



Zywyn Corporation

**With SOI HV BCD
Technology**



Company Overview



- Founded in October 2002, **Zywyn** is a Fabless Semiconductor Company that Designs, Manufactures, and Markets High Voltage Analog Interface ICs with Proprietary Technology

- Jointly Developed SOI BiCMOS/BCD Process Technology with our Taiwan Foundry Partner, **Zywyn** focuses on:
 - Driver Products for Telecom and Consumer Markets in LED, EL, E-paper, Plasma Display, Piezo Transducer and Ultrasound Application Field.

 - **Zywyn** has Developed its Proprietary Patent Pending Transformerless AC/DC WLED Drivers for Industrial Lighting Applications.

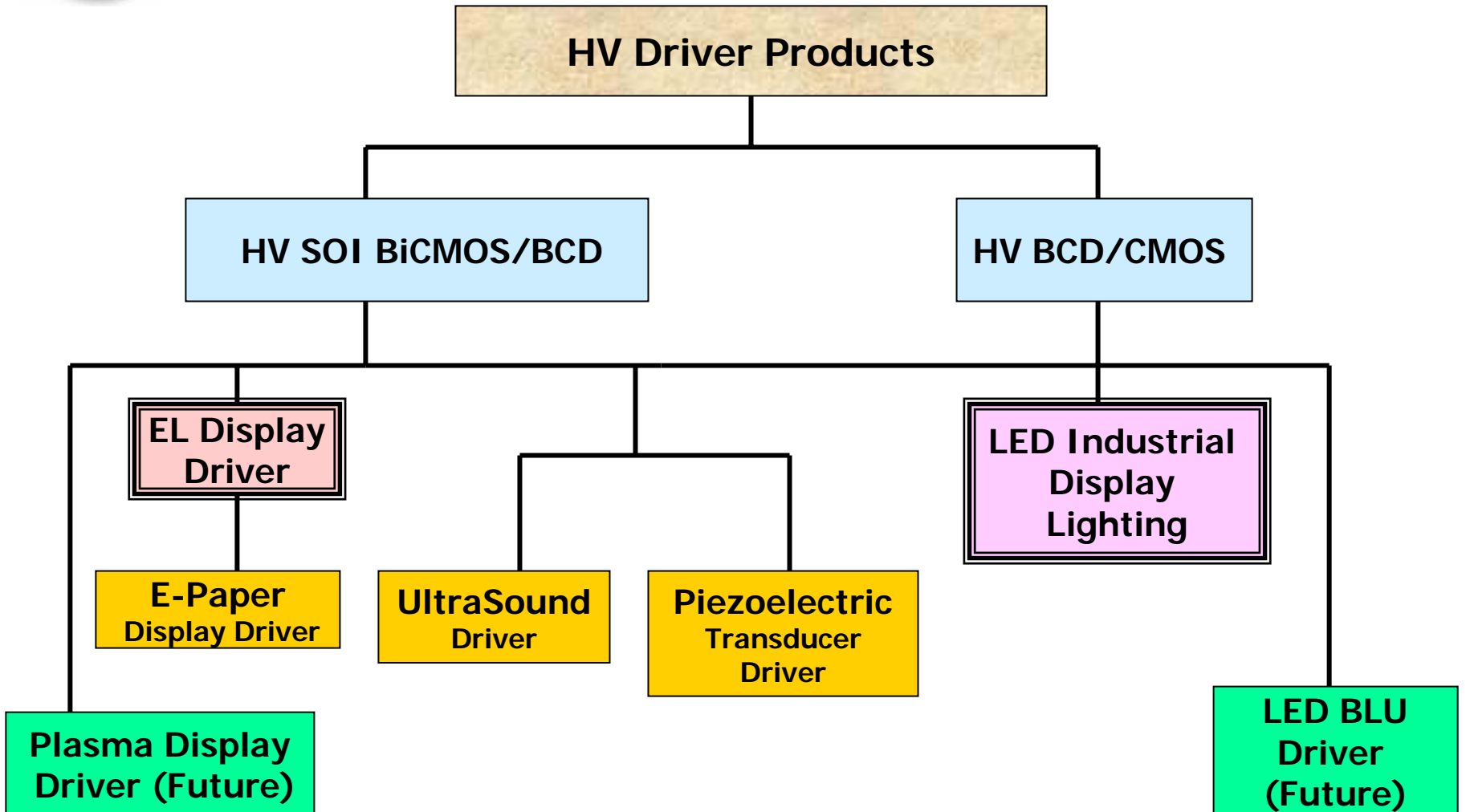
Company Overview



- **Zywyn** also Developed a Whole Series of RS232/RS485 Analog Interface Transceivers With ESD Protection Up to +/- 15KV Human Body Model.

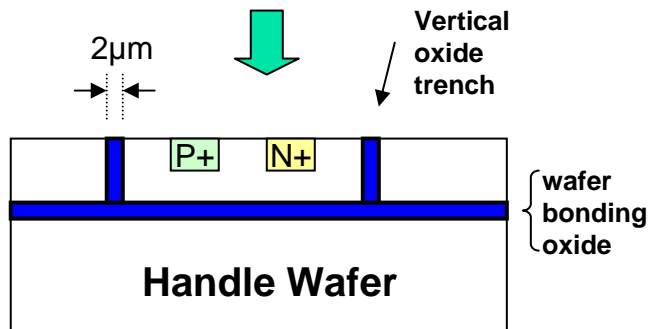
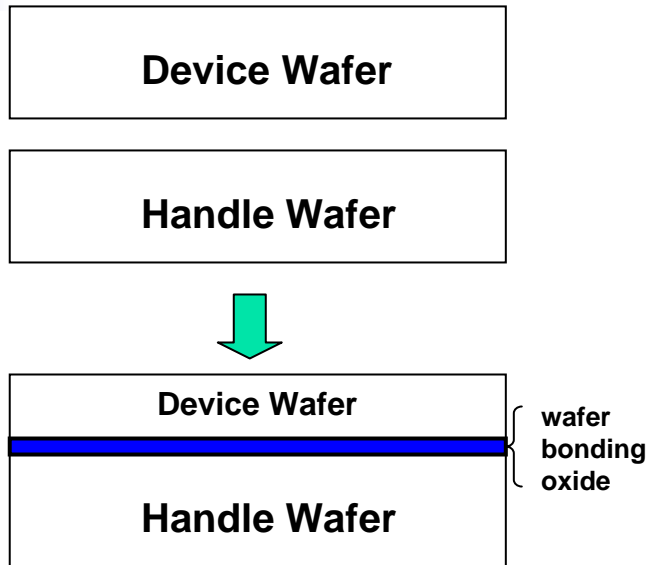
- With its Proprietary Process Technology and Design Know-hows, **Zywyn** Developed a Wide range of Analog Interface Driver ICs with Leading-edge Performance. **Zywyn** has Developed a Total of 78 Products in 6 Years (For details refers to our Catalog).

