



微波爐用高壓二極管  
**High Voltage Diodes for Micro-wave Oven**

**2CL3509+2CLS01**

**Sharp Code: FH-DZA135WRZZ**

拟制 PREPARED BY	审核 CHECKED BY	批准 APPROVED BY	日期 DATE
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# UPDATED RECORD OF SPECIFICATIONS

No.	Prepared Date	Contents For Update	Cause For Update	Date Of Implementation
1				
2				
3				
4				
5				
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8				
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10				

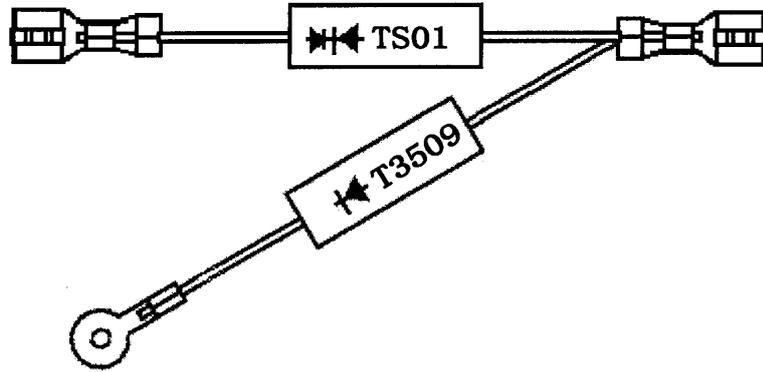
## 原材料及供应商明细表

### LIST OF RAW MATERIALS AND SUPPLIER

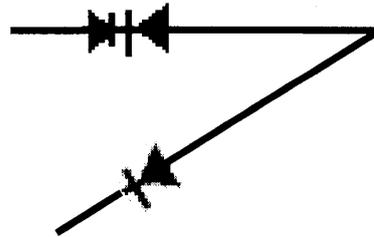
NO	原材料名称 Raw Materials Name	供应商 Supplier	备注 Note
1	硅片 Silicon Wafer	Tianjin Huan-Ou Semiconductor Material Technology Co.,Ltd.	
		Luoyang Silicon Co.,Ltd.	
2	引线 Lead	Tianjin Yutong Wire Material Co.,Ltd.	引线为Φ1.2 裸铜线 Sn plated Cu Wire 1.2 Ø
3	端子 Terminal	Wst/Jst/AMP	WST:B40405BS-2(Round Terminal) JST : STO-81T-250N (Long Terminal) AMP: 170213-2 (Long Terminal)
4	焊片 Solder	Bazhou Bangzhuang Electric Material Co.,Ltd	
5	油墨 Ink	Bon Markelectronic Components Co.,Ltd.	
6	环氧树脂 Epoxy Resin	Jiangsu Huawei Electric Co.Mltd.	Model: EME2500 UL Certificate :E59481
7	PI 胶 Polyimide	Shanghai Dongrong Chemical Co.,Ltd.	

## 外形及内部构造

### 外形



### 内部构造





# 2CL3509

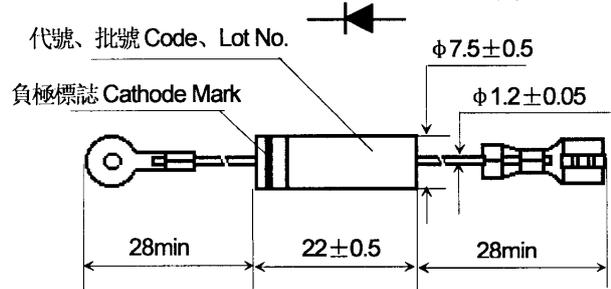
## 微波爐用高壓二極管 High Voltage Diodes for Micro-wave Oven

### ■特徵 Features

- $I_F$  (AV) 350mA
- $V_{RRM}$  9kV
- 高可靠性 High reliability
- 环氧树脂 Epoxy resin UL94V-0

### ■外形尺寸和印記 Outline Dimensions and Mark

單位 Unit: mm



### ■用途 Applications

- 微波爐及其他電子設備高壓電源整流用  
Rectification for high voltage power supply of magnetron in Micro wave oven and others

型號 Type	代號 Code	負極標誌 Cathode Mark
2CL3509	T3509	

### ■極限值 (絕對最大額定值)

#### Limiting Values (Absolute Maximum Rating)

參數名稱 Item	符號 Symbol	單位 Unit	2CL3509	
反向重複峰值電壓 Repetitive Peak Reverse Voltage	$V_{RRM}$	kV	9	
正向平均電流 Average Forward Current	$I_{F(AV)}$	mA	350	(正弦半波 50Hz, 電阻負載, $T_a \leq 60^\circ C$ *) (50Hz Half-sine wave, Resistance load, $T_a \leq 60^\circ C$ )
正向浪湧電流 Forward Surge Current	$I_{FSM}$	A	30	(正弦半波 50Hz, 一個周期, $T_a = 25^\circ C$ ) (50Hz Half-sine wave, 1 cycle, $T_a = 25^\circ C$ )
反向浪湧電流 Reverse Surge Current	$I_{RSM}$	mA	100	(方波, $W_p = 1ms$ , 單脈衝, $T_a = 25^\circ C$ ) ( $W_p = 1ms$ , Rectangular-wave, One-shot, $T_a = 25^\circ C$ )
有效結溫 Virtual Junction Temperature	$T_{(vj)}$	$^\circ C$	130	
貯存溫度 Storage Temperature	$T_{stg}$	$^\circ C$	-40 ~ +130	

\* 散熱方式: 將負極端子固定在厚度為 0.6mm, 面積為 50mm×50mm 以上的散熱片上, 風冷條件: 0.5m/s

Cooling Requirement: Cathode terminal is fastened to radiating fin that size is more than 50mm×50mm×0.6mm Wind-cooled velocity is more than 0.5m/s

