

Amkor's FusionQuad® represents a breakthrough in leadframe-based plastic packaging through the effective integration of ExposedPad™ QFP and MLF® technologies. FusionQuad® is based upon the addition of exposed bottom lands within a standard VQFP package format. The novel integration of bottom lands provides a cost-effective platform for increased lead count in a small form factor. FusionQuad® not only extends the I/O range of classic leadframe packaging to nearly 400 unique pins, it also delivers an approximate 50% reduction in package size for a given leadcount. Additionally, FusionQuad® provides excellent RF electrical performance characteristics with short signal paths to the bottom lands and high power dissipation capability with the solderable exposed die attach paddle.

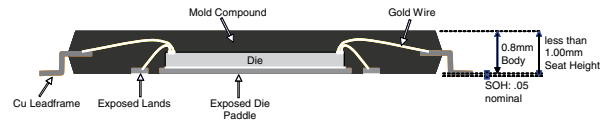
Amkor's FusionQuad® provides an ideal package format for most IC semiconductor technologies including advanced mixed signal SoCs, motor drivers, MCUs, ASICs, DSPs and a variety of others. FusionQuad® is particularly well suited for applications requiring superior electrical or thermal performance in a cost constrained environment including hard disk drives, laptop PCs, Ethernet communication, digital television, data conversion and many others.

FusionQuad®

Part Description	Total Lead Count	External Leads	Internal Leads	Body Size	Body Thickness	Lead Pitch	Quantity Per Tray
Single Row							
A-(V)FQFP176(128/48)-14mm-.4mm	176	128	48	14mm sq	.8mm	.4mm	90
A-(V)FQFP184(128/56)-14mm-.4/.5mm	184	128	56	14mm sq	.8mm	.4/.5mm	90
A-(V)FQFP196(148/48)-16mm-.4/.5mm	196	148	48	16mm sq	.8mm	.4/.5mm	84
A-(V)FQFP220(148/72)-16mm-.4mm	220	148	72	16mm sq	.8mm	.4mm	84
A-(V)FQFP280(224/56)-24mm-.4/.5mm	280	224	56	24mm sq	1.0mm	.4/.5mm	40
A-(V)FQFP304(224/80)-24mm-.4mm	304	224	80	24mm sq	1.0mm	.4mm	40
Dual Row							
A-(V)FQFP216(100/116)-14mm-.5mm	216	100	116	14mm sq	.8mm	.5mm	90

FusionQuad®—176 pin Single Row Design

Standard 14mm x 14mm VQFP
128LD 0.5mm External Lead Pitch

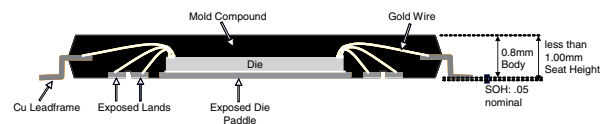


Single Row Exposed Land Design

Order Number: A-VQFP176(128/48)-14mm-0.5-DC-Sn

FusionQuad®—216 pin Dual Row Design

Standard 14mm x 14mm VQFP 100L
0.5mm External Lead Pitch



Double Row Exposed Land Design

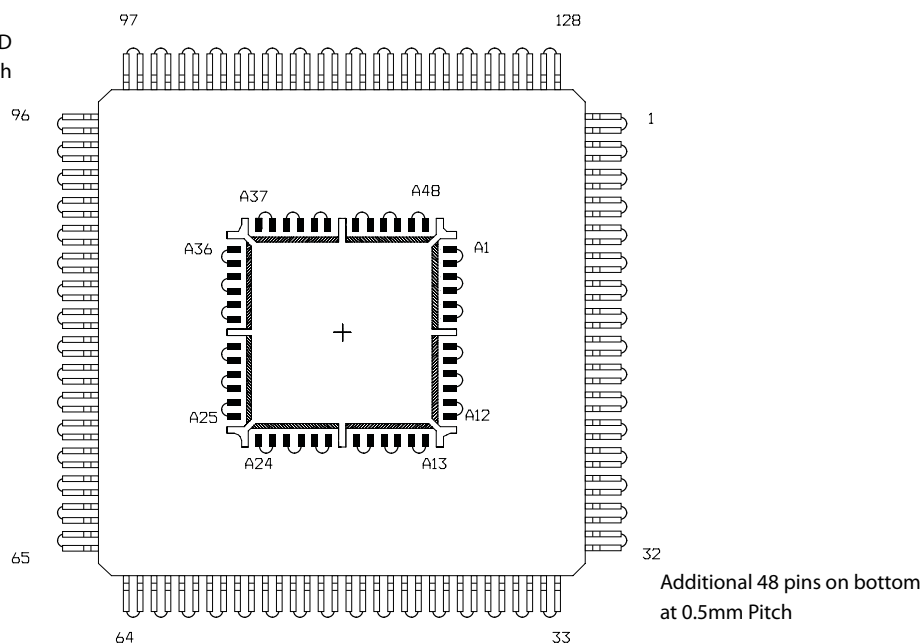
Order Number: A-VQFP216(100/116)-14mm-0.5-DC-Sn



