Innovation in power conversion

Product Selector Guide
Low Power Adapter/Charger Products

November 2017
## Package Design/Pin Layout – Improves Reliability

- Wide package DRAIN – SOURCE creepage reduces probability of arcing
- Important for high pollution degree environments and forced air cooling
- Optimal pin arrangement allows compliance with safety agency adjacent pin short-circuit test
- Packages below are RoHS compliant
### LinkSwitch-CV – Adapters up to 10.5 W

<table>
<thead>
<tr>
<th>Product²</th>
<th>Continuous Output Power (W)</th>
<th>Continuous Output Power (W)</th>
<th>Adapter¹</th>
<th>Adapter¹</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>230 VAC ± 15%</td>
<td>85-265 VAC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK623P/D</td>
<td>6.5</td>
<td>5.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK624P/D</td>
<td>7</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK625P/D</td>
<td>8</td>
<td>6.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK626P/D</td>
<td>10.5</td>
<td>8.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Minimum continuous power in a typical non-ventilated enclosed adapter measured at +50 °C ambient.

### LinkSwitch-3 – Charger/Adapters up to 10 W

<table>
<thead>
<tr>
<th>Product³</th>
<th>90-264 VAC</th>
<th>D (SO-8C) Package</th>
<th>Adapter (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNK6404D / LNK6424D</td>
<td>3.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK6405D / LNK6415D / LNK6425D</td>
<td>4.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK6406D / LNK6416D / LNK6426D / LNK6436D / LNK6446D</td>
<td>5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LNK6407D / LNK6417D / LNK6427D</td>
<td>7.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product³</th>
<th>E (eSIP-7C) and K (eSOP-12B) Packages</th>
<th>Adapter (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNK6407K / LNK6417K / LNK6427K</td>
<td>8.5</td>
<td></td>
</tr>
<tr>
<td>LNK6408K / LNK6418K / LNK6428K / LNK6448K</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>LNK6408E / LNK6418E / LNK6428E / LNK6448E</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Assumes minimum input DC voltage >90 VDC, $K_p \geq 1$ (Recommend $K_p \geq 1.15$ for accurate CC regulation), $\eta > 78\%$, $P_{aux} < 55\%$.
2. Output power capability is reduced if a lower input voltage is used.
3. Minimum continuous power with adequate heat sink measured at 50 °C ambient with device junction below 110 °C.
4. Assumes bias winding is used to supply BYPASS pin.
### IC Product Tables

**LinkSwitch-4 – Charger/Adapter BJT Drivers up to 15 W**

<table>
<thead>
<tr>
<th>Product²,³</th>
<th>85-265 VAC</th>
<th>Adapter¹ (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNK40x2S</td>
<td>6.5</td>
<td></td>
</tr>
<tr>
<td>LNK40x3S</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>LNK40x5D</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>LNK40x6D</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. Minimum continuous power in a typical non-ventilated enclosed adapter measured at +50 °C ambient, device Tj ≤ 100 °C.
2. Cable compensation factor: x = 0 (no cable compensation), x = 1 (3% cable compensation), x = 2 (6% cable compensation).

**Additional Features:**
- Dynamic base drive technology provides flexibility in choice of BJT transistor by dynamically optimizing BJT switching characteristics
- Extends RBSOA of BJT
- Dramatically reduces sensitivity to BJT gain
- Compensates for transformer inductance tolerances
- Compensates for input line voltage variations
- Compensates for cable voltage drop
- Compensates for external component temperature variations
- Very accurate IC parameter tolerances using proprietary trimming technology
- Frequency up to 65 kHz to reduce transformer size
- The minimum peak current is fixed to improve transient load response

**LinkSwitch-HP – Adapters up to 25 W**

<table>
<thead>
<tr>
<th>Product²</th>
<th>Heat Sink</th>
<th>85-265 VAC</th>
<th>Adapter (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNK6xx3K/V</td>
<td>PCB-W¹</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>LNK6xx4K/V</td>
<td>PCB-W¹</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>LNK6xx5K/V</td>
<td>PCB-W¹</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>LNK6xx6K/V</td>
<td>PCB-W¹</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>LNK6xx7K/V</td>
<td>PCB-W¹</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>LNK6xx8K/V</td>
<td>PCB-W¹</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>LNK6xx9K/V</td>
<td>PCB-W¹</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
1. PCB heat sink with wave soldering.

