



DIODE, SILICON, SWITCHING
1N5806-DLCC2
IN ACCORDANCE WITH ESCC 5101/014



Detail Specification No: 8586

Aerospace Division

Issue :1

November 2009

© SEMELAB Ltd 2009

Contents

	Page
CONTENTS	2
1 <u>GENERAL</u>	3
1.1 Scope	3
1.2 Applicable Documents	3
1.3 Terms, Definitions, Abbreviations, Symbols And Units	3
1.4 Component Type Variants	3
1.5 Maximum Ratings Table	4
1.6 Handling Precautions	5
1.7 Physical Dimensions, Terminal Identification and Suggested PCB Layout.....	6
1.8 Functional Diagram	7
1.9 Materials and Finishes	7
2 <u>REQUIREMENTS</u>	8
2.1 General	8
2.1.1 Deviations from the Generic Specification.....	8
2.1.2 Deviations from screening chart (F3)	8
2.2 Marking	9
2.3 Terminal Strength	9
2.4 Electrical Measurements at amb, High and Low temperatures.	10
2.5 Parameter Drift Values.....	11
2.6 Intermediate and End Point Electrical Measurements	11
2.7 High Temperature Reverse Bias Burn-in Conditions.....	11
2.8 Power Burn-in Conditions	12
2.9 Operating Life Conditions.....	12

1 General

1.1 Scope

This specification details the maximum ratings, physical and electrical characteristics, test and inspection data for the 1N5806 DLCC2 and incorporates the test and screening flow, in accordance with the ESCC Generic Specification listed below.

1.2 Applicable Documents

- ESCC Generic Specification No:5000
- MIL-STD-750 Test Methods
- TTelectronics Data Sheet: Doc 8318 ISS 1
- ESCC Basic Specification No:23800
- ESCC Basic Specification No:21700
- ESCC Basic Specification No:21300
- ESCC Basic Specification No:23500

1.3 Terms, Definitions, Abbreviations, Symbols And Units

Definitions, Abbreviations, Symbols and Units specified in this specification shall be used in accordance with ESCC Basic Specification No: 21300.

1.4 Component Type Variants

The variants associated with this specification are listed below:

The terminal material and / or finish shall be in accordance with the requirements of the ESCC Basic Specification No.23500

<i>Variant Type</i>	<i>Part type</i>	<i>Case outline</i>	<i>Breakdown Voltage V(BR)</i>	<i>Working Peak Reverse Voltage VRWM(V)</i>	<i>Terminal Finish</i>	<i>Weight (g)</i>
					2 or 4	0.2
D2B	1N5806	DLCC2	160	150	2 or 4	0.2

1.5 Maximum Ratings Table

The Maximum Ratings should not be exceeded at any time during use or storage.

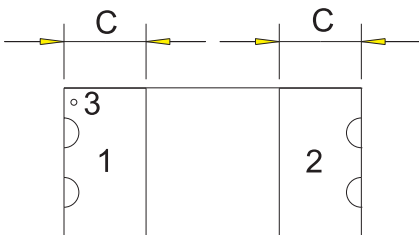
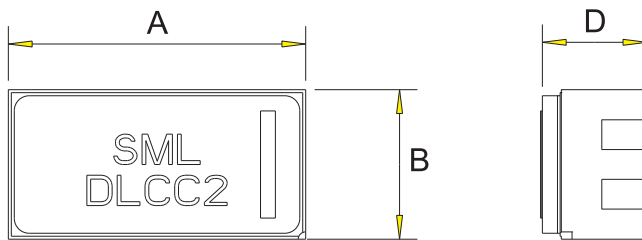
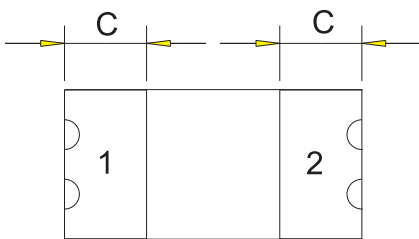
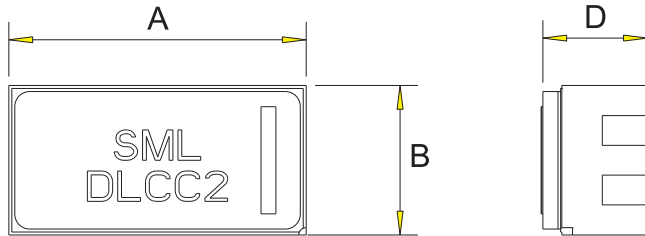
Symbol	Characteristic	Maximum Rating	Units
V_{RRM}	Maximum Reverse Repetitive Peak Voltage	150	V
V_{RMS}	Maximum RMS Voltage	105	V
V_{dc}	Maximum DC Blocking Voltage	150	V
I_{AV}	Maximum Average DC Output Current $T_L = +75^{\circ}C$	2.5	A
I_{FSM}	Non Repetitive Forward Surge Current	35	A
P_D	Total Power Dissipation at $T_{amb} = 25^{\circ}C$	3*	W
	Derate Above 25°C	TBA	W/°C
T_J	Junction Temperature Range	-65 to +175	°C
T_{stg}	Storage Temperature Range	-65 to +175	°C
$R_{\theta jmb}$	Thermal Resistance, Junction To Mounting Base	30	°C/W

