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INNOVATION • EFFICIENCY • EXPERTISE • CONFIGURABLE  
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### 零电压零电流转换器在工业车载领域的应用

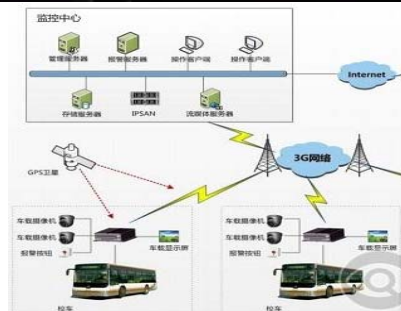


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### 车载应用：PI37xx 升降压转化器

## 车载市场发展趋势

- › 在2014年中国移动布局车联网 (Internet of Vehicle)
  - 针对厂合作伙伴领域的解决方
  - 针对位置安防类的应用
  - 基于后装市场的个人产品和行业解决方案
- › Google、特斯拉无人驾驶汽车
- › 华为、百度与奥迪联合布局车联网
- › 华为与Qualcomm技术供应商，提出LTE标准LTE V2X

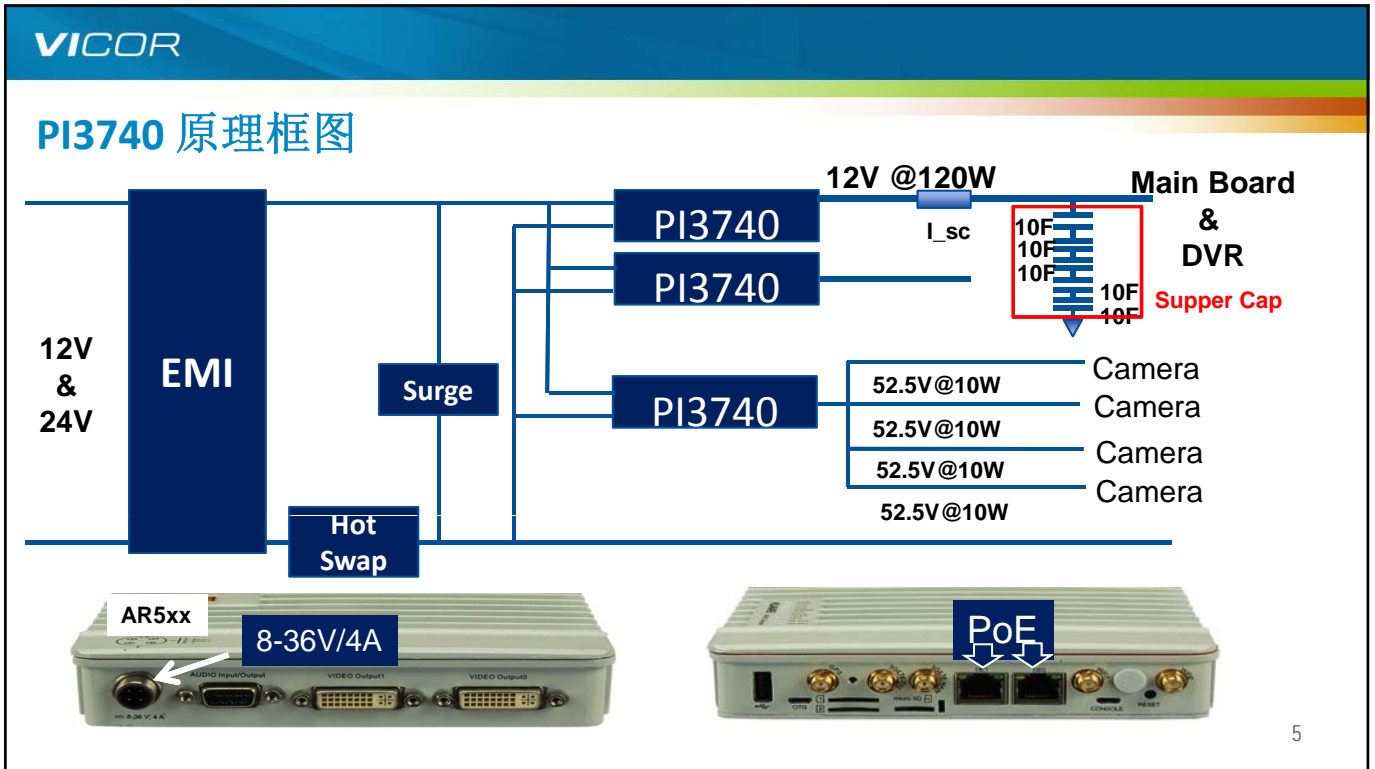


## 设计挑战

- › 产品的高度集成化，大量的图像处理和数据交换
- › 传统的产品设计方式较大如机房中心交换机——新设计类似汽车的“黑匣子”
  - 现有分分立器件解决方案，复杂，难调试和成本高
  - Vicor PI3740优点体积是目前分分立方案的40%
  - 并且效率提升7个百分点



