DESCRIPTION

The AG2106A is a high-voltage, high-speed power MOSFET and IGBT driver based on a P-SUB / P-EPI process. It integrates a floating high-side driver and a low-side driver, enabling the drive of two N-channel MOSFETs or IGBTs in a half-bridge configuration with operation up to 700 V.

Logic inputs are compatible with standard CMOS and LS TTL levels, supporting logic voltages down to 3.3V. The output drivers incorporate a high-pulse-current buffer stage designed to minimize cross-conduction. Matched propagation delays simplify usage in high-frequency applications.

It can operate in a temperature range of -40℃ to 125℃.

AG2106A is available in a SOP-8 package.

ORDERING INFORMATION

Package Type	Part Number	
SOP8 SPQ: 4,000pcs/Reel	M8	AG2106AM8R
		AG2106AM8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

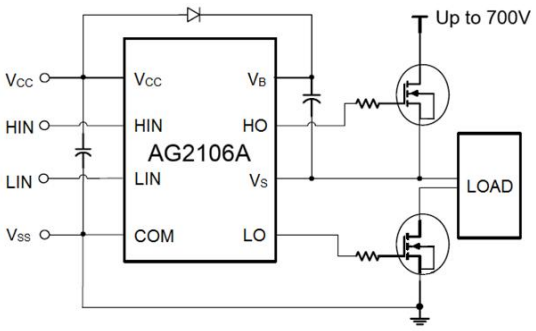
FEATURES

- Fully operational up to +700 V
- 3.3V, 5V and 15V logic level compatible
- High dV/dt Immunity ±50V/ns
- Vs negative bias capability: up to -9V
- Floating high-side channel optimized for bootstrap operation
- UVLO for both high-side and low-side channels
  - Positive threshold: 8.9V,
  - Negative threshold: 8.2V.
- Output Source / Sink Current Capability:
  - 300mA / 600mA
- Cross Conduction Protection with fixed 100ns Internal dead time
- Propagation delay characteristics:
  - T_{on} / T_{off} delay = 130ns /130 ns
  - Delay matching time: 50ns
- Available in SOP8 packages.

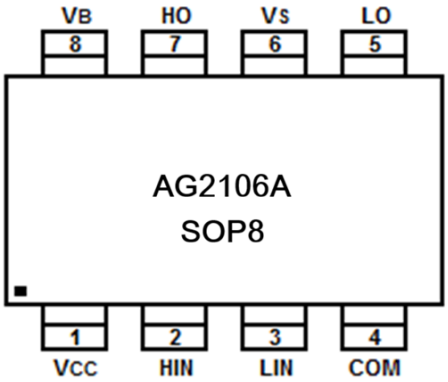
APPLICATION

- Small and medium- power motor driver
- Power MOSFET / IGBT gate driver
- Air conditioner and washing Machine
- Universal Inverter / Driver system

TYPICAL APPLICATION CIRCUIT



PIN DESCRIPTION



SOP8, M8

Top View

Pin #	Symbol	Function
1	V_{CC}	Low side and main power supply
2	HIN	Logic input for high side gate driver output (HO)
3	LIN	Logic input for low side gate driver output (LO)
4	COM	V_{SS} Ground
5	LO	Low side gate drive output, in phase with LIN
6	V_S	High side floating supply return or bootstrap return ground
7	HO	High side gate drive output, in phase with HIN
8	V_B	High side floating supply

ABSOLUTE MAXIMUM RATINGS

V_B, High Side Floating Supply		-0.3V ~ 725V
V_S, High Side Floating Supply Return		V_B -25V ~ V_B +0.3V
V_{HO}, High Side Gate Drive Output		V_S -0.3V ~ V_B +0.3V
V_{CC}, Low Side and Main Power Supply		-0.3V ~ 25V
V_{LO}, Low Side Gate Drive Output		-0.3V ~ V_{CC} +0.3V
V_{IN}, Logic input of HIN and LIN		-0.3V ~ V_{CC} +0.3V
dV_S/dt, Allowable Offset Supply Voltage Transient		50V/ns
ESD, HBM Model		1.5kV
ESD, Machine Model		500V
P_D, Package Power Dissipation @ T_A ≤25°C	SOP8	0.625W
Rth_{JA}, Thermal Resistance Junction to Ambient	SOP8	200℃/W
T_J, Junction Temperature		150℃/W
T_S, Storage Temperature		-55℃~150℃
T_L, Lead Temperature (Soldering, 10 seconds)		300℃

