



Extending InnoSwitch™3 IC Families With PowiGaN™ Technology

Oct 2019

InnoSwitch3 ICs with PowiGaN™ technology

Achieve >100 W

- InnoSwitch3 silicon transistors are highly effective up to 65 W
- PowiGaN switches provide more power
 - ▶ Lower $R_{DS(ON)}$ per unit area
 - ▶ Lower switching losses
- PowiGaN devices
 - ▶ InnoSwitch3-CP – constant power
 - ▶ InnoSwitch3-EP – for open-frame
 - ▶ InnoSwitch3-Pro – digital control

Part Number	230 VAC ± 15%		85 - 264 VAC	
	Adapter	Open Frame	Adapter	Open Frame
INN3X74C	20 W	25 W	15 W	20 W
INN3X75C	25 W	30 W	22 W	25 W
INN3X76C	35 W	40 W	27 W	36 W
INN3X77C	40 W	45 W	36 W	40 W
INN3X68C	55 W	65 W	50 W	55 W
INN3X79C	80 W	85 W	65 W	75 W
INN3X70C	90 W	100 W	75 W	85 W

PowiGaN™ switches

PI GaN Solution are Already Used by Multiple Customers Across Many designs

Anker 60 W Compact



Anker Slim 30 W



30 W Anker Atom PD1

Anker 60 W Multiport



Aukey 60 W



Ravpower 30W



Ravpower 61W



Applications Where Size and Efficiency Matters

- **Aftermarket USB PD adapters**
- **High-end cellphone chargers and other mobile devices**
- **Compact notebook adapters**
- **Appliances, TVs, server standby, AIO PCs, video game console**
- **USB wall sockets, power strips and surge protectors**



We Make GaN Easy to Use in Production

- **GaN transistors are better than silicon**

- ▶ More efficient, cooler, smaller power supplies
- ▶ Leading the way to “no-heatsink” designs at high power levels

- **GaN transistor technology is the future for power conversion**

- **Our strategy is to enclose and protect the GaN device within our ICs**

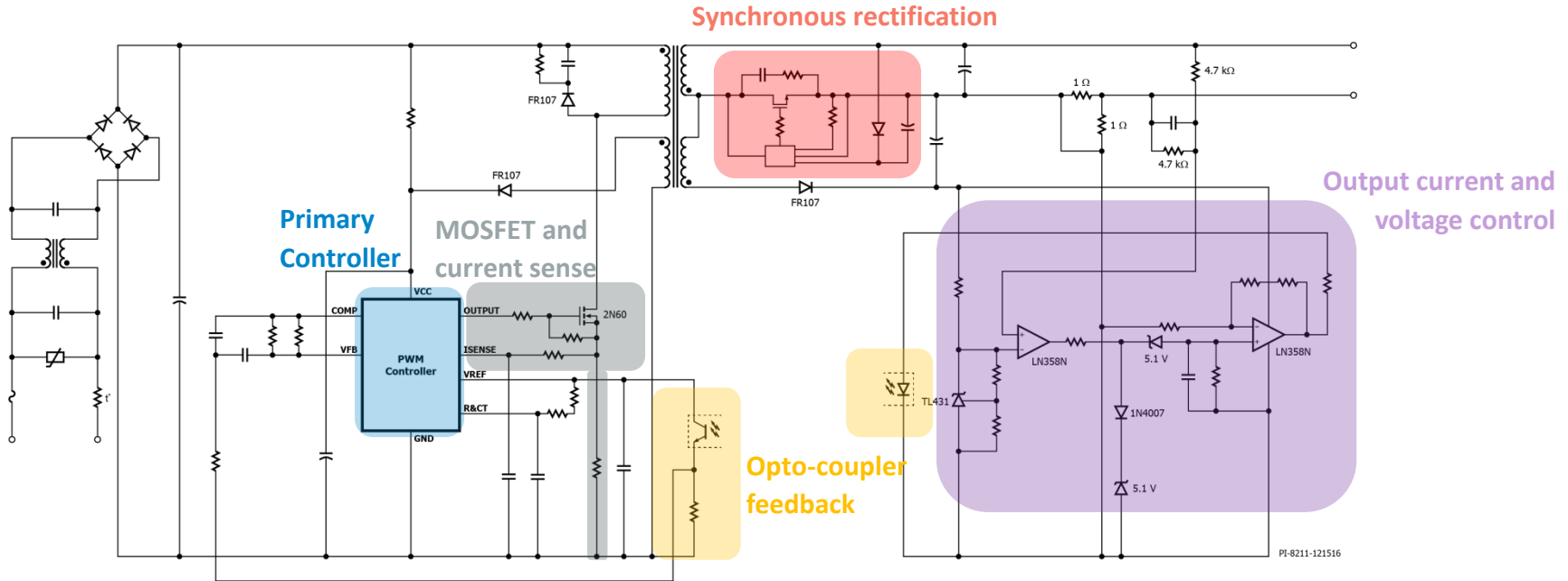
- ▶ Controller, driver, PowiGaN switch, protection, SR control all-in-one
- ▶ Engineers see significant performance benefits
- ▶ But won't otherwise notice a change



