華瑞功率電子股份有限公司

CET-MOS Company Profile

2017

10F, No.176, Jiankang Rd., Chung-Ho Dist.,
New Taipei City, Taiwan. R.O.C. 23585
TEL:886-2-22229138 FAX:886-2-22223833

Outline

- **About CET-MOS**
  Overview / Background / Organization
- **Packages & End products**
  Scope / Advantages / Reliability Qualification
- **CET-MOS Technologies**
  Design Flow / Technology Roadmap
- **Partners and Support**
- **Conclusion**

Overview

CET-MOS at a glance

EST. DATE :

April, 2012.

EMPLOYEES :

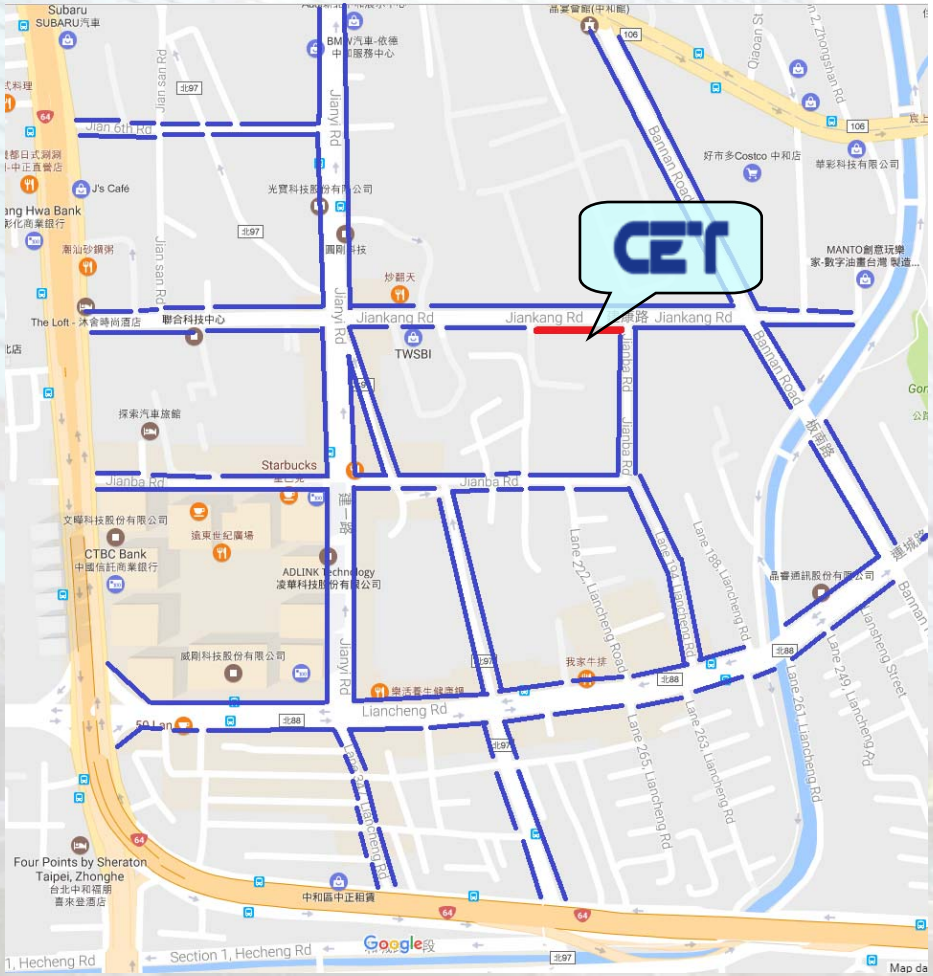
60 People.

CAPITAL :

USD 45 Million.

LOCATION :

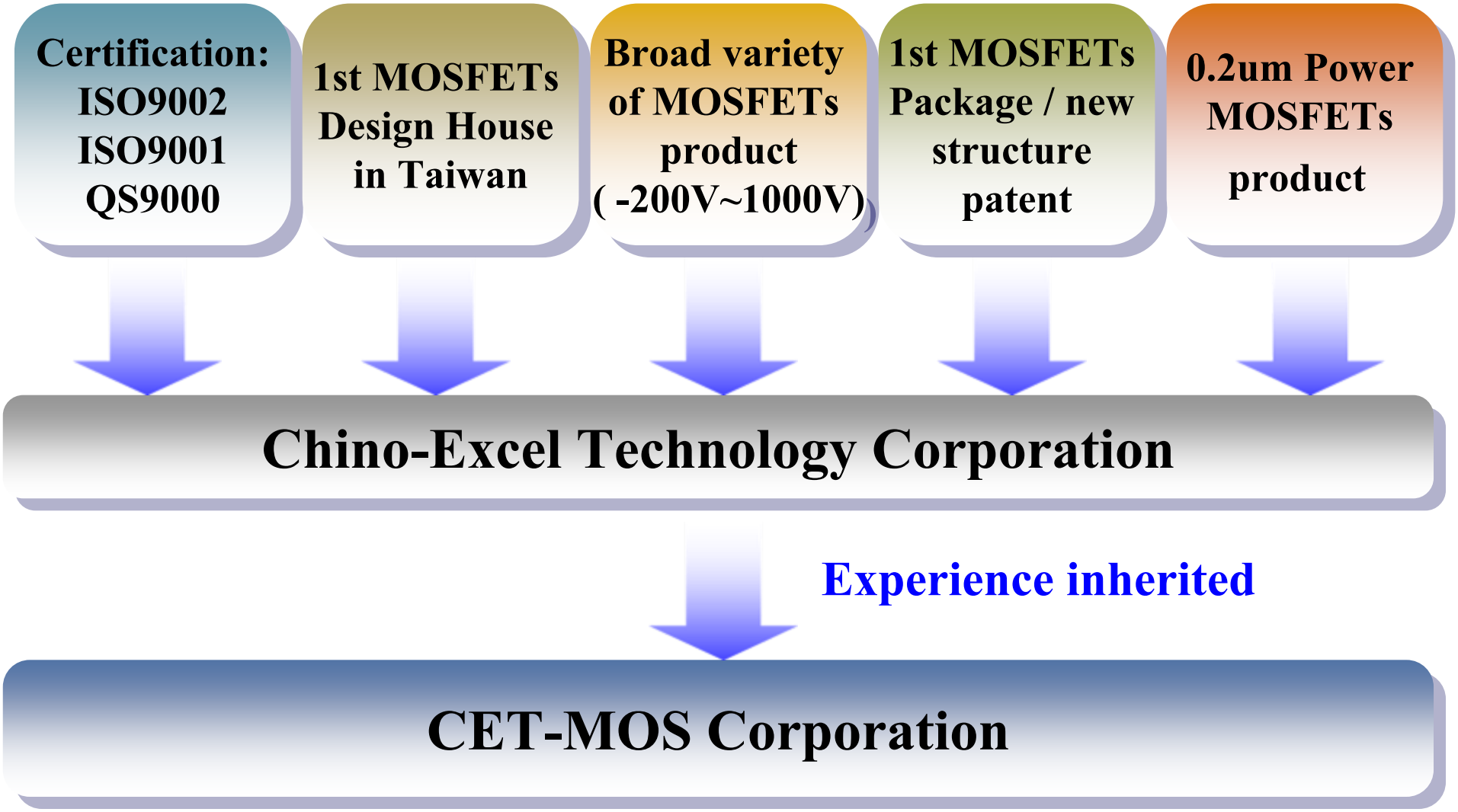
10F., No. 176, Jiankang Rd., Chung-Ho Dist., New Taipei City, Taiwan.



