

11W dimmable LED bulb application designed with ICL8002G

By LeoLiang



Objective

- Solution description
- ICL8002G is a quasi-resonant PWM controller specially designed for high efficient offline LED driving application for Dimmable. It can be configured for different topologies such as flyback and buck converter.
- Types of Test
 - Specification

 - Feature

Specification of design

| Parameter | | Value | | Unit |
|-----------------|--|---------|--|------|
| input voltage | | 190–265 | | V |
| line frequency | | 50/60 | | Hz |
| output power | | 10 | | W |
| output current* | | 280 | | mA |
| output voltage | | 33–40 | | V |
| power factor | | >0.9 | | |
| THD | | <20% | | |
| Efficiency** | | >85% | | |

- •Smooth dimming curve
- •High dimmer compatibility
- •High efficiency (>85%)
- •Very high power factor with low THD (<20%)
- •Compact single stage design
- •Primary side control with high accuracy
- •Tight lumen output tolerance
- •Quasi-resonant flyback operation
- •Integrated power cell for short time to light
- •Built-in digital soft-start
- •Comprehensive protection functions
- •Low system BOM for dimmable bulbs

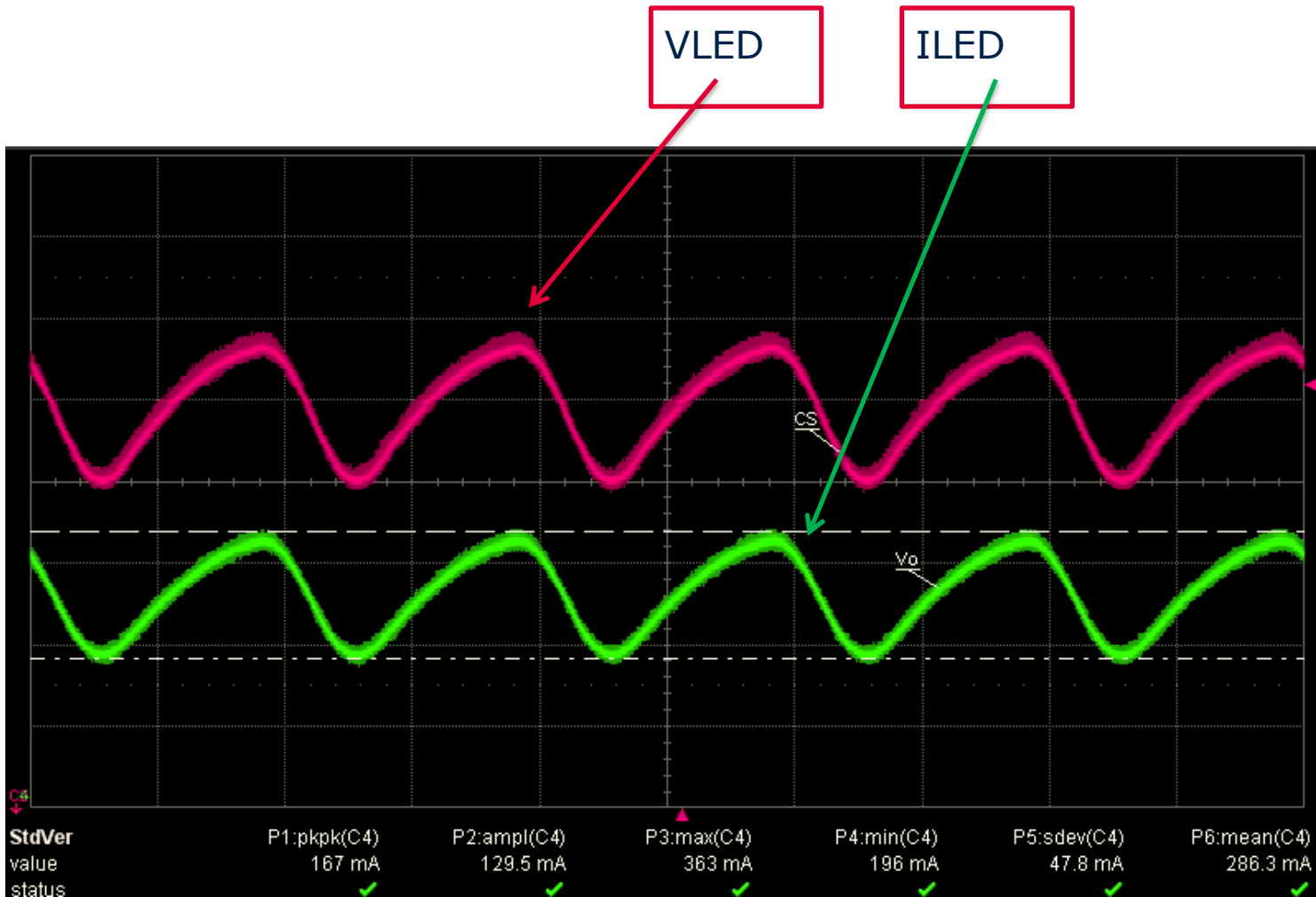
Standard Measurement

| | |
|-------------|--------------------------------|
| Topology | Flyback |
