SHARP®

**APPLICATIONS:**
- Cellular Phone
- Digital Camera
- Set Top Box

Integrated Circuits Group

# LH28F800SG 8M (512K × 16) SmartVoltage Flash Memory

## FEATURES

- SmartVoltage technology
  - 3.0 V or 5 V $V_{CC}$
  - 3.0 V, 5 V or 12 V $V_{PP}$
- High-performance
  - 70 ns (5 V $V_{CC}$) read access time
  - 100 ns (2.7 V $V_{CC}$) read access time
- Enhanced automated suspend options
  - Word write suspend to read
  - Block erase suspend to word write
  - Block erase suspend to read
- Enhanced data protection features
  - Absolute protection with $V_{PP}$ = GND
  - Flexible block locking
  - Block erase/write lockout during power transitions
- Industry standard packaging
  - 48-pin TSOP
  - 44-Pin PSOP
- Chip size packaging
  - 48-ball CSP
- SRAM-compatible write interface
- High-density symmetrically blocked architecture
  - Sixteen 32K-word erasable blocks
- Extended cycling capability
  - 100,000 block erase cycles
  - 1.6 million block erase cycles/device
- Low power management
  - Deep power-down mode
  - Automatic power savings mode
  - Decreases $I_{CC}$ in static mode
- Automated word write and block erase
  - Command user interface
  - Status register
- ETOX™ V nonvolatile flash technology
- Not designed or rated as radiation hardened

## DESCRIPTION

SHARP's LH28F800SG Flash memory with SmartVoltage technology is a high-density, low-cost, nonvolatile, read/write storage solution for a wide range of applications. LH28F800SG can operate at $V_{CC}$ = 2.7 V and $V_{PP}$ = 2.7 V. Its low voltage operation capability realize longer battery life and suits for cellular phone application. Its symmetrically-blocked architecture, flexible voltage and extended cycling provide for highly flexible component suitable for resident flash arrays, SIMMs and memory cards. Its enhanced suspend capabilities provide for an ideal solution for code and data storage applications. For secure code storage applications, such as networking, where code is either directly executed out of flash or downloaded to DRAM, the LH28F800SG offers three levels of protection: absolute protection with $V_{PP}$ at GND, selective hardware block locking, or flexible software block locking. These alternatives give designers ultimate control of their code security needs.

The LH28F800SG is manufactured on SHARP's 0.4 µm ETOX™ V process technology. It comes in industry-standard packages: the 48-pin TSOP and 48-ball CSP, ideal for board constrained applications, and the rugged 44-pin PSOP.

This Product Information is from LH28F800SG Preliminary Specification; Issue Date: February 1997.