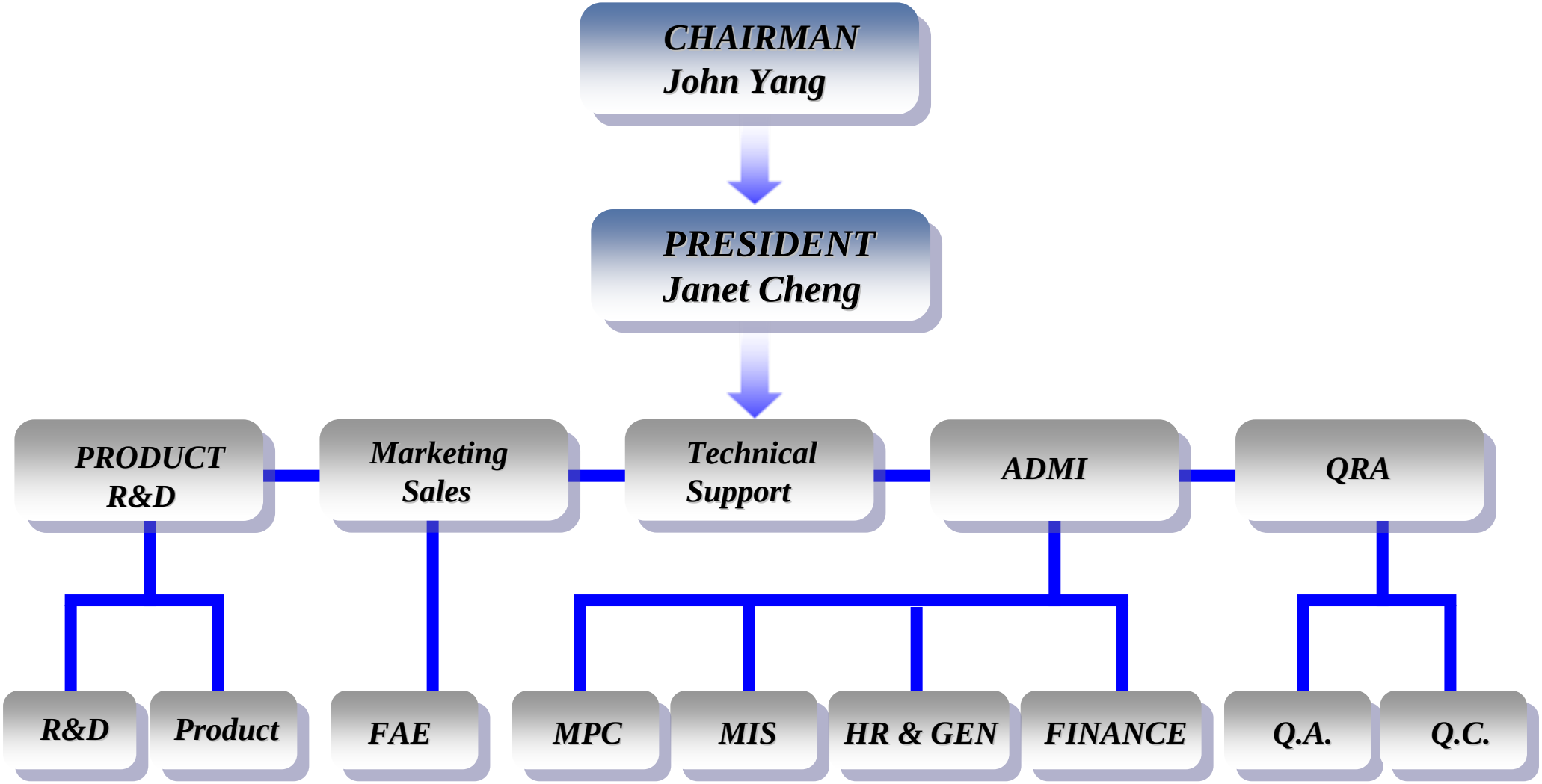
SPECIALTIES:

Product customized
Fab Process setup abilities
Reliability testing team

Background

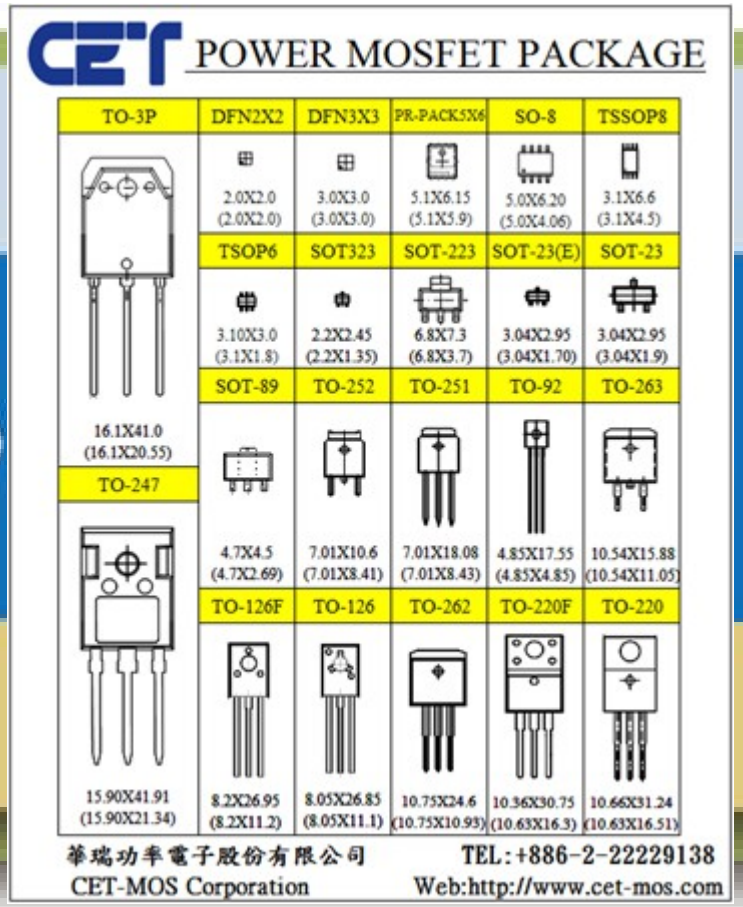

Certification:
ISO9002
ISO9001
QS9000
1st MOSFETs Design House in Taiwan
Broad variety of MOSFETs product (-200V~1000V)
1st MOSFETs Package / new structure patent
0.2um Power MOSFETs product
Chino-Excel Technology Corporation
Experience inherited
CET-MOS Corporation