For kits see pages 52, 53 and 93.

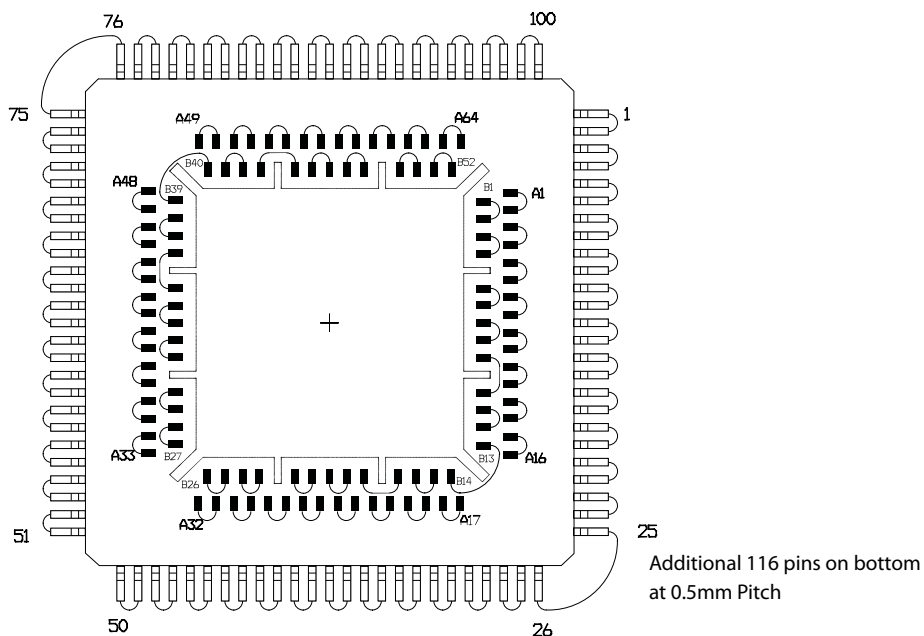
***FusionQuad*[®]—176 (128/48) pin Single Row Design**

Standard 14mm x 14mm VQFP 128LD
0.5mm External Lead Pitch



***FusionQuad*[®]—216 (100/116) pin Dual Row Design**

Standard 14mm x 14mm VQFP 100LD
0.5mm External Lead Pitch



FusionQuad® 176(128/48) Board and Kit

Thermal Cycle Lead Free Kit



Practical Components is offering a New Thermal Cycling test board and kit for Amkor's new *FusionQuad*® components. Thermal Cycling is a diagnostic test for electronic assemblies. The test is severe on solder joints that are under both compressive and tensile strain during cycling as a result of differential thermal expansion.

Amkor's *FusionQuad*® represents a breakthrough in leadframe-based plastic packaging through the effective integration of ExposedPad TQFP / LQFP, ExposedPad TQFP and MLF® technologies. The novel integration of bottom lands in a QFP provides a cost-effective platform for increased lead count in a small form factor. *FusionQuad*® not only extends the I/O range of classic leadframe packaging to nearly 400 unique pins, it also delivers an approximate 50% reduction in package size for a given leadcount. Additionally, *FusionQuad*® provides excellent RF Electrical Package Characterization, electrical performance characteristics with short signal paths to the bottom lands and high power dissipation capability with the solderable exposed die attach paddle.