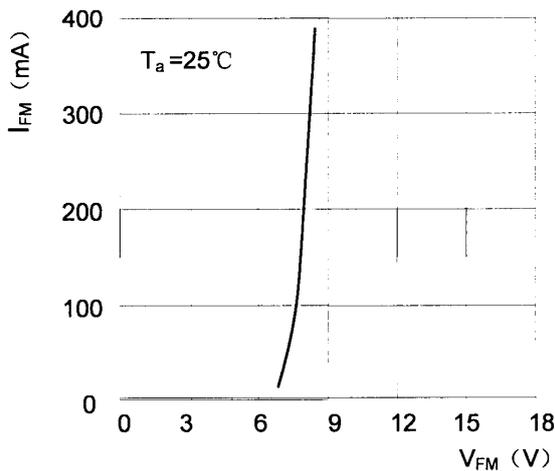
### ■電特性 ( $T_a = 25^\circ C$ 除非另有規定)

#### Electrical Characteristics ( $T_a = 25^\circ C$ Unless otherwise specified)

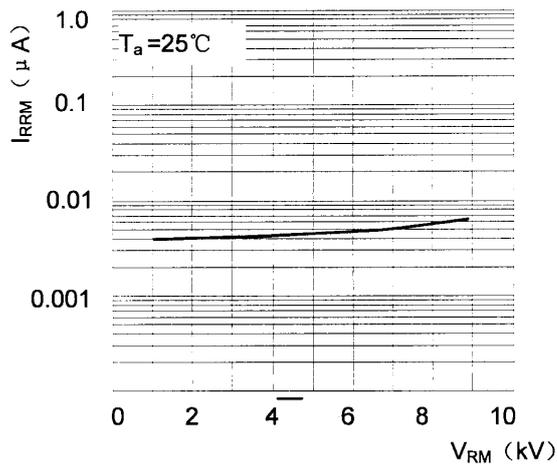
參數名稱 Item	符號 Symbol	單位 Unit	測試條件 Test Condition	2CL3509
正向峰值電壓 Peak Forward Voltage	$V_{FM}$	V	$I_{FM} = 350mA$	$\leq 9$
反向峰值電流 Peak Reverse Current	$I_{RRM1}$	$\mu A$	$V_{RM} = V_{RRM}$	$\leq 5$
雪崩擊穿電壓 Avalanche Breakdown Voltage	$V_{(BR)}$	kV	$I_R = 100 \mu A$	$\geq 9.5$



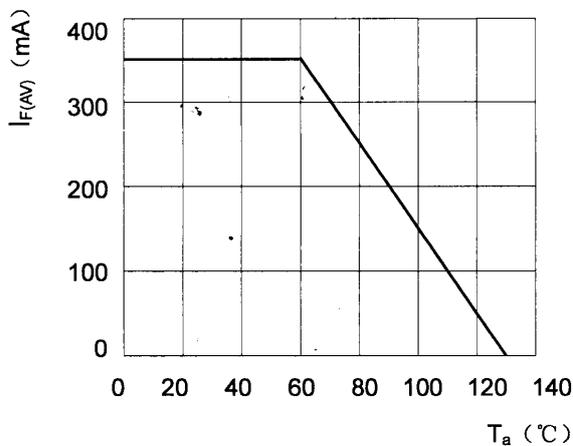
■特性曲綫 (典型) Characteristics(Typical)



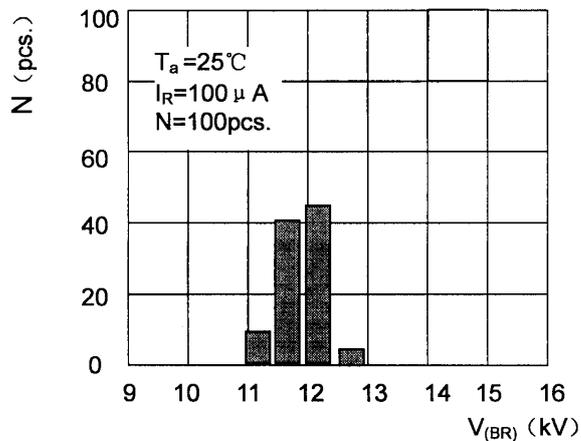
正向特性  
Forward Characteristics



反向特性  
Reverse Characteristics



正向平均電流降額曲綫  
I<sub>F(AV)</sub> — T<sub>a</sub> Derating



擊穿電壓分佈  
Breakdown Voltage Distribution



# 2CLS01

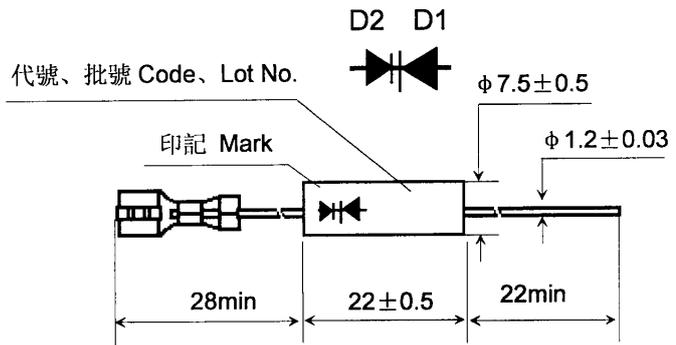
## 微波爐用高壓二極管 High Voltage Diodes for Micro-Wave Oven

### ■特徵 Features

- 小型 small size
- 高可靠性 High reliability
- 高電流容量 High current capability.

### ■外形尺寸和印記 Outline Dimensions and Mark

單位 Unit: mm



空號 Type	2CLS01
代號 Code	TS01

### ■用途 Applications

- 微波爐及其他電子設備保護高壓線路  
Rectification for high voltage circuit in micro wave oven and others.