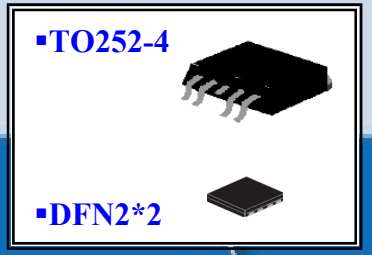
Organization

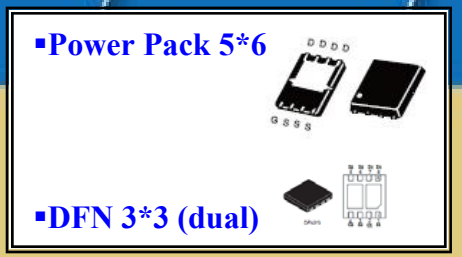


Series of Package Type

Available Package	2010	2013	2016







Capacity

Wafer capacity

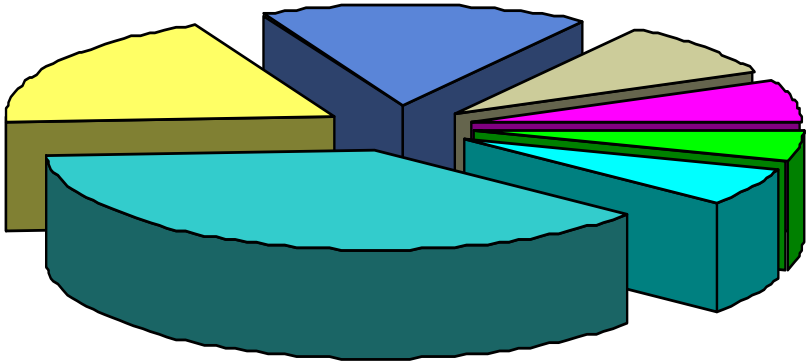
Foundry Wafer Size	6“	6“	8“
Wafer Process	Planar	Trench	Trench
Capacity (pcs/Month)	15K (~23KK dies)	5K (~20KK dies)	10K (~180KK dies)

Package capacity

Package	Taiwan	China	Korea	Malaysia	Total Capacity (K)
SOP8	15,000	40,000		10,000	65,000
TSSOP08		25,000		10,000	35,000
TO-220	8,000	20,000	12,000		40,000
TO-220F		20,000	10,000		30,000
TO-263		10,000	8,000		18,000
TO-251	20,000	20,000	8,000		48,000
TO-252	20,000	20,000	8,000		48,000
TO-247		8,000	5,000		13,000
TO-3P		10,000	6,000		16,000
SOT-23	15,000	50,000			65,000
SOT-223		10,000			10,000
SOT-89		25,000			25,000
TSOP6		20,000			20,000
TO-92		25,000			25,000
PR PAK 3*3	10,000	15,000		6,000	31,000
SC70(SOT-323)		5,000			5,000
TO-126		5,000			5,000
PR PAK 5*6	5,000	5,000			10,000
TOTAL	88,000	333,000	57,000	26,000	509,000

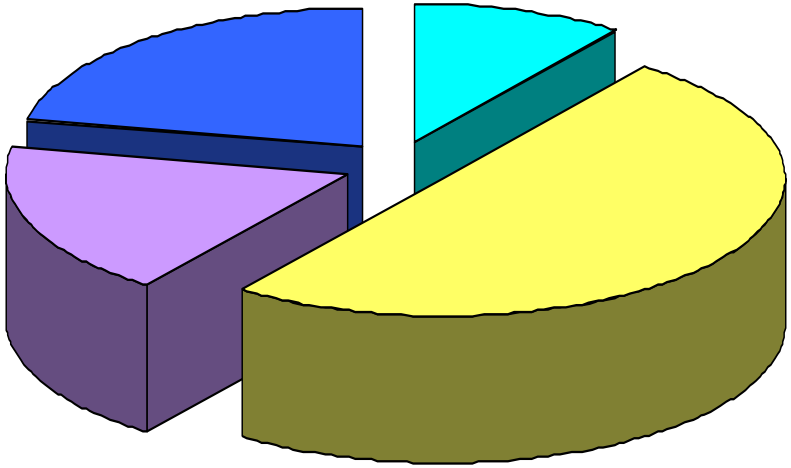
Scope

By Application



- Consumer 38%
- DC Fan 7%
- UPS 19%
- Other 6%
- SPS 16%
- BMS 5%
- Power tool 9%

By Voltage (Include N/P MOS)