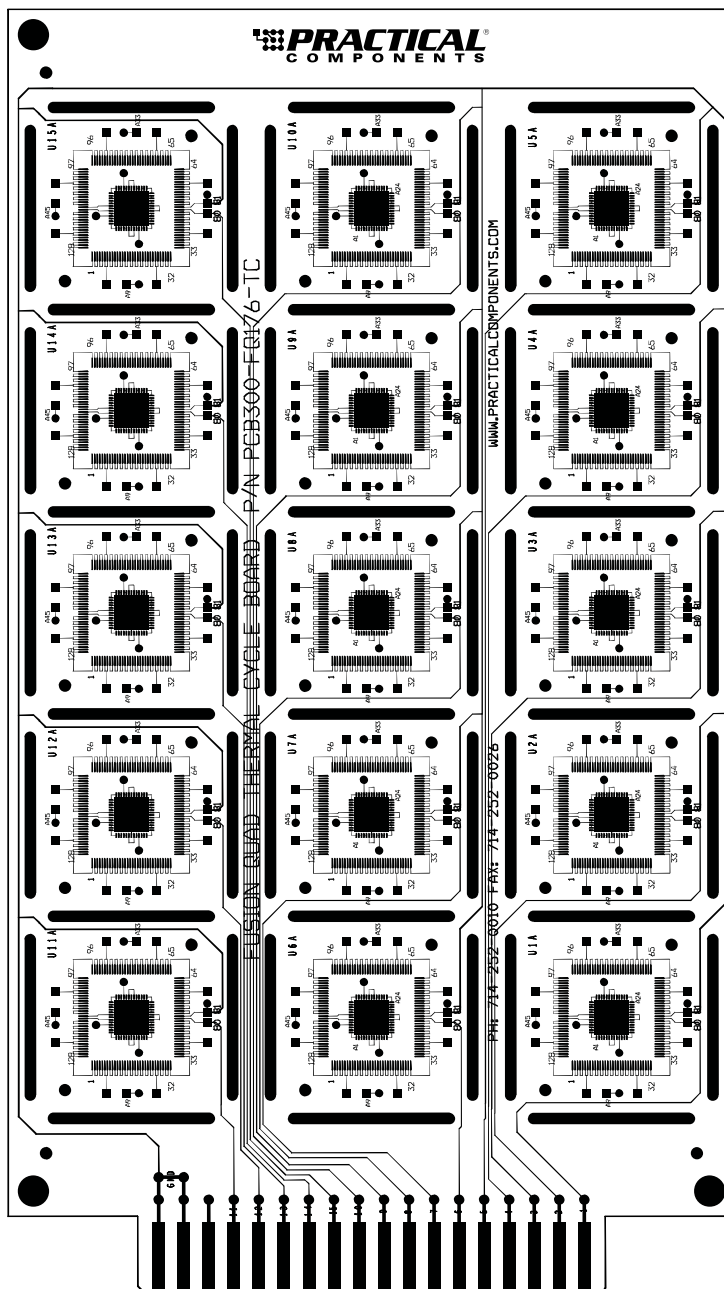
The new *FusionQuad*® Thermal Cycle Test Kit will allow customers to conduct valuable process testing on new technology components. Customers are encouraged to visit the Practical Components website at www.practicalcomponents.com or Amkor website at www.amkor.com for additional technical information regarding Amkor *FusionQuad*® components.

Notes

- Board size is 191 x 74mm, 4-layers, .039" thick, no microvias.
- Board material is IS-410 High Temp. 180Tg.
- Standard board finish is OSP Entek CU-106A-HT.
- 15 daisy-chain pad placements for 176(128/48) *FusionQuad*® components.
- Gerber and X,Y Theta data included at no charge.



PCB300 176(128/48) Thermal Cycle Board



Order Number: 19985 PCB300-FQ176-TC-OSPHT

Order Number: 31460 A-(V)FQFP176(128/48)-14mm-.4mm-DC-Sn

Practical Components is the
exclusive distributor of
Amkor Technology Mechanical Components.

The new *FusionQuad*® 216 ld (100/116) drop test kit contains both the test board and Amkor *FusionQuad*® 216 components. Amkor's new *FusionQuad*® components are particularly well suited for applications requiring superior electrical or thermal performance in a cost constrained environment, including hard disk drives, laptop PC, Ethernet communication, digital television, data conversions and many other applications.

