SCHLEGEL
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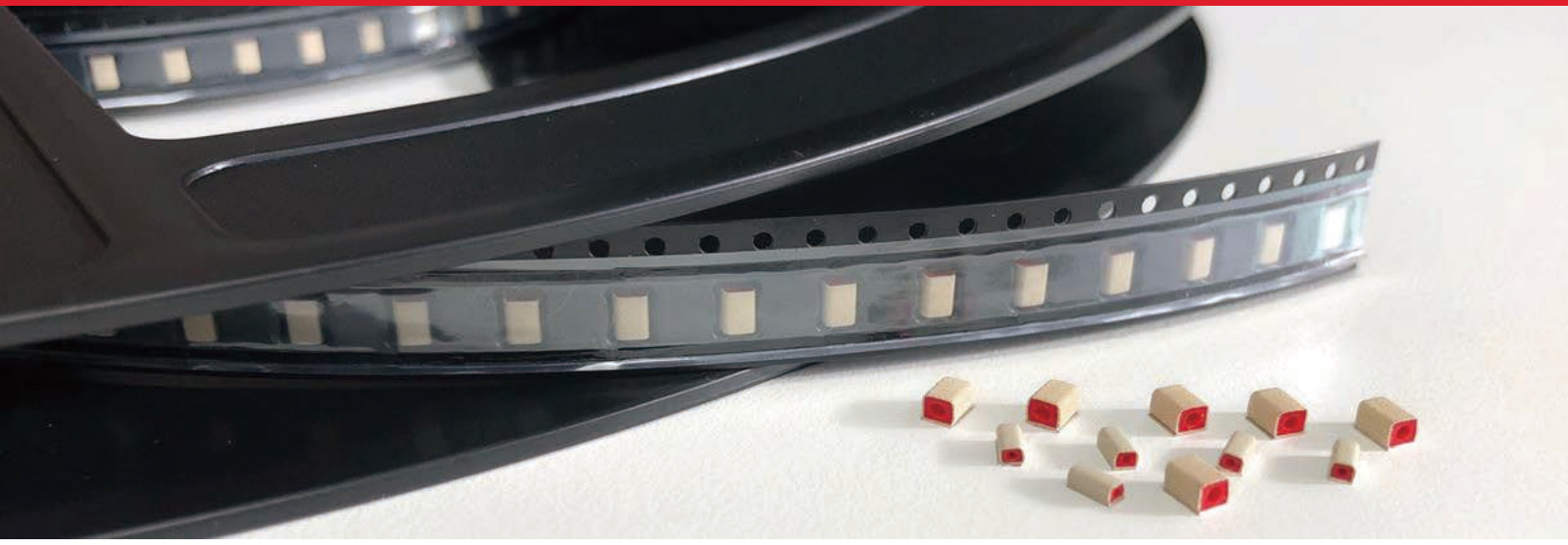
DOUBLESHIELD PAD



Schlegel offers a comprehensive range of shielding products. The Doubleshield Pad is backed by Schlegel EMI's reputation for high quality and performance.

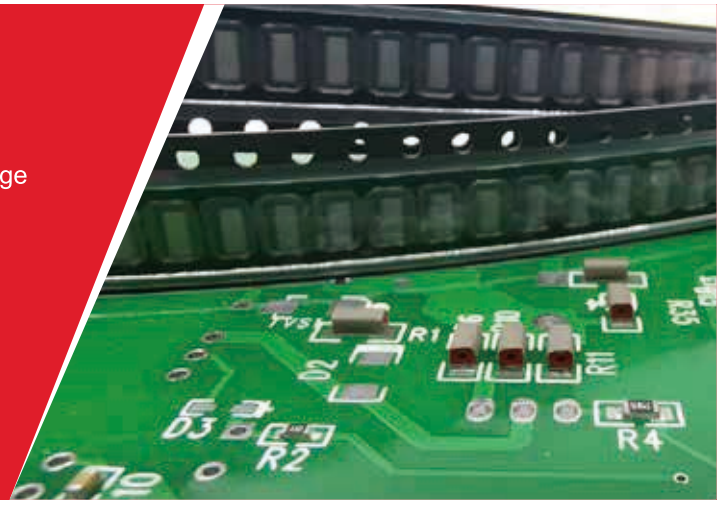
www.schlegelemi.com

DoubleShield Grounding Pads

DoubleShield Grounding Pads
Electric Vehicles

- Ensure you have proper ground planes in your design
- PCBs must withstand incredibly high temperature/voltage
- Our DoubleShield pad ensures reliable, long-lasting grounding performance

Engineers and designers can create innovative, reliable, quality PCBs for Evs and other electronic applications.



