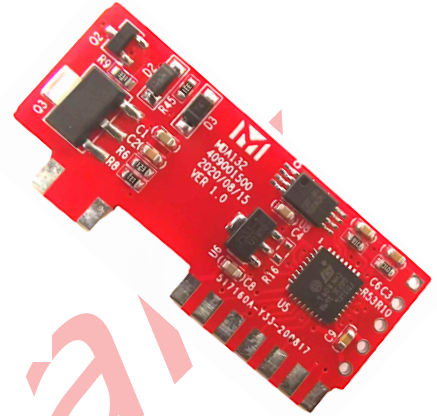
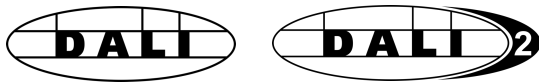


## MDA132

### LED 驱动电源内置 DALI DT8 (Tc) 模块

通过 DALI-2 认证测试序列，支持 DT6，DT8(Tc)  
双路 PWM 输出支持调光调色温，开路 and 短路信号检测  
可选宽电压供电，外形紧凑



### 概述

MDA132 是一款符合 DALI（数字可寻址灯光接口）标准最新版本 DALI-2 的 PCB 模块，它负责处理 DALI 总线的信号，并将 DALI 总线的控制信号转化为 PWM 信号，PWM 信号可以直接和 LED 驱动电源内部的电源转换部分电路接口。本模块适合集成在 LED 色温可调驱动电源内部，加快支持 DALI-2 DT8(Tc) 产品开发 and 认证。

本模块内置固件实现了 DALI 控制装置-LED 模组 (IEC 62386-207:2009 ed1.0, 对应 DT6)、DALI 控制装置-色彩控制 (IEC 62386-209:2011 ed1.0, 对应 DT8) 中的色温类型 (Colour Temperature Tc)，能够兼容主流厂商的 DALI-2 控制器和控制系统，实现开关、调光、调色温、分组和场景等功能。

### 特性

- 符合 DALI-2 标准，兼容性好，缩短 LED 驱动电源产品获得 DALI-2 认证的周期。
- 自带高压保护，DALI 总线误接市电不会损坏模块。
- 默认 3.3V 直接供电，可选控制电路宽范围供电 (4.5 ~ 13.2Vdc)。
- 模块化设计，集成度高，尺寸紧凑。
- 接受固件功能定制、硬件接口规格和结构尺寸定制。
- DALI-2 认证预测试支持
- 支持使用 MDA80 DALI-USB 控制器进行调试和测试
- 支持 MDA132 EVK 评估套件

## 目录

<b>概述</b> .....	1
<b>特性</b> .....	1
<b>规格参数</b> .....	3
<b>外形结构</b> .....	4
实物图.....	4
尺寸图 单位:mm.....	4
PCB 焊盘.....	4
<b>引脚定义</b> .....	5
引脚序号.....	5
输入 (DALI 总线) 信号接口.....	5
控制电路接口.....	5
<b>DALI 命令支持</b> .....	6
IEC 62386-102 协议指令.....	6
IEC 62386-207 协议指令.....	9
IEC 62386-209 协议指令.....	10
<b>应用注意事项</b> .....	12
DALI 总线.....	12
PWM 调光控制信号.....	12
输出开路 and 短路输入信号.....	12
DALI-2 认证考虑.....	12
<b>订购信息</b> .....	14
型号说明.....	14
型号列表.....	14
<b>版本历史</b> .....	15

