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AN-9097

SPM® 55 Package Mounting Guidance

Mounting Guidance

This application note shows the electric spacing and mounting guidance of SPM® 55 Package.

Electric Spacing

The electric spacing specification of SPM 55 Package is shown in Table 1.

Table 1. Typical Electric Spacing of SPM 55 Package

Location	Clearance [mm]	Creepage Distance [mm]
Between Power Terminals	3.08	3.28
Between Control Terminals	2.40	4.40
Between Terminals & H/S	1.55	1.55

Mounting Method and Precautions

When installing a module to a heat sink, excessive uneven fastening force might apply stress to inside chips, which will lead to a damage or degradation of the device. An example of recommended fastening order is shown in Figure 1.

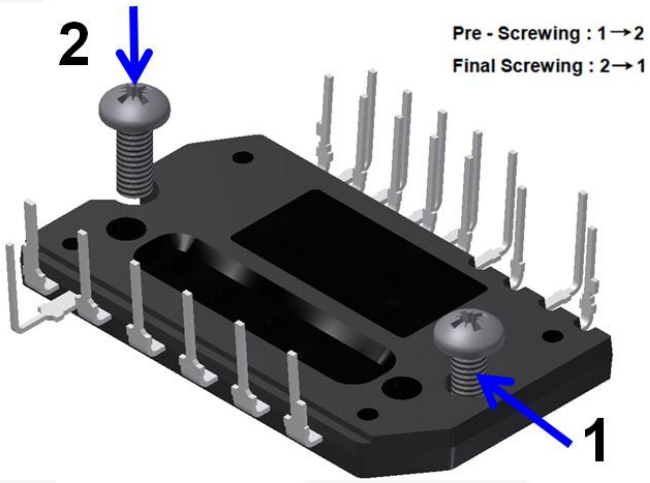

Figure 1. Mounting Screws Fastening Order: Pre-Screwing: 1 → 2; Final Screwing: 2 → 1

Notes:

1. Do not apply excessive torque when mounting screws. Too much torque may cause ceramic cracks as well as destruction of screws and the heat sink.
2. Avoid tightening one side at once. Figure 1 shows the recommended torque order for mounting screws. Uneven mounting can cause the SPM ceramic substrate to be damaged. The pre-screwing torque needs to be set as 20~30% of the maximum torque rating.

Table 2. Mounting Torque and Heat Sink Flatness Specifications

Parameter	Conditions		Limits			Units
			Min.	Typ.	Max.	
Device Flatness	See Figure 2		-50	-	+100	μm
Heat sink Flatness	See Figure 3		-50	-	+100	μm
Mounting Torque	Screw: M3	Recommended 0.9N·m	0.6	0.7	0.8	N·m
		Recommended 9.1kgf·cm	5.9	6.9	7.9	kgf·cm
Weight			-	6.0	-	g

Note:

3. SEMS screws (include spring/plain washer, M3) are recommended.

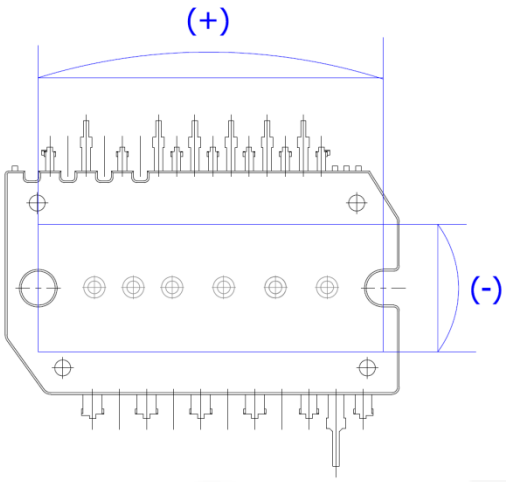

Figure 2. Measurement Points of Package Surface Flatness

Note:

4. The measurement points of flatness of the package surface are package center and four outside corners.

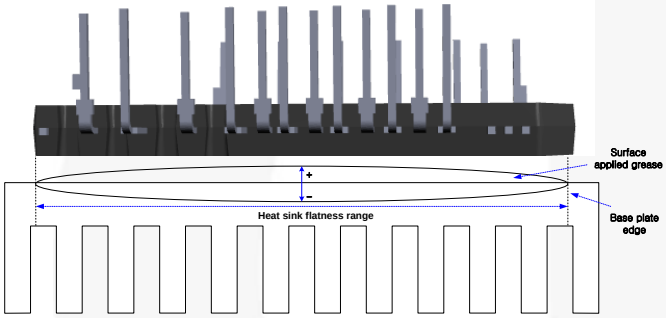

Figure 3. Measurement Point of Heat Sink Flatness

To get the most effective heat dissipation, it is necessary to enlarge the contact area as much as possible to minimize the contact thermal resistance.

Properly apply thermal-conductive grease over the contact surface between the module and the heat sink. It is also useful for preventing the contact surface from corrosion. Furthermore, ensure the grease to be with stable quality and long endurance within the wide operation temperature range. Use a torque wrench to fasten up screws to the specified torque rating. Exceeding the maximum torque limitation might cause a damaged or degraded. Also pay attention not to have any desert remaining on the contact surface.

Thermal Compound

- Used a minimum. 150 μm layer of thermal grease to the module base plate or to the heat sink
- While fastening the module, a rim of thermal compound must be observed around the mounted module.

Fixing Sequence

- Fix all screws 0.5 N·m under (by hand or driver).
- Apply impact torque 1.5 ~ 2.5 N·m crosswise.
- Use recommended SEMS screw (included spring/plain washer M3).

Figure 4. SEMS Screw (Size M3, Spring Washer 5.0Φ, Plain Washer 7.5Φ)

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FNB50560T1 Motion SPM® 55 Series

FNA51060T3 Motion SPM® 55 Series

FNB51060T1 Motion SPM® 55 Series

FNB51560T1 Motion SPM® 55 Series

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AN-9096 –Motion SPM® 55 Series User's Guide

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