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# Automotive Applications Guide

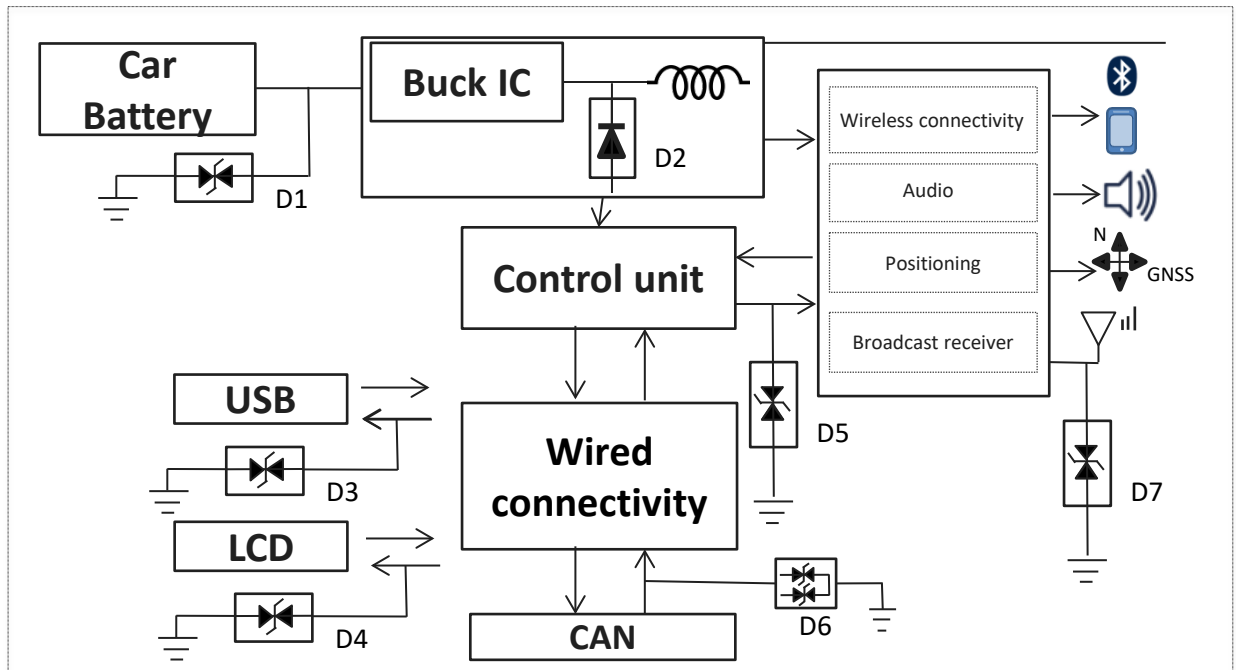
## **2022**

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2022/1/11

# Infotainment Head Unit

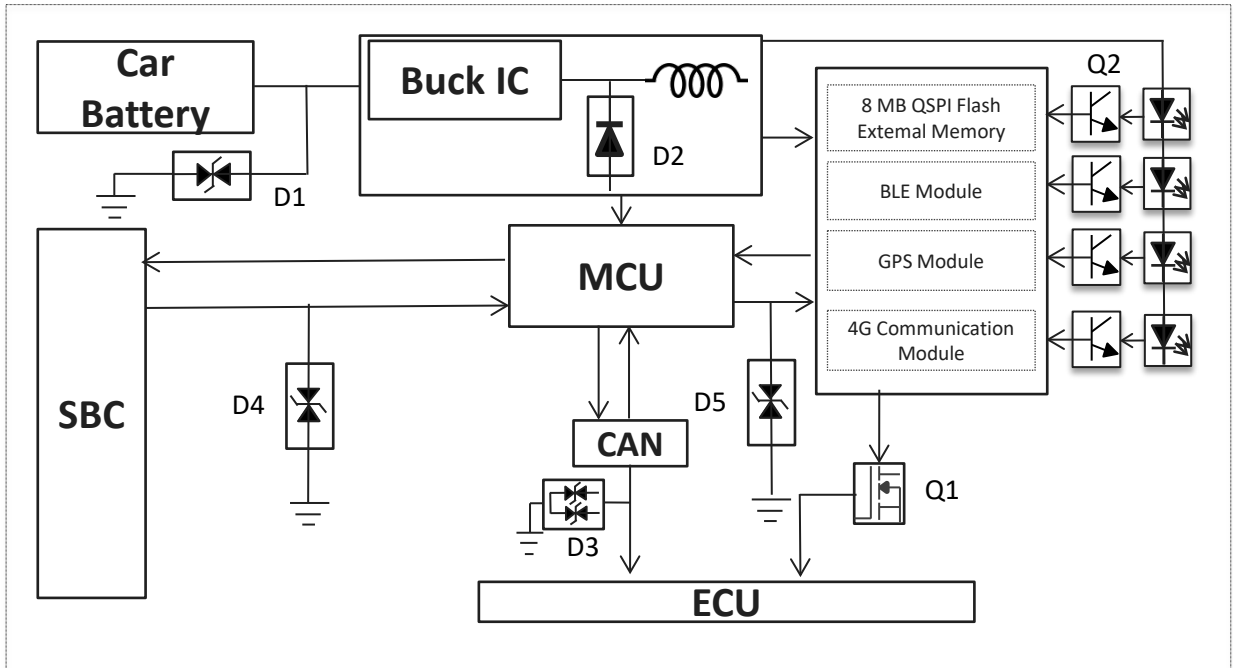
Digital terrestrial tuners, audio power amplifiers and multi-constellation GNSS positioning devices.



