

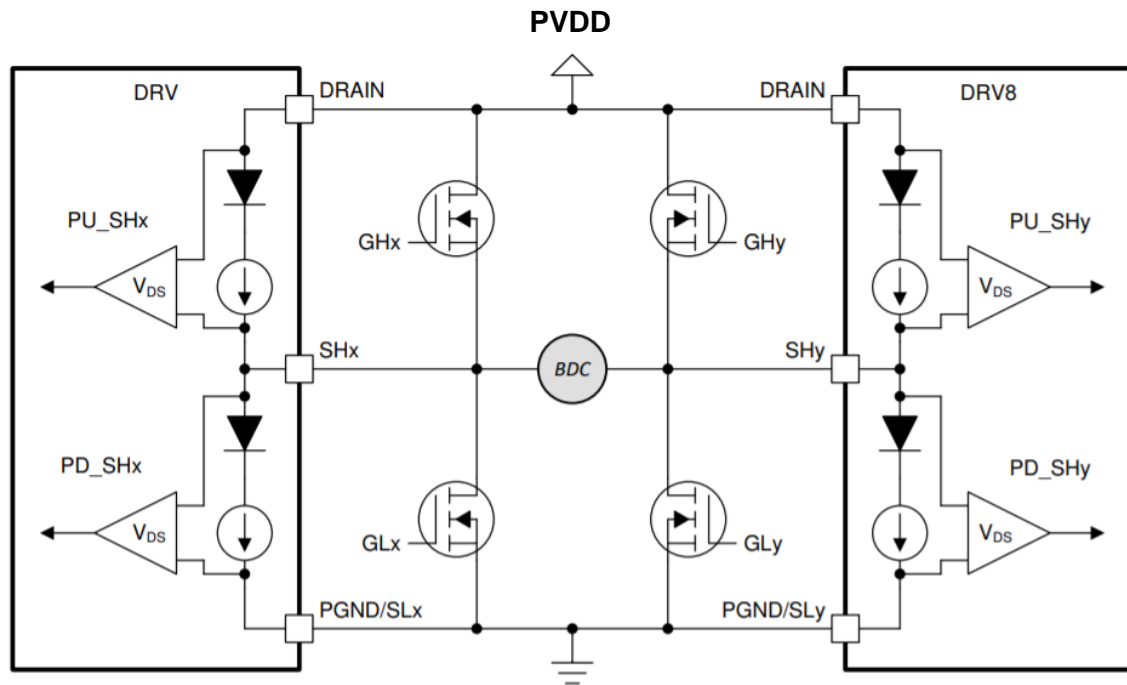
# **DRV8706 & DRV8714/8-Q1**

## **Offline Open Load and Short Circuit Implementation Example**

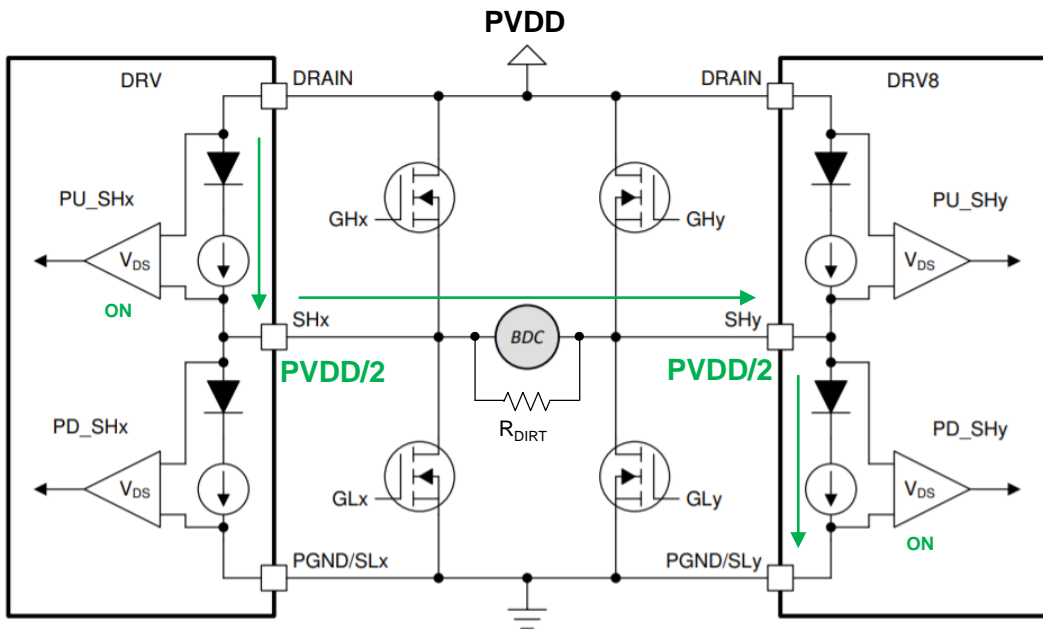
**Motor Drives**  
**BSM**

# Offline Diagnostics

- HW provided in the DRV, controlled through SPI interface by an MCU
- Pull up and pull down current sources available for each output.
- $PU\_SH_{x,y}$  &  $PD\_SH_{x,y} = \sim 3\text{ mA}$
- $V_{DS}$  monitors to detect  $SH_x$  and  $SH_y$  voltages.
- $V_{DS}$  monitors threshold can be programmed between 1 and 2V.
