

SILICON CARBIDE SCHOTTKY RECTIFIER DIODE

SML05SC12DLCC3

- Hermetic Ceramic Surface Mount Package
- "D-5B" / "E-MELF" Compatible Footprint
- 1200V, 5A, Schottky Rectifier
- Zero Forward and Reverse Recovery
- High Frequency Operation
- Fast Temperature Independent Switching
- Positive Temperature Coefficient on VF
- Space Level and High-Reliability Screening Options Available



Typical applications

Applications requiring high voltages low switching losses and fast switching speeds such as Switching Power Supplies, Converters, Power Factor Conversion and Motor Drive and Free Wheeling Diodes

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

V _{RRM}	Repetitive Peak Reverse Voltage	1200V
V _R	DC Reverse Voltage	1200V
V _{RWM}	Working Peak Reverse Voltage	1200V
I _{F(AV)}	Average Forward Current (T _J = 175°C)	5A
I _{FRM}	Repetitive Peak Forward Surge Current (t _p = 8ms Half Sine Wave)	30A
I _{FSM}	Non Repetitive Peak Forward Surge Current (t _p = 10µs pulse)	100A
T _J	Junction Temperature Range	-55 to +175°C
T _{STG}	Storage Temperature Range	-55 to +175°C

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
V _{FM} ⁽¹⁾	Forward Voltage Drop	I _F = 5A			1.8	V
		T _J = 175°C			3.0	
I _R	Reverse Leakage Current	V _R = Rated V _R			200	µA
		T _J = 175°C			1.0	mA
Q _C	Total Capacitive Charge	V _R = 500V I _F = 1.0A di/dt = 500A/µA		28		nC
C _J	Junction Capacitance	V _R = 0V f = 1.0MHz		455		pF
		V _R = 200V f = 1.0MHz		45		
		V _R = 400V f = 1.0MHz		33		

Notes

(1) Pulse Width < 300µs, Duty Cycle <2%

Semelab Limited reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing an order.



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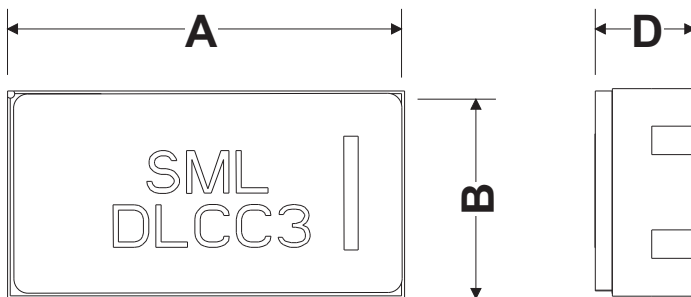
SILICON CARBIDE SCHOTTKY RECTIFIER DIODE SML05SC12DLCC3

THERMAL PROPERTIES

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance Junction to Case	TBD	°C/W

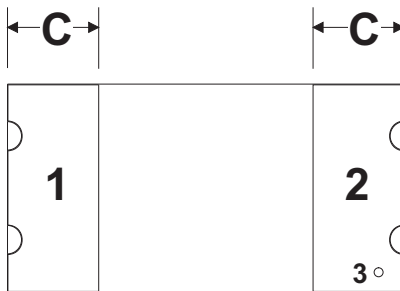
MECHANICAL DATA

Dimensions in mm (Inches)



DLCC3 Variant A (D3A)

PAD 1	ANODE	
PAD 2	CATHODE	
DIMENSION	mm	Inches
A	7.00 ±0.10	0.275 ±0.004
B	3.65 ±0.10	0.143 ±0.004
C	1.60 ±0.10	0.063 ±0.004
D	1.76 ±0.10	0.069 ±0.004

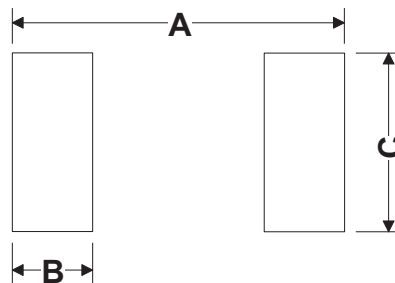


DLCC3 Variant B (D3B)

PAD 1	ANODE	
PAD 2	CATHODE	
PAD 3	LID CONTACT TO CATHODE*	
DIMENSION	mm	Inches
A	7.00 ±0.10	0.275 ±0.004
B	3.65 ±0.10	0.143 ±0.004
C	1.60 ±0.10	0.063 ±0.004
D	1.76 ±0.10	0.069 ±0.004

DLCC3 PCB SOLDER PAD LAYOUT

Soldering temperature should be 260°C for a maximum of 10 seconds.



	Inches	mm
A	0.288	7.32
B	0.070	1.78
C	0.155	3.94

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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.

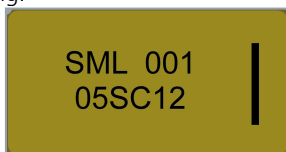
Alternative or additional customer specific conformance or screening requirements would be considered. Contact Semelab sales with enquiries.

MARKING DETAILS

Parts can be marked with approximately 8 characters on two lines and can include the 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 Electrical Stability Characteristics Table
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 SML05SC12DLCC3 part with package variant B, JQRS screening, additional Group C conformance testing and a Data pack.

Part Numbers:

SML05SC12D3B-JQRS (Include quantity for flight parts)
SML05SC12D3B.GRPC (chargeable conformance option)
SML05SC12D3B.GCDE (charge for destructive parts)
SML05SC12D3B.GCDM (charge for destructive parts)
SML05SC12D3B.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