| P/N              | Product  | Package | Specification | RefDes |
|------------------|----------|---------|---------------|--------|
| ATV15C260JB-HF   | TVS      | SMC     | 26V/1500W     | D1     |
| ATV15CXXXJB-HF   | TVS      | SMC     | 1500W         | D1     |
| ACDBA340-HF      | Schottky | SMA     | 40V/3A        | D2     |
| ACDBA360-HF      | Schottky | SMA     | 60V/3A        | D2     |
| ACDBB540-HF      | Schottky | SMB     | 40V/5A        | D2     |
| ACDBC540-HF      | Schottky | SMC     | 40V/5A        | D2     |
| ACPDQC5V0ESPC-HF | ESD      | 0402    | Bi- 5V/0.28pF | D3, D5 |
| ACPDT-24VE-HF    | ESD      | SOT-23  | Bi- 24V/20pF  | D6, D7 |
| ACPDQC24VE-HF    | ESD      | 0402    | Bi- 24V/20pF  | D6, D7 |
| ACPDQC5V0CHT-HF  | ESD      | 0402    | Bi- 5V/30pF   | D4     |

# T-BOX

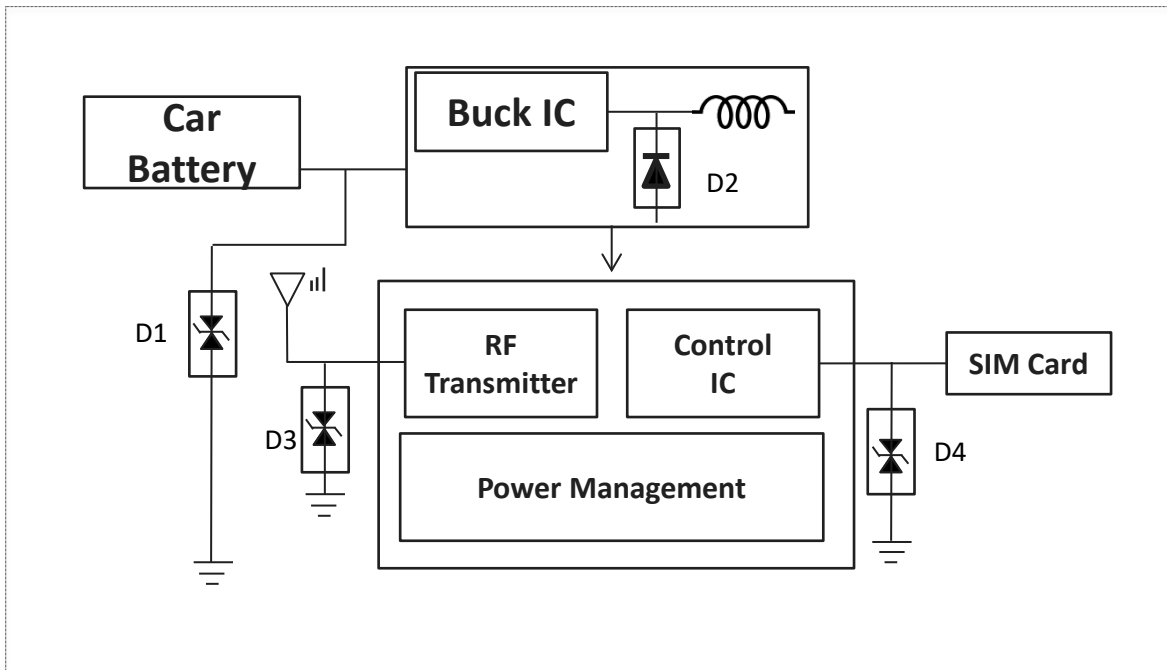
Telematics Box is the hardware responsible for Internet of Vehicles and Cloud Synchronization for digital integration



| P/N              | Product    | Package | Specification | RefDes |
|------------------|------------|---------|---------------|--------|
| ATV15C260JB-HF   | TVS        | SMC     | 26V/1500W     | D1     |
| ATV15CXXXJB-HF   | TVS        | SMC     | 1500W         | D1     |
| ACDBA340-HF      | Schottky   | SMA     | 40V/3A        | D2     |
| ACDBA360-HF      | Schottky   | SMA     | 60V/3A        | D2     |
| ACDBB540-HF      | Schottky   | SMB     | 40V/5A        | D2     |
| ACDBC540-HF      | Schottky   | SMC     | 40V/5A        | D2     |
| ACPDQC5V0ESPC-HF | ESD        | 0402    | Bi- 5V/0.28pF | D4, D5 |
| ACPD24-24VE-HF   | ESD        | SOT-23  | Bi- 24V/20pF  | D3     |
| A2N7002H-HF      | MOSFET     | SOT-23  | 100V/50A      | Q1     |
| AMMBT3904-HF     | Transistor | SOT-23  | 60V/0.2A      | Q2     |