Battery Items	parameters	parameters
Charge voltage	10.8V DC~27.8V DC	8V DC~60V DC
Discharge voltage	9V DC~36V DC	10V DC~54V DC
Max discharge power	50W typical 40W	60W typical 50W



**VICOR**

### Summarize: Why Vicor Win

PI3740 可以给客户带来更高的效率同时减少电源部分的面积  
 简单可靠的电路可可扩展性给设计带来更大的灵活性  
 成熟的电路保证产品的

巴士在线  
BUS AP

- 为**22座**城市，**1亿**乘客提供高速的Wi-Fi接入体验
- All-In-One解决方案，节省客户投资
- 安卓、多媒体接口、GPS，更多商业价值

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## LED 显示屏的应用



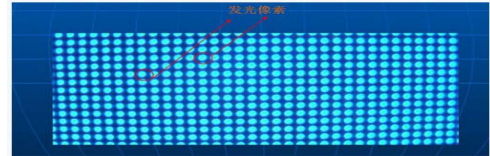
### LED显示屏安装形式

- ✓ 固定式
  - 户外
  - 室内
  - 半户外
- ✓ 移动式



## LED显示屏的发展趋势

- 单像素尺寸变得越来越小
  - P2.5和以下的称为小像素LED面板，P1.2和P1.0为主
- 面板尺寸越来越大
  - 越来越多的大型建筑和体育场
  - 需要更多的功率.
- LED面板安装在外墙外侧，形状各异，例如正方形，长方形，圆形
  - 需要更薄更轻

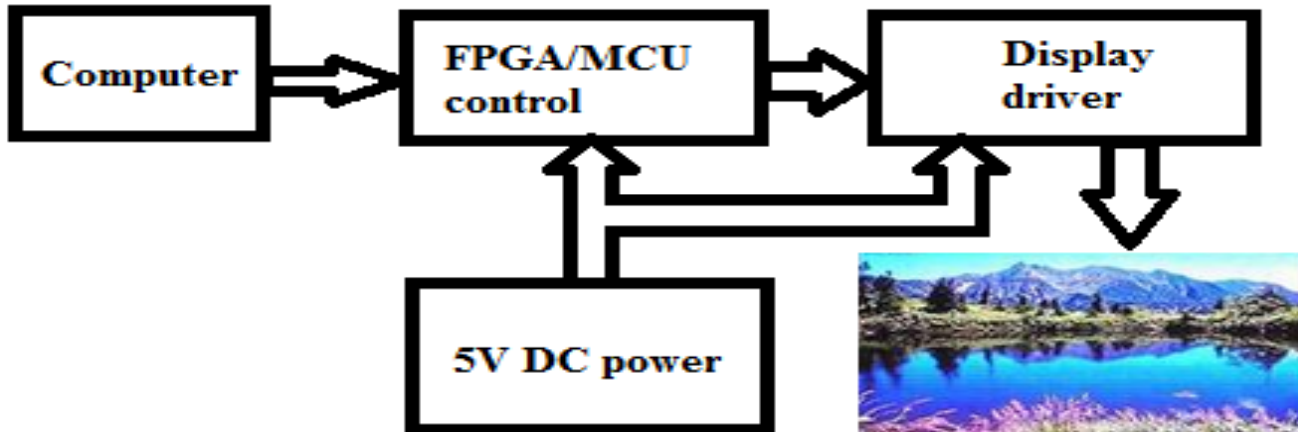


## LED显示屏面临的问题

- 成本持续下降
  - 电源正面临着价格压力，竞争激烈，客户要求成本越来越低
  - 低成本电源广泛应用于低端小尺寸面板
- 像素变小，面板尺寸变大
  - 更高的功率，
  - 重量和厚度是高端面板最大的挑战

