



**Mounting recommendations for ceramic DMOS packages**

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**Introduction**

This application note provides mounting recommendations for ceramic packages used in the assembly of DMOS radio frequency transistors suitable for applications such as ISM and FM broadcasting.

# 1 Mounting recommendations for M174, M177 and M244

## 1.1 Mounting recommendations

- Ensure holes in heatsinks are free from burrs
- Minimum depth of tapped holes in heatsinks is 6 mm
- Use 4-40 UNC-2A cheese-head screws with a flat washer to spread the joint pressure
- The minimum flatness of the mounting area is 0.02 mm
- Mounting area roughness should be less than 0.5 μm (micro)
- Avoid, as much as possible, use of flux or flux solutions because flux can penetrate even when hermetically sealed ceramic-capped transistors. Tin and wash the printed-circuit board BEFORE mounting the power transistors, then solder the transistor leads without using flux
- Transistor leads may be tinned by dipping them full-length into a solder bath at a temperature of about 230°C. No flux should be used during tinning
- Recommended heatsink compounds : WPSII (silicon free) from Austerlitz Electronics, 340 from Dow Corning etc.

## 1.2 Mounting sequence

- Apply a thin layer of evenly distributed heatsink compound to the flange
- Position the device with flat washers in place
- Tighten the screws until finger tight (0.05 Nm)
- Further tighten the screws until the specified torque is reached
- For M174, M177 & M244 type of packages, torque should be minimum 0.6 Nm and 0.75 Nm max.

**Table 1. DMOS packages - list of materials**

Package type	Description	Flange	Leadframe	Ceramic insulator	Plating		Torque (Nm)	
					Leads	Flange	Min.	Max.
M174	0.500 DIA 4L non herm w/flange	Cu	ALLOY 42 (Fe58 / Ni42)	BeO (99.5% min)	Au (100μ min) over Ni (100μ min / 350μ max)	Ni (100μ min) + Pd (10μ min)	0.6	0.75
M174 (Moly disk)	0.500 DIA 4L non herm w/flange (moly disk)	Cu-Mo-Cu	ALLOY 42 (Fe58 / Ni42)	BeO (99.5% min)	Au (100μ min) over Ni (100μ min / 350μ max)	Ni (100μ min) + Pd (10μ min)	0.6	0.75

Table 1. DMOS packages - list of materials (continued)

Package type	Description	Flange	Leadframe	Ceramic insulator	Plating		Torque (Nm)	
					Leads	Flange	Min.	Max.
M177	0.550 DIA 4L non herm w/flange	Cu-Mo-Cu	ALLOY 42 (Fe58 / Ni42)	BeO (99.5% min)	Au (60 $\mu$ min) over Ni (100 $\mu$ min / 350 $\mu$ max)	Au (100 $\mu$ min) over Ni (100 $\mu$ min / 350 $\mu$ max)	0.6	0.75
M244	2x 0.400x0.425 wide 2l lap n/h flange	W (85%) - Cu (15%)	ALLOY 42 (Fe58 / Ni42)	BeO(99.5% min)	Au (60 $\mu$ min) over Ni (100 $\mu$ min / 350 $\mu$ max)		0.6	0.75

## 2 Revision history

**Table 2. Document revision history**

Date	Revision	Changes
27-Sep-2004	1	Initial release.
08-Jun-2011	2	Document reworked to improve readability, no technical changes.

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