## 规格参数

参数	规格
支持协议	IEC 62386-101:2014 ed2.0 IEC 62386-102:2014 ed2.0 IEC 62386-207:2009 ed1.0 IEC 62386-209:2011 ed1.0 ( Colour Type : Colour Temperature Tc )
供电电源 VCC/VSS	额定供电电压：3.3Vdc，供电范围 3.0~3.3Vdc ( 可选板载 LDO 宽范围输入 4.5~13.2Vdc ) 典型消耗电流：<16mA
DALI 总线	电压：9.5 ~ 22.5Vdc 电流：<2.0 mA 与控制电路隔离电压：3000Vac
PWMC_A/PWMW_A 输出	模拟调光 ( Analog Dimming ) 接口，输出为 PWM 逻辑信号，为主要的调光接口信号，也可在混合调光 ( Hybrid Dimming ) 方式中作为高端模拟调光控制信号。 频率：默认 1250Hz，可根据需要在 500 ~ 4KHz 间定制调整 最小占空比 1% ( 默认，可定制为其他值 )，最大占空比：100%， 输出：3.3V 推挽输出 ( 最大 10mA ) 逻辑：正向逻辑 ( 高电平表示 PWM 有效，低电平表示 PWM 无效 )
PWMC_D/PWMW_D 输出	数字调光 ( Digital Dimming ) 接口，输出为 PWM 逻辑信号，只在混合调光 ( Hybrid Dimming ) 方式中作为低端数字 PWM 调光控制信号。 频率：默认 3600Hz，可根据需要在 1250 ~ 4KHz 间定制调整 最小占空比 1% ( 默认，可定制为其他值 )，最大占空比：100%， 输出：3.3V 推挽输出 ( 最大 10mA ) 逻辑：正向逻辑 ( 高电平表示 PWM 有效，低电平表示 PWM 无效 )
ENC/ENW	3.3V 推挽输出 ( 10mA )，当所采用的的电源控制方案无法通过 PWM 信号直接关灯时，可利用该引脚进行辅助输出开关控制。 高电平表示开灯，低电平表示关灯。
OVPC/OVPW， SCPC/SCPW 输入	高电平输入指示电源内部发生故障或保护状态，低电平输入表示无故障，默认为低电平。高电平 > 2.5V，低电平 < 0.7V。当故障发生时，信号应能保持稳定。如有特殊需求 ( 如通过 ADC 采样信号电平来检测 ) 请和我们联系定制固件。
CFG0/CFG1 输入	( 可选 ) 输出最大电流档位设置，默认内部弱上拉为高电平，设计时可将此信号通过拨码开关分别接高电平和地。CFG0/CFG1 组合共可以设置 4 档最大电流。当 CFG0:CFG1 均为高时，为电源能够实现的最大电流，其他 3 档可根据产品定制要求进行设置。高电平 > 2.5V，低电平 < 0.7V。
工作环境	温度：-40~85C，湿度：8% ~ 70%
存储环境	温度：-40~105C，湿度：8% ~ 90%
外形结构	尺寸 ( 长*宽*高 )：38.00mm*17.10mm*6.3mm，PCB 板厚 1.0mm
安装方式	金手指，焊接
重量	10±1g

