



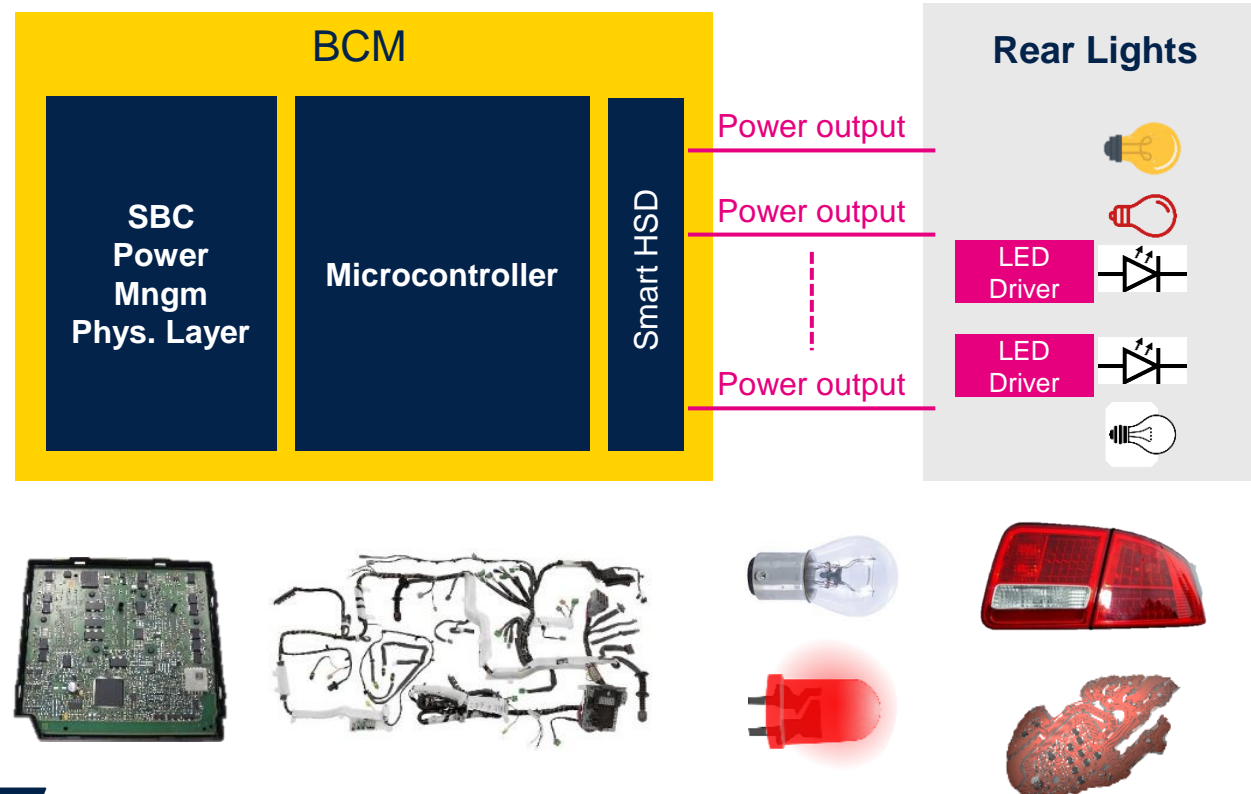
life.augmented

# ST solutions for rear LED/OLED lights

June 2020

# Rear lighting solutions

## What traditional Lighting was



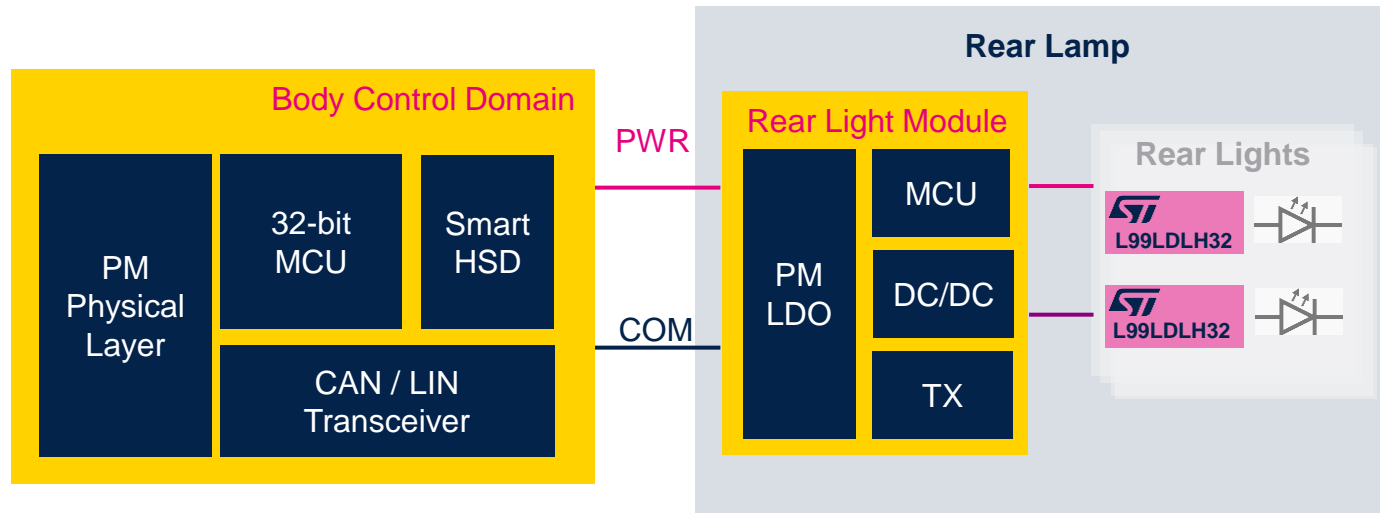
- Quasi Static, some limited Dimming
- Some Differentiation, Large Space
- High Power Consumption, weak Diagnostic
- Bulb compatible interface to BCM mandatory

### Electronic Control required...

- One Smart HSD for each light function
- PCB + lots of active and passive discretes in the rear light