ZYWYN's Strategic HV Driver Product Portfolio



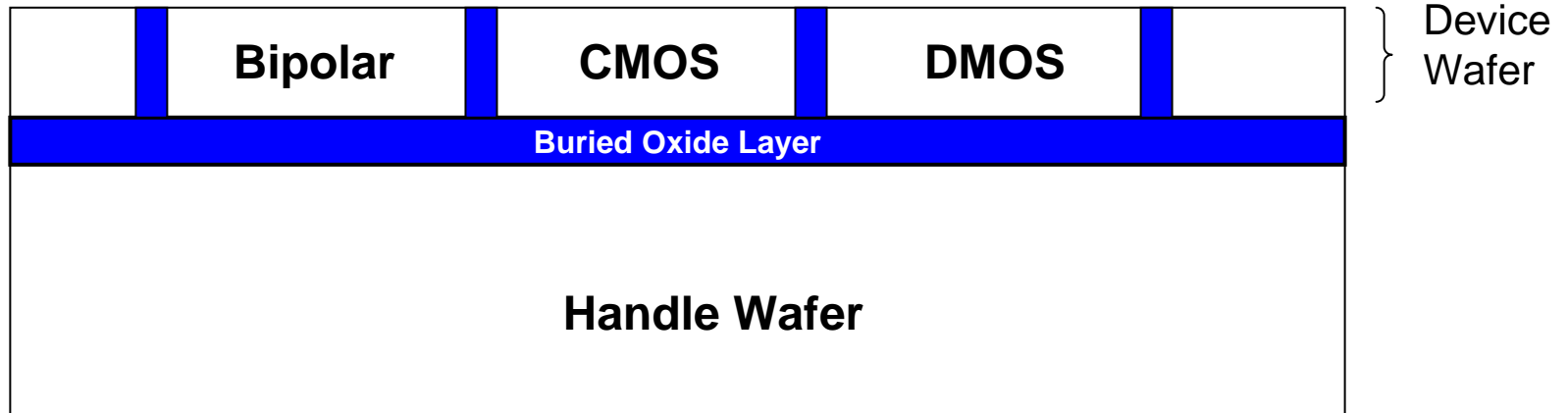
Process Technology IPs

5" Trench HV SOI Process (1st Generation)



- *Proven Wafer Bonding Technique*
- *Improved Trenching and Filling Technique*
- *The Tremendous Advantage is this SOI Process can integrate High Voltage Bipolar and Low voltage CMOS in the same silicon.*
- *Due to the Trench isolation, multiple High Voltage transistors can be integrated on the same silicon with NO Leakage and Latch up problems.*

6" Trench SOI BCD HV Process (2nd Generation)



Technology

- 0.6 μm (25MHz) CMOS
- 150V to 200V Breakdown Bipolar and DMOS
- Handles 500mA to 1000mA Source/Sink Current

Analog Design IPs



➤ Low Voltage DC to High Voltage AC Conversion

Design know how to convert low DC voltage to High Voltage AC Signal for EL Backlighting and Future Proprietary Products (E-Paper, Piezo and Ultrasound HV Drivers).

➤ High Voltage AC to DC Conversion

Design know how to rectify Power Line AC signal to Rectified DC signal. This Design IP needs to have more improvement learned from Phase I Market Application Inputs.

➤ High Efficiency Charge Pump Design

Proprietary BiCMOS Charge Pump Doubler and Inverter for our Interface product line.

