GWM Ambient Light Control Module

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1 Changes 变更记录

No.	Change description	Date	Author	Version
1	Initial version	2016.05.16	Li Gaofeng	Initial
2	Delete wakeup and sleep function Update function description	2016.5.27	Li Gaofeng	00
3	Update CHB071&CHB131 function requirement	2016.06.03	Li Gaofeng	01

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2 Product Overview 产品概述

2.1 System summary 系统概述

This system involved central control functions of Ambient Light.

该系统集成了氛围灯的集中控制功能

2.2 Abbreviation and Terms 缩写

ALCM: Ambient light control module 氛围灯控制模块

GWM: Great Wall Motor 长城汽车

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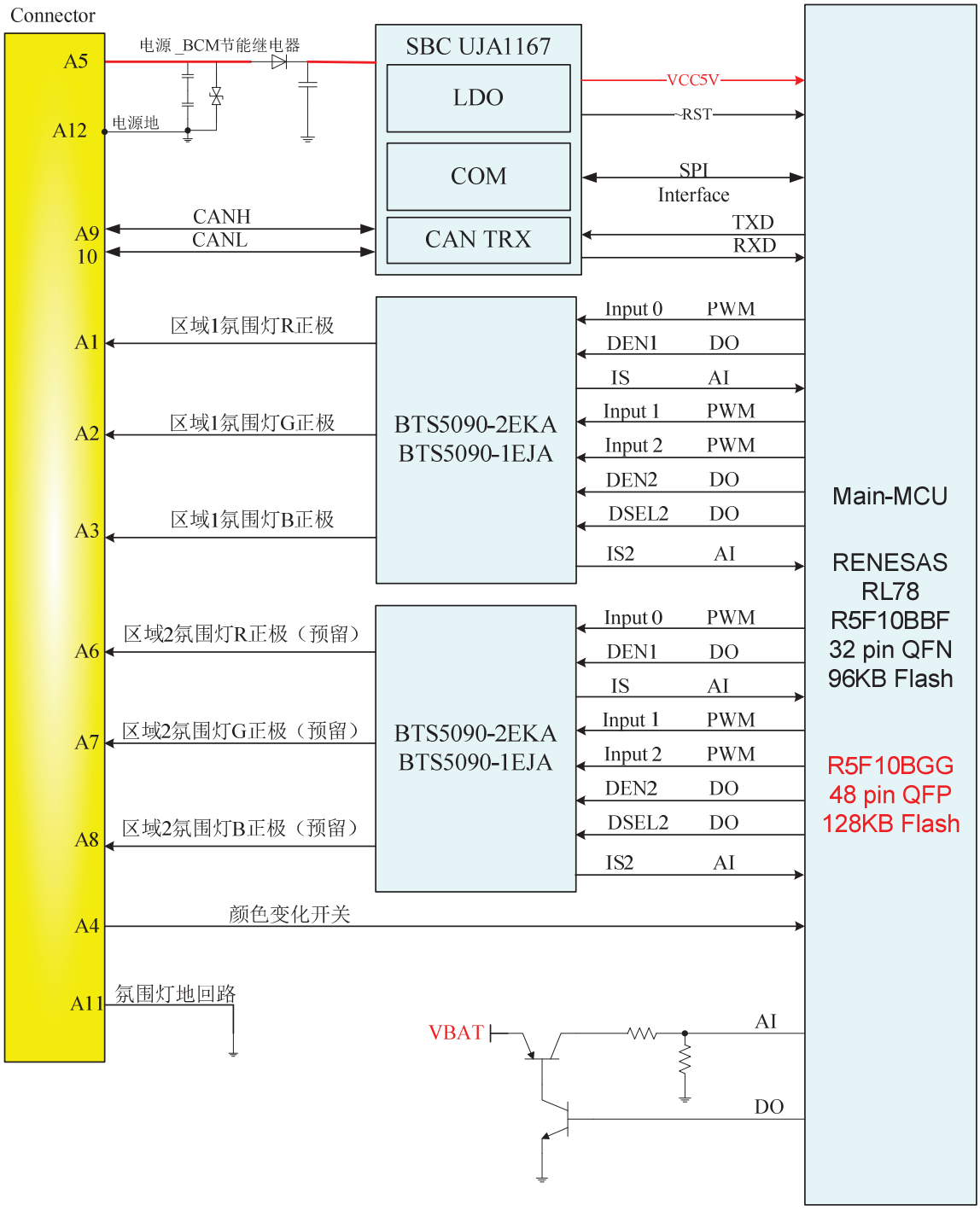
2.3 Frame diagram of system 系统框图



