electrofit
Electric Vehicle Solutions

VCU EFV4 Datasheet

Specification

Operational	Min.	Typ.	Max.
Supply Voltage	+8V	+12V	+20V
Current	10mA	160mA	350mA
Temperature	-40	-	+105
Reverse Voltage	-	-40V	2 Sec

ADC Inputs	Min.	Typ.	Max.
Voltage	+0V		ADC Ref (+5V)
Current	1uA		5uA

Digital Inputs	Min.	Typ.	Max.
ON / OFF Threshold	>+2.35V	-	IO Ref (+5V)
Current	2.5uA	-	5uA

Optical Digital Inputs	Min.	Typ.	Max.
Input Voltage	+3.8V	-	+12V
Input Current	12mA	-	80mA

Low Side Driver per Channel	Min.	Typ.	Max.
Input Voltage	+5V	-	+27V
Input Current	0.9A	1.2A	2.5A

PWM Driver per Channel	Min.	Typ.	Max.
Output Voltage	+4.7V	+5V	+5.3V
Output Current	0	1.2A	5.6A

High Side Output per Channel	Min.	Typ.	Max.
Output Voltage	+9V	+12V	+13.8V
Output Current	0	-	0.7A

Temperature	Min.	Typ.	Max.
Storage Non-Operational	-55C		+155C
Operational	-40C		+105C
Without Optical Inputs	-40C		+125C

Electrical interface

- 3 Full speed Control Area Network (CAN) interfaces configurable to 1 Mbps
- 1 J2411 Single Wire CAN 33.3kbps
- 1 Local Interconnect Network (LIN) bus
- 1 Half Duplex RS485
- 16 Single wire Analogue to Digital Converter (ADC) lines all 12 bit
- 8 Digital inputs at 5V reference (factory configurable mix of inputs and outputs)
- 8 Optically isolated inputs up to +B voltage
- 34 Low side drivers
- 4 Power switch outputs for dedicated Pulse Width Modulated (PWM)
- 4 High-side smart power solid-state relay – high side drivers
- 1 Fused high current power MOSFET low side switch at 33A
- 1 Control pilot switch for charger control
- 5 NPN + PNP Complex digital transistors configured to emulate an ignition sequence

Additional Information

- Full speed CAN Transceivers
    - Fully compatible with the ISO 11898-2 standard
    - High speed software configured up to 1 MB
    - Very low-current standby mode with remote wake-up capability via the bus
    - Very low Electro Magnetic Emission (EME)
    - Differential receiver with high common-mode range for Electro Magnetic Immunity (EMI)
    - Transceiver in unpowered state disengages from the bus (zero load)
    - Voltage source for stabilizing the recessive bus level if split termination is used (further improvement of EME)
    - Transmit Data (TXD) dominant time-out function
    - Bus pins protected against transients in automotive environments
    - Bus pins and pin SPLIT short-circuit proof to battery and ground
    - Thermally protected
- Single wire CAN transceiver
    - Fully compatible with J2411 Single Wire CAN specification for Class B in vehicle communications
    - 30 µA typical power consumption in sleep mode independent from CAN voltage range
    - Operating voltage range 5 to 18V
    - Up to 100 kbps high-speed transmission mode
    - Up to 40 kbps bus speed

- Selective BUS wakeup
- Low RFI due to output wave shaping
- Fully integrated receiver filter
- Bus terminals proof against short-circuits and transients in automotive environment
- Loss of ground protection
- Protection against load dump, jump start
- Thermal overload and short circuit protection
- Under and over voltage lock out
- Bus dominant timeout

- Quad Output High Side Driver

  - Output current: 0.7 A per channel
  - Shorted load protection
  - Junction overtemperature protection
  - Case overtemperature protection for thermal independence of the channels
  - Protection against loss of ground
  - Current limiting
  - Undervoltage shutdown

- PWM Driver

  - Configurable overcurrent protection
  - Overtemperature protection
  - Open load detection
  - Short circuit to GND detection
  - Electrostatic Discharge (ESD) protection

- Low Side Drivers

  - Designed to operate 5.0V < VPWR < 27V
  - Outputs are current limited (0.9 to 2.5A)
  - Output voltage clamp of +50V during inductive switching
  - On/Off control of open load detect current (LED application)
  - VPWR standby current < 10µA
  - RDS(ON) of 0.55Ω at 25°C typical
  - Independent over-temperature protection
  - Output selectable for PWM control
  - Output ON short-to-VBAT and off short-to-ground /open detection

- Case

  - Aluminium alloy top and bottom case
  - Case IP67 with barometric breather in upper case
  - Connectors IP65 sealed
  - Case isolated from internal ground
  - Top and bottom cases hermetically sealed using silicon gasket

- VCA Automotive type approval

  - EMC compliant with VCA EU
    - EEC Directive 95/54/EC
    - Automotive EMC Directive 2004/104/EC

- Environmental
  - WEEE directive 2002/96/EC
  - RoHS Directive 2002/95/EC