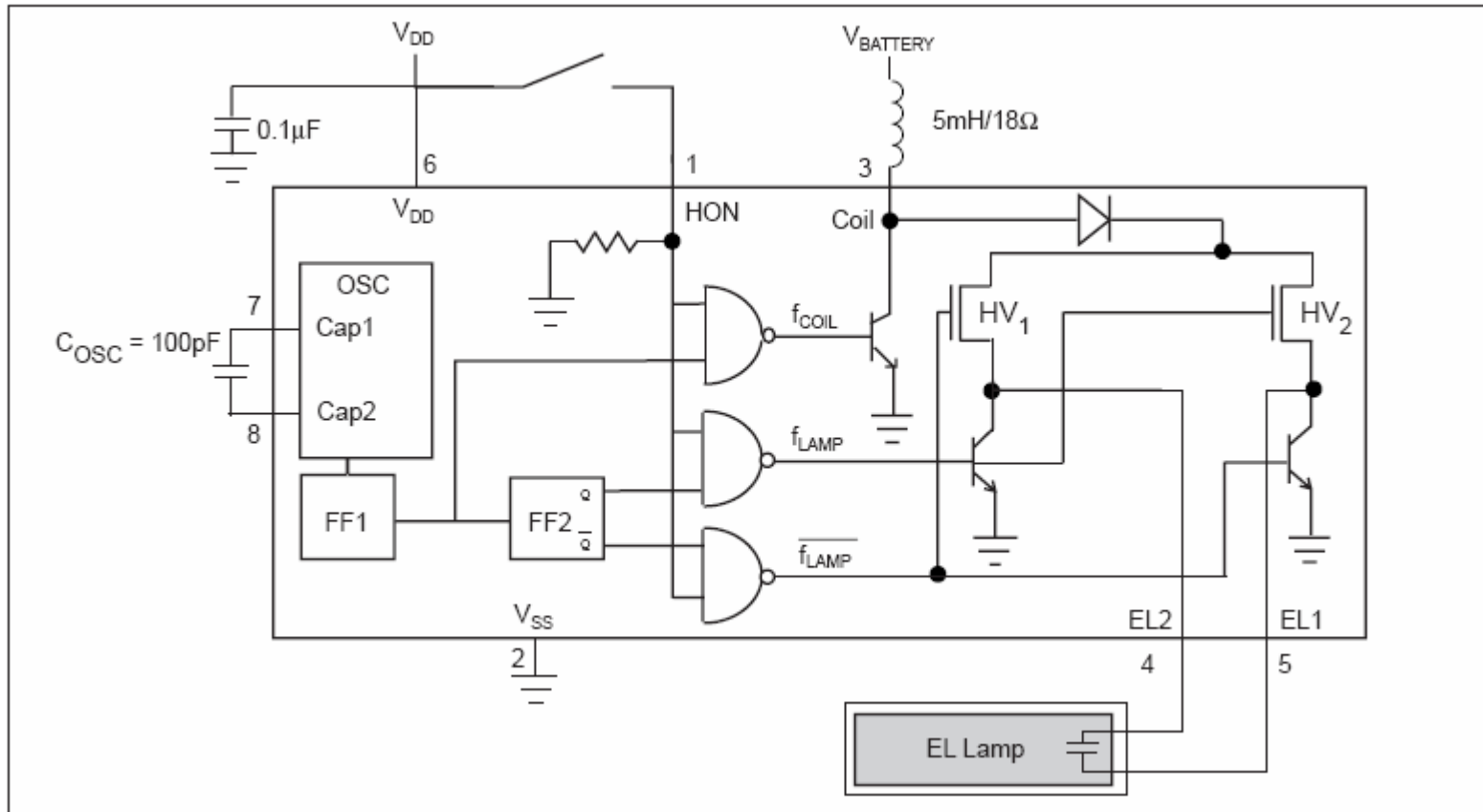
➤ Auto Green

Proprietary Intelligent Shutdown design in some of our Interface products.

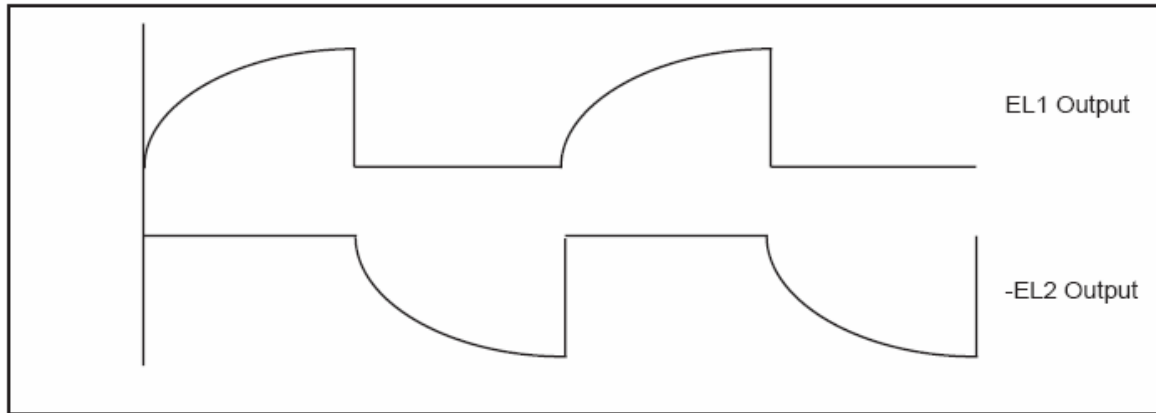
➤ Regulating Charge Pump Design

Proprietary Charge Pump Design for our Charge pump based WLED Drivers. Requiring more Market direction and engineering resources to expand this Charge Pump product Line.

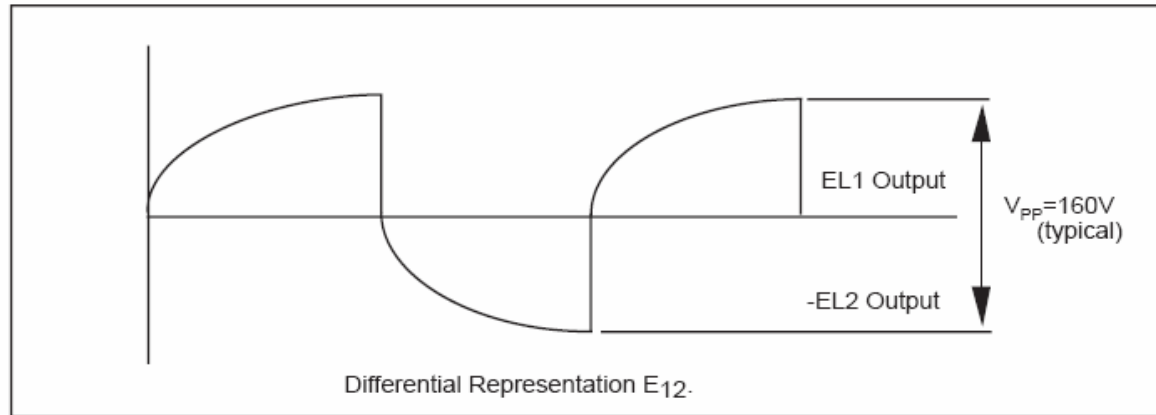
Typical HV Driver Block Diagram for EL and Piezo Driver