Introduction

In automotive electronic devices, grounding and shielding products should ensure electrical performance without breaking under mechanical or environmental stress throughout the product's lifetime. DoubleShield Pad combines unsurpassed conductivity with the convenience of an SMT-compatible format. It is ideal for grounding housings, shields, LCDs, and antenna contacts, e.g. (mobile phones, base stations, power amplifiers, laptop computers, PDAs, cameras & radar systems, infotainment systems, etc.).

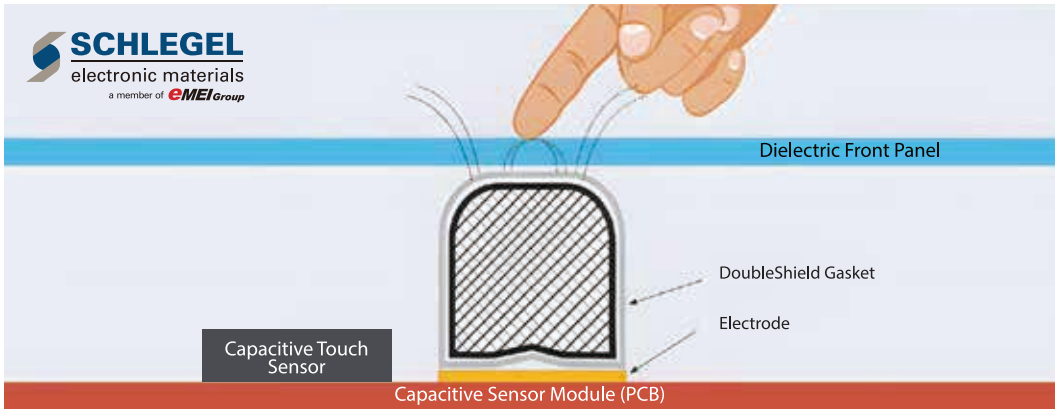
DoubleShield Pad compatibility with SMT equipment helps reduce total engineering costs because these offthe-shelf components eliminate the need for costly custom designs. Additionally, no secondary processing is required, reducing equipment and labor costs during production. Using precise SMT equipment to incorporate DoubleShield Pads improves the consistency and repeatability of printed circuit board (PCB) assembly.

DoubleShield Pads also decrease waste compared to manual installation and dispensing methods typically used for other EMI shielding materials.

Features and Benefits

The flexible and easily compressible DoubleShield Pad can take up tolerances and close the gap between a PCB and another component while providing a reliable grounding contact.

- Large conformable contact area vs. metal spring
- Full chemical bonding between gasket and metal ensures components are not displaced
- Low electrical resistance
- Good elasticity & low compression force
- Replaces most Metal Finger & Fabric Gasket
- No PCB scratching
- No risk for whisker growth. The DoubleShield Pad is a bottom-only termination component where the full plated surface is wetted (ref. JESD201)
- Compatible with SMT equipment—reducing installation cost and increasing reliability



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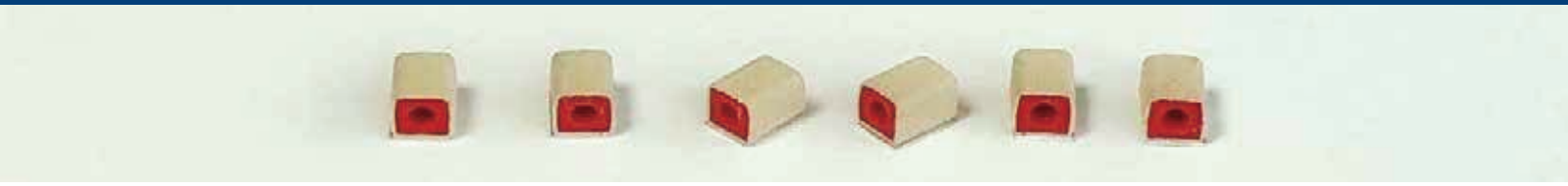
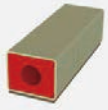
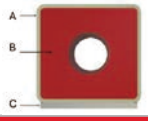
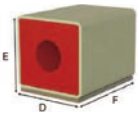
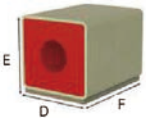
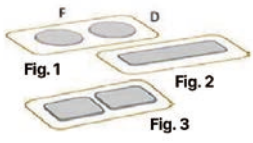
DATA SHEET



Product Properties

The DoubleShield Pad has a hollow profile with a core of soft silicone rubber and a shell of electrically conductive silicone rubber.

