DESCRIPTION

The devices are full bridge drivers to control power devices like MOS-transistors or IGBTs in 3-phase systems with a maximum blocking voltage of +600 V.

The six independent drivers are controlled at the low-side using CMOS and LSTTL compatible signals, down to 3.3V logic. The device includes an under-voltage detection unit with hysteresis characteristic and over -current detection. The over -current level is adjusted by choosing the resistor value and the threshold level at pin ITRIP. Both error conditions (under-voltage and over-current) lead to a definite shut down of all six switches. An error signal is provided at the $\overline{\text{FAULT}}$ open drain output pin. The blocking time after over -current can be adjusted with an RC-network at pin RCIN. Therefore, the resistor R_{RCIN} is optional. The typical output current can be given with 200mA for pull-up and 400mA for pull down. Because of system safety reasons a 0.29us dead time has been realized. The function of inputs EN and ITRIP can optionally be extended with over-temperature detection, using an external NTC resistor, diodes and resistor network.

APPLICATIONS

- Three phase motor drives
- Industrial inverters.
- General purpose three phase inverters

FEATURES

- Drives up to six IGBT/MOSFET power devices
- All high side channels fully operate up to +600V
- Gate drive supplies up to 18 V per channel
- Under-voltage lockout for all channels
- Over-current protection
- Flexible over-temperature shutdown input
- Advanced input filter
- Built-in dead-time protection
- Shoot-through (cross-conduction) protection
- Independent Enable/disable input and fault reporting
- Shutdown all switches during error conditions
- Adjustable fault clear timing
- Separate logic and power grounds
- 3.3 V/5V input logic compatible
- Designed for use with bootstrap power supplies
- Matched propagation delays for all channels
- Matched dead time
- -40°C to 125°C operating range
- SOP28 Package available
- Lead-free

INPUT LOGIC

| Part	Input Logic
PT5616	LIN / HIN
PT5616A	$\overline{\text{LIN}}$ / $\overline{\text{HIN}}$