## 外形结构

### 实物图

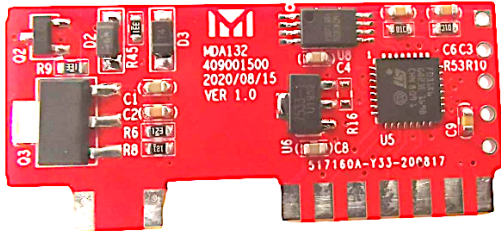


图 1 实物顶面

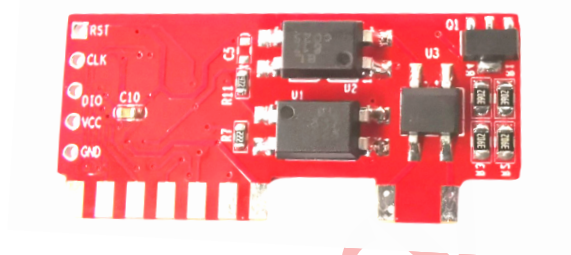


图 2 实物底面

### 尺寸图 单位:mm

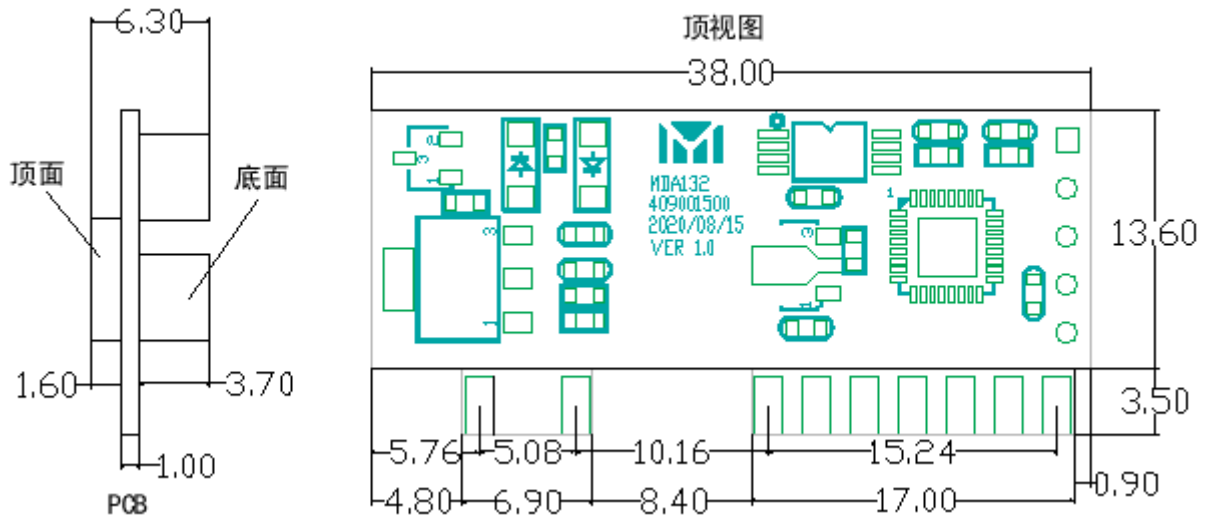


图 3 外形尺寸图

### PCB 焊盘

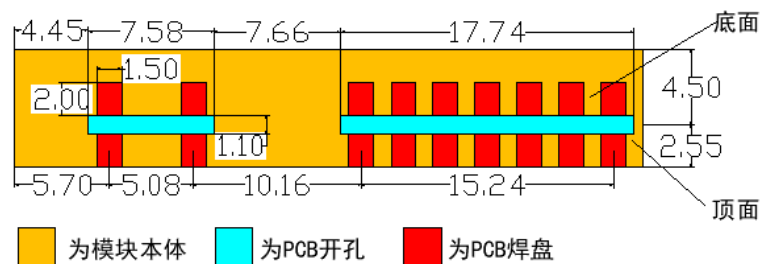


图 4 PCB 焊盘参考设计

## 引脚定义

### 引脚序号

模块引脚序号如下图所示。

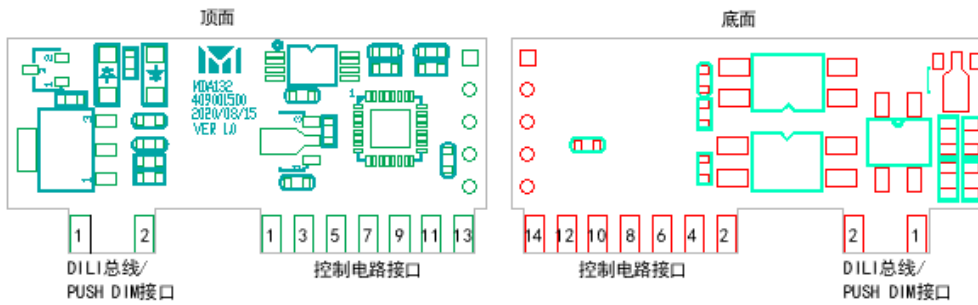


图 4 引脚序号

### 输入 (DALI 总线) 信号接口

序号	名称	功能描述
1	DA	DALI 接口输入
2	DA	DALI 接口输入

### 控制电路接口

序号	名称	描述
1	VCC	控制供电电源
2	GND	控制供电参考地
3	OVPW	暖光输出开路故障信号。由 LED 驱动电源功率电路检测并输入到模块
4	OVPC	冷光输出开路故障信号。由 LED 驱动电源功率电路检测并输入到模块
5	SCPW	暖光输出短路故障信号。由 LED 驱动电源功率电路检测并输入到模块
6	SCPC	冷光输出短路故障信号。由 LED 驱动电源功率电路检测并输入到模块
7	PWMW-D	暖光 PWM 数字调光信号
8	PWMC-D	冷光 PWM 数字调光信号
9	PWMW-A	暖光模拟调光信号
10	PWMC-A	冷光模拟调光信号
11	ENW	暖光输出开关使能
12	ENC	冷光输出开关使能
13	CFG0	最大电流档位选择(由拨码开关选择 0 或 1 进行判断)
14	CFG1	最大电流档位选择(由拨码开关选择 0 或 1 进行判断)

## DALI 命令支持

本产品实现的 DALI 协议符合以下标准：

- IEC 62386-101:2014 ed2.0
- IEC 62386-102:2014 ed2.0
- IEC 62386-207:2009 ed1.0
- IEC 62386-209:2011 ed1.0

### IEC 62386-102 协议指令

本产品实现的 IEC 62386-102:2014 标准命令如下表所列。

#### 控制、配置和查询命令

命令号	名称	描述
	DIRECT ARC POWER CONTROL	Adjusts the lighting control level to any level xxxx xxxx according to the Fade time.
0	OFF	Turns off lighting.
1	UP	Increases the lighting control level for 200 ms according to the Fade rate.
2	DOWN	Decreases the lighting control level for 200 ms according to the Fade rate.
3	STEP UP	Increments the lighting control level.
4	STEP DOWN	Decrements the lighting control level.
5	RECALL MAX LEVEL	Maximizes the lighting control level.
6	RECALL MIN LEVEL	Minimizes the lighting control level.
7	STEP DOWN AND OFF	Decrements the lighting control level and turns off lighting if the level is at the minimum.
8	ON AND STEP UP	Increments the lighting control level and turns on lighting if lighting is off.
9	ENABLE DAPC SEQUENCE	It shows the repeat start of the DAPC command.
10	GO TO LAST ACTIVE LEVEL	Adjusts the previous lighting control level according to the Fade time.
11-15	RESERVED	[Reserved]
16-31	GO TO SCENE	Adjusts the lighting control level for Scene xxxx according to the Fade time.
32	RESET	Changes the variables in the persistent memory to their reset values.
33	STORE ACTUAL LEVEL IN THE DTR (STORE ACTUAL LEVEL IN DTR0)	Saves the current lighting control level to the DTR(DTR0).
34	SAVE PERSISTENT VARIABLES	Saves a variable in a nonvolatile memory (NVM).
35	SET OPERATING MODE	Data of DTR0 is set as an operating mode.
36	RESET MEMORY BANK	The memory bank specified in DTR0 is changed to the reset value.
37	IDENTIFY DEVICE	Starts an identification state of the device.
38-41	RESERVED	[Reserved]
42	STORE THE DTR AS MAX LEVEL (SET MAX LEVEL)	Specifies the DTR (DTR0) data as the maximum lighting control level.
43	STORE THE DTR AS MIN LEVEL (SET MIN LEVEL)	Specifies the DTR (DTR0) data as the minimum lighting control level.

