VIPerPlus
Your SMPS design deserves a Plus
Content

Where every mW counts ............................................................. 5

VIPerPlus series ........................................................................ 7
VIPerPlus0P: zero power mode .................................................. 7
VIPerPlus series 1: minimal BoM & low voltage applications ... 7
VIPerPlus series 5: quasi-resonant ............................................. 8
VIPerPlus series 6: minimal BoM .............................................. 8
VIPerPlus series 7: brown out .................................................. 9
VIPerPlus series 8: peak power ................................................ 9

A Plus for your applications ..................................................... 10
A Plus for metering ................................................................. 10
A Plus for lighting ................................................................. 10
A Plus for home appliances .................................................... 11
A Plus for home automation .................................................... 11
A Plus for consumer and adapters ......................................... 12
A Plus for air conditioning .................................................... 12

Evaluation boards ................................................................... 13

Available in a click ................................................................. 15
Today, power supply units require more sophisticated methods for improving performance while energy-saving regulations push for greater efficiency. VIPerPlus accepts the challenge, combining an 800 V avalanche rugged power section with state-of-the-art PWM circuitry for control, and offering a comprehensive set of features and built-in protections. The result is an SMPS design that meets the most demanding energy-saving regulations and more: high reliability, flexibility and minimal component count.

**MAIN APPLICATIONS**
- Metering
- Lighting
- Home appliances
- Home automation
- Consumer and adapters
- Air conditioning

**GET IT ALL WITH VIPerPlus**
- A Plus in efficiency
  - The easiest way to comply with the most stringent energy-saving regulations
- A Plus in reliability
  - For an improved SMPS lifetime
  - 800 V avalanche-rugged power MOSFET allowing ultra wide V_{AC} input range to be covered
- A Plus in versatility
  - Fitting most popular topologies and power ranges up to 15 W
  - Smart standby architecture using VIPer zero power
- A Plus in cost-effectiveness
  - Small, highly-integrated ICs reduce the number of required external components

**MAIN FUNCTIONAL BLOCKS**

**FAMILY PORTRAIT**

<table>
<thead>
<tr>
<th>Feature</th>
<th>VIPer01</th>
<th>VIPer06</th>
<th>VIPer0P</th>
<th>VIPer11</th>
<th>VIPer16</th>
<th>VIPer17</th>
<th>VIPer25</th>
<th>VIPer26</th>
<th>VIPer28</th>
<th>VIPer35</th>
<th>VIPer37</th>
<th>VIPer38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero-power mode</td>
<td>VIPer0P</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer25</td>
<td>VIPer26</td>
<td>VIPer28</td>
<td>VIPer25</td>
<td>VIPer28</td>
<td>VIPer25</td>
</tr>
<tr>
<td>Low voltage/minimal BoM</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer25</td>
<td>VIPer26</td>
<td>VIPer28</td>
<td>VIPer25</td>
<td>VIPer28</td>
<td>VIPer25</td>
</tr>
<tr>
<td>Quasi resonant</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer25</td>
<td>VIPer26</td>
<td>VIPer28</td>
<td>VIPer25</td>
<td>VIPer28</td>
<td>VIPer25</td>
</tr>
<tr>
<td>Minimal BoM</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer25</td>
<td>VIPer26</td>
<td>VIPer28</td>
<td>VIPer25</td>
<td>VIPer28</td>
<td>VIPer25</td>
</tr>
<tr>
<td>Brown-out</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer25</td>
<td>VIPer26</td>
<td>VIPer28</td>
<td>VIPer25</td>
<td>VIPer28</td>
<td>VIPer25</td>
</tr>
<tr>
<td>Peak power</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer01</td>
<td>VIPer06</td>
<td>VIPer0P</td>
<td>VIPer25</td>
<td>VIPer26</td>
<td>VIPer28</td>
<td>VIPer25</td>
<td>VIPer28</td>
<td>VIPer25</td>
</tr>
</tbody>
</table>