**Additional Features:**
- EcoSmart – energy efficient
- Multi-mode control maximizes efficiency
- No-load consumption below 30 mW at 230 VAC (LNK67xx)
- >75% efficiency with 1 W input at 230 VAC
- >50% efficiency with 0.1 W input at 230 VAC
- High design flexibility for low system cost
- Dramatically simplifies power supply designs
- Eliminates optocoupler and all secondary control circuitry
- ±5% or better output voltage tolerance
- 132 kHz operation reduces transformer and power supply size
- Accurate programmable current limit
- Compensation over line limits overload power
- Frequency jittering reduces EMI filter cost
### InnoSwitch3-CE – Best in Class Efficiency, No-Load, Fast Transient, Chargers up to 65 W

<table>
<thead>
<tr>
<th>Product</th>
<th>230 VAC ± 15%</th>
<th>85-265 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adapter¹ (W)</td>
<td>Open Frame² (W)</td>
</tr>
<tr>
<td>INN3162C</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>INN3163C</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>INN3164C</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>INN3165C</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>INN3166C</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>INN3167C</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>INN3168C</td>
<td>55</td>
<td>65</td>
</tr>
</tbody>
</table>

Notes:
1. Minimum continuous power in a typical non-ventilated enclosed typical size adapter measured at 40 °C ambient. Max output power is dependent on the design. With condition that package temperature must be < = 125 °C.
2. Minimum peak power capability.
3. Package: InSOP-24D.

### InnoSwitch3-CP – Constant Power Profile for USB PD / QC Applications up to 65 W

<table>
<thead>
<tr>
<th>Product</th>
<th>230 VAC ±15%</th>
<th>85-265 VAC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adapter¹ (W)</td>
<td>Open Frame² (W)</td>
</tr>
<tr>
<td>INN3264C/3274C</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>INN3265C/3275C</td>
<td>25</td>
<td>30</td>
</tr>
<tr>
<td>INN3266C/3276C</td>
<td>35</td>
<td>40</td>
</tr>
<tr>
<td>INN3277C</td>
<td>40</td>
<td>45</td>
</tr>
<tr>
<td>INN3267C</td>
<td>45</td>
<td>50</td>
</tr>
<tr>
<td>INN3268C</td>
<td>55</td>
<td>65</td>
</tr>
</tbody>
</table>

Notes:
1. Lowest maximum continuous power in a typical non-ventilated enclosed adapter measured at 40 °C ambient. (package temperature < 125 °C).
2. Minimum peak power capability.
3. Package: InSOP-24D.

Additional Features:
- Up to 94% efficiency across full load range
- Incorporates a multi-mode Quasi-Resonant (QR) / CCM flyback controller, 650 V MOSFET, secondary-side sensing and synchronous rectification driver
- Integrated FluxLink™, HIPOT-isolated, feedback link
- Exceptional CV/CC accuracy, independent of transformer design or external components
- Adjustable accurate output current sense using external output sense resistor

Additional Features:
- Up to 94% efficiency across full load range
- Incorporates a Quasi-Resonant (QR) / CCM flyback controller, 650 V MOSFET (INN326x) or 725 V MOSFET (INN327x), secondary-side sensing and synchronous rectification driver
- Integrated FluxLink, HIPOT-isolated, feedback link
- Supports fast charge protocols such as USB PD/QC 4.0
- Constant Power (CP) Profile minimizes charging time with continuous adjustment of output current and voltage
- Exceptional CV/CC/CP accuracy, independent of transformer design or external components
- External IS resistor allows custom CC programming
- Instantaneous transient response with 0%-100%-0% load step
Design Examples

**LinkSwitch-CV – Constant Voltage Adapter (RDR-201)**

6 W, 5 V, 1.2 A OUTPUT, 90 – 265 VAC INPUT, FLYBACK POWER SUPPLY

![Diagram of LinkSwitch-CV](image)

**LinkSwitch-3 – Constant Voltage, Constant Current DOE v6 Compliant USB Charger**

5 W, 5 V, 1 A OUTPUT, 90 – 265 VAC INPUT, FLYBACK USB POWER SUPPLY

![Diagram of LinkSwitch-3](image)
LinkSwitch-3 – Constant Voltage, Constant Current USB Charger
10 W, 5 V, 2 A OUTPUT, 90 – 265 VAC INPUT, FLYBACK USB POWER SUPPLY

Design Examples
Design Examples

LinkSwitch-4 – Constant Voltage, Constant Current CoC v5 and DOE v6 Compliant USB Smart Phone Charger (RDR-462)
10 W, 5 V, 2 A OUTPUT, 85 – 265 VAC INPUT, FLYBACK USB POWER SUPPLY

LinkSwitch-4 – Constant Voltage, Constant Current CoC v5 and DOE v6 Compliant USB Smart Phone Charger
12 W, 12 V, 1 A OUTPUT, 85 – 265 VAC INPUT, FLYBACK USB POWER SUPPLY
LinkSwitch-HP – Constant Voltage, Network Adapter

18 W, 12 V, 1.5 A OUTPUT, 90 – 265 VAC INPUT, FLYBACK POWER SUPPLY

LinkSwitch-HP – High Efficiency Adapter with Synchronous Rectification (DER-416)