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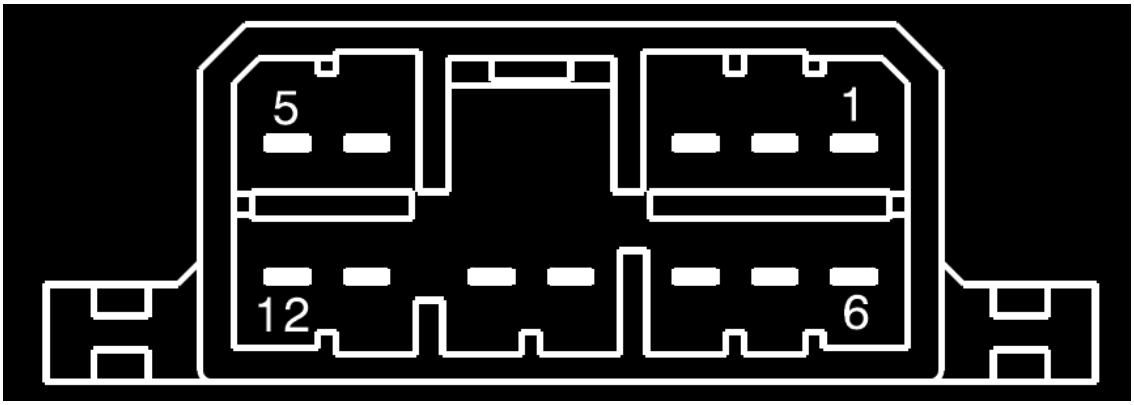
2.4 Definition of LCM LCM 定义

2.4.1 LCM Pin DefinitionLCM 引脚定义



PIN	Signal Name	Input/output	Characteristic(A)			Active
			Max	Nor	Min	
1	区域 1 氛围灯 R 正极	O	2	0.22	0.165	Hi
2	区域 1 氛围灯 G 正极	O	2	0.22	0.165	Hi
3	区域 1 氛围灯 B 正极	O	2	0.22	0.165	Hi
4	颜色变化开关	I	0.014	0.01	0.008	Lo
5	电源_BCM 节能继电器	Power	6.5	2	1.6	BAT
6	区域 2 氛围灯 R 正极（预留）	O	2	0.22	0.165	Hi
7	区域 2 氛围灯 G 正极（预留）	O	2	0.22	0.165	Hi
8	区域 2 氛围灯 B 正极（预留）	O	2	0.22	0.165	Hi
9	CANH	C	0.1	0.025	0.005	C
10	CANL	C	0.1	0.025	0.005	C
11	氛围灯回路地	GND	6	2	0	GND
12	电源地	GND	0.15	0.031	0.01	GND

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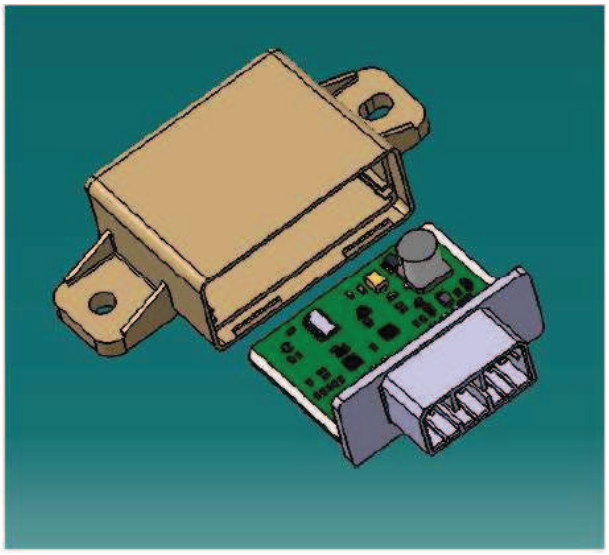
2.4.2 LCM AppearanceLCM 外观

- LCM Geometrical description LCM几何描述



LCM consist of cover, housing and printed board with components. These three parts are fastened by cover plug in housing.

LCM由外壳,带元器件PCB通过插入卡口方式组装在一起.

- Housing外壳

Material: ABS+PC Black 材料:ABS+PC黑色

- Structure explanation 结构说明

Two plastic housing components are made by tooling. Connector refer to Tyco 173858-1, Pin width and thickness (mm): 1.8×0.64(12pins)

结构说明：两个塑胶壳体为模具成型件；接插件直接焊接在PCBA上，接插件参考，Pin的尺寸是：1.8X0.64（12Pin）；

Pin housing material: PBT

接插件壳体材料：PBT

- Plug （harness） 线束端插头

The wire bundle plug in units is tyco368542-1.

线束端插头使用TYCO件, 型号为368542-1

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3 Description of functions 功能描述

- LCM can control ambient light's color and intens via CAN communication and hardware connection.
  氛围灯控制模块主要是通过CAN总线通信和硬线连接以实现调节氛围灯的颜色和亮度.
- LCM can differentiate CHB071EAD or CHB131/CHB071 by flashing configuration byte.
  氛围灯控制模块通过刷写配置字以区分CHB071EAD 或CHB131/CHB071.

3.1 Color definition 颜色定义

LCM can store 6 different PWM outputs work modes and Mode0 for light is shut down which are shown in below table. PWM frequency is 200Hz±5%.

氛围灯可以存储 6 种不同输出颜色模式和熄灭状态 Mode0，PWM 频率为 200Hz±5%，如下表：

	Color mode	Red light Power (With light load,tolerance±2%)	Green light power(With light load,tolerance±2%)	Blue light Power (With light load,tolerance±2%)
	Mode0	0	0	0
Day mode	Mode1红色	100%	0%	3%
	Mode2金色	0%	20%	96%
	Mode3蓝色	100%	32%	0%
Night mode	Mode4红色	75%	0	2%
	Mode5金色	0	15%	72%
	Mode6蓝色	75%	24%	0

3.2 Shut down status 熄灭状态定义，

Switch Off by time: when IGN is Off, once received door open signal and ambient light will be switched on;

自然熄灭：是指 OFF 状态下接收门开信号点亮氛围灯，20s 内未收到 IGN on,ACC 或闭锁信号，氛围灯熄灭；

Switch Off by Locked signal: when Ambient light is on,once received PEPS lock signal, ambient light will be switched off.

