DESCRIPTION

The AG2104 is a high voltage, high speed power MOSFET and IGBT driver based on P_SUB P_EPI process. The floating channel driver can be used to drive two N-channel power MOSFET or IGBT in a half-bridge configuration which operates up to 600V. Logic inputs are compatible with standard CMOS or LSTTL output, down to 3.3V logic. The output drivers feature a high pulse current buffer stage designed for minimum driver cross conduction. Propagation delays are matched to simplify use in high frequency applications.

AG2104 is available in a SOP8 package.

FEATURES

- Fully operational to +600V
- 3.3V logic compatible
- dV/dt Immunity ±50V/nsec
- Floating channel designed for bootstrap operation
- Gate drive supply range from 10V to 20V
- UVLO for low side channels
- Output Source / Sink Current Capability 400mA /650mA
- Cross Conduction Protection with 520ns Internal Fixed Dead Time
- -10V negative Vs ability
- Matched propagation delay for both channels
- Available in a SOP8 package.

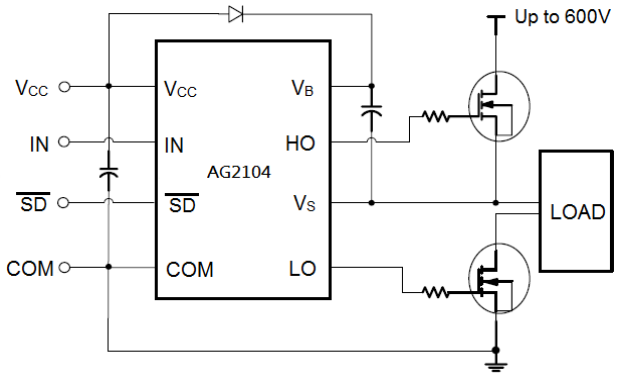
ORDERING INFORMATION

Package Type	Part Number	
SOP8 SPQ: 4,000pcs/Reel	M8	AG2104M8R
		AG2104M8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

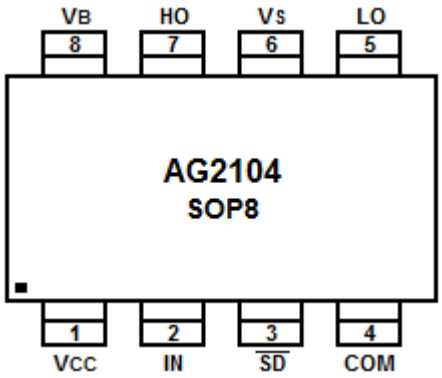
APPLICATION

- Small and medium- power motor driver
- Power MOSFET or IGBT driver

TYPICAL APPLICATION CIRCUIT



PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	V_{CC}	Low side and main power supply
2	IN	Logic input for high and low side gate driver output (HO/LO)
3	$\overline{SD}$	Logic input for shutdown
4	COM	Ground
5	LO	Low side gate drive output
6	V_S	High side floating supply return
7	HO	High side gate drive output
8	V_B	High side floating supply

ABSOLUTE MAXIMUM RATINGS

V_B, High Side Floating Supply		-0.3V ~ 622V
V_S, High Side Floating Supply Return		V_B -22V ~ 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 ~ 22V
V_{LO}, Low Side Gate Drive Output		-0.3V ~ V_{CC} +0.3V
V_{IN}, Logic Input of IN & $\overline{SD}$		-0.3V ~ V_{CC} +0.3V
dVS/dt, Allowable Offset Supply Voltage Transient		50V/ns
ESD, HBM Model		2.5kV
ESD, Machine Model		200V
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℃
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

