



# 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.

# 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.).

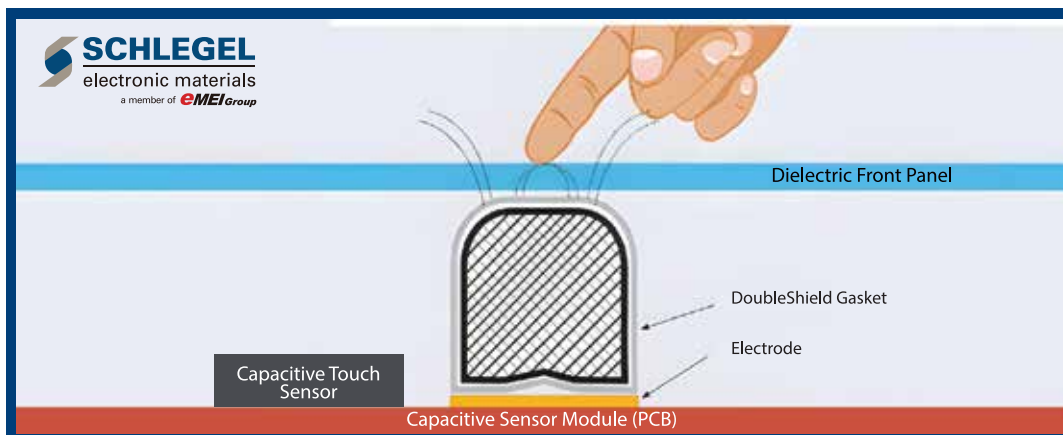
DoubleShield Pad compatibility with SMT equipment helps reduce total engineering costs because these off-the-shelf components eliminate the need for costly custom designs. Additionally, no secondary processing is required, reducing equipment and labor costs during production. Using precise SMT equipment 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



# DOUBLESIELD PAD

## DATA SHEET



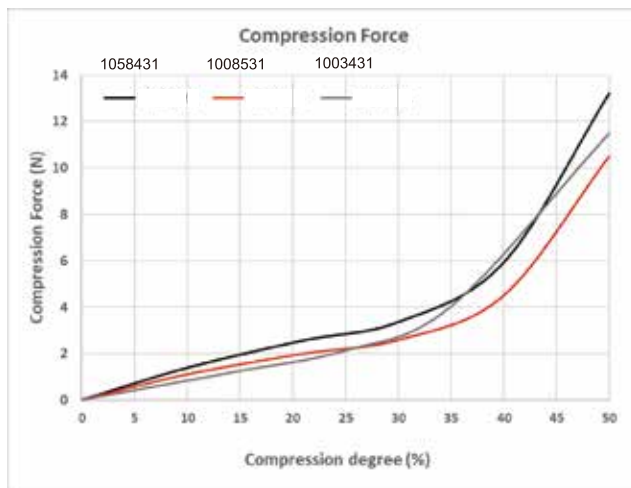
### Product Properties

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

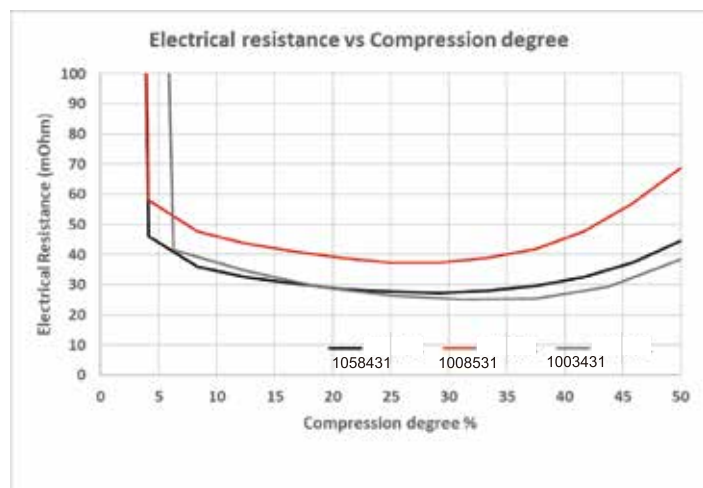
The recommended operating temperature is between  $-40^{\circ}\text{C}$  and  $+125^{\circ}\text{C}$ . To ensure a safe and repeatable compression, Schlegel recommends the use of mechanical compression stops allowing a compression degree of 15-25%. Minimum 15% and maximum 35% compression is recommended.

