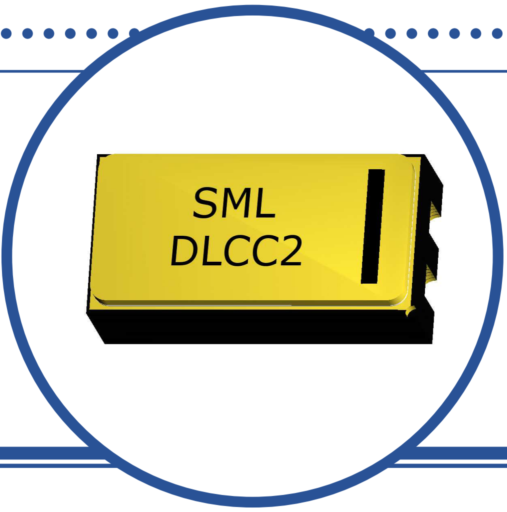
SILICON EPITAXIAL PLANAR DIODE

1N6642D2A / 1N6642D2B
1N6642D2C / 1N6642D2D



- Low Leakage
- Fast Switching
- Low Forward Voltage
- Hermetic Ceramic Package Designed as a Drop-In Replacement for "D-5A"/"B-MELF" Package.
- Suitable for general purpose, switching applications.
- Variants D2C & D2D with solder dip finished pads (63Sn/37Pb).
- Space Level and High-Reliability Screening Options Available

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise stated)

V_{BR}	Breakdown Voltage	100V
V_{RWM}	Working Peak Reverse Voltage	75V
I_O(1)	Average Rectified Output Current, T_A = 75°C	300mA
I_{FSM}(2)	Surge Current (half sine wave, t_p = 8.3ms)	2.5A
T_J	Junction Temperature Range	-65 to +200°C
T_{stg}	Storage Temperature Range	-65 to +200°C

THERMAL PROPERTIES

Symbols	Parameters	Max.	Units
$R_{\theta JA}$(PCB)	Thermal Resistance, Junction To Ambient, On PCB	325	°C/W

(1) I_O is rated at 300mA @ T_A = 75°C for PC boards where thermal resistance from mounting point to ambient is sufficiently controlled where T_J(Max) does not exceed 200°C.

(2) T_A = 25°C @ I_O=0 and VRWM for ten 8.3mS surges at 1 minute intervals.

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise stated)

Symbols	Parameters	Test Conditions		Min.	Typ	Max.	Units
V_{BR}	Breakdown Voltage	I_R = 100µA		100			V
V_F (2)	Forward Voltage	I_F = 10mA				0.8	
		I_F = 100mA				1.2	
		I_F = 10mA	T_A = 150°C			0.8	
		I_F = 100mA	T_A = -55°C			1.2	
I_R	Reverse Current	V_R = 20V				25	nA
		V_R = 75V				500	
		V_R = 20V	T_A = 150°C			50	µA
		V_R = 75V				100	

DYNAMIC CHARACTERISTICS

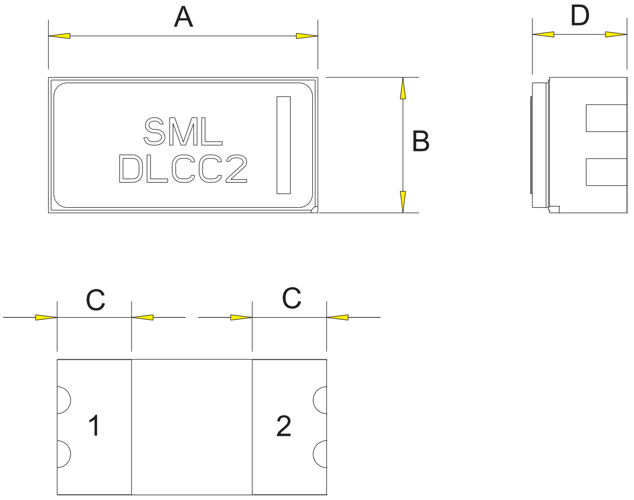
C	Capacitance	V_R = 0V	f = 1.0MHz		4.7		pF
		V_R = 1.5V			4.7		
t_{rr}	Reverse Recovery Time	I_F = IR = 10mA I_{REC} = 1.0mA	R_L = 100Ω			5	ns