闭锁熄灭：氛围灯为点亮状态，接收遥控钥匙闭锁信号熄灭氛围灯；

Switch Off by Power supply down : when Ambient light is on, if Battery or Power Supply is Off, ambient light will be switched off.

断电熄灭： 氛围灯为点亮状态，蓄电池或电源供电断开，氛围灯熄灭；

Mode0 status: after long press one time , ambient light will be switched off.

Mode0 状态，是指长按颜色变化开关导致氛围灯熄灭.

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3.3 Luminance definition 亮度定义

ALCM luminance is included 11 levels in all, which can adjust ambient light level via ALCMLightLvlSet signal value from CAN bus. The inital default color mode is 50%, once the power mode is IGN ON, the ALCMLightLvlSet signa can be actived。 Detial definition refer to table 1

氛围灯控制模块点亮亮度共分为 11 个等级，根据接收 ALCMLightLvlSet 不同信号值进行调节亮度，出厂默认颜色亮度为 50%， 当电源为 ON 时，亮度调节信号有效。亮度定义表如下：

Luminance definition table1 亮度定义表 1

ALCMLightLvlSet 信号值	亮度等级	亮度百分比（%）	备注
0x0	Level0	0	
0x1	Level1	10	
0x2	Level2	20	
0x3	Level3	30	
0x4	Level4	40	
0x5	Leve5	50	默认点亮亮度
0x6	Leve6	60	
0x7	Leve7	70	
0x8	Leve8	80	
0x9	Leve9	90	
0xA	Leve10	100	

3.4 ALCM signls 氛围灯控制模块信号:

3.4.1 Color changing switch 颜色变化开关信号

When IGN is ON, color changing switch is active. If power mode OFF or ACC, switch signal is invalid.

当 IGN 信号为 ON 时，颜色变化开关信号有效，如果电源模式为 OFF 或 ACC 时，颜色变化开关信号无效。

Switch signal is hardware connection and low active , which is included long press and short press:

开关信号为硬线连接，低电平有效，分短按和长按：

When pressed switch time >=32ms and <=800ms,module shall recognize it as a short press;

按压开关时间>=32ms 且<=800ms，模块认为开关为短按；

When pressed switch time is >800ms, module shall recognize it as a long press;

按压开关时间>800ms, 模块认为开关为长按。

3.4.2 PosLmpStsl 位置灯信号

Received PosLmpSts signal by CAN communication , if the lamp status is ON, then the color mode should change to corrsponding night color mode. Actived value is 0x1

接收 CAN 总线上位置灯信号，进行白天和夜晚模式切换, PosLmpStsl 值为 1 时有效.

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3.4.3 DrivingModeReqI 驾驶模式信号

When IGN is ON,Change to corresponding color mode according to received DrivingModeReq by CAN communication.

IGN 为 ON 时，通过 CAN 总线接收驾驶模式信号，切换驾驶模式绑定或定义颜色模式。

3.4.4 ALCMLightLvlSet 亮度调节信号

When IGN is on, ALCM can adjust LCM light level according to ALCMLightLvlSet value by CAN communication，refer to luminance definition table1.

IGN 为 ON 时，通过 CAN 总线接收亮度调节信号，并根据接收到的信号值进行亮度调节。详细定义请参考亮度定义表 1。

3.4.5 Door open signals 门开信号

When IGN is OFF, If the color mode is not mode0 during last shut down, then ALCM can Switch on ambient light via receiving door open sigals by CAN communication

IGN 为 OFF, 如果氛围灯上次熄灭前不为 MODE0，模块可以通过接收 CAN 总线上门开信号进行点亮氛围灯。

3.4.6 SystemPowerMode 电源模式

Logic function can be realized according to system power mode

根据接收到的总线电源模式信号来实现具体功能逻辑。

3.4.7 RKEDoorLockCmd 闭锁信号

When ambient light is switched on,If RKEDoorLockCmd signal is active, then ambient light will be switched off

氛围灯为点亮时，接收到 CAN 总线上闭锁信号为有效时，熄灭氛围灯

3.5 Detail Function definition 详细功能定义

3.5.1 Switch on Ambient light by door open signal 门开信号点亮氛围灯：

When Power mode is OFF, ALCM will ignore DrivingModeReq and ALCMLightLvlSet signal.

当电源模式为 OFF 时， 忽略总线驾驶模式信号和亮度调节信号。

When IGN is OFF and inital power on, once received door open status siganl is active, ALCM will change to default color mode and luminance in 1s by dimming directly, factory default color is Blue and default luminance is 50%

当 IGN 为 OFF 时，初次上电接收门开信号则氛围灯将在 1s 内线自动性点亮到出厂默认颜色蓝色和默认亮度值 50%；

Once received PosLmpStsI is active, ALCM will change color mode from day mode to night mode in 1s by dimming

氛围灯为点亮状态，如果接收位置灯信号为有效，则氛围灯在 1s 内线性切换到夜晚模式。

- CHB071 &CHB131

When IGN is OFF, If there is no color output(color mode is MODE0) during last shut down, once received door open status and ALCM can not switch on ambient light.

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When IGN is OFF, If there is any other color output(color mode is MODE0) during last shut down, once received door open status and ALCM will change to last saved value and luminance in 1s by dimming.

