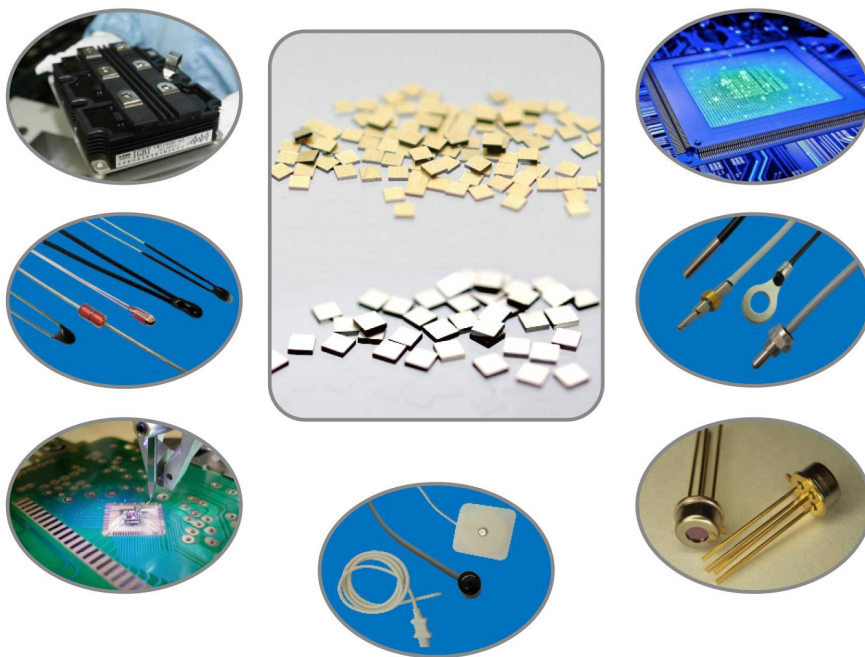


# exsense

传递温度·感知冷暖

## NTC 热敏电阻芯片 NTC Thermistor Chip

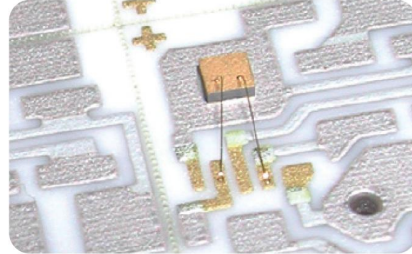
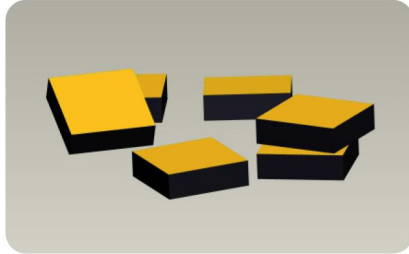


高精度 High Accuracy  
高可靠 High Reliability  
高灵敏 High Sensitivity

**ES**<sup>®</sup> 广东爱晟电子科技有限公司  
EXSENSE Electronics Technology Co., Ltd.

# 金电极热敏电阻芯片

## Gold Electrode Thermistor Bare Chip



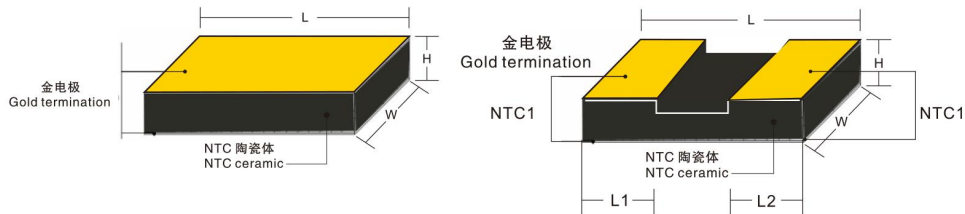
### 应用 Application

- ✧ 用于邦定（红外热电堆、IGBT、热敏打印头、集成模块、半导体模块、功率模块等）、制作温度传感器
- ✧ Bonding (infrared thermal reactor, IGBT, thermal printer head, integrated module, semiconductor module, power mould etc), temperature sensor etc.

