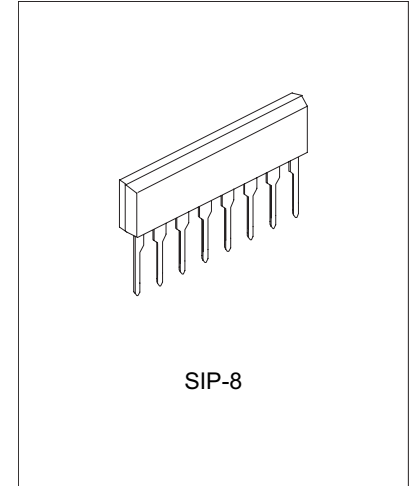


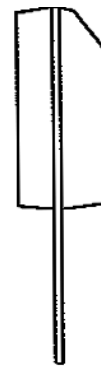
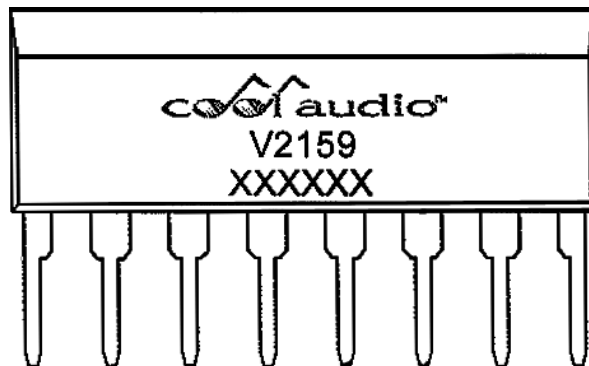
### 1. Description

The V2159 is a state-of-the-art voltage-controlled amplifier (VCA) offering high-performance current-in/current-out technology including two opposing-polarity, voltage-sensitive control ports. The V2159 VCA combines many advantages such as ultra-low noise, ultra-low distortion, low offset and high gain-bandwidth. It requires few external support circuitry and is housed in a space-efficient 8-pin single-in-line (SIP) package.



### 2. Features

- **Wide dynamic range:** >115 dB
- **Wide gain range:** >130 dB
- **Logarithmic gain control with dual gain control (pos/neg)**
- **Low distortion:** (0.008 % @ 0 dB gain, 0.035 % @ 15 dB gain)
- **Wide gain-bandwidth:** 6 MHz
- **Low harmonic distortion:** 0.01 % (typ)
- **Package outline:** SIP-8 (V2159L)
- **ROHS compliant (PB-free)**



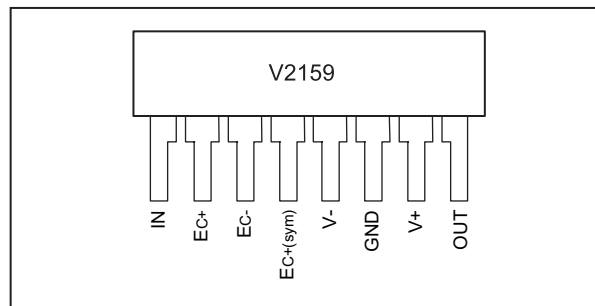
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### 3. Applications

- Faders
- Expanders
- Compressors
- Equalizers
- Oscillators
- Filters
- Automation Systems