Table 1. DoubleShield Pad properties and dimensions

Property	Test Standard	Unit	SEM1003431	SEM1058431	SEM2058431	SEM1008531
						
RCS*		mm	1.2	1.9	1.9	1.9
Force to compress to RCS*		N	2.1	2.6	5.5	2.0
Electrical resistance at RCS*	SEM R9/R10**	Ohm	0.040	0.030	0.020	0.040
Compression set, @22h/125°C	ISO 815	%	11	10	10	13
Material						
A			Schlegel 8610	Schlegel 8610	Schlegel 8610	Schlegel 8610
B			Schlegel 1445	Schlegel 1540	Schlegel 1540	Schlegel 1445
C			Sn plated metal strip			
Dimension (mm)						
D			1.60	2.50	2.50	2.50
E			1.60	2.40	2.40	2.40
F			3.60	3.60	8.00	3.60
Recommended PCB solder mask opening (mm)						
D			1.85	2.75	2.75	2.75
F			3.75	3.75	8.15	3.75
Recommended solder paste pattern (mm)						
Fig. 1			-	⌀1.65 x 2 ± 5%	⌀2.3 x 3 ± 5%	⌀1.65 x 2 ± 5%
Fig. 2			1.46 x 3.55 ± 5%	1.65 x 3.30 ± 5%	1.50 x 7.6 ± 5%	1.65 x 3.30 ± 5%
Fig. 3			-	-	-	-

*RCS-Recommended compression stop. **All is measured with R9 except 1003431 which is measured with R10.

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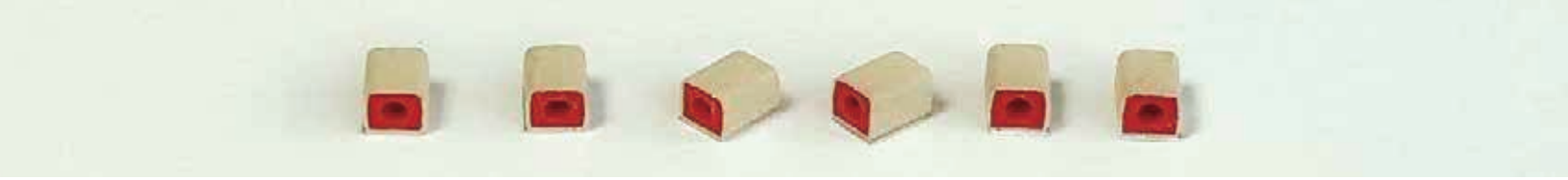
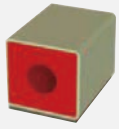
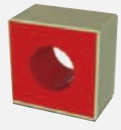
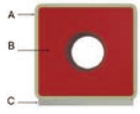
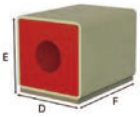
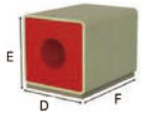
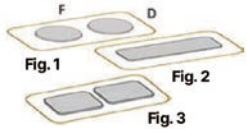


The recommended solder paste pattern for the DoubleShield Pad should be either evenly distributed circles (Fig.1), a rectangle (Fig.2) or evenly spaced rectangles (Fig.3). All patterns allow for a sufficient volume of solder without flooding the ground trace with excess solder.

Property	Test Standard	Unit	SEM1018531	SEM1023141	SEM1060931	SEM1041831
						
RCS*		mm	1.9	2.9	4.0	5.0
Force to compress to RCS*		N	2.6	1.6	2.7	7.9
Electrical resistance at RCS*	SEM R3/R9**	Ohm	0.045	0.075	0.070	0.100
Compression set, @22h/125°C	ISO 815	%	9	18	10	10
Material						
A			Schlegel 8610	Schlegel 8610	Schlegel 8610	Schlegel 8610
B			Schlegel 1445	Schlegel 1445	Schlegel 1445	Schlegel 1445
C			Sn plated metal strip			
Dimension (mm)						
D			2.50	4.0	5.0	3.75
E			2.70	3.9	5.0	6.20
F			3.60	1.9	3.0	6.90
Recommended PCB solder mask opening (mm)						
D			2.75	3.8	5.0	4.0
F			3.75	2.0	3.1	7.0
Recommended solder paste pattern (mm)						
Fig. 1			⌀1.65 x 2 ± 5%	-	-	⌀3.0 x 2 ± 5%
Fig. 2			1.65 x 3.30 ± 5%	3.0 x 1.55 ± 5%	-	3.0 x 6.26 ± 5%
Fig. 3			-	-	2.2 x 2.0 x 2 ± 5%	-

*RCS-Recommended compression stop. **All is measured with R3 except 1018531 which is measured with R9.