# 4G LTE

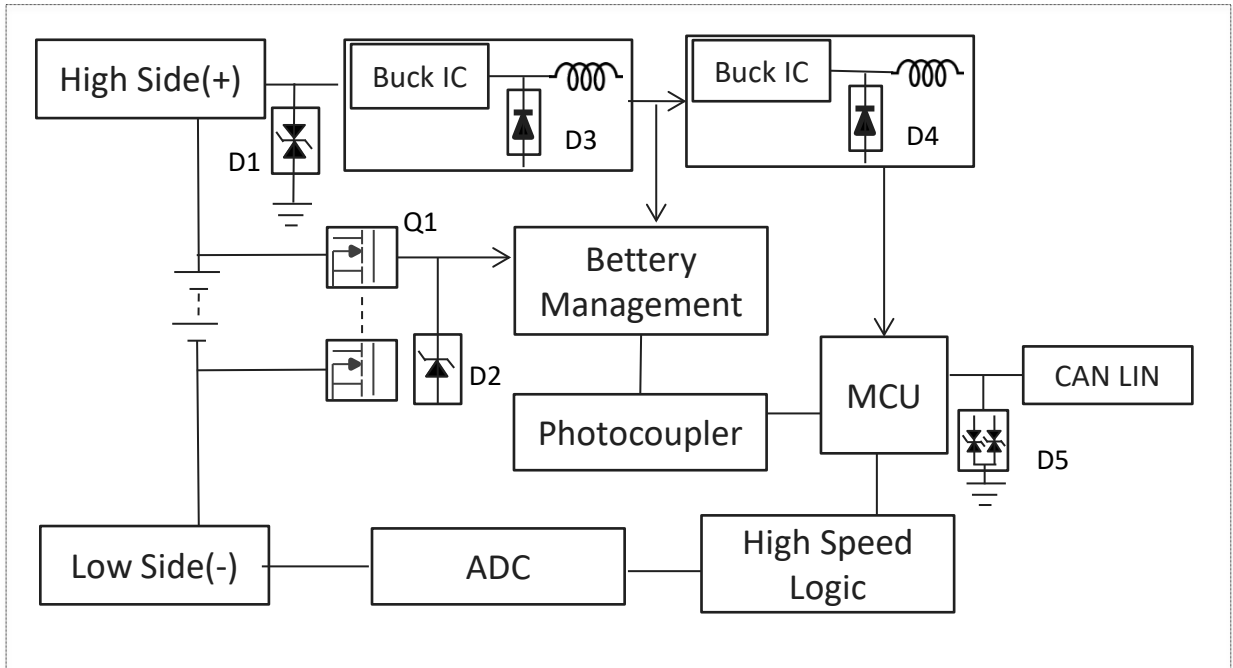
The TVS Diode is the main countermeasure for Automotive LTE module application



| P/N              | Product  | Package  | Specification | RefDes |
|------------------|----------|----------|---------------|--------|
| ACPDQC5V0ESPC-HF | ESD      | 0402     | Bi- 5V/0.28pF | D4     |
| ACPDUC24V-HF     | ESD      | 0603     | Bi- 24V/10pF  | D3     |
| ACPDQC5V0CSP-HF  | ESD      | 0402     | Bi- 5V/0.3pF  | D3     |
| ASMCJ36CA-HF     | TVS      | SMC      | Bi- 36V/1500W | D1     |
| ASMCJ24CA-HF     | TVS      | SMC      | Bi- 24V/1500W | D1     |
| ACDBW0540-HF     | Schottky | SOD-123  | 40V/0.5A      | D2     |
| ACDBMS140-HF     | Schottky | SOD-123F | 40V/1A        | D2     |
| ACDBMT140-HF     | Schottky | SOD-123H | 40V/1A        | D2     |

# BMS

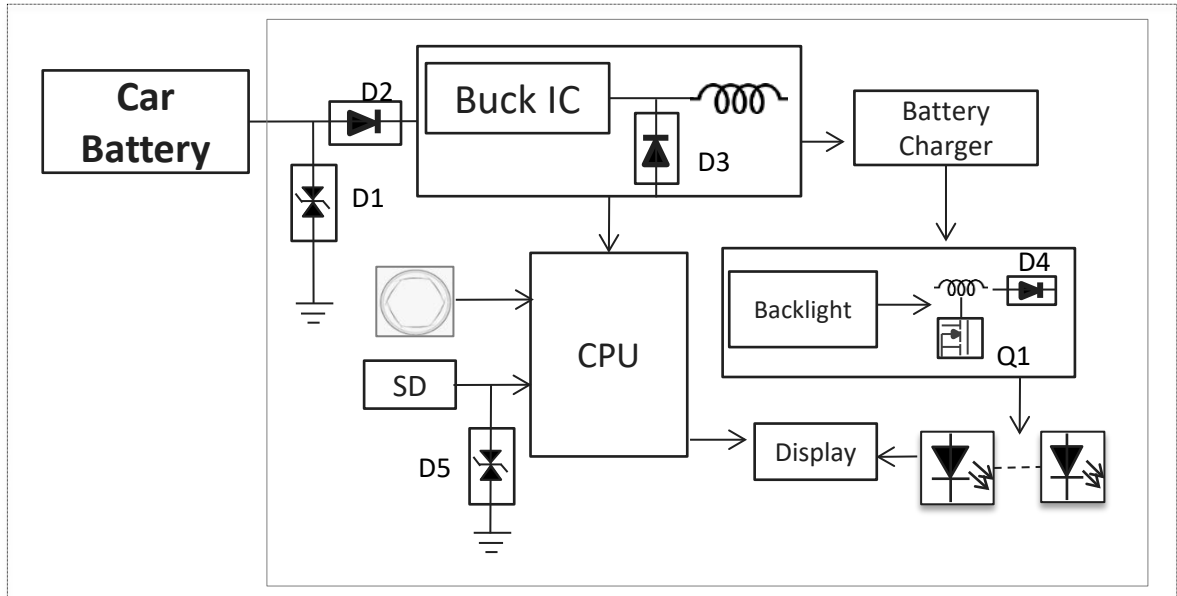
Battery Management System :  
High voltage power supply for motor 380~420V  
Low voltage power supply for control panel  
(Precision action, start up or switch off )



