Since the inner paddle pads 1800 and the outer frame pads 2304 are cut at one end, the same the inner paddle pads 1800 and the outer frame pads 2304 are characterized in being the same general size and having the same truncated oblong shape.

The coverlay tape 1420 may be removed either after encapsulation or during singulation.

Referring now to FIG. 24, therein is shown a bottom view of the integrated circuit package system 2302 of FIG. 23. The integrated circuit package system 2302 has the outer frame pads 2304, the inner frame pads 1506, the outer paddle pads 1508, and the inner paddle pads 1800.

Referring now to FIG. 25, therein is shown a cross-sectional view of the structure of FIG. 24 along line 25--25. The integrated circuit package system 2302 shows the outer frame pads 2304 and the outer paddle pads 1508. A coplanar bottom surface 2502 includes a bottom surface of the outer paddle pads 1805, which were previously separated from the die paddle 1404, of FIG. 14, and a bottom surface of the outer frame pads 2304 exposed from the encapsulant 2300.

Referring now to FIG. 26, therein is shown a cross-sectional view of the structure of FIG. 24 along line 26--26. The integrated circuit package system 2302 shows the inner frame pads 1506 and the inner paddle pads 1800. The coplanar bottom surface 2502 includes a bottom surface of the inner paddle pads 1800, which were previously separated from the die paddle 1404, of FIG. 14, and a bottom surface of the inner frame pads 1506 exposed from the encapsulant 2300.

Referring now to FIG. 27, therein is shown a flow chart of an integrated circuit package system 2700 for manufacturing the integrated circuit package system 2302 in an embodiment of the present invention. The integrated circuit package system 2700 includes: forming a leadframe having a frame and a die paddle having leads thereon in a block 2702; holding the leads with respect to the die paddle in a block 2704; separating the leads from the die paddle in a block 2706; attaching a die to the die paddle in a block 2708; bonding bond wires between the leads and the die in a block 2710; encapsulating the die and the bond wires in a block 2712; and singulating the leadframe to separate the frame and the die paddle in a block 2714.

An important aspect of the present invention is that it valuably supports and services the historical trend of reducing costs, simplifying systems, and increasing performance.

These and other valuable aspects of the present invention consequently further the

state of the technology to at least the next level.

Thus, it has been discovered that the integrated circuit package system 2700 of the present invention furnishes important and heretofore unknown and unavailable solutions, capabilities, and functional aspects for integrated circuit package systems. The resulting processes and configurations are straightforward, cost-effective, uncomplicated, highly versatile and effective, can be surprisingly and unobviously implemented by adapting known technologies, and are thus readily suited for efficiently and economically

The invention claimed is:

1. ~~An~~ A method of manufacturing an integrated circuit package system comprising:

forming a leadframe having a frame and a die paddle having leads thereon;

holding the leads with respect to the die paddle by molding a pre-molding compound between the leads and the die paddle;

separating the leads from the die paddle;

attaching a die to the die paddle;

bonding bond wires between the leads and the die;

forming a coplanar bottom surface by encapsulating with an encapsulant, the die and the bond wires including exposing the leads, separated from the die paddle, wherein the coplanar bottom surface is formed by a bottom surface of the encapsulant and a bottom surface of the leads exposed from the encapsulant; and

singulating the leadframe to separate the frame and the die paddle.

2. The ~~system~~method as claimed in claim 1 wherein separating the leads from the die paddle uses punching, water jet abrasion, or laser processing.

3. The ~~system~~method as claimed in claim 1 wherein separating the leads from the die paddle uses etching.

~~4. The system as claimed in claim 1 wherein holding the leads with respect to the die paddle uses an encapsulant molded within the leadframe.~~

~~5. The system as claimed in claim 1 wherein holding the leads with respect to the die paddle uses a coverlay tape under the leadframe.~~

