



MMC ELECTRONICS (THAILAND) LTD.

Mitsubishi Materials Group

Business Summary

Mitsubishi Materials Corporation

Cement Business

Metals Business

Advanced Materials & Tools Business

Aluminum Business

Electronic Materials & Components Business

Energy Business

Precious Business

Recycling Business

Electronic Component Business

Advance Material Business

Fine chemicals Business

Silicon Business

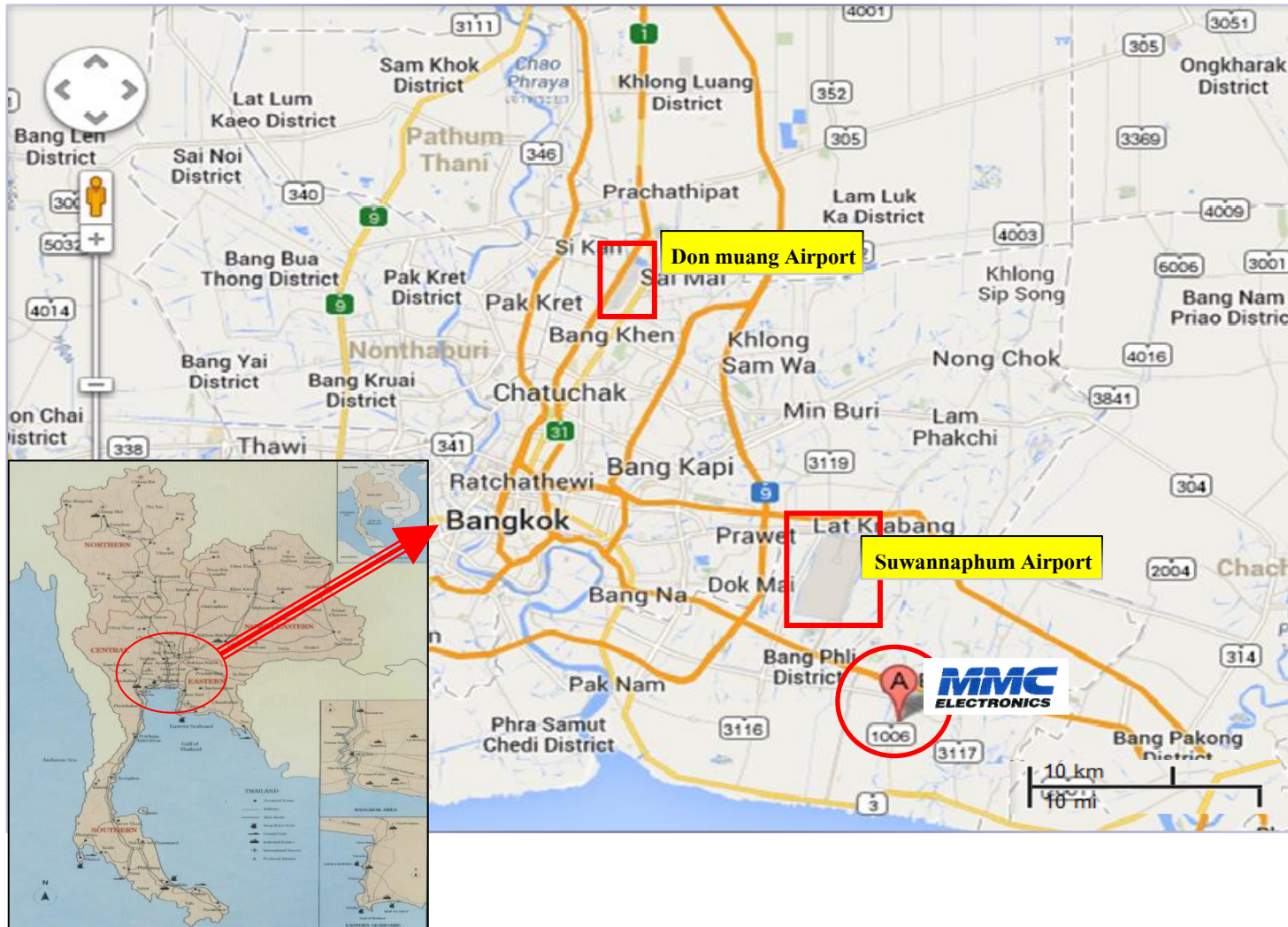


Overseas Network



Location

Bangplee Industrial Estate, 50Kms southesat from the Bangkok City



COMPANY PROFILE

Establishment 13 November 1987

Capital 566MTHB

Sales Amt. 670MTHB (for 2021)

Contents of Work

Production & Sales of Electronics Parts

Sales Products

Surge Absorbers (DSP,DSS,DA38,DE37,FA55,DA53,DB60)

Thermistor Sensors (CTH,FLAKE,DHT,GR25)

Other Products (Mitsubishi Materials Group Products)

Number of Employees 345

(as of E/Jan.2017 Japanese:5,Employees:184(M29,F155),Temp.:87)

Ground Area 10,720m² (Floor Space 5,464m²)

