



3Y Overview



**POWER UP
YOUR LIFE**

Rev. A0

Innovation | Creativity | Quality

Agenda

- 1 Campus recruitment
- 2 3Y (FSP Group)Introduction
- 3 Design Capability



校園徵才活動

全漢集團影片簡介



善元科技: 桃園市龜山區民生北路一段536號2樓

職缺、福利、培訓說明



薪酬福利

薪資

符合市場行情之起薪 (大學畢業-36K ; 碩士畢業-43-50K以上)
年度調薪、年度晉升、任用獎助金

獎酬

年終獎金、專利獎金、研發獎金
介紹獎金、在職進修補助、員工持股信託

職工福利

生育、婚喪喜慶、住院及急難補助、生日禮金、特約廠商折扣、團購活動

休閒保健

美麗人生健檢中心、年度免費健康檢查、健康促進與抒壓性課程
節慶活動、公益慈善活動、有機農業/料理活動

人性化措施

人性化管理週休二日、彈性工作時間、免費提供餐點
健身房

任用獎助金

一、申請對象：

針對優秀院校之電子、電機系日間部修讀碩士之研究生
畢業前一年學年，學業成績75分以上無不及格科目未受記過處分者

二、任用獎助金額：

上述對象畢業後於善元任職，承諾最低服務期限為二年，公司於
承諾之服務期限內給付總額xx萬元任用獎助金；分按三期給付。

三、任用獎助給付方式：

自簽約日起，公司即給付第一期簽約金，之後實際任職滿一年再
發給第二期簽約金；屆滿第二年時發給第三期簽約金。



員工持股信託

- 由員工自行組成「員工持股會」
- 員工每月自薪資中提存一定金額，結合公司給予之獎勵金，全漢公司與員工提存比例為1：1(即員工提存1000元公司也同步提存1000元獎勵金)；交由中國信託(受託人)定期買進全漢(本公司)股票。
- 由受託人依信託契約之目的運用、管理本公司股票，且計算每位員工所持有之信託財產比例。
- 信託契約終止時，受託人即將信託財產返還予該員工。

工作生活環境



工作生活環境





新人培訓與發展

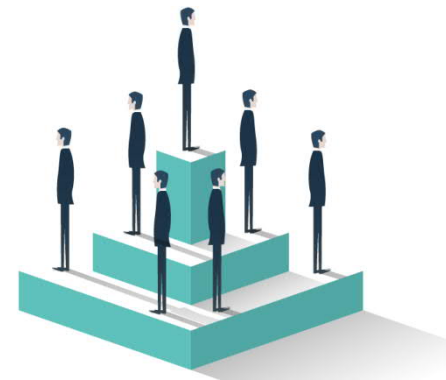


學習是成長的原動力，人才培育發展與同仁自我成長的承諾更是我們所重視的。

依照不同的職系、職等制度及實際需要，規劃多元化培訓課程，強化員工的專業知識技能及專長，從加強員工技能、核心能力到管理領導能力起，進而提昇工作績效。

訓練課程包括：新進人員職前／在職訓練、通識基礎訓練、專業內外訓、高階主管訓練、在職進修及團訓等課程；致力於建立自由多元的學習環境，讓員工自主性規劃、鼓勵積極學習、實現理想，不斷地改善及增進自我能力。





研發職能培訓課程

NO	課程名稱	課程形式
1	高頻變壓器與電感設計實務	數位學習
2	電力電子技術 I -AC/DC及AC/AC轉換器分析與設計	數位學習
3	電力電子技術 II -DC/DC轉換器及電源供應器分析與設計	數位學習
4	電源迴路訊干擾分析與對策元件應用實務	數位學習
5	電源供應器電路控制迴路設計元件應用實務	實體課程
6	隔離型返馳式電源之電路設計與實作	實體課程

Agenda

- 1 Campus recruitment
- 2 3Y (FSP Group) Introduction
- 3 Design Capability



About Us

Established April, 1993 Listed on Taiwan Stock Exchange in 2002

Turnover US\$ 482M

Position Worldwide Top 10 switching power supplier

Employee Worldwide Over 5000 persons

**Quality
Certification** ISO 14001 / ISO 9001 /
OHSAS 18001 / ISO 14064-1 /
ISO 13485





About Us

An Engineering Driven Company

1985 Established in Irvine, CA. – Engineering Driven Company

- Product focus IPC ODM standalone & redundant solutions
- 60 Models with 80+ efficiency certifications

