



DESCRIPTION

The AG6388 is a high-voltage, high-speed power MOSFET driver featuring independent high-side and low-side referenced output channels.

Proprietary HVIC and latch-immune CMOS technologies enable robust and reliable monolithic construction. The logic inputs are compatible with standard CMOS and LSTTL levels, supporting logic operation down to 3.3 V.

The floating high-side channel is designed to drive an N-channel power MOSFET in high-side configurations, supporting operation up to 600 V.

AG6388 is available in a SOP-8 package.

FEATURES

- Floating channel designed for bootstrap operation
- Fully operational up to +650 V
- Compatible with 3.3 V, 5 V, and 15 V logic inputs
- dV/dt immune with high tolerance to negative transient voltage
- Allowable negative VS capability: -9 V
- Undervoltage lockout (UVLO) for both channels:
VCC UVLO: 8.7 V (typ.) / 7.7 V (typ.)
VBS UVLO: 8.2 V (typ.) / 7.3 V (typ.)
- Fast switching performance:
Turn-On/Off delay (tON / tOFF): 250 / 150 ns
Propagation delay matching: < 50 ns
- Built-in shoot-through prevention:
Dead time: 130 ns
- High output drive capability:
Source current: 0.6 A / Sink current: 1.0 A
- Operating temperature range: -40°C to +125°C

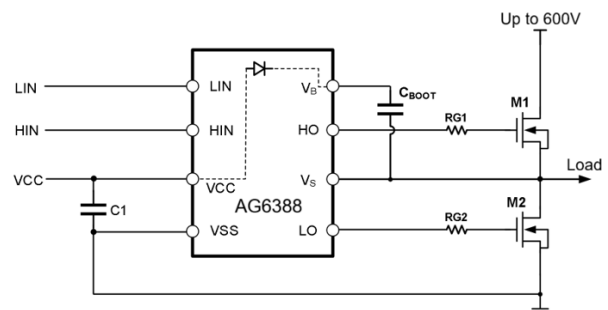
ORDERING INFORMATION

Package Type	Part Number	
SOP8 SPQ: 4,000pcs/Reel	M8	AG6388M8R
		AG6388M8VR
Note	V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

APPLICATION

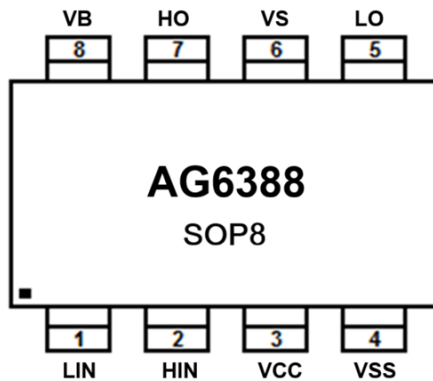
- Motor Control
- Air Conditioners/ Washing Machines
- General Purpose Inverters
- Micro/Mini Inverter Drives

TYPICAL APPLICATION CIRCUIT





PIN DESCRIPTION



SOP8, M8

Top View

Pin #	Symbol	Function
1	LIN	Logic input for the low-side gate driver output (LO), in phase.
2	HIN	Logic input for the high-side gate driver output (HO), in phase
3	VCC	Supply voltage for the low-side driver and logic circuits
4	VSS	Return path for the low-side driver
5	LO	Gate driver output for the low-side power MOSFET
6	VS	Return path for the high-side floating supply
7	HO	Gate driver output for the high-side power MOSFET
8	VB	Floating supply for the high-side gate driver



ABSOLUTE MAXIMUM RATINGS

V_B , High side floating supply -		-0.3V ~ 650V
V_S , High Side Floating Supply Return		$V_B - 25V \sim V_B + 0.3V$
V_{HO} , High Side Gate Drive Output		$V_S - 0.3V \sim V_B + 0.3V$
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 @ $T_A \leq 25^\circ C$	SOP8	0.625W
R_{thJA} , Thermal Resistance Junction to Ambient	SOP8	200°C/W
T_J , Junction Temperature		150°C/W
T_S , Storage Temperature		-55°C~150°C
T_L , Lead Temperature (Soldering, 10 seconds)		300°C