Ambient light can keep on status last for 20s, which is caculated from door open.

IGN 为 OFF 时，若上次氛围灯关闭时，没有颜色输出（颜色模式为 MODE0), 接收门开信号则不会点亮氛围灯。

IGN 为 OFF 时，若上次关闭时，有颜色输出, 接收门开信号则氛围灯将在在 1s 内线性点亮到上次记忆颜色模式和亮度，持续点亮时间从门开信号计时 20s，

Ambient light continue to be switched on for 20s:

氛围灯持续点亮 20s 过程中：

If all doors are closed and any doors are open again, then the time 20s will be re-caculated from door open;

若所有门关闭且有任意门再次打开则重新计时 20s；

If received ACC or IGN ON signal during light 20s, ambient will be continous switched on;

如果 20s 内收到 ACC 或 IGN ON 信号则持续点亮氛围灯颜色和亮度；

If received ACC or IGN ON signal after 20s, ambient light will be shut down and switched on last saved color and luminance in 1s by dimming again;

如果 20s 后收到 ACC 或 IGN ON 信号，则氛围灯将先熄灭并再次在 1s 内线性点亮到上次记忆颜色和亮度；

- CHB071EAD

When IGN is OFF, If there is no color output (color mode is MODE0)during last shut down, once received door open status and ALCM can not switch on Ambient light. Ambient light can be on last for 20s, which is caculated from Door open.

When IGN is OFF, If there is any other color output during last shut down, once received door open status and ALCM will switch on blue and last luminance in 1s by dimming. Ambient light can be on last for 20s, which is caculated from Door open siganl.Ambient light can keep on status last for 20s, which is caculated from door open.

IGN 为 OFF 时，若上次氛围灯关闭时，没有颜色输出（颜色模式为 MODE0), 接收门开信号则不会点亮氛围灯。

IGN 为 OFF 时，若上次关闭时，有颜色输出, 接收门开信号则氛围灯将在在 1s 内线性点亮到蓝色和上次记忆亮度，持续点亮时间从门开信号计时 20s，

Ambient light continue to be switched on for 20s:

氛围灯持续点亮 20s 过程中：

If all doors are closed and any doors are open again, then the time 20s will be re-caculated from door open;

若所有门关闭且有任意门再次打开则重新计时 20s；

If received ACC or IGN ON signal during light 20s, ambient will be continously switched on ;

如果 20s 内收到 ACC 或 IGN ON 信号则持续点亮蓝色和亮度；

If received ACC or IGN ON signal after 20s, ambient light will be shut down and switched on blue and last saved luminance in 1s by dimming again;

如果 20s 后收到 ACC 或 IGN ON 信号，则氛围灯将先熄灭并再次在 1s 内线性点亮到蓝色和上次记忆亮度；

3.5.2 Switch on Ambient light by ACC or IGN ON 接收 ACC 或 IGN ON 点亮氛围灯：

- CHB071&CHB131 function definition CHB071 和 CHB131 功能定义：

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When power mode is ACC, ALCM will ignore DrivingModeReq and ALCMLightLvlSet signal. If IGN is ON, receive and deal with all CAN bus signals.

若电源模式为 ACC 时，忽略总线驾驶模式信号和亮度调节信号；

若电源模式为 ON 时，接收所有总线信号并处理.

Ambient light is Mode0,when Power mode is ACC, then ALCM can not switch on Ambient light .

Ambient light is switched off by time, locked signal or power supply off,when Power mode is ACC, then ALCM can switch on last saved color and luminance in1s by dimming.

Ambient light is Mode0， if there is no color output (color mode is MODE0), received IGN ON signal and short or long press one time,ALCM will switch on last saved color and luminance in 1s by dimming,then will change to corrsponding color and luminance by received DrivingModeReq and ALCMLightLvlSet signal.

Ambient light is switched off by time, locked signal or power supply off, received IGN ON signal and ALCM will switch on last saved color and luminance in 1s by dimming,then will change to corrsponding color and luminance by received DrivingModeReq and ALCMLightLvlSet signal.

氛围灯为 Mode0 状态，当接收电源模式为 ACC 时,不可点亮氛围灯；

氛围灯为自然熄灭，闭锁熄灭或断电熄灭状态时，当接收电源模式为 ACC 时,将在 1s 内线性点亮到上次记忆颜色和亮度；

氛围灯为 Mode0 状态，当接收电源模式为 IGN ON 时，长按或短按开关一次，氛围灯控制模块将在 1s 内线性点亮到上次记忆颜色和亮度，再根据接收当前驾驶模式信号和接收亮度调节信号在 1s 内线性切换到其对应颜色和亮度。

氛围灯为自然熄灭，闭锁熄灭或断电熄灭状态时，当接收电源模式为 IGN ON 时，氛围灯控制模块将在 1s 内线性点亮到上次记忆颜色和亮度，再根据接收当前驾驶模式信号和接收亮度调节信号在 1s 内线性切换到其对应颜色和亮度。

When IGN is off, Ambient light is ON, if received Power mode is ACC , ALCM can not change color;

When IGN is off,Ambient light is ON,if received power mode is IGN ON, ALCM will change to corrsponding color and luminance in 1s by dimming according to received DrivingModeReq and ALCMLightLvlSet signal.