The new PCB300 *FusionQuad*® test board has daisy chain patterns to test both the components and test board for process evaluation testing. This test boards allows customers to become familiar with some of the handling characteristics of the *FusionQuad*® components. The combination of leads on the outside of the package and pads on the interior of the package will require additional process evaluation methods. The intent of this test kit is to provide a low cost method to develop process control procedures for new technology components. Additional information concerning the test vehicle or *FusionQuad*® components is available on the Practical Components web site at www.practicalcomponents.com. *FusionQuad*® component technical data and characteristics is available on the Amkor web at www.amkor.com.

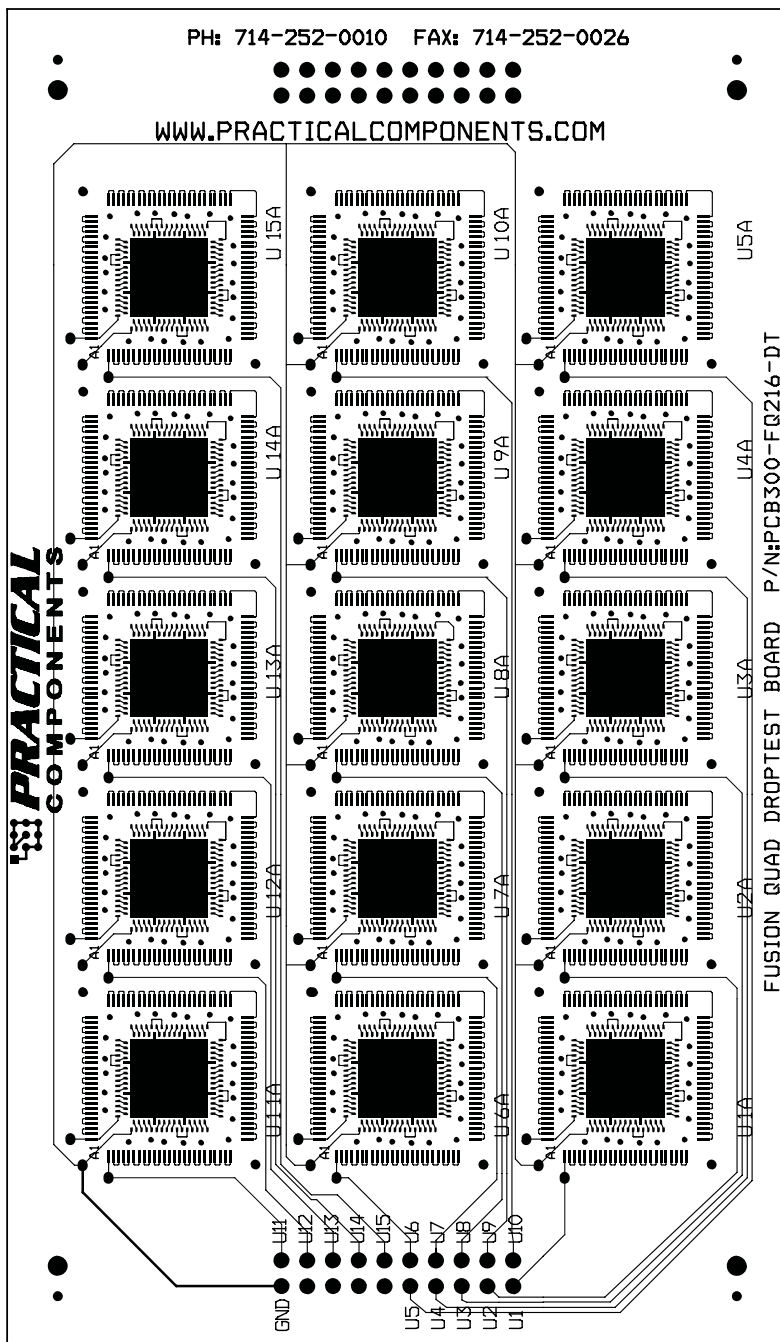
Notes

- Board size is 132 x 77mm, 8-layers, .039" thick, no microvias.
- Board material is IS-410 High Temp. 180Tg.
- Standard board finish is OSP Entek CU-106A-HT.
- 15 daisy-chain pad placements for 216ld (100/116) *FusionQuad*® component.
- Gerber and X,Y Theta data included at no charge.



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PCB300 216ld (100/116) Drop Test Board



Order Number: 19986 PCB300-FQ216-DT-OSPHT

Order Number: 31429 A-(V)FQFP216(100/116)-14mm-.5mm-DC-LF