PT5616 TYPICAL APPLICATION
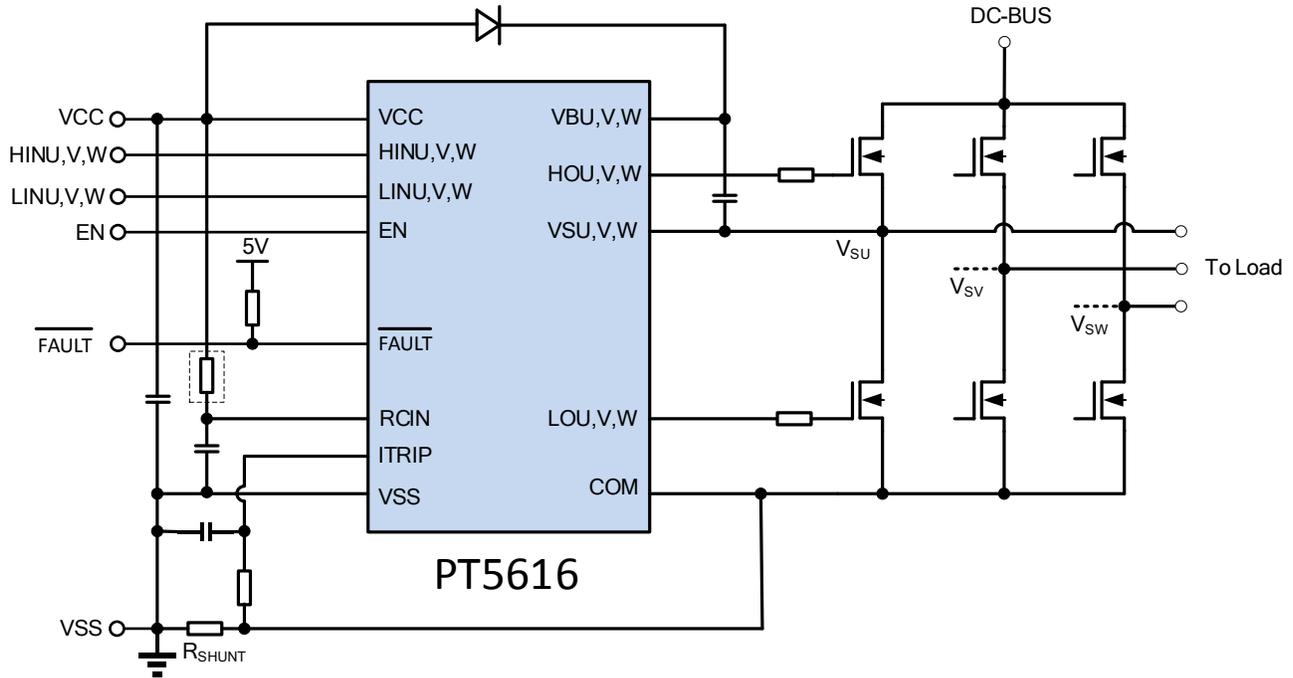
PT5616A TYPICAL APPLICATION