**Different control selections**

**Different MOSFET sizes for different output power capabilities**

<table>
<thead>
<tr>
<th>Power (W)</th>
<th>4 W</th>
<th>6 W</th>
<th>7 W</th>
<th>12 W</th>
<th>15 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current (mA)</td>
<td>100 mA</td>
<td>200 mA</td>
<td>200 mA</td>
<td>300 mA</td>
<td>350 mA</td>
</tr>
<tr>
<td>Current (mA)</td>
<td>720 mA</td>
<td>400 mA</td>
<td>200 mA</td>
<td>100 mA</td>
<td>70 mA</td>
</tr>
</tbody>
</table>

**Where every mW counts**

Today, power supply units require more sophisticated methods for improving performance while energy-saving regulations push for greater efficiency. VIPerPlus accepts the challenge, combining an 800 V avalanche rugged power section with state-of-the-art PWM circuitry for control, and offering a comprehensive set of features and built-in protections. The result is an SMPS design that meets the most demanding energy-saving regulations and more: high reliability, flexibility and minimal component count.
**DIFFERENTIATORS - FIND THE PLUS FOR YOUR APPLICATION**

<table>
<thead>
<tr>
<th>Feature</th>
<th>VIPerPlus series 5</th>
<th>VIPerPlus series 6</th>
<th>VIPerPlus series 7</th>
<th>VIPerPlus series 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quasi-resonant</td>
<td>VIPerPlus series 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jittered frequency</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>(30, 60 or 115/120 kHz)</td>
<td>VIPerPlus series 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown-out protection (settable)</td>
<td>VIPerPlus series 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low input voltage (18 VDC)</td>
<td>VIPerPlus series 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra power timer (peak power)</td>
<td>VIPerPlus series 8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Double-level OCP</td>
<td>VIPerPlus series 5</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
<td></td>
</tr>
<tr>
<td>Feed forward compensation</td>
<td>VIPerPlus series 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Embedded E/A 3.3 V, 1.2 V (V*1 &amp; VOP)</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floating E/A ground</td>
<td>VIPerPlus series 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(for easy negative output setting)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-supply option</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
<td></td>
</tr>
<tr>
<td>(remove auxiliary winding)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wide range $V_{cc}$ (4.5 to 30 V)</td>
<td>VIPerPlus series 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$V_{cc}$ protection</td>
<td>VIPerPlus series 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flux runaway protection (for low start up peak current)</td>
<td>VIPerPlus series 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zero power mode (ZPM)</td>
<td>VIPerPlus series 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input OVP</td>
<td>VIPerPlus series 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output OVP</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
<td></td>
</tr>
<tr>
<td>PWM current mode using optocoupler</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>Cycle-by-cycle OCP</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>Light load management (Burst mode/PFM)</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>Soft start up</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>Thermal shutdown</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>Short-circuit protection</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
<tr>
<td>Automatic restart after fault</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
<td>VIPerPlus series 7</td>
<td>VIPerPlus series 8</td>
</tr>
</tbody>
</table>

**TOPOLOGIES- BEST FIT FOR THE MOST POPULAR ARCHITECTURES**

<table>
<thead>
<tr>
<th>Topology</th>
<th>VIPerPlus series 1</th>
<th>VIPerPlus series 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated flyback Primary Side Regulation (PSR)</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
</tr>
<tr>
<td>Secondary Side Regulation (SSR)</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
</tr>
<tr>
<td>Non-isolated Flyback/buck/buck boost</td>
<td>VIPerPlus series 1</td>
<td>VIPerPlus series 6</td>
</tr>
</tbody>
</table>
VIPerPlus0P: ZERO POWER MODE

<table>
<thead>
<tr>
<th>VIPer0P</th>
<th>7 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{BVDS}$ 800 V</td>
<td></td>
</tr>
<tr>
<td>Max $R_{DS(ON)}$ 20 Ω</td>
<td>$I_{DLIM}$ 400 mA</td>
</tr>
</tbody>
</table>

RECOMMENDED FOR
- Home appliances
- Small Home appliances
- Home lighting
- Home automation
- Air conditioning

DIFFERENTIATORS
- Fixed frequency with jittering reduces the EMI allowing the minimal bill of material
- Zero power mode (ZPM) allows smart turn ON and OFF through button or MCU
- Integrated error amplifier with 1.2 V reference and floating ground to allow direct feedback and simplify BoM for negative output
- Wide supply voltage range: 4.5 V to 30 V
  - 4.5 V allows external supply from low voltage output (5 V)
  - 30 V allows wide auxiliary voltage in case the transformer is used
- Pulse-skip protection to prevent flux runaway and the peak start current
- Topology supported: flyback (PSR and SSR), buck, buck-boost