- a lot of wires, 2~3 meters length, 0.75mm<sup>2</sup> size

# Rear lighting solutions

## Conversion to Full LED/OLED Rear



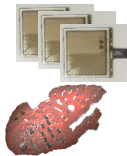
- Dynamic Animation, multifunction Dimming
- Differentiation, Branding, small Space
- Low Power Consumption, Diagnostic
- Simplification of BCM possible

### Electronic Control required...

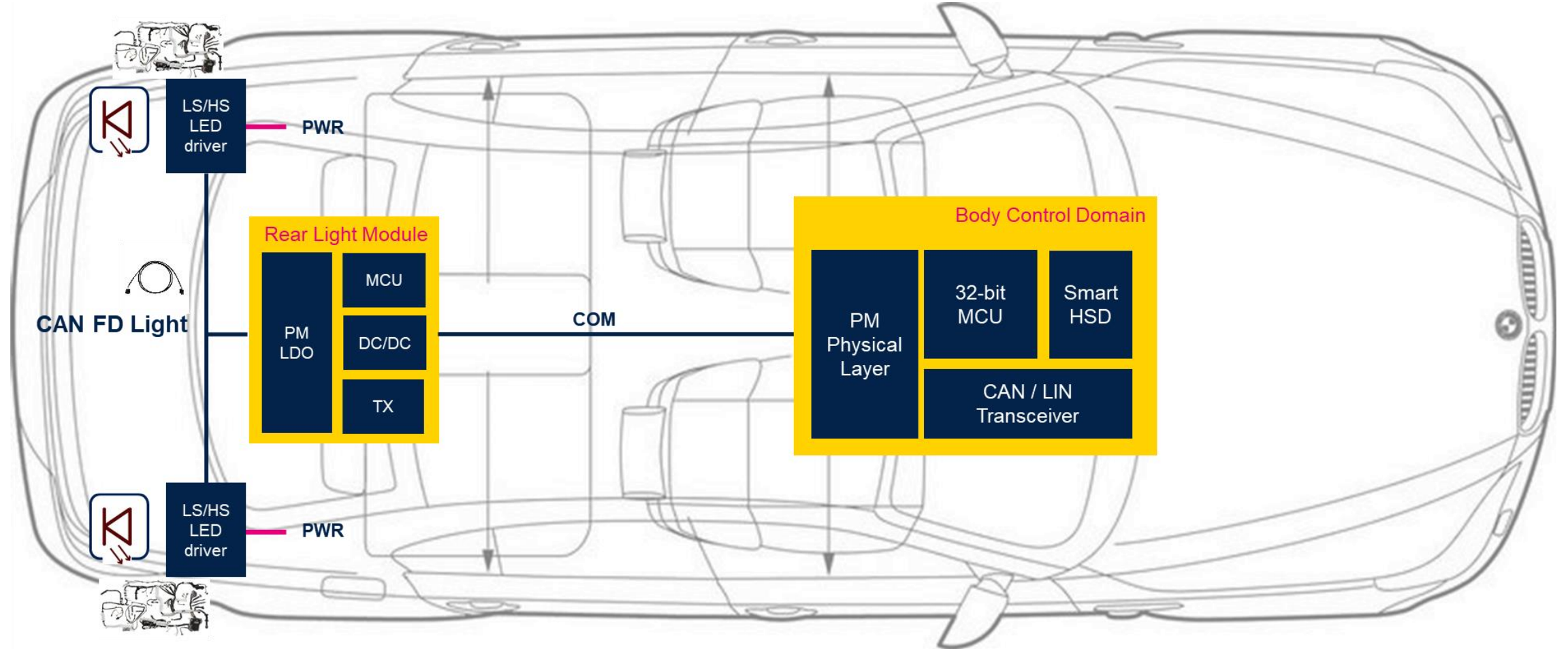
- Less Smart HSD: One per lamp section
- Rear ECUs with uC, Transceivers, Voltage Regulators, + LED Driver PCBs
- Much less wires, smaller gauge



