



CORRECT LED Driver

- ST SOLUTIONS: HVLED SERIES IC

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- Pros & Cons of LED
- Correct LED Solution
- Professional LED Driver Controller: HVLEDxxx
 - HVLEDxxPF
 - HVLED805
- LED Drivers with AC-DC Converters
 - Viper Families: Power: ~10W
 - L6562A: Power: 10W ~90W
 - L6562A+L6599: Power: >90W



Pros & Cons of LED

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Pros & Cons of LED

- **Long Life:** Range from 20k-50k hours (50 time of Incandescent, 10 times of CFL)
- **Save Money:** low average cost by its long life, high initial cost as of today
- **Energy Efficient:** Save energy means reduce carbon footprint.
- **No hazard & reliable:** no mercury, no filament, no glass
- **Instant Light:** LED do not require pre-heat to achieve maximum brightness.

General/Street LED lighting



Source: Macroblock.



Correct LED Solution

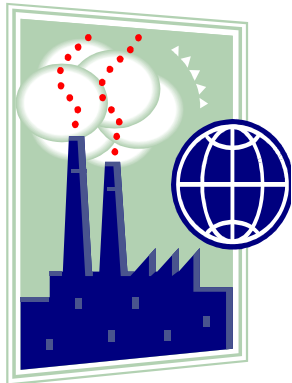
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Correct LED Solution



Questions for LED Drivers : All conditions consider?

**Energy
saving
YES?**



**Life-time
YES?**



**Safety
YES?**

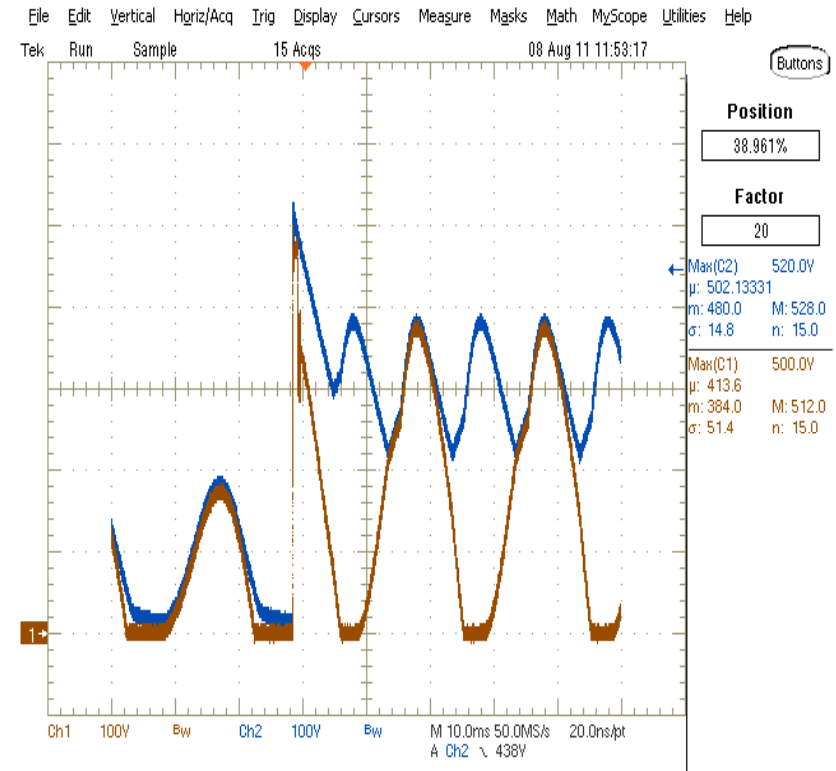
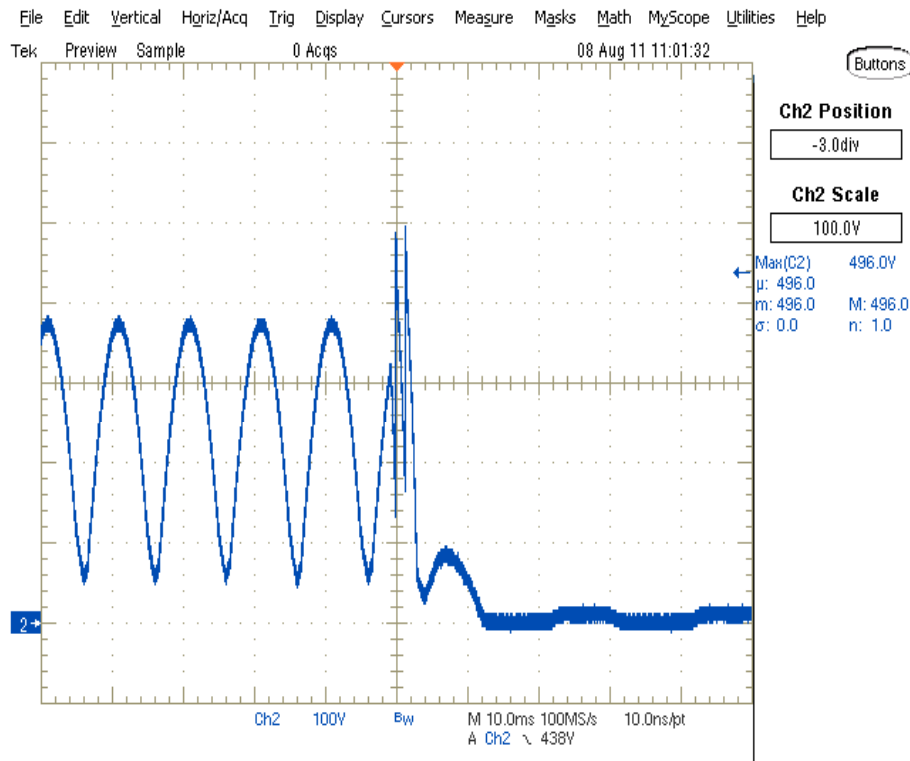


**Where is
the light?**

Correct LED Solution



Input voltage waveform?