### ■極限值 (絕對最大額定值)

#### Limiting Values (Absolute Maximum Rating)

參數名稱 Item	符號 Symbol	單位 Unit	2CLS01	
			D1	D2
反向重複峰值電壓 Repetitive Peak Reverse Voltage	$V_{RRM}$	kV	6	1.7
有效結溫 Virtual Junction Temperature	$T_{(vj)}$	°C	130	
貯存溫度 Storage Temperature	$T_{stg}$	°C	-40 ~ +130	

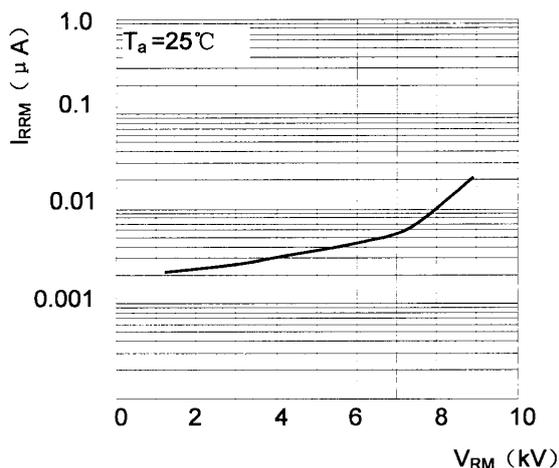
### ■電特性 ( $T_a=25^\circ\text{C}$ 除非另有規定)

#### Electrical Characteristics ( $T_a=25^\circ\text{C}$ Unless otherwise specified)

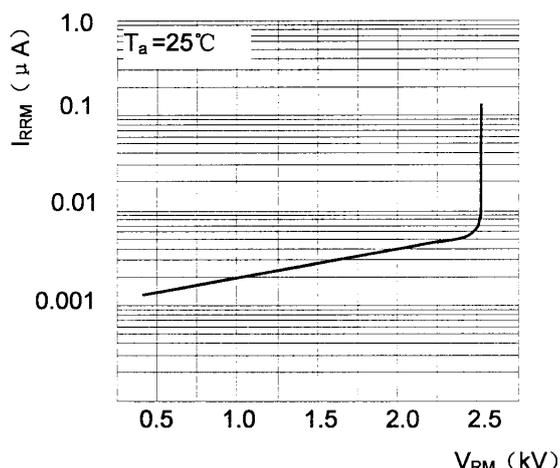
參數名稱 Item	符號 Symbol	單位 Unit	測試條件 Test Condition	2CLS01	
				D1	D2
反向峰值電流 Peak Reverse Current	$I_{RRM1}$	$\mu\text{A}$	$V_{RM}=V_{RRM}$	$\leq 10$	
雪崩擊穿電壓 Avalanche Breakdown Voltage	$V_{(BR)}$	kV	$I_R=100\mu\text{A}$	$\geq 7$	2.1-2.8



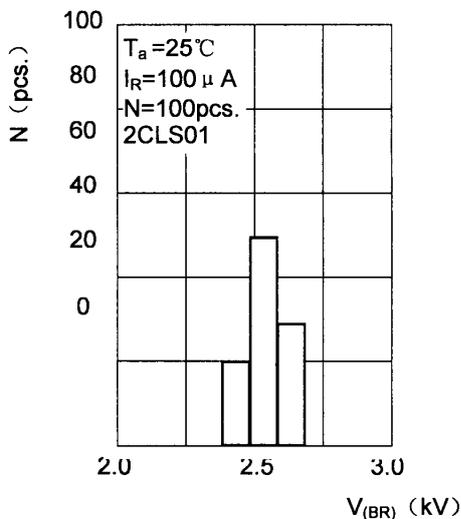
■特性曲綫 (典型) Characteristics(Typical)



D1 反向特性  
Reverse Characteristics for D1



D2 反向特性  
Reverse Characteristics for D2



D2 反向擊穿電壓分佈  
Reverse Breakdown Voltage Distribution of D2

## Lot on the Body

Table 1 Code

Model	Code
2CL3509	T3509
2CL3512	T3512
2CL4509	T4509
2CL4512	T4512
2CL3509H	T3509 H
2CL3512H	T3512 H
2CL4509H	T4509 H
2CL4512H	T4512 H

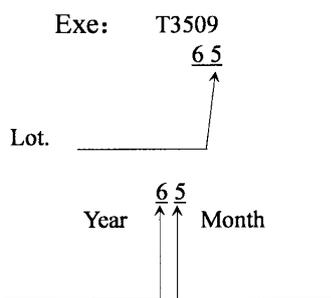


Table 2 Lot. No.

Year	2006											
Year Char.	6											
Month	1	2	3	4	5	6	7	8	9	10	11	12
Month Char.	1	2	3	4	5	6	7	8	9	O	N	D



## Reliability Test( 2CL3509)

### 1. Test Conditions

No.	Item	Rating	Conditions
1	High Temperature Storage Test	1000 hours	$T_a=130\pm 2^{\circ}\text{C}$ , in air
2	Low Temperature Storage Test	1000 hours	$T_a=-40\pm 2^{\circ}\text{C}$ , in air
3	Temperature Cycle Test	10 cycles	$-40^{\circ}\text{C}$ (30min.)~ $130^{\circ}\text{C}$ (30min.), in air
4	Moisture Resistance Test	500 hours	$T_a=85^{\circ}\text{C}$ , 85%RH
5	Boil	8 hours	$T_a=100^{\circ}\text{C}$ , Pure Water
6	High Temperature Reverse Bias Test	1000 hours	Half sinewave voltage with $f=50\text{hz}$ applied, $T_a=100^{\circ}\text{C}$
7	Insulation Resistance Test	1000M $\Omega$ or more	Between the center of the body and terminal See Fig.1
8	Insulation Strength Test	15KV	1 minute between the center of the body and terminal See Fig.1
9	Drop Test	2 time	Naturally drop from 1m height on maple plate
10	Lead Pull Test	10 sec.	Static load 20N as per See Fig.2
11	Lead Bend Test	Lead bend test	Static load 10N as per See Fig.3
12	Press Cooker Test	96 hours	Temperature: $121^{\circ}\text{C}$ , Press : 203kPa RH: 100%

### 2 .Acceptance Criteria

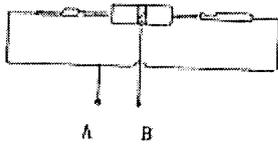
(1)Item No.1~6 The product shall meet the electrical specifications after being exposed to normal temperature for one hour completion of the test.