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

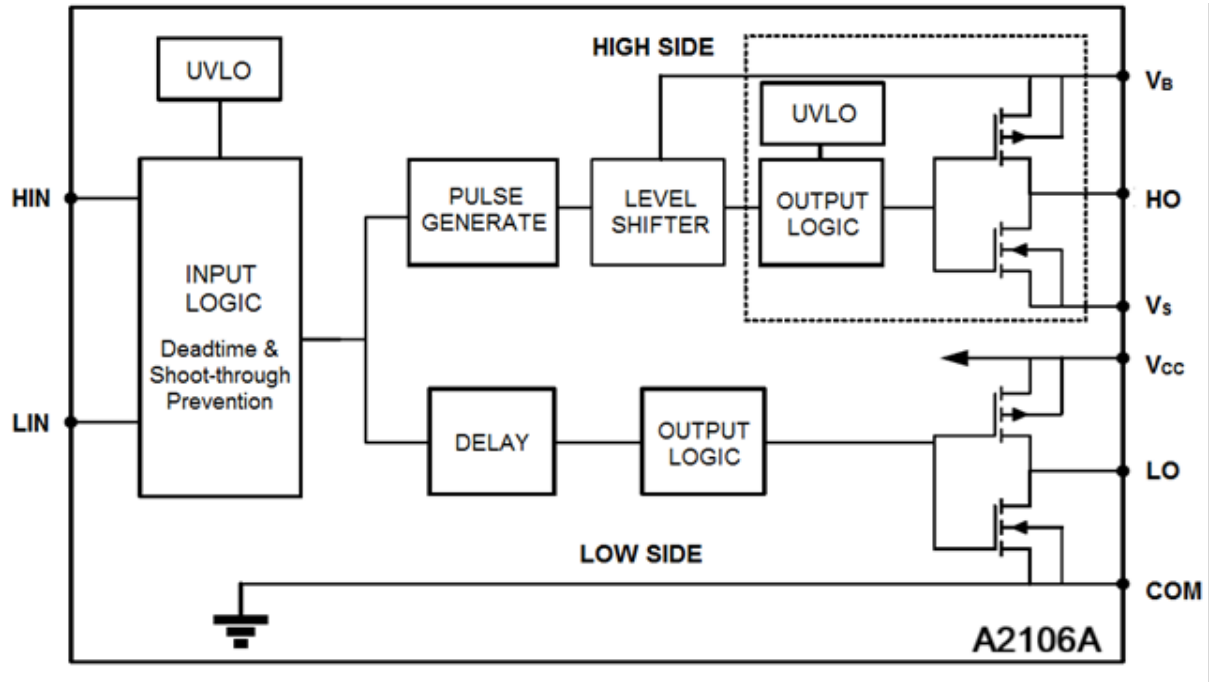
Parameter	Symbol	Min.	Max.	Units
High Side Floating Supply	V_B	V_S +10	V_S +20	V
High Side Floating Supply Return	V_S	-9	700	V
High Side Gate Drive Output Voltage	V_{HO}	V_S	V_B	V
Low Side Supply	V_{CC}	10	20	V
Low Side Gate Drive Output Voltage	V_{LO}	0	V_{CC}	V
Logic Input Voltage(HIN &LIN)	V_{IN}	0	V_{CC}	V
Ambient Temperature	T_A	-40	125	℃

ELECTRICAL CHARACTERISTICS

V_{BIAS} (V_{CC}, V_{BS}) = 15V, C_L = 1000pF and T_A = 25°C, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Dynamic						
Turn-on propagation delay	t_{on}		-	130	200	ns
Turn-off propagation delay	t_{off}		-	130	200	
Dead time	DT		80	100	190	
Delay matching	MT		-	-	50	
Turn-On Rise Time	t_r		-	75	130	
Turn-Off Fall Time	t_f		-	35	70	
Static						
Logic “1”(HIN+LIN) Input Voltage	V_{IH}	V_{CC}=10V to 20V	2.5	-	-	V
Logic “0” (HIN+LIN) Input Voltage	V_{IL}	V_{CC}=10V to 20V	-	-	0.8	
High Level Output Voltage, V_{BIAS} - V_O	V_{OH}	I_O=0A	-	-	0.1	
Low Level Output Voltage, V_O	V_{OL}	I_O=0A	-	-	0.1	
Quiescent V_{CC} Supply Current	I_{QCC}	V_{IN}=0V or 5V	-	120	240	μA
Quiescent V_B Supply Current	I_{QBS}	V_{IN}=0V or 5V	-	50	100	
Leakage Current from V_S(700V) to GND	I_{LK}	V_B=V_S=700V	-	-	50	
Logic “1” Input Bias Current	I_{IN}+	HIN=5V, LIN=5V	-	5	10	
Logic “0” Input Bias Current	I_{IN}-	HIN=0V, LIN=0V	-	-	2	
V_{BS} Supply UVLO Threshold	V_{BSU}+		8	8.9	9.8	V
	V_{BSU}-		7.4	8.2	9.0	
V_{CC} Hysteresis Voltage	$V_{CCUVHYS}$		-	0.7	-	
V_{CC} Supply UVLO Threshold	V_{CCU}+		8	8.9	9.8	
	V_{CCU}-		7.4	8.2	9.0	
Output Source Current	I_O+	V_O=0V P_W≤10us	200	300	-	mA
Output Sink Current	I_O-	V_O=0V P_W≤10us	400	600	-	