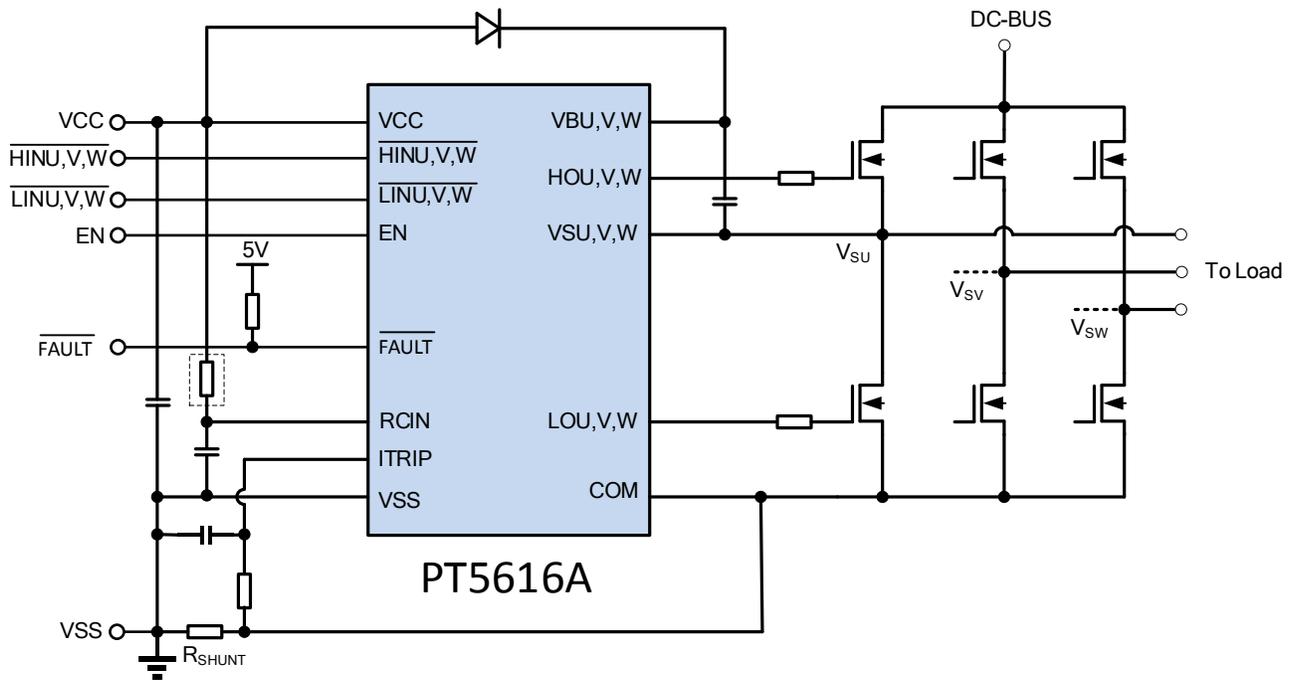
PT5616 BLOCK DIAGRAM
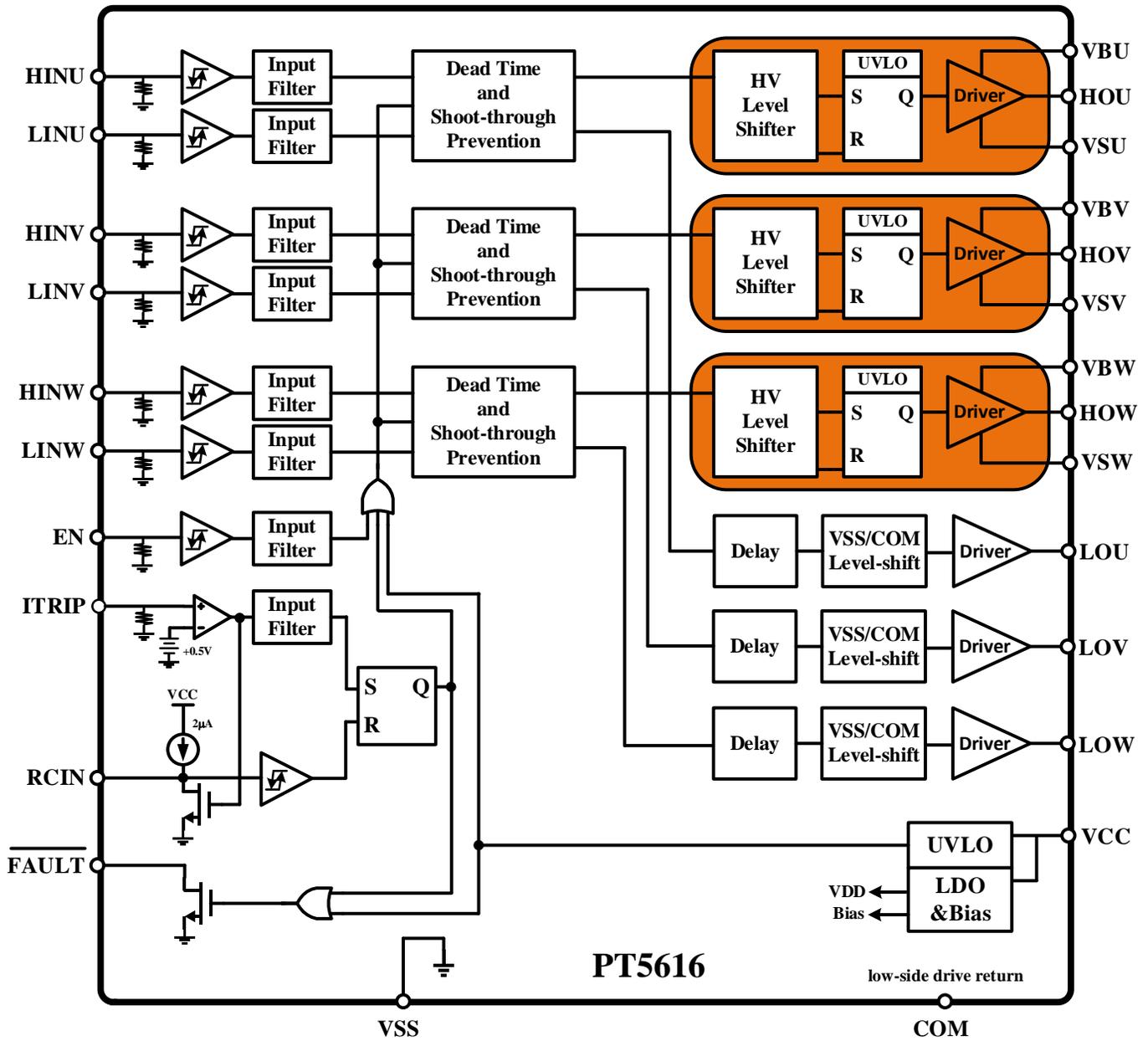
PT5616