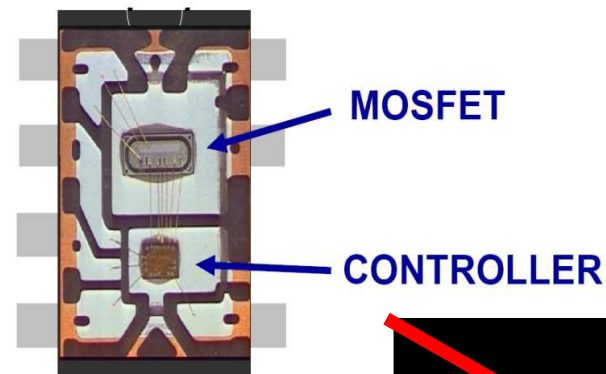
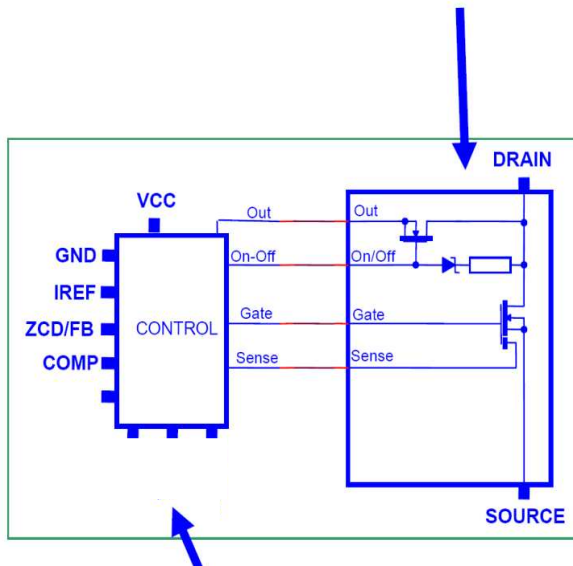
MAX: 496V!
520V!

Correct LED Solution



Correct LED solution!

