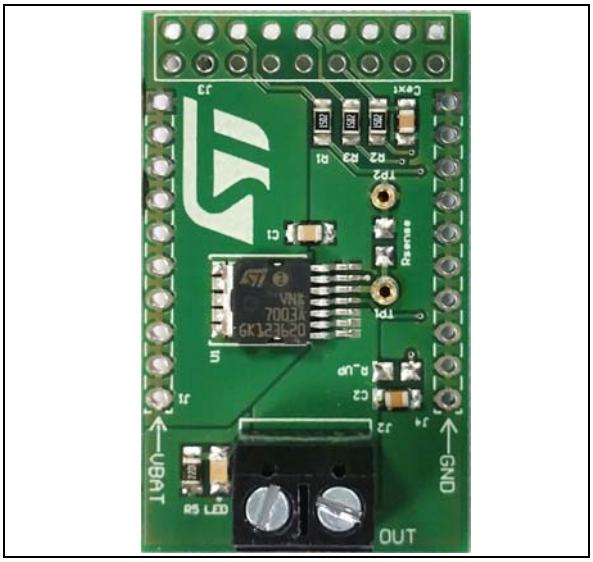
EV-VN7004CH

VN7004CH Evaluation Board

Data brief



Features

Max transient supply voltage	V_{CC}	40 V
Operating voltage range	V_{CC}	4 to 28 V
Typ. on-state resistance (per Ch)	R_{ON}	4 mΩ
Current limitation (typ)	I_{LIMH}	135 A
Stand-by current (max)	I_{STBY}	0.5 µA

- Simple single IC application board dedicated for VN7004CH
- Provides electrical connectivity and thermal heat-sinking for easy prototyping
- General device features
  - Single channel smart high-side driver with CurrentSense analog feedback
  - Very low standby current
  - Compatible with 3 V and 5 V CMOS outputs
- Diagnostic functions
  - Dedicated high precision proportional load current sense
  - Overload and short to ground (power limitation) indication
  - Thermal shutdown indication
  - OFF-state open-load detection
  - Output short to V_{CC} detection
  - Sense enable/ disable
- Protections
  - Undervoltage shutdown
  - Overvoltage clamp
  - Load current limitation
  - Self limiting of fast thermal transients
  - Loss of ground and loss of VCC
  - Reverse battery
  - Electrostatic discharge protection

Applications

Specially intended for Automotive Smart Power Distribution, Glow Plug, Heating Systems, DC Motors, Relay replacement and high power resistive and inductive actuators.

Description

This board provides you an easy way to connect STMicroelectronics® VIPower® M0-7 technology into your existing system.

Table 1. Device summary

Order Code	Reference
EV-VN7004CH	VN7004CH Evaluation Board

For further information contact your local STMicroelectronics sales office. www.st.com

1 Overview

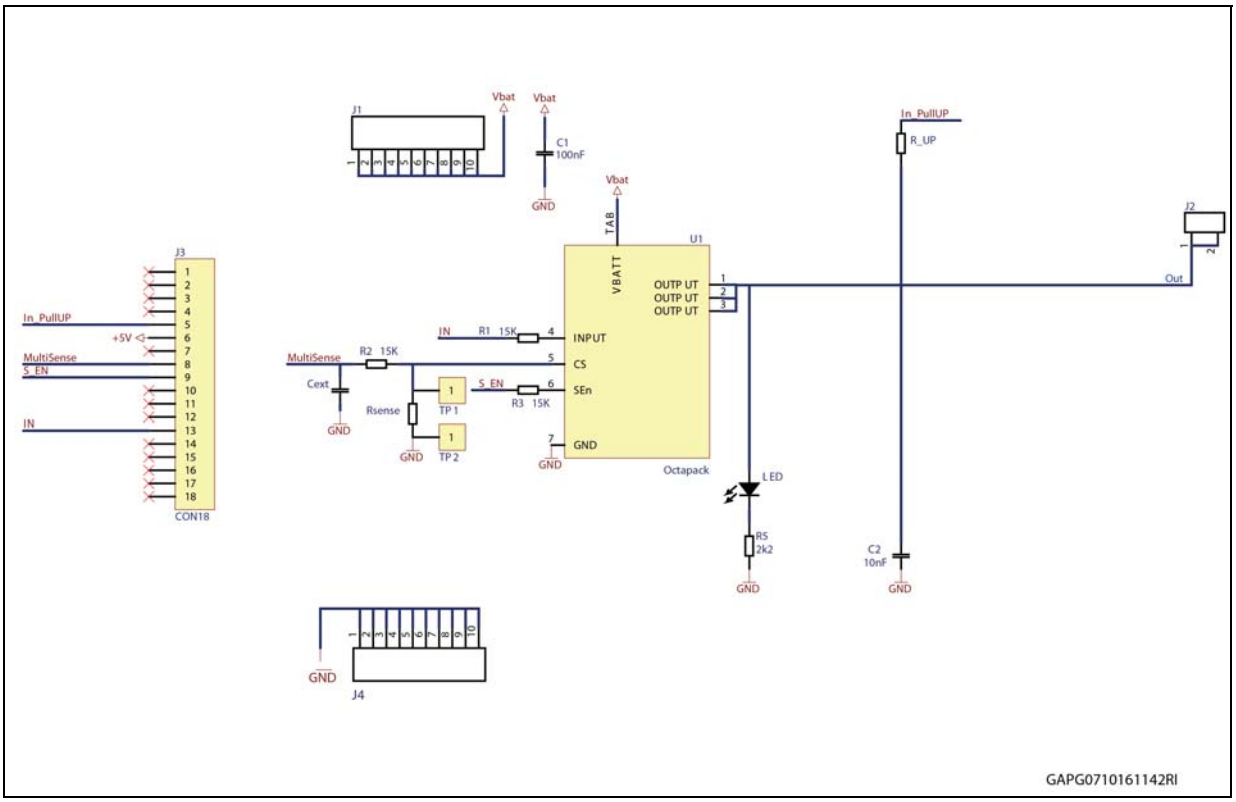
The board comes pre-assembled with VN7004CH high-side driver. On board minimum set of electrical components (as for device datasheet recommendation) is enabling the user to directly connect the load, the power supply and the microcontroller without any additional effort in external component design and connection.