PT5616A BLOCK DIAGRAM
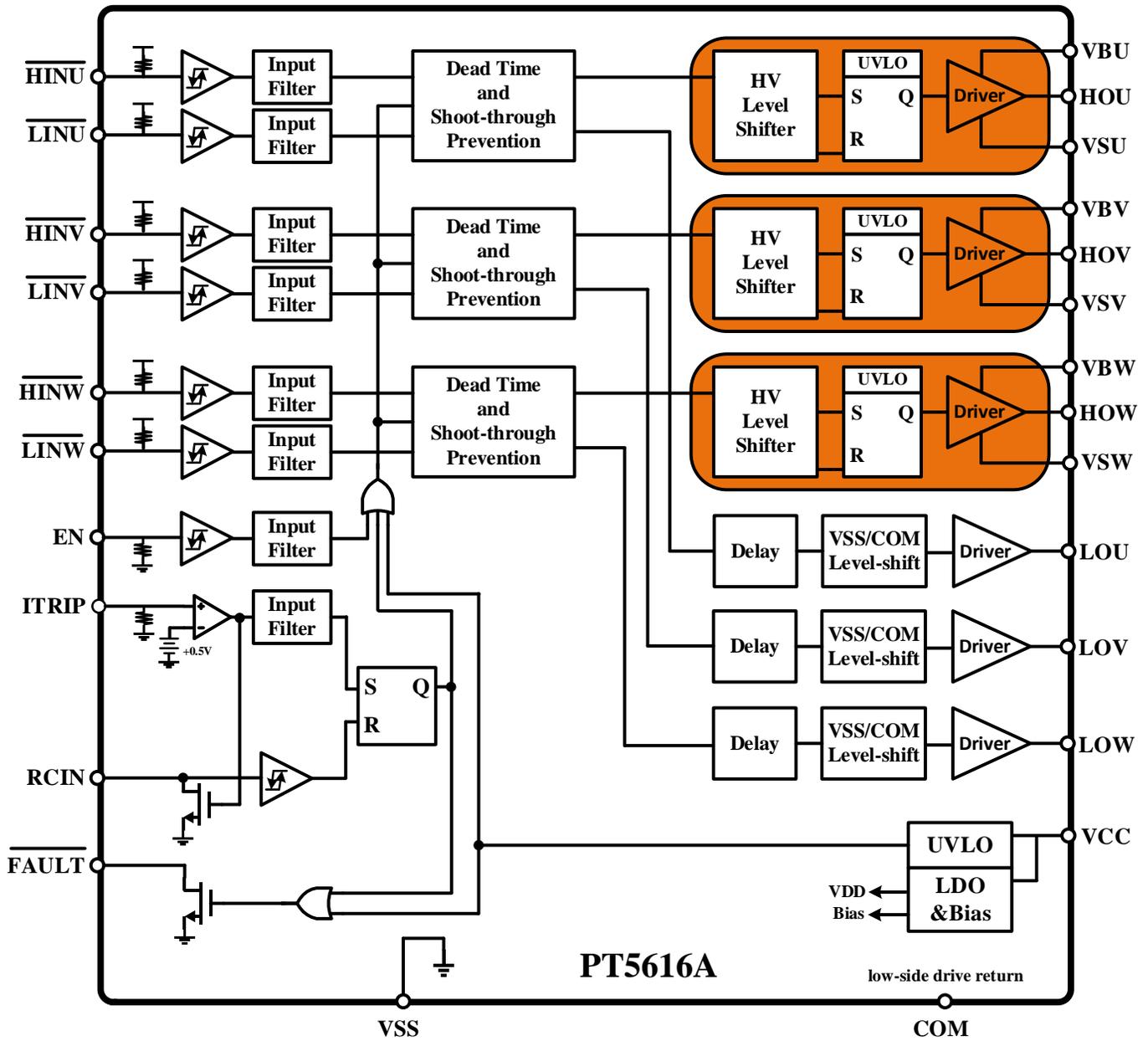
ORDER INFORMATION

Valid Part Number	Package Type	Top Code
PT5616-S	28-SOP, 300MIL	PT5616-S
PT5616A-S	28-SOP, 300MIL	PT5616A-S