VIPer series 1: MINIMAL BoM & 4.5 SUPPLY VOLTAGE

<table>
<thead>
<tr>
<th>VIPer01</th>
<th>4 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{BVDS}$ 800 V</td>
<td></td>
</tr>
<tr>
<td>Max $R_{DS(ON)}$ 30 Ω</td>
<td>$I_{DLIM}$ 120/240/360 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>VIPer11</th>
<th>7 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{BVDS}$ 800 V</td>
<td></td>
</tr>
<tr>
<td>Max $R_{DS(ON)}$ 17 Ω</td>
<td>$I_{DLIM}$ 370/480/590 mA</td>
</tr>
</tbody>
</table>

RECOMMENDED FOR
- Home appliances
- Small Home appliances
- Home lighting
- Home automation

DIFFERENTIATORS
- Fixed frequency with jittering reduces the EMI allowing the minimal bill of material
- Disable pin to set the input or output OVP
- Integrated error amplifier with 1.2 V reference to allow direct feedback by resistor divider
- HV current source starts at 18 VDC (VIPer01) and 26 VDC (VIPer11) input voltage
- Wide supply voltage range: 4.5 V to 30 V
  - 4.5 V allows external supply from low voltage output (5 V)
  - 30 V allows wide auxiliary voltage in case the transformer is used
- Pulse-skip protection to prevent flux runaway and the peak start current
- Topology supported: flyback (PSR and SSR), buck, buck-boost
VIPerPlus series 5: QUASI-RESONANT

**VIPer25**
- 12 W
- $V_{\text{BDSS}}$ 800 V
- $R_{\text{DS(ON)}}$ 7 Ω
- $I_{\text{DIN}}$ 700 mA

**VIPer35**
- 15 W
- $V_{\text{BDSS}}$ 800 V
- $R_{\text{DS(ON)}}$ 4.5 Ω
- $I_{\text{DIN}}$ 1 A

**DIFFERENTIATORS**
- The quasi-resonant operation reduces the switching losses and improves power conversion efficiency at wide range load
- Quasi resonant operations reduces the EMI allowing to minimize the input filter size
- Feed forward compensation allows a stable power capability for a wide input voltage
- Embedded protections: output OVP, short circuit/OLP, 2nd OCP, settable brown-out
- Topology supported: isolated flyback- SSR

**RECOMMENDED FOR**
- Consumer
- Adapters
- Air conditioning

VIPerPlus series 6: MINIMAL BoM

**VIPer06**
- 4 W
- $V_{\text{BDSS}}$ 800 V
- $R_{\text{DS(ON)}}$ 32 Ω
- $I_{\text{DIN}}$ 350 mA

**VIPer16**
- 6 W
- $V_{\text{BDSS}}$ 800 V
- $R_{\text{DS(ON)}}$ 24 Ω
- $I_{\text{DIN}}$ 400 mA

**VIPer26**
- 12 W
- $V_{\text{BDSS}}$ 800 V
- $R_{\text{DS(ON)}}$ 7 Ω
- $I_{\text{DIN}}$ 700 mA

**DIFFERENTIATORS**
- Fixed frequency with jittering reduces the EMI allowing the minimal bill of material and reduces the number of required external components
- Integrated error amplifier allows direct feedback using a resistor divider
- No auxiliary winding costs
- Feedback disconnection protection
- Topology supported: flyback (PSR and SSR), buck, and buck-boost

**RECOMMENDED FOR**
- Home appliances
- Lighting
- Home automation
- Metering
**VIPerPlus series 7: BROWN-OUT**

<table>
<thead>
<tr>
<th>Model</th>
<th>Max $R_{DS(on)}$</th>
<th>$I_{D(SM)}$</th>
<th>Max Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIPer17</td>
<td>24 Ω</td>
<td>400 mA</td>
<td>6 W</td>
</tr>
<tr>
<td>VIPer27</td>
<td>7 Ω</td>
<td>700 mA</td>
<td>12 W</td>
</tr>
<tr>
<td>VIPer37</td>
<td>4.5 Ω</td>
<td>1 A</td>
<td>15 W</td>
</tr>
</tbody>
</table>