800V Avalanche Ruggedness Power
MOSFET in SuperMESH Technology



~~The reason of
No light : 600V,
650V!~~

Professional LED Driver controller: HVLEDxxx

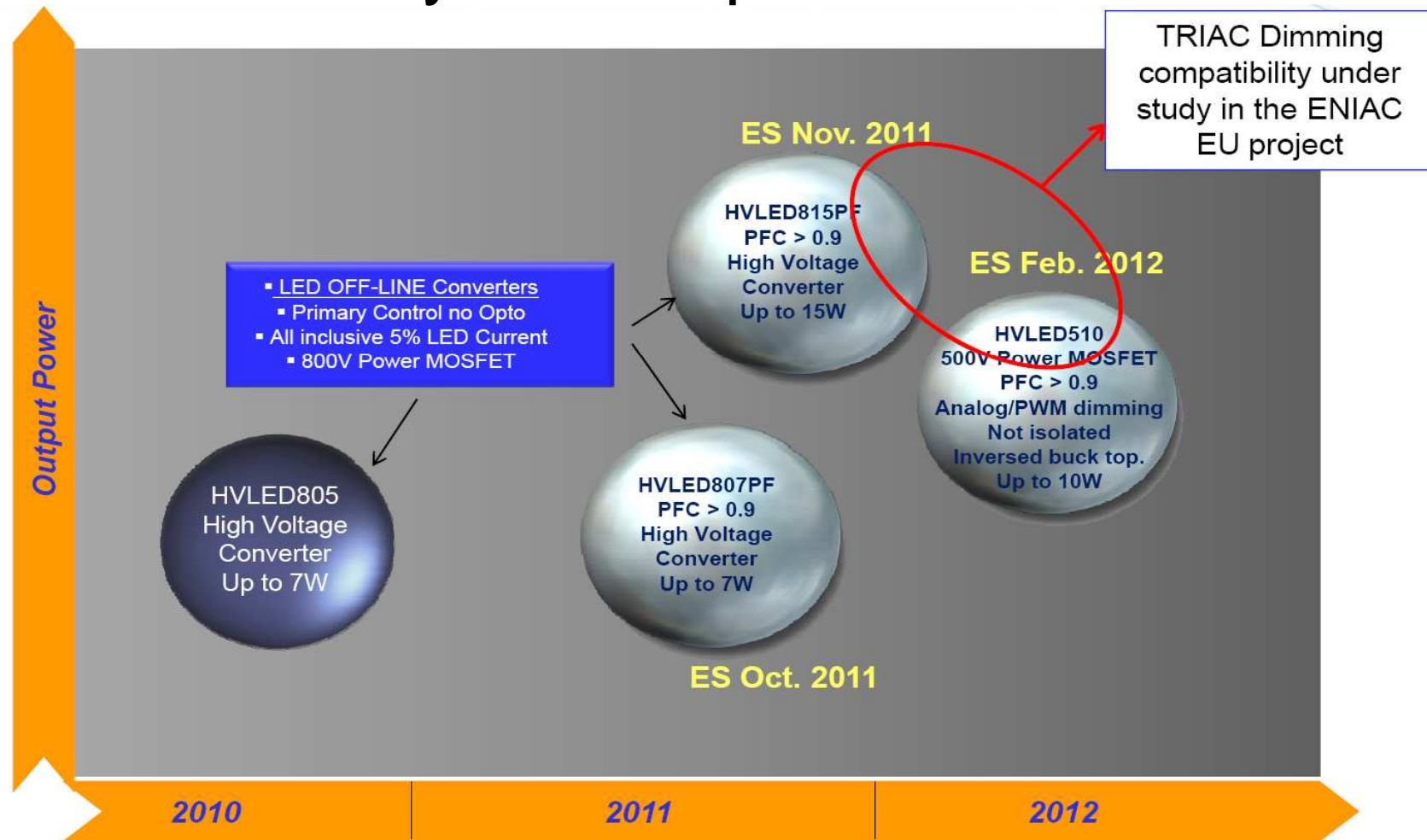


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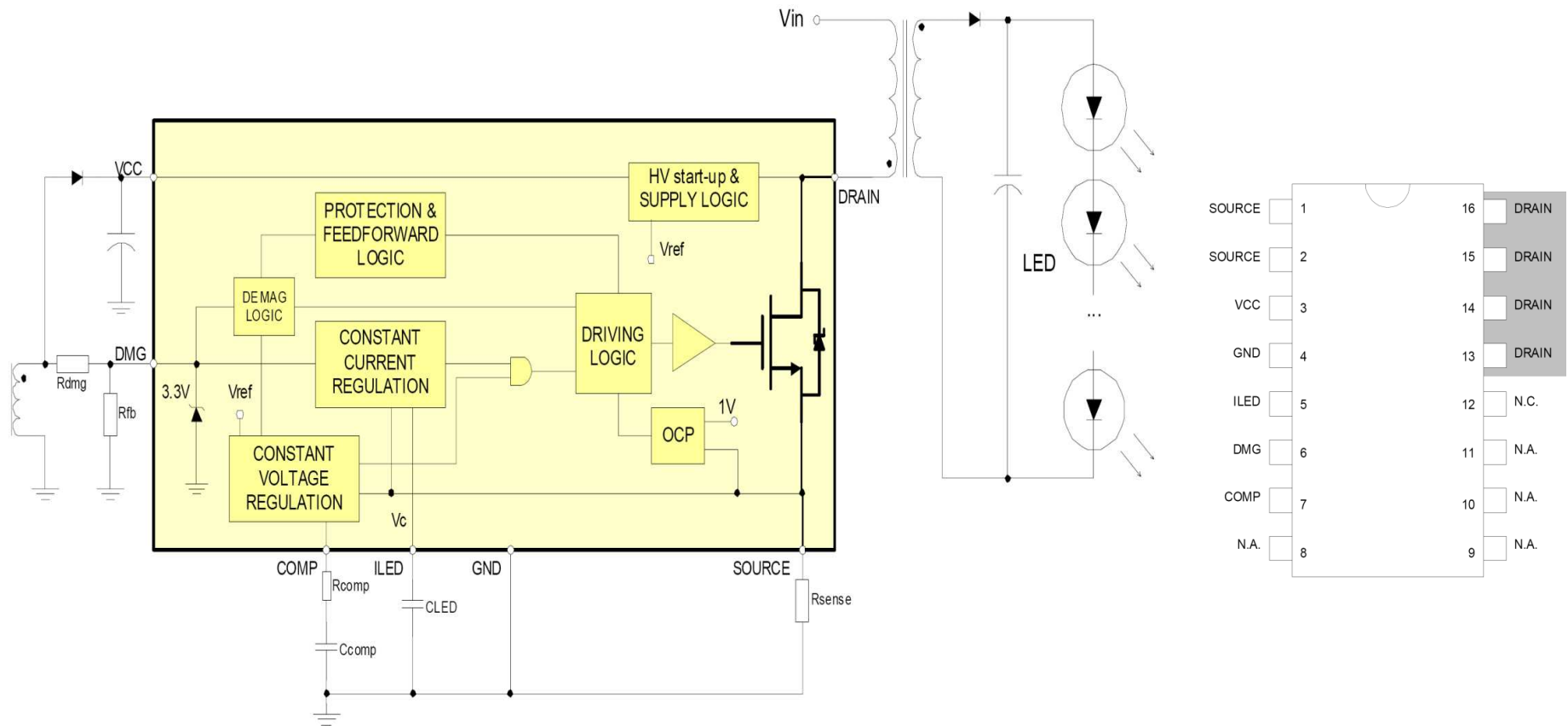
HVLED Family roadmap



Professional LED Driver Controller: HVLEDxxx



HVLED805



Professional LED Driver Controller: HVLEDxxx



HVLED805

- HVLED805 6.8V/650mA demoboard test report
 - Constant Current character @6.8v output

Input voltage	Vout	Iout(a)	PF	Pin(w)	efficiency
160	7.251	0.655	0.638	5.826	81.5%
180	7.256	0.655	0.739	5.695	83.4%
220	7.259	0.656	0.767	5.612	84.85%
230	7.262	0.656	0.784	5.687	83.76%
240	7.262	0.656	0.792	5.635	84.5%
265	7.263	0.656	0.800	5.678	83.91%