| P/N              | Product  | Package  | Specification | RefDes |
|------------------|----------|----------|---------------|--------|
| ATV15C260JB-HF   | TVS      | SMC      | 26V/1500W     | D1     |
| ATV04A240JB-HF   | TVS      | SMA      | 24V/400W      | D1     |
| ATV06A330JB-HF   | TVS      | SMA      | 33V/600W      | D1     |
| ABZT52B3V3-HF    | Zener    | SOD-123  | 3.3V/0.5W     | D2     |
| ACDBW0540-HF     | Schottky | SOD-123  | 40V/0.5A      | D3,D4  |
| ACDBMS140-HF     | Schottky | SOD-123F | 40V/1A        | D3,D4  |
| ACPDQC5V0ESPC-HF | ESD      | SOT-23   | Bi- 24V/10pF  | D5     |
| ACPDT-24VE-HF    | ESD      | SOT-23   | Bi- 24V/20pF  | D5     |
| A2N7002H-HF      | MOSFET   | SOT-23   | 60V/0.3A      | Q1     |
| ACMSN2312T-HF    | MOSFET   | SOT-23   | 20V/4.9A      | Q1     |

# Dashcam

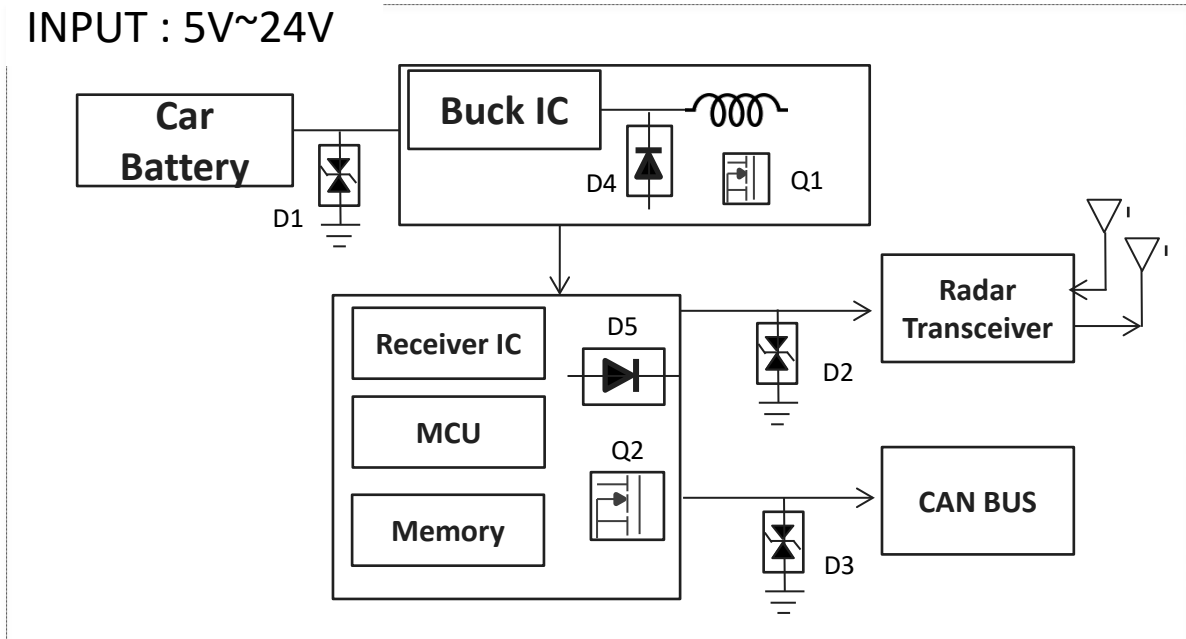
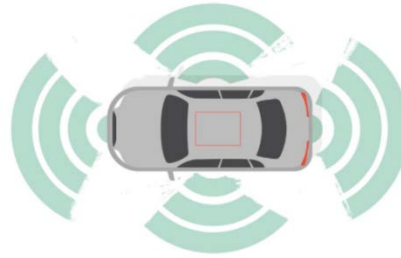
Aftermarket installed product. TVS, Schottky, ESD are commonly used as protection and transmission