Company's History

- 1987. 11 Established Company(KCK CERAMICS CAPACITORS LTD.).
- 1988. 9 Started operating Disc Ceramic Capacitors.
- 1994. 10 MMC ELECTRONICS (THAILAND) LTD.
- 1996. 4 Became listed subsidiary company of MMC (Capital 172MTHB)
- 2000. 6 Increase the Capital (Capital 566MTHB)
- 2000. 12 Started operating Surge absorbers (DSP/DSS,DRV)
Chip thermistors (CTH)
- 2003. 2 Flake Thermistors (FLAKE) (⇒MMCE(M),Sanko Viet Nam)
- 2004. 8 Glass type On-board thermistors (DHT)
- 2008. 10 Chip thermistors (CTH) Taping
- 2009. 9 Surge absorbers (DA38,DE37)
- 2011. 4 Glass type Thermistors (GR25)
- 2011. 9 Surge absorbers (DB60)
- 2012. 12 Surge absorbers (CSA70)
- 2013. 2 Surge absorbers (DA53,FA55)
- 2013. 9 Bangkok sales office open
- 2014.11 IPO license
- 2016. 3 Non contact temperature censer
- 2016. 5 Surge absorber (CDA70L)

International Standard

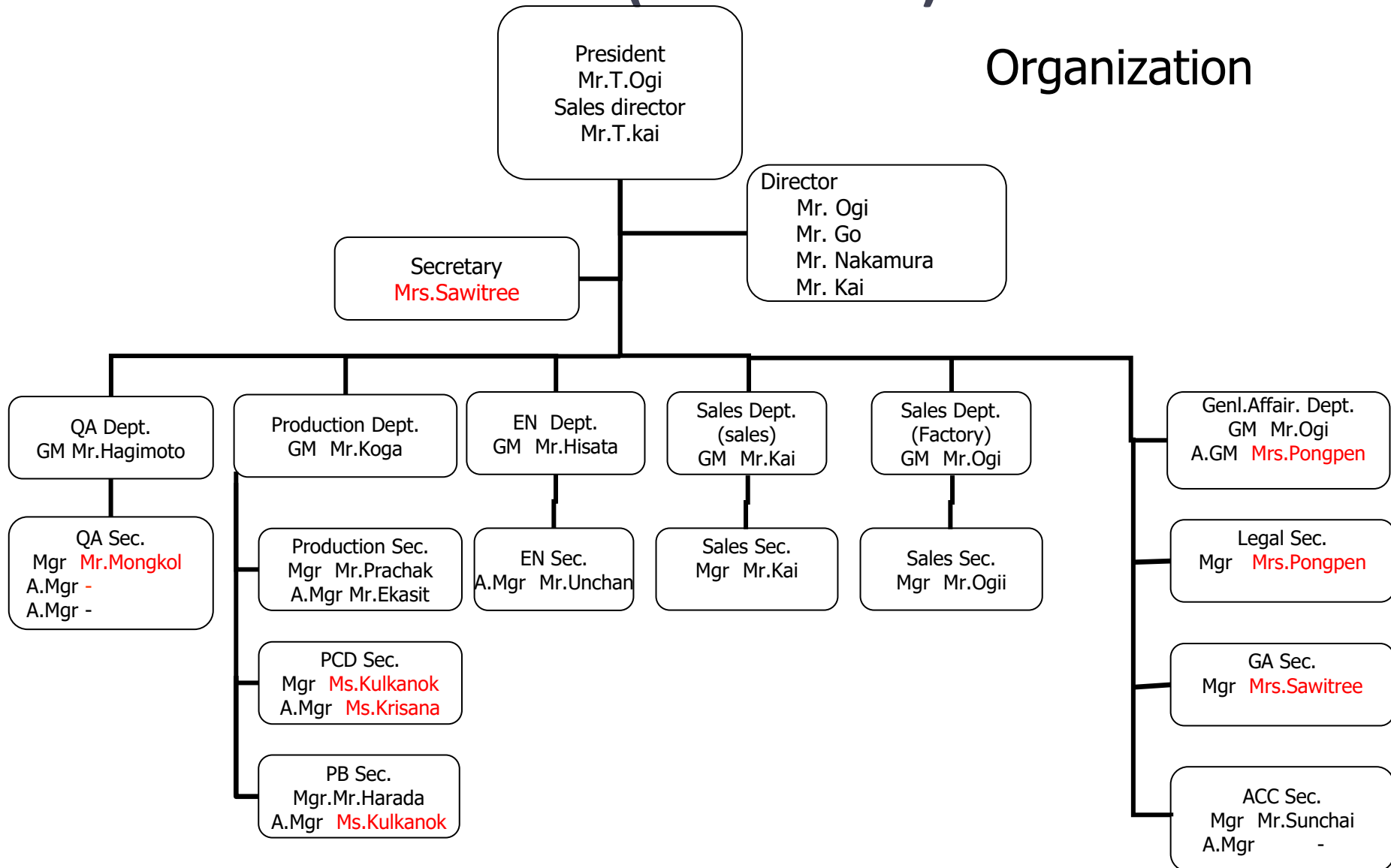
- 1997. 10 Certified ISO9002
- 2002. 7 Certified ISO9001-2000
- 2003. 11 Certified ISO14001
- 2006. 5 Certified ISO14001-2004
- 2009. 11 Certified ISO9001-2008
- 2012. 3 Certified ISO/TS16949-2009

Awards

- 2003. 8 Certified SONY GREEN PARTNER
- 2004. 12 Received SONY Supply Chain Management Award
- 2005. 12 Received SONY QCDS Silver Award
- 2006. 10 Received MACO Good Performance Award
- 2007. 9 Received MACO Good Performance Award
- 2008. 4 Received CANON Green Activity Award
- 2009. 6 Received OMRON Good Performance Award
- 2010. 9 Received MACO Green Product Award
- 2014. 5 Received NEC Good Performance Award

MMC ELECTRONICS (THAILAND) LTD.

