QFP-SD

Stacked Die Quad Flat Pack

Highlights

- Stacking of die enables more functionality and integration in a conventional QFP package

Features

- Combining devices into one package reduces PCB real estate and cost
- Increased sub-system performance by integrating multiple chips into a single package
- Die to die bonding capability for device/signal integration
- Standard and green/lead-free materials and Pb-free plating
- Options for mixed technologies, 2 or more stacked dice (pending device layout)
- Fine pitch bonding capability
- Exposed pad provides enhanced thermal performance
- Low profile package thickness of 1.40mm (LQFP-SD and LQFP-ep-SD); 1.00mm (TQFP-ep-SD)
- Lead pitch ranges from 0.80mm to 0.40mm
- Pin count ranges from 32 to 144 leads (LQFP-SD), 100 to 164 leads (LQFP-ep-SD), 80 to 144 leads (TQFP-ep-SD)
- JEDEC standard compliant package outlines

Applications

Suitable for a variety of applications including memory integration (ASIC or Logic), chipset integration (Analog/ Digital), mixed technologies integration (Baseband/RF), handheld products (Cellular Phones, Pagers, MP3 Players, GPS), consumer electronics (Internet applications, Digital Cameras/ Camcorders), computers (Network PCs), and PC peripherals (Disk Drivers, CD-R/RW, DVD Drivers).

Description

LQFP-SD is a stacked die low profile Quad Flat Package. Our chip stacking technology allows the integration of multiple ICs within a single package to improve package performance and functionality while reducing overall package size and cost. The die to die wire bonding capability enables device/signal integration to improve electrical performance and reduce overall package I/O requirements.

Our Stacked Die QFP offering includes LQFP-SD, LQFP-ep-SD and TQFP-ep-SD. LQFP-ep-SD is an exposed pad version that provides enhanced thermal performance. TQFP-ep-SD is a thin profile exposed pad version with enhanced thermal performance.

Our Stacked Die QFPs with nominal package thickness of 1.40mm and 1.00mm are suitable for a variety of product applications. Stacked Die QFP packages are currently available in LQFP, LQFP-ep and TQFP-ep configurations, and are offered in standard and green/lead-free bill of materials.

Specifications

Die Thickness	100-600µm (4-24mils)
Package Body Thickness	1.0, 1.4mm
Marking	Laser
Packing Options	Tape & reel, tube, JEDEC tray

Reliability

Moisture Sensitivity Level	JEDEC Level 3, 260°C reflow
Temperature Cycling	Condition C -65°C to150°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

Electrical Performance

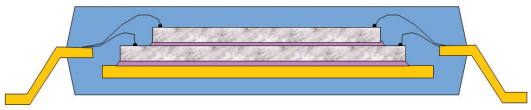
Conductor Component	Pad Size (mm)	Wire Length (mm)	Resistance (m0hm)	Inductance (nH)	Inductance Mutual (nH)	Capacitance (pF)	Capacitance Mutual (pF)
7 x 7 (32L)	3.5 x 3.5	1.4 - 2.2	11.0 - 18.0	0.64 - 0.99	0.31 - 0.49	0.21 - 0.33	0.07 - 0.12
		2	120	1.65	0.45 - 0.85	0.1	0.01 - 0.02
14 x 14mm (44L)	7.0 x 7.0	3.0 - 4.5	24.0 - 36.0	1.96 - 2.92	1.08 - 1.61	0.69 - 1.03	0.31 - 0.45
		2	120	1.65	0.45 - 0.85	0.1	0.01 - 0.02

Thermal Performance θja (°C/W)

The thermal performance of each die in the stack is influenced by other die in the stack. Thermal performance is highly dependent on package size, die size, substrate layers and thickness, and lead configuration. Simulation for specific applications should be performed.

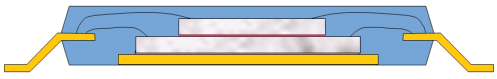
Cross Sections

LQFP-SD



LQFP-ep-SD

TQFP-ep-SD



Package Configurations

Package	Body Size (mm)	Lead Count
LQFP-SD	7 x 7 to 20 x 20	32 to 144
LQFP-ep-SD	14 x 14 to 20 x 20	100 to 164
TQFP-ep-SD	12 x 12	80
TQFP-ep-SD	14 x 14	128
TQFP-ep-SD	16 x 16	144

NOTE: Check with your Technical Product Manager on availability of suitable leadframes.

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