命令号	名称	描述
44	STORE THE DTR AS SYSTEM FAILURE LEVEL (SET SYSTEM FAILURE LEVEL)	Specifies the DTR (DTR0) data as the "FAILURE LEVEL".
45	STORE THE DTR AS POWER ON LEVEL (SET POWER ON LEVEL)	Specifies the DTR (DTR0) data as the "POWER ON LEVEL".
46	STORE THE DTR AS FADE TIME (SET FADE TIME)	Specifies the DTR (DTR0) data as the "Fade time".
47	STORE THE DTR AS FADE RATE (SET FADE RATE)	Specifies the DTR (DTR0) data as the "Fade rate".
48	SET EXTENDED FADE TIME	Specifies the DTR (DTR0) data as the "Extended Fade Time".
49-63	RESERVED	[Reserved]
64-79	STORE THE DTR AS SCENE (SET SCENE)	Specifies the DTR (DTR0) data as Scene <code>XXXX</code> .
80-95	REMOVE FROM SCENE	Deletes the Scene <code>XXXX</code> setting. (Specifies 1111 1111 for the Scene register.)
96-111	ADD TO GROUP	Adds the slave to Group <code>XXXX</code> .
112-127	REMOVE FROM GROUP	Deletes the slave from Group <code>XXXX</code> .
128	STORE DTR AS SHORT ADDRESS (SET SHORT ADDRESS)	Specifies the DTR (DTR0) data as a Short Address.
129	ENABLE WRITE MEMORY	Admits the writing of the memory bank.
130-143	RESERVED	[Reserved]
144	QUERY STATUS	Returns STATUS INFORMATION
145	QUERY CONTROL GEAR (QUERY CONTROL GEAR PRESENT)	Is there a slave that can communicate?
146	QUERY LAMP FAILURE	Is there a lamp problem?
147	QUERY LAMP POWER ON	Is a lamp on?
148	QUERY LIMIT ERROR	Is the specified lighting control level out of the range from the minimum to the maximum values?
149	QUERY RESET STATE	Is the slave in 'RESET STATE'?
150	QUERY MISSING SHORT ADDRESS	Does the slave not have a Short Address?
151	QUERY VERSION NUMBER	What is the corresponding IEC standard number?
152	QUERY CONTENT DTR (QUERY CONTENT DTR0)	What is the DTR (DTR0) content?
153	QUERY DEVICE TYPE	What is the device type? (fluorescent lamp:0000 0000)
154	QUERY PHYSICAL MINIMUM LEVEL	What is the minimum lighting control level specified by the hardware?
155	QUERY POWER FAILURE	Has the slave operated without the execution of reset-command or the adjustment of the lighting control level?
156	QUERY CONTENT DTR1	What is the DTR1 content?
157	QUERY CONTENT DTR2	What is the DTR2 content?
158	QUERY OPERATING MODE	What is the OperatingMode?
159	QUERY LIGHT SOURCE TYPE	What is the type of light source?
160	QUERY ACTUAL LEVEL	What is the "ACTUAL LEVEL" (the current lighting control level)?
161	QUERY MAX LEVEL	What is the maximum lighting control level?
162	QUERY MIN LEVEL	What is the minimum lighting control level?
163	QUERY POWER ON LEVEL	What is the "POWER ON LEVEL" (the lighting control level when the power is turned on)?
164	QUERY SYSTEM FAILURE LEVEL	What is the "SYSTEM FAILURE LEVEL" (the lighting control level when a failure occurs)?
165	QUERY FADE TIME / FADE RATE	What are the Fade time / Fade rate?

