

## 15V, 1.5W buck converter based on VIPER26K

### Introduction

The **STEVAL-VP26K01B** is a 15 V – 1.5 W power supply in buck topology featuring the **VIPER265KDTR** offline high voltage converter, specifically developed for ultra-wide input range solutions.

The evaluation board has the following characteristics:

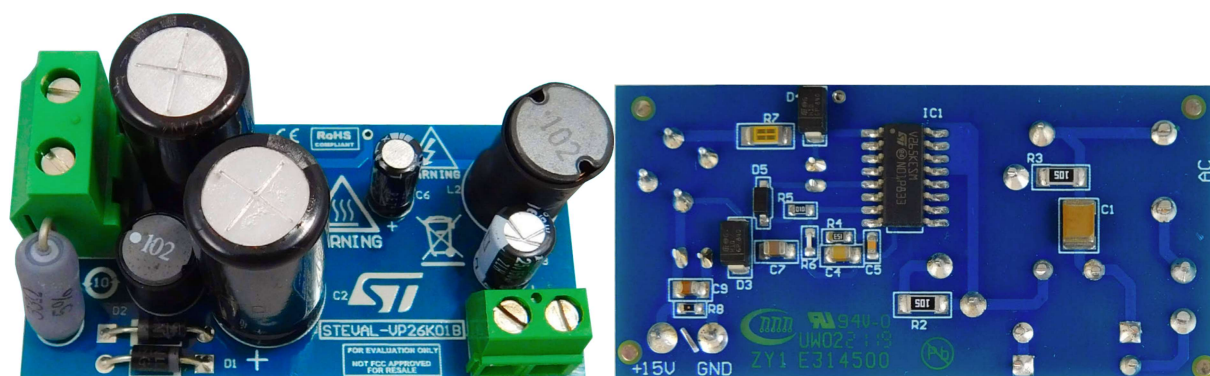
- Ultra-wide range: 90–600 V<sub>AC</sub> or 60–870 V<sub>DC</sub>
- Meets IEC55022 Class B conducted EMI even with a reduced EMI filter, thanks to the frequency jittering feature
- RoHS compliant

Some of the main features of the **VIPER265KDTR** include:

- 1050 V avalanche rugged Power MOSFET
- Embedded HV start-up
- 60 kHz fixed switching frequency with jittering
- Embedded error amplifier internally referenced to 3.3 V
- Current mode PWM controller with drain current limit protection for easy compensation
- Several protection mechanisms:
  - delayed overload protection (OLP)
  - open loop failure protection
  - thermal shutdown with hysteresis

All protections are in auto restart mode

**Figure 1. STEVAL-VP26K01B evaluation board top and bottom**



**Table 6. Supply section**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
<b>High voltage start-up current source</b>						
$V_{VDSS\_SU}$	Startup breakdown drain-source voltage	$I_D = 1\text{ mA}$ , $V_{COMP} = \text{GND}$ , $T_J = 25^\circ\text{C}$	1.05			kV
$V_{HV\_START}$	Drain-source start voltage		38		60	V
$I_{DDch1}$	Charging current during startup	$V_{DRAIN} = 50\text{ V}$ to 1.05 kV, $V_{DD} = 4\text{ V}$	-0.6		-1.8	mA
$I_{DDch2}$	Charging current in self-supply	$V_{DRAIN} = 50\text{ V}$ to 1.05 kV, $V_{DD} = 9\text{ V}$ falling edge	-7		-13	mA
<b>IC supply and consumptions</b>						
$V_{DD}$	Operating voltage range		11.5		23.5	V
$V_{DDclamp}$	$V_{DD}$ clamp voltage	$I_{DD} = 15\text{ mA}$	23.5			V
$V_{DDon}$	$V_{DD}$ start up threshold		12	13	14	V

( $T_J = -40$  to  $125^\circ\text{C}$ ,  $V_{DD} = 14\text{V}$ ; unless otherwise specified.)

**Table 5. Power section**

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit.
$V_{BVDSS}$	Breakdown voltage	$I_D = 1\text{ mA}$ , $V_{COMP} = \text{GND}$ , $T_J = 25^\circ\text{C}$	1.05			kV
$I_{DSS}$	Drain-source leakage current	$V_{DRAIN} = 1050\text{V}$ , $V_{COMP} = \text{GND}$ , $T_J = 25^\circ\text{C}$			29	$\mu\text{A}$
$R_{DS(on)}$	Drain-Source ON state resistance	$I_{DRAIN} = 0.2\text{ A}$ ; $T_J = 25^\circ\text{C}$			7	$\Omega$
		$I_{DRAIN} = 0.2\text{ A}$ ; $T_J = 125^\circ\text{C}$			14	

**Figure 2. STEVAL-VP26K01B schematic diagram**