~~6.~~4. ~~An~~ A method of manufacturing an integrated circuit package system comprising:

forming a leadframe having inner frame leads and outer frame leads on a frame and inner paddle leads and outer paddle leads on a die paddle;

half-etching the inner frame leads and the outer paddle leads;

holding the inner paddle leads and the outer paddle leads with respect to the die paddle by molding a pre-molding compound between the leads and the die paddle;

separating the inner paddle leads and the outer paddle leads from the die paddle including forming inner paddle pads and outer paddle pads;

attaching a die to the die paddle;

bonding bond wires among the die, the inner frame leads, the outer frame leads, the inner paddle ~~leads~~pads and the outer paddle ~~leads~~pads;

forming a coplanar bottom surface by encapsulating with an encapsulant the die and the bond wires including exposing the inner paddle leads and the outer paddle leads, separated from the die paddle, wherein ~~on~~ the coplanar bottom surface is formed by a bottom surface of the encapsulant and a bottom surface of the leads exposed from the encapsulant; and

singulating the leadframe to separate the frame from the inner frame leads and the outer frame leads.

5. ~~7~~ The ~~system~~method as claimed in claim 4~~6~~ wherein separating the inner paddle leads and the outer paddle leads from the die paddle uses punching, water jet abrasion, or laser

processing.

~~8.~~6. The ~~system~~method as claimed in claim ~~6~~4 wherein separating the inner paddle leads and the outer paddle leads from the die paddle uses etching

~~9. The system as claimed in claim 6 wherein holding the inner paddle leads and the outer paddle leads with respect to the die paddle uses an encapsulant molded only within the leadframe.~~

~~10.~~7. The ~~system~~method as claimed in claim ~~6~~4 wherein:

~~holding the inner paddle leads and the outer paddle leads with respect to the die paddle uses a coverlay tape under the leadframe; and~~

separating the inner paddle leads and the outer paddle leads from the die paddle opens a space between the die paddle and inner paddle leads and the outer paddle leads.

~~11.~~8. An integrated circuit package system comprising:

a die paddle;

lead pads characterized in being separated from the die paddle;

a die-attached to the die paddle;

a pre-molding compound molded between the lead pads and the die paddle;

bond wires connected between the lead pads and the die; and

a coplanar bottom surface formed by a bottom surface of an encapsulant encapsulating the die and the bond wires, and a bottom surface of the lead pads, separated from the die paddle, and exposed from the encapsulant.~~.~~

~~12.~~9. The system as claimed in claim ~~11~~8 wherein the lead pads include a characteristic surface finish of ~~are characterized in~~ being separated from the die paddle by punching, water jet abrasion, or laser processing.

~~13.~~10. The system as claimed in claim ~~11~~8 wherein the lead pads include a characteristic surface finish of ~~are characterized in~~ being separated from the die paddle by etching.

~~14. The system as claimed in claim 11 further comprising a pre-molding compound molded between the lead pads and the die paddle.~~

~~15. The system as claimed in claim 11 wherein the encapsulant is molded between the lead pads and the die paddle.~~

~~16.~~11. The system as claimed in claim ~~11~~8 wherein:

the lead pads include inner paddle pads and outer paddle pads characterized in being separated from the die paddle;

inner frame pads and outer frame pads characterized in being singulated by sawing, laser cutting, water jet abrasion, or punching;

the inner frame pads and the outer paddle pads having metal removed from the undersides thereof;

the inner paddle pads and outer paddle pads held with respect to the die paddle; and

the bond wires among the die, the inner frame pads, the outer frame pads, the inner paddle pads, and the outer paddle pads.

~~17.~~12. The system as claimed in claim ~~16~~11 wherein the inner paddle pads and the outer paddle pads are characterized in being separated from the die paddle by punching, water jet abrasion, or laser cutting.

~~18.~~13. The system as claimed in claim ~~16~~11 wherein the inner paddle pads and the outer paddle pads are characterized in being separated from the die paddle by etching.

~~19.~~14. The system as claimed in claim ~~16~~ 11 wherein the ~~further comprising a~~ pre-molding compound hold~~ing~~s the inner paddle pads and the outer paddle pads with respect to the die paddle.

~~20. The system as claimed in claim 16 wherein:~~

~~the encapsulant holds the inner paddle pads and the outer paddle pads with respect to the die paddle.~~