2004 FSP Group acquires majority share of 3Y Power Technology

- Gains manufacturing capability through FSP-Group

2005 HQ moves to Taiwan



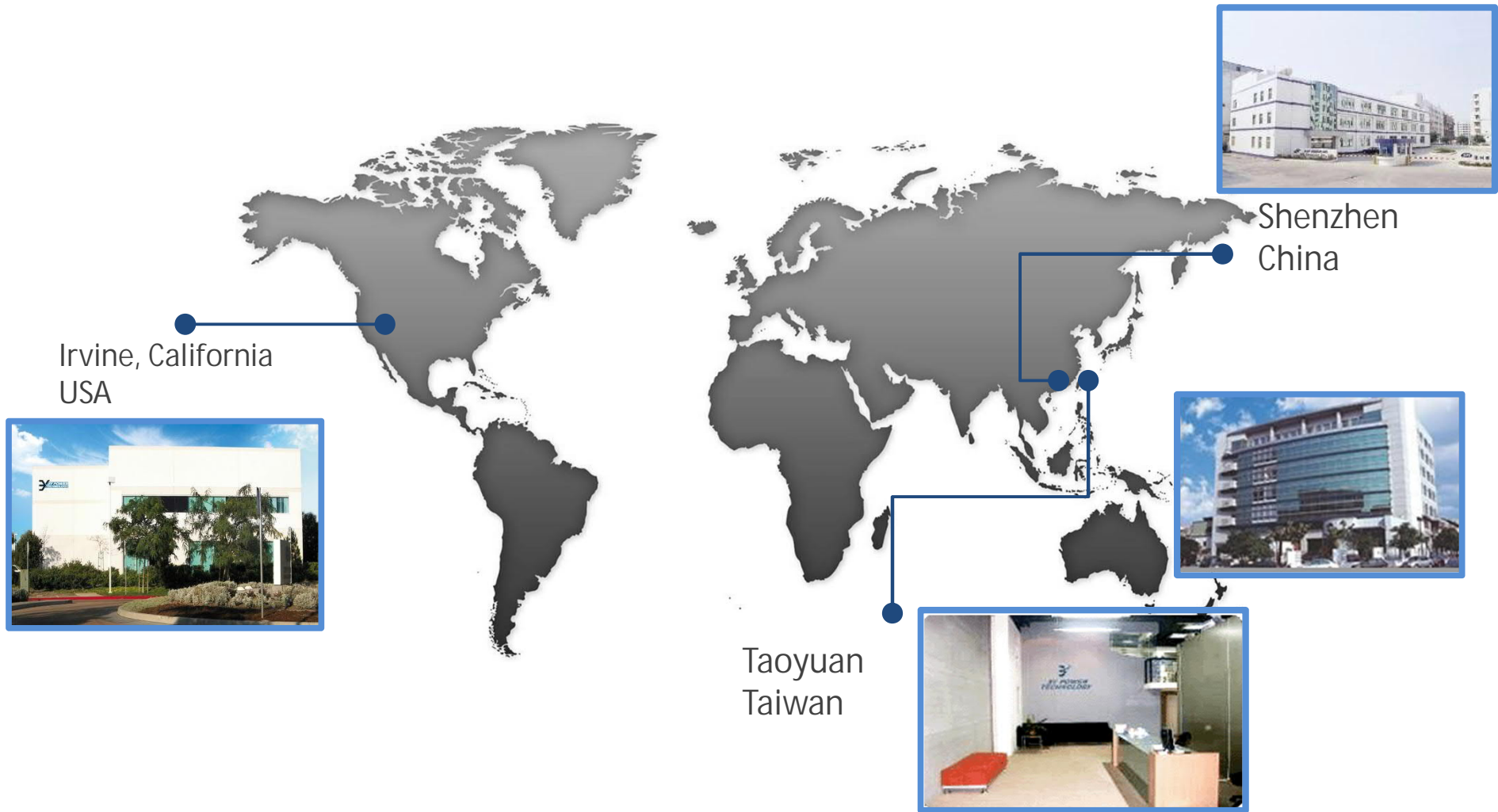
- Headquarter : Taiyuan, Taiwan
- US Operations : Irvine, CA
- Established : 1985
- Capital : US \$ 8.2 million
- Quality Certified : ISO14001 & ISO 9001
- Corporate Parent : FSP Group (Taiwan)
- Capital : US\$ 63 Million/ stock #3015



