



Diode Leadless Chip Carrier - DLCC

Features

The DLCC family of Ceramic Leadless Chip Carrier packages for Diodes is designed for all high reliability applications – Space, Aerospace, High temperature and Military.

Detailed information

The DLCC package design takes full advantage of the proven high reliability pedigree of the High Temperature Cofired Ceramic (HTCC) surface mount packaging technology, which is easily integrated for automated assembly. Semelab has taken the existing standards for ceramic surface mount package manufacture and added additional design features to enhance thermal performance, to present a competitive alternative for high reliability applications.

The physical dimensions for the DLCC ceramic packages are designed to fully utilise the recommended solder footprint for the popular MELF packages, and as such present a drop in replacement for existing board design. Thermal vias improve the heat transfer to the solder pads reducing the diode junction temperature and increasing operating lifetime; options are also available to allow the lid to be connected to the Anode or Cathode. Connecting the metal lid to a known electrical potential stops deep dielectric discharge in space applications; see the Space Weather link www.semelab.co.uk/mil/DLCC on the Semelab web site.

The DLCC has been designed and tooled to be able to meet small, medium and high volume demand allowing customers to access the technology and grow the requirements with their product, utilising scalable assembly techniques to offer high rel diodes, at competitive pricing structures. This includes full pre cap access for inspection of semiconductor prior to hermetic encapsulation.

Semelab has more than 35 years of history in the manufacture of semiconductor devices for high reliability applications with tier one suppliers of Worldwide Space, Military and Aerospace equipment. Our diverse product range, focused customer response coupled with flexible batch size processing and screening in accordance with the most recognised reliability standards offers an attractive and cost effective solution for new and existing designs.

Experience and Innovation in Semiconductor Solutions

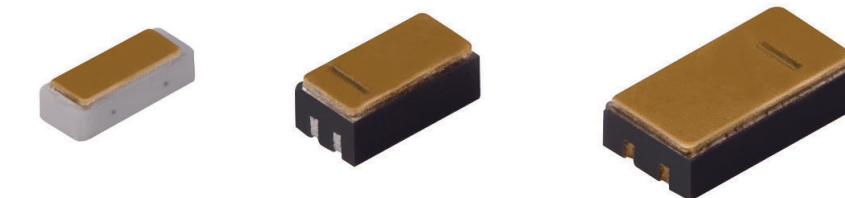
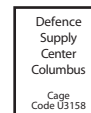
Specialists In

- Ceramic surface mount products
- Hermetic metal packaged devices
- Hermetic power modules
- Standard and custom products
- Screening and qualifications
- Continued supply of earlier device types and packages

Semelab holds approvals for many aerospace semiconductor devices, and can manufacture in accordance with CECC, JANTX, ESAlevel 5000 and other major process flows.

Please let us know your requirements - we can almost certainly meet them.

Your Semelab Distributor:



Diode Leadless Chip Carrier - DLCC

The DLCC family of Ceramic Leadless Chip Carrier packages

AEROSPACE

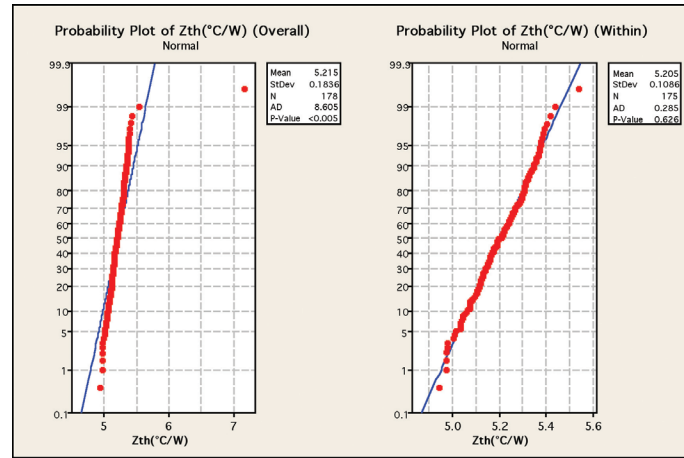
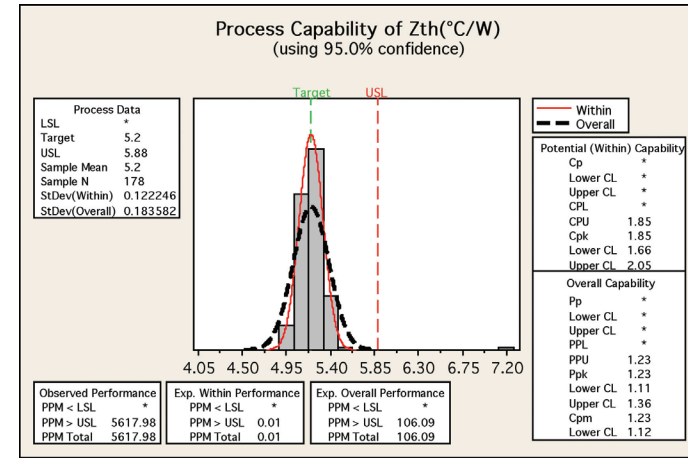