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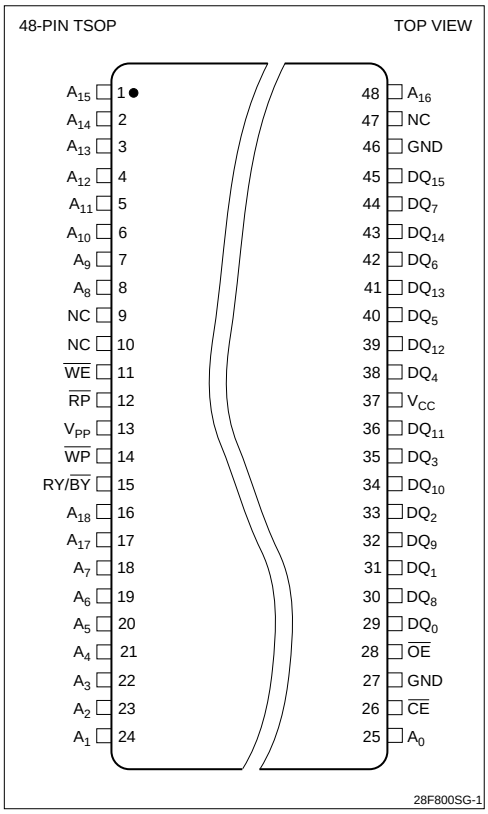
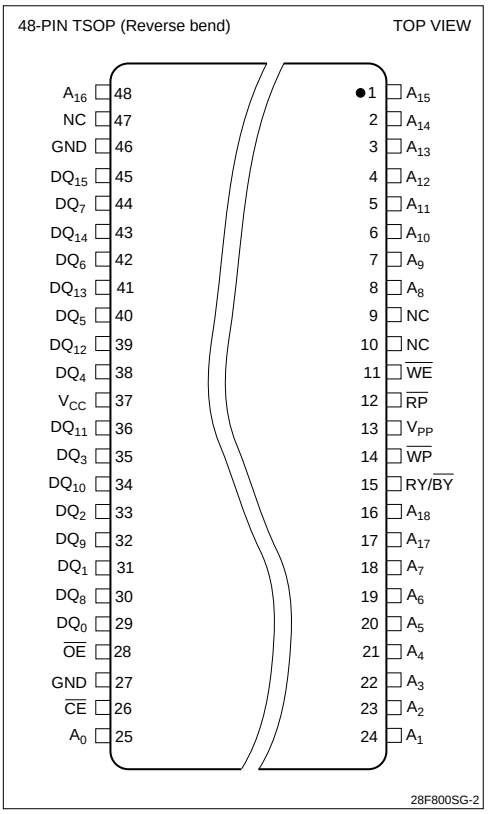
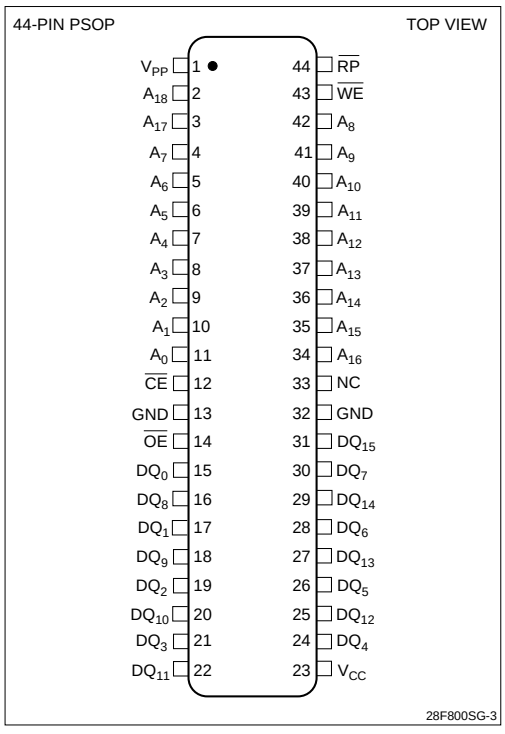
## 48-PIN TSOP PINOUT

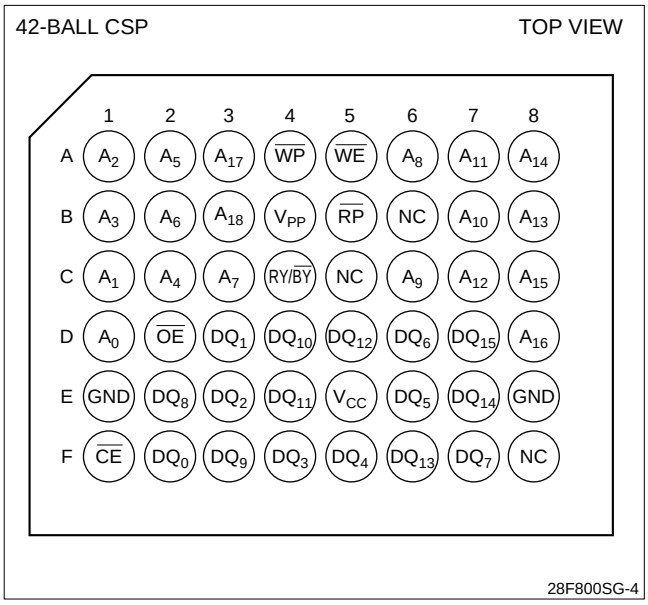



## 48-PIN TSOP REVERSE PINOUT




## 44-PIN PSOP PINOUT




## 42-BALL CSP PINOUT