BLOCK DIAGRAM



LOGIC FUNCTION & TIMING SPEC

Fig 1. Input/Output Timing Diagram

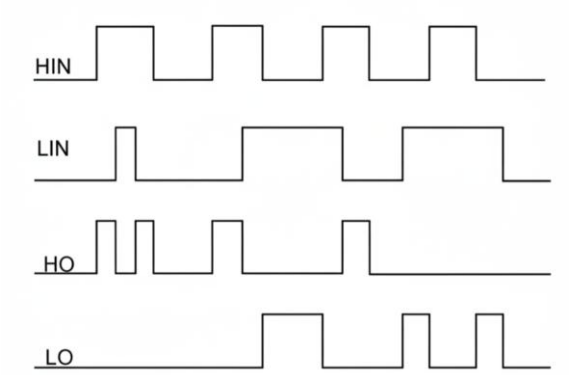
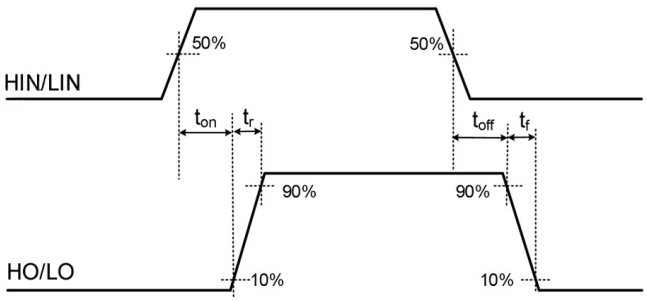
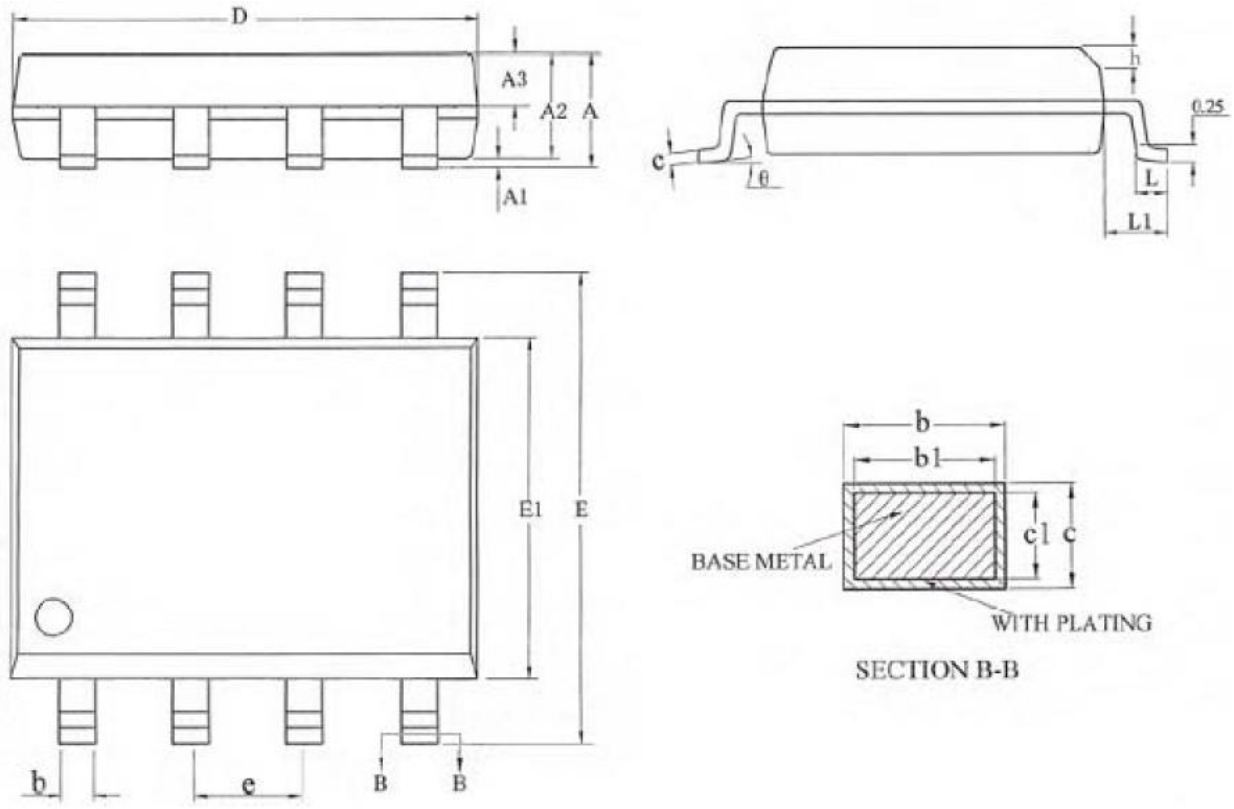


Fig 2. Switching Time Waveform Definitions



PACKAGE INFORMATION

Dimension in SOP8 (Unit: mm)



Symbol	Min.	Max.
A	-	1.75
A1	0.10	0.225
A2	1.30	1.50
A3	0.60	0.70
b	0.39	0.48
b1	0.38	0.43
c	0.21	0.26
c1	0.19	0.21
D	4.70	5.10
E	5.80	6.20
E1	3.70	4.10
e	1.27 BSC	
h	0.25	0.50
L	0.50	
L1	1.05 BSC	
θ	0°	8°

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