- Current sources enabled/disabled through SPI interface.
- Each half-bridge can be individually enabled to deal with half-bridge, H-bridge, or group/zoning configurations.
- Real-time voltage status through  $V_{DS}$  monitors SPI bits (consider capacitive or inductive delays).



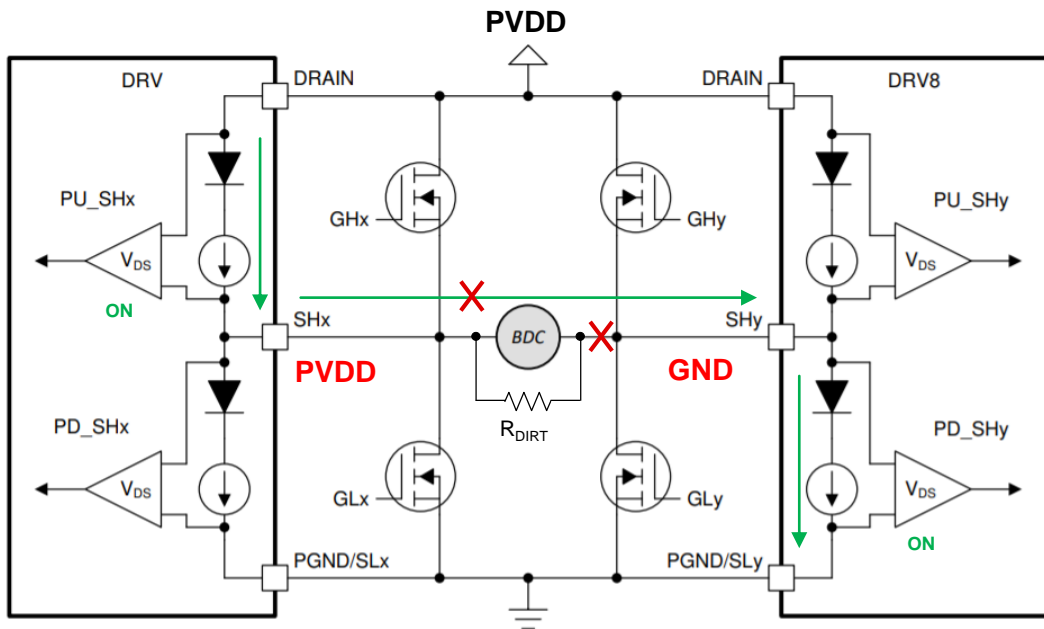
# No Fault Example



No Fault:

Voltage			
SHx	PVDD/2	SHy	PVDD/2
SPI Config. (Enable Current Sources)			
PU_SHx	1	PU_SHy	0
PD_SHx	0	PD_SHy	1
SPI Report (Read V <sub>DS</sub> Comparators)			
VDS_Hx	1	VDS_Hy	1
VDS_Lx	1	VDS_Ly	1