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	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 (HIN & LIN)	V_{IN}	0	V_{CC}	V
Ambient Temperature	T_A	-40	125	°C



ELECTRICAL CHARACTERISTICS

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

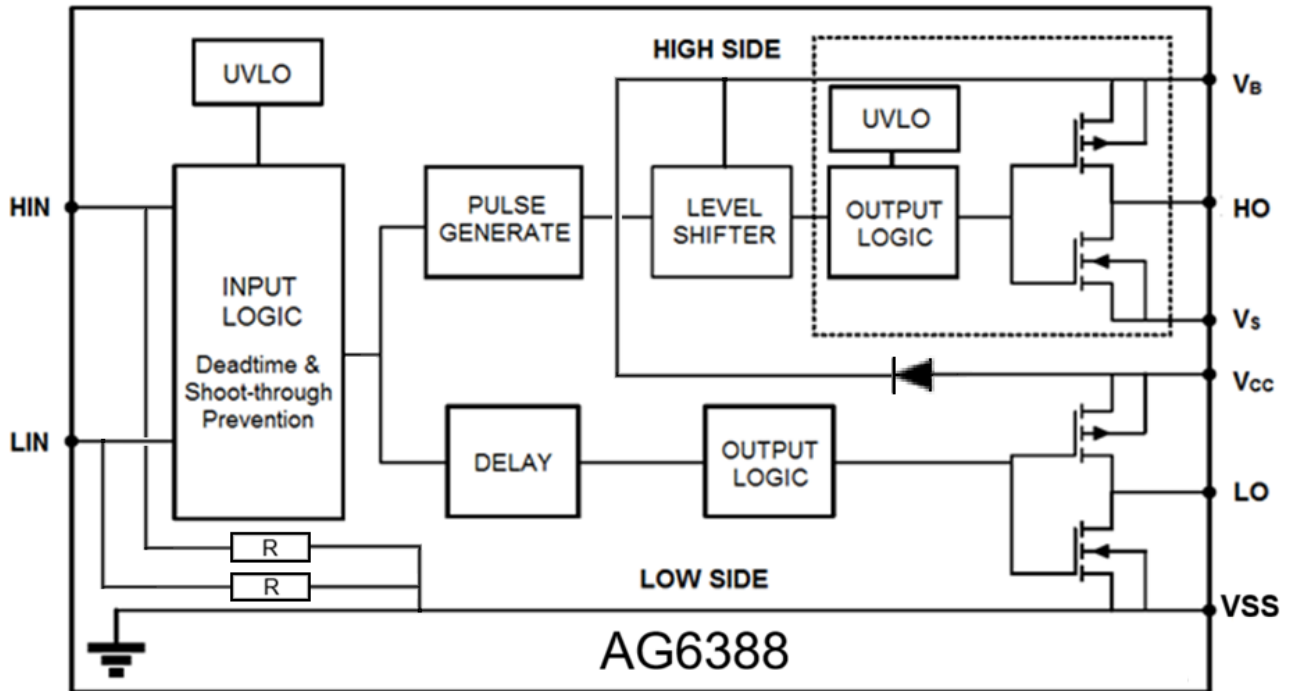
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Dynamic						
Turn-on propagation delay	t_{on}	$V_S=0V$	-	250	200	ns
Turn-off propagation delay	t_{off}	$V_S=600V$	-	150	200	
Dead time	DT		-	130	220	
Delay matching	MT		-	-	50	
Turn-On Rise Time	t_r		-	70	130	
Turn-Off Fall Time	t_f		-	35	70	