- -200V ~ -20V 10%
- 20V ~ 100V 50%
- 100V ~ 400V 18%
- 400V ~ 900V 22%

Field Application

BMS

BLDC

LED TV / Monintor

Adapter

DC Fan

Power tool

Audio AMP

Power bank

Power inverter

Lighting

Photo

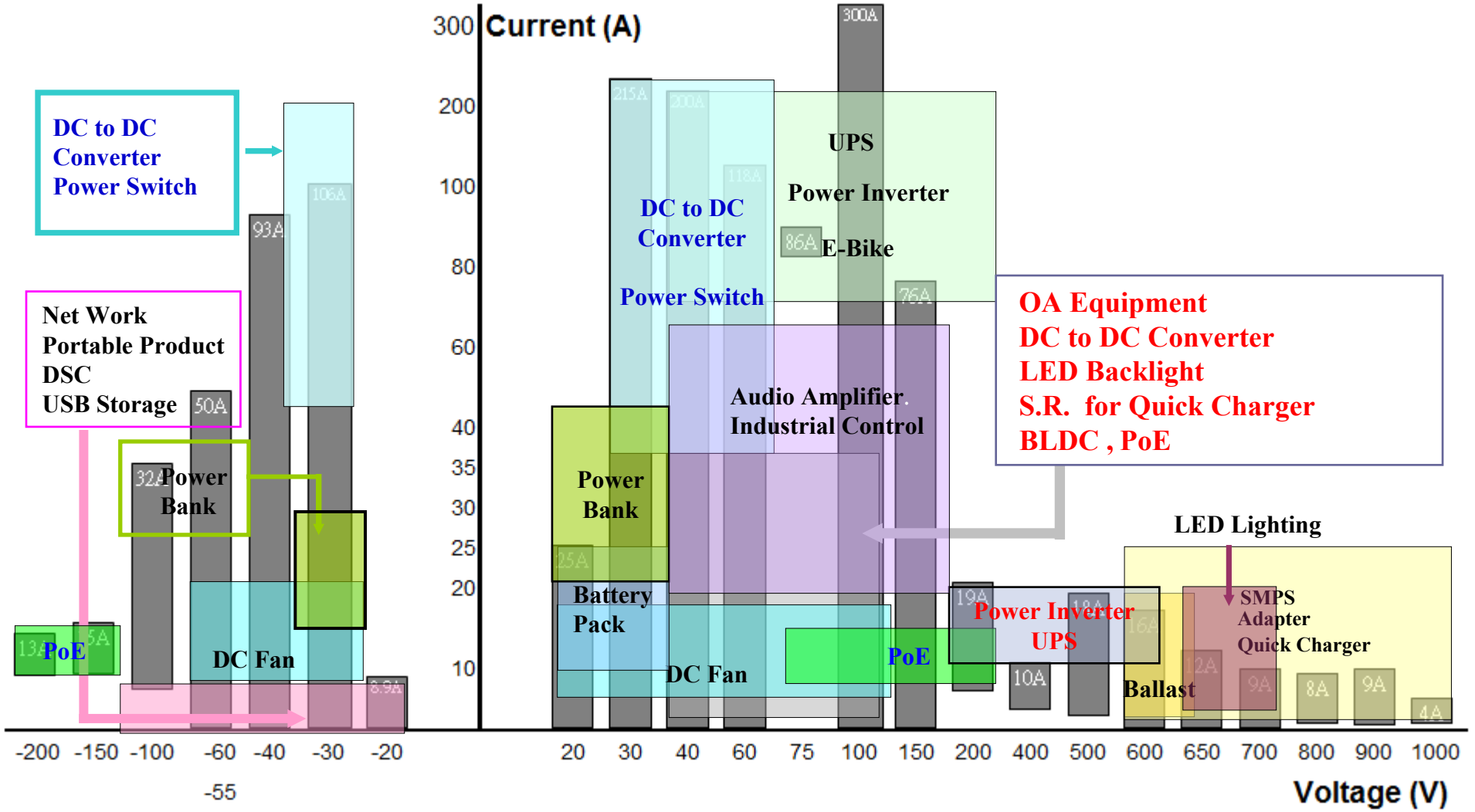
SPS

Quick charger

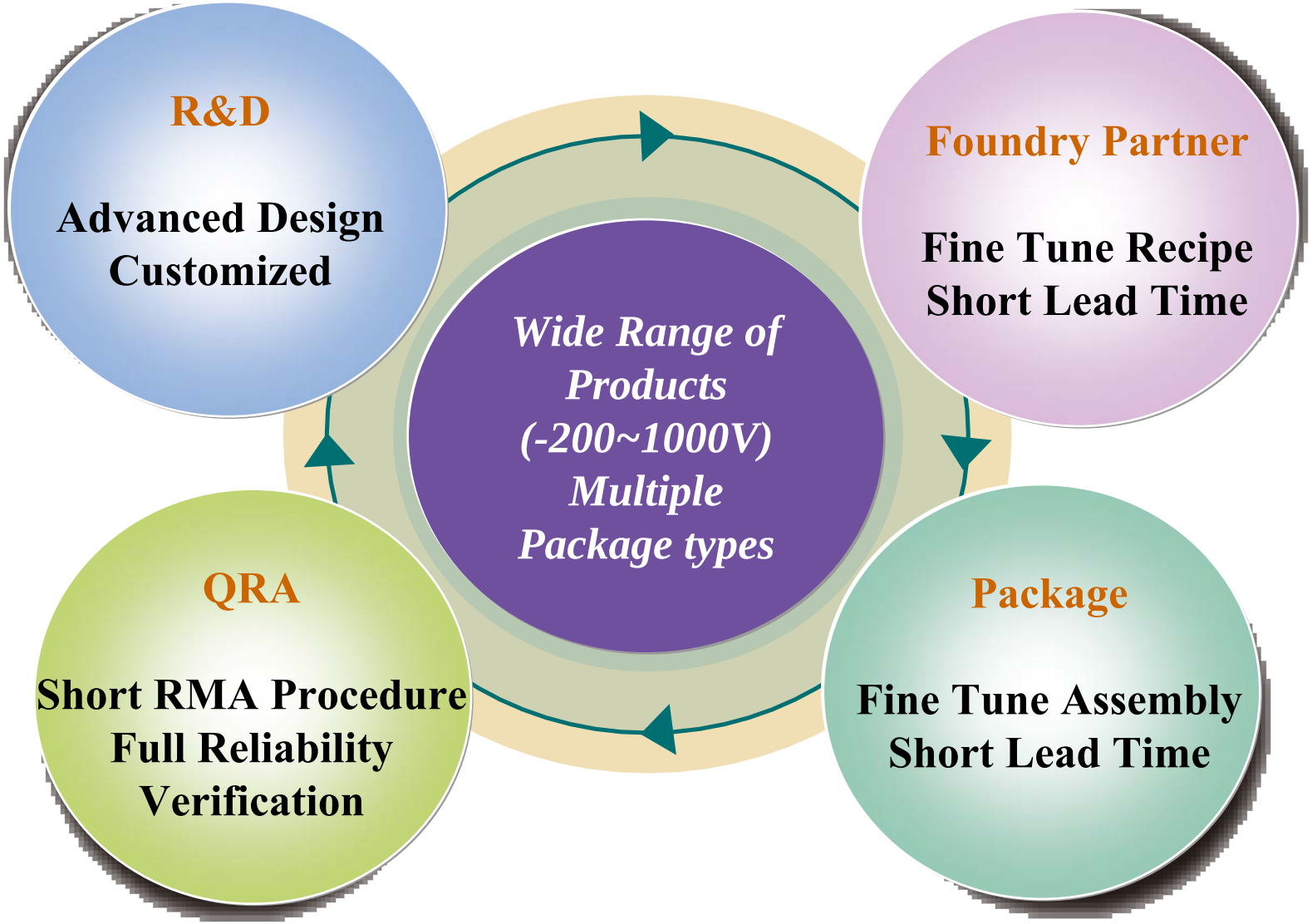
UPS

PoE