**DIFFERENTIATORS**
- Fixed frequency with jittering reduces the EMI allowing the minimal bill of material and reduces the number of required external components
- Brown out protection with configurable minimum input voltage
- Embedded protections: output OVP, short circuit/OLP, 2nd OCP
- Topology supported: isolated flyback-SSR

**RECOMMENDED FOR**
- Adapters
- Lighting
- Industrial power supplies
- Air conditioning

**VIPerPlus series 8: PEAK POWER**

<table>
<thead>
<tr>
<th>Model</th>
<th>Max $R_{DS(on)}$</th>
<th>$I_{D(SM)}$</th>
<th>Max Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIPer28</td>
<td>7 Ω</td>
<td>800 mA</td>
<td>12 W/20 W (peak)</td>
</tr>
<tr>
<td>VIPer38</td>
<td>4.5 Ω</td>
<td>1.15 A</td>
<td>15 W/25 W (peak)</td>
</tr>
</tbody>
</table>

**DIFFERENTIATORS**
- Fixed frequency with jittering reduces the EMI allowing the minimal bill of material and reduces the number of required external components
- Extra power timer (peak power) for improved response during load transient
- Embedded protections: output OVP, short circuit/OLP, 2nd OCP
- Topology supported: isolated flyback-SSR

**RECOMMENDED FOR**
- Metering
- Lighting
- Consumer
A PLUS FOR METERING

REQUIREMENTS
- High voltage robustness
- High immunity to electrical discharge
- Reduced noise in the communication band
- Peak power for data transfer

RECOMMENDED:
ViperPlus series 6
ViperPlus series 8

KEY BENEFITS FOR METERING
- Three switching frequency options to avoid noise in the communication band
- 800 V avalanche-rugged power MOSFET allowing ultra wide range input V_{ac} to be covered
- Embedded error amplifier for direct feedback from output or primary regulation
- Settable timer for peak power capability

BEST-FIT TOPOLOGIES
- Non isolated converter
  - buck
  - buck boost (negative output)
  - flyback with direct output feedback
- Isolated Flyback
  - SSR with optocoupler
  - Peak power

A PLUS FOR LIGHTING

REQUIREMENTS
- Low standby consumption
- High efficiency
- Robustness
- Cost saving
- Reduced size

RECOMMENDED:
ViperPlus0P
ViperPlus series 1
ViperPlus series 5
ViperPlus series 6

KEY BENEFITS FOR LIGHTING
- Energy-saving: 10 mW @ no load @ 230 V_{ac} and 4 mW in ZPM @ 230 V_{ac}
- Quasi-resonant for high efficiency
- 800 V avalanche-rugged power MOSFET allowing ultra wide range input V_{ac} to be covered
- Reduced peak drain current during the start up
- Smart and efficient buck led driver using the floating ground and low ref voltage
- Embedded error amplifier for direct feedback from output or primary regulation
- Operating temperature: -40 to +150 °C
- Brown-out with settable turn-ON and turn-OFF thresholds

BEST-FIT TOPOLOGIES
- Non isolated converter
  - buck
  - buck boost (negative output)
  - flyback with direct output feedback
- Isolated Flyback
  - SSR with optocoupler
  - PSR by auxiliary winding
  - Quasi-resonant
A PLUS FOR HOME APPLIENCES

REQUIREMENTS
• Low standby power
• High efficiency at light load
• Small EMI input filter
• Ultra-wide input voltage
• Small size

RECOMMENDED:
- VIPerPlus0P
- VIPerPlus series 1
- VIPerPlus series 6

KEY BENEFITS FOR HOME APPLIANCES
• Frequency jittering reduces the EMI allowing small input filter
• Compliance with the more stringent energy saving regulations
• Zero Power Mode allowing IC shut down and wake up using smart interface with MCU for touch button or remote control
• 800 V avalanche-rugged power MOSFET allowing ultra wide range input V_{AC} to be covered
• Self-supply for reduced part count
• Embedded error amplifier for direct feedback from output or primary regulation
• Reduced peak drain current during the start up
• Wide supply voltage range: 4.5 to 30 V
  • 4.5 V allows external supply from low voltage output (5 V)
  • 30 V allows wide auxiliary voltage in case the transformer is used