- soft start function: ok
- output short circuit protection: ok

Professional LED Driver Controller: HVLEDxxx



HVLED805

Figure 1: No e-cap solution

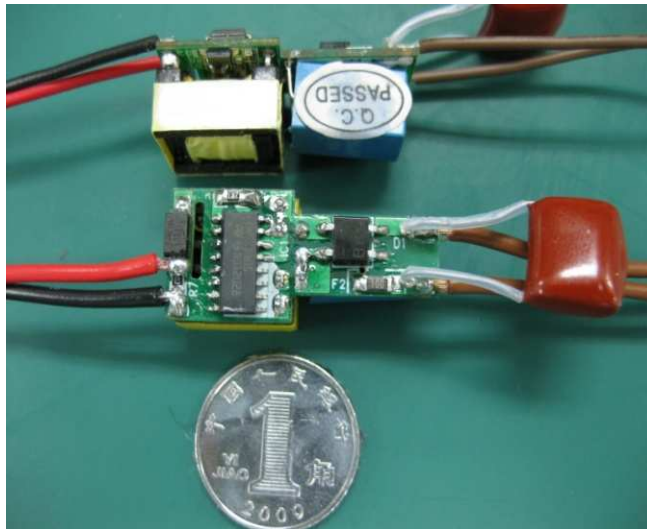
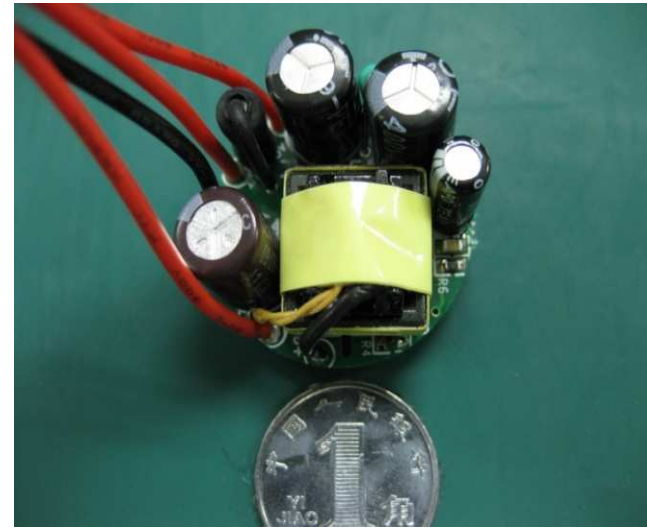


Figure 2: Solution with e-cap



GU10: YES!

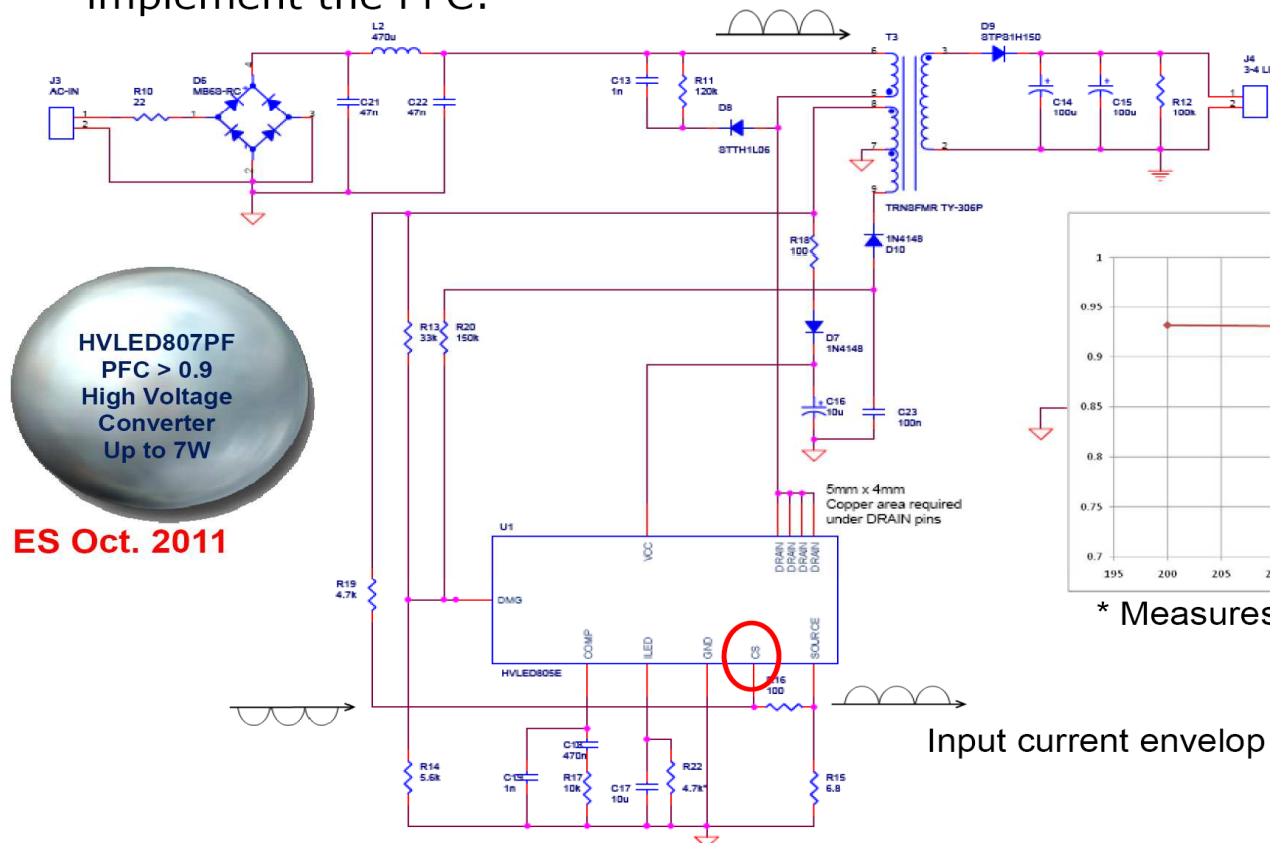
Demoboard's photos of the no e-cap and e-cap solution

Professional LED Driver Controller: HVLEDxxx

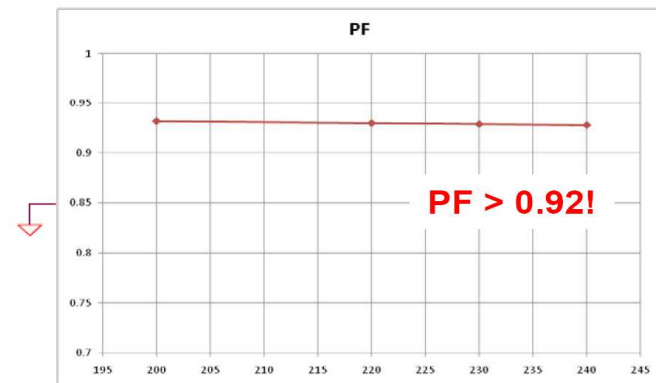


HVLED807PF

Differences vs HVLED805: the CS of the controller is externally available to implement the PFC:



ES Oct. 2011



* Measures on ceramic sample

Input current envelop

Professional LED Driver Controller: HVLEDxxx



HVLED815PF

- Differences vs HVLED805: the CS of the controller is externally available to implement the PFC (same as HVLED807PF)
- The internal PMOS is a 7 Ω R_{dson} max (T_{amb})

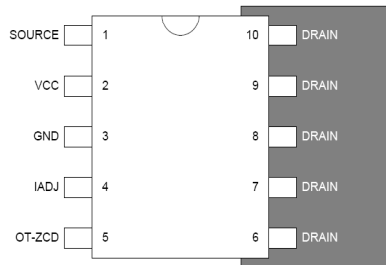
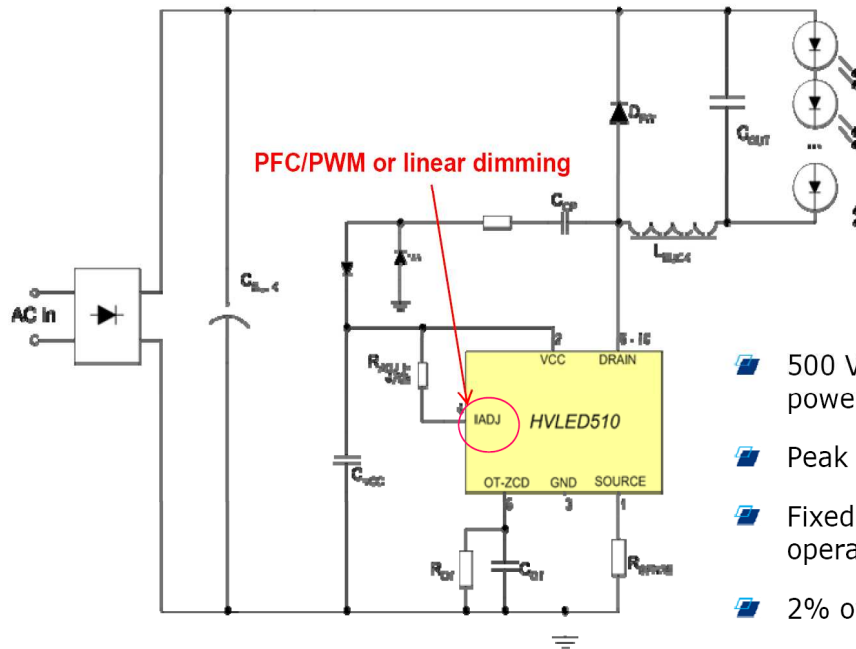
ES Nov. 2011



Professional LED Driver Controller: HVLEDxxx



HVLED510



ES Feb. 2012



- 500 V / 6 Ω max (@25C) avalanche rugged internal power MOSFET and HV start-up
- Peak current control mode
- Fixed-Off-Time (FOT) or Transition-mode (TM) operation
- 2% overall peak current accuracy
- 2% overall off-time accuracy
- Operating frequency up to 500 kHz
- Multifunction IADJ pin: PFC, Linear/PWM dimming
- SSOP10 package
- Thermal Shutdown @ 150C with hysteresis

LED Drivers with AC-DC Converters



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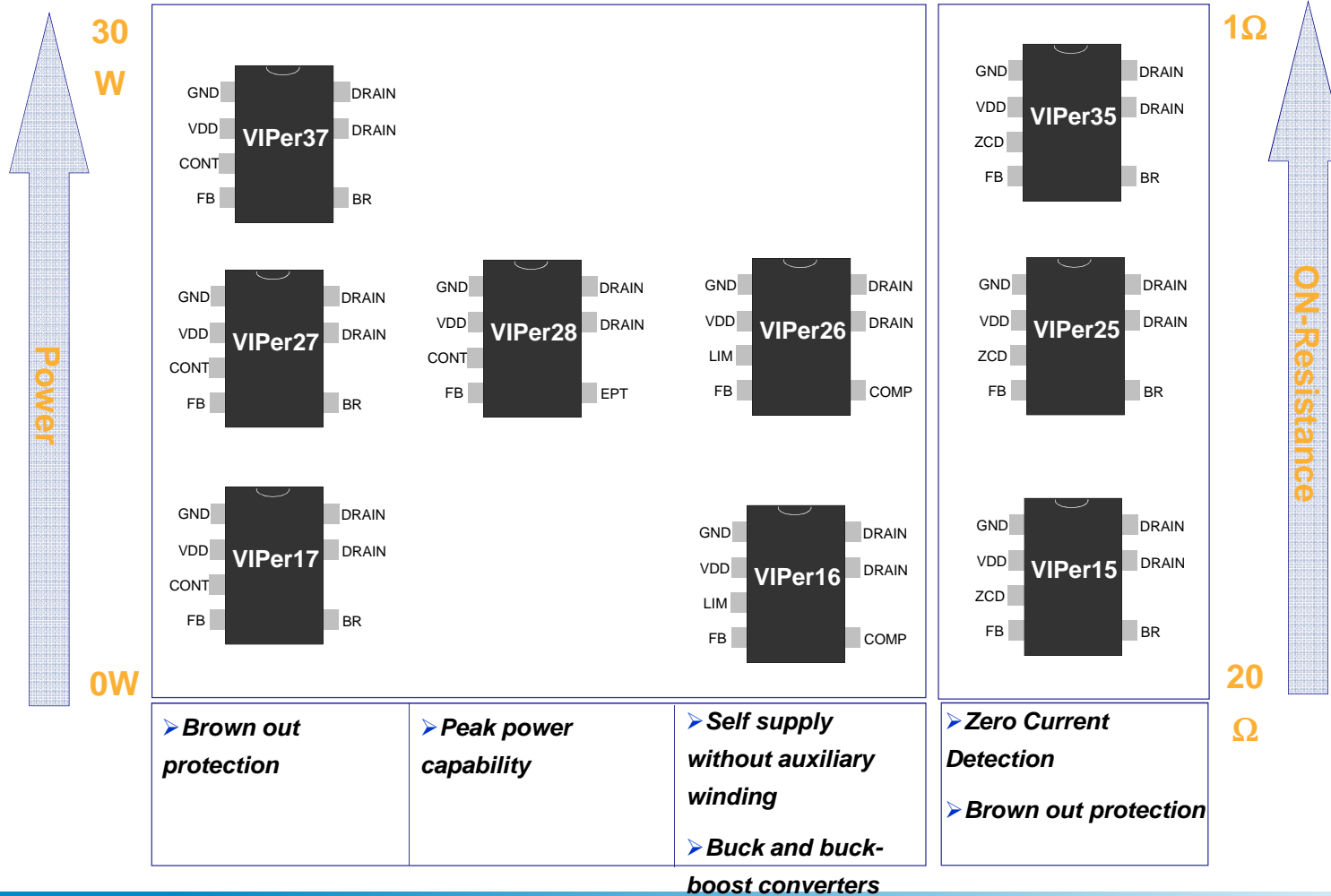
LED Drivers with AC-DC Converters