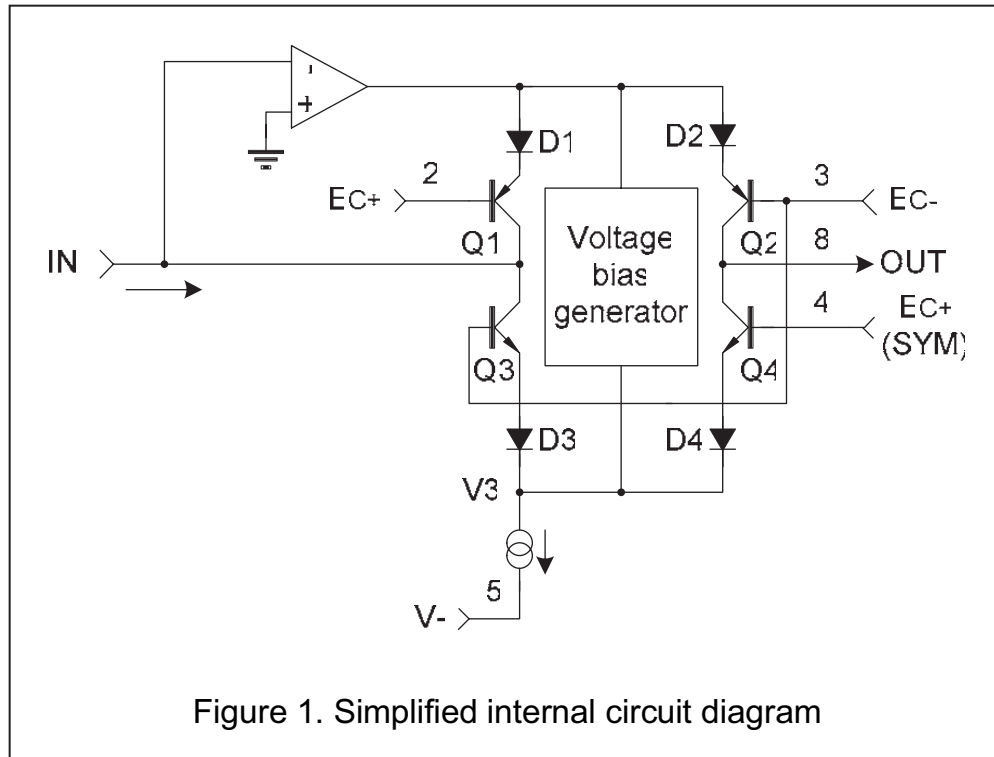
### 4. Pin Configuration

