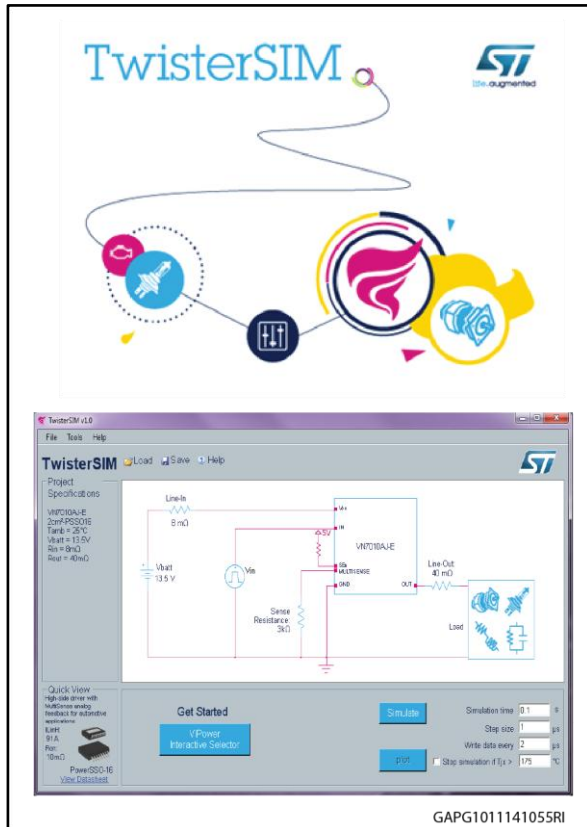


## Dynamic Electro-Thermal simulator for VIPower products

Data brief



- Free full version (requires user activation code)

### Description

TwisterSIM is a unique Electro-Thermal simulator that helps shorten the design solution cycle by enabling, in a few clicks, complex engineering evaluations with accurate simulations like load-compatibility, wiring harness optimization, fault condition impact analysis, diagnostic behavior analysis and Dynamic Thermal performance.

A built-in Interactive Selector provides a short list of suitable devices based on first level system requirements. It assists you in detailing your actual system configuration with layout, load and driving profile customization to build an accurate model of the final application.

Simulation results, including junction and case thermal profiles, load current and diagnostic behavior are shown on dedicated scopes views or exported in a number of different commonly used formats.

TwisterSIM supports a large selection of Low/High-side driver/switches and H-bridges for Motor Control.

A trial version, to explore the main functionalities of TwisterSIM, is available for download at [www.st.com/twistersim](http://www.st.com/twistersim) and it also contains, in the main toolbar, the instructions to request an activation code (free of charge but subject to STMicroelectronics approval) for the full version.

An on-line forum provides additional support to TwisterSIM users. Access to the forum is available at <http://www.st.com/twistersim-forum>.

### Features

- Device pre-selection using simple high level compatibility criteria
- Device selection fine-tuning with PCB Layout specification
- Supply voltage and Input Signal source selection
- Load type selection
- Wire harness selection
- Ambient temperature selection
- Simulation accuracy and time selection
- Built-in VIPower® technology tutorial
- Built-in user manual
- Free evaluation version

**Table 1: Device summary**

Order code	Reference
TwisterSIM	TwisterSIM

---

## Contents

1	System requirements .....	3
2	Interactive selector .....	4
3	Electro-thermal simulation .....	5
4	TwisterSIM evaluation version download flow .....	6
5	Full version request and activation flow.....	7
6	Revision history .....	9

# 1 System requirements

- Windows 7
- .NET Framework 2.0
- Microsoft Visual C++ 2005/2008 Redistributable

## 2 Interactive selector

Providing application conditions and loads specifications, TwisterSIM displays the list of recommend VIPower products including their thermal behavior.