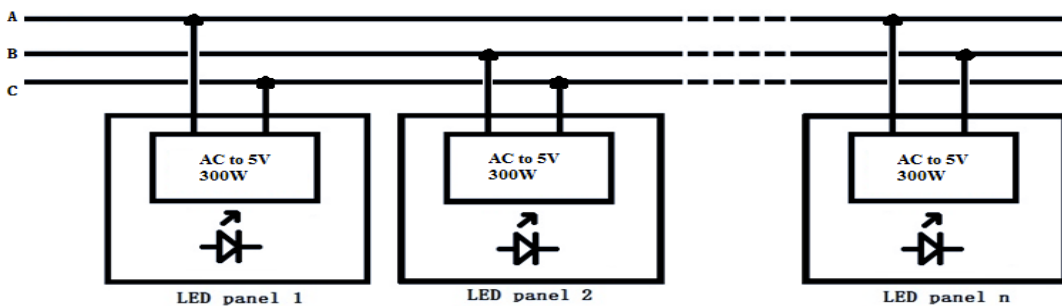
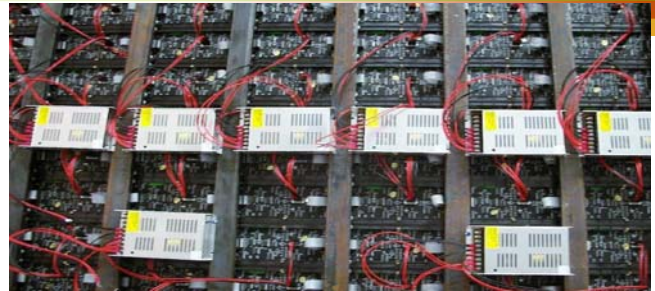
## LED显示结构框图