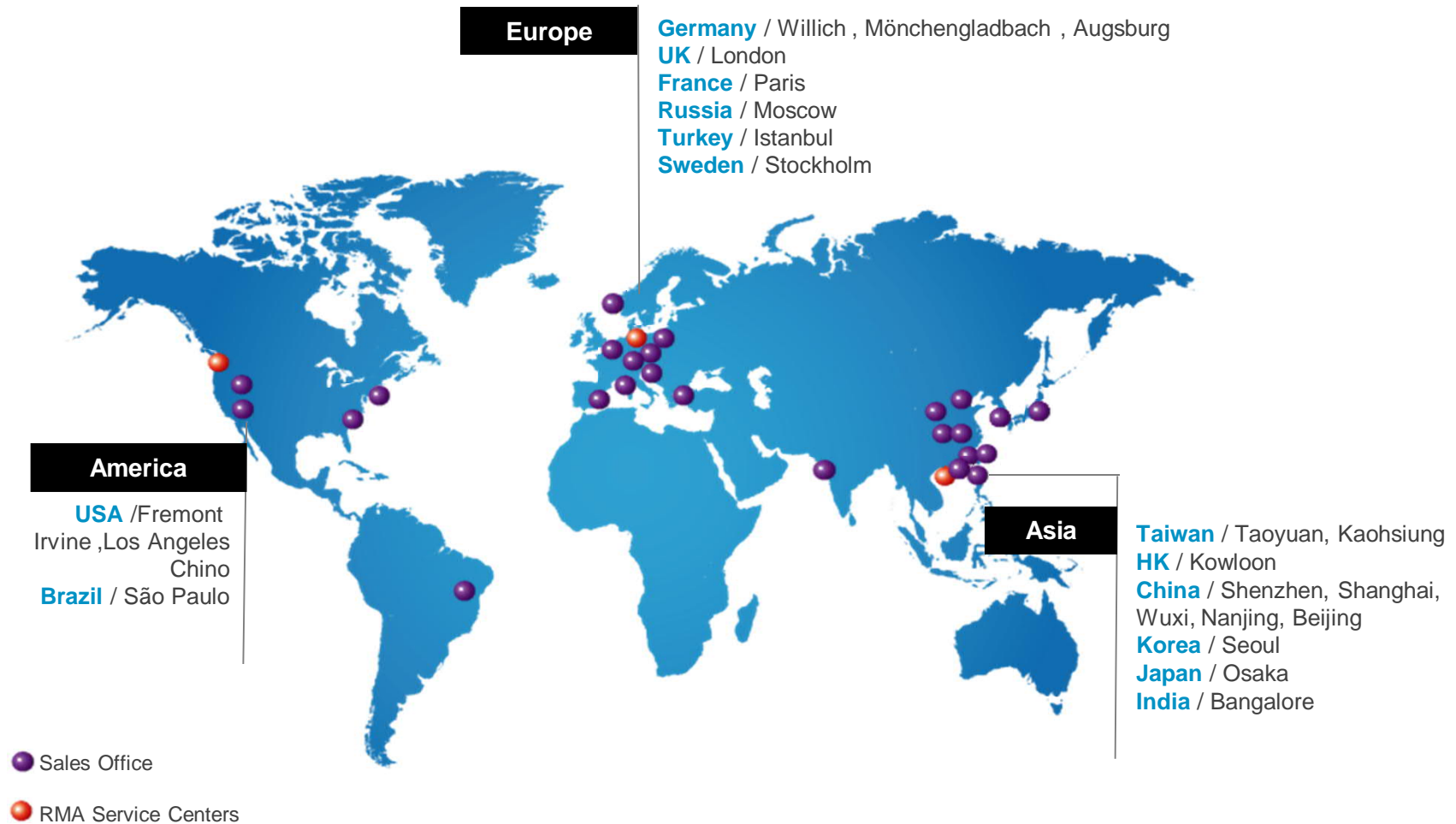
Milestones



3Y Power Global Locations



Global Presence



Manufacturing sites/capacity



Shenzhen Site

- Production Line: 36 lines / 2 lines for RPSU
- Employee: 6000 persons
- Capacity: 3500K per month / 80~100K per month for RPSU

Wuxi Site

- Production line: 5 lines
- Employee: 900 persons
- Capacity: 1300K per month

Taiwan Site (Build up now-Assembly line)

- Production line: 1 lines
- Employee: est. 200 persons
- Capacity: est. 25~30K per month

Monthly producing over 1,000 part numbers in all facilities to fulfill ODM / Disty clients type.