### 特点 Key Features

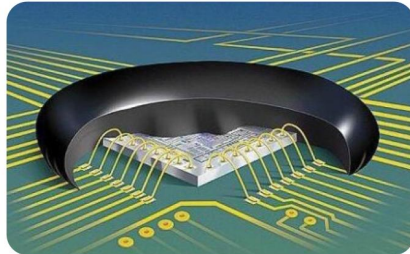
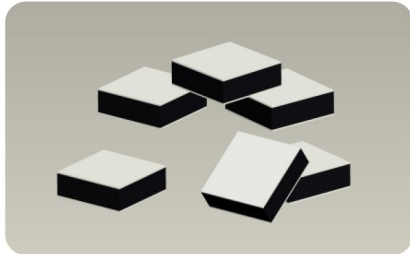
- ✧ 采用金电极，可靠性更高，采用金、铝、银线邦定
- ✧ 高精度可达  $\pm 0.3\%$ 、 $\pm 1\%$ 、 $\pm 3\%$
- ✧ 高稳定性、高可靠性
- ✧ 体积小，最小可做 $0.3 \times 0.3\text{mm}$
- ✧ 快速反应
- ✧ 可根据客户要求定制不同尺寸及参数
- ✧ Adopt gold electrode, higher reliability, gold/aluminum/silver wire bonding
- ✧ High accuracy, can reach  $\pm 0.3\%$ ,  $\pm 1\%$ ,  $\pm 3\%$
- ✧ High stability & reliability
- ✧ Small size, can be  $0.3 \times 0.3\text{mm}$
- ✧ Fast response
- ✧ Customized sizes and parameters are available

### 尺寸图 Dimension



# 高可靠银电极芯片

## High Reliability Silver Electrode NTC Chip



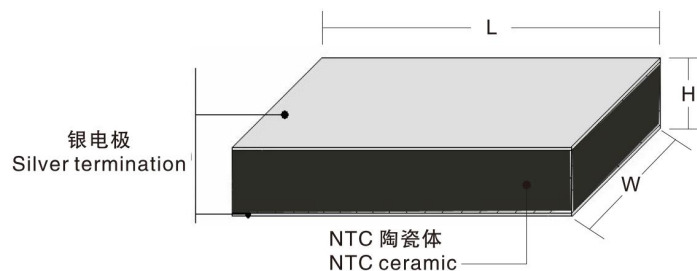
### 应用 Application

- ✧ 邦定 ( 红外热电堆、IGBT、热敏打印头、集成模块、半导体模块、功率模块等 )
- ✧ 温度传感器、医疗测温
- ✧ 家电类测温、智能家居、太阳能等
- ✧ 汽车空调、汽车引擎等
- ✧ Bonding (infrared thermal reactor, IGBT, thermal printer head, integrated module, semiconductor module, power mould etc.)
- ✧ Temperature sensor, medical measurement
- ✧ Home appliance/ smart home, solar home appliance, etc.
- ✧ Automotive air conditioner and engine, etc.

### 特点 Key Features

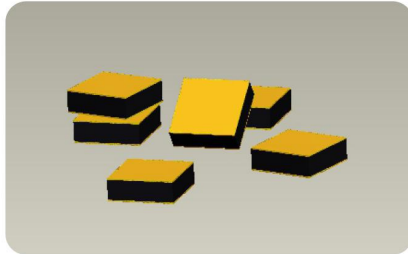
- ✧ 采用银电极，性价比高
- ✧ 可采用金/银线邦定
- ✧ 高稳定性，高可靠性
- ✧ 体积小、快速反应
- ✧ 精度可达  $\pm 1\%$
- ✧ 适合各种封装
- ✧ 可根据客户要求定制不同尺寸及参数
- ✧ Adopt silver electrode, high cost performance
- ✧ Gold/silver wire bonding
- ✧ High stability & reliability
- ✧ Small size, fast response
- ✧ Accuracy reaches to  $\pm 1\%$
- ✧ Suitable for all kinds of encapsulation
- ✧ Customized sizes and parameters are available

