



IS25RLP256E IS25RWP256E

256Mb

**SERIAL FLASH MEMORY 166MHZ MULTI I/O SPI &
QUAD I/O QPI DTR INTERFACE WITH RPMC**

PRELIMINARY DATA SHEET

256Mb

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PRELIMINARY INFORMATION

FEATURES

- **Industry Standard Serial Interface**
 - IS25RLP256E: 256Mbit/32Mbyte
 - IS25RWP256E: 256Mbit/32Mbyte
 - 3 or 4 Byte Addressing Mode
 - Supports Standard SPI, Fast, Dual, Dual I/O, Quad, Quad I/O, SPI DTR, Dual I/O DTR, Quad I/O DTR, and QPI
 - QE=1 from the factory
 - Software & Hardware Reset
 - Supports Serial Flash Discoverable Parameters (SFDP)
- **High Performance Serial Flash (SPI)**
 - 80MHz Normal Read⁽³⁾
 - Up to 166MHz Fast Read
 - Up to 80MHz DTR (Dual Transfer Rate)
 - Equivalent Throughput of 664 Mb/s
 - Up to 104MHz RPMC Operation
 - Selectable Dummy Cycles
 - Configurable Drive Strength
 - Supports SPI Modes 0 and 3
 - More than 100,000 Erase/Program Cycles
 - More than 20-year Data Retention
- **Flexible & Efficient Memory Architecture**
 - Chip Erase with Uniform Sector/Block Erase (4/32/64KB or 4/32/256 KB)⁽²⁾
 - Program 1 to 256 or 512 Byte per Page⁽²⁾
 - Program/Erase Suspend & Resume
- **Efficient Read and Program modes**
 - Low Instruction Overhead Operations
 - Continuous Read 8/16/32/64 Byte Burst Wrap
 - Selectable Burst Length
 - QPI for Reduced Instruction Overhead
 - AutoBoot Operation
 - Data Learning Pattern for training in DTR operation
- **Low Power with Wide Temp. Ranges**
 - Single Voltage Supply
 - IS25RLP: 2.30V to 3.60V
 - IS25RWP: 1.70V to 1.95V
 - 7 mA Active Read Current
 - Temp Grades:
 - Industrial: -40°C to +85°C
- **Advanced Security Protection**
 - Software and Hardware Write Protection
 - Advanced Sector/Block Protection
 - Top/Bottom Block Protection
 - Power Supply Lock Protection
 - 4x256 Byte Dedicated Security Area with OTP User-lockable Bits
 - 128 bit Unique ID for Each Device (Call Factory)
- **RPMC Features**
 - Support Reply Protection Monotonic Counter
 - Four 32-bit Monotonic counters
 - Volatile HMAC Key register
 - Non-volatile Root Key register
- **Industry Standard Pin-out & Packages⁽¹⁾**
 - M = 16-pin SOIC 300mil
 - J = 8-contact WSON 8x6mm

Notes:

1. Call Factory for other package options available.
2. For optional 512 Byte Page size with 256 KB Block size, see the Ordering Information.
3. 80MHz for 3.0V device and 50MHz for 1.8V device.

GENERAL DESCRIPTION

The IS25RLP256E and IS25RWP256E Serial Flash memory offers a versatile storage solution with high flexibility and performance in a simplified pin count package. ISSI's "Industry Standard Serial Interface" Flash is for systems that require limited space, a low pin count, and low power consumption. The device is accessed through a 4-wire SPI Interface consisting of a Serial Data Input (SI), Serial Data Output (SO), Serial Clock (SCK), and Chip Enable (CE#) pins, which can also be configured to serve as multi-I/O (see pin descriptions).

The device supports Dual and Quad I/O as well as standard, Dual Output, and Quad Output SPI. Clock frequencies of up to 166MHz allow for equivalent clock rates of up to 664MHz (166MHz x 4) which equates to 83Mbytes/s of data throughput. The IS25xE series of Flash adds support for DTR (Double Transfer Rate) commands that transfer addresses and read data on both edges of the clock. These transfer rates can outperform 16-bit Parallel Flash memories allowing for efficient memory access to support XIP (execute in place) operation.

Initial state of the memory array is erased (all bits are set to 1) when shipped from the factory.

QPI (Quad Peripheral Interface) supports 2-cycle instruction further reducing instruction times. Pages can be erased in groups of 4Kbyte sectors, 32Kbyte blocks, 64K/256Kbyte blocks, and/or the entire chip. The uniform sector and block architecture allows for a high degree of flexibility so that the device can be utilized for a broad variety of applications requiring solid data retention.

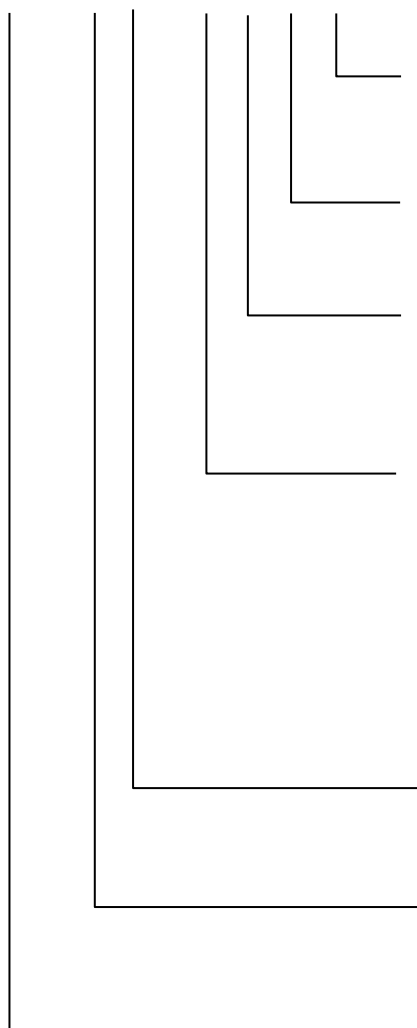
The device supports RPMC (Replay Protection Monotonic Counter) function as an additional security, which could detect Hardware attack.

Supply Voltage Range vs. Maximum Speed

		Voltage	Speed
IS25RLP (3.0V typ.)	SPI NOR protocol	2.30~3.6V	133MHz
		2.70~3.6V	166MHz
	RPMC protocol	2.30~3.6V	104MHz
IS25RWP (1.8V typ.)	SPI NOR protocol	1.70~1.95V	166MHz
	RPMC protocol	1.70~1.95V	104MHz

11. ORDERING INFORMATION – Valid Part Numbers

IS25RLP 256 E - P M L I



TEMPERATURE RANGE

I = Industrial (-40°C to +85°C)

PACKAGING CONTENT

L = RoHS compliant

PACKAGE Type

J = 8-contact WSON (8x6mm)

M = 16-pin SOIC 300mil (Call Factory)

Option

J = Standard (Call Factory)

Q = QE bit set to 1

P = QE bit set to 1 + Dedicated RESET# (Call Factory)

Die Revision

E = Revision E

Density

256 = 256 Megabit

BASE PART NUMBER

IS = Integrated Silicon Solution Inc.

25RLP = FLASH, 2.30V ~ 3.60V, QPI & RPMC

25RWP = FLASH, 1.70V ~ 1.95V, QPI & RPMC (Call Factory)

Note:

1. Call Factory for other package options available

Density, Voltage	Frequency (MHz)	Order Part Number	Package
256M, 3V	STR 166, DTR 80, RPMC 104	IS25RLP256E-QJLI	8-contact WSON 8x6mm