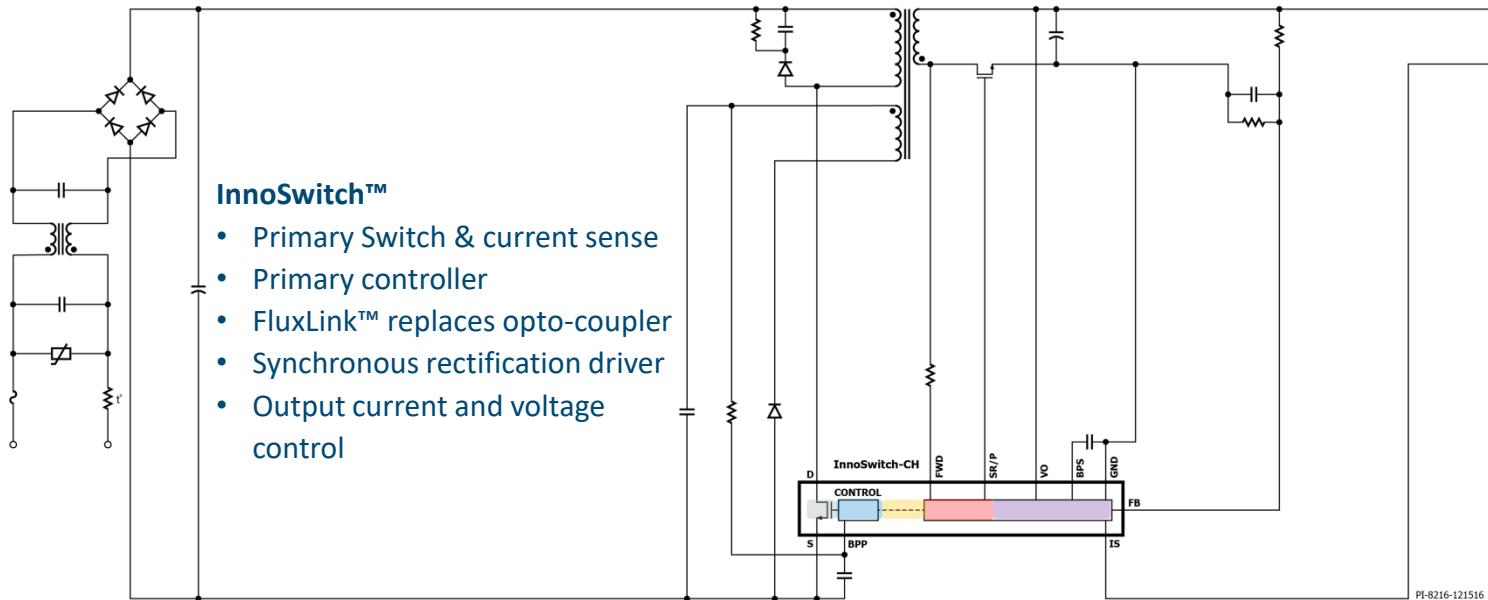
The InnoSwitch Advantage



Conventional High Efficiency Charger

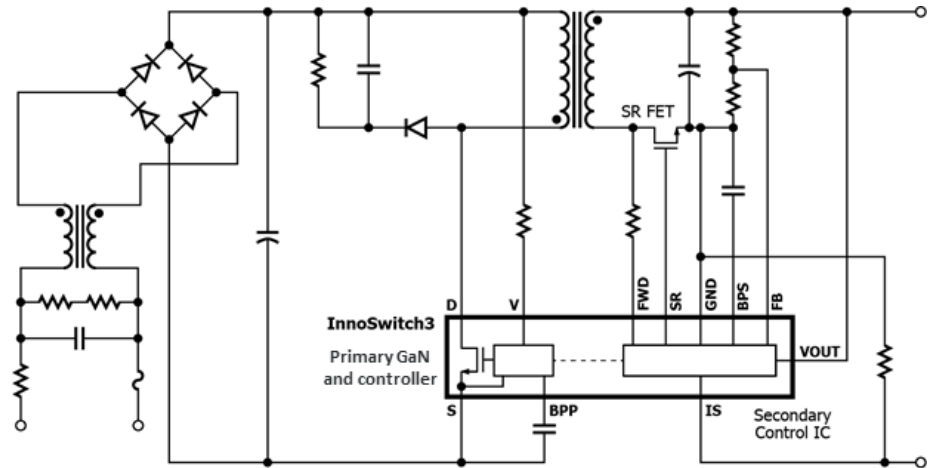


InnoSwitch High Efficiency Charger



Consistent, Familiar and Easy to Implement

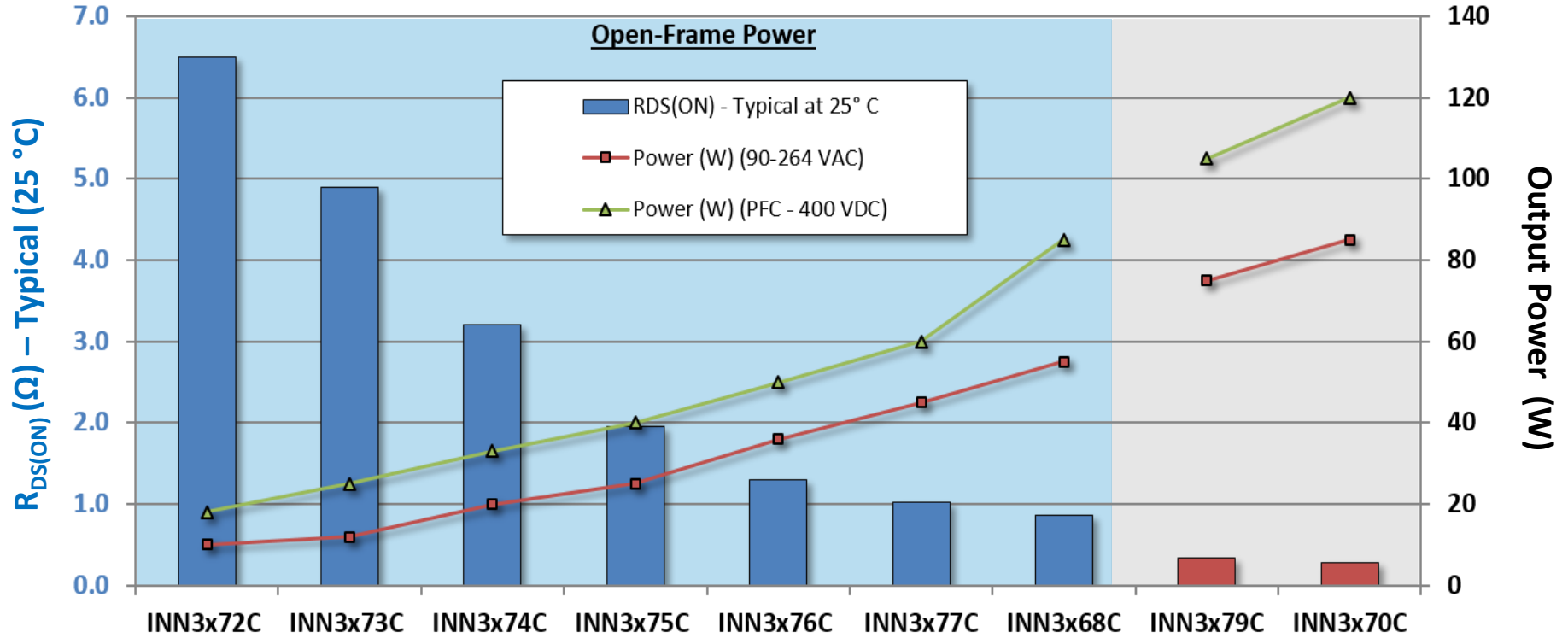
- Same simple flyback circuit topology
- Use identical SMPS design flows for silicon and PowiGaN InnoSwitch3 ICs
- Identical switching frequency
- External components scale for power
- Switching waveforms are the same
- No unusual behaviors or concerns
 - ▶ EMI Standard techniques
 - ▶ ESD No different from silicon



