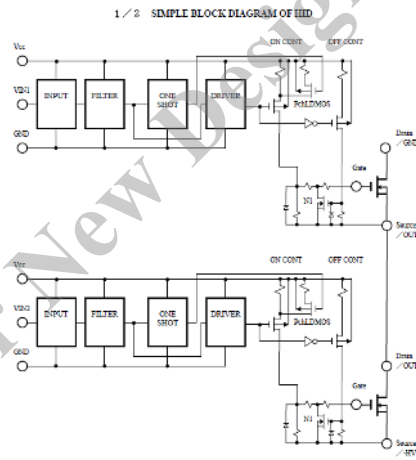
Recommended input signal dead time

| No. | Item | Symbol | Unit | Value | | | Conditions |
|-----|-----------------------|--------|-------|-------|------|------|---------------------------|
| | | | | Min. | Typ. | Max. | |
| 1 | dV/dt | dV/dt | V/μ s | | | 2 | Ta=25°C, Vcc=10V, VM=400V |
| 2 | Recommended dead time | td | μ s | 4.5 | | | Ta=-40 ~ 150°C |

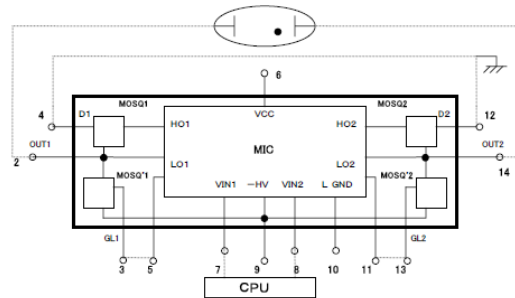
■ Package



■ Circuit block diagram



■ Typical connection diagram



■ Timing Chart