Electroluminescence Lamp or Piezo Transducer HV AC Output



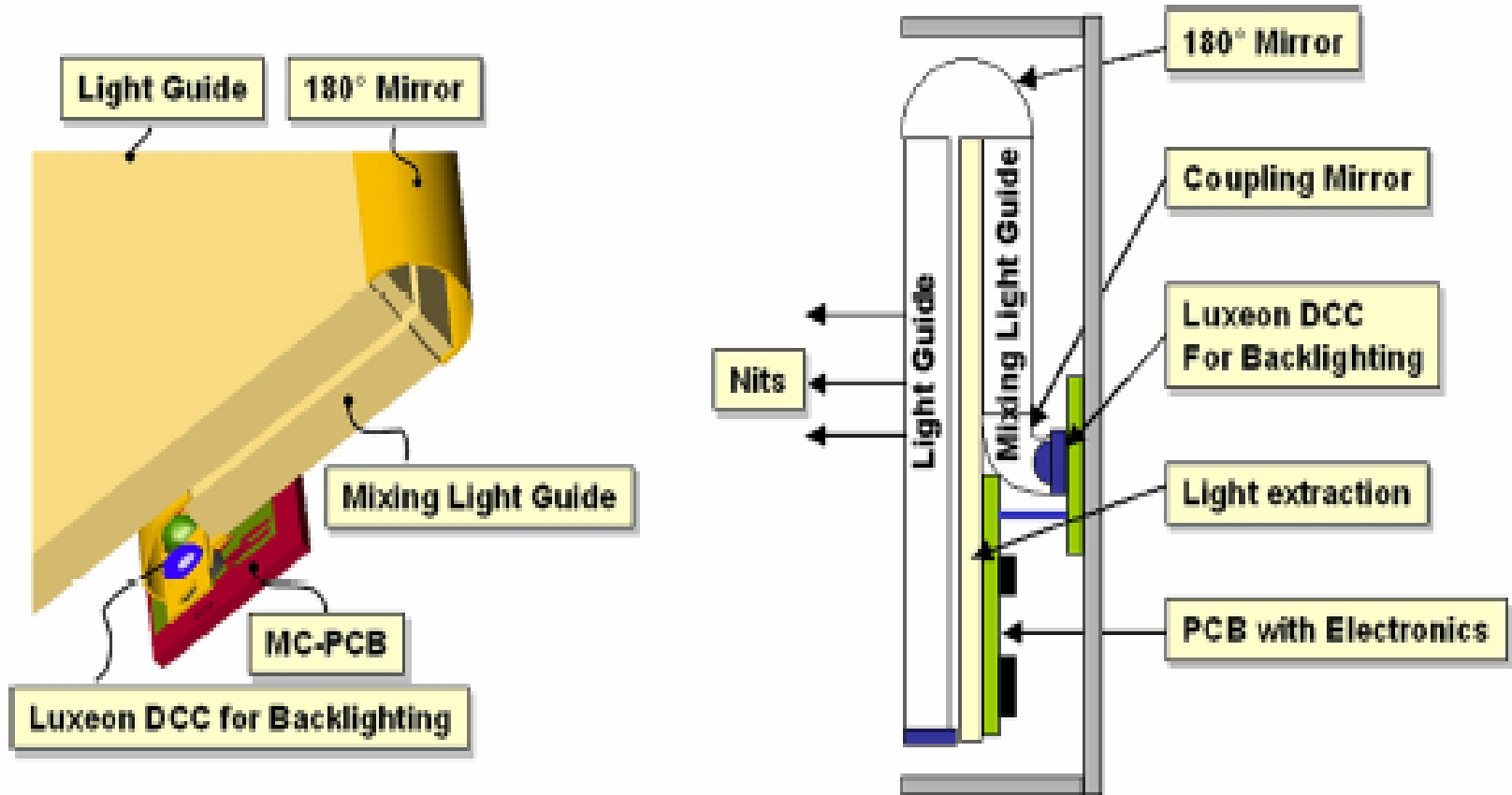
EL Voltage Waveforms from the EL1 and EL2 Outputs



EL Differential Output Waveform of the EL1 and EL2 Outputs

How Are WLED Used For Backlighting

3



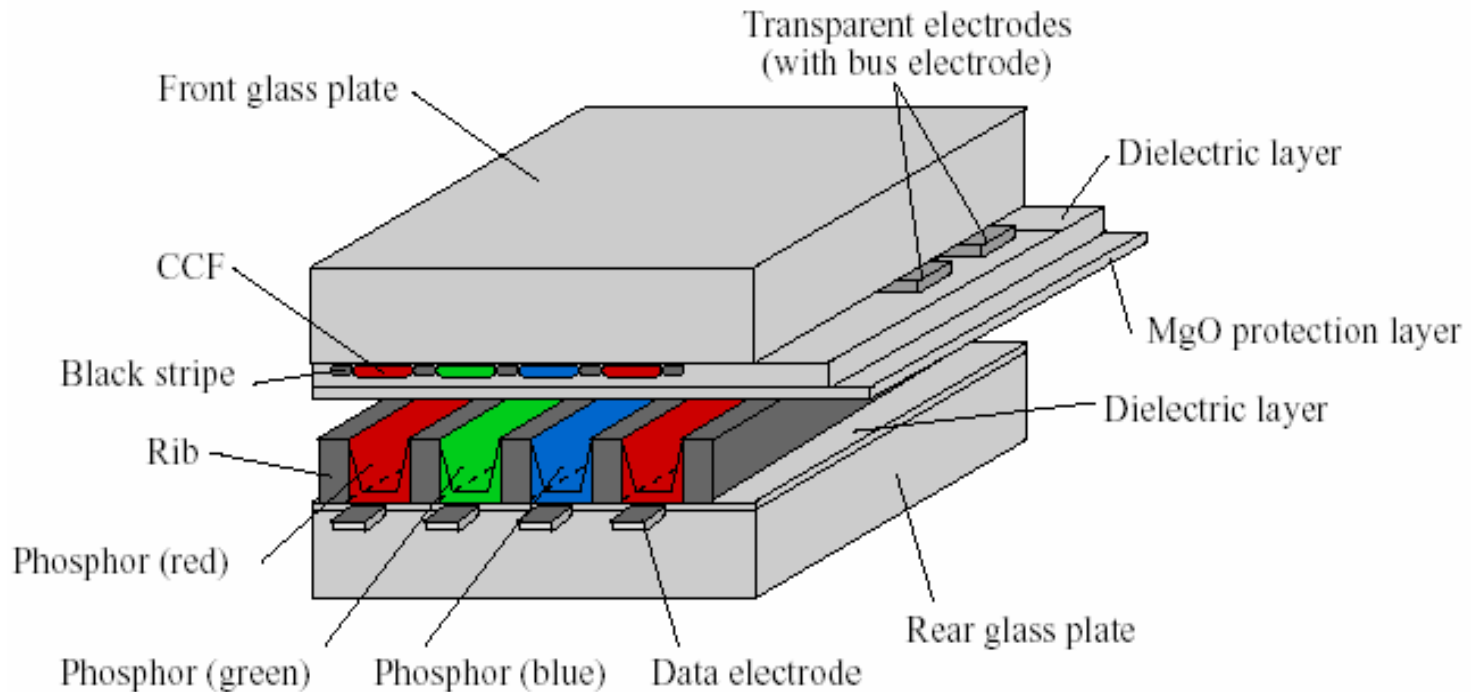
One possible backlight implementation using Luxeon DCC