Property	Test Standard	Unit	SEM1058431	SEM1008531	SEM1003431
Recommended compression stop		mm	1.9	1.9	1.2
Force to compress to RCS*		N	2.6	2.0	2.1
Electrical resistance at RCS*	SEM R9 / R10	Ohm	0.03	0.04	0.04
Compression set, @ 22h/125 °C	ISO 815	%	10	13	11

\*RCS – Recommended compression stop



Compression force versus compression degree



Electrical resistance versus compression degree

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

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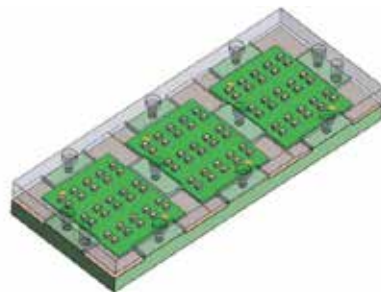


### Accelerated Life Testing

The Doubleshield Pad performance has been evaluated after accelerated life testing. The tests were performed at different conditions (see table below):

The performance was tested on 90 Pads after accelerated aging test in a test fixture simulating a grounding application.

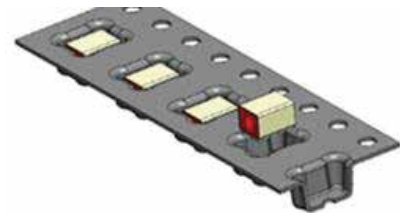
Property	Test Conditions
Cold	-65°C / 96 hr
Thermal cycling	-40 to +125°C (30 min. dwell time & 10K/min.) 1000 cycles
Dry heat	125 °C 2000 hours
Damp Heat Steady State	85 °C/ 85% RH duration 1000 hours



Accelerated Life test fixture

### Packaging

The Doubleshield Pad is delivered in a standard tape-and-reel format for automated placement in standard SMT process. The packaging complies with the EIA-481 standard.



### Storage conditions

The Doubleshield Pad is MSL-1 classified with unlimited storage time. This assumes that the component is 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 one year of storage is recommended.

# DOUBLESIELD PAD

## DATA SHEET



### Product Dimensions

The recommended solder paste pattern for the Doubleshield Pad should be either evenly distributed circles (Fig 1) or a rectangle (Fig 2). Either pattern allows for a sufficient volume of solder without flooding the ground trace with excess solder.

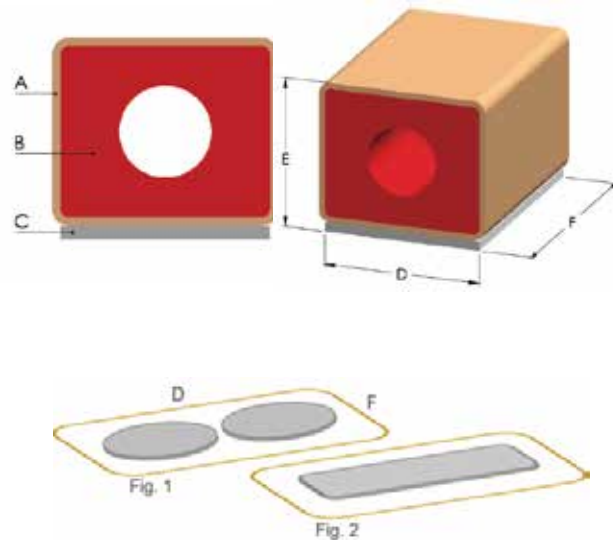
The nominell solder paste coverage should be 55%  $\pm$ 5% for 2.50 x 3.60 package and ~90% for the 1.60 x 3.60 size.

This recommendation minimizes rotation or lateral movements of the gasket during reflow.

The recommended screen stencil solder paste pattern is based on trials using a stencil thickness of ~0.127 mm and with SAC305 solder paste.

Performing additional evaluation if using a solder paste thickness that is less or greater than ~0.127 mm is recommended.

