

Designing Power Supplies with

***TOPSwitch[®]-HX and
TinySwitch[®]-PK***

Seminar Agenda

- **Introduction to Power Integrations**
- **Introducing *TOPSwitch-HX***
 - Features, Operation and Performance
 - Designing with *TOPSwitch-HX*
 - Design Examples and Hints and Tips
- **PI Expert practical demonstration**
 - Using *PI Xls*, *PI Expert*[™] and *PI Transformer Designer* to complete a design
 - Solving common power supply problems by adjusting the transformer design
- **Introducing *TinySwitch-PK***
 - Features, Operation and Performance
 - Designing with *TinySwitch-PK*
 - Design Examples and Hints and Tips
- **PI Device Quick Design checklist**

Power Integrations Overview

Company Overview

- Leader in high voltage monolithic power conversion ICs
- > 2 billion devices shipped
- Revolutionary products
- Proven quality and delivery performance
- Pioneers in energy efficiency (EcoSmart®)



Global Applications Support




- Fully equipped applications labs (shown in red)
- 55+ application engineers worldwide

Design Examples Page Has > 150 Designs


PI FACTS

- Application Notes
- ▶ Design Examples
- Reference Designs (DAKs)
- Design Software
- Technical Support
- IP Licensing
- Design Consultants
- Component Suppliers
- Design Seminars
- Conferences/Papers



Technical Support Search

PI FACTS



EcoSmart

Energy-Efficient Solutions

Design Examples

Design Example Reports (DER)
Design Example Reports contain a power supply design specification, schematic, bill of materials, transformer documentation, and pcb layout. This design has been built and bench-tested to provide performance data and typical operation characteristics.


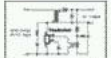

Design Ideas (DI)
Design Ideas are concise two-page documents describing a design for a specific application. Key design points are highlighted.

Engineering Prototype Reports (EPR)
Engineering Prototype Reports contain a power supply reference design specification, schematic, bill of materials, transformer documentation, and pcb layout. Performance data and typical operating characteristics are included. The design has been put into production for use in our [DAKs](#).

The documents are organized by application, starting from the most recent document. To sort by a different column, position your cursor over an underlined column heading and click once with your left mouse button.

✓**CEC** - "Green Design". Sample designs that can be used to meet the efficiency requirements set by the **California Energy Commission (CEC)** and **ENERGY STAR**, as well as many other regulations worldwide. For information on global energy-efficiency standards and *EcoSmart* solutions, visit our [Green Room](#).

Quick Jump: --Select Your Application--
(please make --Select Your Application-- before using this feature)

Application	Output Voltage	Output Power (W)	Schematic	Topology	Doc#	DAK	Gerber							
Appliance	5 V / 24 V	7.3		Flyback	DER-110	-	-							
			🔍 click to enlarge											
			Appliance					6 V	10		Flyback	DER-107	-	-
										🔍 click to enlarge				
										Appliance				
🔍 click to enlarge														
Appliances	TOPSwitch-GX	TOP243Y	207-400 VAC	14 V / 5 V	19.3		Flyback	DER-105	-	-				
						🔍 click to enlarge								