| Application | LED Lighting for dimming bulbs |

Standard Specification

| Parameters | Test Condition | Minimum | Nominal | Maximum |
|---------------------|----------------|---------|---------|---------|
| Input voltage (V) | 190–265V | 190 | 230 | 265 |
| Input Current (mA) | | 60.6 | 50 | 42.53 |
| Input power (W) | | 11.27 | 11.19 | 10.756 |
| Output voltage (V) | | 34.45 | 34.43 | 34.18 |
| Output current (mA) | | 281.75 | 282.11 | 273.65 |
| Efficiency (%) | | 86.12% | 86.80% | 86.50% |
| PF | | 0.9758 | 0.973 | 0.9514 |
| iTHD (%) | | 19.56% | 15% | 17.90% |
| | | | | |

Feature Measurement – Feature 1



Line regulation

1. Line regulation

| Input Voltage(V) | Input Power(W) | Power factor | Output Voltage(V) | Output Current(mA) | Efficiency | Line Regulation |
|------------------|----------------|--------------|-------------------|--------------------|------------|-----------------|
| 200 | 11.21 | 0.975 | 34.826 | 278 | 86.366% | 1.7668% |
| 210 | 11.25 | 0.972 | 34.85 | 279 | 86.428% | 1.4134% |
| 220 | 11.27 | 0.961 | 34.88 | 280 | 86.658% | 1.0601% |
| 230 | 11.33 | 0.962 | 34.91 | 283 | 87.198% | 0.0000% |
| 240 | 11.35 | 0.961 | 34.921 | 284 | 87.379% | 0.3534% |
| 250 | 11.38 | 0.956 | 34.928 | 285 | 87.473% | 0.7067% |
| 265 | 11.41 | 0.955 | 34.928 | 282 | 86.325% | -0.3534% |