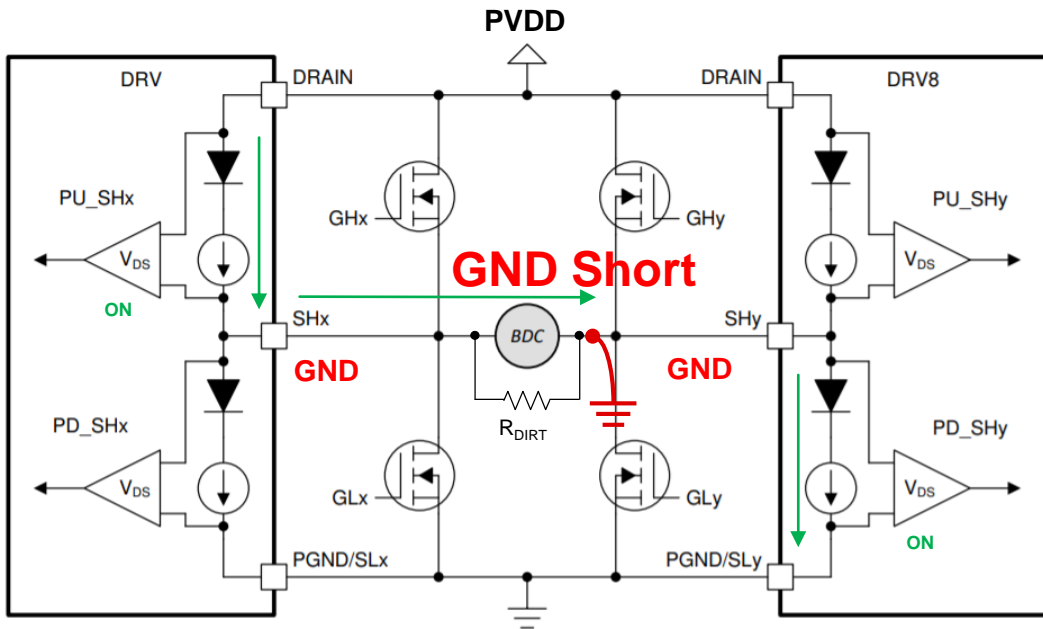
# Open Load Fault Example



Open Load Fault Detected:

Voltage			
SHx	PVDD	SHy	GND
SPI Config. (Enable Current Sources)			
PU_SHx	1	PU_SHy	0
PD_SHx	0	PD_SHy	1
SPI Report (Read $V_{DS}$ Comparators)			
VDS_Hx	0	VDS_Hy	1
VDS_Lx	1	VDS_Ly	0

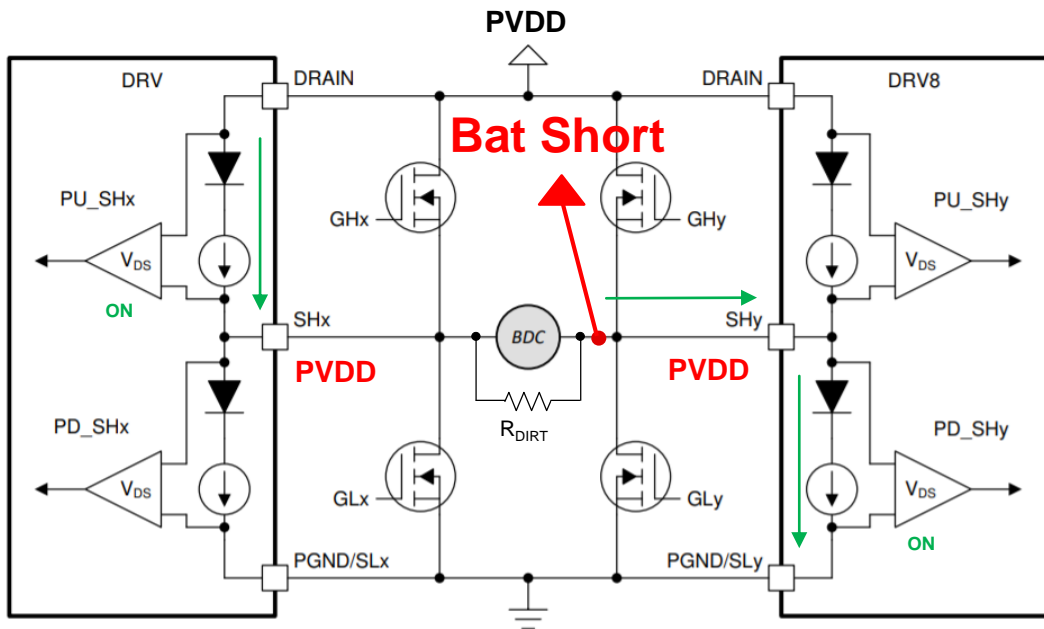
# GND Short Circuit Fault Example



**GND Short Circuit Fault Detected:**

Voltage			
SHx	GND	SHy	GND
SPI Config. (Enable Current Sources)			
PU_SHx	1	PU_SHy	0
PD_SHx	0	PD_SHy	1
SPI Report (Read V <sub>DS</sub> Comparators)			
VDS_Hx	1	VDS_Hy	1
VDS_Lx	0	VDS_Ly	0

# Battery Short Circuit Fault Example



Battery Short Circuit Fault Detected:

Voltage			
SHx	PVDD	SHy	PVDD
SPI Config. (Enable Current Sources)			
PU_SHx	1	PU_SHy	0
PD_SHx	0	PD_SHy	1
SPI Report (Read V <sub>DS</sub> Comparators)			
VDS_Hx	0	VDS_Hy	0
VDS_Lx	1	VDS_Ly	1