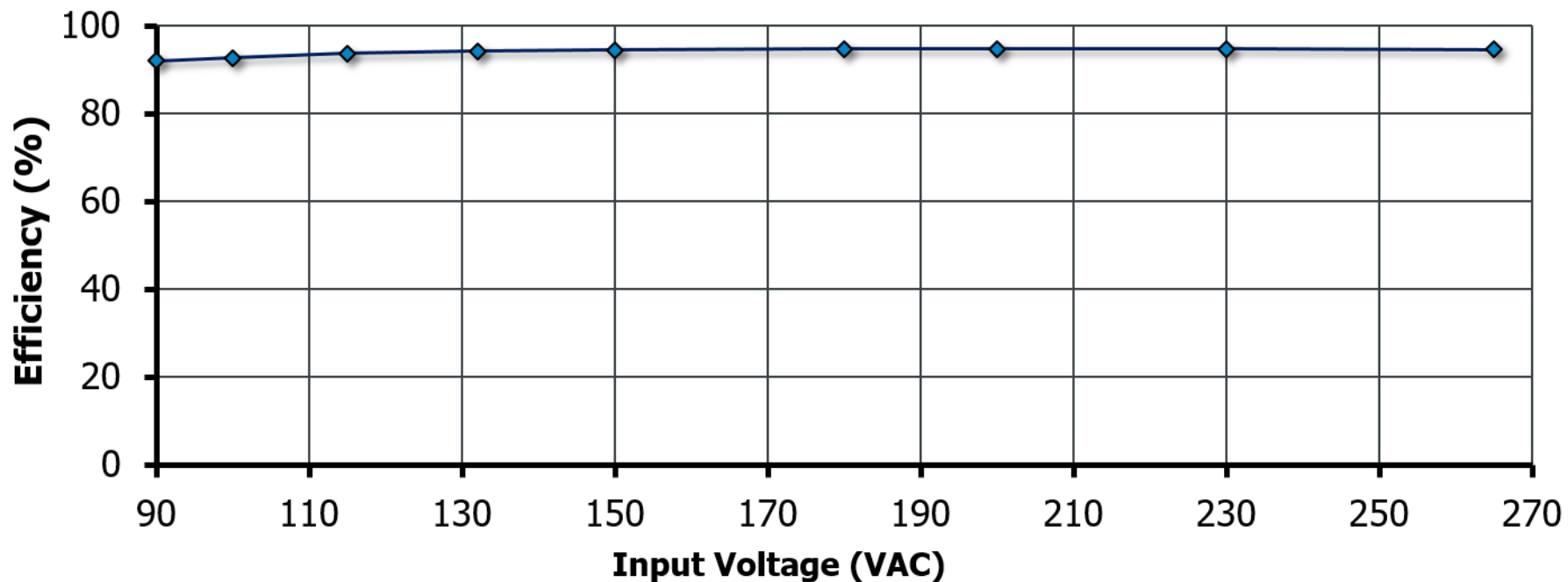
PowiGaN Increases Performance of Industry-Leading InnoSwitch-3 ICs