What Is Plasma Display Panel (PDP)?

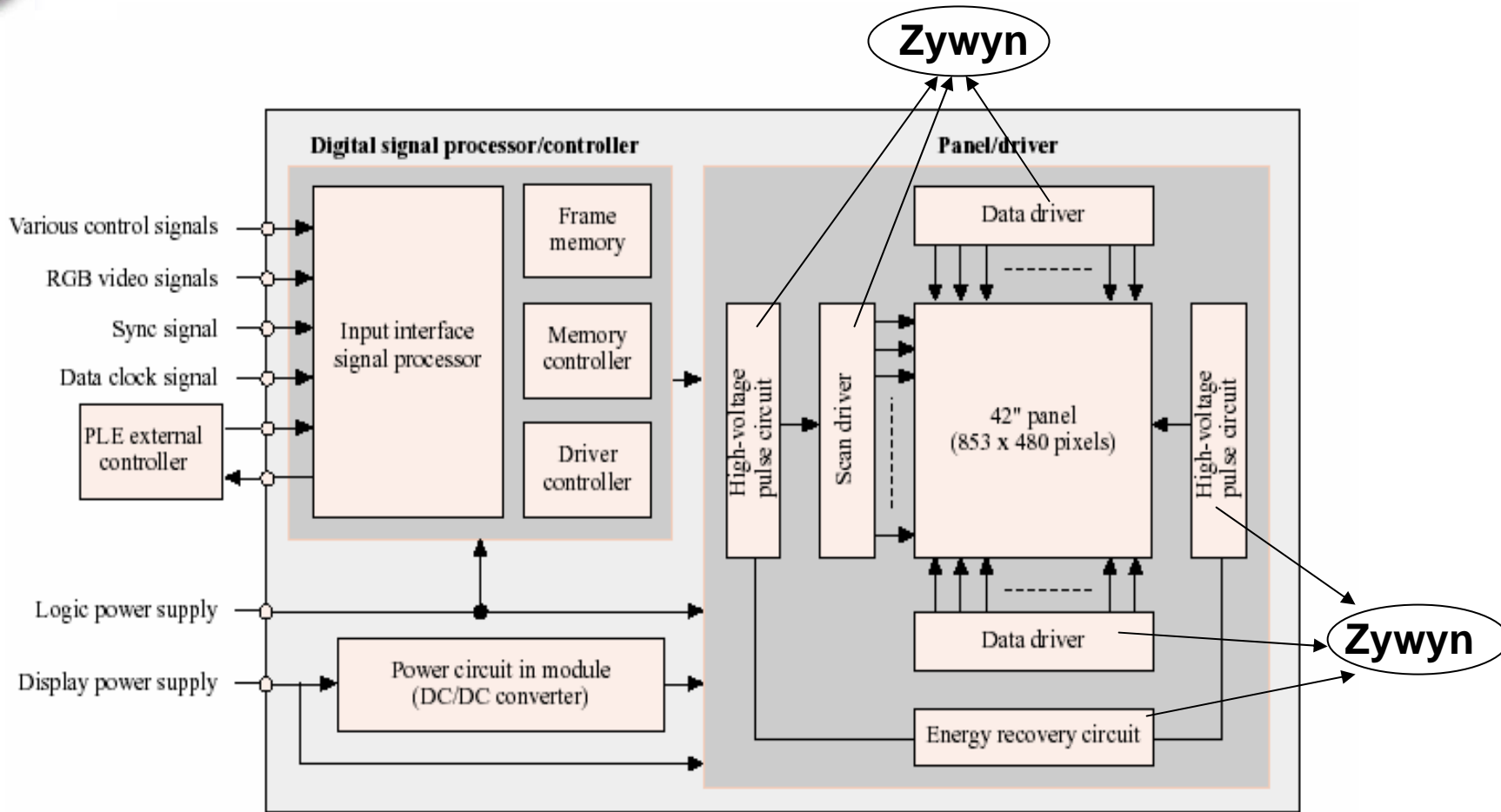


PDP is a Flat Plasma Display Panel that Generate Ultraviolet Rays by Aerial Discharge to Light the Colored Phosphor of each Pixel on the Panel.