The VN7004CH is a single channel high-side driver manufactured using ST proprietary VIPower technology and housed in the Octapak package. The device is designed to drive 12 V automotive grounded loads through a 3 V and 5 V CMOS-compatible interface, providing protection and diagnostics.

The device integrates advanced protective functions such as load current limitation, overload active management by power limitation and overtemperature shutdown.

A sense enable pin allows OFF-state diagnosis to be disabled during the module low-power mode as well as external sense resistor sharing among similar devices.

Figure 1. EV-VN7004CH schematic



2 Board connections

Figure 2 shows the placement of the connectors to be used for supplying the evaluation board, connecting the load and controlling the functionality and diagnostic of the device.

Figure 2. Evaluation board connections

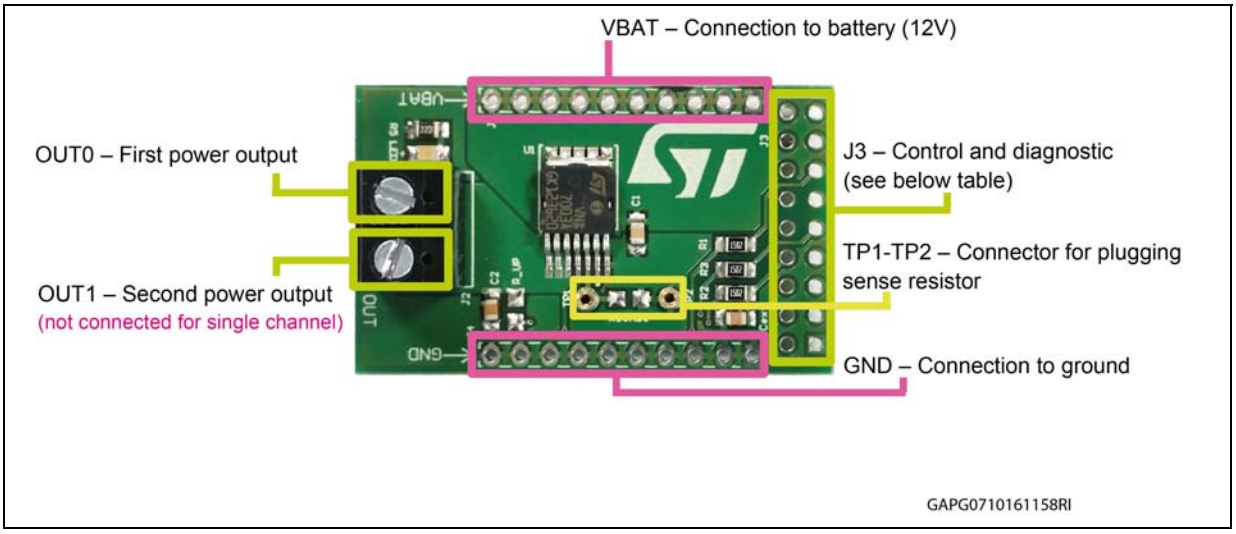


Table 2. J3 connector: pin functions

Connector	Pin number	Pin name	Pin function
J3	1…4	N/A	Not connected
J3	5	IN_PullUP	Connection to optional external pull-up resistor for open load detection in off-state.
J3	6	+5V	5V Power Supply
J3	7	N/A	Not connected
J3	8	MultiSense	Analog current sense output pin delivers a current proportional to the load current.
J3	9	S_EN	Active high compatible with 3 V and 5 V CMOS outputs pin; it enables the CurrentSense diagnostic pin.
J3	10...11	N/A	Not connected
J3	12	N/A	Not connected
J3	13	IN0	Voltage controlled input pin with hysteresis, compatible with 3 V and 5 V CMOS outputs. It controls OUT0 switch state.
J3	14	IN1	Voltage controlled input pin with hysteresis, compatible with 3 V and 5 V CMOS outputs. It controls OUT1 switch state (Input not available for single channel)
J3	15…18	N/A	Not connected