Figure 1: Interactive selector

The screenshot shows the 'VIPower Interactive Selector' window. It features several configuration panels:
 

- Supply:** Volt. Max (V) with values 12, 24, 16.
- Device Topology:** High Side, Low Side, H-Bridge.
- Number of Channels:** 1, 2, 4.
- Load:** Resistor, Inductor, Lamp, Motor. Sub-sections: By Current, By Power (Max Power: 12V-H1 (55W)), Harness Resistor (86 mΩ).
- Source Type:** DC, PWM (Freq. (Hz): 10, Duty Cycle (%): 50).
- Ambient Temperature:** 25 °C.
- PCB and Heat Sink:** FootP, 2 Layers - 2cm², 2 Layers - 8cm², 4 Layers.
- Suggested Devices Table:**

Device	Package	Ron typ. (mΩ)	IlimH typ. (A)
VN7020AJ	PowerSSO-16	20	63
VN7016AJ	PowerSSO-16	16	77
VN7010AJ	PowerSSO-16	10	91
VN5E025AJ	PowerSSO-12	25	60
VN5E016AH	HPAK	16	73
VN5E010AH	HPAK	10	85
VN5016AJ	PowerSSO-12	16	60
VN5012AK	PowerSSO-24	12	65
VN5010AK	PowerSSO-24	10	65
- Legend:**
  - Blue square:  $T_j < 110^\circ\text{C}$
  - Light blue square:  $110^\circ\text{C} < T_j < 135^\circ\text{C}$
  - Yellow square:  $T_j > 135^\circ\text{C}$
  - Red square: Suggested detailed analysis
  - Purple square: Available for simulation

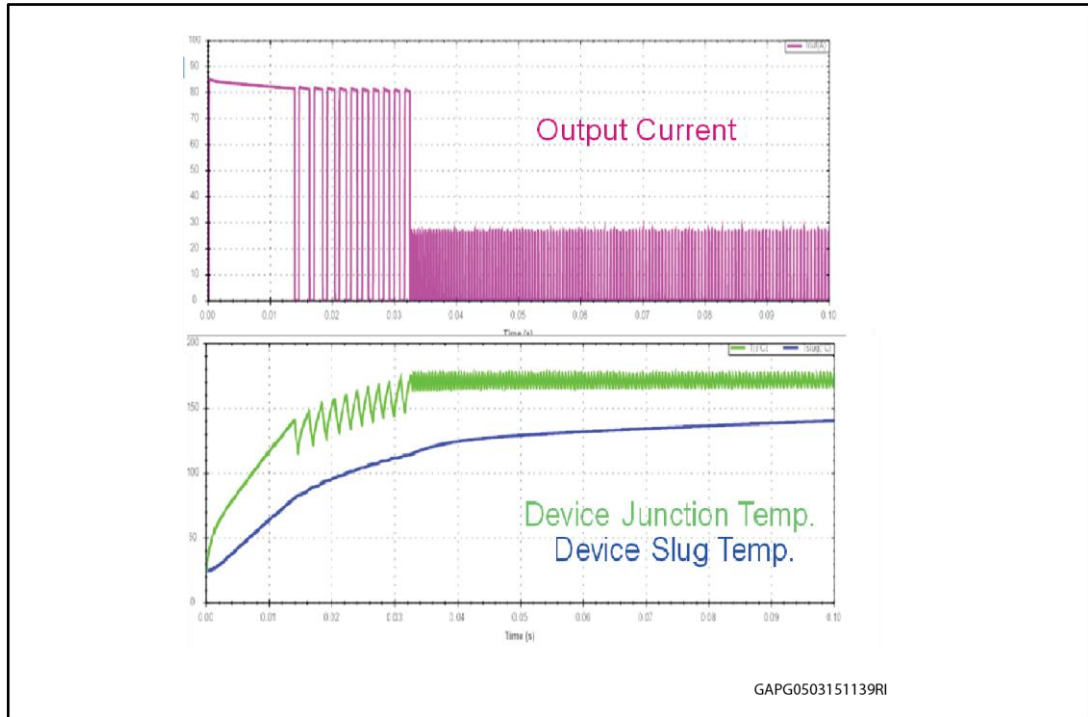
 The interface also includes 'Export Layout for Simulation', 'Reset', and 'Help' buttons at the bottom.