IGN 为 Off 时，若氛围灯为持续点亮状态，当接收电源模式为 ACC 时，不可切换颜色；

IGN 为 Off 时，若氛围灯为持续点亮状态，当接收电源模式为 ON 时，则根据接收当前驾驶模式信号和亮度在 1s 内线性点切换到其对应颜色和亮度。

When IGN is ON and Ambient light is switched on, if the current color is red, short press color swtich can not change color; If current color is not red, short press color switch can change color between blue and golden, changing process will ignore short press switch again.

IGN 为 ON 且氛围灯点亮时，

若点亮颜色为运动模式绑定红色，则短按开关不可切换颜色；

若点亮颜色不为红色，短按开关可进行相互切换蓝色或金色，切换过程中短按开关，不做处理；

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Once received PosLmpStsI is active, ALCM will change color mode from day mode to night mode in 1s by dimming

氛围灯为点亮状态，如果接收位置灯信号为有效，则氛围灯在 1s 内线性切换到夜晚模式。

- Sport mode: the binding color is red, when power mode is IGN ON, ALCM can receive sport mode and will switch on red color in 1s by dimming, short press can not change color, ALCM can remember drive mode, current color and luminance.

  运动模式：绑定颜色为红色，IGN 为 ON 时，接收运动模式并在 1s 内线性切换到红色；短按开关不可切换颜色，可记忆驾驶模式，颜色和亮度。

- Normal mode: the binding color is blue, when power mode is IGN ON, ALCM can receive normal mode and will switch on last saved color or default color in 1s by dimming, short press can change color between blue and golden, ALCM can remember drive mode, current color and luminance.

  标准模式：出厂默认颜色为蓝色，IGN 为 ON 时，接收标准模式并在 1s 内线性切换到默认颜色或上次标准模式记忆颜色；短按开关可进行切换蓝色和金色，可记忆驾驶模式，颜色和亮度。

- Economic mode: Factory default color is blue, when power mode is IGN ON, ALCM can receive economic mode and will switch on last saved color or default color in 1s by dimming, short press can change color between blue and golden, ALCM can remember drive mode, current color and luminance.

  经济模式：默认出厂模式为蓝色， IGN 为 ON 时，接收经济模式并在 1s 内线性切换到默认颜色或上次经济模式记忆颜色；短按开关可进行切换蓝色和金色，可记忆驾驶模式，颜色和亮度。

- Other mode: Factory default color is blue, when power mode is IGN ON, ALCM can receive other mode and will switch on last saved color or default color in 1s by dimming, short press can change color between blue and golden, ALCM can remember drive mode, current color and luminance.

  其他模式：出厂默认颜色为蓝色，IGN 为 ON 时，接收其他模式并在 1s 内线性切换到默认颜色或上次其他模式所记忆对应颜色；短按开关可进行切换蓝色和金色，可记忆驾驶模式，颜色和亮度。

- Drive mode changing 驾驶模式切换

  When sport mode, normal mode, economic mode and other mode change from each other, ALCM will change to corrsonding binding color,last saved color or default color and last saved luminance.

  当运动模式，标准模式，经济模式和其他模式进行相互切换时，氛围灯颜色在 1s 内线性切换到其绑定颜色，记忆颜色或默认颜色，亮度为记忆亮度；

  Normal mode, economic mode and other mode default color and last saved color are all same, if short press one time under one of the three drive modes, the three drive modes save will save next same color at same time

  标准模式，经济模式和其他模式默认颜色或记忆颜色均为相同，若在三种驾驶模式中任意模式下短按开关切换颜色， 则三种驾驶模式记忆颜色同时切换。

  After drive mode changed from other mode to sport mode, normal mode or economic mode, then change back to other mode, then ALCM switch on last saved mode under other mode in 1s by dimming.

  若从其他模式切换到运动模式，标准模式或经济模式后，再次切换到其他模式，则氛围灯在 1s 内线性点亮到上次其他模式记忆对应颜色；

  After drive mode changed from economic mode to sport mode, normal mode or other mode, then change back to economic mode, then ALCM switch on last saved mode under economic mode in 1s by dimming.

  若从经济模式切换到运动模式，标准模式或其他模式后，再次切换到经济模式，则氛围灯在 1s 内线性点亮到上次经济模式记忆颜色；

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After drive mode changed from normal mode to sport mode, economic mode or other mode, then change back to normal mode, then ALCM switch on last saved mode under normal mode in 1s by dimming.

若从标准模式切换到运动模式，经济模式或其他模式后，再次切换到标准模式，则氛围灯在 1s 内线性点亮到上次标准模式记忆颜色；

When IGN is ON and ambient light is on , if continous change drive mode signal , ALCM will switch on corrsponding color and luminance in 1s by dimming then will change to next corrsponding color and luminance by received drive mode.

在电源模式为 ON 且氛围灯点亮后，连续切换驾驶模式，氛围灯将先在 1s 内线性点亮到第一次切换驾驶模式对应颜色，之后再根据接收新的驾驶模式进行点亮颜色。

CHB071 &CHB131 color definition table refer to below table 2

CHB071 和 CHB131 颜色定义表如下表 2:

CHB071 和 CHB131 颜色定义表 2

项目	功能要求	运动模式	标准模式	经济模式	其他模式	
CHB071 CHB131	颜色	绑定红色	蓝色，金色	蓝色，金色	蓝色，金色	
	颜色是否可调	不可调	可调	可调	可调	
	亮度是否可调	可调	可调	可调	可调	
	默认颜色	/	蓝色	蓝色	蓝色	

- CHB071 EAD function definition CHB071EAD 功能定义

When power mode is ACC, ALCM will ignore DrivingModeReq and ALCMLightLvlSet signal. If IGN is ON, receive and deal with all CAN bus signals.