| P/N             | Product  | Package  | Specification | RefDes |
|-----------------|----------|----------|---------------|--------|
| ATV30C260JB-HF  | TVS      | SMC      | 26V/3000W     | D1     |
| ATV15C260JB-HF  | TVS      | SMC      | 26V/1500W     | D1     |
| ACDBA340-HF     | Schottky | SMA      | 40V/3A        | D2     |
| ACDBA360-HF     | Schottky | SMA      | 60V/3A        | D2     |
| ACDBC540-HF     | Schottky | SMC      | 40V/5A        | D2     |
| ACDBC560-HF     | Schottky | SMB      | 60V/5A        | D3     |
| ACDBW0540-HF    | Schottky | SOD-123  | 40V/0.5A      | D4     |
| ACDBMS140-HF    | Schottky | SOD-123F | 40V/1A        | D4     |
| ACPDZC5V0SPC-HF | ESD      | 0201     | 5V/0.2Pf      | D5     |
| ACPDZC5V0C-HF   | ESD      | 0201     | 5V/3Pf        | D5     |
| CPDVR5V0-HF     | ESD      | 0402     | 5V/12Pf       | D5     |
| A2N7002H-HF     | MOSFET   | SOT-23   | 60V/0.3A      | Q1     |
| ACMSN2312T-HF   | MOSFET   | SOT-23   | 20V/4.9A      | Q1     |

# ADAS

Advanced Driver Assistance System. Millimeter wave radar is employed for the pedestrian detection and vehicle distance detection

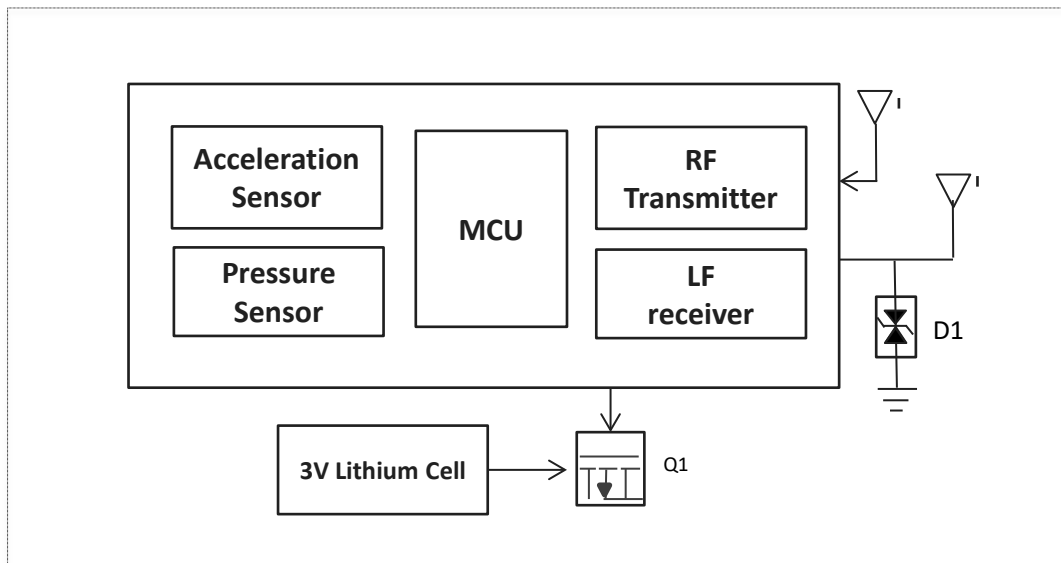


| P/N                  | Product  | Package     | Specification | RefDes |
|----------------------|----------|-------------|---------------|--------|
| ATV02 ~ ATV30 series | TVS      | SOD-123~SMC | 200W~3000W    | D1     |
| ACPDUC24V-HF         | ESD      | 0603        | Bi- 24V/10pF  | D2,D3  |
| ACPDQC5VOCSP-HF      | ESD      | 0402        | Bi- 5V/0.3pF  | D2,D3  |
| ACPDUC5V0-HF         | ESD      | 0603        | Bi- 5V/15pF   | D2,D3  |
| ACDBW0540-HF         | Schottky | SOD-123     | 40V/0.5A      | D4,D5  |
| ACDBMS140-HF         | Schottky | SOD-123F    | 40V/1A        | D4,D5  |
| A2N7002H-HF          | MOSFET   | SOT-23      | 60V/0.3A      | Q1,Q2  |
| ACMSN2312T-HF        | MOSFET   | SOT-23      | 20V/4.9A      | Q1,Q2  |

# TPS/TX



TX Module is employed for the tire pressure detection and temperature of tire. Because it continues using for a long period, 3 voltage lithium battery is the main power supply and it requires energy-saving components. Antenna will increase voltage during transmitting, thus ESD is required as protection.

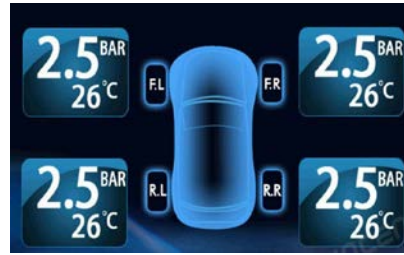


| P/N             | Product | Package | Specification | RefDes |
|-----------------|---------|---------|---------------|--------|
| ACPDQC5V0CSP-HF | ESD     | 0402    | Bi- 5V/0.3pF  | D1     |
| CJ2301          | MOSFET  | SOT-23  | P-CH/20V      | Q1     |