$V_{BIAS} (V_{CC}, V_{BS}) = 15V$, $T_A = 25^\circ C$, unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
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}	$I_O=0A$	-	-	0.2	
Low Level Output Voltage, V_O	V_{OL}	$I_O=0A$	-	-	0.2	
Quiescent V_{CC} Supply Current	I_{QCC}	LIN/HIN Floating	-	60	150	μA
Quiescent V_B Supply Current	I_{QBS}	LIN/HIN Floating	-	35	100	
High-side floating supply leakage current	I_{LK}	$V_B=V_S=600V$	-	-	50	
Logic "1" Input Bias Current	I_{IN+}	HIN=5V, LIN=5V	-	25	60	
Logic "0" Input Bias Current	I_{IN-}	HIN=0V, LIN=0V	-	-	5	
V_{BS} Supply UVLO Threshold	V_{BSU+}		7.2	8.2	9.2	V
	V_{BSU-}		6.3	7.3	8.3	
V_{CC} UVLO Hysteresis Voltage	$V_{CCUVHYS}$		-	1	-	
V_{BS} UVLO Hysteresis Voltage	$V_{BSUVHYS}$			0.9		
V_{CC} Supply UVLO Threshold	V_{CCU+}		7.7	8.7	9.7	
	V_{CCU-}		6.7	7.7	8.7	
Output high short circuit pulse current	I_{O+}	$V_O=0V$ $P_w \leq 10\mu s$	270	600	-	mA
Output low short circuit pulse current	I_{O-}	$V_O=0V$ $P_w \leq 10\mu s$	400	1000	-	
Bootstrap diode on-state equivalent resistance	$R_{DS(ON)}$			100		Ω



BLOCK DIAGRAM



DETAILED INFORMATION

Fig1. AG6388 Input and Output Timing Waveform

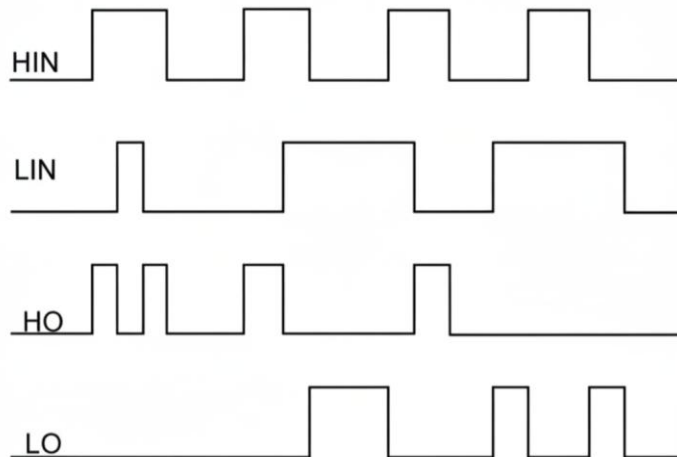




Fig2. Propagation Time Waveform Definition

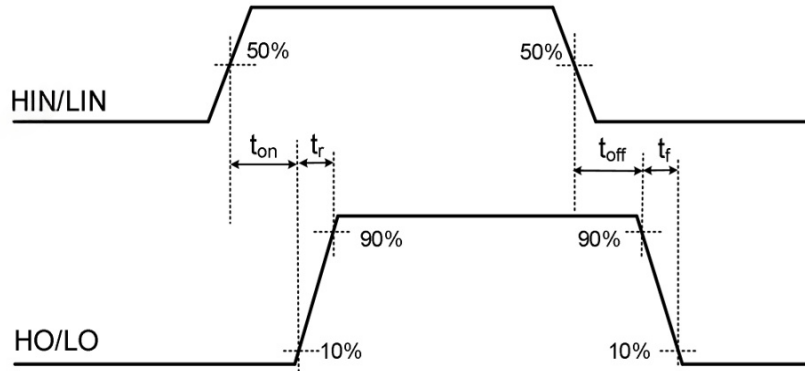
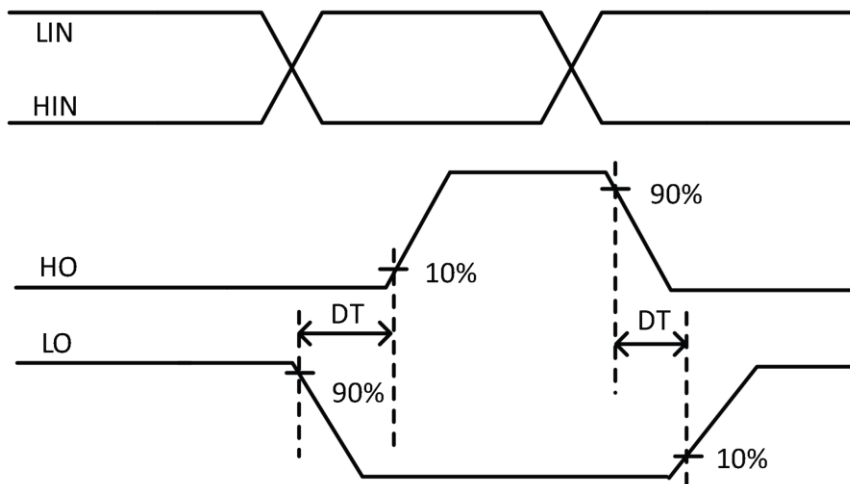