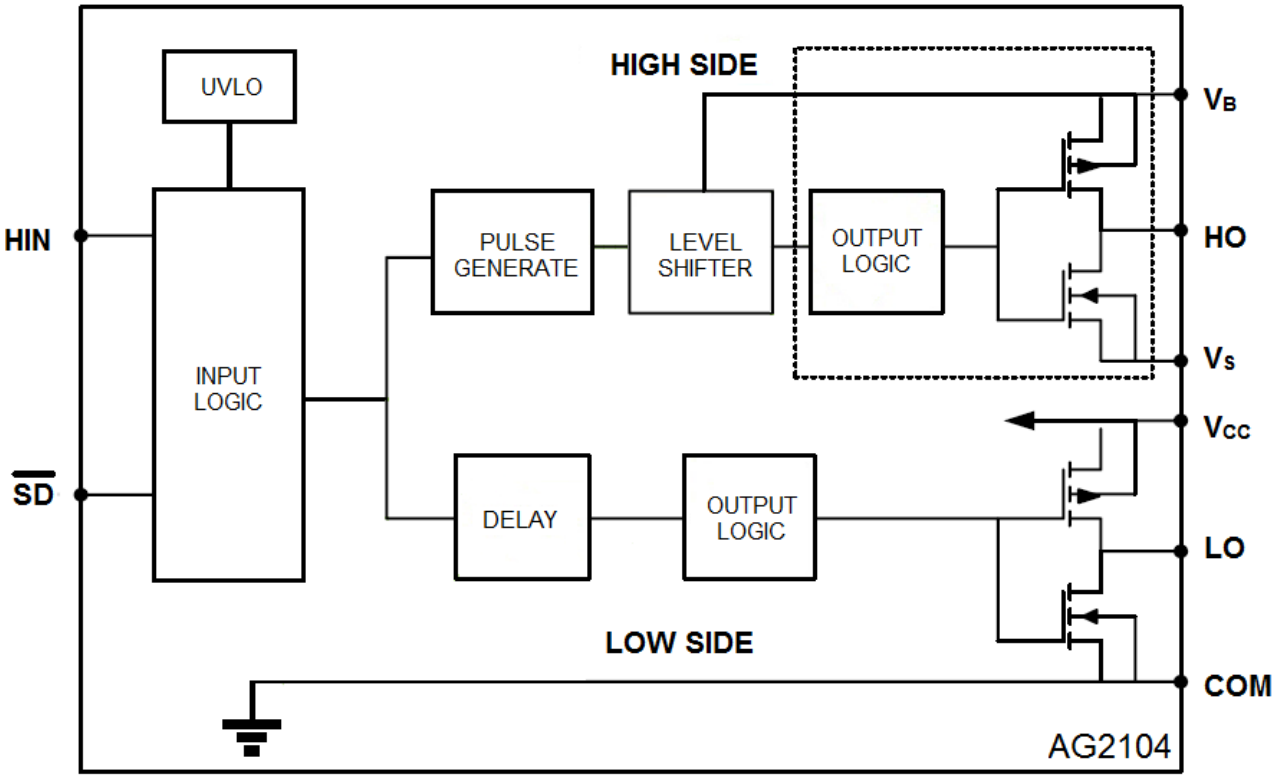
Parameter	Symbol	Min.	Max.	Units
High Side Floating Supply	V_B	V_S +10	V_S +20	V
High Side Floating Supply Return	V_S	-	600	V
High Side Gate Drive Output Voltage	V_{HO}	V_S	V_B	V
Low Side Supply	V_{CC}	10	20	V
Low Side Gate Drive Output Voltage	V_{LO}	0	V_{CC}	V
Logic Input Voltage(IN & $\overline{SD}$)	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.

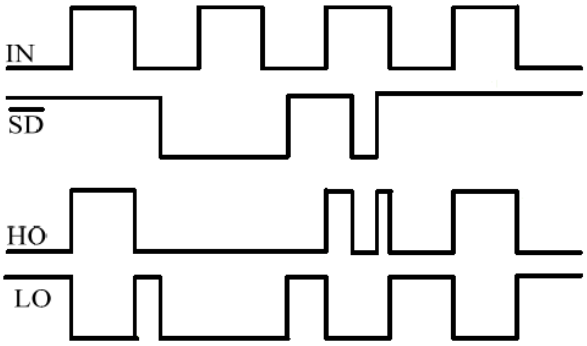
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Dynamic Electrical Characteristics						
Turn-On Propagation Delay	t_{on}		-	650	800	ns
Turn-Off Propagation Delay	t_{off}		-	140	210	
Shutdown Propagation Delay	t_{sd}		-	140	210	
Dead TIME, LS Turn-Off to HS Turn-On & HS Turn-On to LS Turn-Off	DT		-	520	650	
Delay Matching	MT		-	-	60	
Turn-On Rise Time	t_r		-	70	140	
Turn-Off Fall Time	t_f		-	50	90	
Static Electrical Characteristics						
Logic “1”(IN) Input Voltage	V_{IH}		3	-	-	V
Logic “0” (IN) Input Voltage	V_{IL}		-	-	0.8	
$\overline{SD}$ Input Positive Going Threshold	$V_{SD,TH}$+		3	-	-	
$\overline{SD}$ Input Negative Going Threshold	$V_{SD,TH}$-		-	-	0.8	
High Level Output Voltage, V_{BIAS} - V_O	V_{OH}		-	-	0.1	
Low Level Output Voltage, V_O	V_{OL}		-	-	0.1	
Quiescent V_{CC} Supply Current	I_{QCC}		-	150	270	µA
Quiescent V_B Supply Current	I_{QB}		-	30	55	
Leakage Current from V_S(600V) to GND	I_{LK}		-	-	50	
Logic “1” Input Bias Current	I_{IN}+		-	6	15	
Logic “0” Input Bias Current	I_{IN}-		-	-	1	
V_{CC} Supply UVLO Threshold	V_{CCU}+		-	8.7	-	V
	V_{CCU}-		-	8	-	
Output High Short Circuit Pulsed Current	I_O+		-	400	-	mA
Output Low Short Circuit Pulsed Current	I_O-		-	650	-	