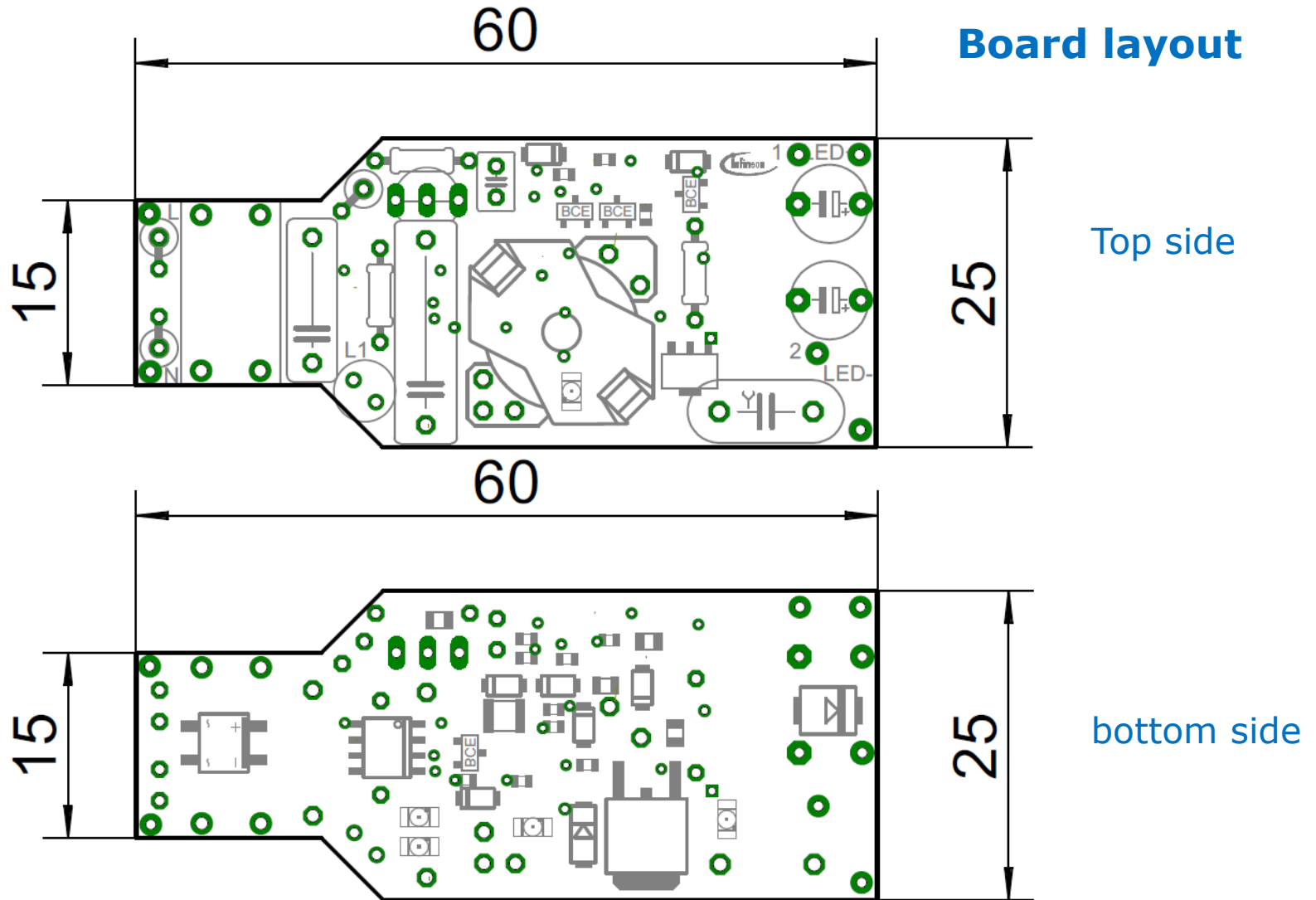
Test Condition: Fluke 187 Multimeter for output; WT210 Power meter for Input