Cross Section For PDP Pixel Cell

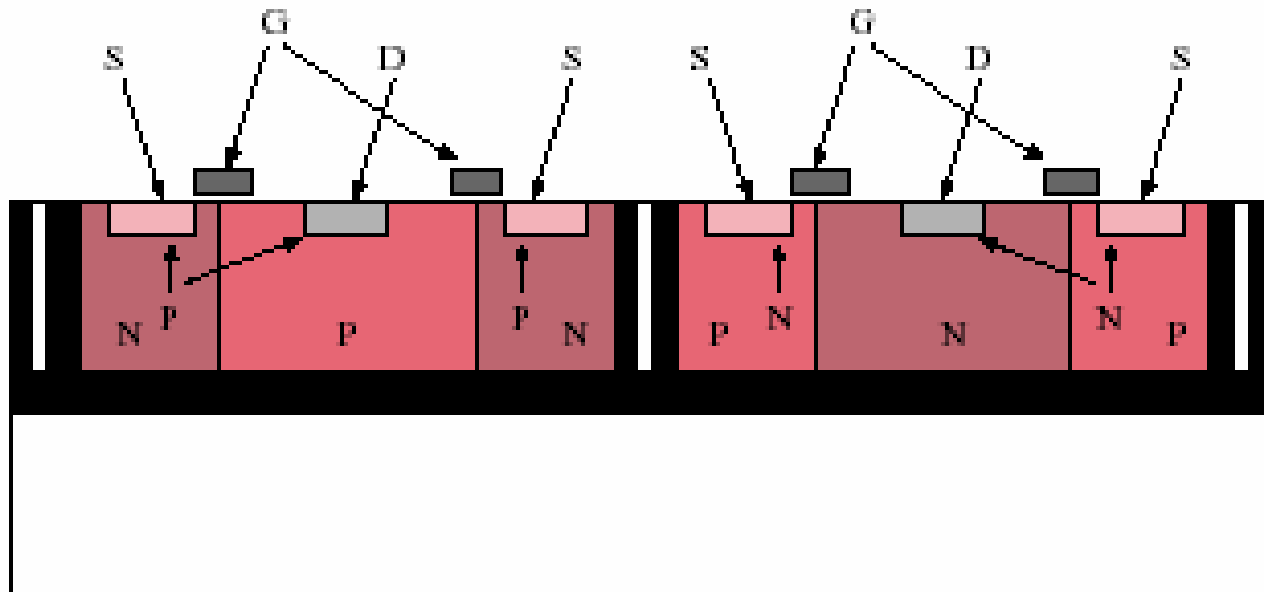


PDP Block Diagram





Zywyn's Proprietary SOI HV BCD Process For PDP Driver



Deep Trench Oxide with Benefits of NO Parasitic element, NO latch up, Minimize Cross-talk, Fast Charge Recovery and Smaller die Geometry for Lower cost. High Density Multiple HV Driving Channels in a Single Silicon.

World Class Universal Transformerless AC-DC Constant Current LED Driver



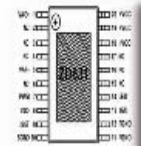
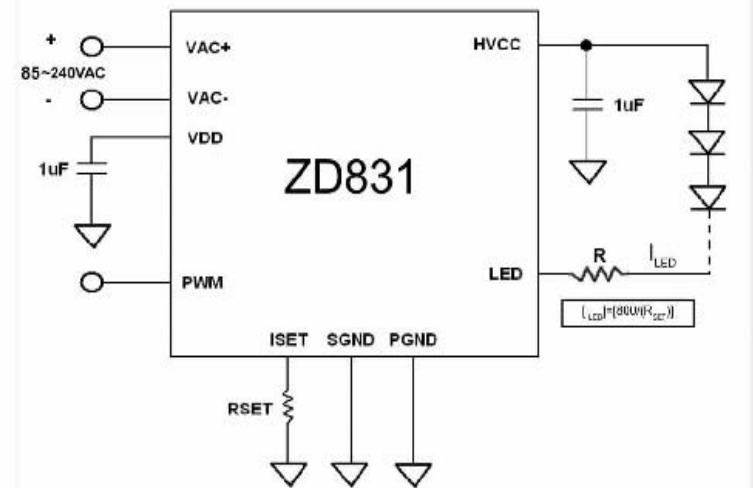
**...In The Smallest Footprint
For All Form-Factored LED Lamps**

- No Transformer, No Bridge Rectifier
- 85VAC to 240VAC Input Voltage Range
- 30mA Constant Output Current
- Drives up to 70 LEDs per String
- PWM Dimming Control
- Over-Temperature/Voltage Protection
- Very Minimum External Components
- Thermally Enhanced 20-Pin Exposed TSSOP RoHS Green Package

ZD831 Display Driver



Typical Application



Ordering Information

Part Number	Temperature Range	Package Type
ZD831LEY	-40°C to +85°C	20-Pin TSSOP
ZD831EVB	na	Evaluation Board

Pin Description

Pin Number	Pin Name	Pin Function
1	VAC+	High Voltage AC Input, from 85~240VAC.
5	VAC-	High Voltage AC Input, from 85~240VAC.
7	PWM	LED Dimming Control Input.
8	ISET	Internal High Voltage Output. The external pin with a 1.1F capacitor.
9	ISET	Output Current Level Feedback Input. Connecting a resistor ISET from this pin to ground sets the output current of the LED driver.
10	SGND	Signal Ground. Connects all small signal components to this ground.
11, 12	PGND	Power Ground. Connects to high voltage decoupling capacitor in this ground.
13, 14	LED	LED Driver Output.
18, 19, 20	HVCC	High Voltage DC Output. Connects a 1uF decoupling capacitor from this pin to PGND. The power rating (P _{avg}) of the capacitor depends on the input VAC voltage.
3, 4, 6, 16, 18, 19	NC	No Function Pins. Must be left open and unconnected.



ZD831 Display Driver



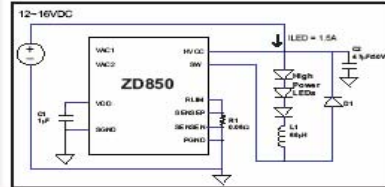
AC/DC Transformerless LED Driver



Typical Applications

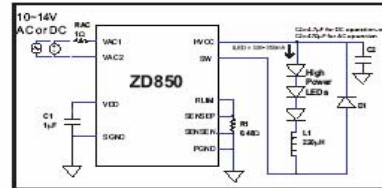
VDC to HVCC Input
For 1W~15W
Output Power
Using 350mA,
750mA, and 1.5A
Types of LEDs

# Of LEDs	Min HVCC (VDC)	Max HVCC (VDC)	LED 350mA	LED 750mA	LED 1.5A
N=1	4	5	✓	✓	✓
N=2	15	30	✓	✓	✓
N=3	10.5	20	✓	✓	✓
N=4	14	28	✓	✓	✓
N=5	17	34	✓	✓	✓