命令号	名称	描述
166	QUERY MANUFACTURER SPECIFIC MODE	What is the Specific Mode?
167	QUERY NEXT DEVICE TYPE	What is the next Device Type?
168	QUERY EXTENDED FADE TIME	What is the Extended Fade Time?
169	QUERY CONTROL GEAR FAILURE	Does a slave have abnormality?
170-175	RESERVED	[Reserved]
176-191	QUERY SCENE LEVEL (SCENES 0-15)	What is the lighting control level for Scene XXXX?
192	QUERY GROUPS 0-7	Does the slave belong to a Group among Groups 0 to 7? (Each bit corresponds to a Group.)
193	QUERY GROUPS 8-15	Does the slave belong to a Group among Groups 8 to 15? (Each bit corresponds to a Group.)
194	QUERY RANDOM ADDRESS (H)	What are the higher 8 bits of the random address?
195	QUERY RANDOM ADDRESS (M)	What are the middle 8 bits of the random address?
196	QUERY RANDOM ADDRESS (L)	What are the lower 8 bits of the random address?
197	READ MEMORY LOCATION	The value of the specified address of the specified memory bank? (DTR0: address, DTR1: Memory Bank number)
198-223	RESERVED	[Reserved]

### 特殊命令

命令号	名称	描述
256	TERMINATE	Releases the INITIALISE status.
257	DATA TRANSFER REGISTER(DTR)(DTR0)	Stores the data XXXX XXXX to the DTR (DTR0).
258	INITIALISE	Sets the slave to the INITIALISE status for 15 minutes. Commands 259 to 270 are enabled only for a slave in this status.
259	RANDOMISE	Generates a random address.
260	COMPARE	Is the random address smaller or equal to the search address?
261	WITHDRAW	Excludes slaves for which the random address and search address match from the compare process.
262	RESERVED	[Reserved]
263	PING	Slave ignores.
264	SEARCHADDRH	Specifies the higher 8 bits of the search address.
265	SEARCHADDRM	Specifies the middle 8 bits of the search address.
266	SEARCHADDRL	Specifies the lower 8 bits of the search address.
267	PROGRAM SHORT ADDRESS	Sets the slave of Short Address of being selected to the AAA AAA.
268	VERIFY SHORT ADDRESS	Is the Short Address AAA AAA?
269	QUERY SHORT ADDRESS	What is the Short Address of the slave being selected?

### 特殊命令

命令号	名称	描述
272	ENABLE DEVICE TYPE X	Adds the device XXXX XXXX (a special device).
273	DATA TRANSFER REGISTER 1 (DTR1)	Stores data XXXX XXXX in DTR1.
274	DATA TRANSFER REGISTER 2 (DTR2)	Stores data XXXX XXXX in DTR2.
275	WRITE MEMORY LOCATION	Writes data to the specified address of the specified memory bank. (there is BW) (DTR (DTR0): address, DTR1: memory bank number)

命令号	名称	描述
276	WRITE MEMORY LOCATION – NO REPLY	Writes data to the specified address of the specified memory bank. (there is not BW) (DTR (DTR0): address, DTR1: memory bank number)
273-287	RESERVED	[Reserved]

## IEC 62386-207 协议指令

本产品默认支持下表中的 IEC 62386-207:2009 ed1.0 命令。

命令号	名称	描述
224	REFERENCE SYSTEM POWER	Measures the power level.
225	ENABLE CURRENT PROTECTOR	Enables the current protector.
226	DISABLE CURRENT PROTECTOR	Disables the current protector. (IEC62386-207ed1.0 only)
227	SELECT DIMMING CURVE	Specifies the dimming curve according to DTR value. (IEC62386-207ed1.0 only)
228	STORE DTR AS FAST FADE TIME	Specifies Fast Fade time. (IEC62386-207ed1.0 only)
229-236	Reserved	
237	QUERY GEAR TYPE	Gear type? (IEC62386-207ed1.0 only)
238	QUERY DIMMING CURVE	Dimming curve? (IEC62386-207ed1.0 only)
239	QUERY POSSIBLE OPERATING MODE	Possible Operating Mode? (IEC62386-207ed1.0 only)
240	QUERY FEATURES	FEATURES? (IEC62386-207ed1.0 only)
241	QUERY FAILURE STATUS	Failure status? (IEC62386-207ed1.0 only)
242	QUERY SHORT CIRCUIT	Is Short circuit detected? (IEC62386-207ed1.0 only)
243	QUERY OPEN CIRCUIT	Is Open circuit detected? (IEC62386-207ed1.0 only)
244	QUERY LOAD DECREASE	Is Load decrease detected? (IEC62386-207ed1.0 only)
245	QUERY LOAD INCREASE	Is Load increase detected? (IEC62386-207ed1.0 only)
246	QUERY CURRENT PROTECTOR ACTIVE	Is the current protector active? (IEC62386-207ed1.0 only)
247	QUERY THERMAL SHUTDOWN	Is Thermal shut down detected? (IEC62386-207ed1.0 only)
248	QUERY THERMAL OVERLOAD	Is Thermal overload detected? (IEC62386-207ed1.0 only)
249	QUERY REFERENCE RUNNING	During power level measurement? (IEC62386-207ed1.0 only)
250	QUERY REFERENCE MEASUREMENT FAILED	Is power level measurement failed? (IEC62386-207ed1.0 only)
251	QUERY CURRENT PROTECTOR ENABLE	Is the current protector enabled? (IEC62386-207ed1.0 only)
252	QUERY OPERATING MODE	OPERATING MODE? (IEC62386-207ed1.0 only)

