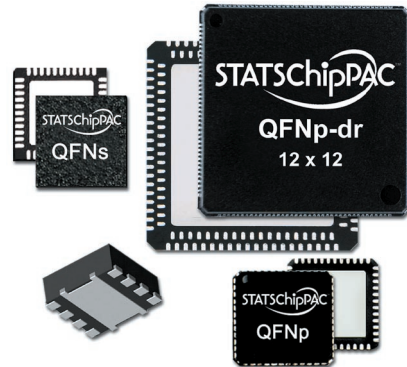


QFN

Quad Flat No-Lead Package

HIGHLIGHTS

- Punch or Saw singulated formats
- Body sizes from 1.0 x 1.3mm to 12 x 12mm
- Pin counts from 4L to 156L
- Square or rectangular body sizes
- Leads on four sides of the body (QFN)
- Leads on two opposing sides of the body (DFN)
- Dual row lead design options
- Thin package thickness options



FEATURES

- Body sizes: 1.0 x 1.3 to 12 x 12mm
- Lead pitch: 0.40, 0.50, 0.65 and 0.80mm
- Custom lead/pitch configurations available
- Package profile heights: 0.45, 0.55, 0.75, 0.85 and 0.90mm
- Option for non-exposed die pad
- Available in gold or copper wire bond versions
- Multi-die versions available
- Chip on Lead (COL) using Wafer Backside Coating (WBC) available
- Thin packages per JEDEC available (V, W, U, X)
- Green materials set
- Option for 100% matte Sn or PPF
- Small chip scale design offers 50% reduction in board space (16L TSSOP vs. 16L QFN)
- 33% weight reduction (16L TSSOP vs. 16L QFN)
- Excellent thermal & electrical performance
- Full in-house package and leadframe design capability
- Full in-house assembly and test capability
- Full in-house electrical, thermal and mechanical simulation and measurement capability
- Wide range of open tool leadframe and die pad sizes available

DESCRIPTION

STATS ChipPAC's Quad Flat No-Lead (QFN) and Dual Flat No-Lead (DFN) package offering includes QFNs (saw singulated), QFNp (punch singulated), VQFN, WQFN, UQFN, XQFN and QFN-dr. These are leadframe based, plastic encapsulated, chip scale packages in single mold cavity format (punch singulated) or molded array format (saw singulated).

An exposed die pad coupled with extremely low RLC provides excellent electrical and thermal performance enhancements which are ideal for high frequency and high power applications, and are especially suited for wireless and handheld portable applications such as cell phones.

QFN-dr with staggered dual row leads offers higher I/O counts. STATS ChipPAC's QFN packages are currently available in various body sizes and thicknesses, offered in standard and green/lead-free bill of materials and can be processed by conventional SMT equipment, benefiting surface mount operations downstream.

APPLICATIONS

- RF
- Power management
- Discretes
- Analog/Linear
- Logic
- Applications requiring enhanced electrical and thermal performance and reduced package size, thickness and weight

Quad Flat No-Lead Package

SPECIFICATIONS

Die Thickness	125-350µm
Wire	
Gold:	18-33µm (0.7-1.3mils) diameter
Copper: QFN	18-30µm (0.7-1.2mils) diameter <i>Contact STATS ChipPAC for availability.</i>
Copper: QFN-dr	18-25µm (0.7-1.0mils) diameter <i>Contact STATS ChipPAC for availability.</i>
Lead Finish	Matte Tin or preplated Ni/Pd/Au
Marking	Laser
Packing Options	Tape & reel, tube, JEDEC tray

RELIABILITY

Moisture Sensitivity Level	JEDEC MSL 3/2/1 (depending on package)
Temperature Cycling	-65°C/150°C, 1000 cycles
High Temperature Storage	150°C, 1000 hrs
Pressure Cooker Test	121°C, 100% RH, 2 atm, 168 hrs
Temperature/Humidity Test	85°C/85% RH, 1000 hrs

THERMAL PERFORMANCE, θ_{ja} (°C/W)

Package	Body Size (mm)	Pad Size (mm)	Die Size (mm)	Thermal Performance θ_{ja} (°C/W)	Thermal Vias (on test board)
48L UQFN	7 x 7 x 0.50	5.1 x 5.1	2.26 x 2.26	26.3	25
64L QFN	9 x 9 x 0.85	7.3 x 7.3	4.52 x 4.52	19.2	36
76L QFN-dr	8 x 8 x 0.85	5.28 x 5.28	4.52 x 4.52	26.6	16

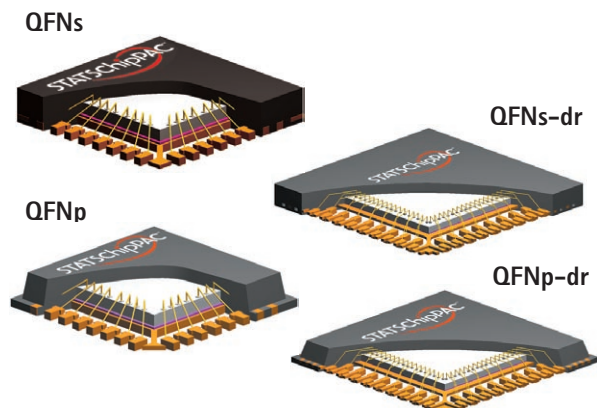
Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-7) under natural convection as defined in JESD51-2.

ELECTRICAL PERFORMANCE

Package	Body Size (mm)	Frequency	Length	Inductance (nH)	Capacitance (pF)
48L UQFN	7 x 7 x 0.50	100 MHz	Self (short)	0.88	0.191
			Mutual	0.20	0.032
			Self (long)	0.98	0.223
			Mutual	0.27	0.064
76L QFN-dr	8 x 8 x 0.85	100 MHz	Self (short)	1.33	0.180
			Mutual	0.45	0.080
			Self (long)	1.68	0.270
			Mutual	0.53	0.110

Note: Results are simulated values per JEDEC EIA/JEP123 standards.

CROSS-SECTIONS



PACKAGE CONFIGURATIONS

Pkg Size (mm)	Lead Pitch (mm)	Lead Count
1.0 x 1.3	0.50	4
2 x 2	0.65 / 0.50	4 / 8
2 x 3	0.50	6 / 8
3 x 3	0.80 / 0.65 / 0.50 / 0.40	4 / 8 / 12 / 16 / 20
4 x 4	0.80 / 0.65 / 0.50 / 0.40	12 / 14 / 16 / 20 / 24 / 28
5 x 5	0.80 / 0.65 / 0.50 / 0.40	14 / 16 / 20 / 28 / 32 / 40
6 x 5	0.80 / 0.65 / 0.50	18 / 20 / 22 / 32
6 x 6	0.80 / 0.65 / 0.50 / 0.40	20 / 24 / 28 / 32 / 36 / 38 / 40 / 48
7 x 7	0.80 / 0.65 / 0.50 / 0.40	28 / 32 / 36 / 40 / 44 / 48 / 56
8 x 8	0.80 / 0.65 / 0.50 / 0.40	28 / 32 / 36 / 40 / 44 / 48 / 52 / 56 / 64
9 x 9	0.65 / 0.50 / 0.40	44 / 48 / 56 / 60 / 64 / 72
10 x 10	0.50 / 0.50* / 0.40	64 / 68 / 72 / 84 / 88 / 132*
11 x 11	0.50 / 0.50*	80 / 148*
12 x 12	0.50 / 0.50*	88 / 156*

Note: *Dual Row configuration

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