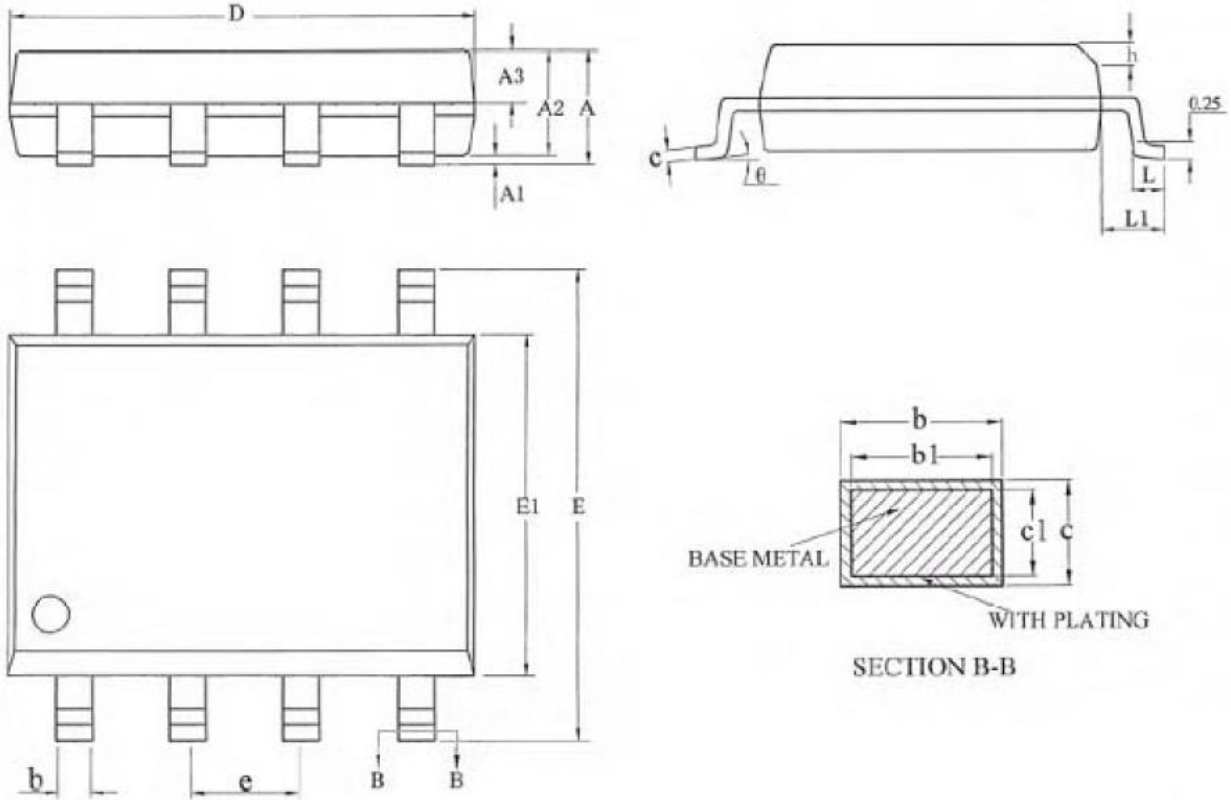
Fig3. Shoot through prevention delay waveform definition





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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