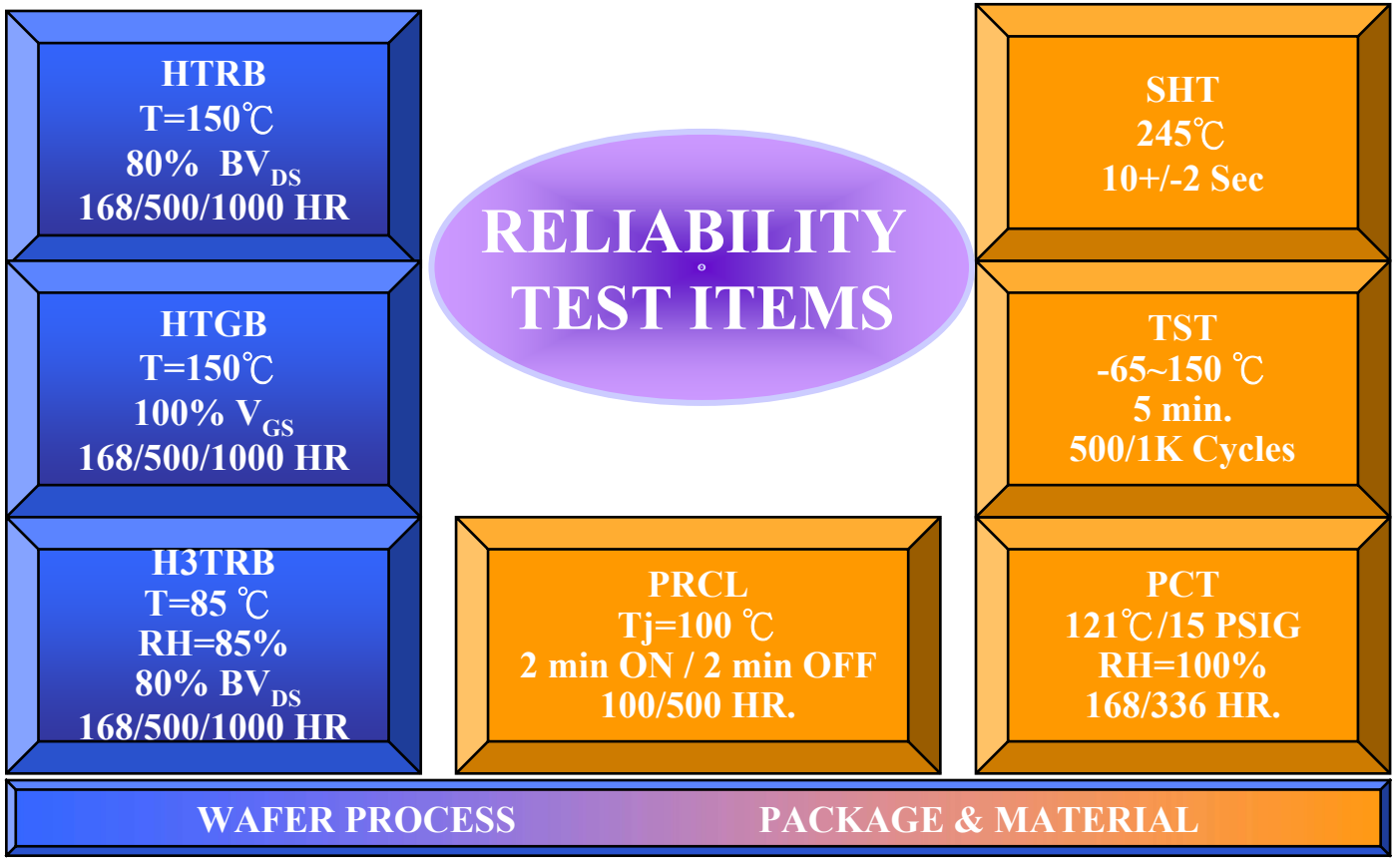
Power Device Application



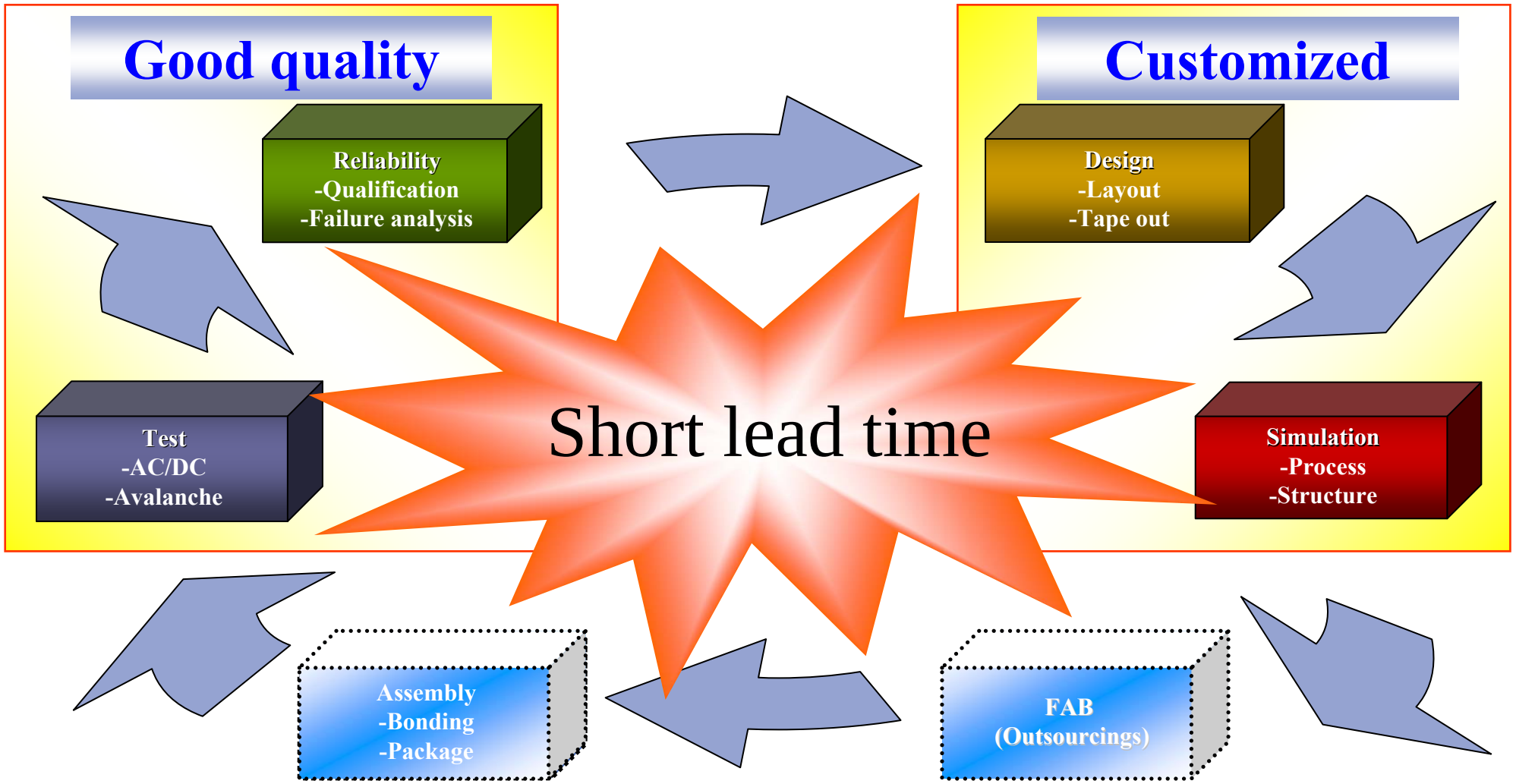
Advantages


R&D
Advanced Design
Customized
Foundry Partner
Fine Tune Recipe
Short Lead Time
Wide Range of Products (-200~1000V) Multiple Package types
QRA
Short RMA Procedure
Full Reliability Verification
Package
Fine Tune Assembly
Short Lead Time

