

TSSOP and MSOP

Small Outline Packages

- Wide range of body sizes
- 8 to 56 lead counts
- Thermally enhanced versions available (TSSOP-ep and MSOP-ep)



FEATURES

TSSOP

- Body Size: 3.0 x 4.4mm to 14.0 x 6.1mm
- Lead Count: 8L to 56L
- Lead Pitch: 0.50mm & 0.65mm
- Package Height: 1.20mm max.
- JEDEC standard compliant (MO-153)
- Lead-free (Pb-free) and Green
- Thermal Enhancements: ep (exposed pad)

MSOP

- Body Size: 3 x 3mm
- Lead Count: 8L & 10L
- Lead Pitch: 0.65mm (8L) and 0.50mm (10L)
- JEDEC standard compliant
- Lead-free (Pb-free) and Green
- Thermal enhancements: ep (exposed pad)

APPLICATIONS

- Analog and Operation Amplifiers
- Controllers and Drivers
- Logic, Memory, and RF/Wireless
- Disk drives, video/audio and consumer electronics/appliances

DESCRIPTION

STATS ChipPAC offers a complete line of Small Outline Package (SOP) families including TSSOP, TSSOP-ep, and MSOP. STATS ChipPAC's TSSOP (Thin Shrink Small Outline Package) is suitable for applications requiring a thin profile. TSSOP is a leadframe based, plastic encapsulated package with gull wing shaped leads on two sides with lead count ranging from 8 to 56 leads. The ultra thin TSSOP is made possible by optimal wire looping control during the wire bonding process as well as optimal package warpage control during the molding process. TSSOP is designed to fill the niche of low pin count devices where low profile and small footprint are key design considerations. The TSSOP features 0.5 and 0.65mm lead pitch, and is ideal for low pin count analog and mixed signal devices in handheld applications such as PDAs and mobile / cellular phones.

Taking the reliability of Small Outline Packages (SOP) one step further, STATS ChipPAC offers a Micro Small Outline Package (MSOP) for applications requiring thin, small, and high reliability. This smaller package offers a smaller footprint, shorter wires for improved electrical connections, and better moisture reliability (MRT/MSL).

In addition to standard TSSOP and MSOP, STATS ChipPAC offers thermally enhanced "ep" versions featuring an exposed die paddle for efficient heat dissipation. The exposed die attach pad design of the TSSOP package can provide excellent thermal dissipation by soldering the copper die attach pad directly onto the PCB, and is ideal for low pin count analog and mixed signal devices.

STATS ChipPAC uses the latest leadframe technology and state of the art design and simulation tools to achieve optimum electrical and thermal performance. STATS ChipPAC's state of the art assembly facility and proven materials assure high yield manufacturing and long term reliability.

TSSOP and MSOP

Small Outline Packages

SPECIFICATIONS (TSSOP)

Die Thickness	9-11mil range preferred (TSSOP) 6-16mil range preferred (TSSOP-ep)
Gold Wire	20µm (0.8mils) diameter, 99.99% Au
Lead Finish	Sn/Pb (85/15%) or Matte Tin
Marking	Laser
Packing Options	Tube

SPECIFICATIONS (MSOP)

Die Thickness	6-9mil range preferred
Gold Wire	20µm (0.8mils) diameter, 99.99% Au
Lead Finish	Sn/Pb (85/15%) or Matte Tin
Marking	Laser
Packing Options	Tube

RELIABILITY (all)

Temperature Cycling	Condition C, -65°C/150°C, 1000 cycles
Temp/Humidity Test	85°C/85% RH, 1000 hrs
Pressure Cooker Test	121°C, 100% RH, 2 atm, 250 hrs

THERMAL PERFORMANCE, θ_{ja} (°C/W)

Package	Body Size (mm)	Pad Size	Die Size	PCB Vias	Thermal Performance θ_{ja} (°C/W)
30L TSSOP	4.4 x 7.8 x 0.9	3.0 x 3.0	2.54 x 2.54	0	74.0
30L TSSOP-ep	4.4 x 7.8 x 0.9	3.0 x 3.0	2.54 x 2.54	9	49.5

Note: Simulation data for package mounted on 4 layer PCB (per JEDEC JESD51-5) under natural convection as defined in JESD51.2.

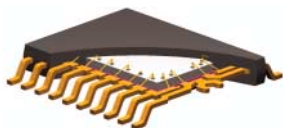
ELECTRICAL PERFORMANCE: 4.4 x 9.7 x 0.9 (38L)

Conductor Component	Pad Size (mm)	Lead/Wire (mm)	Resistance (mOhm)	Inductance Self (nH)	Inductance Mutual (nH)	Capacitance Self (pF)	Capacitance Mutual (pF)
Lead	185 x 113	0.6-3.09	5-25	0.30-1.70	0.14-0.77	0.09-0.46	0.04-0.21
Wire		1.65	99	1.36	0.37-0.65	0.08	0.01-0.02
TOTALS			104-124	1.66-3.06	0.51-1.42	0.17-0.54	0.05-0.23

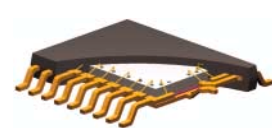
Note: Results are simulated values at 100MHz.

CROSS-SECTION

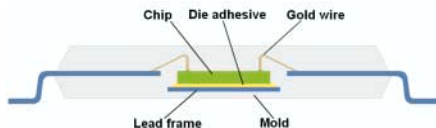
TSSOP



TSSOP-ep



MSOP



PACKAGE CONFIGURATIONS

Package	Body Size (mm)	Lead Count
TSSOP	3.0 x 4.4	8
	5.0 x 4.4	14, 16
	6.5 x 4.4	20
	7.8 x 4.4	24
	9.7 x 4.4	38
	7.8 x 4.4	30
	12.5 x 6.1	48
	14.0 x 6.1	56
MSOP	3.0 x 3.0	8, 10

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 81-43-351-3320 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. 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 in 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 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 2005. STATS ChipPAC Ltd. All rights reserved.
January 2005