若电源模式为 ACC 时，忽略总线驾驶模式信号和亮度调节信号；

若电源模式为 ON 时，接收所有总线信号并处理.

Ambient light is Mode0,when Power mode is ACC, then ALCM can not switch on Ambient light .

Ambient light is switched off by time, locked signal or power supply off,when Power mode is ACC, then ALCM can switch on blue and last saved luminance in1s by dimming.

Ambient light is Mode0， if there is no color output (color mode is MODE0), received IGN ON signal and short or long press one time,ALCM will switch on blue and last saved luminance in 1s by dimming,then will change to corrsponding color and luminance by received DrivingModeReq and ALCMLightLvlSet signal.

Ambient light is switched off by time, locked signal or power supply off, received IGN ON signal and ALCM will switch on blue and last saved luminance in 1s by dimming,then will change to corrsponding color and luminance by received DrivingModeReq and ALCMLightLvlSet signal.

若氛围灯为 Mode0 状态，当接收电源模式为 ACC 时,不可点亮氛围灯；

若氛围灯为自然熄灭，闭锁熄灭或断电熄灭状态时，当接收电源模式为 ACC 时,将在 1s 内线性点亮到蓝色和上次记忆亮度；

氛围灯为 Mode0 状态，当接收电源模式为 IGN ON 时，长按或短按开关一次，氛围灯控制模块将在 1s 内线性点亮到蓝色和上次记忆亮度，再根据接收当前驾驶模式信号和接收亮度调节信号在 1s 内线性切换到其绑定颜色和亮度。

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氛围灯为自然熄灭，闭锁熄灭或断电熄灭状态时，当接收电源模式为 IGN ON 时，氛围灯控制模块将在 1s 内线性点亮到蓝色和上次记忆亮度，再根据接收当前驾驶模式信号和接收亮度调节信号在 1s 内线性切换到其对应颜色和亮度。

When IGN is off,Ambient light is switched on blue,if Power mode is ACC , ALCM can not change color;

When IGN is off,Ambient light is switched on blue,when received power mode is IGN ON, ALCM will change to corrsponding color and luminance in 1s by dimming according to received DrivingModeReq and ALCMLightLvlSet signal.

IGN 为 Off 时，若氛围灯为持续点亮蓝色，电源模式为 ACC 时，不可切换颜色；

IGN 为 off 时，若氛围灯为持续点亮蓝色，当电源模式为 ON 时，则根据接收当前驾驶模式信号和亮度在 1s 内线性切换到其绑定颜色和亮度。

When IGN is ON, All drive modes will be bound the corrspondin color, short press switch can not change color during ambient On.

IGN 为 ON 时，所有驾驶模式点亮颜色均为绑定颜色，点亮过程中短按开关不可切换颜色

When IGN is ON and ambient light is on , if continous change drive mode signal , ALCM will switch on corrsponding color and luminance in 1s by dimming then will change to next corrsponding color and luminance by received drive mode.

在电源模式为 ON 且氛围灯点亮后，连续切换驾驶模式，氛围灯将先在 1s 内线性点亮到第一次切换驾驶模式绑定颜色，之后再根据接收新的驾驶模式进行点亮其绑定颜色。

- Power mode: the binding color is red, when power mode is IGN ON, received power mode and switch on red color and current luminance in 1s by dimming, ALCM can not remember drive mode and current color except luminance.

  Power 模式：绑定颜色为红色，当电源模式为 IGN ON 时，接收 Power 模式并在 1s 内线性点亮到红色和当前亮度，不记忆驾驶模式和颜色， 记忆亮度。

- Pure &Auto mode: the binding color is blue, when power mode is IGN ON, received Pure/Auto mode and switch on blue color and current luminance in 1s by dimming, ALCM can not remember drive mode and current color except luminance.

  Pure/Auto 模式：绑定颜色为蓝色，当电源模式为 IGN ON 时，接收 Pure/Auto 模式并在 1s 内线性点亮到蓝色和当前亮度；不记忆驾驶模式和颜色， 记忆亮度；

- Save/awd mode: the binding color is golden, when power mode is IGN ON, received Save/awd mode and switch on golden color and current luminance in 1s by dimming, ALCM can not remember drive mode and current color except luminance.

  Save/awd 模式：绑定颜色为金色，当电源模式为 IGN ON 时，接收 save/awd 模式并在 1s 内线性点亮金色和当前亮度；不记忆驾驶模式和颜色， 记忆亮度；

- Other mode: the binding color is golden, when power mode is IGN ON, received other mode and switch on golden color and current luminance in 1s by dimming, ALCM can not remember drive mode and current color except luminance.

  其他模式：绑定颜色为金色，当电源模式为 IGN ON 时，接收其他模式并在 1s 内线性点亮到金色和当前亮度；不记忆驾驶模式和颜色， 记忆亮度；

- Drive mode changing 驾驶模式切换：

  When power mode, Pure/auto mode, Save/awd mode and other mode change from each other, ALCM will change to corrsonding binding color and current luminance.