Reliability Qualification



Design Flow

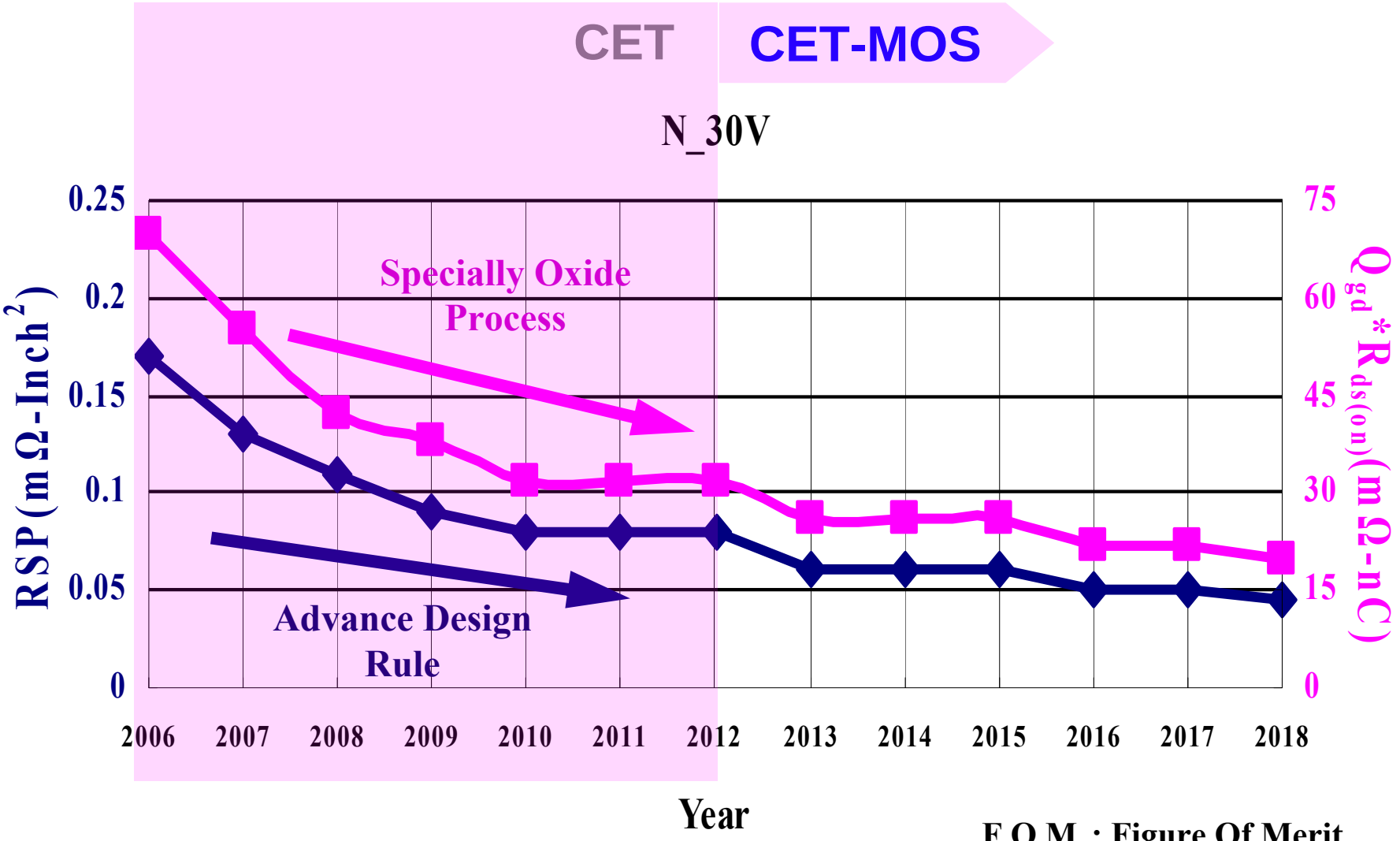

Good quality
Reliability
-Qualification
-Failure analysis
Test
-AC/DC
-Avalanche
Customized
Design
-Layout
-Tape out
Simulation
-Process
-Structure
Short lead time
Assembly
-Bonding
-Package
FAB
(Outsourcings)

Technology Roadmap

CET → CET-MOS

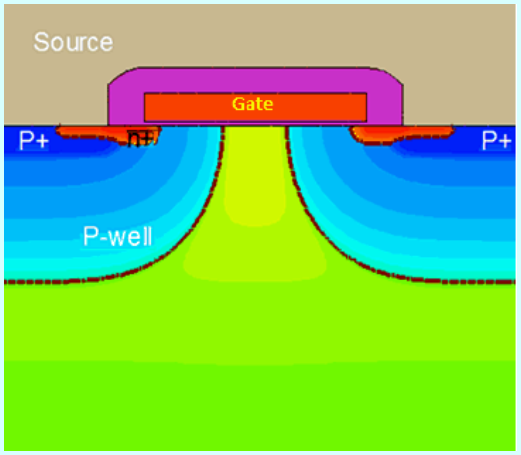
	Available Technology	2013~2016	2017	2018
LOW VOLTAGE	.Low Q_{gd} (Special Oxide) .Low R_g Device .Ultra-low $R_{ds(on)}$ (High Density) .High Speed (Special Gate) .8" 650M cell	.Ultra fast device .DFN 2X2 (small size) .Ultra-low $R_{ds(on)}$ .Custom Specific .Design Service	.Ultra fast device .DFN 2X2 (small size) .Ultra high UIS .Bottom Oxide .Customer made	. 4 in 1 module .Ultra high UIS .Bottom Oxide .Clip Bonding PDS .Customer made
MIDDLE VOLTAGE	.Super Low $R_{ds(on)}$ .High Switch Speed .ESD Device .Low Gate Charge .150V Trench Power MOS	.Super low Rdson .Trench (-150V~200V) .High Ruggedness MOS .Custom Specific .Design Service	.Trench (-150V~250V) .High Ruggedness Device .Split Gate Device .Custom Specific Design	.Trench (300V ↗) .High Ruggedness Device .Split Gate Device .Custom Specific Design
HIGH VOLTAGE	.High Voltage to 800V .Low Gate Charge .Low Q_{gd} .LTO process (High UIS) .Custom Specific Design	.High UIS High Voltage Power MOS (1000V) .Short terminal .Custom Specific .Design Service	.Low Q_{gd} .High UIS High Voltage Power MOS (1000V) .Short termunal .Custom Specific Design	.Low Q_{gd} .Compound Material .High dv/dt device .GaN on silicon .Custom Specific Design

Technology Roadmap (F.O.M.)