1.6 Handling Precautions

These Devices are susceptible to electrostatic discharge (ESD) therefore suitable precautions should be taken throughout all stages of manufacture, test and final packing and shipping.

These components are categorised as class 3 per ESCC Basic Specification No:23800 with a minimum critical path failure of 15000 volts.

1.7 Physical Dimensions, Terminal Identification and Suggested PCB Layout.



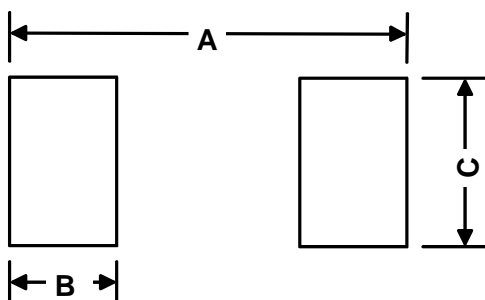
DLCC2 Variant A (D2A)

PAD 1	ANODE	
PAD 2	CATHODE	
DIMENSION	mm	Inches
A	5.00 ±0.10	0.197 ±0.004
B	2.51 ±0.10	0.099 ±0.004
C	1.08 ±0.10	0.043 ±0.004
D	1.76 ±0.10	0.069 ±0.004

B (D2B)

PAD 1	ANODE	
PAD 2	CATHODE	
PAD 3	LID CONTACT TO ANODE*	
DIMENSION	mm	Inches
A	5.00 ±0.10	0.197 ±0.004
B	2.51 ±0.10	0.099 ±0.004
C	1.08 ±0.10	0.043 ±0.004
D	1.76 ±0.10	0.069 ±0.004

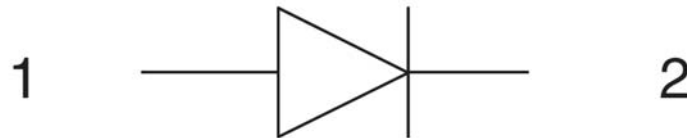
Note: The Cathode Terminal is indicated by the band on the lid



SOLDER PAD LAYOUT

1.8 Functional Diagram

Terminal 1 = Anode, Terminal 2 = Cathode



Note:

- Variant A has no connection to the lid.
- Variant B has the lid connected to the Anode.

1.9 Materials and Finishes

The Materials and Finishes should be in accordance with the requirements of ESCC Basic Specification No:23500 and as below.

- Case: the case shall be hermetically sealed and have an alumina body with a kovar lid.
- Terminal Finish: parts can be hot solder dipped or Au Plated.

2 Requirements

2.1 General

The complete requirements for procurement of the components specified herein are as stated in this specification and the ESCC Generic Specification.

Permitted deviations from the Generic Specification and this detailed specification have to be formally agreed with the customer and are acceptable only if they do not affect the reliability and integrity of the device.