### 尺寸图 Dimension



# 军品级超稳芯片

## Military Grade Super Stable NTC Chip



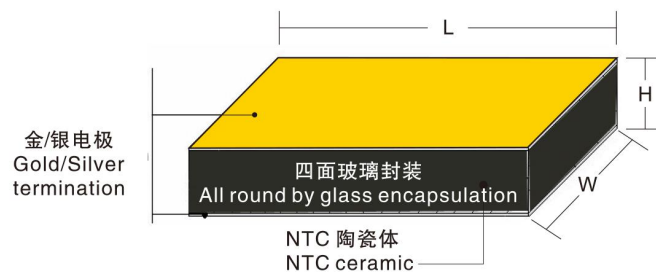
### 应用 Application

- ✧ 军品级传感器
- ✧ 航天航空
- ✧ 医疗、汽车等
- ✧ Military grade sensor
- ✧ Aerospace/satellite etc
- ✧ Medical device/vehicle etc

### 特点 Key Features

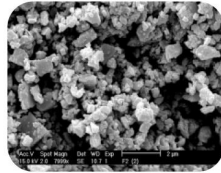
- ✧ 芯片半导体陶瓷表面采用玻璃封装，可靠性更高
- ✧ 年变化率超低、可达  $\pm 0.01\%$
- ✧ 可靠性稳定性极高
- ✧ 耐高温、高精度
- ✧ 响应时间快
- ✧ Adopt glass encapsulation on the semiconducting ceramic surface to make it with higher reliability
- ✧ Super low yearly changing rate to  $\pm 0.01\%$
- ✧ Super high reliability and stability
- ✧ High temperature and accuracy
- ✧ Fast response

### 尺寸图 Dimension

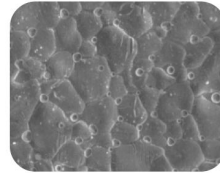


# 品质检测 Quality Control

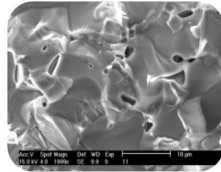
## ★ 材料结构微观检控 Microcosmic QC of Material Structure



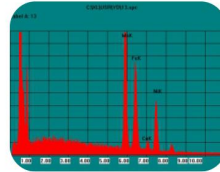
NTC半导体陶瓷粉体品质控制  
NTC Semiconductor Ceramic Powder QC



