

VN7050ASTR-E Datasheet

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DiGi Electronics Part Number	VN7050ASTR-E-DG
Manufacturer	STMicroelectronics
Manufacturer Product Number	VN7050ASTR-E
Description	IC PWR DRIVER N-CHANNEL 1:1 8SO
Detailed Description	Power Switch/Driver 1:1 N-Channel 21A 8-SOIC

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Purchase and inquiry

Manufacturer Product Number:

VN7050ASTR-E

Series:

VIPOWER™

Switch Type:

General Purpose

Ratio - Input:Output:

1:1

Output Type:

N-Channel

Voltage - Load:

4V ~ 28V

Current - Output (Max):

21A

Input Type:

Non-Inverting

Fault Protection:

Current Limiting (Fixed), Open Load Detect, Over Temperature, Over Voltage, UVLO

Mounting Type:

Surface Mount

Package / Case:

8-SOIC (0.154", 3.90mm Width)

Manufacturer:

STMicroelectronics

Product Status:

Obsolete

Number of Outputs:

1

Output Configuration:

High Side

Interface:

On/Off

Voltage - Supply (Vcc/Vdd):

Not Required

Rds On (Typ):

50mOhm

Features:

Auto Restart, Status Flag

Operating Temperature:

-40°C ~ 150°C (TJ)

Supplier Device Package:

8-SOIC

Base Product Number:

VN7050

Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8542.39.0001

Moisture Sensitivity Level (MSL):

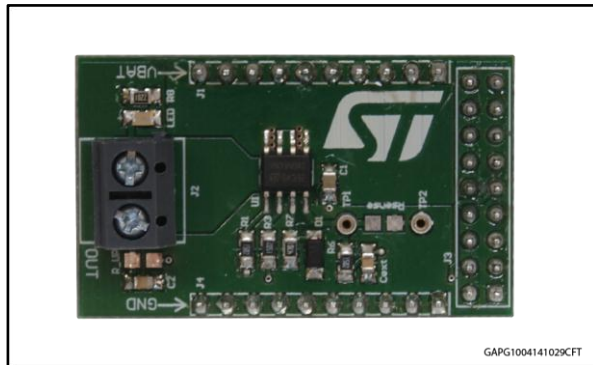
3 (168 Hours)

ECCN:

EAR99

VN7050AS 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}	50 m Ω
Current limitation (typ)	I_{LIMH}	30 A
Stand-by current (max)	I_{STBY}	0.5 μ A

- Simple single IC application board dedicated for VN7050AS
- Provides electrical connectivity and thermal heat-sinking for easy prototyping
- General device features
 - Single channel smart high side driver with 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 V_{CC}
 - Reverse battery with external components
 - Electrostatic discharge protection

Applications

Typical applications are all types of automotive resistive, inductive and capacitive loads.

Table 1: Device summary

Order code	Reference
EV-VN7050AS	VN7050AS evaluation board

2 Board connections

Figure 2: "Evaluation board connections" 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