2.1.1 Deviations from the Generic Specification

<None>

2.1.2 Deviations from screening chart (F3)

Surge testing shall be done on a sample of 32 pcs minimum with zero (0) failures. And the following conditions apply.

MIL-STD 750, Test Method 4066, condition A

- $I_{FSM} = 35A$ (PK)
- $I_O = 1.0A$
- $V_{RWM} = 150V$
- 10 Surges at a rate of 1 per minute maximum and a duration 8.3ms or 10.0ms.

After the surge current test drift shall be performed as specified and referred to the measurements prior to test.

Immediately after the surge current test components shall be analysed on a scope for reverse breakdown characteristics using MIL-STD-750 Test Method 4023. Any dynamic instability or discontinuity shall be cause for rejection.

- Display Calibration $50\mu A$ to $100\mu A$ and 20V to 50V per division
- Reverse current over the knee $500\mu A$ minimum

2.2 Marking

The marking should be in accordance with the requirements of ESCC Basic Specification No:21700 and as below.

- Terminal Identification
- Device type
- Serial number <sno>
- Week of seal <wos>

Where space is limited the customer can specify the primary marking.

2.3 Terminal Strength

The test condition for terminal strength shall be tested as specified in the ESCC Generic Specification

2.4 Electrical Measurements at amb, High and Low temperatures.

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise stated)

Symbols	Parameters	Test Conditions	Min	Typ	Max	Units	
V_F	Forward Voltage	$I_{FM} = 1.0\text{A}$			0.875	V	
					$T_{AMB}=125^\circ\text{C}$		0.800
					$T_{AMB}=-65^\circ\text{C}$		1.075
		$I_{FM} = 2.5\text{A}$			0.975		
I_R	Reverse Current	$V_R = 150\text{V}$			1.0	μA	
					$T_{AMB}=125^\circ\text{C}$		175
V_{BR}^*	Breakdown Voltage	$I_{BR} = 100\mu\text{A}$			160	V	
					$T_{AMB}=-65^\circ\text{C}$		150

DYNAMIC CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise stated)

t_{rr}	Reverse Recovery Time	$I_F = I_{RM} = 0.5\text{A}$, $I_{(REC)} = 0.05\text{A}$ $di/dt = 65\text{A}/\mu\text{s}$			25	ns
C_J	Capacitance	$V_R = 10\text{V}$ $f = 1.0\text{MHz}$, $V_{sig} = 50\text{mV}$			25	pF

* Pulse Test: $t_p = 300\mu\text{s}$, Duty Cycle • 2%

providing they pass if a failure occurs the batch must be tested 100%.

2.5 Parameter Drift Values

<i>Characteristics</i>	<i>Symbols</i>	<i>Limits</i>			<i>Units</i>
		<i>Drift Value</i>	<i>Absolute</i>		
			<i>min</i>	<i>max</i>	
		±			
		±			
		±			

= +22 ±3°C unless otherwise

stated.

The drift values (Δ) shall not be exceeded for each characteristic specified and the corresponding absolute values should not be exceeded.

2.7 High Temperature Reverse Bias Burn-in Conditions

<i>Characteristics</i>	<i>Symbols</i>	<i>Test Conditions</i>	<i>Units</i>
Ambient Temperature	T _{amb}	+150	°C
Reverse Voltage	V _R	120	V
Duration	t	≥48	hours

2.8 Power Burn-in Conditions

<i>Characteristics</i>	<i>Symbols</i>	<i>Test Conditions</i>	<i>Units</i>
Ambient Temperature	T_{amb}	+22 ±3	°C
Junction Temperature	T_j	135	°C
Average Output Rectified Current	I_O	1.15*	A
Duration	t	≥168	hours

* The output current can be adjusted to achieve a minimum junction temperature of 135°C. if this cannot be achieved without exceeding the max output current specified in the maximum ratings table the ambient temperature can also be increased to a maximum of 55°C to help achieve the desired junction temperature.

2.9 Operating Life Conditions

The conditions shall be as specified as specified for Power Burn-in