(2)Item No.7~8 The product shall meet the rating.

(3)Item No.9~11 There shall be no trouble in testing and the electrical characteristics shall be met.

**3. Fig.**

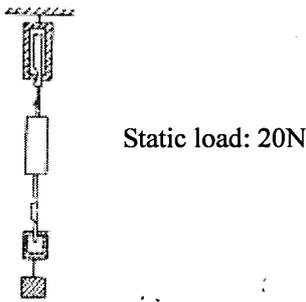
**(1) Fig.1** Insulation resistance test and insulation strength test



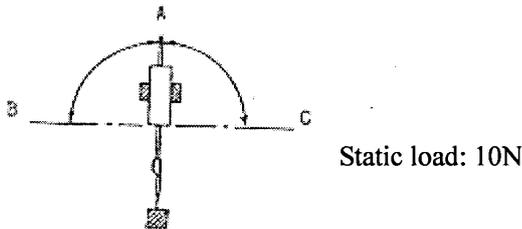
Roll metal foil with 3mm width around center of the body

Insulation resistance test condition: Measure between A and B by using a DC 500V insulation resistance tester.  
insulation strength test condition: Apply half sine wave voltage with 15KV wave height between A and B in insulation liquid.

**(2) Fig.2** Lead pull test



**(3) Fig.3** Lead bend test



The lead shall be bend in A→B→A→C→A



## Reliability Test( 2CLS01)

### 1. Test Conditions

No.	Item	Rating	Conditions
1	High Temperature Storage Test	1000 hours	$T_a=130\pm 2^{\circ}\text{C}$ , in air
2	Low Temperature Storage Test	1000 hours	$T_a=-40\pm 2^{\circ}\text{C}$ , in air
3	Temperature Cycle Test	10 cycles	$-40^{\circ}\text{C}$ (30min.)~ $130^{\circ}\text{C}$ (30min.), in air
4	Moisture Resistance Test	500 hours	$T_a=85^{\circ}\text{C}$ , 85%RH
5	Boil	8 hours	$T_a=100^{\circ}\text{C}$ , Pure Water
6	High Temperature Reverse Bias Test	1000 hours	Half sinewave voltage with $f=50\text{hz}$ applied, $T_a=100^{\circ}\text{C}$
7	Insulation Resistance Test	1000M $\Omega$ or more	Between the center of the body and terminal See Fig.1
8	Insulation Strength Test	15KV	1 minute between the center of the body and terminal See Fig.1
9	Drop Test	2 time	Naturally drop from 1m height on maple plate
10	Lead Pull Test	10 sec.	Static load 20N as per See Fig.2
11	Lead Bend Test	Lead bend test	Static load 10N as per See Fig.3
12	Press Cooker Test	96 hours	Temperature: $121^{\circ}\text{C}$ , Press : 203kPa RH: 100%

### 2 .Acceptance Criteria

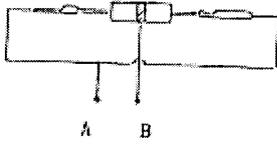
(1)Item No.1~6 The product shall meet the electrical specifications after being exposed to normal temperature for one hour completion of the test.

(2)Item No.7~8 The product shall meet the rating.

(3)Item No.9~11 There shall be no trouble in testing and the electrical characteristics shall be met.

**3. Fig.**

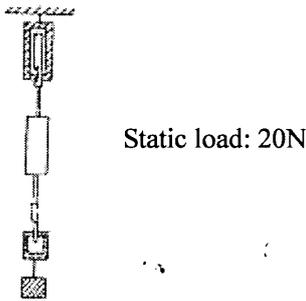
**(4) Fig.1 Insulation resistance test and insulation strength test**



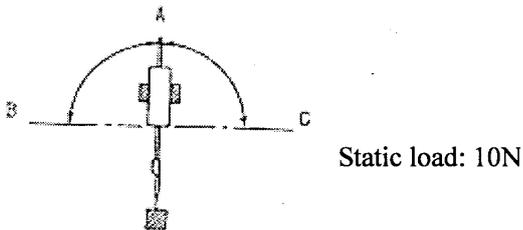
Roll metal foil with 3mm width around center of the body

Insulation resistance test condition: Measure between A and B by using a DC 500V insulation resistance tester.  
insulation strength test condition: Apply half sine wave voltage with 15KV wave height between A and B in insulation liquid.

**(5) Fig.2 Lead pull test**



**(6) Fig.3 Lead bend test**



The lead shall be bend in A→B→A→C→A

# SHIPMENT INSPECTION

PRODUCT NAME		EPOXY MOLDED HIGH VOLTAGE SILICON DIODE	
TYPE		2CL3509,2CLS01	
No.	Test item	n	Test Condition
A1	External visual examination	45	Visual examination
A2a	Inoperative devices	328	$I_{FM}=350/450mA, V_{RM}=9kV, T_{amb}=25^{\circ}C.$
A2b	$V_{FM}, I_{RRMI}$ measurement	76	$I_{FM}=350/450mA, V_{RM}=9kV, T_{amb}=25^{\circ}C.$
B1	Exterior size	15	$\phi D, L$
B3	Lead bending	15	Two bends in opposite directions, Force: 10N, Tested leads number: 2.
B6	Free fall	15	1000mm 2 times
B8	High temperature reverse bias	22	$T_{amb}=100^{\circ}C V_{RM}=9kV 168h.$
C1	Diameterd of lead, Length of lead	8	$\phi D, L$
C2c	$I_{FSM}, I_{RSM}$ .	15	$I_{FSM}=30A, I_{RSM}=100mA.$ Number of cycles per surge:1 Number of surge: 1.
C3	Lead Pulling	15	Force: 20 N Tested terminal: 2, Time: 10 s
C5a	Change of Temperature	11	$TA=-40^{\circ}C, TB=130^{\circ}C.$ Test time: $t1=30$ min, Transition time: $t2=2-3$ min, Cycles:10.
C5b	Boil	11	Pure water: $100^{\circ}C$ Time: 8h
C7	Damp heat, Steady-State, Accelerated	11	Temperature: $85^{\circ}C \pm 2^{\circ}C$ Relative Humidity: $(85 \pm 5)\%$ Time: 500h
C8	Electrical endurance (1000h)	22	$V_{RWM}=9kV, Ta=100^{\circ}C,$ time: 1000 h, Sine-wave 50 Hz, The length of lead between body and electrode should not short than 5 mm.
C9a	Storage at low temperature	15	$(-40 \pm 2)^{\circ}C, 1000h.$
C9b	Storage at high temperature	15	$(130 \pm 2)^{\circ}C, 1000h.$