A PLUS FOR HOME AUTOMATION

REQUIREMENTS
• Small size
• Low standby power
• High efficiency at light load
• Small EMI input filter
• Reduced part count

RECOMMENDED:
- VIPerPlus0P
- VIPerPlus series 1
- VIPerPlus series 6

KEY BENEFITS FOR HOME AUTOMATION
• Energy saving: 10 mW @ no load @ 230 V_{AC}, 4 mW in ZPM @ 230 V_{AC}
• 800 V avalanche-rugged power MOSFET allowing ultra wide range input V_{AC} to be covered
• Embedded auto-restart protections
• Self-supply for reduced part count
• Embedded error amplifier for direct feedback from output or primary regulation
• Operating temperature: -40 to +150 °C
• Remote control availability through ZPM function (only ViperOP)

BEST-FIT TOPOLOGIES
• Non isolated converter
  • buck
  • buck boost (negative output)
  • flyback with direct output feedback
• Isolated Flyback
  • SSR with optocoupler
  • PSR by auxiliary winding
### A PLUS FOR CONSUMER AND ADAPTERS

**Requirements**
- Low standby power
- High efficiency
- Reliability
- Cost saving
- Minimized size and weight
- Robustness

**Recommended:**
- VIPerPlus series 5
- VIPerPlus series 8

### KEY BENEFITS FOR CONSUMER AND ADAPTERS

- Energy saving: 30 mW no load consumption @ 230 Vac
- Compliance with the more stringent energy saving regulations
- Quasi resonant for high efficiency
- 800 V avalanche-rugged power MOSFET allowing ultra wide range input Vac to be covered
- Peak power capability for improved response during load transient
- Operating temperature: -40 to +150 °C
- Brown-out with settable turn-ON and turn-OFF thresholds

### A PLUS FOR AIR CONDITIONING

**Requirements**
- Robustness & Reliability
- Low EMI
- High efficiency
- Ultra wide range input voltage
- Minimized size and BoM

**Recommended:**
- VIPerOP
- VIPer35
- VIPer37

### KEY BENEFITS FOR AIR CONDITIONING

- 800 V avalanche-rugged power MOSFET with embedded failure protections
- Frequency Jittering for reduced EMI
- Quasi Resonant for high efficiency and reduced EMI
- Remote control availability through ZPM function (only ViperOP)
- Energy efficiency meets the most stringent regulations
- Embedded auto-restart protections and thermal shutdown

### BEST-FIT TOPOLOGIES

**Isolated Flyback**
- SSR with optocoupler
- Peak power
- Quasi-resonant
<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA101V1</td>
<td>VIPER16LN</td>
<td>Not-isolated buck converter, 60 kHz, DIP7 package</td>
<td>85-500 V</td>
<td>12 V ±10%, 5 V ±4%, 150 mA</td>
<td>AN2872</td>
</tr>
<tr>
<td>STEVAL-ISA106V1</td>
<td>VIPER06XS</td>
<td>Not-isolated buck boost converter, 30 kHz, SS010 package</td>
<td>85-265 V</td>
<td>-12 V/150 mA</td>
<td>UM1470</td>
</tr>
<tr>
<td>STEVAL-ISA114V1</td>
<td>VIPER06XS</td>
<td>Not-isolated buck converter, 30 kHz, SS010 package</td>
<td>80-265 V</td>
<td>5 V/160 mA</td>
<td>AN4273</td>
</tr>
<tr>
<td>STEVAL-ISA115V1</td>
<td>VIPER06XS</td>
<td>Not-isolated buck converter, 30 kHz, SS010 package</td>
<td>85-265 V</td>
<td>12 V/150 mA</td>
<td>AN4260</td>
</tr>
<tr>
<td>STEVAL-ISA116V1</td>
<td>VIPER26LD</td>
<td>Not-isolated buck converter, 60 kHz, SO16N package</td>
<td>85-265 V</td>
<td>16 V, 5 V/300 mA</td>
<td>AN4562</td>
</tr>
<tr>
<td>STEVAL-ISA119V1</td>
<td>VIPER16LD</td>
<td>Not-isolated buck converter, 60 kHz, SO16N package</td>
<td>85-265 V</td>
<td>12, 5 V/150 mA</td>
<td>AN4345</td>
</tr>
<tr>
<td>STEVAL-ISA130V1</td>
<td>VIPER06XN</td>
<td>Not-isolated buck converter, 30 kHz, DIP7 package</td>
<td>85-375 V</td>
<td>12 V/140 mA</td>
<td>DN0009</td>
</tr>
<tr>
<td>STEVAL-ISA178V1</td>
<td>VIPER013XS</td>
<td>Not-isolated buck converter, jittered 30 kHz, SS010 package</td>
<td>85-265 V</td>
<td>5 V/200 mA</td>
<td>AN4858</td>
</tr>
<tr>
<td>STEVAL-ISA179V1</td>
<td>VIPER0PLD</td>
<td>Non-isolated buck converter, jittered 60 kHz, SO16N package</td>
<td>85-265 V</td>
<td>15 V/150 mA</td>
<td>AN4857</td>
</tr>
<tr>
<td>STEVAL-ISA195V1</td>
<td>VIPER115XS</td>
<td>Not-isolated buck converter, 30 kHz, SO16N package</td>
<td>85-265 V</td>
<td>5 V/350 mA</td>
<td>AN5081</td>
</tr>
<tr>
<td>STEVAL-LL003V1</td>
<td>VIPER0PLD</td>
<td>Non-isolated buck converter, jittered 60 kHz, SO16N package</td>
<td>85-265 V</td>
<td>8 W/130 mA</td>
<td>AN5107</td>
</tr>
</tbody>
</table>