GAPG0403151039RI

### 3 Electro-thermal simulation

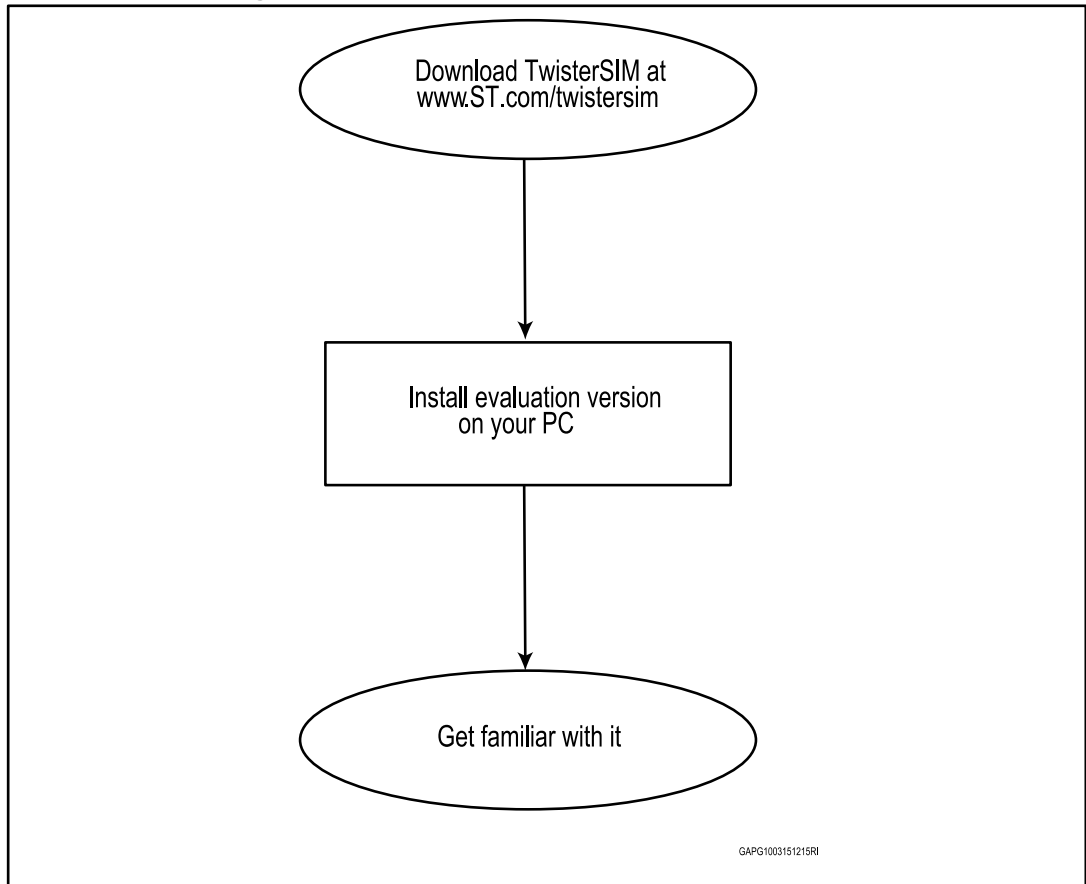
For the chosen device you can run electro-thermal dynamic simulations and fine tune device identification by an in-depth analysis of its behaviour in the target application through graphical representation of the electrical and thermal data. Simulation results can be saved and exported for further analysis.

Figure 2: Simulation results



## 4 TwisterSIM evaluation version download flow

Figure 3: TwisterSIM evaluation version download flow



## 5 Full version request and activation flow

From TwisterSIM toolbar “Registration Info” you can easily require and receive by mail the activation code to get the tool full version .