New VIPer Plus Product Portfolio

FIXED FREQUENCY

QUASI RESONANT

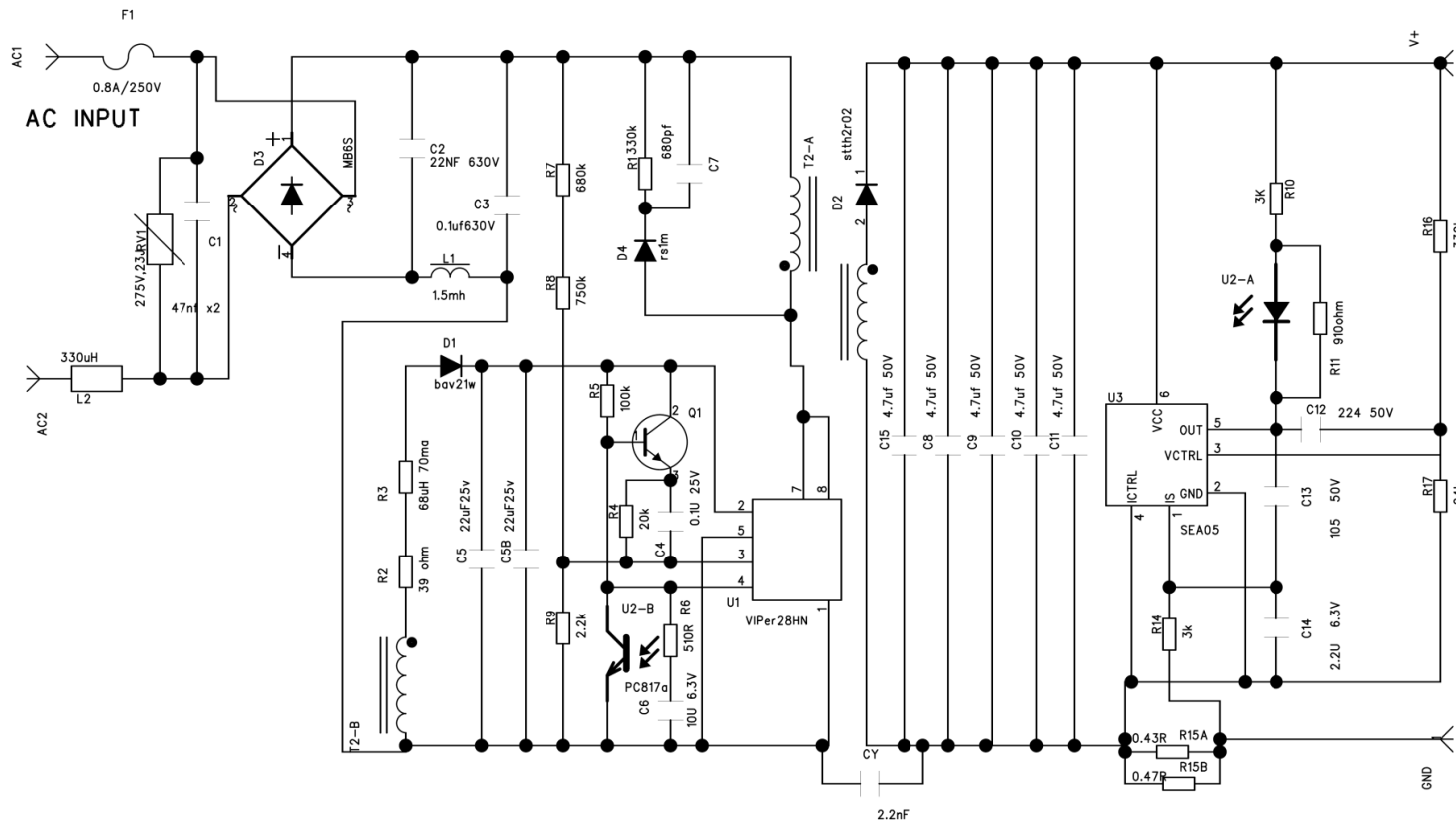


LED Drivers with AC-DC Converters



Viper families – High PF Flyback

VIPerxx+SEA05

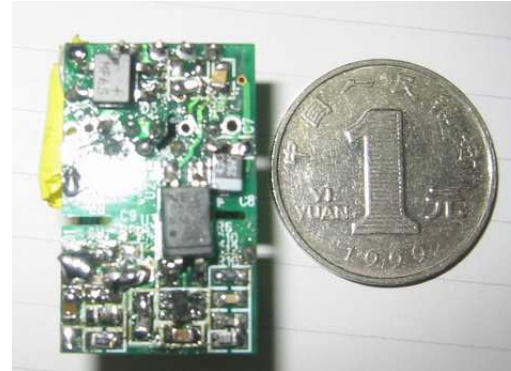


LED Drivers with AC-DC Converters



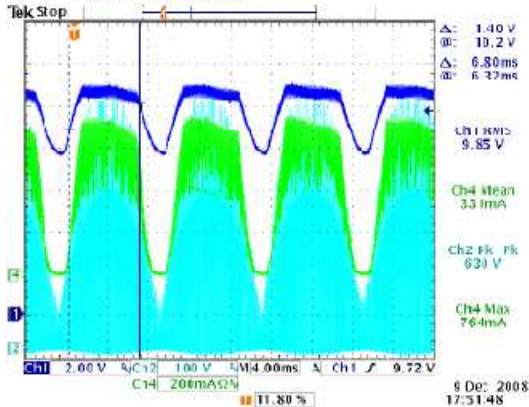
3.6W no E cap

- High power factor at tiny size