Organization



Products

Surge Absorbers

Prevent abnormal high voltage



DSP

Prevent static electricity
Antenna circuit
Power supply (Choke coil)

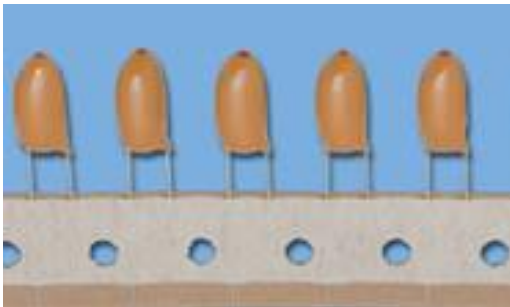


DSS

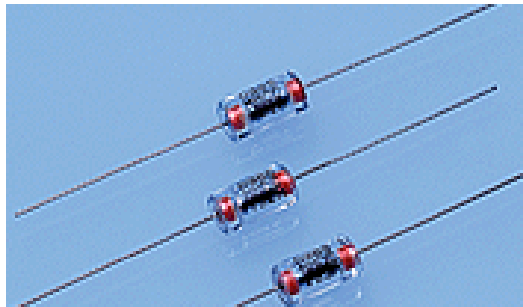


CSA70

Communication circuit
(Splitter, Modem, Security equipment)
CSA70: Surface mount type



DB60



DA53

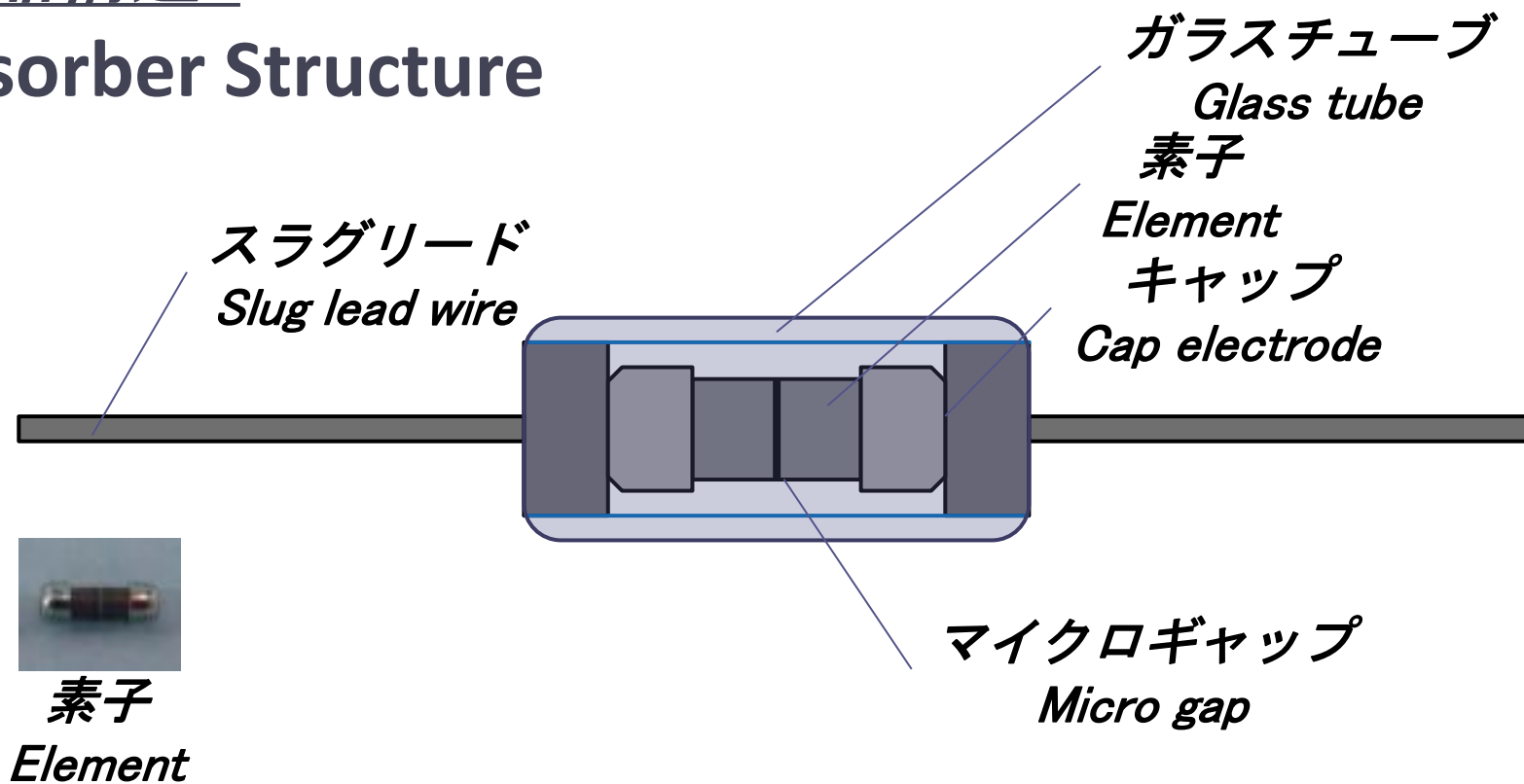


FA55

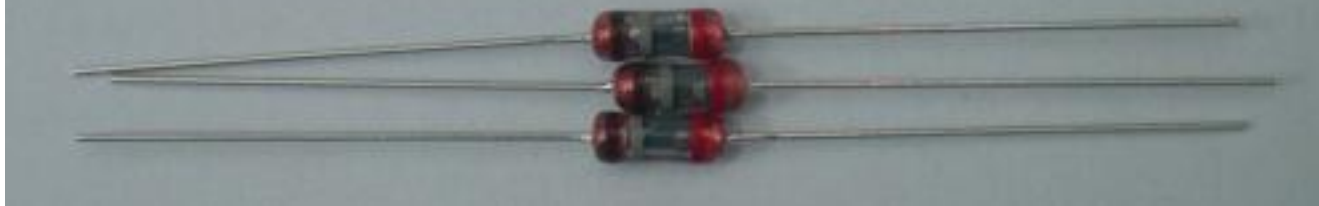
Power supply circuit
Prevention lightning-induced surge
(home electric appliances, industrial equipment ,Air conditioner)