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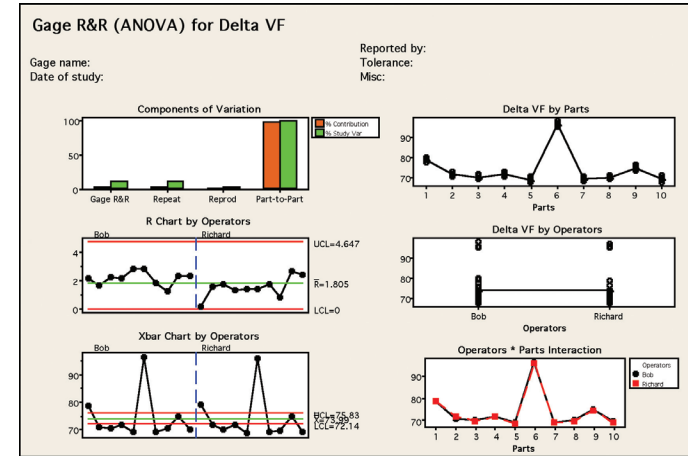
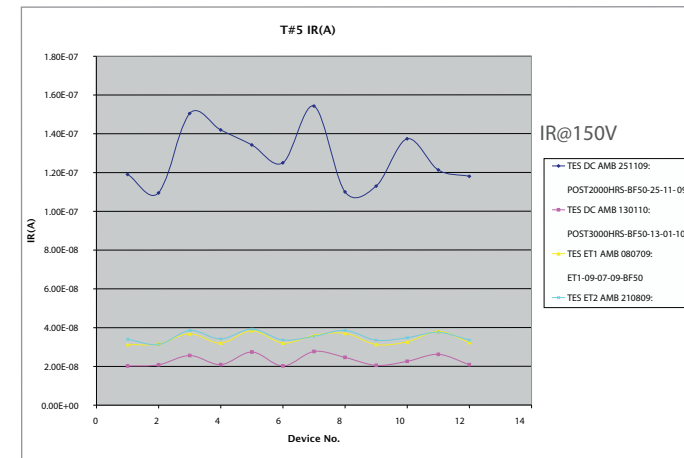
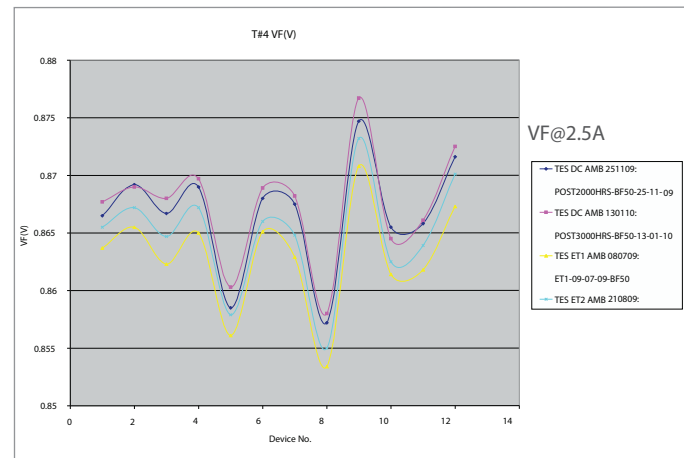
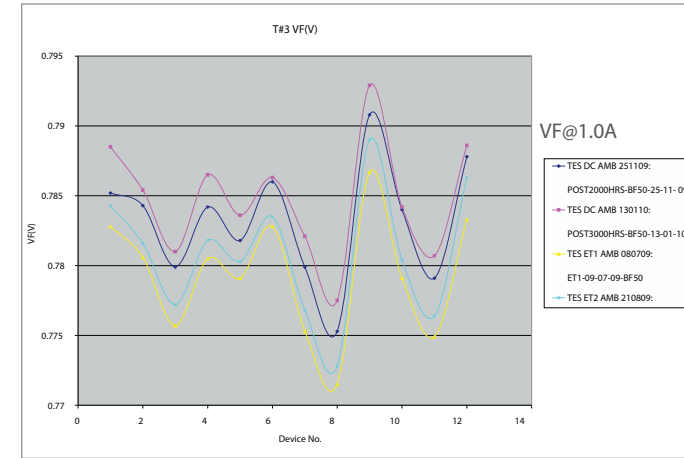
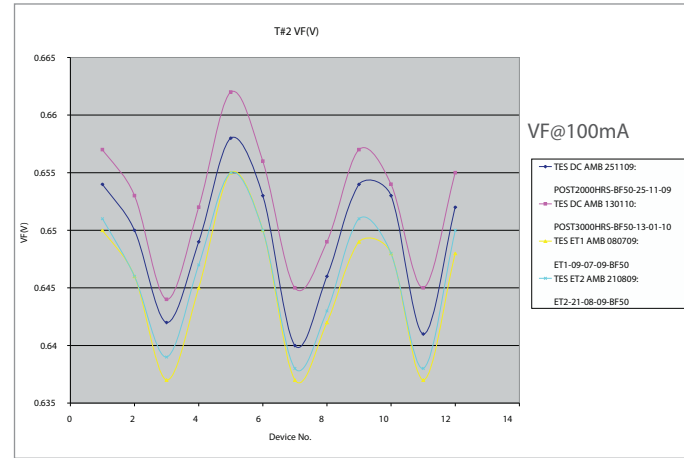
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A subsidiary of TT electronics plc.