**Flyback**

Up to 4.5 W at Wide Input Voltage Range - Non Isolated

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA112V1</td>
<td>VIPER06HN</td>
<td>Flyback, 115 kHz, DIP7 package</td>
<td>85-265 V</td>
<td>12 V/350 mA</td>
<td>AN4116</td>
</tr>
<tr>
<td>STEVAL-ISA113V1</td>
<td>VIPER06HS</td>
<td>Flyback, 115 kHz, SS010 package</td>
<td>85-265 V</td>
<td>12 V/350 mA</td>
<td>AN4164</td>
</tr>
<tr>
<td>STEVAL-ISA177V1</td>
<td>VIPER013LS</td>
<td>Flyback, 60 kHz, SS010 package</td>
<td>85-265 V</td>
<td>5 V/800 mA</td>
<td>AN4855</td>
</tr>
</tbody>
</table>

Up to 4.5 W at Wide Input Voltage Range - Isolated

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ILL017V1</td>
<td>VIPER17HN</td>
<td>Flyback (LED driver), 115 kHz DIP7 package</td>
<td>220 ±20%</td>
<td>7 V/500 mA</td>
<td>AN2811</td>
</tr>
<tr>
<td>STEVAL-ISA134V1</td>
<td>VIPER06HN</td>
<td>Flyback, 115 kHz, DIP7 package</td>
<td>85-265 V</td>
<td>12 V/330 mA</td>
<td>AN4372</td>
</tr>
<tr>
<td>STEVAL-ISA135V1</td>
<td>VIPER06HS</td>
<td>Flyback, 115 kHz, SS010 package</td>
<td>85-265 V</td>
<td>12 V/330 mA</td>
<td>AN4404</td>
</tr>
<tr>
<td>STEVAL-ISA136V1</td>
<td>VIPER06HN</td>
<td>Flyback, 115 kHz, DIP7 package</td>
<td>85-265 V</td>
<td>5 V/600 mA</td>
<td>AN4410</td>
</tr>
<tr>
<td>STEVAL-ISA137V1</td>
<td>VIPER06HS</td>
<td>Flyback, 115 kHz, SS010 package</td>
<td>85-265 V</td>
<td>5 V/600 mA</td>
<td>AN4418</td>
</tr>
</tbody>
</table>