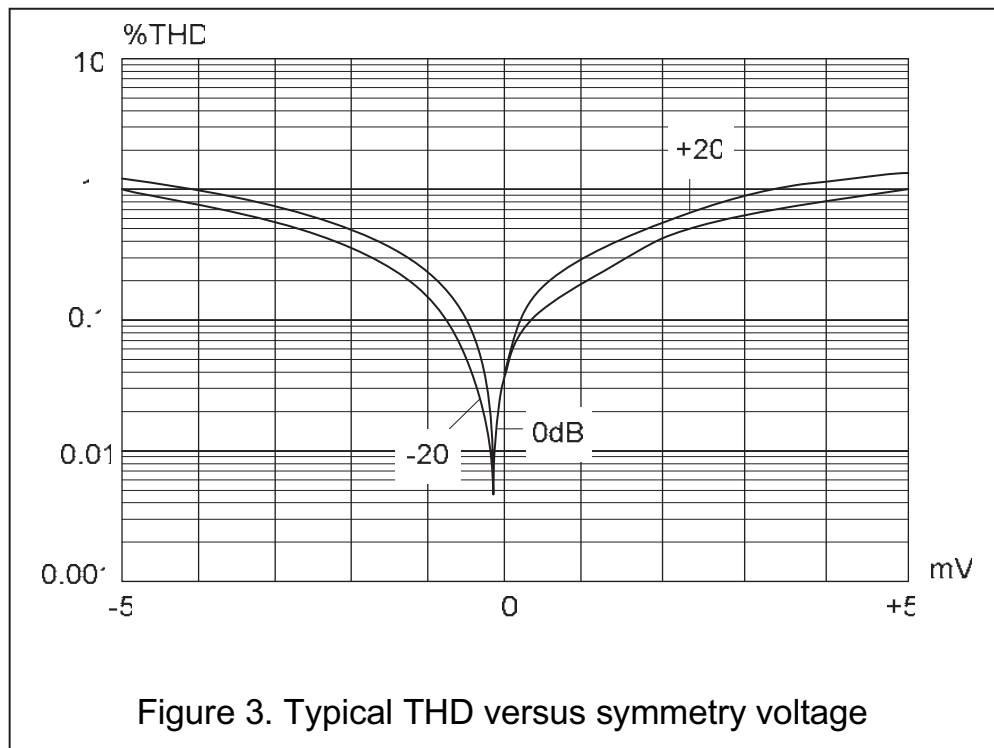
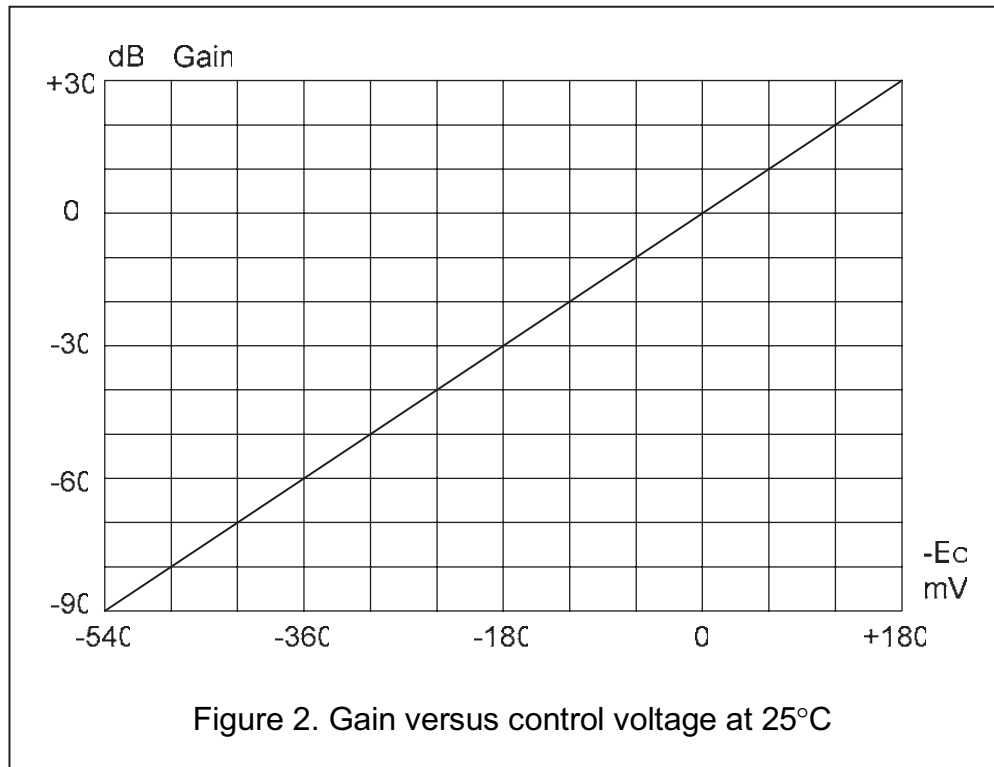