Histogram of Thermal Impedance and probability Plots.



3000 Hours Life Testing



Gage R&R

Source	VarComp	%Contribution
Total Gage R&R	0.8975	1.27
Repeatability	0.8916	1.26
Reproducibility	0.0058	0.01
Operators	0.0058	0.01
Part-To-Part	69.8376	98.73
Total Variation	70.7350	100.00

Measurements of Delta VF are capable with <10% Total Gage R&R contribution.

Gage R & R study for Delta VF

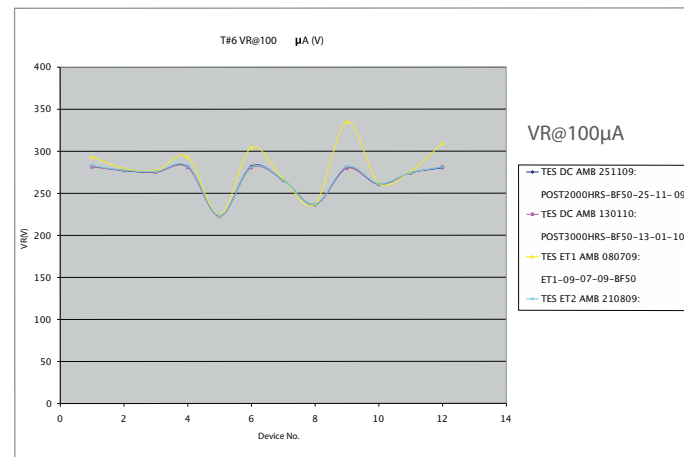
Delta VF Test Conditions

No Significant variation in either K factor or VH Zth/Delta VF test conditions:-

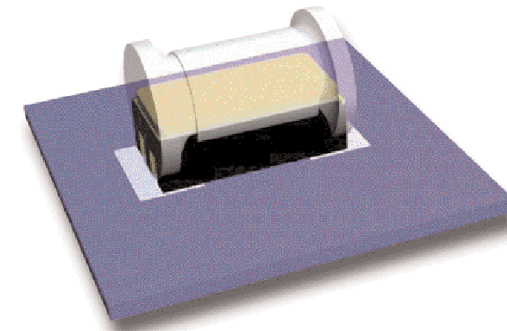
- IM 2mA
- IH 9A
- tH 10mS
- tMD + tSW 10_S

Device	Zth (°C/W)	R ² _{sp(V)} (°C/W)	R ² _{sp(W)} (°C/W)	R ² _{sp(W)} (°C/W)	VH(V)	CU
1	5.04				70.3	81.272
2	5.15				71.5	83.043
3	5.01				69.6	80.649
4	5.12				70.4	82.532
5	5.07				70.3	81.744
6	5.04				69.7	81.141
7	4.94				68.4	79.627
8	5.12				71.0	82.462
9	5.10				71.2	82.217
10	5.24				72.6	84.419
11	5.08				71.5	81.808
12	4.98				68.7	80.257
13	5.18				71.2	83.372
14	5.04				69.7	81.141
15	5.44	26.07	125	110	76.3	87.600
16	4.98	24.89			68.1	80.212
17	5.24				73.9	84.561
18	5.02				70.3	80.805
19	5.01				69.1	80.724
20	5.03				69.1	81.103
21	5.18				71.4	83.411
22	5.16				71.3	83.197
23	5.30				72.6	85.911
24	5.05				70.0	81.301
25	5.15				71.2	82.984
27	7.18				86.6	115.592
n	26.0					
Max	7.175				86.600	115.592
Min	4.94				68.10	79.63
Avg	5.19				71.85	83.55
sd	0.42				5.73	6.78