命令号	名称	描述
253	QUERY FAST FADE TIME	Fast Fade time? (IEC62386-207ed1.0 only)
254	QUERY MIN FAST FADE TIME	Minimum Fast Fade time? (IEC62386-207ed1.0 only)
255	QUERY EXTENDED VERSION NUMBER	What is the Edition number of the Part2XX? IEC62386-207ed1.0 adapted to DALI-2 : 0x08 (version 2.0)

## 其他说明

对于 IEC 62386-102ed1.0 中的部分命令在新版本标准中已经不支持，本产品默认不支持这些命令。如果需要支持这些命令，可以联系我们进行固件定制。

## IEC 62386-209 协议指令

本产品默认支持下表中的 IEC 62386-209:2011 ed1.0 命令。

命令号	名称	描述
226	ACTIVATE	
231	SET TEMPORARY COLOUR TEMPERATURE TC	
232	COLOUR TEMPERATURE TC STEP COOLER	
233	COLOUR TEMPERATURE TC STEP WARMER	
238	COPY REPORT TO TEMPORARY	
239	STORE COLOUR TEMPERATURE TC STEP INCREMENT	
242	STORE COLOUR TEMPERATURE TC LIMIT	
243	STORE GEAR FEATURES/STATUS	
247	QUERY GEAR FEATURES/STATUS	
248	QUERY COLOUR STATUS	
249	QUERY COLOUR TYPE FEATURES	
255	QUERY EXTENDED VERSION NUMBER	What is the Edition number of the Part2XX? IEC62386-209ed1.0 adapted to DALI-2 : 0x08 (version 2.0)

## 其他说明

最新的 DALI-2 DT8 (Tc) 认证测试中包括了 DiiA 在 IEC 62386-209:2011 ed1.0 的基础上增加的修订内容，本模块固件已经支持。以下为 MDA132 在 MDA132 EVK 评估套件上通过 DALI-2 测试的情况。

**Check content**

- passed - IEC 62386-102 / 6.25 / EXTENDED FADE
- passed - IEC 62386-102 / 6.12 / FADE TIME/FADE
- passed - IEC 62386-102 / 7.11 / IDENTIFY BEHIC
- passed - IEC 62386-102 / 6.6 / FADE TIME, rate
- passed - IEC 62386-102 / 6.13 / FADE TIME/FADE
- passed - IEC 62386-102 / 6.8 / FADE RATE, tran
- passed - IEC 62386-207 / 7.1.8 / QUERY THERMAL
- passed - IEC 62386-207 / 7.2.9 / Reset State /
- passed - IEC 62386-209 / 7.4.10 / Colour Tempe
- passed - IEC 62386-209 / 7.2.9 / Power On Colo
- passed - IEC 62386-102 / 7.3 / INITIALISE - de
- passed - IEC 62386-209 / 7.2.11 / Store The DT
- passed - IEC 62386-101 / 4.4 / Dynamic behavi
- passed - IEC 62386-209 / 7.2.6 / Automatic Act
- passed - IEC 62386-209 / 7.2.10 / System Failu
- passed - IEC 62386-102 / 5.3 / READ MEMORY LOC
- passed - IEC 62386-207 / 7.2.2 / REFERENCE STS
- passed - IEC 62386-101 / 4.8 / Power supply sh
- passed - IEC 62386-102 / 4.9 / SET MAX LEVEL

**1. DUT**

Name	MDA132_EVK
Version	Demo
Manufacturer	Meijay Technologies
Comment	MDA132 Firmware on MDA100D

**2. Test environment**

Program: ProbitBench V4.2.7.0  
 Hardware: ProbitLab2 V4.10 / #124  
 Used test sequence set: DiiA V2 2.1.1.0

**3. Test parameters**

Default test conditions: yes  
 Used physical parameters: 16V / 0V / 250mA / 3µs / 3i  
 Used edition: 2  
 Used break on error: no

**DiiA V2 2.1.1.0**

- IEC 62386-101 System
- IEC 62386-102 Control gear
- IEC 62386-103 Control device
- IEC 62386-207 LED modules (device type 6) - Ed1 adapted to E42
- IEC 62386-209 Colour control (device type 8) - Ed1 adapted to E42
- IEC 62386-250 Integrated Bus Power Supply
- IEC 62386-251 Memory bank 1 extension
- IEC 62386-252 Energy reporting
- IEC 62386-253 Diagnostics And Maintenance
- IEC 62386-301 Push buttons
- IEC 62386-302 Absolute inputs
- IEC 62386-303 Occupancy sensor
- IEC 62386-304 Light sensor