表面电极微观结构品质控制  
The Surface of Electrode Grain QC

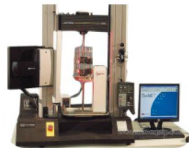


NTC半导体陶瓷烧结晶型结构品质控制  
NTC Semiconductor Ceramic Sintering Grain QC



NTC半导体材料成份检测控制  
NTC Semiconductor Material QC

## ★ 机械强度可靠性 Reliability of Mechanical Intensity



引脚拉力测试  
Pulling Test



元件离心力测试  
Centrifugal Force Test



邦定/焊锡结合强度测试  
Bonding/Soldering Intensity Test



元件机械冲击强度测试  
Mechanical Shock Intensity Test



元件震动实验  
Vibration Test

## ★ 电气性能稳定性 Stability of Electrical Performance



高温负荷实验  
High Temperature Loading Test



材料老化测试  
Material Aging Test



冷热冲击实验  
Temperature Shock Test



高温高压高湿实验  
High Temperature/ Humidity/ Pressure Test



## 快速可靠性评估方法

### Quick Reliability Comparison and Evaluation Method

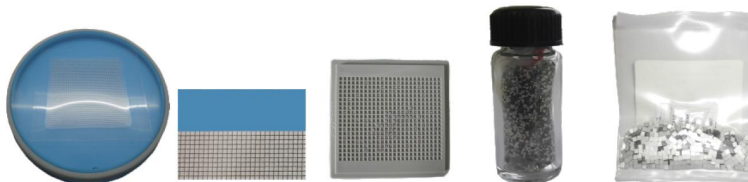
产品类别 Product Series	评估项目 Evaluation Item	加速测试方案 Quick Test Method
NTC Chip 芯片	材料老化 Material Aging	空气中300 ± 5°C/50H老化 Aging 300 ± 5°C for 50h in air
	温度冲击 Temperature Shock	焊锡炉260 ± 5°C/2 ~ 3Sec。 Dipping in 260°C ± 5°C for 2~3 Sec in soldering pot
	高温负荷 High Temperature Loading	1.2倍使用上限温度/2.5倍工作电流/100H 1.2 times practical upper limit temperature & 2.5 times working current for 100h
	冷热冲击 Cold Hot Shock	0°C/5min $\xrightarrow{10s内完成转换}$ 100°C/5min X 10 cycles (液体中) change within 10Sec (in liquid)
	高温负荷 High Temperature Loading	1.2倍使用上限温度/2.5倍工作电流/100H 1.2 times practical upper limit temperature & 2.5 times working current for 100h
	温度循环 Thermal Cycle	0°C/5min $\xrightarrow{10s内完成转换}$ 100°C/5min X 10 cycles (液体中) change within 10Sec (in liquid)
	高温高湿高压 High Temperature / Humidity / Pressure	烹饪高压锅隔水喷气30min Impervious air injection by pressure cooker for 30 minutes

## 包装方式

### Package

✧ 可选择针对邦定的蓝膜包装、其他可采用塑料袋、玻璃瓶、托盘等

Blue film packing for bonding, plastic bag / glass bottle / pallet for other applications.