- 5V广泛应用于LED显示中，LED驱动器直接用5V供电。
- 5V也用于系统的控制供电。

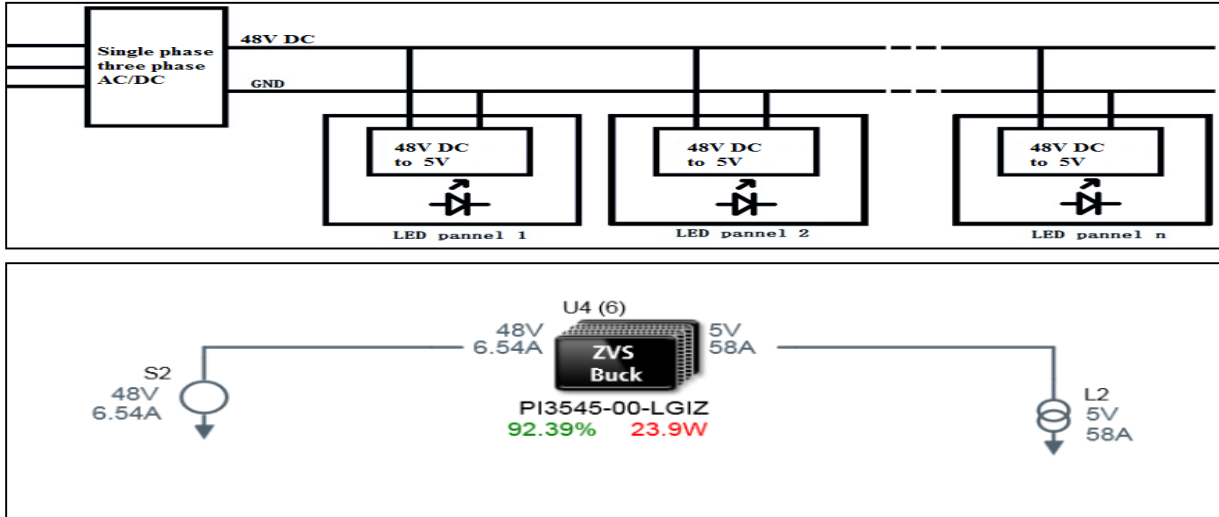


## 目前交流输入应用现状

- 单相和三相输入
- 复杂的线连接
- 比较重
- 不能制作薄面板
- 效率约85%



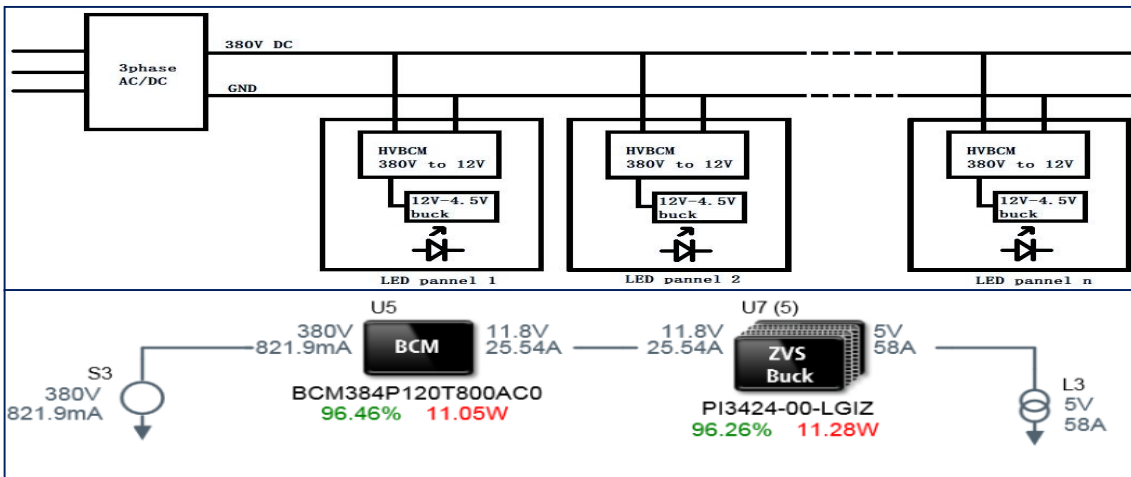
48V 总线电压转5V 转换器  
ZVS Buck PI3545/PI3525



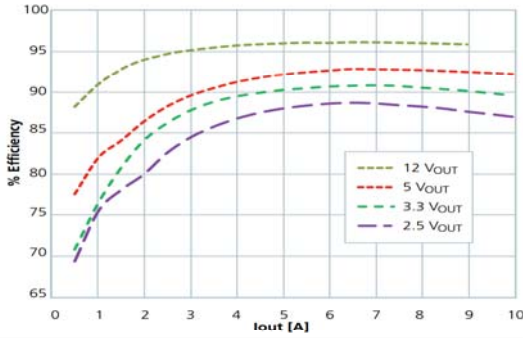
高压直流380V方案

BCM + ZVS BUCK

效率:  $96.46\% * 96.26\% = 92\%$

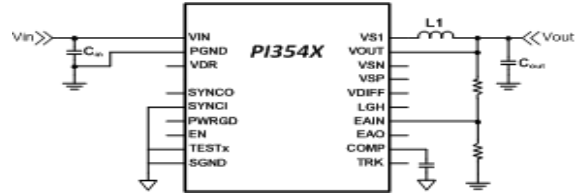


48V 输入 10A 输出降压稳压器 -- PI354x Series



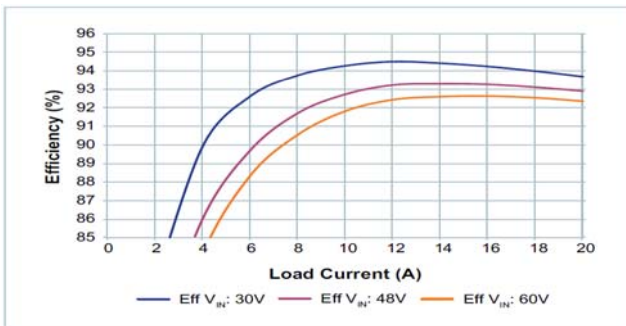
PI35 4x 48V输入效率

Device	Output Voltage		I <sub>OUT</sub> Max
	Set	Range	
PI3542-00-LGIZ	2.5 V	2.2 V to 3.0 V	10 A
PI3543-00-LGIZ	3.3 V	2.6 V to 3.6 V	10 A
PI3545-00-LGIZ	5.0 V	4.0 V to 5.5 V	10 A
PI3546-00-LGIZ	12 V	6.5 V to 14 V	9 A