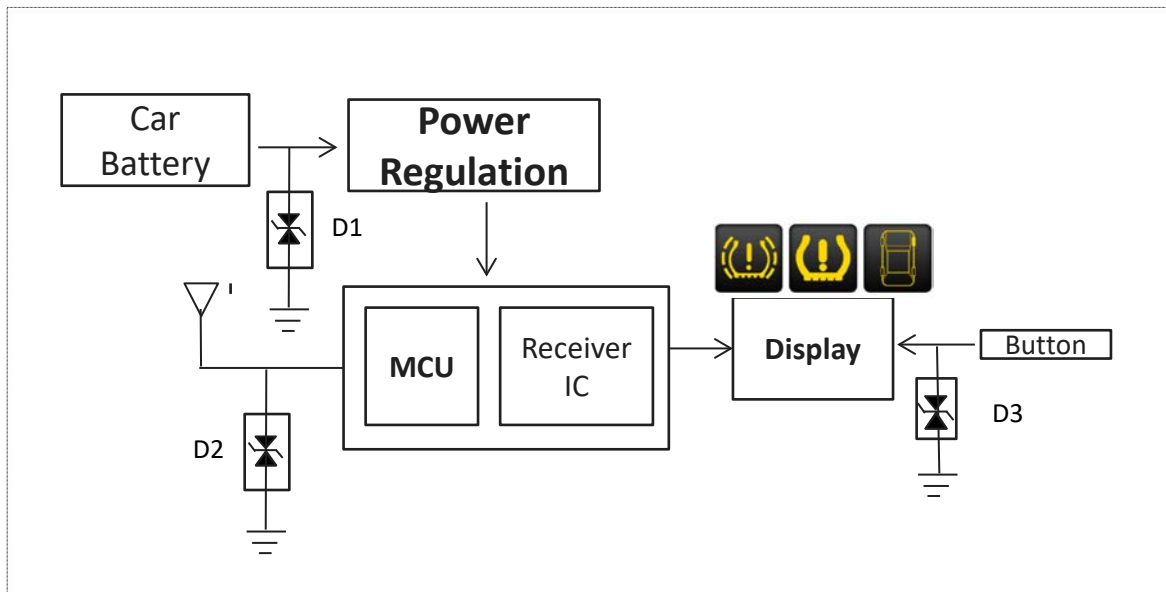


# TPS/RX

RX Module main purpose is interpretation of data from Tx



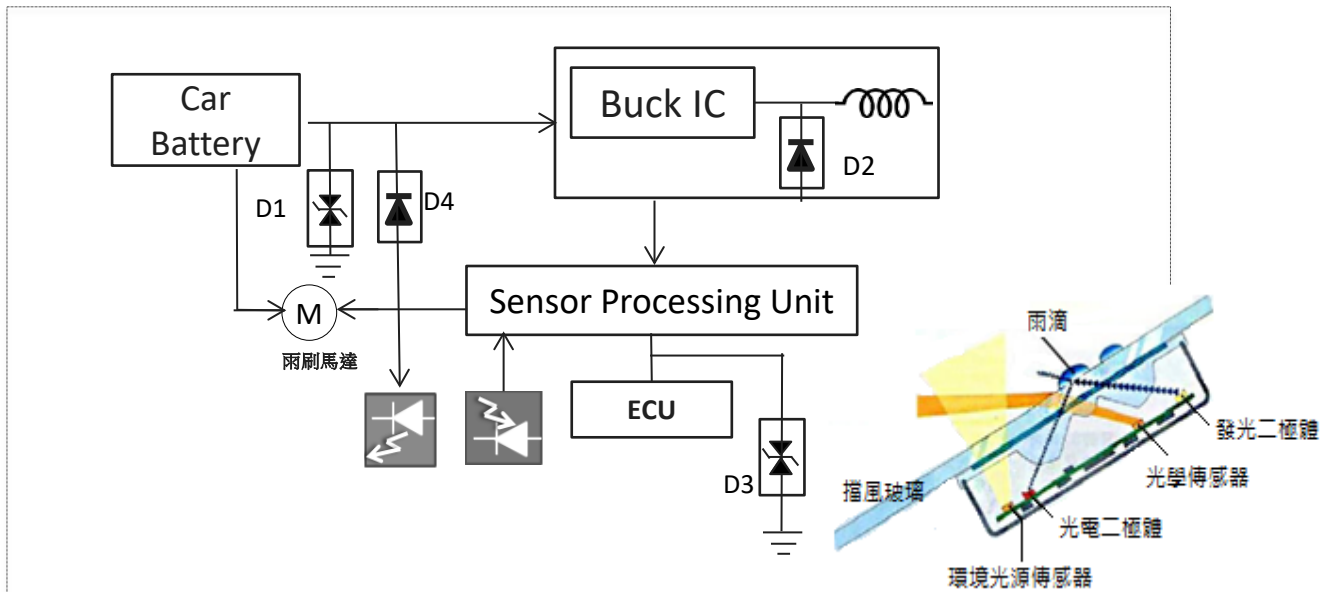
The monitor main power supply is from Car battery. The power regulation of IC or MCU may destruct by Battery Surge; therefore placed in ESD or TVS as protection. Display Button occasionally been pressed, also ESD could breakdown MCU or RF IC from inside, thus ESD is required as protection.



| P/N                  | Product | Package     | Specification | RefDes |
|----------------------|---------|-------------|---------------|--------|
| ATV02 ~ ATV30 series | TVS     | SOD-123~SMC | 200W~3000W    | D1     |
| ACPDUC24V-HF         | ESD     | 0603        | Bi- 24V/10pF  | D2     |
| ACPDQC5V0CSP-HF      | ESD     | 0402        | Bi- 5V/0.3pF  | D2     |
| ACPDUC5V0-HF         | ESD     | 0603        | Bi- 5V/15pF   | D3     |

# Sunlight Sensor

The sensor detects the intensity of the rain and transmits its information to the windshield wiper's control electronics.