Up to 7 W at Wide Input Voltage Range - Non Isolated

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA071V2</td>
<td>VIPER16LN</td>
<td>Flyback (negative), 60 kHz, DIP7 package</td>
<td>85-265 V</td>
<td>-5 V/400 mA, +7 V/160 mA</td>
<td>UM0920</td>
</tr>
<tr>
<td>STEVAL-ISA118V1</td>
<td>VIPER16LN</td>
<td>Flyback, 60 kHz, DIP7 package</td>
<td>85-265 V</td>
<td>16 V/280 mA</td>
<td>AN3028</td>
</tr>
<tr>
<td>STEVAL-ISA129V1</td>
<td>VIPER16HN</td>
<td>Flyback, 115 kHz, DIP7 package</td>
<td>85-265 V</td>
<td>16 V/280 mA</td>
<td>AN4372</td>
</tr>
<tr>
<td>STEVAL-ISA147V1</td>
<td>VIPER0PLD</td>
<td>Flyback, 60 kHz, DO16N package, Zero-Power</td>
<td>85-265 V</td>
<td>7 V, -5 V 7 W</td>
<td>AN4836</td>
</tr>
<tr>
<td>STEVAL-ISA192V1</td>
<td>VIPER0PLD</td>
<td>Flyback, 60 kHz, DO16N package, Zero-Power with Tactile switches and STM32L</td>
<td>85-265 V</td>
<td>-5 V/800 mA, +7 V/400 mA</td>
<td>AN4941</td>
</tr>
<tr>
<td>STEVAL-ISA196V1</td>
<td>VIPER114LS</td>
<td>Flyback, 60 kHz, SO16N package</td>
<td>85-265 V</td>
<td>5 V/1.2 A</td>
<td>AN5072</td>
</tr>
</tbody>
</table>
### UP TO 8 W AT WIDE INPUT VOLTAGE RANGE - ISOLATED

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA062V1</td>
<td>VIPER17HN</td>
<td>Flyback (double out), 115 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>5 V, 12 V/750 mA</td>
<td>AN2934</td>
</tr>
<tr>
<td>STEVAL-ISA117V1</td>
<td>VIPER16LN</td>
<td>Flyback, 60 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>12 V/400 mA</td>
<td>AN4259</td>
</tr>
<tr>
<td>STEVAL-ISA124V1</td>
<td>VIPER17HN</td>
<td>Flyback (CC/CV charger), 115 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>5 V/1 A</td>
<td>AN2840</td>
</tr>
<tr>
<td>STEVAL-ISA125V1</td>
<td>VIPER28LN</td>
<td>Flyback (PEAK Power), 60 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>5 V/2.4 A</td>
<td>Databrief</td>
</tr>
<tr>
<td>STEVAL-ISA126V1</td>
<td>VIPER28HN</td>
<td>Flyback (PEAK Power), 115 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>5 V/2.4 A</td>
<td>AN2950</td>
</tr>
<tr>
<td>STEVAL-ISA180V1</td>
<td>VIPER0PHID</td>
<td>Flyback, 60 kHz, SO16N package, Zero Power</td>
<td>85-265 Vac</td>
<td>12 V/0.5 A</td>
<td>AN4905</td>
</tr>
<tr>
<td>STEVAL-ISA181V1</td>
<td>VIPER0PHID</td>
<td>STM32L151C6, Flyback, 120 kHz, SO16N package, Zero Power, Remote control</td>
<td>85-265 Vac</td>
<td>12 V/0.5 A</td>
<td>AN4940</td>
</tr>
<tr>
<td>STEVAL-ISA197V1</td>
<td>VIPER114LS</td>
<td>Flyback (iso), 60 kHz, SO16N package</td>
<td>85-265 Vac</td>
<td>12 V/0.65 A</td>
<td>AN5057</td>
</tr>
</tbody>
</table>

### UP TO 12 W AT WIDE INPUT VOLTAGE RANGE - NON ISOLATED

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA110V1</td>
<td>VIPER26LN</td>
<td>Flyback, 60 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>12 V/1 A</td>
<td>AN4106</td>
</tr>
<tr>
<td>STEVAL-ISA111V1</td>
<td>VIPER26HN</td>
<td>Flyback, 115 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>12 V/1 A</td>
<td>AN4165</td>
</tr>
</tbody>
</table>