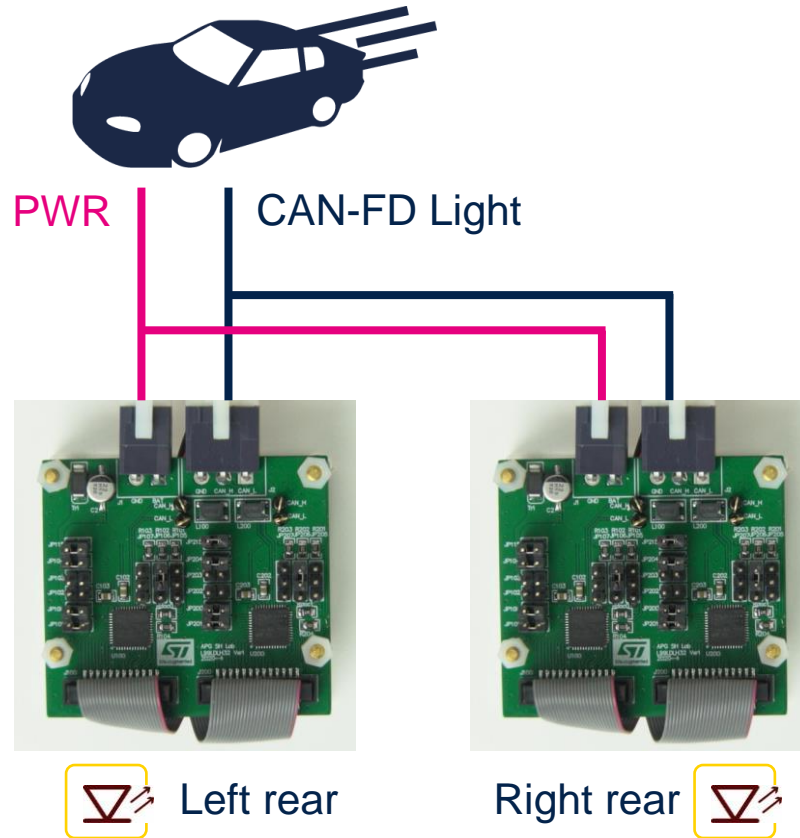
private CAN-FD Light



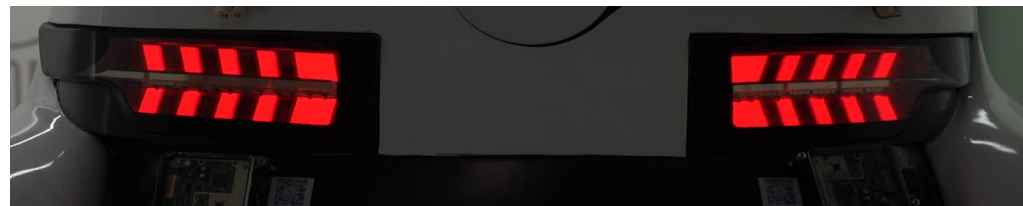
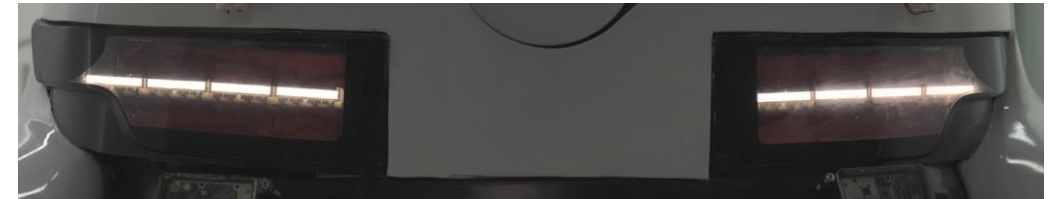
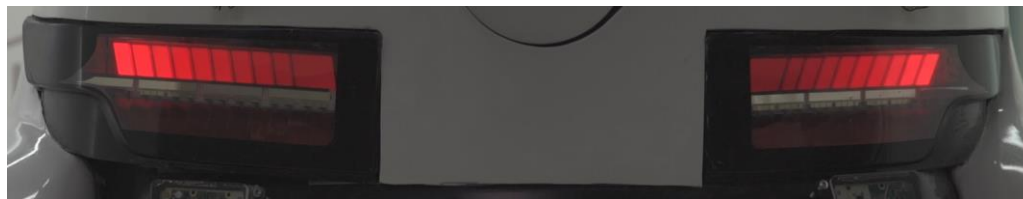
# Rear lighting: ST innovation



