STATSChipPAC™

LQFP

Low Profile Quad Flat Pack: LQFP, LQFP-ep

HIGHLIGHTS

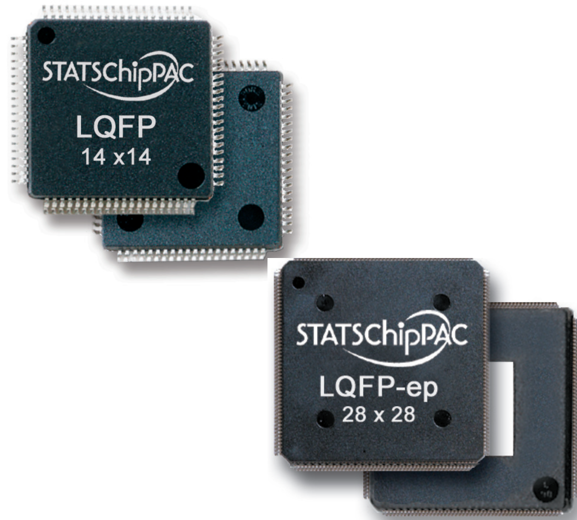
- **7 x 7mm to 28 x 28mm body sizes**
- **32 to 208 lead counts**
- **Lead pitch range from 0.80mm to 0.40mm**

FEATURES

- Body Sizes: 7 x 7mm to 28 x 28mm
- Package Height: 1.4mm
- Lead Counts: 32L to 208L
- Lead Pitch: 0.80mm to 0.40mm
- Wide range of open tool leadframe and die pad sizes available
- Moisture Sensitivity: JEDEC Level 3
- JEDEC standard compliant
- Lead-free and Green materials sets available

APPLICATIONS

- 3D Graphics
- Multimedia
- PC Chipsets
- Video / Audio
- Telecom
- Disc Drives
- Communication Boards (Ethernet, ISDN)



DESCRIPTION

STATS ChipPAC's LQFP is a low profile (1.4mm) version of the QFP. The LQFP is a leadframe based, plastic encapsulated package with gull wing shaped leads on four sides. The LQFP offers pin counts up to 208, and is suitable for designs with high I/Os while meeting low profile requirements. They are used for mainstream cost sensitive applications.

STATS ChipPAC also offers the LQFP in an Exposed Pad configuration (LQFP-ep). This is a thermally enhanced version of the LQFP package. Thermal enhancement is achieved by means of an exposed die pad, which can be soldered to a mother PC board for effective heat removal and grounding, if needed. This enhanced thermal package is made possible by a deep downset die pad leadframe design.

STATSChipPAC™

LQFP

Low Profile Quad Flat Pack: LQFP, LQFP-ep

SPECIFICATIONS

Die Thickness	280-430µm (11-17mils) range preferred
Gold Wire	18 -30µm (0.7-1.2mils) diameter, 99.99% Au
Lead Finish	Matte Tin
Marking	Laser
Packing Options	JEDEC tray / tape and reel

RELIABILITY

Moisture Sensitivity Level	JEDEC Level 3
Temperature Cycling	-65°C/150°C, 1000 cycles
High Temperature Storage	150°C, 500 hrs
Pressure Cooker Test	121°C 100% RH, 2 atm, 168 hrs
Liquid Thermal Shock (opt)	-55°C/125°C, 1000 cycles

LQFP THERMAL PERFORMANCE, θja (°C/W)

Package	Body Size (mm)	Pad Size (mm)	Die Size (mm)	Thermal Performance, θja (°C/W)
48L	7 x 7 x 1.4	5.3 x 5.3	3.8 x 3.8	50.0
100L	14 x 14 x 1.4	9.0 x 9.0	7.8 x 7.8	37.2
208L	28 x 28 x 1.4	9.0 x 9.0	7.8 x 7.8	32.1

Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-7) under natural convection as defined in JESD51-2.