〈製品構造〉

Absorber Structure



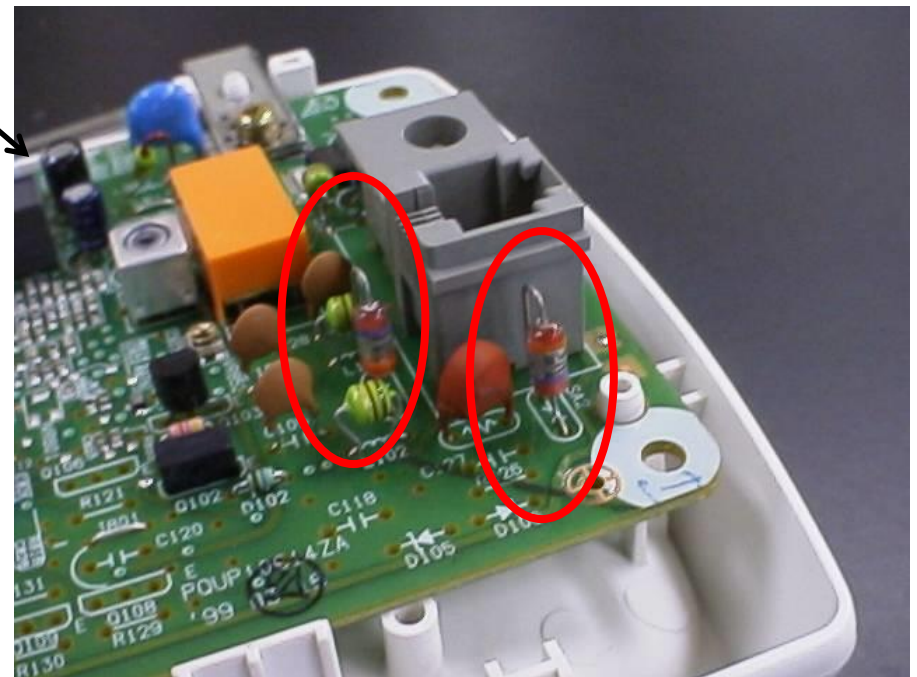
Spark in the micro gap when it is added high voltage surge ,then insulation resistance is lower