# 微波炉用高压硅堆工艺流程及 QC 工程图

HIGH VOLTAGE DIODES FOR MICROWAVE OVEN PROCESS FLOW

AND

QUALITY MANAGEMENT FLOW DIAGRAM

序号 No.	流程 Flow	工序名称 Process Name	控制项目 Control Item	控制方法 Control Method	主要设备 Main Equipment
01	□	硅片检验 Wafer Inspection	电阻率 Resistivity	50 片/盒 抽验 50pcs/box Sampling Inspection	电阻率测试仪 Resistivity Tester
			厚度 Thick.		厚度测试仪 Thick. Tester
			直径 Dia.		千分尺 Calliper
			外观 Appearance		100%检验 Total/Lot 目检 Visual examination
02	○	磷—硼扩散 P-B Diffusion	温度 Temp. 时间 Time	扩散前炉温检测 Temp. Testing Before Diff. 扩散中自动控制 Auto Control in Diff.	温度测试仪 Temp. Tester 扩散炉 Diff. Furnace
			方块电阻 $R_{\square}$ Sheet Resistance	5 片/批 5 pcs/Lot	方块电阻测试仪 $R_{\square}$ Tester
03	□	检验 Inspection	结深 $X_j$ Junction Depth	1 片/批 1 pc/Lot $\bar{X}-R$ 管理图 $\bar{X}-R$ Management Diagram	读数显微镜 Microscope
			方块电阻 $R_{\square}$ Sheet Resistance	100%检验 100% Inspection	方块电阻测试仪 $R_{\square}$ Tester
04	□	一次先行试验 First Pretest	$V_{FM}$ 、 $V_Z$ $I_{R1}$ 、 $I_{R2}$	50 支/批 50 pcs/Lot	检验试验设备 Relative Testing Apparatuses
05	○	镀镍、镀金 Nickel Plating & Gold Plating	温度 Temp. 时间 Time	1 次/批 1 Time/ Lot	镀镍、镀金设备 Nickel Plating & Gold Plating Equipment 温度测试仪 Temp. Tester
06	○	焊片检验 Soldering Inspection	尺寸 Dimension	1 片/批 1 pc/Lot	千分尺 Calliper
			外观 Appearance		目检 Visual examination
			先行试验 Pretest	13 片/批 13 pcs/Lot	相应仪器设备 Relative Apparatuses
07	○	合金 Stack Bonding	温度 Temp. 时间 Time	自动控制 Auto Control	合金炉 Conveying Furnace
			厚度 Thick.	100%检验 100% Inspection	厚度测试仪 Thick. Tester
08	○	切断 Slicing	硅条厚度 Thick. of Slice	1 条/5 条 1 Slice/5 Slices	限度规 Calliper
09	○	选别 Dice Inspection	外形尺寸 Dice Dimension	100%检验 100% Inspection	测试设备 Testing Apparatuses
			$V_F$ 、 $I_F$		
10	○	管芯化学处理 Dice-Etching	温度 Temp. 时间 Time	自动控制 Auto Control	化学腐蚀设备 Chemical Etching Equipment
			腐蚀量 Etching Depth	2 支/架 2 pcs/Carrier $\bar{X}-R$ 管理图 $\bar{X}-R$ Management Diagram	投影仪 Projector

# 微波炉用高压硅堆工艺流程及 QC 工程图 (续)

HIGH VOLTAGE DIODES FOR MICROWAVE OVEN PROCESS FLOW

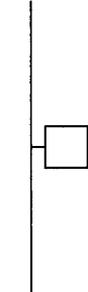
AND

QUALITY MANAGEMENT FLOW DIAGRAM (CONTINUED)

序号 No.	流程 Flow	工序名称 Process Name	控制项目 Control Item	控制方法 Control Method	主要设备 Main Equipment	
11		组装烧结 Assembling & Bonding	温度 Temp. 链速 Chain Speed	自动控制 Auto Control	链式炉 Conveying Furnace	
12		管粒化学处理 Etching & Cleaning	温度 Temp. 时间 Time	自动控制 Auto Control	腐蚀设备 Etching Equipment	
13		□	聚酰亚胺检验 Polyimide Inspection	粘度 Viscosity	1 次/批 1 time/Lot	粘度测试仪 Viscosity Tester
				外观 Appearance		目检 Visual examination
				先行试验 Pretest	28g/批 28g/Lot	相应仪器设备 Relative Apparatuses
14		涂胶 PI Coating	粘度 Viscosity	1 次/批 1 time/Lot	粘度测试仪 Viscosity Tester	
15		胶固化 PI Curing	温度 Temp. 时间 Time	自动控制 Auto Control	烘箱 Oven	
16		□	环氧塑封料 检验 Epoxy Inspection	外观 Appearance	1 次/批 1 time/Lot	目检 Visual examination
				先行试验 Pretest	制成 50 支样品/批 Making 50 pcs/Lot	相应仪器设备 Relative Apparatuses
17		塑料封装 Epoxy Molding	温度 Temp. 压力 Pressure 注塑速度 Injection Speed	自动控制 Auto Control	塑封机 Molding Machine	
18		后固化 Post Curing	温度 Temp. 时间 Time	自动控制 Auto Control	烘箱 Oven	
19		□	二次先行试验 Second Pretest	$V_{FM}$ 、 $V_Z$ 、 $I_{R1}$ 、 $I_{R2}$	15 支/批 15 pcs/ Lot	相关仪器 Relative Apparatuses
20		○	全数测试打印 Test & Marking	$V_{FM}$ 、 $I_{R1}$ 印记 Mark	100%测试 Total/Lot Testing	自动测试打印机 Auto Test & Marking Machine
21		○	外观检验 Appearance Insp. 25 支 $I_{R1}$ 测试 25 pcs $I_{R1}$ Testing	25 支 $I_{R1}$ 并联测试 25 pcs $I_{R1}$ Parallel Retest	100%检验 Total/Lot Inspection	$I_{R1}$ 测试仪 $I_{R1}$ Tester
22		○	包装 Packing	数量 Quantity 极性方向 Polarity Direction	100%检验 Total/Lot Inspection	目检 Visual examination
23		□	成品检验 Finished Products Inspection	$V_{FM}$	50 支/批 50 pcs/Lot	$V_{FM}$ 测试仪 $V_{FM}$ Tester
				$I_{R1}$	50 支/批 50 pcs/Lot	$I_{R1}$ 测试仪 $I_{R1}$ Tester
				$V_Z$	50 支/批 50 pcs/Lot	$V_Z$ 测试仪 $V_Z$ Tester