Material	SEM1008531	SEM1058431	SEM1003431
A	8610	8610	8610
B	1445	1540	1445
C	Sn/Ni/Cu	Sn/Ni/Cu	Sn/Ni/Cu
Dimension (mm)			
D	2.50	2.50	1.60
E	2.40	2.40	1.60
F	3.60	3.60	3.60
Recommended PCB solder mask opening (mm)			
D	2.75	2.75	1.85
F	3.75	3.75	3.75
Recommended solder paste pattern (mm)			
Fig. 1	$\varnothing 1.78 \times 2 \pm 5\%$	$\varnothing 1.78 \times 2 \pm 5\%$	-
Fig. 2	$1,50 \times 3,30 \pm 5\%$	$1,50 \times 3,30 \pm 5\%$	$1,46 \times 3,55$



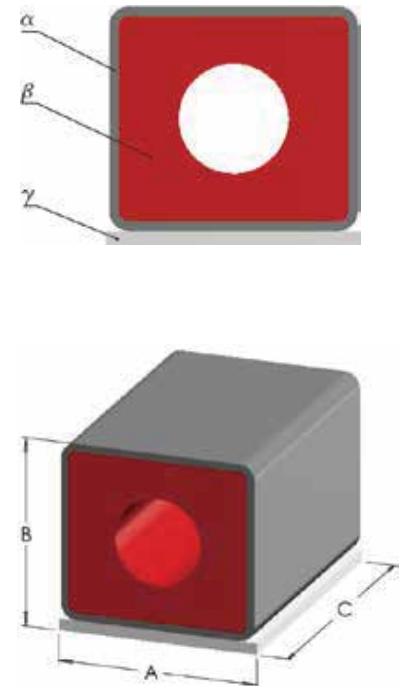
# DOUBLESIELD PAD

## DATA SHEET

### 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
$\alpha$	Schlegel 8686	Schlegel 8686	Schlegel 8686
$\beta$	Schlegel 1445	Schlegel 1540	Schlegel 1445
<b>NEW</b> $\gamma$	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.

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

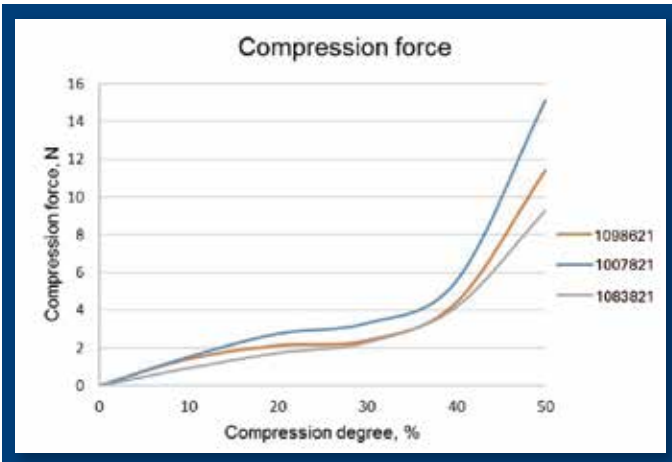


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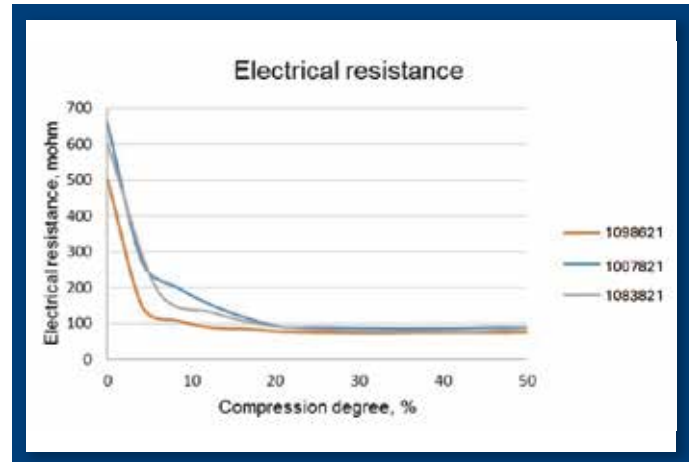
### Compression force

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



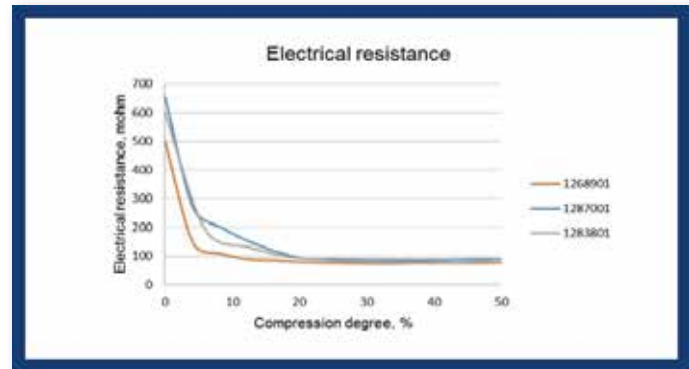
### Electrical resistance

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.



### Disclaimer

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