# Rear OLED demo



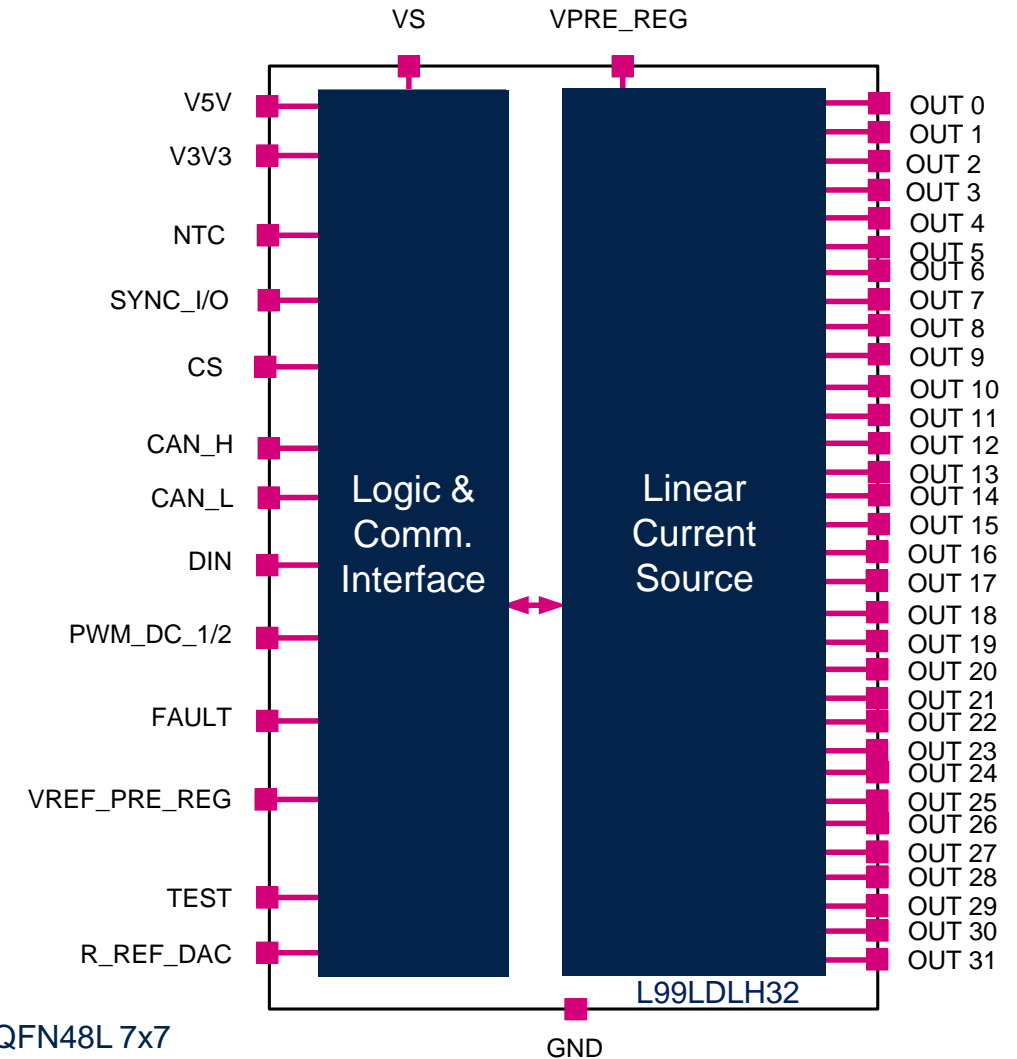
- **Short wires** : one driver board for one rear lamp.
  - 20 pcs red units and 24 white units in each OLED rear lamp
  - Red OLEDs and white OLEDs are controlled by separate L99LDLH32.
- **Independent control** : each OLED unit could be switch on/off or dimming separately, which makes more dynamic animation come true.





