**DESIGN PARAMETERS FOR THE CADMP POWER DEVICE**

**Constraints**

| | | |
|---|---|---|
| Package type | Quad Flat Pack | |
| Material type | Ceramic | |
| Minimum I/O Pitch | 10 mils | |
| Maximum I/O Pitch | 100 mils | |
| Max allowable package length | 1000 mils | |
| Max allowable package width | 1000 mils | |
| Max allowable package height | 400 mils | |
| Number of substrates | | 0 |
| Mounting packaging material | PWBMATR.FR4 | |

**Semiconductor Device**

| | | |
|---|---|---|
| Element ID | SEM 1 | |
| Element Name | SEM 1 | |
| Stacked | NONE | |
| Element Orientation | Flat | |
| Element material | DIEMATR.SI | |
| Semiconductor Technology | MOSFET | |
| Interconnect Technology | Al_wire | |
| Interconnection to: | SUBSTRATE | |
| Power Dissipation | 150 watts | |
| Element Length | 275 mils | |
| Element Width | 275 mils | |
| Element Thickness | 15 mils | |
| Bond Pad Material | METAMATR.AL | |
| Bond Pad Pitch | 50 mils | |
| Bond Pad Length | 40 mils | |
| Bond Pad Thickness | 0.5 mils | |
| Bond Pad Width | 40 mils | |
| High Output Voltage | 99 volts | |
| Low Output Voltage | 1 volt | |
| High Input Voltage | 19 volts | |
| Low Input Voltage | 1 volt | |
| Clock frequency | 33 MHz | |
| Bandwidth | 250 MHz | |
| Worst case current density | 1 E 06 A/cm2 | |
| Avalanche breakdown voltage | 50 volts | |
| Internal bulk resistance | 8 ohms | |
| Thermal breakdown energy | 1000 J | |
| Input junction energy | 5 J | |
| Voltage (source-to-drain) | 100 volts | |
| Potential drop | | 0 |
| Carrier concentration | 1 E 20 | |
| Doping density | 1 E 20 | |
| Poly width | | 0 |
| Diffusion length | | 0 |
| Initial vertical crack depth | 0.5 mils | |

| | |
|---|---|
| Final vertical crack depth | 1 mils |
| Initial horizontal crack depth | 0.5 mils |
| Final horizontal crack depth | 1mils |
| Min. distance between tracks | 0.08 mils |
| Passivation Deposition Temp | 475 C |
| Gate oxide thickness | 500 angstroms |
| Effective oxide thickness | 400 angstroms |
| Horiz elliptical crack length | 2mils |
| Horiz elliptical crack depth | 1mils |
| Vertical elliptical crack length | 2 mils |
| Vertical elliptical crack depth | 1 mils |
| Metallization material | METAMATR.AL |
| Max metallization length | 250 mils |
| Max metallization width | 0.08 mils |
| Max metallization thickness | 0.04 mils |
| Maximum crack width | 0.4 mils |
| Grain boundary width | 0.4 mils |

**Device Placement** **CENTER**

**Device Attach**

| | |
|---|---|
| Attach material | ATTAMATR.AUSI |
| Initial Horiz. Crack Depth | 0.25 mils |
| Final Horiz. Crack Depth | 1 mil |
| Half Horiz. Crack Length | 0.5 mils |
| Bonding Temperature | 363 C |
| **Attach thickness** | **1.5 mils** |

**Lead** **FLAT LEAD**

| | |
|---|---|
| Lead Select | Deselect all leads on the top and bottom<br>Deselect the third and seventh lead on each side |
| Lead/Pin Pitch | 65 mils |
| Min Lead Margin | 0 mils |
| Solder Length | 65 mils |
| Solder Width | 65 mils |
| Solder Height | 2 mils |

**Lead Designer**

| | |
|---|---|
| Lead material | LEADMATR.CU194 |
| Solder material | SOLDER.SNPB3 |
| Lead length | 100 mils |
| Lead width | 65 mils |
| Lead thickness | 10 mils |

**Lead Seal**

| | |
|---|---|
| Lead seal material | ATTAMATR.EPOXYN |

| | |
|---|---|
| Lead seal thickness | 10 mils |

**Lid**

| | |
|---|---|
| Lid material | LIDMATR.AL2O3 |
| Lid ring width | 0 mils |
| Lid ring length | 0 mils |
| Lid ring thickness | 20 mils |
| Lid width | 600 mils |
| Lid thickness | 20 mils |

**Lid Seal**

| | |
|---|---|
| Lid seal material | ATTAMATR.EPOXYN |
| Lid seal thickness | 10 mils |

**Case**

| | |
|---|---|
| Case width | 600 mils |
| Case thickness | 60 mils |
| Inner case width | 550 mils |
| Inner case thickness | 25 mils |
| Wall material | HERMMATR.AL2O3N |
| Header material | HERMMATR.BEO |
| Header attach material | ATTAMATR.EPOXYN |
| Header attach thickness | 10 mils |
| Leak rate | 1 E -12 Pa/m3s |

Radioactive Element Conc 0

| **Interconnect Design** | **Al_wire** |
|---|---|
| Wire material | WIREMATR.AL |
| Bond type | WEDGE |
| Length of the wire bond | 4 mils |
| Wire span | 50 mils |
| Wire diameter | 5 mils |
| Wire length | 70 mils |
| Initial radius of curvature | 10 mils |
| Angle of wire contact (far end) | 30 degrees |