PIN CONFIGURATION

Pin	PT5616 SOP28		Pin
1	VCC	VBU	28
2	HINU	HOU	27
3	HINV	VSU	26
4	HINW	NC	25
5	LINU	VBV	24
6	LINV	HOV	23
7	LINW	VSV	22
8	$\overline{\text{FAULT}}$	NC	21
9	ITRIP	VBW	20
10	EN	HOW	19
11	RCIN	VSW	18
12	VSS	NC	17
13	COM	LOU	16
14	LOW	LOV	15

Pin	PT5616A SOP28		Pin
1	VCC	VBU	28
2	$\overline{\text{HINU}}$	HOU	27
3	$\overline{\text{HINV}}$	VSU	26
4	$\overline{\text{HINW}}$	NC	25
5	$\overline{\text{LINU}}$	VBV	24
6	$\overline{\text{LINV}}$	HOV	23
7	$\overline{\text{LINW}}$	VSV	22
8	$\overline{\text{FAULT}}$	NC	21
9	ITRIP	VBW	20
10	EN	HOW	19
11	RCIN	VSW	18
12	VSS	NC	17
13	COM	LOU	16
14	LOW	LOV	15

PIN DESCRIPTION

Pin Name	Description	Pin No.
VCC	Logic and low-side gate drivers power supply voltage	1
HINU $\overline{\text{HINU}}$	Logic inputs for high-side gate driver outputs (phase U); PT5616A input is out-phase with output	2
HINV $\overline{\text{HINV}}$	Logic inputs for high-side gate driver outputs (phase V); PT5616A input is out-phase with output	3
HINW $\overline{\text{HINW}}$	Logic inputs for high-side gate driver outputs (phase W); PT5616A input is out-phase with output	4
LINU $\overline{\text{LINU}}$	Logic inputs for low-side gate driver outputs (phase U); PT5616A input is out-phase with output	5
LINV $\overline{\text{LINV}}$	Logic inputs for low-side gate driver outputs (phase V); PT5616A input is out-phase with output	6
LINW $\overline{\text{LINW}}$	Logic inputs for low-side gate driver outputs (phase W); PT5616A input is out-phase with output	7
$\overline{\text{FAULT}}$	Indicates over-current, over-temperature (ITRIP), or low-side under-voltage lockout has occurred. This pin has negative logic and an open-drain output. The use of over-current and over-temperature protection requires the use of external components.	8
ITRIP	Analog input for over-current shutdown. When active, ITRIP shuts down outputs and activates $\overline{\text{FAULT}}$ and RCIN low. When ITRIP becomes inactive, $\overline{\text{FAULT}}$ stays active low for an externally set time t_{FLTCLR}, then automatically becomes inactive (open-drain high impedance).	9
EN	Logic input to shutdown functionality. Logic functions when EN is high (i.e., positive logic). No effect on $\overline{\text{FAULT}}$ and not latched. EN can also be extended as input of over-temperature protection when equipped with an external NTC resistor.	10
RCIN	An external RC network input used to define the FAULT CLEAR delay (t_{FLTCLR}) approximately equal to R*C. When RCIN > 8 V, the $\overline{\text{FAULT}}$ pin goes back into an open-drain high-impedance state.	11
VSS	Logic ground	12
COM	Low-side gate drive return	13
LOW	Low-side gate driver W-phase output	14
LOV	Low-side gate driver V-phase output	15
LOU	Low-side gate driver U-phase output	16
NC.	Not Connected	17
VSW	High-side driver W-phase floating supply offset voltage	18
HOW	High-side driver W-phase gate driver output	19
VBW	High-side driver W-phase floating supply	20
NC.	Not Connected	21
VSV	High-side driver V-phase floating supply offset voltage	22
HOV	High-side driver V-phase gate driver output	23
VBV	High-side driver V-phase floating supply	24
NC.	Not Connected	25
VSU	High-side driver U-phase floating supply offset voltage	26
HOU	High-side driver U-phase gate driver output	27
VBU	High-side driver U-phase floating supply	28