# Rear OLED demo key component high-side (O)LED driver L99LDLH32

- **Operating supply voltage range 5.5V – 38V**
- **Up to 32 channels**
  - Outputs parallelable
  - Output current: 1mA – 15mA
  - Output voltage: up to 35V
- **Current Setting per channel by 8-bit DAC**
- **Analogue and PWM dimming**
- **Bus mode operation - Serial Interface proprietary “CAN FD Light”**
  - Restricted to Rear Lamp Communication
  - Physical layer & protocol handler
  - 2kV ESD protected
  - CAN FD structure for long frames
  - 1Mbit/s baud rate
- **Integrated ADC for most flexible diagnostic**
- **Stand alone operation – integrated NVM**
- **1 Direct drive inputs for only one function group**
- **1 Fault line for diagnostic bus**
- **Thermal management**



QFN48L 7x7

# Support package



Databrief / Datasheet



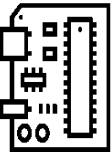
Application notes



FMEDA



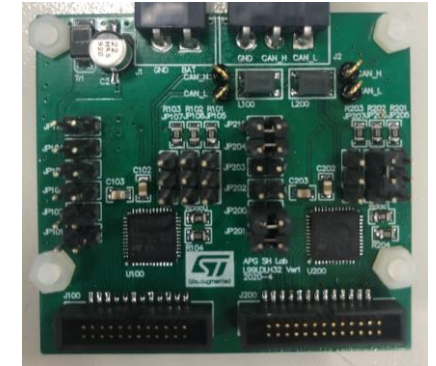
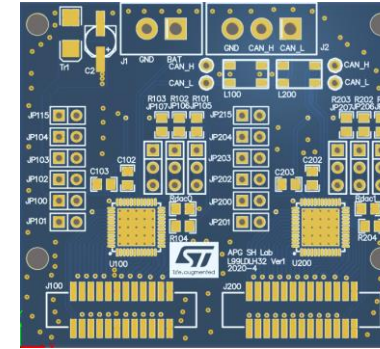
Safety manual



Evaluation board



User GUI  
Reference code



RearLed Evaluation Board GUI

File Communication View Settings Services Help

(C) Copyright 2019, STMicroelectronics, ADG BODY/AUDIO DIVISION

**EvalBoard**  
Rear LED  
rev. 1.7 April 2019

Tx: 01:10:08:00:00:00:00:00:01:10 | 895  
Rx: 46:08:01:00:14:00:00:00:01 | 1509

Board Status  
WDC trigger: Enabled VBat: ??? GSEN: FS Operation mode: uC: Active Relinit

Standard Control | Control Regs: PWM | Control Regs: Current Set | Control Reg: DIN MAP | Config | Status Registers 1 | Status Registers 2 | Watchdog | Device Info

PWM Settings Device [0,1] I/O Controls Device [0,1] Broadcast & UniCast Frames

» Device 0 - L99DLH32  
» Device 1 - L99DLH32

CH	PG MAP	DIN MAP	PWM Duty Cycle %	Hex	CURRENT	Hex	FAULTS	STATUS	VLED
0	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
1	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
2	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
3	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
4	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
5	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
6	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
7	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
8	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
9	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
10	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
11	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
12	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
13	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
14	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
15	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
16	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
17	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
18	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V
19	REGA	00 01	0.0 %	0x00	1.0 mA	0x00	OUT_STATE	OL SHT	0.00 V

Operative Mode

Device STATUS: Active Get Slave\_ID 12 Set Slave\_ID 12

ENABLE GO STBY FAIR SAFE

PWM ALL

Global Status Byte 0x14

GSEN RST SPIR FE2 FE1 DE GW PS

WDC Fail VS UV Tw TSD

PG NOT PREA PG NOT PREB

Clear Faults

Board connected and ready...

RearLed L99DLH32 Eval Board, Fw. rev.1.0

# Thank you

© STMicroelectronics - All rights reserved.

The STMicroelectronics corporate logo is a registered trademark of the STMicroelectronics group of companies. All other names are the property of their respective owners.



life.augmented