- Target for domestic lamp
- Long lifetime by not using

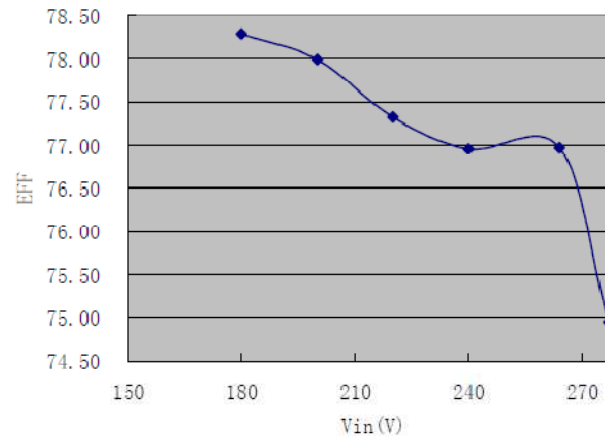


Waveform
CH1:Vo
CH2:Vdrain
CH4:Io

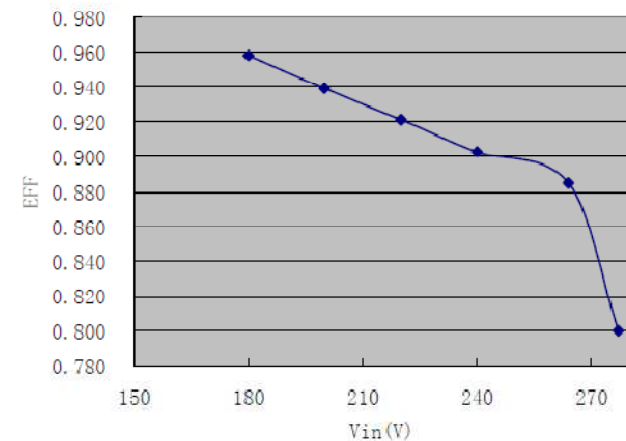
1.1 180Vac/50Hz



3.6W No E-Cap LED driver EFF



3.6W No E-Cap LED driver PF

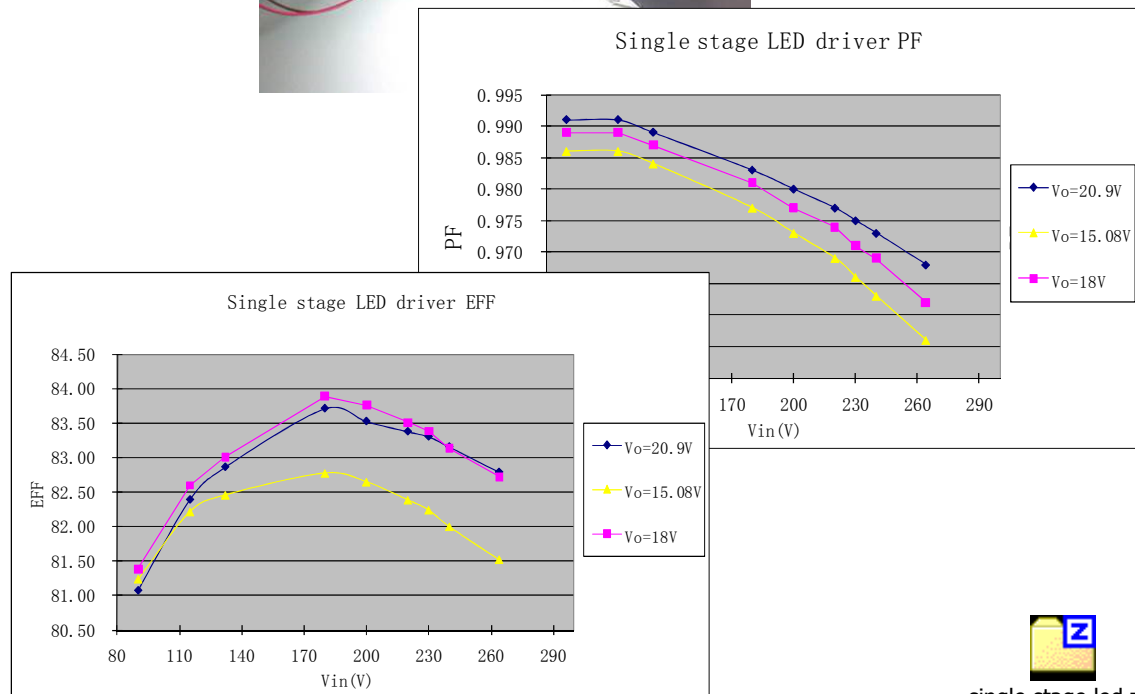
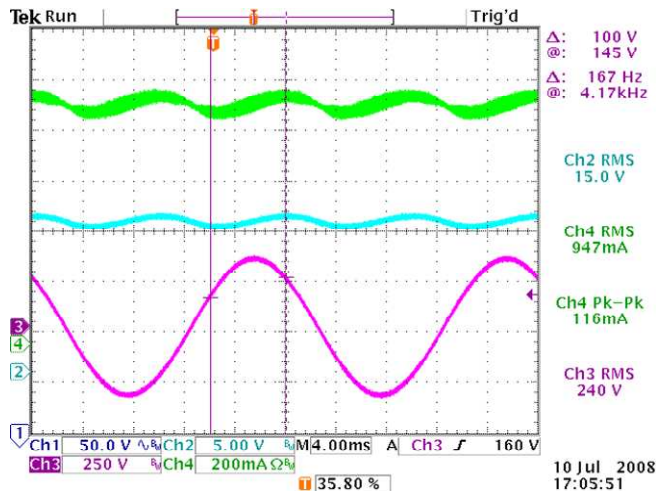
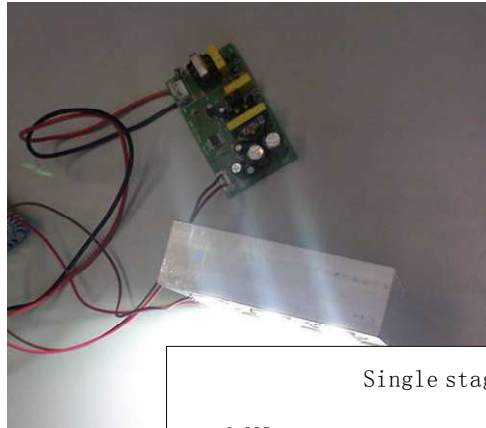