FIG 12. Thermal Impedance and Resistance Results for Sample devices.



3000 hours
Mean Time Between Failures Figure:
MTBF= 55049869 hours



The DLCC2 part was designed as a direct replacement for the D-5A which is an industry standard MELF (Metal Ended Leadless Face). The image below shows the outline to be comparable:

DLCC Advantages

Features and benefits:

- Fully hermetic, ceramic diode leadless chip carrier
- Replacement for MELF-style standard product with enhanced features
- Fits on existing PCB layouts
- Castellated design to ensure solder meniscus between board and component is visible
- Thermal performance within MIL standards, for the challenging surface mount PCB environment
- Thermal vias incorporated in design to enhance thermal performance
- Rectangular design to aid in PCB assembly
- Designed to be a more cost effective solution
- Manufactured in accordance with MIL-19500 and ESA specifications

Applications:

- Space
- Aerospace
- High temperature
- Military

Vertical End Markets:

- Commerical,
- Medical
- Military

Keywords:

- DLCC
- Diode Leadless Chip Carrier
- LCC
- Leadless Chip Carrier

Part numbers:

1N4109D2A	1N6642D2A
1N4109D2B	1N6642D2B
1N4148D2A	1N750AD1A
1N4148D2B	SML05SC06D3A
1N4574AD2A	SML05SC06D3B
1N4574AD2B	SML05SC12D3A
1N4620D2A	SML05SC12D3B
1N4620D2B	
1N5550D3A	
1N5550D3B	
1N5806D2A	
1N5806D2B	
1N5811D3A	
1N5811D3B	
1N5819D2A	
1N5819D2B	
1N6328D2A	
1N6328D2B	

Datasheets and Shortform Information

Part No.	Type	Wattage	Voltage	Current	Package
1N4109D2A	Reference	-	15V	250nA	DLCC2
1N4109D2B	Reference	-	15V	250nA	DLCC2
1N4148D2A	Signal	0.5W	75V	200mA	DLCC2
1N4148D2B	Signal	0.5W	75V	200mA	DLCC2
1N4574AD2A	Temperature Compensated Zener Diode	-	6.4V	1mA	DLCC2
1N4574AD2B	Temperature Compensated Zener Diode	-	6.4V	1mA	DLCC2
1N4620D2A	Reference	-	3.3V	250µA	DLCC2
1N4620D2B	Reference	-	3.3V	250µA	DLCC2
1N5550D3A	Power Rectifier Diode	-	200V	5A	DLCC3
1N5550D3B	Power Rectifier Diode	-	200V	5A	DLCC3
1N5806D2A	Ultra Fast Rectifier	-	150V	1A	DLCC2
1N5806D2B	Ultra Fast Rectifier	-	150V	1A	DLCC2
1N5811D3A	Ultra Fast Rectifier	-	150V	3A	DLCC3
1N5811D3B	Ultra Fast Rectifier	-	150V	3A	DLCC3
1N5819D2A	Schottky Rectifier	-	40V	1A	DLCC2
1N5819D2B	Schottky Rectifier	-	40V	1A	DLCC2
1N6328D2A	Reference	0.5W	15V	8.5mA	DLCC2
1N6328D2B	Reference	0.5W	15V	8.5mA	DLCC2
1N6642D2A	Switching Diode	0.385W	100V	300mA	DLCC2
1N6642D2B	Switching Diode	0.385W	100V	300mA	DLCC2
1N750AD1A	Reference	0.5W	4.7V	20mA	DLCC1
SML05SC06D3A	Ultra Fast Recovery Power Rectifier	-	600V	5A	DLCC3
SML05SC06D3B	Ultra Fast Recovery Power Rectifier	-	600V	5A	DLCC3
SML05SC12D3A	Silicon Carbide Schottky Rectifier	-	1200V	5A	DLCC3
SML05SC12D3B	Silicon Carbide Schottky Rectifier	-	1200V	5A	DLCC3