Shenzhen factory
(Huili 1)



Shenzhen factory
(Huili 2)



Shenzhen factory
(Fuyung)



Wuxi factory



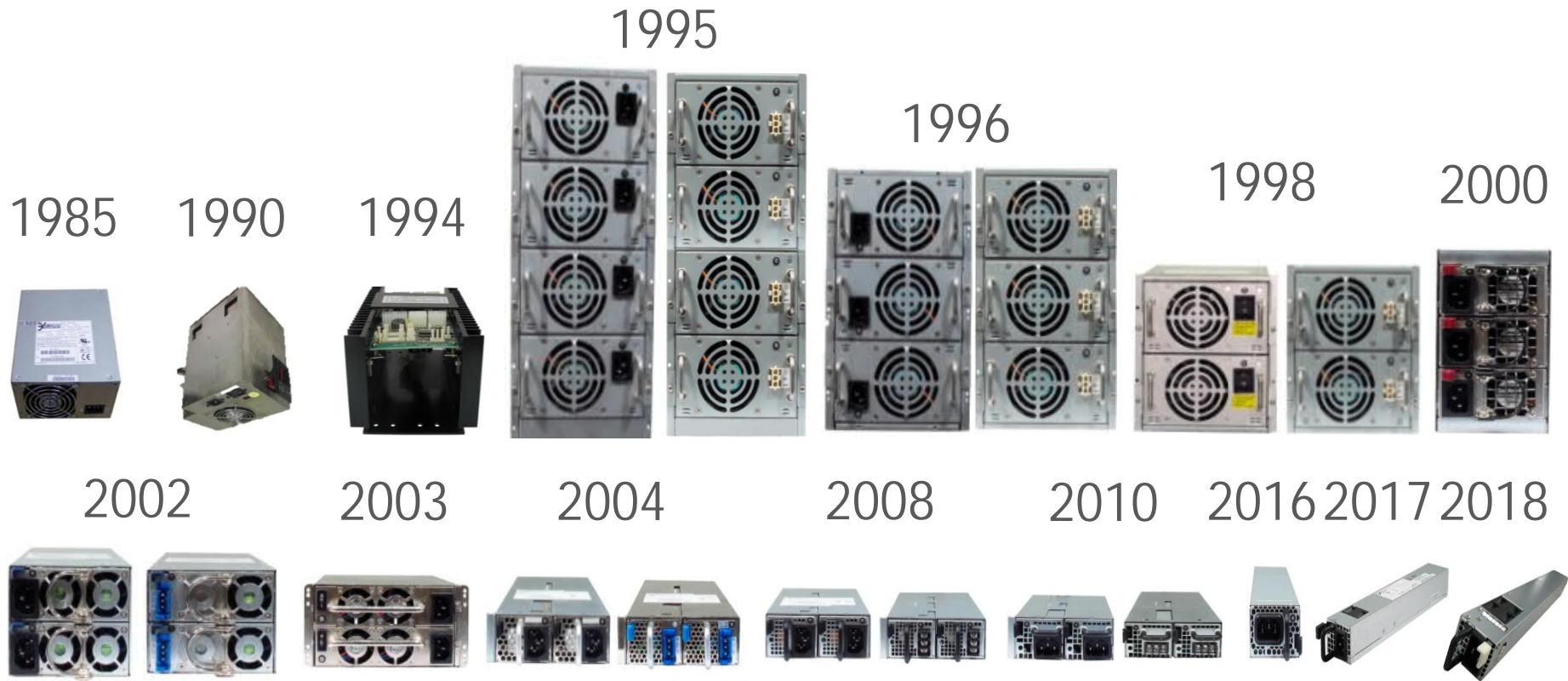
Dongguan Site

Major Products of 3Y





Why Choose 3Y ?



Established in Irvine, CA. – Engineering Driven Company

多樣兼容的產品設計

Power Feeding



多樣兼容的產品設計

Input & Output Redundancy



Few Watts to Thousand Watts



NEBS
LEVEL 3

PMBus






寬溫 +70 to -40°C

高溼 0-95%

防水 IP66

抗雷 Surge +-6KV

3Y -5G RPSU Products Selection

		5G Product	FSP/3Y PSU	PSU Features
	Rack Server	<ul style="list-style-type: none"> • Cloud Server • Data Center 	CRPS (73.5mm) Slim CRPS(68mm)	<ul style="list-style-type: none"> • AC:550W~2400W 80+ Titanium • DC:800W~2000W
	Network Switch	<ul style="list-style-type: none"> • 10G Switch • 25G Switch • 40G Switch • 100G Switch • 200G Switch 	POE (73.5mm)	<ul style="list-style-type: none"> • 300W~3000W • Same of CRPS dimension • Meter function • Support Peak load
	Storage Server	<ul style="list-style-type: none"> • Storage Server • JBOD/JBOF 	Slim (50.5mm)	<ul style="list-style-type: none"> • 80W~2000W • Meet NEBS • Complete series of DC PSU
	IT & IPC Server	<ul style="list-style-type: none"> • High Density Server 	Slim (54.5mm)	<ul style="list-style-type: none"> • 400W~2200W
	Surveillance & AI System	<ul style="list-style-type: none"> • Security • AI & Facial Recognition 	O/F	<ul style="list-style-type: none"> • 60W~900W • Support with Wide temperature rang (290W is developing)
			Customization	