微波炉用高压硅堆工艺流程及 QC 工程图(续)

HIGH VOLTAGE DIODES FOR MICROWAVE OVEN PROCESS FLOW  
AND  
QUALITY MANAGEMENT FLOW DIAGRAM (CONTINUED)

序号 No.	流程 Flow	工序名称 Process Name	控制项目 Control Item	控制方法 Control Method	主要设备 Main Equipment
24		质量一致性检验 (出厂前最终检 验) Quality Conformance Inspection (The Last Inspection)	A 组 A group	逐批检验 Lot by Lot	相关设备 Relative Equipment
			B 组 B group	逐批检验 Lot by Lot	
			C 组 C group	周期检验 Periodic	
25		入库 Storage			

1. Change Information.

As follows at each generation of the important change matter of the correspondence, apply to manager of Supplies Department for united document set by Sharp Corp. execute it.

Important change matter.

(1) Change by safety standard (new established and change equipment).

(2) Design change (specification, mechanism, circuit and composition material).

Design change means that the material we procure or use based on Sharp Corp. design is to procure or use the material not approved.

(3) Production place change (factory change, new addition of cooperation company, change, and abolition)

(4) Change various inspection methods, work methods, and processing methods.

(5) Change which influences other quality.

When we apply for the above-mentioned important matter change, we append material (data) which proves securing the demand quality.

2. Ozone depleting substances.

No CLASS-I, CLASS-II ozone depleting substances are used in this component or its manufacturing (as defined under section 611 of the clean air act.)

Substances under control: CFC-11,12,13,111,112,113,114,116,211,212,213,214,215,216,217,  
Halon-1211,1301,2402, Carbontetracloride, Methyl chloroform.

3. Brominated materials fro flame-retardant.

Substance under control: PBBOs, PBDO, PBDPO, PBDE, PBDPE, DBDO, OBDO, TBDO, PBBs.

4. Law concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances.

All the materials used in this part are registered material under the Law concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances.

5. Heavy materials.

All the materials used in this part do not contain nor apply heavy materials.

Substances under control: Mercury, Lead (but except soldering, Lead glass), Cadmium, Chromium Frixide.

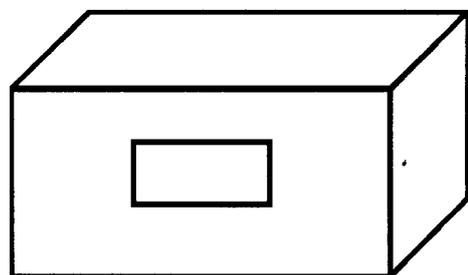
For internal connection, the high-melting point solder (Pb: 85% or more) is used. (i.e. Rohs compliant).



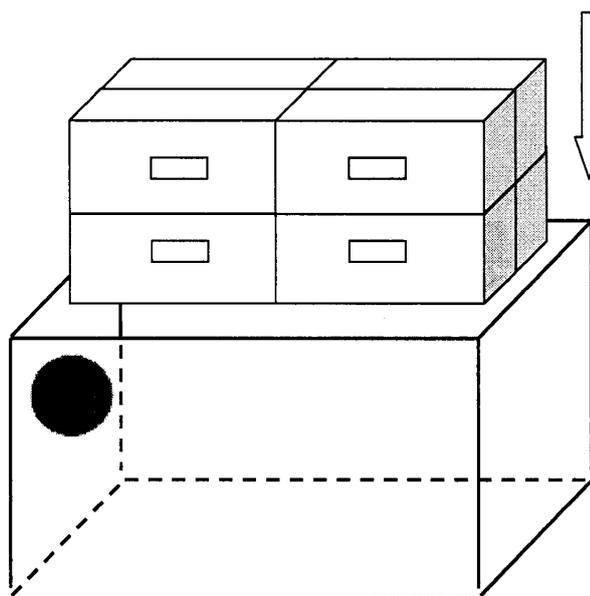
# 包裝說明 Packing Illustration

(适用于微波爐用高壓二極管 Applied to High Voltage Diodes used for Micro-wave Oven)

包裝物名稱	尺寸 Size mm	產品數量 Product Quantity 支 pcs.	備註 Remarks
小塑膠袋 Small polybag	130×90	10	每 5 個小塑膠袋放入 1 個中塑膠袋。 Every 5 small polybags are packed in a middle polybag.
	155×90		
中塑膠袋 Middle polybag	195×130	50	每 10 個中塑膠袋繙入 1 個紙盒。 Every 10 middle polybags are packed in a paperboard box.
	215×130		
紙盒 Paperboard box	220×160×100	500	每 8 個紙盒放入 1 個紙箱。 Every 8 paperboard boxes are packed in a carton. 紙盒上印有型號、批號、數量、生產日期等內容。 The paperboard box printed TYPE, DATE CODE, QUANTITY, PRODUCTION DATE etc on surface.
紙箱 Carton	465×345×235	4000	紙箱表面印有產品名稱、型號、收貨單位等內容并粘貼 ROHS 标签。 The carton printed Product Name, Type, Customer Name etc on surface. ROHS MARK will be pasted on surface.