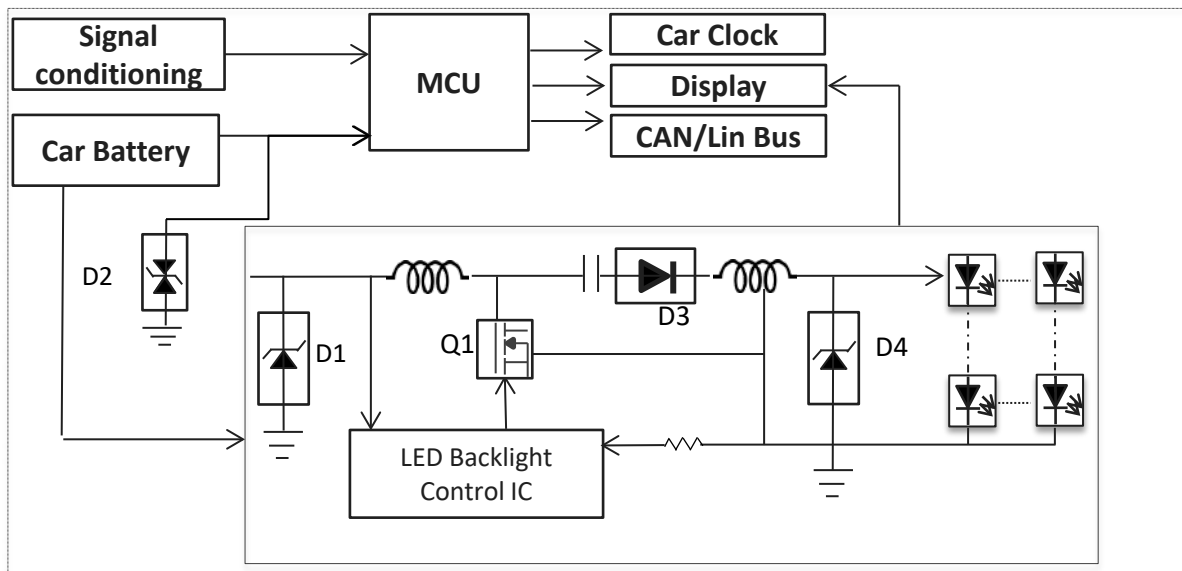


| P/N              | Product   | Package  | Specification | RefDes |
|------------------|-----------|----------|---------------|--------|
| ATV15C260JB-HF   | TVS       | SMC      | 26V/1500W     | D1     |
| ATV15CXXXJB-HF   | TVS       | SMC      | 1500W         | D1     |
| ACDBA340-HF      | Schottky  | SMA      | 40V/3A        | D2     |
| ACDBA360-HF      | Schottky  | SMA      | 60V/3A        | D2     |
| ACDBB540-HF      | Schottky  | SMB      | 40V/5A        | D2     |
| ACDBC540-HF      | Schottky  | SMC      | 40V/5A        | D2     |
| ACPDQC5V0ESPC-HF | ESD       | 0402     | Bi- 5V/0.3pF  | D3     |
| ACPDT-24VE-HF    | ESD       | SOT-23   | Bi- 24V/20pF  | D3     |
| ACPDUC24V-HF     | ESD       | 603      | Bi- 24V/10pF  | D3     |
| ACGRTS4007-HF    | Rectifier | SOD-123L | 1000V/1A      | D4     |

# Instrument Cluster



Instrument Cluster backlight is mainly use in LED light up or brightness adjustment to provide a richer vision. It will pass through Schottky, Mosfet and become the switch. In addition, LED can adapt TVS to protect and avoid the damage from the surge.