Notes

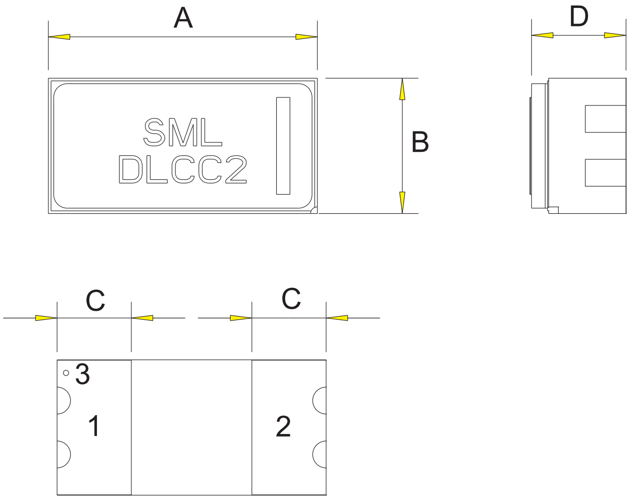
(1) Pulse Width ≤ 300us, δ ≤ 2%

MECHANICAL DATA

DLCC2 Variants A (D2A) & C (D2C)



DLCC2 Variants B (D2B) & D (D2D)

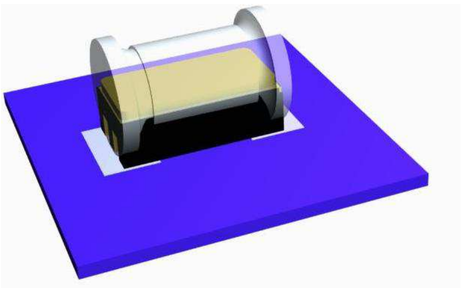


DIMENSION	mm	Inches
A	5.00 ±0.10	0.197 ±0.004
B	2.61 ±0.10	0.103 ±0.004
C	1.08 ±0.10	0.043 ±0.004
D	1.76 ±0.10	0.069 ±0.004

PACKAGE VARIANT / PART NUMBER TABLE

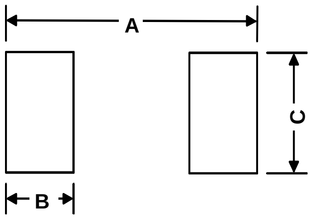
Variant	Pad 1	Pad 2	Pad 3	Pad Finish	Order Part No.
A	Anode	Cathode	No Pad (2 Pad)	Au Finished	1N6642D2A
B	Anode	Cathode	Lid Contact To Anode*	Au Finished	1N6642D2B
C	Anode	Cathode	No Pad (2 Pad)	Hot Solder Dip - 63Sn/37Pb	1N6642D2C
D	Anode	Cathode	Lid Contact To Anode*	Hot Solder Dip - 63Sn/37Pb	1N6642D2D

DLCC2/ D-5A MELF OVERLAY



SOLDER PAD LAYOUT D-5A

DIMENSION	mm	Inches
A	6.25	0.246
B	1.70	0.067
C	2.67	0.105



* The additional contact provides a connection to the lid in the application. 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/dlcc2.html on the Semelab web site. Package variant to be specified at order.

Other Package Outlines may be available – Contact Semelab Sales to Enquire

SCREENING OPTIONS

Space Level (JQRS/ESA) and High Reliability options are available in accordance with the High Reliability and Screening Options Handbook available for download from the from the TT electronics Semelab web site.