Dimming Performance

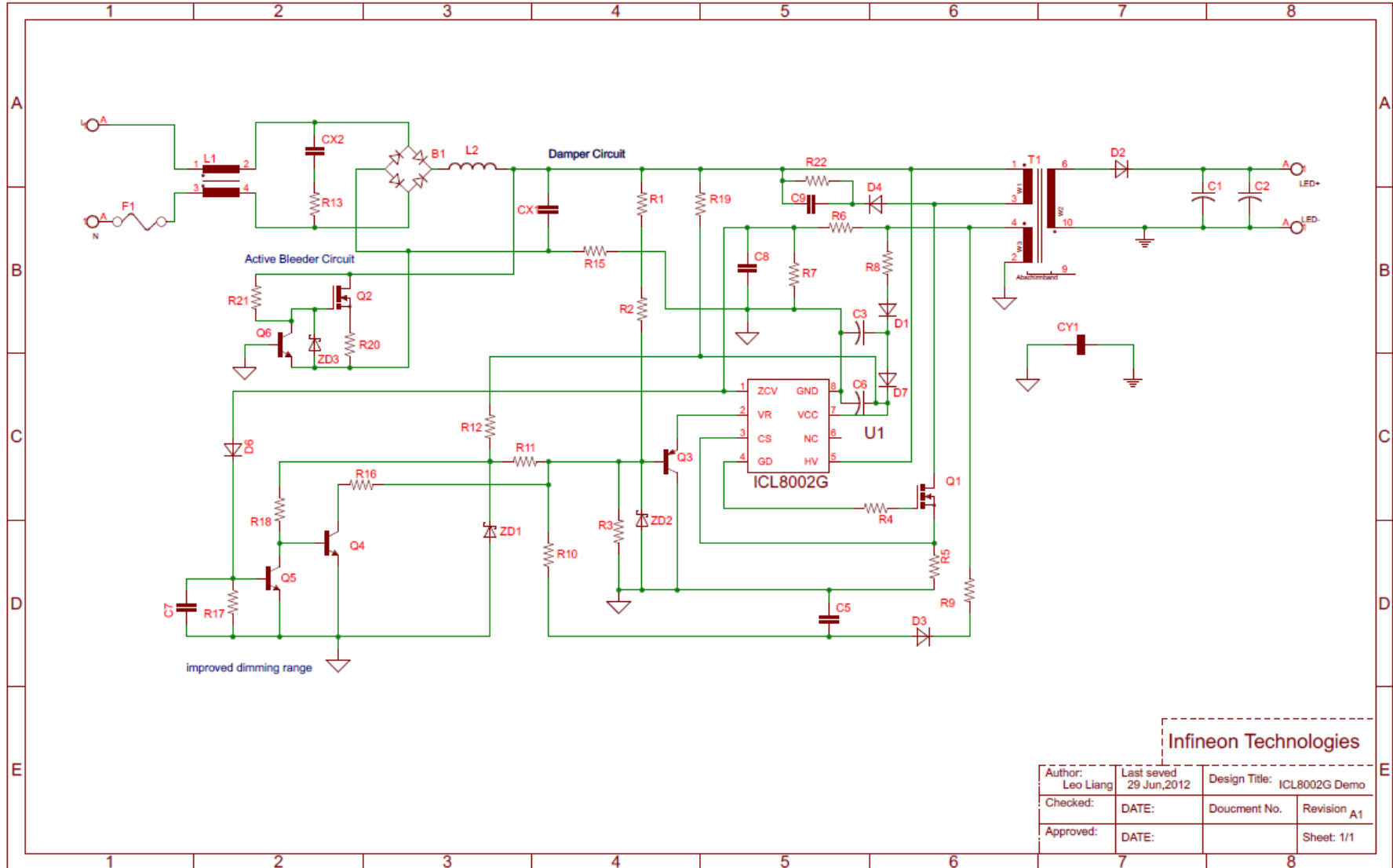
| No. | Manufacture | Model P/N | Min Current(mA) | Max Current(mA) | Flicker |
|-----|-------------|----------------|-----------------|-----------------|---------|
| 1 | TCL | K9051/630 W | 0.5 | 283.05 | no |
| 2 | GZQS | 600W | 6 | 280.6 | no |
| 3 | Siemens | 25-500W | 12.83 | 279.1 | no |
| 4 | Simtone | 500W | 11.34 | 279.69 | no |
| 5 | Siemens | 500W u-contact | 10 | 278.78 | no |
| 6 | Siemens | 40-500W | 5 | 279.23 | no |
| 7 | TCL | A8051 400W | 0.5 | 279.76 | No |

Test Condition: autotransformer

Solution Physical Parameter



shows the schematic for a 11W dimmable LED bulb application designed with ICL8002G



Infineon Technologies

| | | | |
|----------------------|----------------------------|-----------------------------|--------------|
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