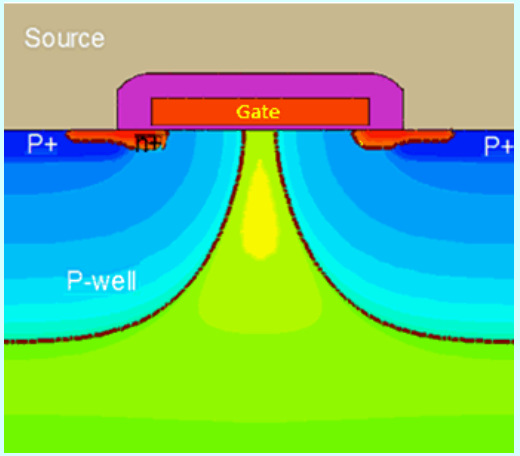


F.O.M. : Figure Of Merit

MOSFETs Technology



Traditional Planar NMOS

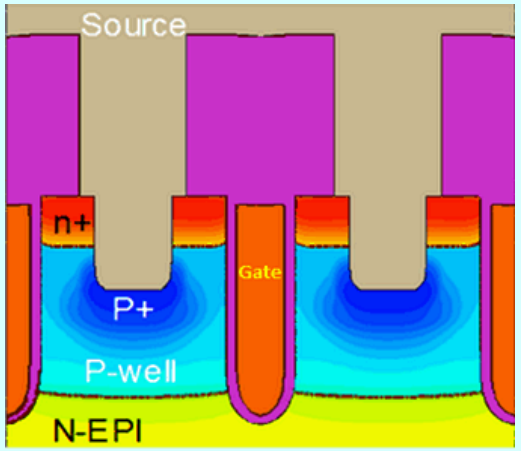


Low-Q_{gd} Planar NMOS

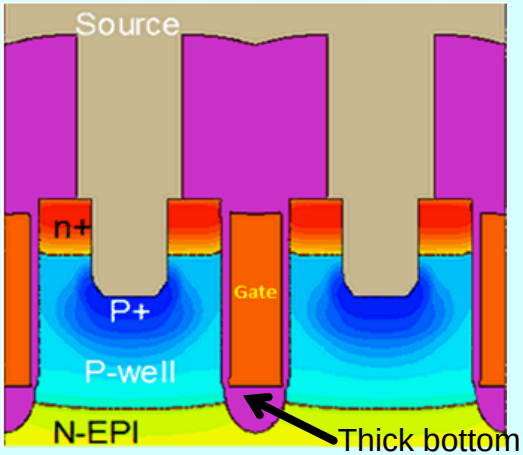
MOSFETs Technology Features

- Traditional Planar MOSFETs - High voltage.
- Low-Q_{gd} Planar MOSFETs - High density, Low-Q_{gd}, High UIS.

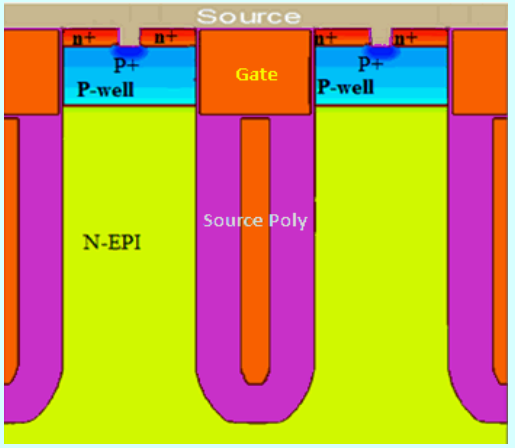
MOSFETs Technology



Traditional Trench NMOS



NMOS with thick bottom oxide.