ESA Quality Level Products are based on the testing procedures specified in the generic ESCC 5000 and in the corresponding part detail specifications.

Semelabs QR216 and QR217 processing specifications (JQRS), in conjunction with the companies ISO 9001:2000 approval present a viable alternative to the American MIL-PRF-19500 space level processing.

QR217 (Space Level Quality Conformance) is based on the quality conformance inspection requirements of MIL-PRF-19500 groups A (table V), B (table VIa), C (table VII) and also ESA / ESCC 5000 (chart F4) lot validation tests.

QR216 (Space Level Screening) is based on the screening requirements of MIL-PRF-19500 (table IV) and also ESA /ESCC 5000 (chart F3).

JQRS parts are processed to the device data sheet and screened to QR216 with conformance testing to Q217 groups A and B in accordance with MIL-STD-750 methods and procedures.

Additional conformance options are available, for example Pre-Cap Visual Inspection, Buy-Off Visit or Data Packs. These are chargeable and must be specified at the order stage (See Ordering Information). Minimum order quantities may apply.

Alternative or additional customer specific conformance or screening requirements would be considered. Contact Semelab sales with enquires.

MARKING DETAILS

Parts can be laser marked with approximately 7 characters on two lines and always includes cathode identification.
Typical marking would include part or specification number, week of seal or serial number subject to available space and legibility.

Customer specific marking requirements can be arranged at the time of order.

Example Marking:

ORDERING INFORMATION

Part numbers are built up from Type, Package Variant, and screening level. The part numbers are extended to include the additional options as shown below.

Type – See Main Part Type
Package Variant – See Mechanical Data
Screening Level – See Screening Options (ESA / JQRS)

Additional Options:

Customer Pre-Cap Visual Inspection	.CVP
Customer Buy-Off visit	.CVB
Data Pack	.DA
Solderability Samples	.SS
Scanning Electron Microscopy	.SEM
Radiography (X-ray)	.XRAY
Total Dose Radiation Test	.RAD
MIL-PRF-19500 (QR217)	
Group B charge	.GRPB
Group B destructive mechanical samples	.GBDM (12 pieces)
Group C charge	.GRPC
Group C destructive electrical samples	.GCDE (12 pieces)
Group C destructive mechanical samples	.GCDM (6 pieces)
ESA/ESCC	
Lot Validation Testing (subgroup 1) charge	.LVT1
LVT1 destructive samples (environmental)	.L1DE (15 pieces)
LVT1 destructive samples (mechanical)	.L1DM (15 pieces)
Lot Validation Testing (subgroup 2) charge	.LVT2
LVT2 endurance samples (electrical)	.L2D (15 pieces)
Lot Validation Testing (subgroup 3) charge	.LVT3
LVT3 destructive samples (mechanical)	.L3D (5 pieces)

Additional Option Notes:
1) All 'Additional Options' are chargeable and must be specified at order stage.
2) When Group B,C or LVT is required, additional electrical and mechanical destructive samples must be ordered
3) All destructive samples are marked the same as other production parts unless otherwise requested.

Example ordering information:
The following example is for the 1N6642 part with package variant D (lid contact to anode, 63Sn/37Pb terminal finish), JQRS screening, additional Group C conformance testing and a Data pack.

Part Numbers:
1N6642D2D-JQRS (Include quantity for flight parts)
1N6642D2D-JQRS.GRPC (chargeable conformance option)
1N6642D2D-JQRS.GCDE (charge for destructive parts)
1N6642D2D-JQRS.GCDM (charge for destructive parts)
1N6642D2D-JQRS.DA (charge for Data pack)

Customers with any specific requirements (e.g. marking or screening) may be supplied with a similar alternative part number (there is maximum 20 character limit to part numbers). Contact Semelab sales with enquiries

High Reliability and Screening Options Handbook link: http://www.semelab.co.uk/pdf/misc/documents/hirel_and_screening_options.pdf