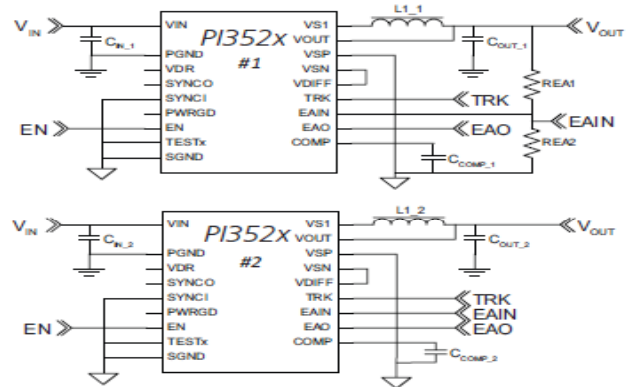


- > 从36V到60V宽输入范围
- > 输出电压2.2V到3.6V, 10A
- > 10x10mm LGA SiP 封装

48V 输入100W ZVS Buck – PI3525



- > 输入电压30V到60V
- > 输出4V-6.5V, 20A
- > 完整的保护
- > 可调软启动, 跟踪功能

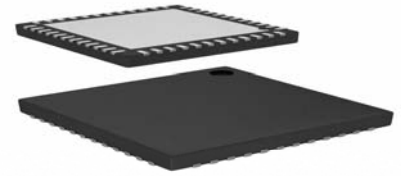


单线并联均流



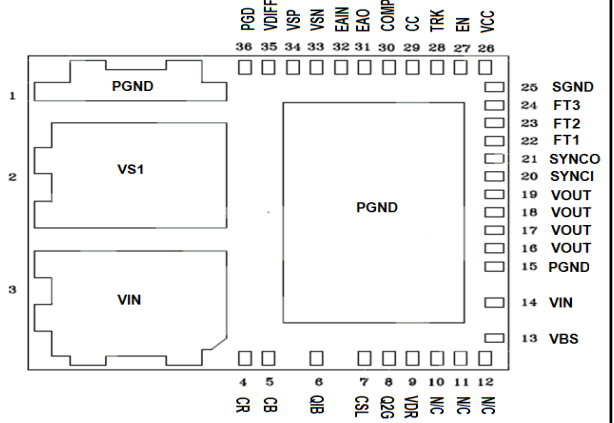
QFN 小封装48V ZVS buck

2018年初发布



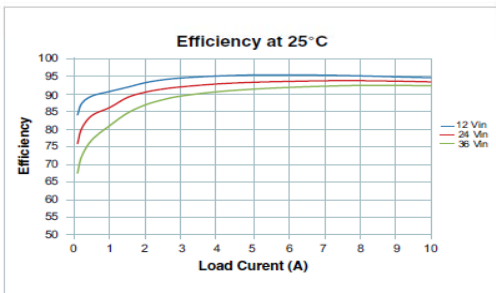
7x8mm QFN

Device	Output Voltage		Iout Max
	Set	Range	
PI3582-00-QFIZ	2.5V	2.2 to 3.0V	10A
PI3583-00-QFIZ	3.3V	2.6 to 4.0V	10A
PI3585-00-QFIZ	5.0V	4.0V to 6.5V	10A
PI3586-00-QFIZ	12V	6.5V to 14V	9A

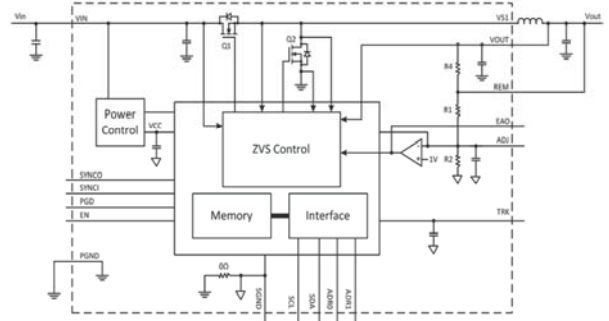


24V输入, 10A输出 ZVS buck --PI33xx

PI3302-x0-LGIZ (5.0 V<sub>OUT</sub>) Electrical Characteristics



Device	Output Voltage		Iout Max
	Set	Range	
PI3311-x0-LGIZ	1.0 V	1.0 to 1.4 V	10 A
PI3318-x0-LGIZ	1.8 V	1.4 to 2.0 V	10 A
PI3312-x0-LGIZ	2.5 V	2.0 to 3.1 V	10 A
PI3301-x0-LGIZ	3.3 V	2.3 to 4.1 V	10 A
PI3302-x0-LGIZ	5.0 V	3.3 to 6.5 V	10 A
PI3303-x0-LGIZ	12 V	6.5 to 13.0 V	8 A
PI3305-x0-LGIZ	15 V	10.0 to 16.0 V	8 A



- > 8V到36V输入范围
- > 10\*14mm LGA 封装
- > 应用简单, 外围器件少



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谢谢