紙盒 Paperboard Box



紙箱 Carton

The labels on the boxes and cartons are as follows:

<b>TYPE</b>		<b>2CL3509+2CLS01</b>	
<b>SHARP CODE</b>		<b>FH-DZA135WRZZ</b>	
<b>LOT NO.</b>		<b>SUPPLIER NAME</b>	<b>TJZHSEMI</b>
<b>QUANTITY</b>		<b>500pcs</b>	
<b>PRODUCTION DATE</b>			

<b>SEMICONDUCTOR</b>			
<b>SHARP CODE</b>		<b>RH-DZA135WRZZ</b>	
<b>TYPE</b>		<b>2CL3509 + 2CLS01</b>	
<b>LOT NO.</b>		<b>SUPPLIER NO.</b>	
<b>QUANTITY</b>		<b>4000pcs</b>	
<b>PRODUCTION DATE</b>			

1. Scope.

This specification shall only apply to the packing of Zhonghuan High Voltage Diode 2CL3509 & 2CL4509 to Sharp Corp.

2. Packing condition.

Please look above page for detailed packing condition.

3. Indication.

Each carton.

Customer name,P/O No., Part No., Quantity and shipping date shall be described in the packing label attached onto the outside of the carton.

4. Packing label.

The following information is included on a packing label.

- (1) Customer's P.O. number.
- (2) Customer's part number.
- (3) Zhonghuan part number.
- (4) Delivery date.
- (5) Shipping date.
- (6) Quantity to be shipped.
- (7) Number of box.
- (8) The country of origin: MADE IN CHINA.
- (9) RoHS Directive Compliance.( A RoHS Compliance Mark)

To: SHARP Corporation

**Report on Environmental Impact Substances  
Contained in Parts and Materials**

Date of Preparation: Feb 25, 2007

Name of Company: Tianjin Shenghuan

Name of Department: O.C Dept.

We guarantee the following verified results on the environmental impact substances:

**1. Information on survey applicable part:**

- 1) Part Name High Voltage Diode
- 2) Sharp Part Code Number FH-D2A15WR-22
- 3) Manufacturer's Part Code Number 2CL3D + 2CL501

**2. Presence of banned substances in the part (material)**

No.	Substances	Details (Criteria)	Verified Result
1	Hexavalent chromium compound	Content is 1000ppm or less. Not intentionally added. (*1)	Not present/ Present ✓
2	Bis(tri-n-butyltin) oxide	Not intentionally added.	Not present/ Present ✓
3	Tributyl tins (TBTs) and Triphenyl tins (TPTs)	Not intentionally added. (Only tributyl tin compound and triphenyl tin compound are subject to the regulation.)	Not present/ Present ✓
4	Polybrominated biphenyls (PBBs)	Content is 1000ppm or less. Not intentionally added.	Not present/ Present ✓
5	Polybrominated diphenyl ethers (PBDEs)	Content is 1000ppm or less. Not intentionally added.	Not present/ Present ✓
6	Polychlorinated biphenyls (PCBs)	Not intentionally added. (Only polychlorinated biphenyl and polychlorinated triphenyl are subject to the regulation.)	Not present/ Present ✓
7	Polychlorinated naphthalene	Not intentionally added. (Only poly chlorinated naphthalene with three chlorines and more is subject to the regulation.)	Not present/ Present ✓
8	Short chain chlorinated paraffin	Not intentionally added. (Only C:10-13 are subject to the regulation.)	Not present/ Present ✓
9	Asbestos	Not intentionally added.	Not present/ Present ✓

Note: When the verified results show the substances are "present", the part or material is prohibited by the SHARP standard.

**3. Presence of banned substances depending on application**

No.	Substances	Details (Criteria)	Verified Result(*2)
1	Cadmium and its compound	Content is 100ppm or less. Not intentionally added. (*1)	Not present/ Present ✓
2	Lead and its compound	Not intentionally added. Content in plastics is 300ppm or less. Content in others is 1000ppm or less. (*1)	Not present/ Present ✓
3	Mercury and its compound	Content is 1000ppm or less. Not intentionally added. (*1)	Not present/ Present ✓
4	Ozone-depleting substances	Content is 1000ppm or less. Not intentionally added. (Only Class I and II substances regulated by the Montreal Protocol are subject to the regulation.)	Not present/ Present ✓
5	Arsenic and its compound	Content is 1000ppm or less. Not intentionally added.	Not present/ Present ✓
6	Beryllium and its compound	Content is 1000ppm or less. Not intentionally added.	Not present/ Present ✓
7	Azo colorants	Not intentionally added.	Not present/ Present ✓
8	Polyvinyl Chloride	Not intentionally added.	Not present/ Present ✓
9	Phthalate esters	Content is 1000ppm or less. Not intentionally added.	Not present/ Present ✓
10	Radioactive substances	Not intentionally added.	Not present/ Present ✓
11	Formaldehyde	Wood component: atmospheric concentration is 0.1ppm or less (by the chamber method). Plastics/fibers: content is 75ppm or less.	Not present/ Present ✓

\*1) For packaging part and packaging material, the total concentration of these 4 heavy metals in part/material, ink and paint which constitute a package is 100ppm or less each.

\*2) When the verified result shows the substances are "present", please complete and return the "CONFIRMATION OF USE" form which details use of each substance.

Name of person in charge: Yang Zhao  
Signature: Yang Zhao

Prepared: Shaojun Chen  
Signature: Shaojun Chen



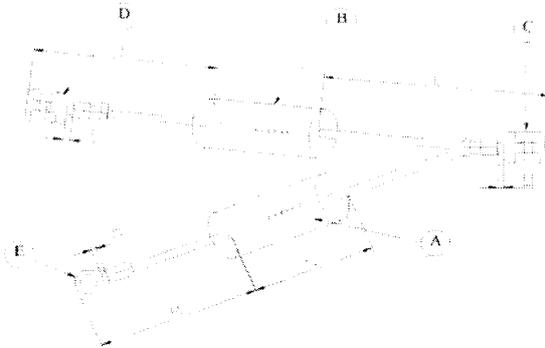


HOEI MATSUYAMA (THAILAND) CO., LTD.