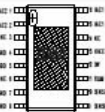
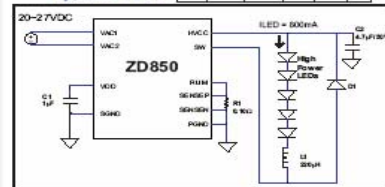
VAC/VDC-VAC Input
For 1W~3W
Output Power
Using 350mA
Type of LEDs

# Of LEDs	Min VAC (VAC)	Max VAC (VAC)	LED 350mA	LED 750mA	LED 1.5A
N=1	4	6	✓	✓	✓
N=2	7.5	12	✓	✓	✓
N=3	10.5	16	✓	✓	✓



VDC to VAC Input
For 1W~13W
Output Power
Using 350mA
and 750mA
Types of LEDs

# Of LEDs	Min VAC (VDC)	Max VAC (VDC)	LED 350mA	LED 750mA	LED 1.5A
N=1	5	10	✓	✓	✓
N=2	9	17	✓	✓	✓
N=3	12	22	✓	✓	✓
N=4	15	28	✓	✓	✓
N=5	18	34	✓	✓	✓



Ordering Information

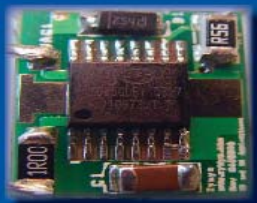
Part Number	Temperature Range	Package Type
ZD850LY	-40°C to +85°C	16-EP TSSOP
ZD850VE	n/a	Evaluation Board

0807

High Efficiency 1 Watt To 15 Watts AC-DC or DC-DC Constant Current LED Driver



For Offline LED Lamps and Fixtures, Industrial Lighting, Decorative MR16/MR11, Traffic, and Automotive Lighting



ZD850

1.5A High Power LED Driver



ZYWYN CORPORATION
www.zywyn.com

- 4VAC~16VAC on VAC1/2 with up to 350mA current
- 5VDC~27VDC on VAC1/2 or HVCC/PGND with up to 800mA current
- 5V~16VDC on HVCC/PGND with up to 1.5A current
- Drives 1~5 High Power LEDs in series per string
- PWM or Analog Voltage Dimming Control
- Over-Temperature Thermal Protection
- Over-Voltage Circuit Protection
- Very Minimum External Components
- Thermally Enhanced 16-Pin Exposed TSSOP RoHS Green Package

ZD850

1.5A High Power LED Driver



ZYWYN CORPORATION
www.zywyn.com

Step Up Controller LCD Backlighting LED Driver



**High Efficiency
Multi-Channel Current Sink
Auxiliary Gate Drive
Single-Chip LED Driver**



**For LCD Panel Display Backlighting Unit (BLU),
LED Plane Lighting and Industrial Lighting Systems**

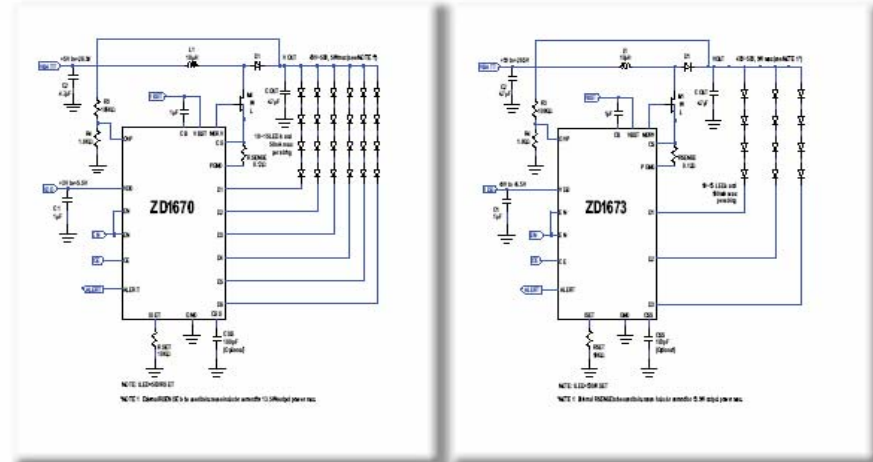
- Drives 6 (ZD1670) or 3 (ZD1673) Channels Of Up To 15 LEDs In Series
- Up To 13.5W Output Driving Power
- 50mA Per Channel (ZD1670) And 100mA Per Channel (ZD1673)
- Single Enable, PWM or Analog Dimming Control
- LED Current Set By Single RSET Resistor
- VBST Auxiliary Gate Drive Versatility
- LED Open/Short Detection
- UVLO, Prog. Soft-Start, Internal Thermal Protection
- Available in 28-Exposed-TSSOP RoHS Green Package

ZD1670/73

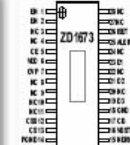
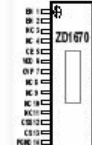
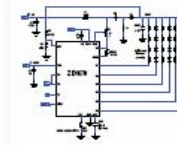
**Step-Up Controller
Multi-Channel LED Driver**



Typical Applications

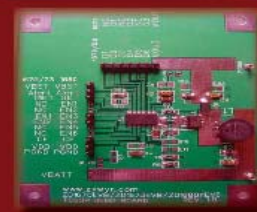


Buck-Boost (SEPIC) Operation



Ordering Information

Part Number	Temperature Range	Package Type
ZD1670LEY	-40°C to +85°C	28-EP-TSSOP
ZD1673LEY	-40°C to +85°C	28-EP-TSSOP
ZD1670EVB	n/a	Evaluation Board
ZD1673EVB	n/a	Evaluation Board