<http://www.powerint.com/appcircuits.htm>

Parametric Search Simplifies Finding Designs

Power Integrations' Parametric Search

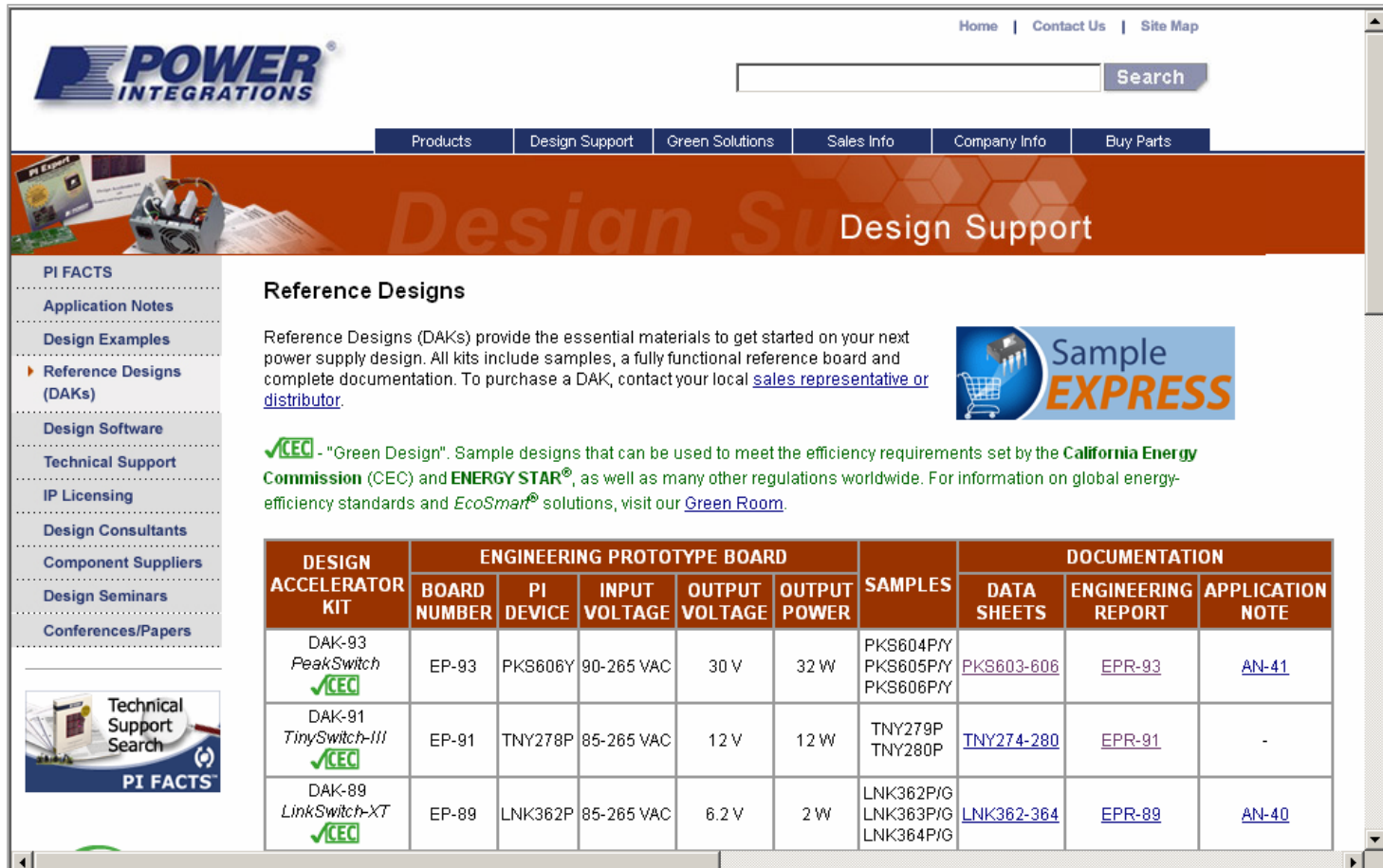
Speed your time to market - use our new fuzzy search to find a best-fit reference design, and modify it. If you have feedback, tell us what you think! [Email your comments.](#)

Isolated Supply? Yes No Both Output Type CV CC CV/CC

DocLink	V _{in} (VAC)		# of Outputs	V _{out}						Total Power	Topology	Product Family	Product	Schematic	RDK	Gerber File	Isolated	CV/CC
	min	max		1	2	3	4	5	6									
	85	265	-															
	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?	?
DI-115	85	265	4	3.3	5	12	-12	0	0	7.5	Flyback	TinySwitch-PK	TNY376PN				Y	CV
RDR-115	85	265	4	3.3	5	12	-12	0	0	7.5	Flyback	TinySwitch-PK	TNY376PN		RDK-115		Y	CV
DI-138	85	265	2	5	18	0	0	0	0	5.9	Flyback	LinkSwitch-XT	LNK364P				N	CV
DI-133	85	265	2	5	18	0	0	0	0	5.9	Flyback	LinkSwitch-XT	LNK364P				N	CV
DI-131	85	265	1	12	0	0	0	0	0	3	Buck	LinkSwitch-TN	LNK306DN				N	CC
RDR-131	85	265	1	12	0	0	0	0	0	3	Buck	LinkSwitch-TN	LNK306DN		RDK-131		N	CC
DI-124	57	580	1	12	0	0	0	0	0	3	Flyback	LinkSwitch-TN	LNK304P				Y	CV
DI-123	85	265	2	5	24	0	0	0	0	9.65	Flyback	TinySwitch-III	TNY275PN				Y	CV
DI-122	85	265	2	-5	-12	0	0	0	0	13	Flyback	TinySwitch-III	TNY279P				N	CV
DI-119	85	265	1	7.7	0	0	0	0	0	1.6	Flyback	LinkSwitch-LP	LNK562P				Y	CV/CC
DER-114	83	295	1	5	0	0	0	0	0	21	Flyback	TinySwitch-III	TNY280P				Y	CV
DER-113	85	264	1	5	0	0	0	0	0	5	Flyback	TinySwitch-III	TNY274P				Y	CV/CC
DER-98	85	265	5	3.3	5	12	23	30	0	41	Flyback	TOPSwitch-GX	TOP246Y				Y	CV
DER-97	85	265	1	48	0	0	0	0	0	21.7	Flyback	TOPSwitch-GX	TOP246P				Y	CV
DER-92	85	265	2	12.9	20	0	0	0	0	0.5	Buck-Boost	LinkSwitch-TN	LNK302P				N	CC
DI-92	85	265	1	12.9	0	0	0	0	0	0.5	Buck-Boost	LinkSwitch-TN	LNK302P				N	CC
DI-91	85	265	1	12	0	0	0	0	0	12	Flyback	TinySwitch-III	TNY278P				Y	CV
EPR-91	85	265	1	12	0	0	0	0	0	12	Flyback	TinySwitch-III	TNY278P		DAK-91		Y	CV
DI-89	85	265	1	6.2	0	0	0	0	0	2	Flyback	LinkSwitch-XT	LNK362P				Y	CV
EPR-89	85	265	1	6.2	0	0	0	0	0	2	Flyback	LinkSwitch-XT	LNK362P		DAK-89a		Y	CV/CC
DI-85	85	265	1	6	0	0	0	0	0	2	Flyback	LinkSwitch-LP	LNK564P				Y	CV
EPR-85	85	265	1	6	0	0	0	0	0	2	Flyback	LinkSwitch-LP	LNK564P		DAK-85		Y	CV