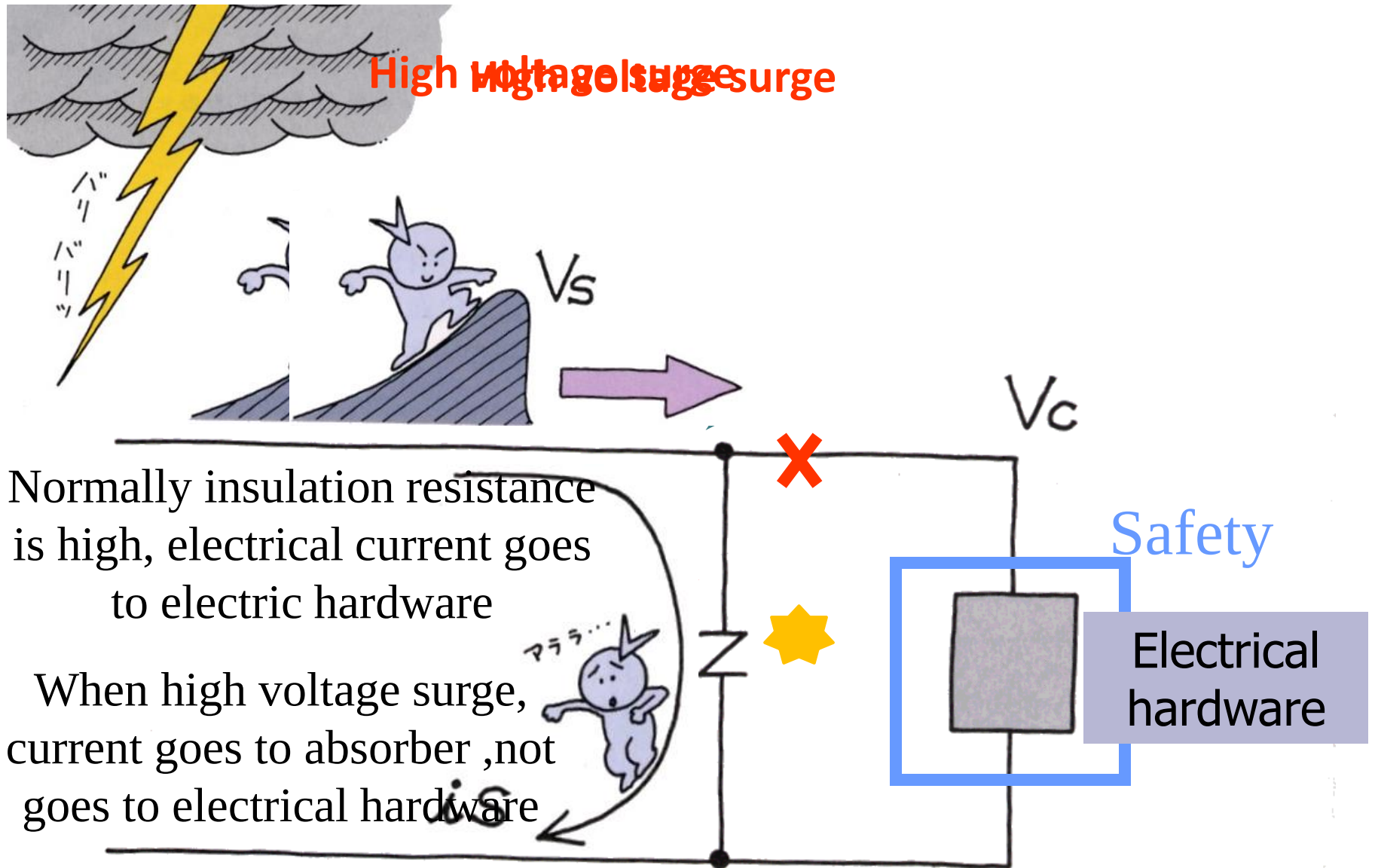
製品
Product

アブソーバーの使用例

電話機



Action of surge absorber



Products

Thermistor Measuring temperature

Chip Thermistor (CTH)

Surface mount type



Min $0.6 \times 0.3\text{mm}$

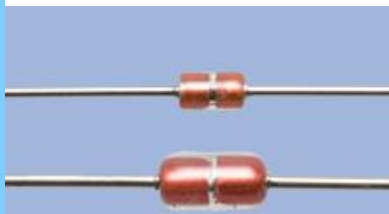
Thermistor element (For Sensor)



GR25



Flake chip



GA13, GA20

Application

- To prevent over heat for BP
- Temperature monitor for CPU, HDD
- Measurement temperature for Air conditioner, Refrigerator etc

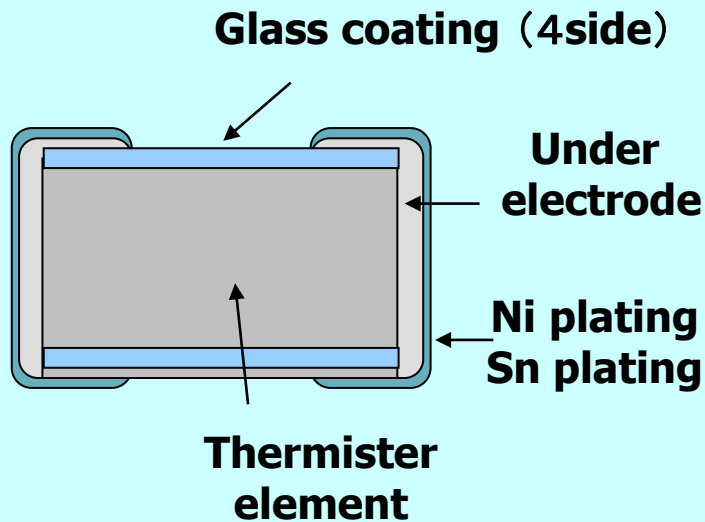
Usage example

- Mobile phone, personal computer
- Battery pack
- Air conditioner, Refrigerator
- Microwave oven
- Water heater
- Inlet air temperature sensor

Sensor: MMCE(M), MMELao,
Sanko VietNam

Structure of chip thermister

Structure



Characteristics

- High reliability (Glass coating)
- High precision resistance and B value
- Very small size
- High performance for high frequency

Manufacturing process of chip thermistor T series

Ceramic Plant



Thermistor material

Thermistor block

Mixing and calcination

Pulverization · granulation ·
Forming and firing

outsourcing



Thermistor wafer

Slicing process

MMETH



Stick(Tanzaku)

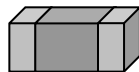
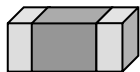
Chip

Glass coat
(Up and down)

Dicing

Glass coat
(side)

Dicing



Terminal electrode
Coating / Firing

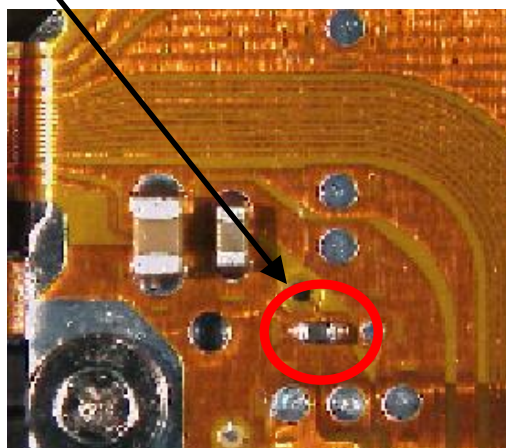
Plating
(Ni/Sn)