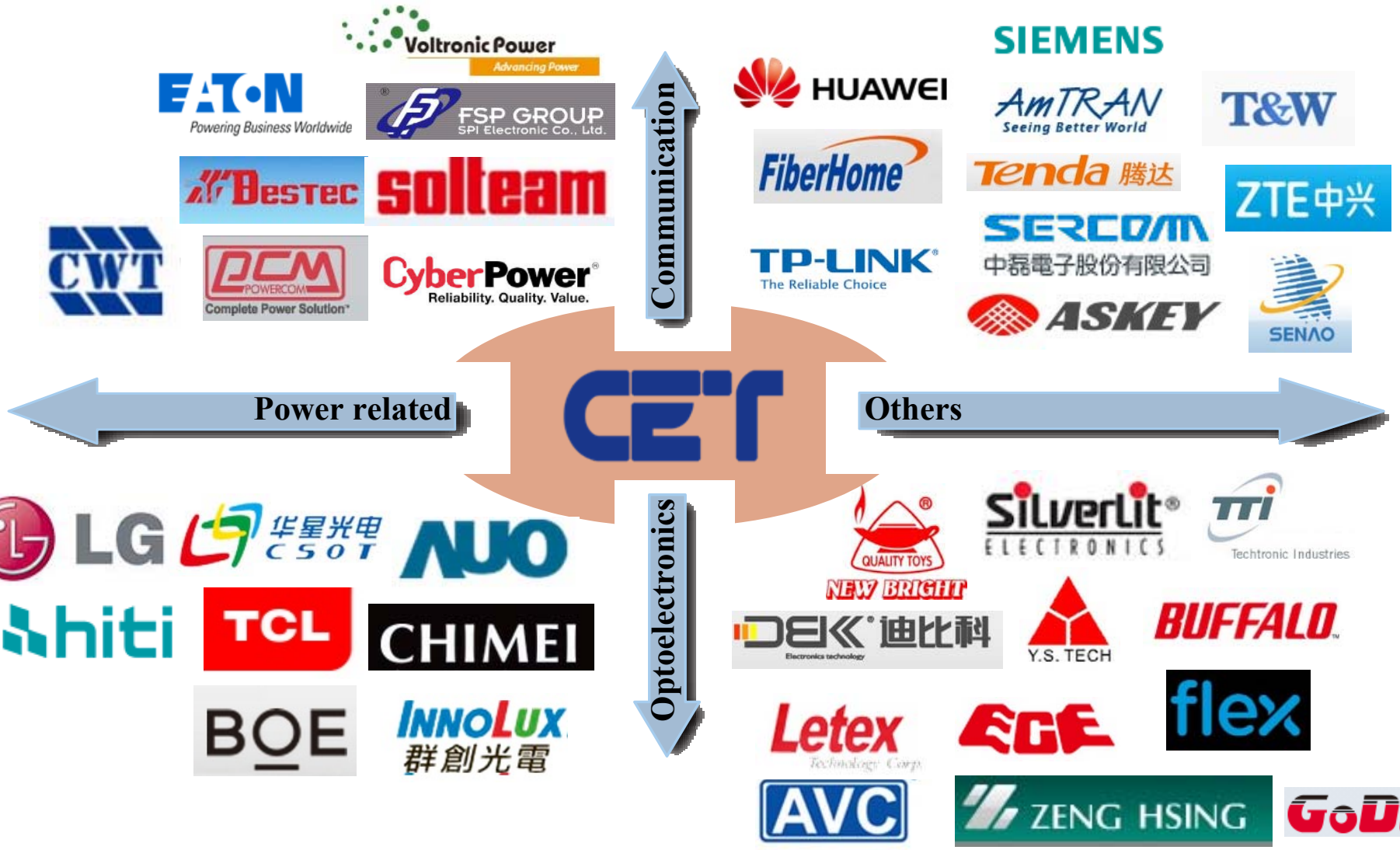


NMOS with split gate

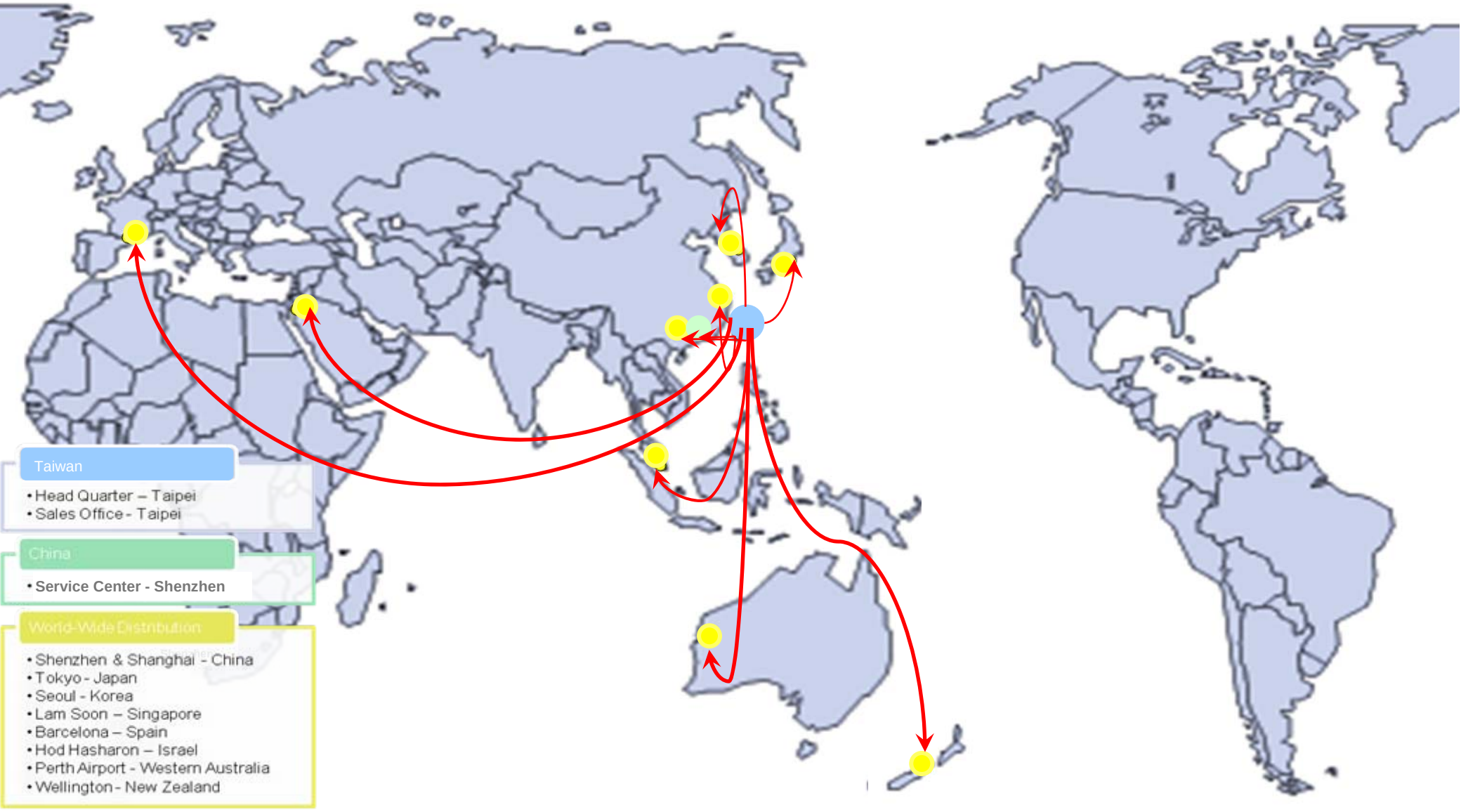
MOSFETs Technology Features

- Traditional Trench MOSFETs – High density, Low $R_{ds(on)}$.
- Thick Bottom Oxide Design– High density, Low $R_{ds(on)}$, Low Q_{gd} .
- Split Gate Structure– High density, Ultra-low $R_{ds(on)}$, Ultra-low Q_{gd} .

Partners


Voltronic Power
Advancing Power
EATON
Powering Business Worldwide
FSP GROUP
SPI Electronic Co., Ltd.
Bestec
solteam
CWT
POWERCOM
Complete Power Solution
CyberPower
Reliability. Quality. Value.
Communication
HUAWEI
SIEMENS
AmTRAN
Seeing Better World
T&W
FiberHome
Tenda 腾达
ZTE中兴
SERCOM
中磊電子股份有限公司
TP-LINK
The Reliable Choice
ASKEY
SENAO
Power related
CET
Others
LG
华星光电
CSOT
AUO
hiti
TCL
CHIMEI
BOE
INNOLUX
群創光電
Optoelectronics
QUALITY TOYS
NEW BRIGHT
SilverLit
ELECTRONICS
TTI
Techtronic Industries
DEK 迪比科
Electronics technology
Y.S. TECH
BUFFALO
flex
Letex
Technology Corp.
EGE
AVC
ZENG HSING
GoDEX

Global Support



Taiwan
- Head Quarter – Taipei
- Sales Office - Taipei

China
- Service Center - Shenzhen

World-Wide Distribution
- Shenzhen & Shanghai - China
- Tokyo - Japan
- Seoul - Korea
- Lam Soon – Singapore
- Barcelona – Spain
- Hod Hasharon – Israel
- Perth Airport - Western Australia
- Wellington - New Zealand

Why CET-MOS?

Over 25 years experience from CET

Package support and FA laboratory

All aspects technology team

Real time response

Variety and flexibility for MOSFETs product

Well capacity plan

Fully characteristics and reliability tested

Professional experience FAE for circuit application


Thanks for Your Attention