## 常规R-T曲线 Common R-T Curve

R25 Temp	2.252KΩ	5KΩ		10KΩ		30KΩ	50KΩ	100KΩ	
	EQ	IM	IM	IQ	EQ	EQ	QG	GI	QS
B 25/50	3936A	3470A	3950A	3387A	3950A	4100A	3950A	3950A	4250A
B 25/85	3948B	3554B	3978B	3435B	4010B	4148B	3996B	4004B	4352B
-40	77.156	90.784	167.192	205.565	293.406	1016.425	1654.972	3203.157	3815.018
-35	55.440	69.465	120.532	155.088	214.353	732.744	1194.705	2329.013	2728.703
-30	40.317	53.640	87.916	118.189	158.337	534.347	872.494	1711.523	1973.775
-25	29.652	41.777	64.835	90.925	118.179	393.900	644.157	1270.374	1442.864
-20	22.040	32.801	48.311	70.574	89.071	293.333	480.472	951.835	1065.291
-15	16.519	25.974	36.268	55.227	67.917	220.697	361.748	718.683	794.883
-10	12.505	20.710	27.496	43.562	52.202	167.520	274.872	547.367	598.165
-5	9.554	16.621	21.040	34.621	40.426	128.220	210.677	420.315	453.749
0	7.365	13.422	16.242	27.710	31.531	98.916	162.803	325.261	346.813
5	5.723	10.928	12.651	22.307	24.774	76.988	126.720	253.250	266.927
10	4.483	8.935	9.928	18.081	19.584	60.301	99.387	198.678	206.862
15	3.539	7.335	7.847	14.752	15.570	47.515	78.515	156.986	161.364
20	2.813	6.045	6.244	12.110	12.446	37.653	62.453	124.890	126.656
25	2.252	5.000	5.000	10.000	10.000	30.000	50.000	100.000	100.000
30	1.814	4.150	4.029	8.304	8.074	24.025	40.279	80.563	79.397
35	1.471	3.456	3.265	6.932	6.550	19.335	32.639	65.285	63.375
40	1.200	2.887	2.660	5.816	5.337	15.633	26.596	53.199	50.844
45	0.984	2.418	2.179	4.903	4.367	12.695	21.789	43.580	40.988
50	0.811	2.032	1.794	4.153	3.588	10.354	17.941	35.882	33.195
55	0.673	1.719	1.487	3.533	2.970	8.514	14.863	29.714	27.042
60	0.562	1.459	1.240	3.019	2.470	7.037	12.376	24.727	22.132
65	0.471	1.244	1.038	2.590	2.064	5.845	10.354	20.674	18.195
70	0.397	1.064	0.874	2.230	1.732	4.877	8.702	17.362	15.021
75	0.337	0.913	0.739	1.928	1.460	4.088	7.346	14.643	12.451
80	0.287	0.785	0.627	1.672	1.235	3.441	6.227	12.401	10.362
85	0.245	0.679	0.535	1.451	1.050	2.916	5.296	10.540	8.669
90	0.210	0.588	0.458	1.263	0.897	2.482	4.521	8.992	7.281
95	0.181	0.511	0.394	1.102	0.769	2.121	3.873	7.698	6.138
100	0.157	0.446	0.340	0.964	0.662	1.820	3.330	6.613	5.192
105	0.136	0.389	0.294	0.846	0.571	1.568	2.872	5.700	4.407
110	0.119	0.341	0.256	0.744	0.495	1.355	2.485	4.929	3.752
115	0.104	0.300	0.223	0.656	0.430	1.176	2.157	4.274	3.205
120	0.091	0.264	0.195	0.579	0.375	1.023	1.878	3.718	2.746
125	0.080	0.233	0.171	0.513	0.327	0.894	1.639	3.243	2.359
130	0.071	0.206	0.151	0.455	0.287	0.783	1.435	2.836	2.032
135	0.063	0.183	0.133	0.404	0.252	0.688	1.260	2.487	1.756
140	0.056	0.162	0.118	0.360	0.222	0.606	1.108	2.187	1.520
145	0.050	0.144	0.104	0.321	0.196	0.536	0.978	1.927	1.320
150	0.044	0.129	0.093	0.287	0.174	0.475	0.864	1.702	1.149

## 常规电性能参数和型号 General Parameter and Part No.

型号 Part No.	标称电阻值 R25: K $\Omega$	B值 B-constance: K 25/50C	额定功率 Rated power @25°C(mV)	耗散系数 Dissipation factor ( mW/C)	热时间常数 Thermal time constance (s)
DT*472□3435	4.7	3435	15	2.5	≤15
DT*502□3274	5	3274			
DT*502□3435	5	3435			
DT*502□3977	5	3977			
DT*103□3274	10	3274			
DT*103□3435	10	3435			
DT*103□3470	10	3470			
DT*103□3950	10	3950			
DT*103□4100	10	4100			
DT*153□3950	15	3950			
DT*153□3435	15	3435			
DT*203□3950	20	3950			
DT*203□4100	20	4100			
DT*203□3435	20	3435			
DT*303□3435	30	3435			
DT*303□3950	30	3950			
DT*473□3950	47	3950			
DT*473□3435	47	3435			
DT*503□3950	50	3950			
DT*503□4100	50	4100			
DT*503□3435	50	3435			
DT*104□3950	100	3950			
DT*104□4100	100	4100			
DT*104□4400	100	4400			

\* 应用application 符号表示symbol: V:automobile, M:medical  
□ 阻值精度tolerance 符号表示symbol: B: 0.15%, C: 0.3%, D: 0.6%, F:1%, G:2%, H:3%, J:5%

电阻值精度为±3%以内的，B值对应误差为±1%，其余B值误差均为±2%。  
The B-tolerance is ±1% when R-tolerance within ±3%, others are ±2%.  
可根据客户要求定做特殊规格。  
Special part number could be custom designed.



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