LQFP-ep THERMAL PERFORMANCE, θja (°C/W)

Package	Body Size (mm)	Pad Size (mm)	Die Size (mm)	PCB Vias	Thermal Performance, θja (°C/W)
48L	7 x 7 x 1.0	5.5 x 5.5	5.3 x 5.3	25	26.9
64L	10 x 10 x 1.0	6.5 x 6.5	6.0 x 6.0	36	24.0
80L	12 x 12 x 1.0	7.2 x 7.2	6.0 x 6.0	36	23.0

Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-7) under natural convection as defined in JESD51-2. Based on TQFP-ep simulations.

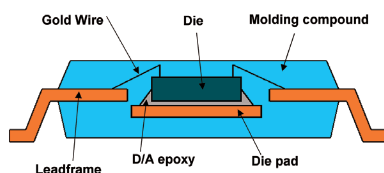
ELECTRICAL PERFORMANCE

Electrical parasitic data is highly dependent on the package layout. 3D electrical simulation can be used on the specific package design to provide the best prediction of electrical behavior. Data below is for a frequency of 100MHz and assumes 1.0 mil gold bonding wire.

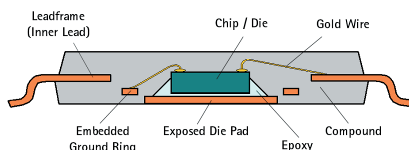
Conductor Component	Length (mm)	Resistance (mOhms)	Inductance (nH)	Inductance Mutual (nH)	Capacitance (pF)	Capacitance Mutual (pF)
Wire	2	120	1.65	0.45 - 0.85	0.10	0.01 - 0.02
Lead (7 x 7mm, 32L)	1.4 - 2.2	11.0 - 18.0	0.64 - 0.99	0.31 - 0.49	0.21 - 0.33	0.07 - 0.12
Total (7 x 7mm, 32L)		131 - 138	2.29 - 2.64	0.76 - 1.34	0.31 - 0.43	0.08 - 0.14
Wire	2	120	1.65	0.45 - 0.85	0.10	0.01 - 0.02
Lead (14 x 14mm, 128L)	3.0 - 4.5	24.0 - 36.0	1.96 - 2.92	1.08 - 1.61	0.45 - 0.67	0.20 - 0.30
Total (14 x 14mm, 128L)		144.0 - 156.0	3.61 - 4.57	1.53 - 2.46	0.55 - 0.77	0.21 - 0.32

CROSS-SECTION

LQFP



LQFP-ep



PACKAGE CONFIGURATIONS

Package	Size (mm)	Lead Count
LQFP	7 x 7	32, 48, 64
	10 x 10	44, 64, 80
	14 x 14	64, 80, 100, 120
	20 x 20	144, 164, 176
	24 x 24	176
	28 x 28	208
LQFP-ep	10 x 10	64
	14 x 14	64, 80, 100
	20 x 20	144, 176
	24 x 24	176
	28 x 28	208

NOTE: Other LQFP-ep packages available with tooling up in an exposed pad leadframe design.

Corporate Office 10 Ang Mo Kio St. 65, #05-17/20 Techpoint, Singapore 569059 Tel: 65-6824-7777 Fax: 65-6720-7823
Global Offices USA 510-979-8000 JAPAN 81-03-3507-5675 CHINA 86-21-5976-5858 MALAYSIA 603-4257-6222
KOREA 82-31-639-8911 TAIWAN 886-3-593-6565 UK 44-1483-413-700 NETHERLANDS 31-38-333-2023

The STATS ChipPAC logo is a registered trademark of STATS ChipPAC Ltd. Trademark registered in the United States. Singapore company registration number 199407932D. All other product names and other company names herein are for identification purposes only and may be the trademarks or registered trademarks of their respective owners. STATS ChipPAC disclaims any and all rights to those marks. STATS ChipPAC makes no guarantee or warranty of its accuracy in the information given, or that the use of such information will not infringe on the intellectual rights of third parties. Under no circumstances shall STATS ChipPAC be liable for any damages whatsoever arising out of the use of, or inability to use the materials in this document. STATS ChipPAC reserves the right to change the information at any time and without notice.
©Copyright 2010. STATS ChipPAC Ltd. All rights reserved.
March 2010