## 5. Function Description

The V2159 VCA is designed for high performance in audio applications which requires exponential gain control, low distortion, wide dynamic range and low DC “control feedthrough” modulation. Gain is controlled by converting an input current signal to a bipolar logged voltage, adding a DC control voltage and reconvertng the summed voltage back to a current through a bipolar antilog circuit.

The simplified internal circuit diagram of the IC is shown in figure 1. The AC input signal current flows in the input pin 1, which is maintained at a virtual ground by an internal opamp.





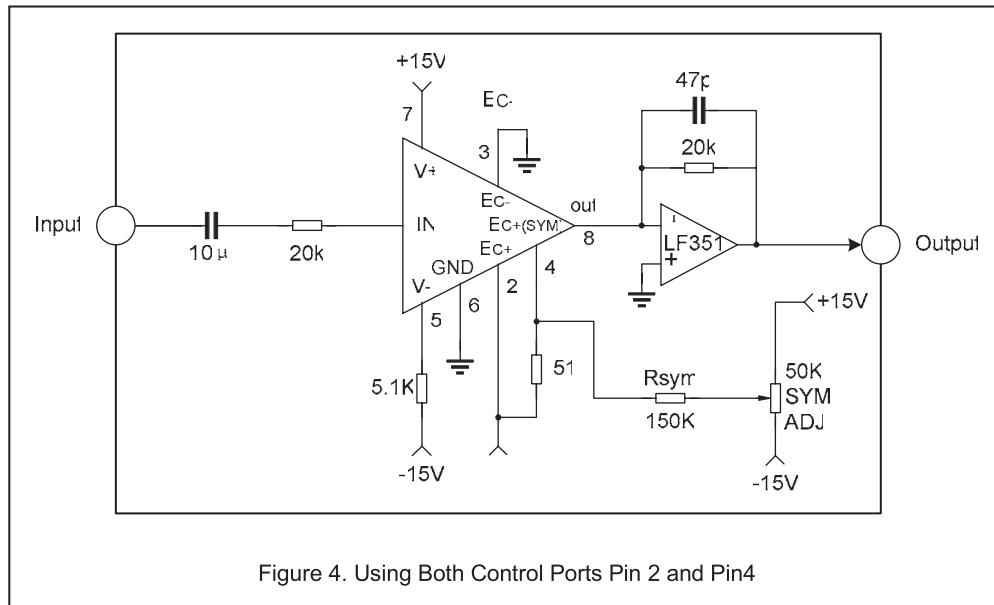


Figure 4. Using Both Control Ports Pin 2 and Pin4

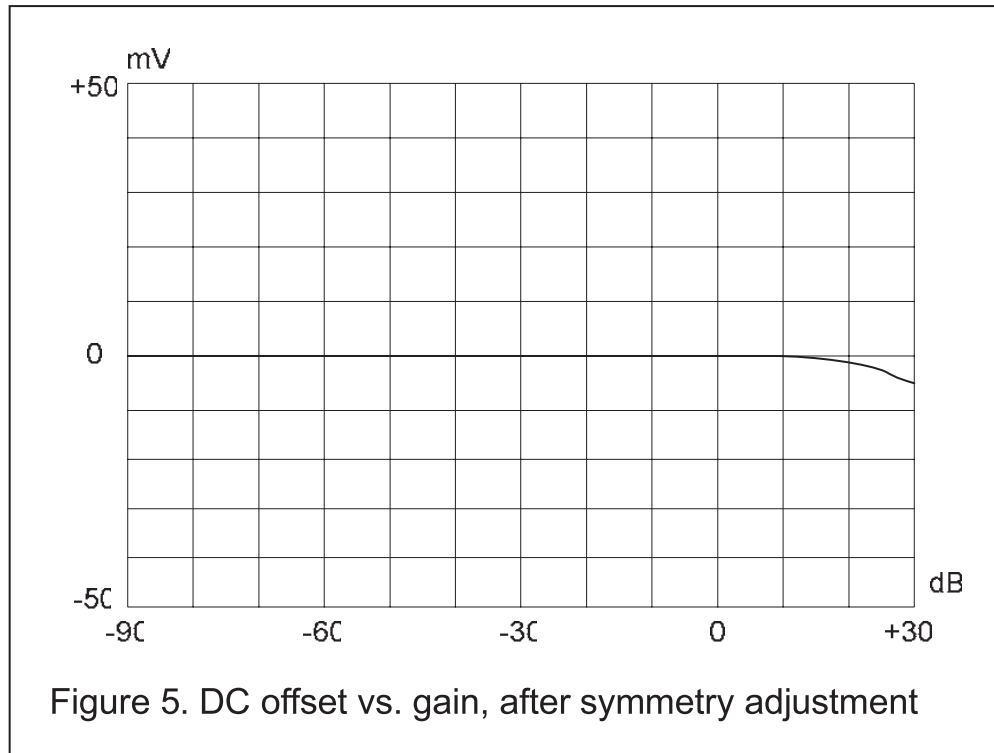
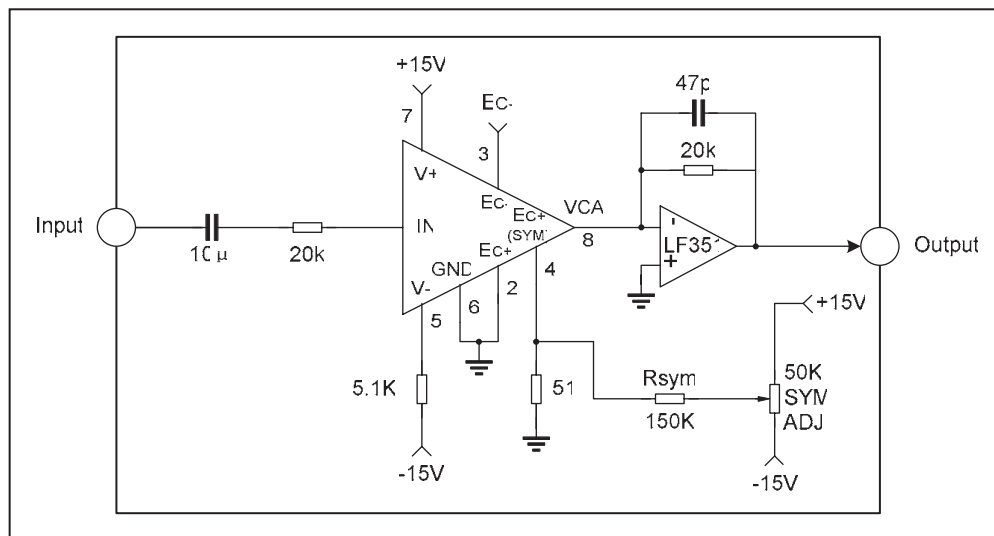
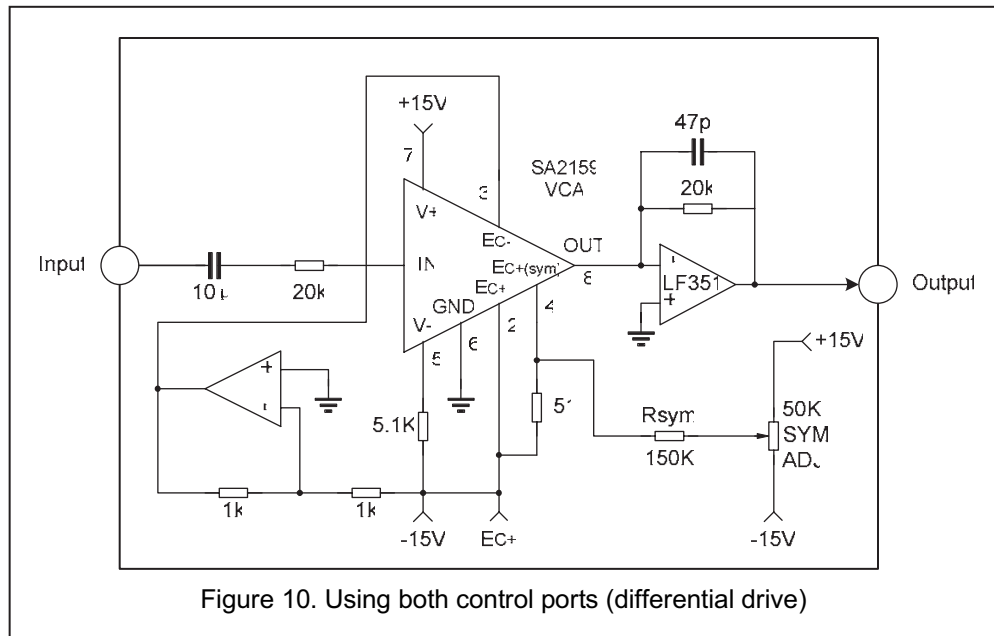
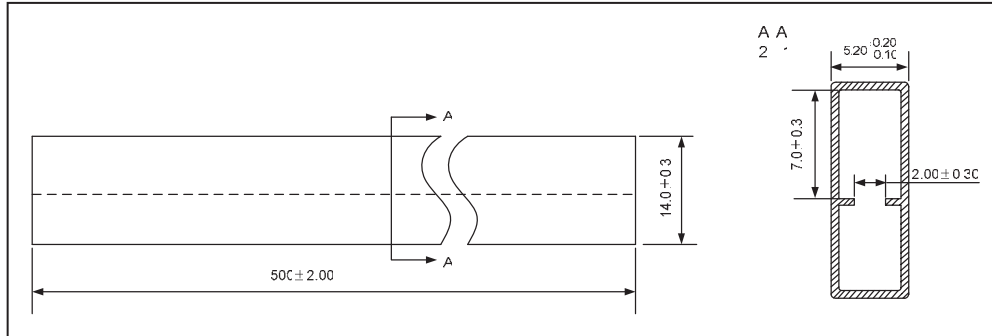