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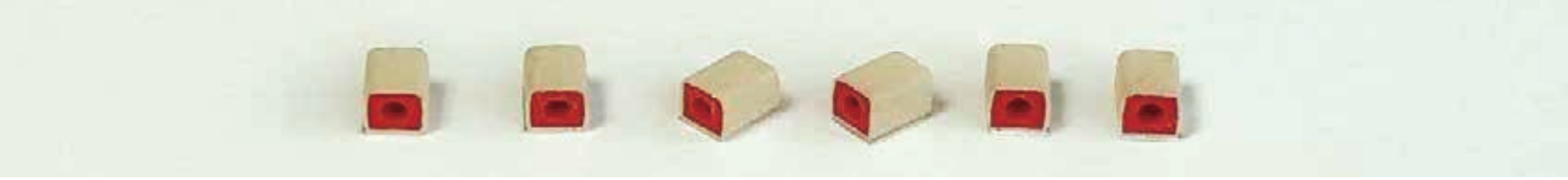

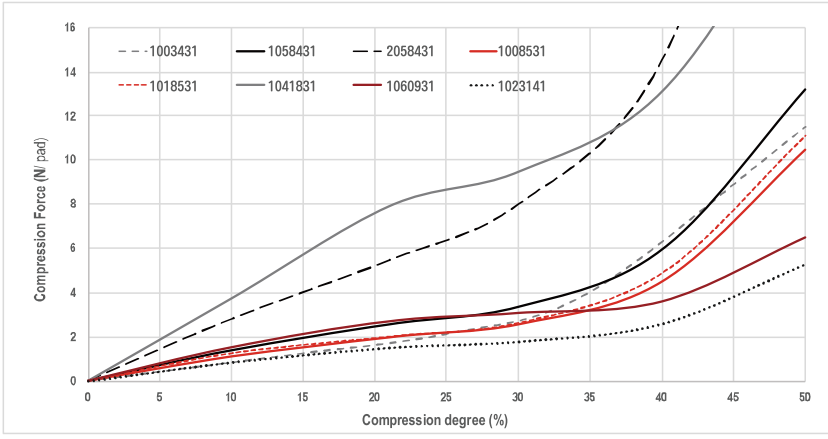

Diagram 1. Compression force vs compression degree.

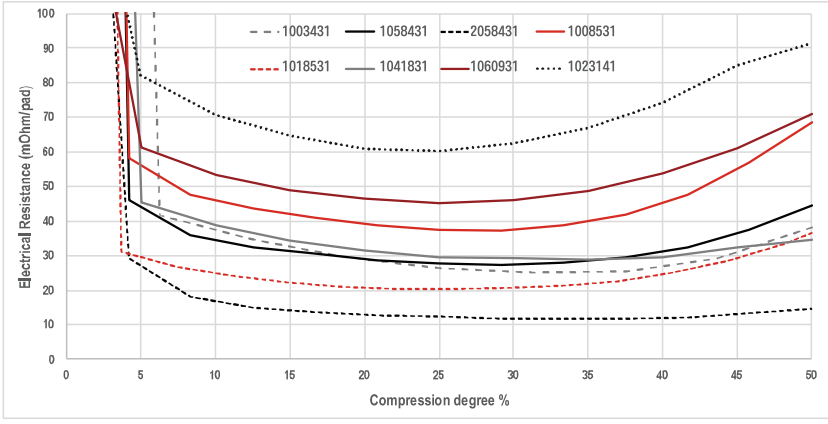

Diagram 2. Electrical resistance vs compression degree.

The recommended operating temperature is between -40°C and +125°C. To ensure a safe repeatable compression, Schlegel recommends the use of mechanical compression stops. A compression degree of 15-35% is recommended. A higher compression degree can be used after evaluation by customer.

Accelerated Life Testing

DoubleShield Pad performance has been evaluated after accelerated life testing. The tests were performed at different conditions (see below).
The DoubleShield Pad performance was tested after accelerated aging test in a test fixture simulating a grounding application.