Topologies Standardization

*Traditional control

Single phase PFC + LLC (FSP6600+FAN7688+MCU)

Single phase PFC + ACF(FSP6600 + MCU)

*Semi Digital control

Single phase PFC + LLC (FSP 6600+ UCD3138)

Single phase PFC + LLC (STM32F051K + FAN7688)

Interleave PFC + LLC (UCD3138 + FAN7688)

Interleave PFC + PSFB (UCD3138+ UC28950)

*Full Digital control

(UCD3138 or STM32F051K With Primary & Secondary)

Single phase PFC + LLC

Interleave PFC + LLC

Interleave PFC + PSFB

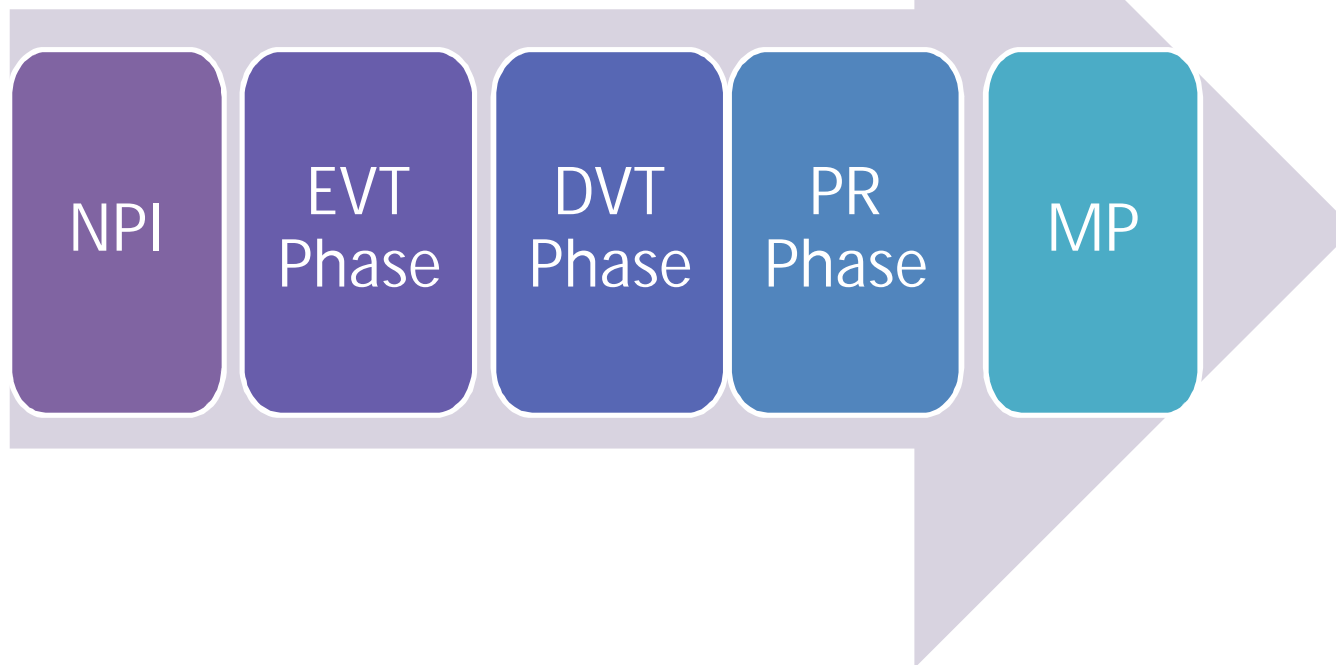
Agenda

- 1 Campus recruitment
- 2 3Y (FSP Group)Introduction
- 3 Design Capability

Design & Evaluation

➤ New design project from NPI to PR

➤ Modify project from DVT to PR



Tools of Design

Layout	Magnetic Component & M/E design	E/E	Thermal Simulation
Protel99SE	AutoCAD	Mathcad	FloTHERM
			