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当 Power 模式，Pure/auto 模式，Save/awd 模式和其他模式进行相互切换时，氛围灯颜色在 1s 内线性切换到驾驶模式对应的绑定颜色和接收亮度；

CHB071EAD color definition table refer to below table 3

CHB071EAD 颜色定义表如下表 3:

CHB071EAD 颜色定义表 3

	功能要求	Power 模式	Pure 与 Auto 模式	Save and awd	其他模式	
CHB071EAD	颜色	绑定红色	绑定蓝色	绑定金色	绑定金色	
	颜色是否可调	不可调	不可调	不可调	不可调	
	亮度是否可调	可调	可调	可调	可调	
	默认颜色	/	/	/	/	

3.5.3 Switch Off function 氛围灯熄灭功能：

CHB071&CHB131 CHB071EAD Ambient light switch off function are same.

CHB071&CHB131 CHB071EAD 熄灭功能逻辑相同

When ambient light is on, if below conditions can be fullfilled, the ambient light will be switched off:

若氛围灯为点亮状态，则满足以下条件氛围灯熄灭：

IGN is OFF, if not received ACC or IGN signal during 20s, then ALCM will remember current color mode and luminance and switch off ambient light in 1s by dimming.

IGN 为 OFF,若 20s 内没有收到 ACC 或 IGN 信号，则记忆当前颜色及亮度并在 1s 内线性熄灭氛围灯；

When received RKEDoorLockCmd is active, ALCM will remember current color mode and luminance , then will switch off ambient light in 1s by dimming

当收到 PEPS 闭锁信号为有效时，则记忆当前颜色及亮度并在 1s 内线性熄灭氛围灯；

If long press switch one time, then will remember current color mode and luminance , then will switch off ambient light in 1s by dimming. During dimming off, if short press switch again, then ambient light will be switched on again

如果长按颜色变化开关一次，则记忆当前颜色及亮度并在 1s 内线性熄灭氛围灯，渐灭过程中若再次短按开关，则重新点亮氛围灯；

3.5.4 Memory function 氛围灯记忆功能：

- CHB071&CHB131

  Ambient light status change from ON to OFF， ALCM will save the current drive mode, color mode and luminance before shut down.

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氛围灯从点亮状态切换到熄灭状态时，氛围灯控制模块可对当前驾驶模式，点亮颜色和亮度进行记忆。

When Power supply is Off, ALCM will save the current drive mode, color mode and luminance before shut down 蓄电池掉电时可进行记忆驾驶模式，颜色和亮度。

- CHB071EAD

Ambient light status change from ON to OFF， ALCM will save the other drive mode, color mode and luminance before shut down except Power mode.

氛围灯从点亮状态切换到熄灭状态时，氛围灯控制模块可对除 Power mode 之外的驾驶模式，点亮颜色和亮度进行记忆。

When Power supply is Off, ALCM can save luminance under Power mode, also can save the other drive mode, color mode and luminance before shut down except Power mode.

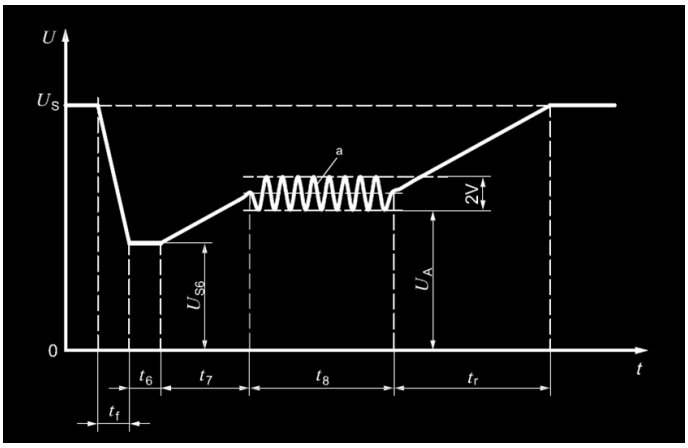
蓄电池掉电时,氛围灯控制模块可对 Power mode 亮度进行记忆， 同时可对除 Power mode 之外的驾驶模式，点亮颜色和亮度进行记忆。

3.5.5 Ambient light need hold on during engine starting process 发动机启动过程中氛围灯保持点亮

If ambient light is on before engine start,When Engine start is inprocess, MCU can not reset, ambient light can not be swiched off.

启动前，若氛围灯为点亮状态，则发动机启动过程中不能熄灭.

Refer to standard 16750-2 参考 16750-2 标准



3.5.6 Protect Function 保护功能

ALCM adopt MOSFET output to drive ambient light. Driver IC has over current, over voltage and over temperature protection function. Which can realize hardware protection.

ALCM 采用 MOSFET 输出驱动氛围灯.驱动芯片具有过流,过压,过温保护功能,实现硬件保护.