Property	Test Conditions
Cold	65°C / 96hr
Thermal cycling	-40 to +125°C (30 min. dwell time & 10K/min.) 1000 cycles
Dry heat	125°C 2000 hours
Damp heat steady state	85°C / 85% RH duration 1000 hours

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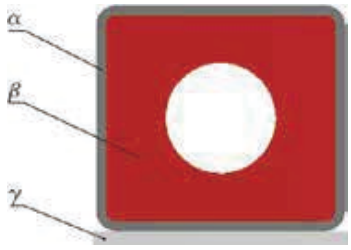
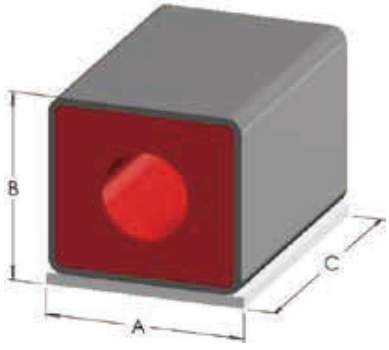
Product dimensions

The Doubleshield Pad is delivered in different versions but different cross sections and length can be developed to fit any demand.

Material	SEM1098621	SEM1007821	SEM1083821
α	Schlegel 8686	Schlegel 8686	Schlegel 8686
β	Schlegel 1445	Schlegel 1540	Schlegel 1445
γ	Nickel Alloy 201	Nickel Alloy 201	Nickel Alloy 201
Dimension (mm)			
A	2.55	2.55	1.80
B	2.40	2.40	1.60
C	3.60	3.60	3.60
PCB Footprint Recommendation* (mm)			
A	2.70	2.70	1.85
C	3.85	3.85	3.85





*Recommended footprint dimensions are based on successful production tests made by Schlegel, we always recommend users to consider their internal production properties.

4. Product properties

Property	Test Standard	Unit	SEM1098621	SEM1007821	SEM1083821
Recommended compression stop		mm	1.9	1.9	1.2
Force to compress to RCS*		N	2.2	3.0	2.0
Electrical resistance at RCS*	Schlegel S9	Ohm	0.15	0.15	0.15
Compression set, @ 22h/125 °C	ISO 815	%	15	12	12

*RCS – Recommended compression stop

The recommended operating temperature is between -55°C and +125°C. To assure a safe and repeatable compression Schlegel recommend the use of mechanical compression stops allowing a compression degree of 20 - 25%. Minimum 10% and maximum 50% compression is recommended.

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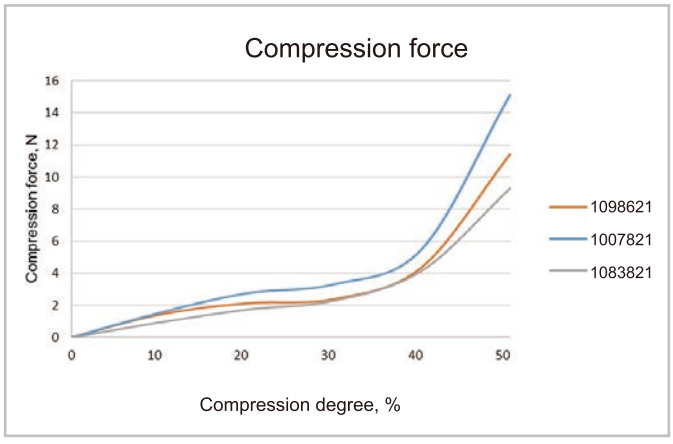
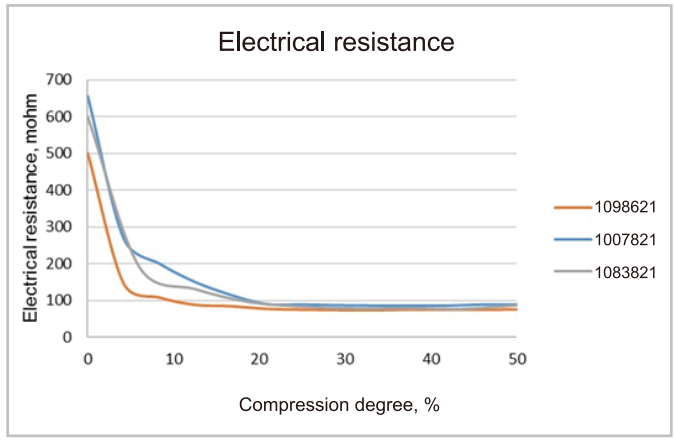
Compression force
The compression force versus compression degree is shown in the graph below.