Pcad2004	ProE	PCMS	
			
Altium Designer	Creo		
			

Evaluation

Loss	
Mathcad	
Compo	Power loss(W)
FL11	2.649
BD11	12.192
C15	0.5
L12	3.158
L11	3.158
Q12	6.232
Q11	6.232
Q15	5.306
Q16	5.306
Q13	5.306
L13	1.851
T11	20.131
Q17~Q20	2.05
Q21~Q24	2.05
L14	10.5965
Q29	0.93
Q30	0.93
Q31	0.93
Q28	0.93
C41	0.626
Total loss	96.99 W

$m := 10^{-3}$

Specification

$P_{in_DC} := 650 \text{ W}$	$V_{o_DC} := 12 \text{ V}$	$N_{P_DC} := 35$	$L_m := 1.5 \text{ mH}$
$V_{in_DC} := 380 \text{ V}$	$I_{o_DC} := 53 \text{ A}$	$N_{S_DC} := 3$	$V_{sec} := 12 \text{ V}$
$Duty_{DC} := 0.40$	$I_{o_ripple} := I_{o_DC} \cdot 0.25$	$N := \frac{N_{P_DC}}{N_{S_DC}}$	$V_{Lk} := 0 \text{ V}$
$f_{sw_DC} := 81 \cdot 10^3 \text{ Hz}$	$T_{sw_DC} := \frac{1}{f_{sw_DC}}$		

BSC028N06NS SR MOSFET

Step1: Define Parameter

$Q_g := 37 \text{ nC}$	$Q_{ge} := 12 \text{ nC}$	$Q_{gd} := 7 \text{ nC}$	$Q_{rr_SR1} := 29 \text{ nC}$
$t_f := 8 \cdot \text{ns}$	$V_{plateau} := 4.6 \text{ V}$	$V_{gs} := 20 \text{ V}$	$R_{ds_on_SR1} := 3.1 \text{ m}\Omega$
$t_r := 38 \cdot \text{ns}$	$Quality_{SR1} := 2$		



2000W PSFB



2000W PFC

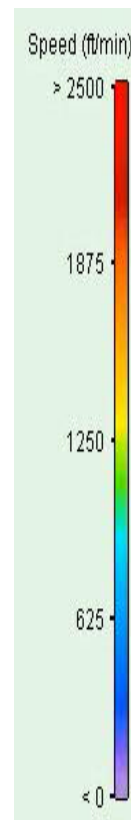
Thermal Simulation

To explore the thermal characteristics of current design power supply.

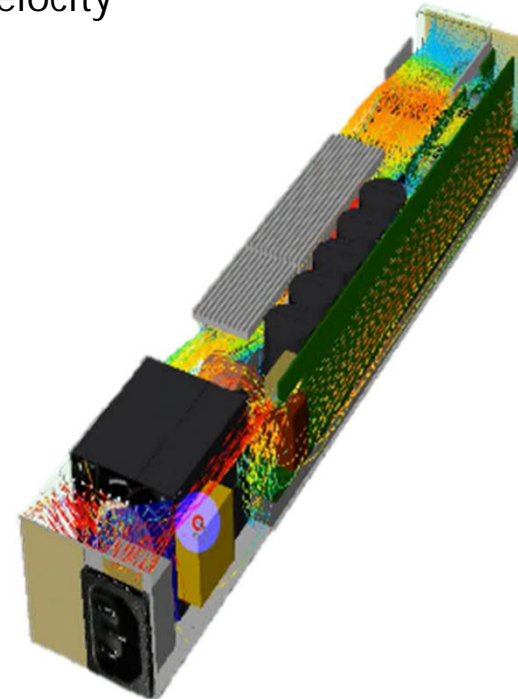
- Cutting plane velocity profiles
- Case temperature of critical components
- Cutting plane temperature profiles
- Air flow rate and impedance of power supply.

Critical Component Temperature

	900w/90V	1300w/180V
Component	Temp(°C)	Temp(°C)
FL11	99.4	89.7
BD11	119.2	111.1
L12	101.8	107.1
L11	96.9	103.6
Q12	94.6	96.5
Q11	93.9	100.1
Q15	99.1	112.1
Q16	102.1	119.5
Q13	96.6	108.5
Q14	97.9	116.4
L13	82.8	91.6
T11	92.3	123.6
Q17-Q20	85.2	108.1
Q21-Q24	84.1	106.2
L14	89.2	121.5
Q29	78.5	97.8
Q30	78.4	97.7
Q31	78.3	97.4
Q28	78.2	97.3
C40	71.9	84.9
C41	70.7	82.2