ZD1670/73

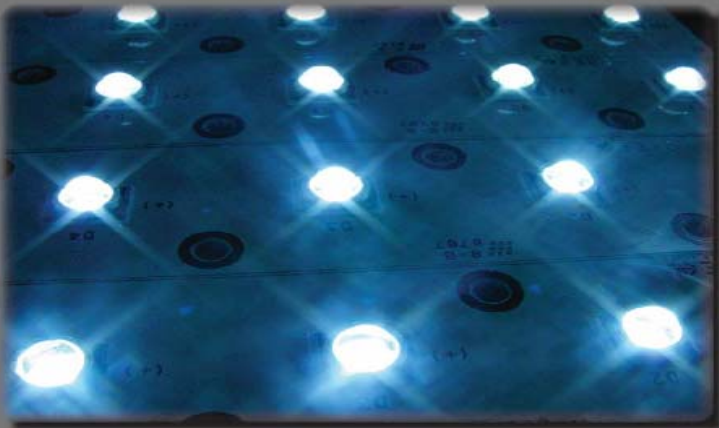
**Step-Up Controller
Multi-Channel LED Driver**



4 Channel Inductorless LED Driver



**High Efficiency
High-Voltage
Inductorless Regulated
4-Channel LED Driver**



**For LCD Module & Panel Backlighting (BLU),
LED Light Bar, Industrial Lighting & Automotive Lighting**

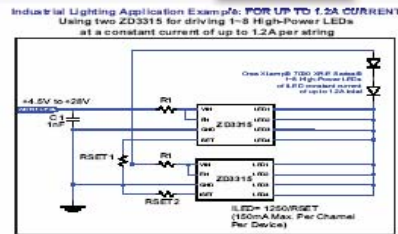
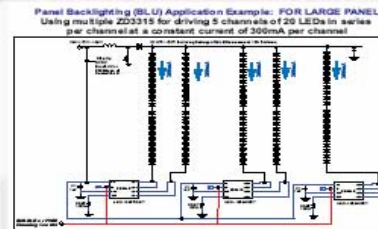
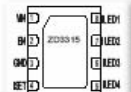
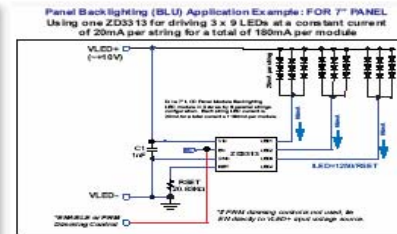
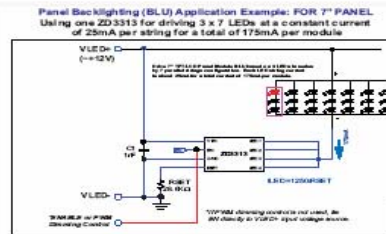
- Drives 4 Channels Of Multiple LED Strings With Matched, Regulated Constant Current Source
- No Inductor And No Charge Pump Design
- Wide Input Supply Range +4.5V To +28V
- Up To 80mA Per Channel (ZD3313) And 150mA Per Channel (ZD3315)
- Enable, PWM or Analog Voltage Dimming Control
- LED Current Set By Single RSET Resistor
- Thermal Shutdown Protection
- In 8-MSOP or 2x3 8-DFN RoHS Green Package

ZD3313/15

4-Channel LED Driver

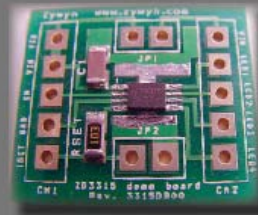


Typical Applications



Ordering Information

Part Number	Temperature Range	Package Type
ZD3313LEU	-40°C to +85°C	8-MSOP
ZD3315LED	-40°C to +85°C	2x3-8-DFN
ZD3313EVB	n/a	Evaluation Board
ZD3315EVB	n/a	Evaluation Board



ZD3313/15

4-Channel LED Driver



Worldwide Sales Network



Asia	North America & Canada	Europe
<p>Japan Saint Technology Corporation MegaChips LSI Solutions Inc. Universe Electron Corporation</p> <p>Korea ChipGate Corporation GenTech Incorporation Sunin Technology Incorporation Tekro Incorporation</p> <p>Taiwan Prohubs International Corporation Jeritronics Limited Techmosa International Inc.</p> <p>Hong Kong & China Lestina International Limited Fortune Techgroup Company Ltd.</p> <p>Singapore McCoy Components Pte Limited</p> <p>Australia & New Zealand Adilam Electronics Pty Limited</p>	<p>US Northeast Nexus Technology Sales</p> <p>US Midwest Carlson Electronics Sales Associates Inc. CBR Associates</p> <p>US Southeast Eagle Tech Associates, Inc.</p> <p>US West First Rep Company</p> <p>Distributors Future Electronics Incorporated</p>	<p>France Attitude Electronics</p> <p>Belgium, Luxemburg, The Netherlands Alcom electronics</p> <p>Germany, Austria & Switzerland Stressless Electronics</p> <p>Italy, Greece, Turkey ATM Electronics SrL</p> <p>Eastern Europe Elatec GmbH</p> <p>Israel Vectronics Limited Startronics Limited</p> <p>United Kingdom & Ireland M B Components Limited</p> <p>Finland, Norway, Sweden, Denmark TBD</p> <p>Distributors 2001 Electronic Components Ltd. Alcom electronics Attitude Electronics CoDiCo GmbH & Co. KG. Comprel SrL Elatec GmbH Future Electronics Incorporated Milgray Distribution GmbH Stressless Electronics Tecnika Due SrL</p>

Worldwide Supporting Customers

3





Company Organization

- ❑ Zywyn Corporation Headquarters is located in Sunnyvale California with Sales, Marketing, R&D Engineering and General Administration Departments. Target \$7M revenue in 2008. (12 Full time Employees and 9 part time Consultants). Zywyn will Continue to look for Cooperation Partners and Funding to Expand our Growth.
- ❑ Our Logistic office is located in Taipei Taiwan to Support all Manufacturing and Worldwide shipments.
- ❑ Regional Sales offices are located in Taiwan and Munich Germany.
- ❑ Company Website: www.zywyn.com.
Corporate Address:
1270, Oakmead Parkway, Suite 201, Sunnyvale, CA 94085, U.S.A.
Zywyn Taiwan:
9F, #66, Lane 700, Jhong-Jheng Road, Sindian City,
Taipei County, 231, Taiwan, R.O.C.
Zywyn Europe:
Wallbergweg 6-8, D-82335 Berg, Germany.