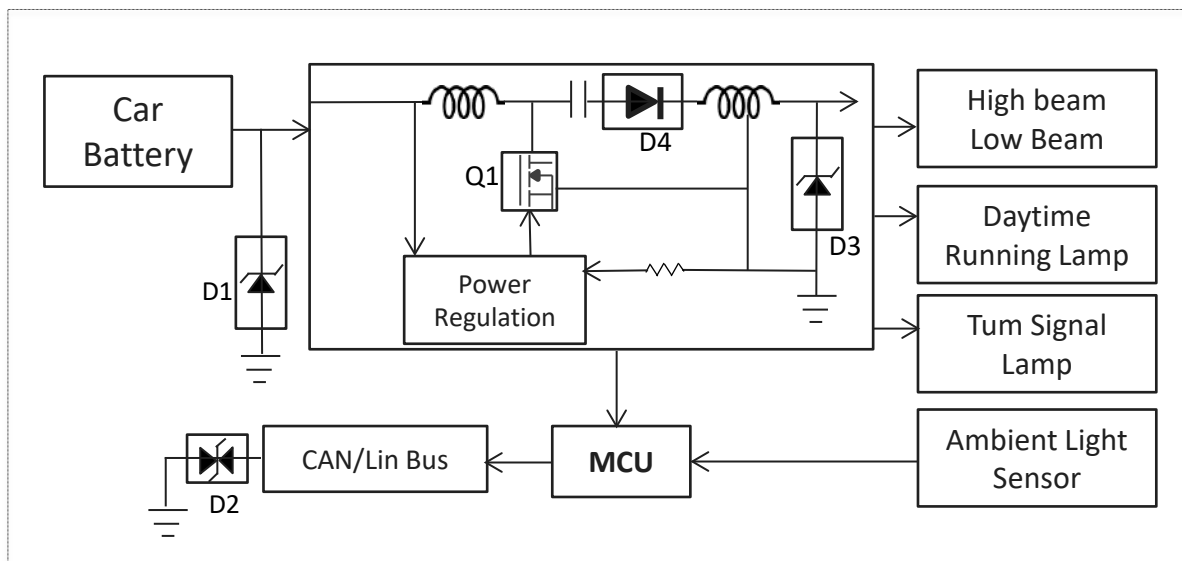


| P/N            | Product  | Package | Specification | RefDes |
|----------------|----------|---------|---------------|--------|
| ATV15260JB-HF  | TVS      | SMC     | 26V/1500W     | D1,D4  |
| ATV15CXXXJB-HF | TVS      | SMC     | 1500W         | D1,D4  |
| ACPDUC24V-HF   | ESD      | 603     | Bi- 24V/10pF  | D2     |
| ACPDUC24VE-HF  | ESD      | 603     | Bi- 24V/16pF  | D2     |
| ACDBA360-HF    | Schottky | SMA     | 60V/3A        | D3     |
| CMS50P04D-HF   | P-Mosfet | TO252   | -40V/-11A     | Q1     |

# LED Headlight



The battery input will cause alternating current wave because of back electromotive force. Therefore, place TVS at the input of the battery.

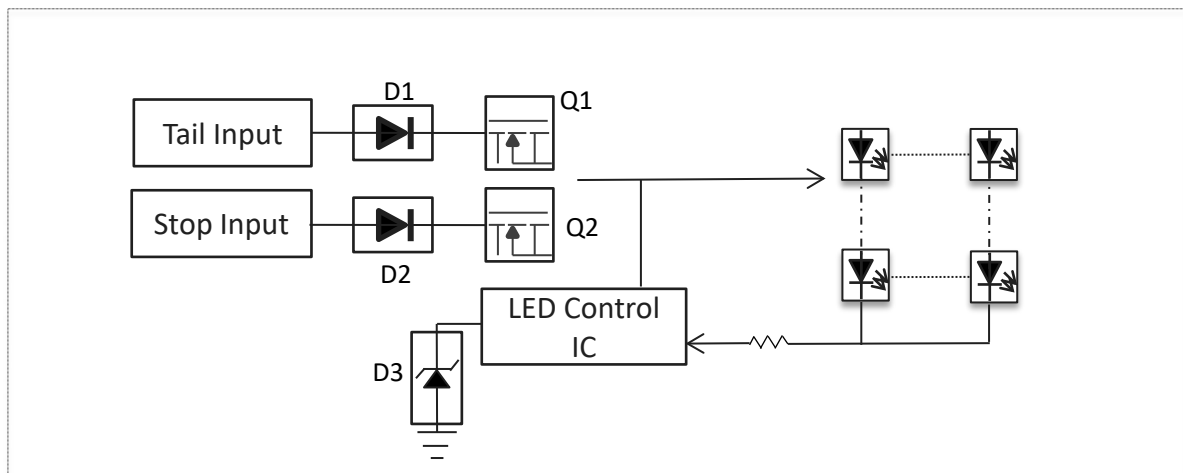


| P/N            | Product  | Package | Specification | RefDes |
|----------------|----------|---------|---------------|--------|
| ATV15C260JB-HF | TVS      | SMC     | 26V/1500W     | D1,D3  |
| ATV15CXXXJB-HF | TVS      | SMC     | 1500W         | D1,D3  |
| ACPDUC24V-HF   | ESD      | 0603    | Bi- 24V/10pF  | D2     |
| ACPDUC24VE-HF  | ESD      | 0603    | Bi- 24V/16pF  | D2     |
| ACDBA360-HF    | Schottky | SMA     | 60V/3A        | D4     |
| ACDBC540-HF    | Schottky | SMC     | 40V/5A        | D4     |
| CMS50N10D-HF   | N-MOSFET | TO-252  | 100V/50A      | Q1     |

## LED Tail Light



The tail input and stop input power busbars are recommended to use Rectifier, Schottky or Switch diode because of reverse voltage protection when there is a peak in voltage to ensure the LED Control IC won't breakdown.



| P/N           | Product   | Package  | Specification | RefDes |
|---------------|-----------|----------|---------------|--------|
| ACDBA340-HF   | Schottky  | SMA      | 3A/40V        | D1,D2  |
| ACGRKM4005-HF | Rectifier | SOD-123  | 1A/600V       | D1,D2  |
| ACDSW4148-HF  | Switching | SOD-123  | 300mA/75V     | D1,D2  |
| ACZRM Series  | Zener     | SOD-123F | 500mW         | D3     |
| ACZA4745-HF   | Zener     | SMA      | 1W            | D3     |
| CMS50P04D-HF  | P-Mosfet  | TO252    | -40V/-11A     | Q1,Q2  |