24 W, 12 V, 2 A OUTPUT, 90 – 265 VAC INPUT, FLYBACK ADAPTER POWER SUPPLY
Design Examples

InnoSwitch3-CE – Constant Voltage, Constant Current Adapter (DER-610)

10 W, 5 V, 2 A OUTPUT, 85 – 265 VAC INPUT, FLYBACK USB POWER SUPPLY

![Diagram of InnoSwitch3-CE](image)

InnoSwitch3-CP – USB PD Mobile Phone Charger (DER-536)

45 W, 5 V, 3 A, and 9 V, 3 A and 15 V, 3 A OUTPUTS, 85 – 265 VAC INPUT, FLYBACK USB PD POWER SUPPLY

![Diagram of InnoSwitch3-CP](image)
InnoSwitch3-CE – Dual Output Industrial Power Supply (DER-537)
36 W, 12 V, 3 A OUTPUT, 90 – 265 VAC INPUT, FLYBACK, NETWORK POWER SUPPLY
Worldwide Sales Support Locations

World Headquarters
5245 Hellyer Avenue
San Jose, CA 95138, USA
Main: +1 408-414-9200
Customer Service:
Worldwide: +1-65-635-6480
Americas: +1-408-414-9621
Email: usasales@power.com
info@power.com

AMERICAS EAST
7360 McGinnis Ferry Road
Suite 225
Suwanee, GA 30024
Tel: +1-678-957-0724
Fax: +1-678-957-0784
Email: usasales@power.com

AMERICAS CENTRAL
3100 Dundee Road, Suite 204
Northbrook, IL 60062
Tel: +1-847-721-6293
Email: usasales@power.com

AMERICAS WEST
5245 Hellyer Avenue
San Jose, CA 95138 USA
Tel: +1-408-414-8778
Fax: +1-408-574-3760
Email: usasales@power.com

CHINA (Shanghai)
Room 1601-1603, Charity Plaza
No. 88 North Caosi Road
Shanghai, PRC 200030
Tel: +86-021-6354 6323
Fax: +86-021-6354 6325
Email: chinasales@power.com

CHINA (Shenzhen)
17/F, Hivic Building, No 2
Keji South 8th Road, Nanshan District
Shenzhen, China
Zip Code: 518057
Tel: +86-755-8672-8689
Fax: +86-755-8672-8690
Email: chinasales@power.com

GERMANY (AC-DC/LED Sales)
Lindwurmstrasse 114
D-80337 München
Germany
Tel: +49-89-5527-39100
Fax: +49-89-1228-5374
Email: eurosales@power.com

GERMANY (Gate Driver Sales)
HellwegForum 1
59469 Ense
Germany
Tel: +49-2938-64-39990
Email: gate-drivers.sales@power.com

INDIA (Mumbai)
Power Integrations India Private Limited
Unit: 106-107, Sagar Tech Plaza-B
Sakina, Andheri Kurla Road
Mumbai - 400072, Maharashtra, India
Tel 1: +91-22-40033700
Tel 2: +91-22-40033600
Email: indiasales@power.com

INDIA (New Delhi)
#45, Top Floor
Okhla Industrial Area, Phase – III
New Delhi, India
Pin – 110020
Tel: +91-11-4055-2351/53
Email: indiasales@power.com

INDIA (Bangalore)
# 1, 14th Main Road
Vasantha nagar
Bangalore 560052 India
Tel 1: +91-80-4113-8020
Tel 2: +91-80-4113-8028
Fax: +91-80-4113-8023
Email: indiasales@power.com

ITALY
Via Milanese 20
20099 Sesto San Giovanni (MI)
Italy
Tel: +39 02 455 08708
Email: eurosales@power.com

JAPAN
Yusen Shin-Yokohama 1-chome Bldg.
1-7-9, Shin-Yokohama, Kohoku-ku
Yokohama-shi, Kanagawa
222-0033 Japan
Phone: +81-45-471-1021
e-mail: japansales@power.com

KOREA
RM602, 6FL, 22
Teheran-ro 87-gil, Gangnam-gu
Seoul, 06164, Korea
Tel: + 82-2-2016-6610
Fax: + 82-2-2016-6630
Email: koreasales@power.com

SINGAPORE
51 Newton Road
#20-01/03 Goldhill Plaza
Singapore, 308900
Tel: +65-6358-2160
Cust. Svc: +65-6356-4480
Fax: +65-6358-2015
Email: singaporesales@power.com

UNITED KINGDOM
Building 5, Suite 21
The Westbrook Centre
Milton Road
Cambridge
CB4 1YG
Tel: +44 (0)7823 557484
Email: eurosales@power.com

On the Web
www.power.com