LED Drivers with AC-DC Converters



Single stage 20W

- High power factor at tiny size
- Suitable for T5/T8 FL tube replacement



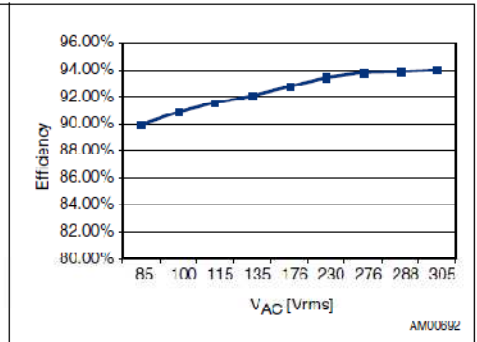
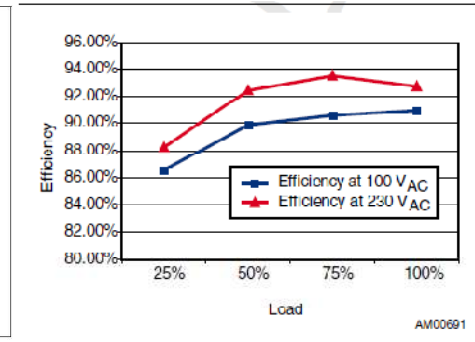
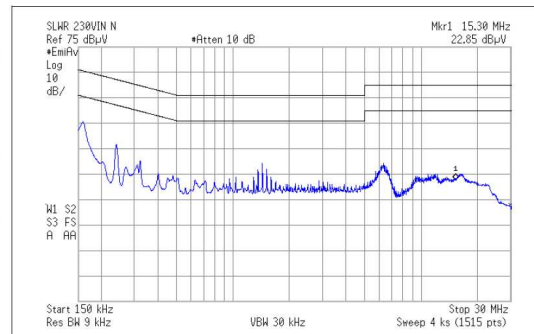
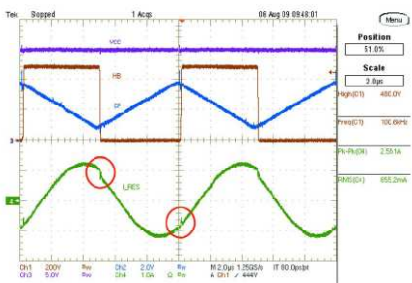
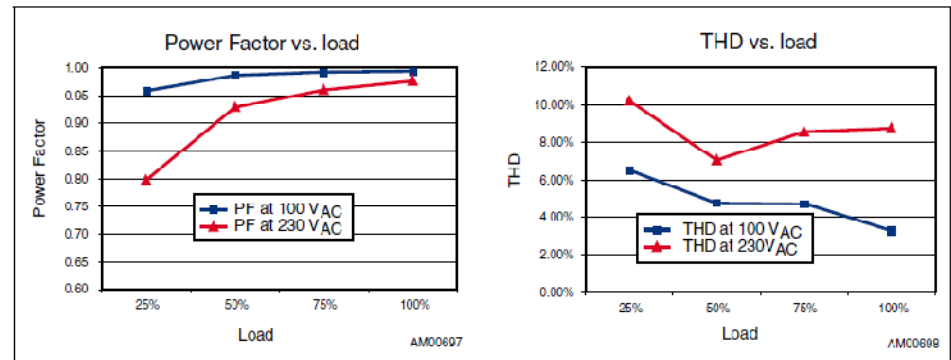
single stage led.zip

LED Drivers with AC-DC Converters



Street lamp no E cap

- EVIL130W-STRLIG
- High power factor & efficiency
- Target for street lamp and outdoor decorations
- Long lifetime by not using any E-cap
- Design to pass CE conduct EMI



Q&A



THANK YOU!

For more information please contact local Marketing David Huang (david.huang@st.com) or FAE Sam Guo (same.guo@st.com), or visit www.stmicroelectronics.com.cn