—OUTGOING INSPECTION SHEET

Approved	Checked	Prepared

Parts Name	DIODE ASS'Y	Customer	SHARP APPLIANCES (THAILAND) LTD.
Parts No.	<b>RH-DXA135WRZZ</b>	Quantity	Pcs.
Production Lot N		Sampling of Dimension	<b>5 PCS / LOT</b>



Item	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
Standard	Appearance		Appearance			2.35±0.05	1.45±0.05	1.80±0.05	Min. 20 Kgs.	Min. 20 Kgs.	Min. 22 Kgs.	(33.8)	(32.5)	22 ±0.5	1 ±0.5	Appearance
No. Result	OK. NG.	OK. NG.	OK. NG.	OK. NG.	OK. NG.	Value (mm.)	Value (mm.)	Value (mm.)	Value	Value	Value	Value (mm.)	Value (mm.)	Value (mm.)	Value (mm.)	OK, NG.
1																
2									-	-	-					
3									-	-	-					
4									-	-	-					
5									-	-	-					
6																
7																

Sampling of Appearance ..... PCS. **MIL-STD-105E AQL S-2 (0.40%)**

Remark:

A = HV. Diode Type : 2CL3509                      B = HV. Diode Type : 2CLS01

C = Terminal Type : STO-81T-250N              D = Terminal Type : STO-61T-250N

E = Terminal Type : CSS14325-N2                F = Crimp height terminal point C

G = Crimp height terminal point D                H = Crimp height terminal point E

I = Tensile strength terminal point C            J = Tensile strength terminal point D

K = Tensile strength terminal point E            L = Dimension L

M = Dimension M                                    N = Dimension N

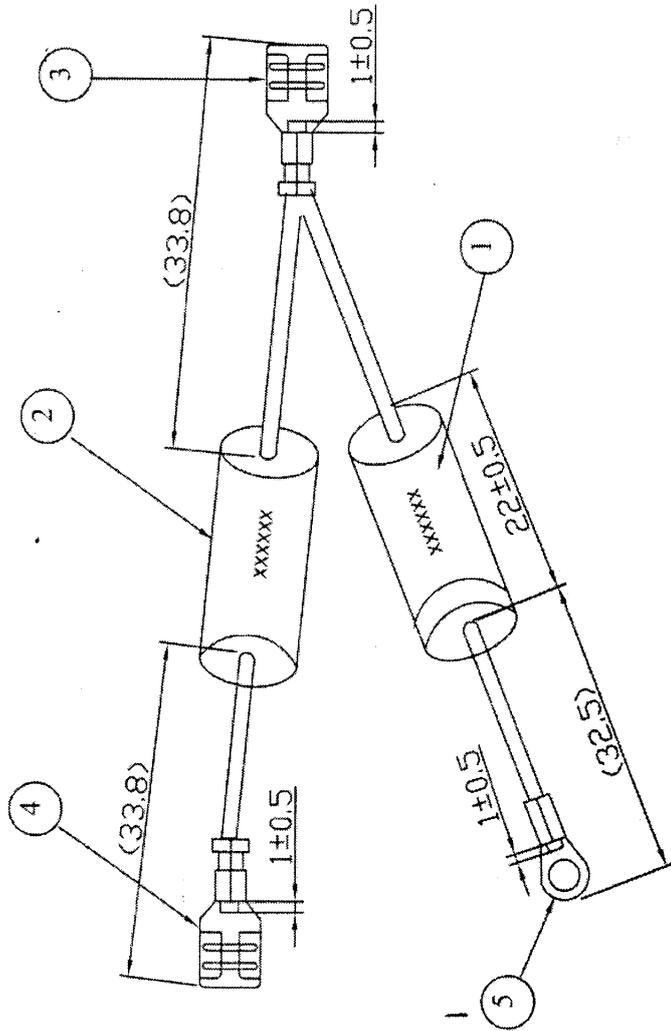
O = Dimension O                                    P = Label and Q'ty Packing

SS2
QC. Judgment

# HMT

## HV. RECTIFIER ASS'Y

### SPECIFICATIONS



#### REMARK

- 1) TERMINAL STO-61T-250N W.C.H. 1.45±0.05
- 2) TERMINAL STO-81T-250N W.C.H. 2.35 ± 0.05 , I.C.H. 4.25 ± 0.05
- 3) TERMINAL CSS14325-N2 W.C.H. 1.8± 0.05
- 3) TENSILE STRENGTH (TERMINAL STO) >20 KG.
- 4) TENSILE STRENGTH (RING TERMINAL) >22 KG.

DRAWING	CHECKED	APPROVED
	<i>[Signature]</i> 6/14/07	<i>[Signature]</i> 6/14/07
MODEL	FH-DZAI35WRZZ	
CUSTOMER	SHARP	
HMT CODE	SS2	
1.HV. DIODE 1 2CL3509 , TIANJIN		
2.HV. DIODE 2 SCL501 , TIANJIN		
3.TERMINAL STO-81T-250N (JST) OR 170213-2 (AMP)		
4.TERMINAL STO-61T-250N (JST) OR 170213-2 (AMP)		
5.TERMINAL CSS14325-N2 (NICHIFU) OR SRC-50T-M4 (JST)		
DATE	REVISION	
25 DEC 2006	0	
8 MAR 2007	1. CHANGE TERMINAL NO.4	
19 MAR 2007	2. ADDITION REMARK	
27 MAR 2007	3. ADDITION DIMENSION	
5 APR 2007	4. ADD CRIMPED TOLERANCE AND CHANGE DIODE PART & ADD TERMINAL	
DRAWING NO.	PS110633	