PowiGaN Increases Efficiency and Power



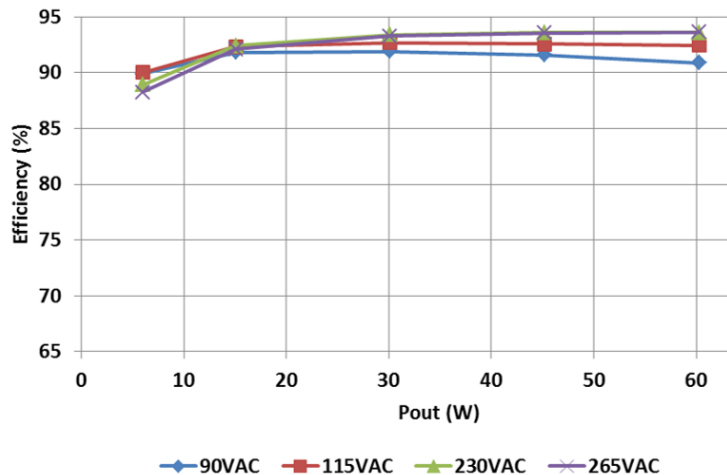
PowiGaN Design Achieves 95% Full-Load Efficiency - Eliminates Heatsink from Adapter



DER-747 (65 W, 20 V Adapter): Full-load efficiency is 95% at 230 VAC and 94% at 115 VAC

PowiGaN High Efficiency Also Improves Performance Across Load for 60 W USB PD

- Same high-efficiency-across-load as standard InnoSwitch3
 - ▶ Ideal for high-power USB PD applications
- Average efficiency is 92.49% at 115 VAC and 93.24% at 230 VAC



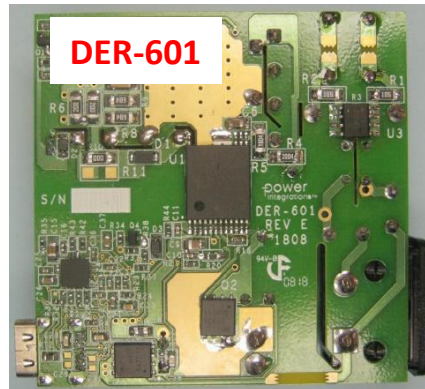
PowiGaN Reference Designs Available Now

■ Use InnoSwitch3 for PD-only designs

- ▶ DER-601: 60 W USB-PD (WT6615F)
- ▶ DER-602: 100 W USB-PD (WT6633P)
- ▶ DER-751: 132 W PSU for multi-port USB-PD adapter
- ▶ DER-747: 65 W 20 V / 3.25 A adapter

■ Use InnoSwitch3-Pro for PD + PPS designs

- ▶ DER-802: 60 W USB-PD (WT6635P)
- ▶ DER-803: 60 W USB-PD (VP302)
- ▶ DER-805: 100 W USB-PD (VP302)



PI Expert Now Supports PowiGaN Devices

- **Creates real-time custom solutions that match customer specifications**
 - ▶ Provides design that is fully functional across operating conditions, start-up & overload
 - ▶ Complete schematic –including EMI filtering and heatsinking guidance
 - ▶ Bill of material is user-adjustable to accommodate preferred components
 - ▶ Transformer documentation and full build information

- **Free download from PI website**

PI Expert™
Online 



PowiGaN – Powerful, Efficient, Reliable

- **PowiGaN devices deliver more power**
 - ▶ Reduced on-resistance
 - ▶ Lower switching loss
- **Operation indistinguishable InnoSwitch-3 silicon devices**
- **Manufacturing processes developed and maintained by PI**
 - ▶ Working with established partners
- **Industry-leading GaN qualification process**
- **Shipping in high volume production now**

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