www.powerint.com/psearch

>18 Working Reference Designs Available



The screenshot shows the Power Integrations website's Design Support page. The page features a navigation menu with links for Home, Contact Us, and Site Map. A search bar is located at the top right. Below the navigation, there are tabs for Products, Design Support, Green Solutions, Sales Info, Company Info, and Buy Parts. The main content area is titled "Design Support" and includes a sidebar with various links like PI FACTS, Application Notes, Design Examples, Reference Designs (DAKs), Design Software, Technical Support, IP Licensing, Design Consultants, Component Suppliers, Design Seminars, and Conferences/Papers. The main content area is titled "Reference Designs" and contains a paragraph explaining that Reference Designs (DAKs) provide essential materials for getting started on a power supply design. It also includes a "Sample EXPRESS" logo and a paragraph about "Green Design" (CEC) and ENERGY STAR®. Below this is a table listing three Reference Designs (DAKs) with their respective specifications and documentation links.

DESIGN ACCELERATOR KIT	ENGINEERING PROTOTYPE BOARD					SAMPLES	DOCUMENTATION		
	BOARD NUMBER	PI DEVICE	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT POWER		DATA SHEETS	ENGINEERING REPORT	APPLICATION NOTE
DAK-93 <i>PeakSwitch</i> ✓CEC	EP-93	PKS606Y	90-265 VAC	30 V	32 W	PKS604PY PKS605PY PKS606PY	PKS603-606	EPR-93	AN-41
DAK-91 <i>TinySwitch-III</i> ✓CEC	EP-91	TNY278P	85-265 VAC	12 V	12 W	TNY279P TNY280P	TNY274-280	EPR-91	-
DAK-89 <i>LinkSwitch-XT</i> ✓CEC	EP-89	LNK362P	85-265 VAC	6.2 V	2 W	LNK362P/G LNK363P/G LNK364P/G	LNK362-364	EPR-89	AN-40

www.powerint.com/dak.htm

Worldwide Technical Support

Design Support

Technical Support

<p>PI FACTS</p> <ul style="list-style-type: none">Application NotesDesign ExamplesReference Designs (DAKs)Design Software▶ Technical SupportIP LicensingDesign ConsultantsComponent SuppliersDesign SeminarsConferences/Papers	<h3>By Email</h3> <p>Ask a PI Engineer: Submit your technical question using our online Technical Support Request form.</p> <hr/> <p>PI Expert Technical Support: If you have questions about using PI Expert, fill out the PI Expert Problem Report Form.</p> <p>Note: For sales or purchasing questions, please contact your local Power Integrations sales office or distributor location.</p>
<div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"><p>Technical Support Search PI FACTS</p></div> <div style="text-align: center;"><p>EcoSmart Energy-Efficient Solutions</p></div>	<h3>By Phone</h3> <p>Direct Design Support: Call dedicated applications hotlines worldwide.</p> <hr/> <p>For India and Southeast Asia</p> <p>Phone: 1-860 425-9660 A local call from within India when using the BSNL/MTNL service provider</p> <p>080-2237-2252 From outside Bangalore but within India</p> <p>+91-80-2237-2252 From anywhere in the world outside India</p> <p>Contact person: Himmat Parmar, Applications Hotline Engineer, PI-India Email: himmat.parmar@powerint.com Skype ID: pi_hotline Support office location: Bangalore, India</p> <hr/> <p>For China</p> <p>中国 86-755-8379-3243 广东、福建、香港、海南</p> <p>86-21-6215-5548 上海、江苏、浙江、湖北、江西、安徽、河南、山西、山东、河北、北京、辽宁、吉林、黑龙江、内蒙古、天津</p> <p>86-28-8676-3012 四川、重庆、云南、贵州、广西、湖南、陕西、宁夏、甘肃、新疆、青</p>

www.powerint.com/techsupport.htm