Resistance /
Appearance
sorting

Taping

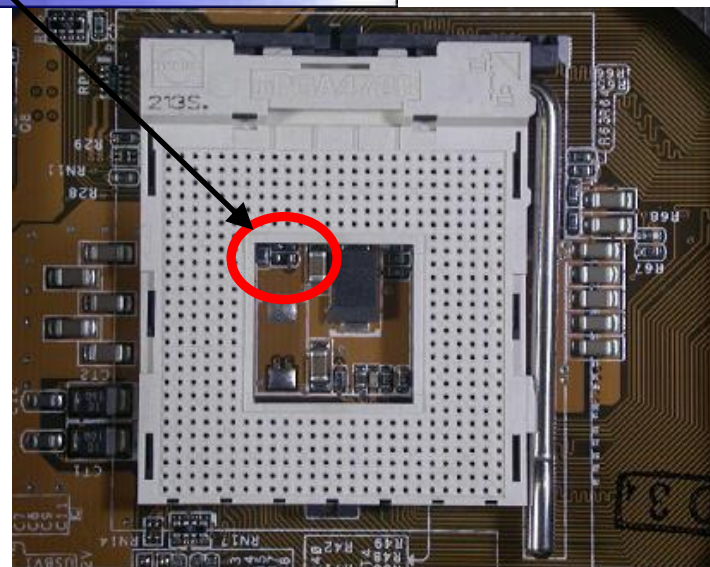
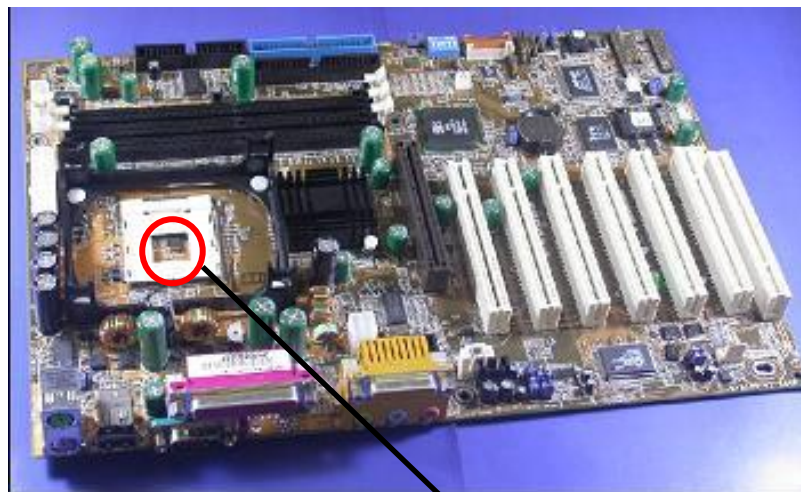
Shipping

チップサーミスタの使用例

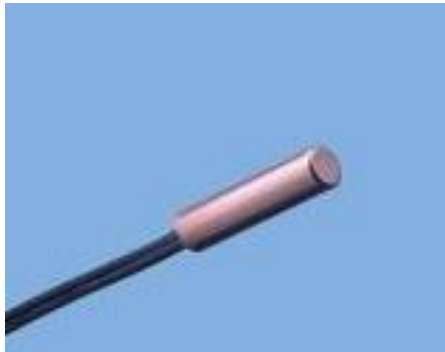


ハードディスク

マザーボード

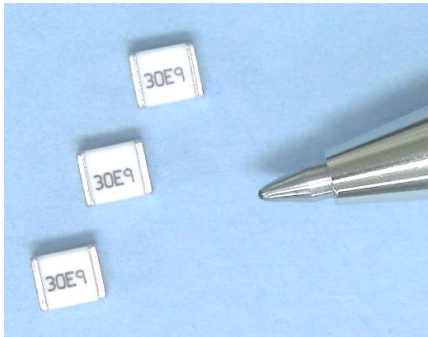


<サーミスタセンサー>

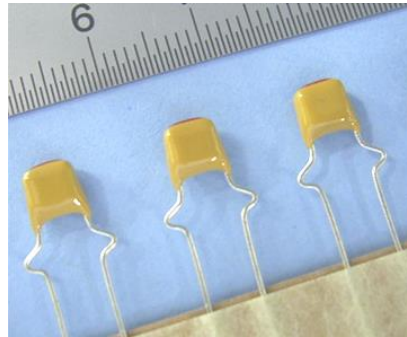


Thermistor Sensor

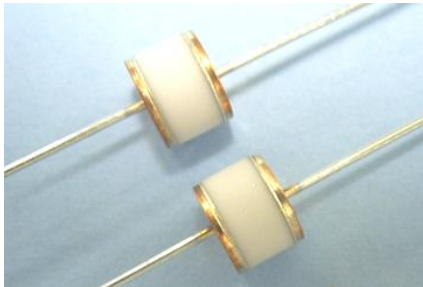
New Products



CDA70 series



CDA70L series



EA80 series

Surge absorber for power supply
(Non glass type)
SMD and Radial lead type

CDA70
Smaller size with same surge
strength
2016/5 Product in Thailand

EA80, EA50
Higher surge strength
(~20KA)