### UP TO 12 W AT WIDE INPUT VOLTAGE RANGE - ISOLATED

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA081V1</td>
<td>VIPER26LN</td>
<td>Flyback (PRIMARY reg), 60 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>12 V, 3.3 V/1 A</td>
<td>UM0984</td>
</tr>
<tr>
<td>STEVAL-ISA103V1</td>
<td>VIPER27LN</td>
<td>Flyback, 60 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>5 V/2.4 A</td>
<td>AN2929</td>
</tr>
<tr>
<td>STEVAL-ISA122V1</td>
<td>VIPER27HN</td>
<td>Flyback, 115 kHz, DIP7 package</td>
<td>85-265 Vac</td>
<td>5 V/2.2 A</td>
<td>AN3011</td>
</tr>
<tr>
<td>STEVAL-ISA162V1</td>
<td>VIPER25HD</td>
<td>Quasi-resonant flyback, 225 kHz frequency limit, SO16N package</td>
<td>85-265 Vac</td>
<td>12 V/830 mA</td>
<td>AN4685</td>
</tr>
<tr>
<td>STEVAL-ISA175V1</td>
<td>VIPER26HD</td>
<td>Three outputs, flyback for Smart meter and Power Line Communication system</td>
<td>85-440 Vac</td>
<td>16 V/500 mA (700 mA pk) 5 V/100 mA, 3.3 V/200 mA</td>
<td>AN4878</td>
</tr>
<tr>
<td>STEVAL-ISA182V1</td>
<td>VIPER38HD</td>
<td>Flyback (PEAK Power),115 kHz, SO16N package</td>
<td>85-132 Vac</td>
<td>12 V/0.7 A (2.5 A peak for 10 ms)</td>
<td>AN4924</td>
</tr>
</tbody>
</table>

### UP TO 15 W AT WIDE INPUT VOLTAGE RANGE - ISOLATED

<table>
<thead>
<tr>
<th>Order code</th>
<th>Part number</th>
<th>Short description</th>
<th>Vin</th>
<th>Vout/Iout</th>
<th>Document</th>
</tr>
</thead>
<tbody>
<tr>
<td>STEVAL-ISA121V1</td>
<td>VIPER37LE</td>
<td>Flyback, 60 kHz, SDIP10 package</td>
<td>85-265 Vac</td>
<td>5 V, 3 A</td>
<td>AN4407</td>
</tr>
<tr>
<td>STEVAL-ISA140V1</td>
<td>VIPER37HE</td>
<td>Flyback, 60 kHz, SDIP10 package</td>
<td>85-265 Vac</td>
<td>12 V/1.2 A</td>
<td>AN4419</td>
</tr>
<tr>
<td>STEVAL-ISA153V1</td>
<td>VIPER38LE</td>
<td>Flyback (PEAK Power), 60 kHz, SDIP10 package</td>
<td>90-265 Vac</td>
<td>12 V/1.2 A peak 1.8 A</td>
<td>AN4479</td>
</tr>
<tr>
<td>STEVAL-ISA171V1</td>
<td>VIPER35HD</td>
<td>Quasi-resonant flyback, 225 kHz frequency limit, SO16N package</td>
<td>85-265 Vac</td>
<td>12 V/1.25 A</td>
<td>AN4812</td>
</tr>
<tr>
<td>STEVAL-ISA191V1</td>
<td>VIPER37LE</td>
<td>Flyback double output, 60 kHz, SDIP10 package</td>
<td>85-265 Vac</td>
<td>5 V/1.2 A, 12 V/0.75 A</td>
<td>AN4830</td>
</tr>
<tr>
<td>STEVAL-ISA183V1</td>
<td>VIPER35LD</td>
<td>Quasi resonant triple output flyback, 136 kHz frequency limit</td>
<td>175-275 Vac</td>
<td>12 V/1 A, 15 V/0.2 A 5 V/0.2 A</td>
<td>AN5030</td>
</tr>
<tr>
<td>STEVAL-ISA184V1</td>
<td>VIPER37LD</td>
<td>Flyback double output, 60 kHz, SO16N package</td>
<td>85-265 Vac</td>
<td>5 V/1.2 A, 12 V/0.75 A</td>
<td>AN4830</td>
</tr>
</tbody>
</table>
Available in a click

SURFACE-MOUNT AND THROUGH-HOLE PACKAGES

SO16N

SDIP10

DP7

SS010

MAKE YOUR DESIGN EASILY USING EDESIGNSUITE

For technical documentation, samples and on-line ordering, visit us at: www.st.com/viperplus
life.augmented