NSEC53T series Embedded Multimedia Card (eMMC) with FBGA153 package (3D)

Overview

Insignis Technology Corporation eMMC products follow the JEDEC eMMC 5.1 standard. It is an ideal universal storage solution for many electronic devices including smartphones, tablets, PDAs, eBook readers, digital cameras, recorders, MP3, MP4 players, electronic learning products, digital TVs and set-top boxes. eMMC encloses the 3D-64Layers NAND and eMMC controller inside as one JEDEC standard 153 ball FBGA(TFBGA) package, providing a standard interface to the host. The eMMC controller directly manages NAND flash, including ECC, wear-leveling, IOPS optimization and read sensing.

Features

- Packaged NAND flash memory with eMMC 5.1 interface
  - Compliant with eMMC Specification Ver. 4.3, 4.4, 4.41, 4.5, 4.51, 5.0, 5.1
  - Device can be converted to eMMC 4.3, 4.41 (Shows 4.4), 4.51 (Shows 4.5), 5.0 via initializing
- Bus mode
  - High-speed eMMC protocol
  - Clock frequency: 0-200MHz.
  - Ten-wire bus (clock, 1 bit command, 8 bit data bus) and a hardware reset.
- Supports three different data bus widths: 1 bit (default), 4 bits, 8 bits
  - Data transfer rate: up to 52Mbyte/s (using 8 parallel data lines at 52 MHz)
  - Single data rate: up to 200Mbyte/s @ 200MHz
  - Dual data rate: up to 400Mbyte/s @ 200MHz
- Operating voltage range:
  - I/O (VCCQ) Voltage
    - Automotive AEC-Q100 Grade 3 & Industrial: 1.7-1.95V / 2.7-3.6V
    - Automotive AEC-Q100 Grade 2: 1.7-1.95 V
  - Core Voltage (VCC) = 2.7-3.6 V
- Error free memory access
  - Internal error correction code (ECC) to protect data communication
  - Internal enhanced data management algorithm
  - Solid protection of sudden power failure safe-update operations for data content
- Security
  - Supports secure erase/trim commands
  - Enhanced write protection with permanent and partial protection options

- Quality
  - RoHS compliant (for detailed RoHS declaration, please contact your Insignis representative.)
  - Reliability report with AEC-Q100 test items (for details, please contact your Insignis representative.)
- Supports Field Firmware Update (FFU)
- Enhanced Device Lifetime
- Supports Pre EOL information
- Optimal Size
- Supports Power Off Notification
- Supports HS400
- Supports Command Queuing
- Supports Cache Barrier
- Supports Cache Flushing Report
- RPMB throughput improvement
- Supports BKOPS Control
- Supports Enhanced Strobe
- Supports Secure Write Protection
- Operating temperature ranges
  - Industrial (IT): -40℃ to 85℃
  - Automotive (AT) grade 3: -40℃ to 85℃
  - Automotive (AT) grade 2: -40℃ to 105℃
- Also available in p-SLC mode
- Automotive temp (AT) parts are PPAP and AEC-Q100 compliant
- JEDEC Standard Package with a 0.5mm pitch.

Table 1. How to Order

Operating voltage	Package	NAND	Option	No. of Dies	Usable Capacity	Insignis Part Number
VCC=3.3V, VCCQ=1.8V/3.3V	FBGA153	3D TLC	Industrial Temperature	1	16GB	NSEC53T016-IT
				1	32GB	NSEC53T032-IT
				2	64GB	NSEC53T064-IT
				4	128GB	NSEC53T128-IT
		pSLC		1	8GB	NSEC53T008-ITJ
				1	16GB	NSEC53T016-ITJ
				2	32GB	NSEC53T032-ITJ
				4	64GB	NSEC53T064-ITJ
		3D TLC	Automotive Temperature*	1	16GB	NSEC53T016-AT
				1	32GB	NSEC53T032-AT
				2	64GB	NSEC53T064-AT
				4	128GB	NSEC53T128-AT
		pSLC		1	8GB	NSEC53T008-ATJ
				1	16GB	NSEC53T016-ATJ
				2	32GB	NSEC53T032-ATJ
				4	64GB	NSEC53T064-ATJ

* Automotive Temperature (-AT) devices are available in all densities.
- AT devices have options of Automotive Grade 2 or Automotive Grade 3 specifications.
- AT, Grade 2 devices are only available with VCCQ=1.8V.
- AT devices are subject to spec agreement with customer.

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Engineering Specifications are available upon request by emailing info@insignis-tech.com.

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