Electrical resistance
The electrical resistance versus compression degree is shown in the graph below.



Applications

- **Electric vehicles | Predictable and consistent pressure and electrical contact to the battery cell**
- Portable Electronic Devices.
- GPS & Telematics Instrumentation.
- Gaming Devices.
- Personal Computers and Laptops.
- Telecommunications Infrastructure.
- Infotainment/Media Systems.

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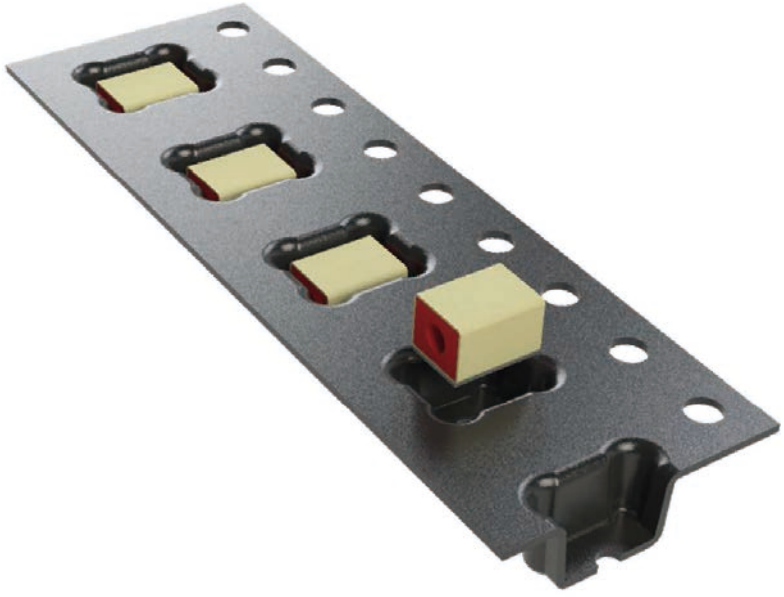
Environment

The Schlegel DoubleShield Pad fulfill the requirements set by the Directive 2011/65/EU and its amendments (RoHS).

Packing

The DoubleShield Pad is delivered in a standard Tape-and-Reel format for automated placement in standard SMT process. The packing complies with EIA-481 standard.



Storage Conditions

The DoubleShield Pad is MSL-1 classified with unlimited storage time. This assumes that the component is stored in a vacuum sealed bag in Tape-and-Reel and protected from rain, direct sunshine or other pollution in the environment that could affect its properties. Solderability testing by customer after 1 year of storage is recommended.

Disclaimer

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DEFINING EMI SOLUTIONS SINCE 1987

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NORTH AMERICA

Schlegel Electronic Materials, Inc.

1555 Jefferson Road,
Rochester, NY 14623
Tel No: +1 585-643-2000
Fax No: +1 585-427-7216
Email: schlegelemi.na@schlegelemi.com

EUROPE

Schlegel Electronic Materials, bv

Schatting 73,
8210 Zedelgem,
Belgium
Tel No: +32 59 560 270
Email: schlegelbe@schlegelemi.com

ASIA

Schlegel Electronic Materials Asia Limited
Unit 1, 3/F, Block A, New Trade Plaza,
6 On Ping Street, Shatin, N.T., Hong Kong
Tel No: +852-2686 8168
Fax No: +852-2686 8268
Email: schlegelemi@emeigroup.com

Schlegel (Dongguan) Electronics Limited
No. 8A Qiaoxin Road, Qiaotou, Dongguan,
Guangdong, China
Postal Code: 523525
Tel No: +86-769-8334 1628
Fax No: +86-769-8334 2028
Email: schlegelemi@emeigroup.com

Schlegel (Shanghai) Electronics Limited (Sales Office)
Room 402-02, Building 1-A,
Han's Science and Technology Center,
No. 199 Jinwan Road, Pudong New Area,
Shanghai, China
Postal Code: 201206
Tel No: +86-21-5868 3383
Fax No: +86-21-5868 3386
Email: schlegelemi@emeigroup.com

Taiwan Schlegel Electronics Limited (Sales Office)
No.99, Alley 3, Lane 182, Section 2,
Wenhua Rd, Banqiao Dist. New Taipei City,
Taiwan R.O.C
Postal Code: 22044
Tel No: +886-2-8258 5148
Fax No: +886-2-8258 5149
Email: schlegelemi@emeigroup.com

01/2026

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