Velocity



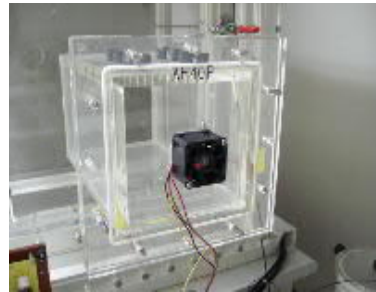
 / Velocity field

Evaluation

Wind Tunnel

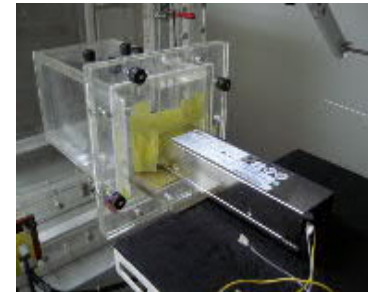


1



Fan Spec Fan report Fan database

2



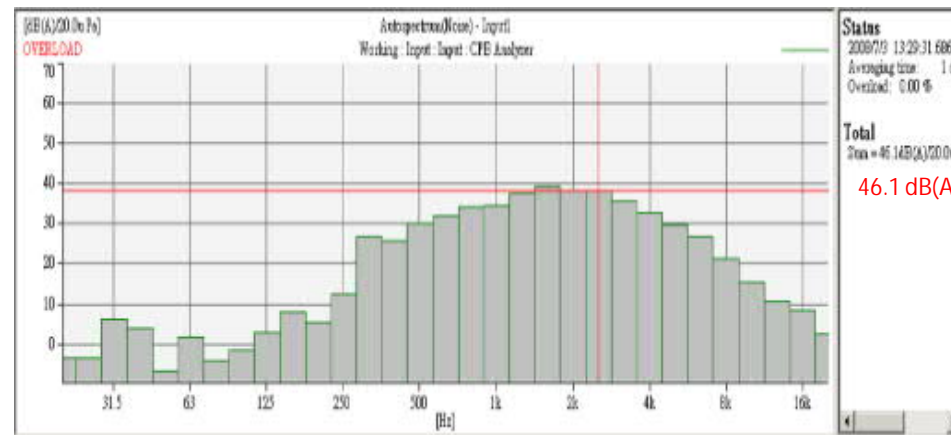
PSU airflow PSU Impedance

3



System airflow System Impedance

Acoustic Chamber



Acoustic Report

EVT & DVT



EMI Lab.



EMS Lab.



Anechoic Chamber



Wind Tunnel System



Highly Accelerated Life Test



Environmental Test



Infrared Thermal Camera



Programmable Safety Test System



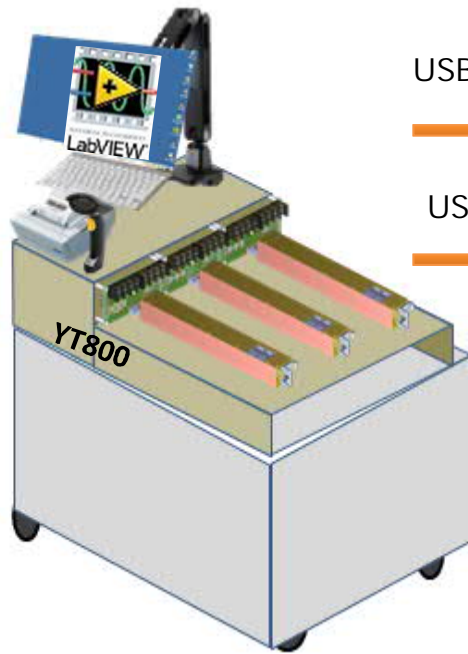
Thermal Shock Chamber



Vibration

- **Electrical Function**
- **Reliability & Safety**
- **Environment**

Auto Bench (YT800)



USB to RS232



RS485



USB to I2C



YT800自動測試機

- ◆適用Redu.的全功能生產測試機
可搭配簡易的Source/E-LOAD達到電源功能性
I2C/EEPROM/校驗/均流/初測等功能。
亦可搭配CHROMA 6000/8000達到全功能測試。
體積小附掛輪組可隨線配置。
- ◆UI自動化控制與管理
GO/NO GO。
程式系統化中央統一管理。
可同時控管三台待測物。
Error code print.
- ◆低成本/高產能
自動換切待測物設計，減少直接人力資源成本。
自動化設計減少教育訓練成本。
兼容設計一體適用減少治具成本。
- ◆自我開發軟/硬體技術
成本低/易維護/易升級。

