CLAIMS:

1. A process for manufacturing a wafer-level microelectromechanical systems (MEMS) device package, comprising:

a) providing a substrate having a freestanding movable microelectromechanical structure;

b) forming a thermally decomposable sacrificial layer overlying said substrate, where said sacrificial layer essentially encapsulates said freestanding movable microelectromechanical structure;

c) patterning said sacrificial layer;

d) encapsulating said substrate with a molding compound at a first temperature ~~of from 160°C to 200°C~~ for a first period of time where said sacrificial layer remains substantially present; and

e) curing said molding compound at a second temperature ~~of from 180°C to 250°C~~ such that said patterned sacrificial layer is thermally decomposed to form a cavity surrounding said freestanding movable microelectromechanical structure.

2. The process of Claim 1 where said substrate comprises a silicon material.

~~3. The process of Claim 2 where said substrate is a silicon wafer.~~

~~4. The process of Claim 1 where said substrate comprises a non-silicon material.~~

~~5~~3. The process of Claim 1 where said sacrificial layer is formed from a material selected from the group consisting of polycarbonate, polynorbornene, polyether, polyester and combinations thereof.

~~6~~4. The process of Claim 1 where said sacrificial layer is formed from a polycarbonate selected from the group consisting of polypropylene carbonate (PPC), polyethylene

carbonate (PEC), polycyclohexane carbonate (PCC), polycyclohexanepropylene carbonate (PCPC), polynorbornene carbonate (PNC) and combination thereof.

~~7~~5. The process of Claim 1 where said sacrificial layer is formed either from polypropylene carbonate (PPC) or polyethylene carbonate (PEC).

6. The process of Claim 1 where said sacrificial layer is having a thickness of from about 1 µm to about 10 µm.

7. The process of Claim 1 where said molding compound is having a thickness of from about 0.1 mm to about 5 mm.

8. The process of Claim 1 where said molding compound is an epoxy compound.

9. The process of Claim 1 where said molding is carried out by an injection molding at a temperature of from about 160°C to about 200°C and at an injection gauge pressure of from about 8 MPa to about 12 MPa; and where said sacrificial layer is decomposed at a temperature of from about 180°C to about 250°C.

~~8~~10. The process of Claim 1 where said sacrificial layer is formed from polyethylene carbonate (PEC).

~~9~~11. The process of any of Claim~~s 6 to 8~~1 where said sacrificial layer further comprises a photo-acid generator (PAG).

~~10. The process of Claim 9 where said photo-acid generator (PAG) is a diphenyliodonium or triphenylsulfonium salt.~~

~~11~~12. The process of Claim ~~9~~11 where photo-acid generator (PAG) is selected from the group consisting of tetrakis(pentafluorophenyl)borate-4-methylphenyl[4-(1-methylethyl)phenyl iodonium (DPITPFPB), tris(4-t-butylphenyl)sulfonium

tetrakis-(pentafluorophenyl)borate (TTBPS-TPFPB) and tris(4-t-butylphenyl)sulfonium hexafluorophosphate (TTBPS-HFP).

13. The process of Claim 11 where said photo-acid generator (PAG) is a diphenyliodonium or triphenylsulfonium salt.

~~12~~14. The process of Claim 1 further comprising, prior to patterning the sacrificial layer, providing a first overcoat layer overlying said sacrificial layer where said first overcoat layer is formed from a polymer selected from the group consisting of epoxycyclohexyl polyhedral oligomeric silsequioxane (EPOSS), polyimide, polynorbornene, epoxy resin, benzocyclobutene based polymer, polyamide and polybenzoxazole (PBO).

~~13. The process of Claim 12 further comprising a contiguous second overcoat layer, said second overcoat layer encapsulating said patterned sacrificial layer and overlying portions of said substrate.~~

~~14~~15. The process of Claim ~~12~~14 where patterning said sacrificial layer comprises first patterning said first overcoat layer and transferring the pattern of said first overcoat layer to said sacrificial layer.

~~15~~16. The process of Claim ~~14~~15 where said first overcoat layer is removed after said patterning of said sacrificial layer.

~~16~~17. The process of Claim ~~1~~14 where said first overcoat layer is formed from epoxycyclohexyl polyhedral oligomeric silsequioxane (EPOSS).

~~17. The process of Claim 1 where said sacrificial layer is having a thickness of from about 1 µm to about 10 µm.~~

18. The process of Claim ~~12~~17 where said first overcoat layer is having a thickness of from about 0.1 µm to about 3 µm.

19. The process of Claim 14 further comprising a contiguous second overcoat layer, said second overcoat layer encapsulating said patterned sacrificial layer and overlying portions of said substrate.

~~19~~20. The process of Claim ~~1~~19 where said second overcoat layer is having a thickness of from about 0.1 µm to about 3 µm.

~~20. The process of Claim 1 where said molding compound is having a thickness of from about 0.1 mm to about 5 mm.~~

~~21. The process of Claim 1 where said molding compound is having a thickness of from about 0.2 mm to about 2 mm.~~

~~22. The process of Claim 20 or 21 where said molding compound is an epoxy compound.~~

~~23. The process of Claim 1 where said molding is carried out by an injection molding an injection gauge pressure of from about 8 MPa to about 12 MPa.~~

~~24. A wafer level microelectromechanical system (MEMS) device package made by the process of Claim 1.~~

~~25. A capacitive resonator packaged in accordance with the process of Claim 1.~~

~~26. A wafer level microelectromechanical system (MEMS) device package, comprising:~~

~~a) a substrate having a freestanding movable microelectromechanical structure;~~

~~b) a cavity surrounding said freestanding movable microelectromechanical structure;~~

~~c) one or more contiguous overcoat layers disposed around said cavity; and~~

~~f) a molding compound encapsulating at least part of said substrate, where said cavity is formed by an *in situ* thermal decomposition of a patterned sacrificial layer.~~

~~27. The wafer level microelectromechanical system (MEMS) device package of Claim 26, comprising a capacitive resonator.~~

~~28. A wafer level microelectromechanical system (MEMS) device package, comprising:~~

~~a) a substrate having a freestanding movable microelectromechanical structure, said substrate encapsulated with a molding compound; and~~

~~b) a cavity surrounding said freestanding movable microelectromechanical structure and contacting said molding compound.~~