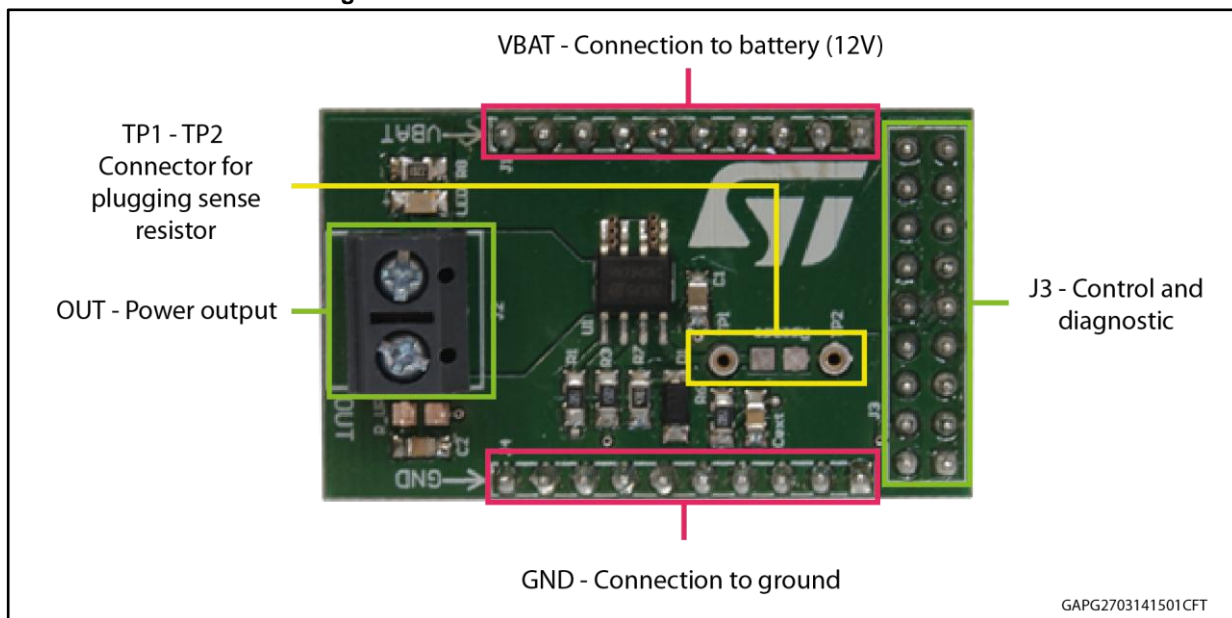


Table 2: J3 connector: pin functions

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	5 V Power Supply
J3	7	N/A	Not connected
J3	8	MultiSense	Current Sense pin: it delivers a current proportional to load current
J3	9	S_EN	Active high compatible with 3 V and 5 V CMOS outputs pin; it enables the MultiSense diagnostic pin.
J3	10...12	N/A	Not connected
J3	13	IN	Voltage controlled input pin with hysteresis, compatible with 3 V and 5 V CMOS outputs. It controls OUT switch state.
J3	14...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 R_{SENSE} .

The package includes a through-hole resistor, to be mounted on TP1-TP2 (see Figure 4: "Mounting through-hole sense resistor").

Different R_{SENSE} 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: "Pads for soldering SMD resistor"](#).

Figure 3: No sense resistor



Figure 4: Mounting through-hole sense resistor

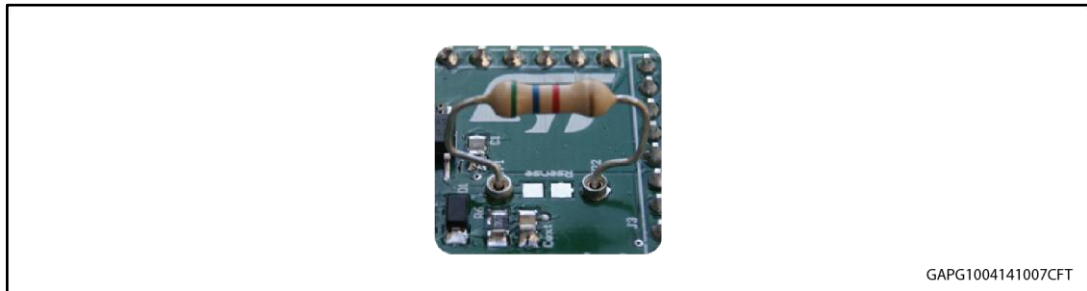
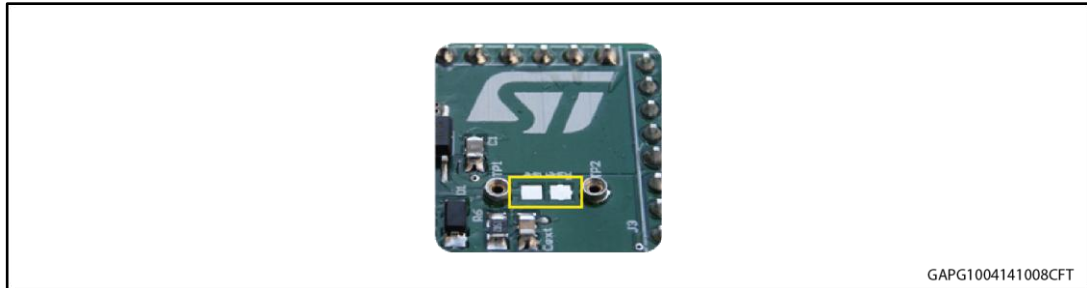


Figure 5: Pads for soldering SMD resistor



3 Thermal data

Table 3: Thermal data

Symbol	Parameter	Max	Unit
$R_{thj-amb}$	Thermal resistance junction-ambient (MAX)	64	°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 μ m
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: Revision history

Date	Revision	Changes
01-Oct-2014	1	Initial release.
03-Sep-2015	2	Changed EV-VN7050AS-E in EV-VN7050AS. Updated Section "Features" and Section 1: "Description"

EV-VN7050AS

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