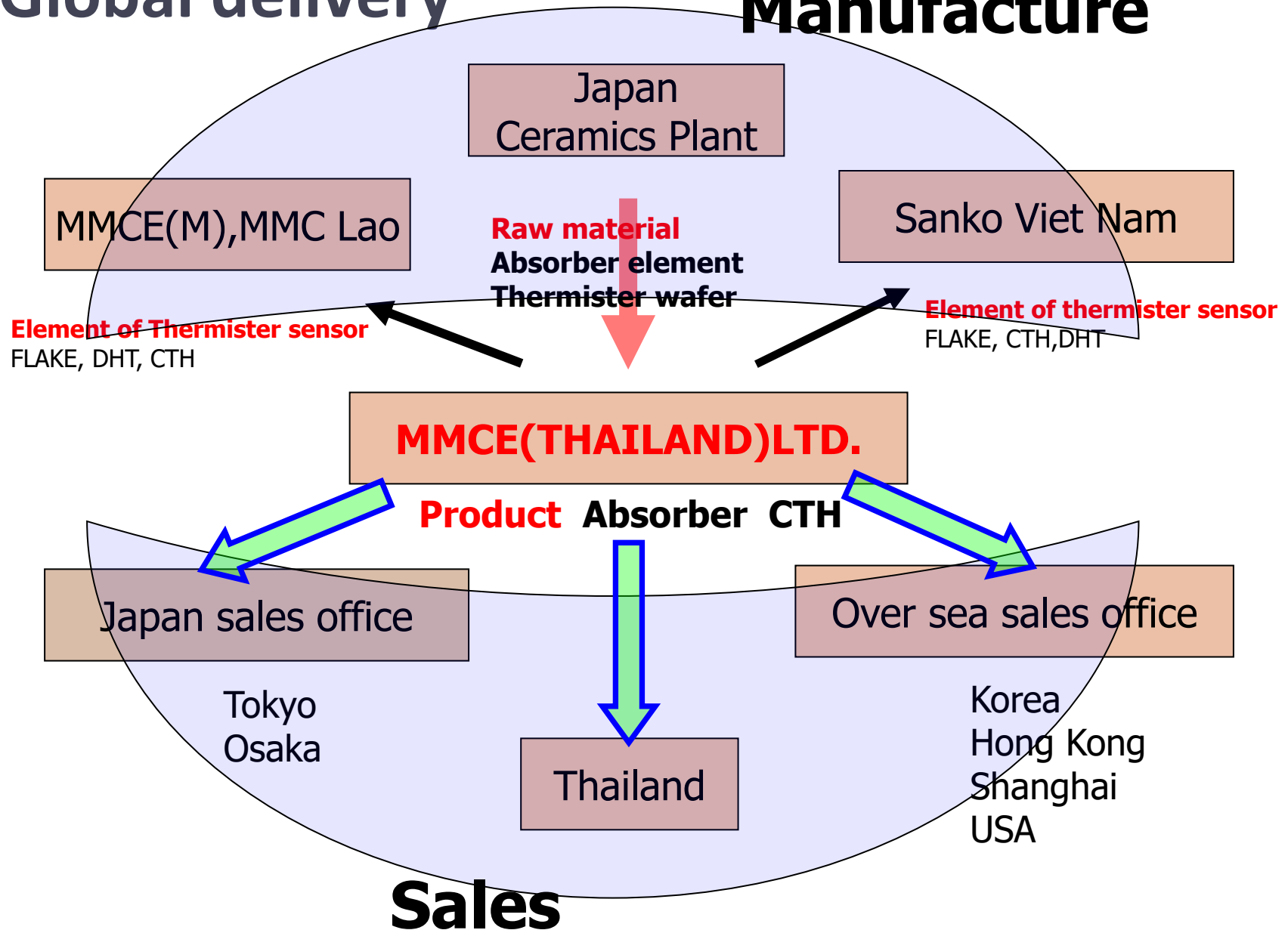
Measuring thermal radiation

2015/2 Production start in Thailand
(Partially process)
2016/3 All process in Thailand