Figure 4: TwisterSIM full version activation request

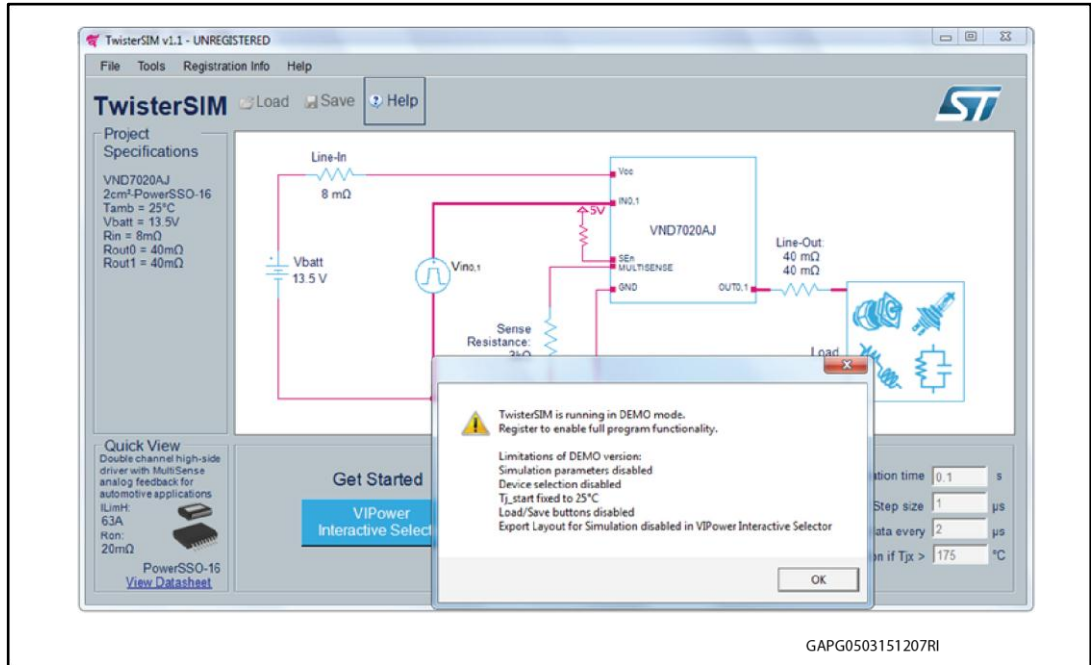


Figure 5: TwisterSIM registration code

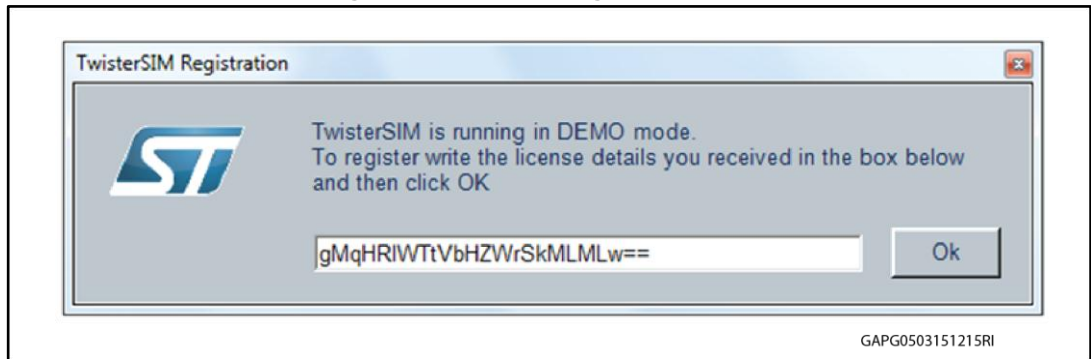
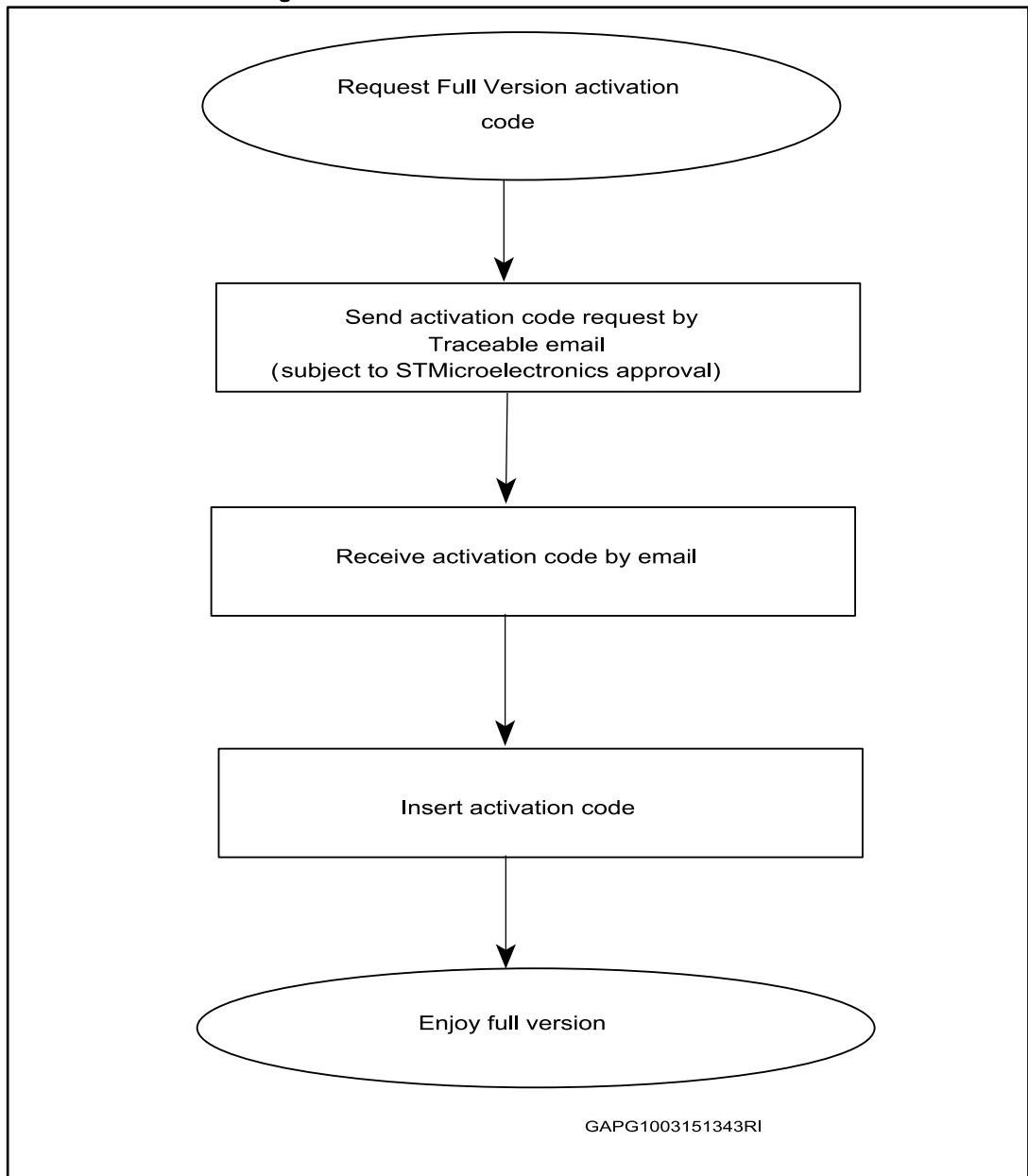


Figure 6: TwisterSIM full version activation flow





## 6 Revision history

Table 2: Revision history

Date	Revision	Changes
10-Nov-2014	1	Initial release.
19-Jan-2015	2	Updated Description and the image in the cover
13-Mar-2015	3	Updated figure in Cover page. Updated <a href="#">Section "Description"</a> . Added <a href="#">Section 2: "Interactive selector"</a> ; <a href="#">Section 3: "Electro-thermal simulation"</a> ; <a href="#">Section 4: "TwisterSIM evaluation version download flow"</a> ; <a href="#">Section 5: "Full version request and activation flow"</a>
16-Mar-2015	4	Changed the url <a href="http://www.st.com/twisterforum">www.st.com/twisterforum</a> in <a href="#">Section "Description"</a> to <a href="http://www.st.com/twistersim-forum">www.st.com/twistersim-forum</a>
29-Apr-2015	5	Updated <a href="#">Section "Description"</a> .

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2015 STMicroelectronics – All rights reserved