In case the user wishes to utilize the Current Sense / MultiSense function of the device, it is necessary to plug a sense resistor in Rsense.

The package includes a through-hole resistor, to be mounted on TP1-TP2 - see *Figure 4*.

Different Rsense values can be adopted based on user preference.

Another option is soldering an SMD resistor on the dedicated PCB pad, as shown in *Figure 5*.

Figure 3. No sense resistor

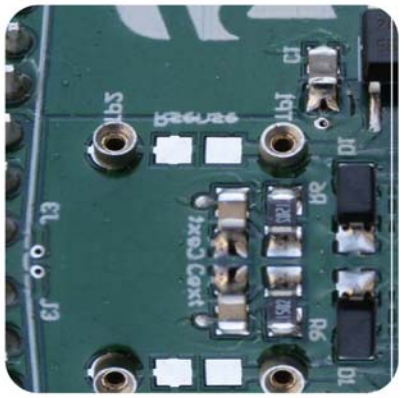


Figure 4. Mounting through-hole sense resistor

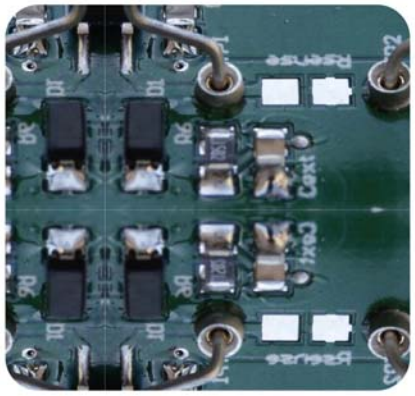
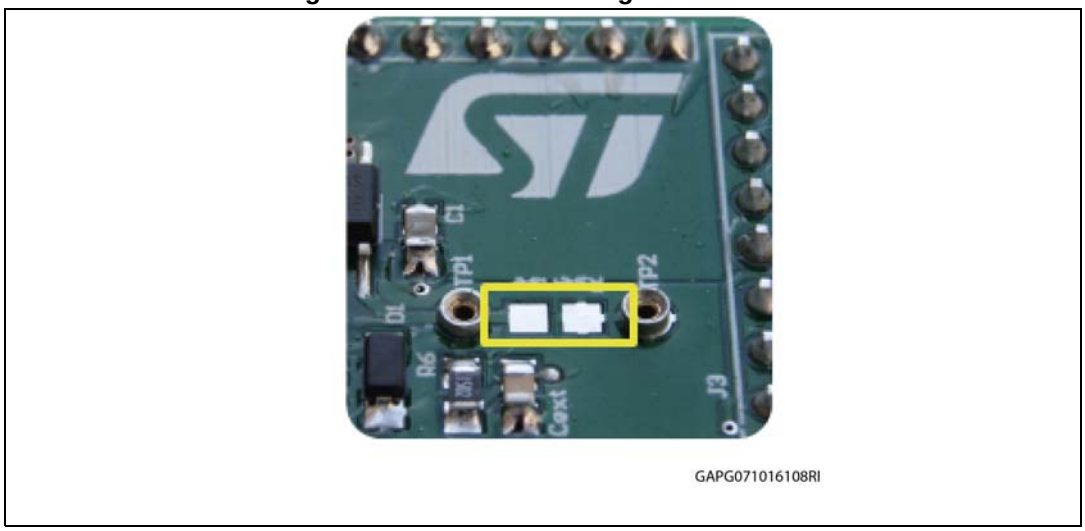


Figure 5. Pads for soldering SMD resistor



3 Thermal data

Table 3. EV-VN7004CH thermal data

Symbol	Parameter	Max	Unit
Rthj-amb	Thermal resistance junction-ambient (MAX)	39°	°C/W

Table 4. PCB specifications

Parameter	Value
Board dimensions	25 mm x 41.5 mm
Number of Cu layer	2
Layer Cu thickness	35 µm
Board finish thickness	1.6 mm +/- 10%
Board Material	FR4
Thermal vias separation	1.1 mm
Thermal vias diameter	0.5 mm

4 Revision history

Table 5. Document revision history

Date	Revision	Changes
14-Oct-2016	1	Initial release.

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