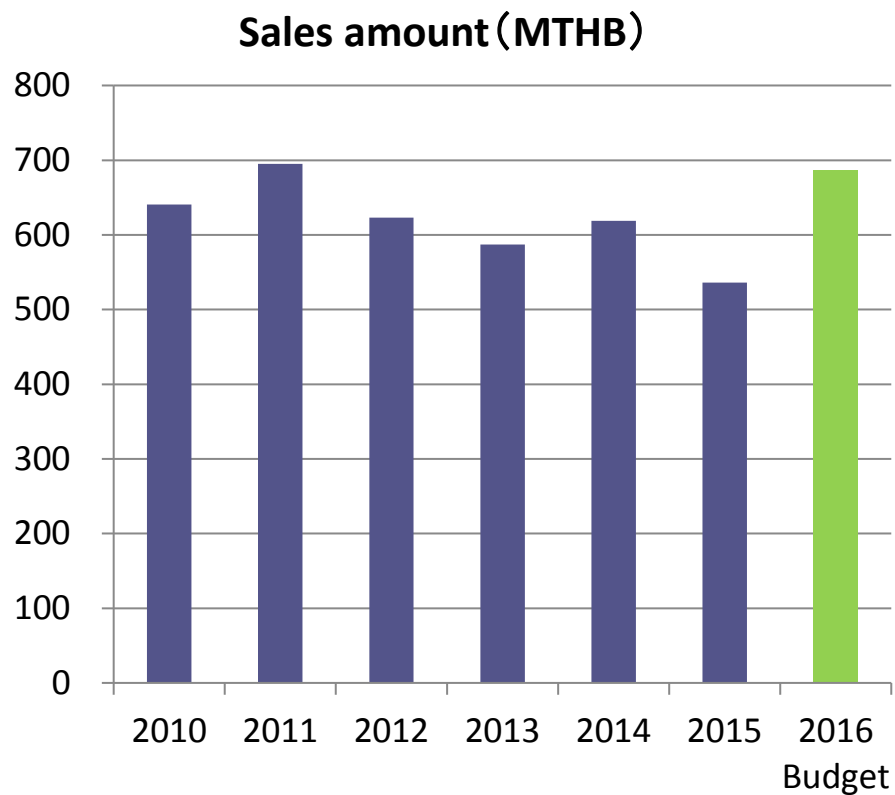
Non contact temperature sensor

Global delivery

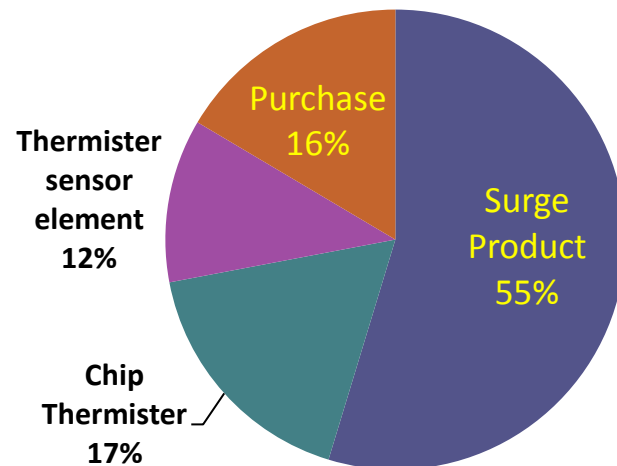
Manufacture



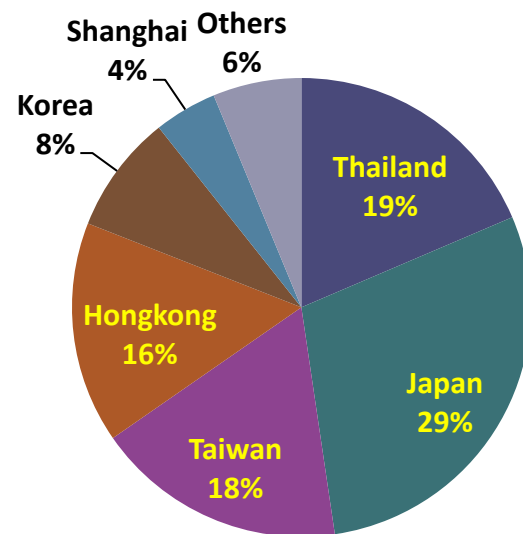
Sales amount



Sales composition



Sales Area



Factory Layout



Non contact temperature sensor



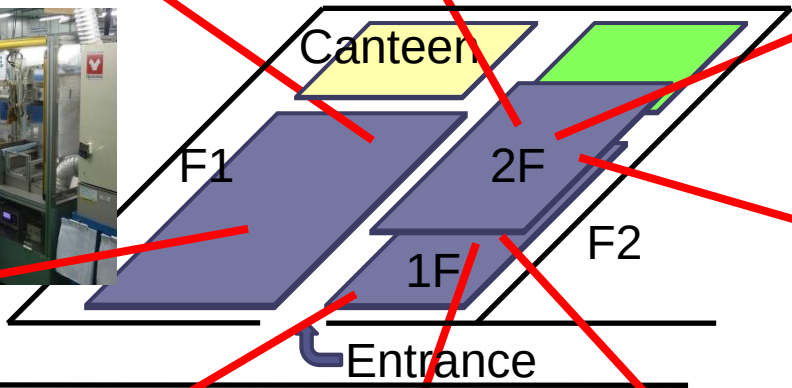
CTH R-sorting



Appearance



Thermistor GR type



Surge Electric Sorting



DSPS Enclosing



CTH Dicing



CTH Electrode termination

Power up of the Quality Control system

In-process QC



Manufacturing process audit



Education and Training



Education Training



Education plan and history

เอกสารสังกัดอ้างอิง 7 Page 1 / 2
Th EP-12 EDITION 17 付属書 7

AUGUST '2016 Revise Date : 17/08/2016

ตารางแผนผังความสามารถ (Skill map table) PROCESS
DAI SURGE

No.	Name	Employee No.	Depart	ENCLOSING	SOLDER DIPPING	ELECTRIC SORTING	COLOUR MARKING	APPEARANCE SORTING				BULK PACKING	TAPING
								DSP,DSS DE37	DA38	DA53	EA55		
1	MS.P.SINEENUCH	887098	PD					1	4	1	4		
2	MS.J. YUPA	884018	PD					2	3	2	3		
3	MS.S.THANEERA	902126	PD					1	4	1	4		
4	MS.T.PATRAPORN	909070	PD					2	3	2	3		
5	MS.LARUNYA	907157	PD					1	4	1	4		
6	MS.T. SADJA	919437	PD					2	3	2	3		
7	MS.S.NAREE	911225	PD					1	4	1	4		

ภาพ สัญลักษณ์ ที่แสดงถึงทักษะ ความสามารถของพนักงาน

Th ALL K-2050T EDITION 4 เอกสารสังกัดอ้างอิง 2

MGR.

รายการบันทึกผู้ที่ได้รับการรับรอง การคัดเลือกลักษณะภายนอก CTH

NO.	ชื่อ	ลงชื่อ	หน่วยงาน	วันให้การรับรอง	วันสิ้นสุดให้การรับรอง	REMARK
1	N.KANYARAT	N.Kanyarat	PD	17/8/2016	16/8/2017	CTH
2	K.SUDARAT	K.Sudararat	PD	17/8/2016	16/8/2017	CTH
3	S.M. JAI	S.M. Jai	PD	17/8/2016	16/8/2017	CTH
4	K.JANEJIRA	K.Janejira	PD	17/8/2016	16/8/2017	CTH
5	R.SUPRIYA	R.Supriya	PD	17/8/2016	16/8/2017	CTH

ภาพ สัญลักษณ์ ที่แสดงถึงทักษะ ความสามารถของพนักงาน

NO.	Sybol	สัญลักษณ์	Skill	ทักษะ ความสามารถ
1			Super Job	ผู้ให้การฝึกหัด
2			ผู้ที่ได้รับการรับรอง	
3			Trainee	
4			QC. INSPECTION	



Thank you very much