Figure 5. DC offset vs. gain, after symmetry adjustment

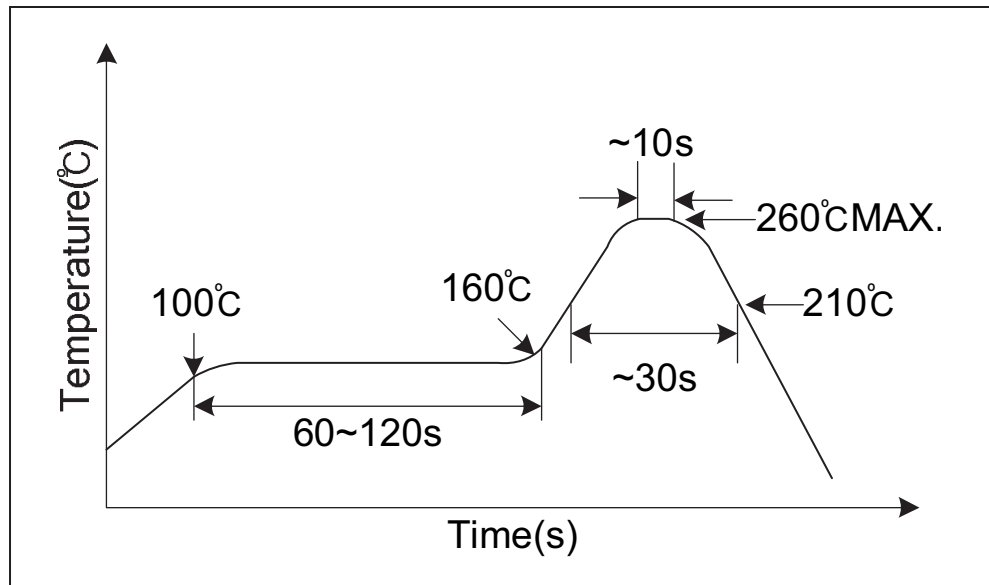


6. Stick Packaging

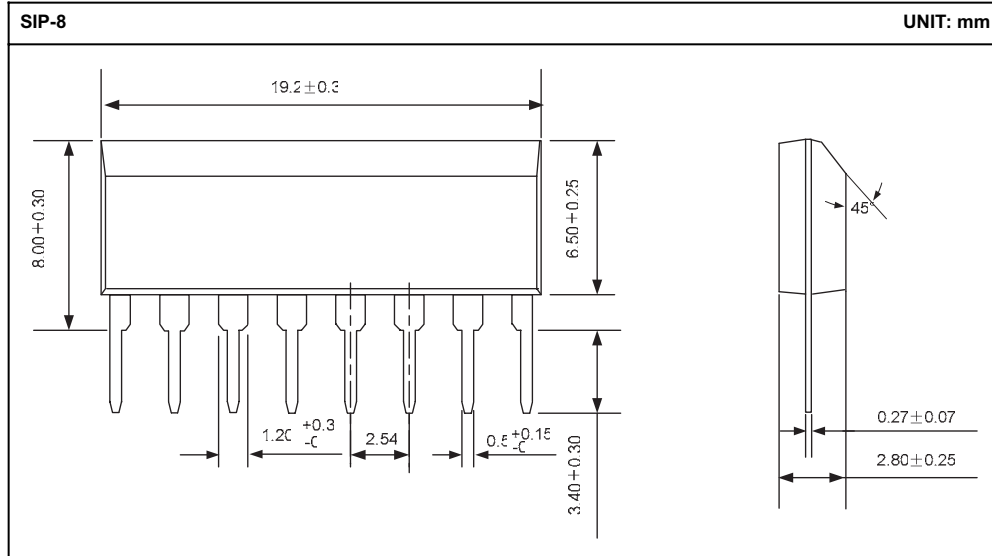


7. Soldering

MAX. Temperature (Surface) : Below  $260^{\circ}\text{C}$   
 MAX. Temperature Duration :  $\leq 10\text{s}$   
 Above  $220^{\circ}\text{C}$  Duration :  $\leq 30\text{s}$   
 Between  $150^{\circ}\text{C}$  and  $180^{\circ}\text{C}$  :  $60\text{-}120\text{s}$   
 Duration  
 Soldering Times : 2 Times



MAX. Temperature (Surface) : Below 260°C  
 MAX. Temperature Duration : <10s  
 Pre-heat Temperature : 120°C  
 Soldering Times : 1 Time



Name of the Part	Material Weight (mg/unit)	Material Name	Material Analysis (element)	Material Analysis (weight%)	Prohibited Content in total (ppm)
Leadframe	122	Cu-Alloy	Cu Fe Zn Pb	>97% 2.1-2.6% 0.05-0.2% <0.03%	<47
Plastic	633	Epoxy Resin	SiO <sub>2</sub> Epoxy Sb <sub>2</sub> O <sub>3</sub>	70-90% 8-12% 1-3%	
Chip	7	Doped Silicon	Si Al	99.6% 0.4%	
Die attach material	0.5	Glue	Ag Epoxy Resin	82% 18%	
Wires	0.5	Gold	Au	99.99%	
Leads finishing	12.5	Sn Solder Ball	Sn Pb Cd	>99.9% <0.02% <0.0005%	<3 <0.1