- passed - IEC 62386-207 / 7.1.2 / QUERY SHORT CIRCUIT
- passed - IEC 62386-207 / 7.1.3 / QUERY OPEN CIRCUIT
- passed - IEC 62386-207 / 7.1.4 / QUERY LOAD INCREASE
- passed - IEC 62386-207 / 7.1.5 / QUERY LOAD DECREASE
- passed - IEC 62386-207 / 7.1.6 / QUERY CURRENT PROTECTOR ACTIVE: Underload
- passed - IEC 62386-207 / 7.1.7 / QUERY CURRENT PROTECTOR ACTIVE: Overload
- passed - IEC 62386-207 / 7.1.8 / QUERY THERMAL SHUT DOWN
- passed - IEC 62386-207 / 7.1.9 / QUERY THERMAL OVERLOAD
- passed - IEC 62386-207 / 7.1.10 / Query control gear information
- passed - IEC 62386-207 / 7.2.1 / REFERENCE SYSTEM POWER
- passed - IEC 62386-207 / 7.2.2 / REFERENCE SYSTEM POWER: 100 ms-timeout
- passed - IEC 62386-207 / 7.2.3 / REFERENCE SYSTEM POWER: Command in-between
- passed - IEC 62386-207 / 7.2.4 / REFERENCE SYSTEM POWER: 15 minutes timer
- passed - IEC 62386-207 / 7.2.5 / REFERENCE SYSTEM POWER: failed
- passed - IEC 62386-207 / 7.2.6 / ENABLE / DISABLE CURRENT PROTECTOR
- passed - IEC 62386-207 / 7.2.7 / SELECT DIMMING CURVE
- passed - IEC 62386-207 / 7.2.8 / FAST FADE TIME
- passed - IEC 62386-207 / 7.2.9 / Reset State / Persistent Memory
- passed - IEC 62386-207 / 7.3.1 / ENABLE DEVICE TYPE: Application extended commands
- passed - IEC 62386-207 / 7.3.2 / ENABLE DEVICE TYPE: Application extended configuration c
- passed - IEC 62386-207 / 7.3.3 / ENABLE DEVICE TYPE: Application extended configuration c
- passed - IEC 62386-207 / 7.4.1 / QUERY EXTENDED VERSION NUMBER
- passed - IEC 62386-207 / 7.4.2 / RESERVED APPLICATION EXTENDED COMMANDS
- passed - IEC 62386-209 / 2.1.1 / Reset
- passed - IEC 62386-209 / 7.1.1 / Query Gear Features / Status
- passed - IEC 62386-209 / 7.1.2 / Query Colour Status
- passed - IEC 62386-209 / 7.1.3 / Query Colour Type Features
- passed - IEC 62386-209 / 7.1.4 / Query Colour Value
- passed - IEC 62386-209 / 7.2.4 / Store Colour Temperature Tc Limit
- passed - IEC 62386-209 / 7.2.5 / Store Gear Features / Status
- passed - IEC 62386-209 / 7.2.6 / Automatic Activate Tc
- passed - IEC 62386-209 / 7.2.9 / Power On Colour
- passed - IEC 62386-209 / 7.2.10 / System Failure
- passed - IEC 62386-209 / 7.2.11 / Store The DTB As Scene XXXX / Goto Scene XXXX
- passed - IEC 62386-209 / 7.3.1 / Enable Device Type: Application Extended Commands
- passed - IEC 62386-209 / 7.3.2 / Enable Device Type: Application Extended Configuration
- passed - IEC 62386-209 / 7.4.3 / DTB Activate (Tc Only)
- passed - IEC 62386-209 / 7.4.8 / Set Temporary Tc
- passed - IEC 62386-209 / 7.4.10 / Colour Temperature Tc Step Warmer/Cooler
- passed - IEC 62386-209 / 7.4.15 / Copy report to temporary
- passed - IEC 62386-209 / 7.5.1 / Query Extended Version Number
- passed - IEC 62386-209 / 7.5.2 / Reserved Application Extended Commands

Step 1: Select a test set based on the DUT results

Step 2: Select a test sequence set or parts of it for comparison

Step 3: View comparison result

Preliminary

## 应用注意事项

### DALI 总线

LED 驱动电源在使用本产品的 DALI 总线接口时，只需要将电源外侧的 2 条 DALI 总线信号与模块相应引脚连接即可，引线注意保持和 AC 交流信号/电源输出/控制电路间保持必要的电气隔离距离。具体要求应该根据所设计的电源产品应该遵守的认证规范。