BLOCK DIAGRAM

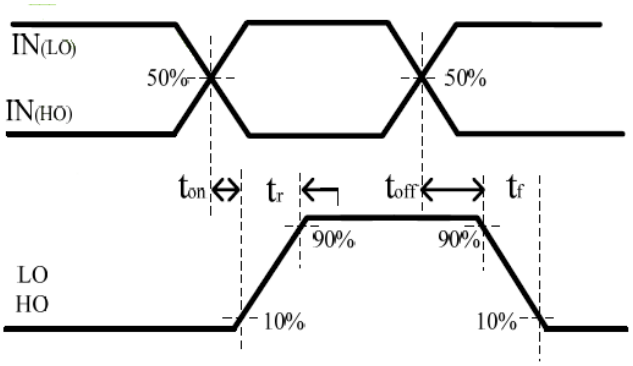


DETAILED INFORMATION

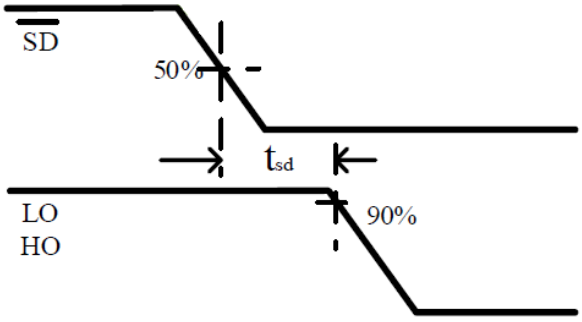
Logic Function & Timing Spec



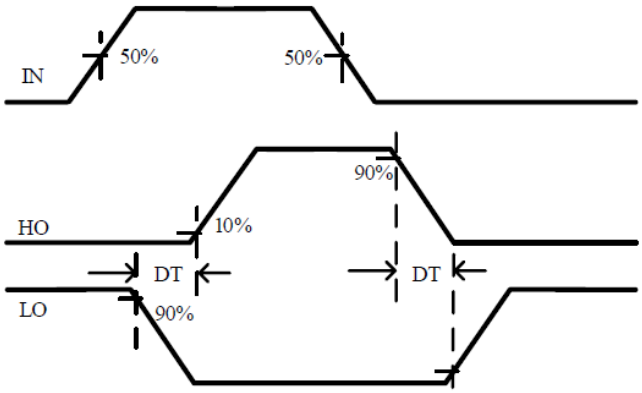
Input / Ouptut Timing Diagram



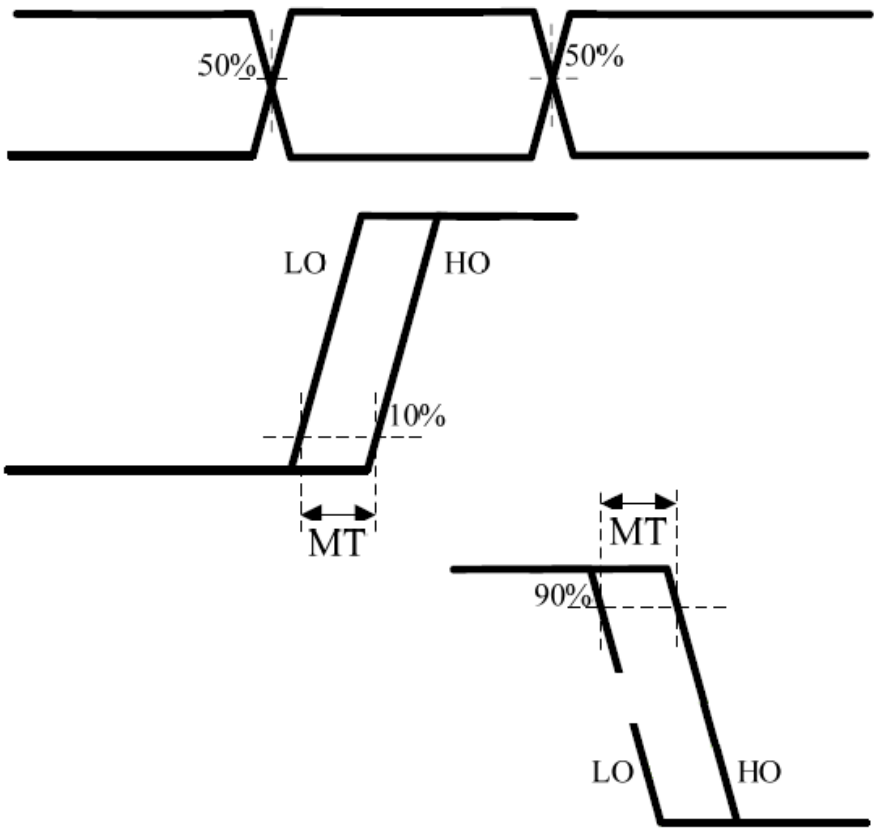