Formal version
Chroma 6000/8000



Simple version



Testing automatically

A-Test by RD

1. Electrical Function
2. Reliability & Safety
3. Environment

YH-2112 A Test

Derating

IPC9592

Develop & Test Plan

Test check list

EVT Stage

1. Module_Electrical Function		Stage		Auto Test	SPEC	RD自測	Test result		Result		
		EVT	DVT				data	waveform			
1.1	Inrush Current	●	●	●		●	●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.2	Input Current	●	●	●		●	●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.3	Brownout	●	●	●		●	●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.4	Cross Regulation	●	●	●			●		<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.5	Overshoot	●	●	●				●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.6	Ripple & Noise	●	●	●			●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.7	Maximum Load Change	●	●	●			●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.8	Turn on Delay Time	●	●	●			●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.9	Rise Time	●	●	●			●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.10	Hold up Time	●	●	●			●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A
1.11	Over Current Protection	●	●	●		●	●	●	<input type="checkbox"/> P	<input type="checkbox"/> F	<input type="checkbox"/> N/A

B-Test by DQ

- 1. Electrical Function
- 2. Reliability & Safety
- 3. Environment



DVT Stage



B-Test Check List

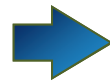


YH-2112H B Test

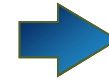
Design Qualification Summary Report							
Model No. :			Description :				
Option .:			DQ Job No. :				
Data Sheet Inputs	Values	Units	Document	Name / Date	Rev.		
Vin-low		Vac	Specification				
Vin-hi		Vac	BOM				
Vnominal		Vac	PCB				
Vout							
Maximum Load							
Minimum Load							
Test Item	Test Board	Units	Ambient(^o C)			PASS / FAIL	Remark
			L	R	H		
1. Electrical Function							
1.1	Power Factor						
1.2	Input Current						
1.3	Cross Regulation						
1.4	Maximum Load Change						
1.5	Peak Load						
1.6	Overshoot						

Hui-Li Line Process – Station Before Burn in-1

1. SMT



2. Hand Insertion



3. Wave-Soldering



CTQ & Control point :
 Printing machine
 Pressure/Timing/Speed
 Parts location/Polarity
 Reflow machine
 Timing /Speed/Temperature



CTQ & Control point :
 Parts location/Polarity
 Insertion Workmanship



CTQ & Control point :
 Solder machine Speed/Temperature
 Flux Gravity
 Pre-heating Temperature
 Solder reliability



12.0(M) pixels, misjudgment rate : <2%



Hui-Li Line Process – Station Before Burn in-2



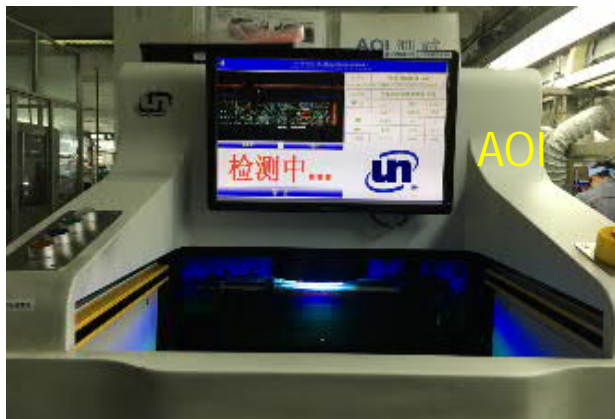
CTQ & Control point :
PCBA Solderability
Components Status
Solder Iron Temperature



CTQ & Control point :
Voltage/ Current /Wave form
Adjustment and verification
OATY

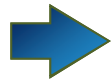


CTQ & Control point :
Assembly Workmanship
Product MOI



500(M) pixels, misjudgment rate : <5%

Hui-Li Line Process – Station After Burn in-1



7. Second Test



CTQ & Control point :
 Output Voltage
 Protection Function Test
 OATY



8. Burn- In



CTQ & Control point :
 Temperature (45+/- 5 C)
 Cycle & Timing
 Loading (>80%)
 OATY



Energy saving Burn- in chamber to optimize real time monitor system and power saving(power re-cycle using).

Hui-Li Line Process – Station After Burn in-2



- ★ 電源研發工程師
- ★ 韌體研發工程師
- ★ 資訊系統工程師
- ★ 自動化工程師
- ★ 測試工程師
- ★ 維修工程師
- ★ 熱流工程師
- ★ 製程工程師





Thank you!

POWER UP
YOUR LIFE

Innovation | Creativity | Quality