### PWM 调光控制信号

模块为每一路恒流输出提供了 2 个 PWM 信号 (PWM\_A 和 PWM\_D)，一路为模拟 (Analog) 调光接口，一路为数字 (Digital) PWM 调光接口。一般使用时仅使用 PWM\_A 模拟调光接口，而当电源调光方案采用混合调光 (Hybrid Dimming) 时，PWM\_A 提供高段模拟调光信号，PWM\_D 则提供在低段进行数字 PWM 的信号。混合调光是实现深度调光的一种常见方法，具体设计时需要联系我们定制合适的固件以匹配对应的硬件驱动电路。

根据我们的经验，即使仅仅使用单一的 PWM\_A 信号，通常也需要对 PWM 控制信号的频率、占空比上下限范围进行匹配才能获得最佳性能，甚至有时候需要采用特殊的调光算法才能匹配相应的功率控制电路。如果有这方便的需求，请和我们联系，我们也已经匹配了常用的控制电路。

### 输出开路 and 短路输入信号

模块为每一路恒流功率电路提供了输出 OVP (Open-Circuit /Over Voltage Protection, 开路过压保护) 和 SCP (Short Circuit Protection, 短路保护) 信号输入接口，使用时请设计合适的外围电路以便在上述故障保护状态时能够提供稳定的高电平输入。

需要注意的是在检测到以上故障状态时，模块并不会尝试关闭功率输出。并且外围电路仅需保证在功率电路被开启 (即模块输出有效的开灯) 的状态下能够检测到故障状态即可，在模块接收到系统指令关灯后，即使输出发生开路或短路，也可以接受故障信号的暂时无效。

### DALI-2 认证考虑

为了通过 DALI-2 认证，尽管绝大多数功能已有模块支持，但电源设计仍需要特别考虑以下几点：

- 1) 在电源输入 (无论是 AC 或者 DC 供电) 中断 200ms 以内，模块供电应该保持正常以便 DALI 通信维持稳定工作。这通常可以通过在模块供电端的 LDO 前级放置较大的电解电容实现 (如 LDO 前级电压正常时为 12V，那么可放置 470uF 的电解电容)，具体数值可依照设计功耗和实测数据进行调整。

- 2) DALI 调光电源的输出电流调整速度影响调光的一致性，也是电源调光性能的重要指标，推荐选用响应快速的控制方案，不推荐使用平均电流模式下的环路响应较慢的恒流驱动方案，也不推荐在输出端放置较大的滤波电容以避免影响电流变化速度。建议最大功率开关的响应速度不超过 50ms。
- 3) DALI 调光电源从输入上电到光输出（带 LED 负载测试）的时间有时序要求，产品设计时要保证冷启动时从上电到模块供电正常的时间小于 500ms，并且要保证输出默认开启的情况下 600ms 之内应有光输出。这两项数值越短越好，当模块供电时间低于 100ms 时，模块有机会在启动时即可直接检测到 DALI 总线故障（总线故障检测至少需要 500ms）。如果需要做 DALI-2 认证，请将以上两项具体测量数值提供给我们进行固件定制。
- 4) DALI-2 认证还涉及到产品的相关数据，如对应每个产品型号的 GTIN 编码（厂商自行购买）、产品序列号 SN（模块内置了一种序列号自动生成机制，如需要自定义则要定制固件）。

## 订购信息

### 型号说明

型号代码:

**M DA 132 -XXX**

含义如下:

- M: Module ( 模块 )
- DA : DALI 标准
- 132: 产品主型号
- XXX : 可选定制代码 , 标准品无此位

### 型号列表

型号	订货代码	描述	特殊要求
MDA132	MDA132	LED 驱动电源内置 DALI DT8 Tc 协议转换模块	
MDA132-12V	MDA132-12V	LED 驱动电源内置 DALI DT8 Tc 协议转换模块	内置 LDO , 宽电压供电

### 联系方式

南京美加杰智能科技有限公司

地址 : 南京市江宁区长亭街 9 号俊杰科创大厦 1302 室

电话 : 177-495-23281

电子邮箱 : [sales@meijay.com](mailto:sales@meijay.com)

网址 : [www.meijay.com](http://www.meijay.com)

### 关于美加杰智能

南京美加杰智能科技有限公司是一家专业智能照明产品解决方案厂商, 提供包括基于 DALI、DMX/RDM、zigbee、BLE、LoRa 等协议的照明控制模块、控制器、传感器和控制系统等产品和方案。公司为 DALI 联盟组织 DiiA 的长期会员, 拥有 DALI-2 认证测试专用设备 ProbitLab2, 可为客户提供一站式 DALI-2 产品设计到认证服务。



## 版本历史

版本	修订日期	描述	修订人	审核人
1.0	2020/8/24	初次发行。		Joey Tian

Preliminary