Switching Time Waveform Definitions



Shutdown Waveform Definitions



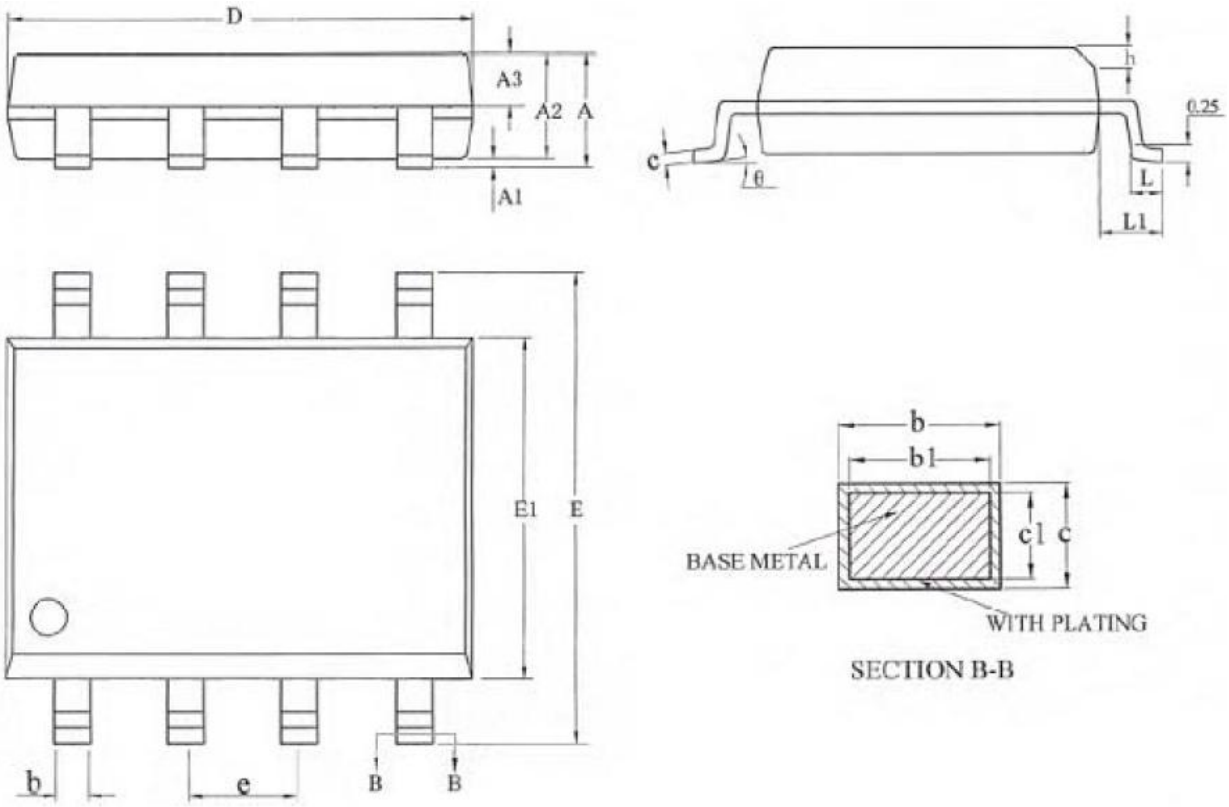
Dead time Waveform Definitions



Delay Matching 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	0.80
L1	1.05 BSC	
θ	0°	8°

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