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4 Pin-out error connect PIN PIN 端口短路开路保护

All pin-out with a connection error protection 所有输出端口具有连接出错保护功能

4.1 The state of pin open circuit 开路状态

PIN	Signal Name	Type	State of open circuit	Interior effect	Exterior effect	Evaluation
1	区域 1 氛围灯 R 正极	O	Low output	No effect	No red color output	
2	区域 1 氛围灯 G 正极	O	Low output	No effect	No Green color output	
3	区域 1 氛围灯 B 正极	O	Low output	No effect	No Blue color output	
4	颜色变化开关	I	High input	No effect	No change light color	
5	电源_BCM 节电继电器	Power	No power supply	No power supply	No Function	
6	区域 2 氛围灯 R 正极（预留）	O	Low output	No effect	No red color output	
7	区域 2 氛围灯 G 正极（预留）	O	Low output	No effect	No Green color output	
8	区域 2 氛围灯 B 正极（预留）	O	Low output	No effect	No Blue color output	
9	CANH	C	No communication	No communication	Abnormal or No function	
10	CANL	C	No communication	No communication	Abnormal or No Function	
11	氛围灯回路地	GNG		No effect	No Function	
12	电源地	GND	No power supply	No power supply	No function	

4.2 The state of pin short circuit 短路状态

If any one of the three outputs short to Gound, all the three outputs will be shut down, and record the DTC. Next Power on,if the short failure is removed, the function will try to recover

若氛围灯控制模块三路颜色输出中至少有一路短路到地，则关闭所有颜色输出并记录 DTC. 下次上电时，若短路故障消除，则功能恢复正常。

PIN	Signal Name	Type	State of short circuit	effect for load	Recovery strategy
1	区域 1 氛围灯 R 正极	O	Short to Battery	Always operation	Once short failure
			Short to GND	No Function	

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2	区域 1 氛围灯 G 正极	O	Short to Battery	Always operation	occured, LCM will shut down outputs, if switch triggered again and failure is removed,then the function will recover to normal.
			Short to GND	No Function	
3	区域 1 氛围灯 B 正极	O	Short to Battery	Always operation	
			Short to GND	No Function	
4	颜色变化开关	I	Short to Battery	No damage, function abnormality	
			Short to GND	No damage, function abnormality	
5	电源_BCM 节电继电器	Power	-	-	
6	区域 2 氛围灯 R 正极（预留）	O	Short to Battery	Always operation	
			Short to GND	No Function	
7	区域 2 氛围灯 G 正极（预留）	O	Short to Battery	Always operation	
			Short to GND	No Function	
8	KL 31 区域 2 氛围灯 B 正极（预留）	O	Short to Battery	Always operation	
			Short to GND	No Function	
9	CANH	C	Short to Battery	No damage, function abnormality	
			Short to GND	No damage, function abnormality	
10	CANL	C	Short to Battery	No damage, function abnormality	
			Short to GND	No effect	
11	氛围灯回路地	GND	Short to Battery	Not allowed	
			Short to GND	No effect	
12	电源地	Power GND	-	-	

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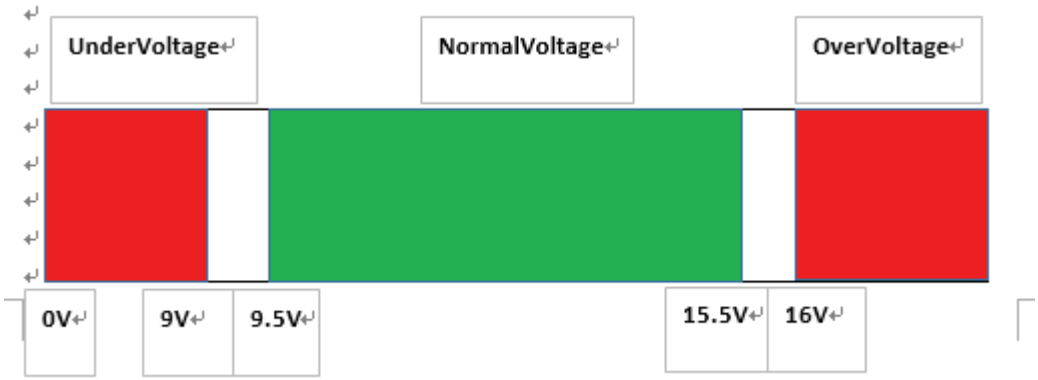
5 Classification 电器参数

5.1 Operation Voltage 工作电压

The normal operation range of supply voltage is between 9V and 16V.

正常工作电压范围为 9V~16V.

When LCM voltage <9V or >16V for 1s, voltage tolerance ±0.2V, saved current color mode then switch off directly, no dimming function during switch off.
When LCM voltage change from under voltage status to 9.5V or from overvoltage status to 15.5V for 1s, ambient light will recover to last saved mode directly, no dimming function during recovery.
当控制器电源电压<9.0V或>16.0持续时间1s时，保存当前颜色模式然后直接关闭氛围灯，无渐灭功能。
当控制器电源电压从欠压恢复到 9.5V 或从过压恢复到 15.5V 持续时间 1 秒时，氛围灯将直接恢复到上次记忆点亮颜色模式，无渐亮功能



5.2 Reversed Polarity 反极性保护

LCM must be able to withstand without damage to the reverse voltage lasted 1min. Reverse Voltage is 14V±0.2V.
LCM also can withstand one hour under DC （18±0.1）V and withstand one minute under DC （24±0.1）V
LCM 必须能够不受损害的承受1分钟方向电压. 反向电压14V±0.2V.
LCM 还需要可以承受1小时 DC （18±0.1）V和1分钟 DC （24±0.1）V

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5.3 Current Consumption 电流消耗

Parameter	Description	value
Operation Current 工作电流	No press switch 无开关按下	<100mA

5.4 Temperature Requirment 温度要求

Working range工作温度：-40℃～+85℃

Storage range 存储温度：-40℃～+95℃

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