FM24C256A
2-Wire Serial EEPROM

Data Sheet

Oct. 2016

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com
微信扫码咨询客服

INFORMATION IN THIS DOCUMENT IS INTENDED AS A REFERENCE TO ASSIST OUR CUSTOMERS IN THE SELECTION OF SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD PRODUCT BEST SUITED TO THE CUSTOMER'S APPLICATION; THEY DO NOT CONVEY ANY LICENSE UNDER ANY INTELLECTUAL PROPERTY RIGHTS, OR ANY OTHER RIGHTS, BELONGING TO SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD OR A THIRD PARTY.

WHEN USING THE INFORMATION CONTAINED IN THIS DOCUMENTS, PLEASE BE SURE TO EVALUATE ALL INFORMATION AS A TOTAL SYSTEM BEFORE MAKING A FINAL DECISION ON THE APPLICABILITY OF THE INFORMATION AND PRODUCTS. PURCHASERS ARE SOLELY RESPONSIBLE FOR THE CHOICE, SELECTION AND USE OF THE SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD PRODUCTS AND SERVICES DESCRIBED HEREIN, AND SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD ASSUMES NO LIABILITY WHATSOEVER RELATING TO THE CHOICE, SELECTION OR USE OF THE SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD PRODUCTS AND SERVICES DESCRIBED HEREIN. UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD REPRESENTATIVE, SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.

FUTURE ROUTINE REVISIONS WILL OCCUR WHEN APPROPRIATE, WITHOUT NOTICE. CONTACT SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD SALES OFFICE TO OBTAIN THE LATEST SPECIFICATIONS AND BEFORE PLACING YOUR PRODUCT ORDER. PLEASE ALSO PAY ATTENTION TO INFORMATION PUBLISHED BY SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD BY VARIOUS MEANS, INCLUDING SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD HOME PAGE (HTTP://WWW.FMSH.COM/).

PLEASE CONTACT SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD LOCAL SALES OFFICE FOR THE SPECIFICATION REGARDING THE INFORMATION IN THIS DOCUMENT OR SHANGHAI FUDAN MICROELECTRONICS GROUP CO., LTD PRODUCTS.

Trademarks

Shanghai Fudan Microelectronics Group Co., Ltd name and logo, the “复旦” logo are trademarks or registered trademarks of Shanghai Fudan Microelectronics Group Co., Ltd or its subsidiaries in China.

Shanghai Fudan Microelectronics Group Co., Ltd, Printed in the China, All Rights Reserved.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Description

The FM24C256A provides 262,144 bits of serial electrically erasable and programmable read-only memory (EEPROM) organized as 32,768 words of 8 bits each. The device's cascadable feature allows up to 8 devices to share a common 2-wire bus. The device is optimized for use in many industrial and commercial applications where low-power and low-voltage operations are essential.

Features

- **Low Operation Voltage: V_{CC} = 1.7V to 5.5V**
- **Internally Organized: 32,768 x 8**
- **2-wire Serial Interface**
- **Schmitt Trigger, Filtered Inputs for Noise Suppression**
- **Bi-directional Data Transfer Protocol**
- **1MHz (2.5V, 5.5V) and 400 kHz (1.7V) Compatibility**
- **Write Protect Pin for Hardware Data Protection**
- **64-byte Page Write Modes (Partial Page Writes are Allowed)**
- **Self-timed Write Cycle (5 ms max)**
- **High-reliability**
  - **Endurance: 1,000,000 Write Cycles**
  - **Data Retention: 40 Years**
- **PDIP8 Package (RoHS Compliant)**
- **SOP8, TSSOP8, MSOP8, TDFN8 Packages (RoHS Compliant and Halogen-free)**

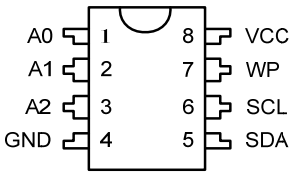
Absolute Maximum Ratings

Operating Temperature (Plastic Package)	-55°C to +125°C
Operating Temperature (Module Package)	-20°C to +60°C
Storage Temperature (Plastic Package)	-65°C to +150°C
Storage Temperature (Module Package)	-25°C to +70°C
Voltage on Any Pin with Respect to Ground	-1.0V to +7.0V
Maximum Operating Voltage	6.25V
DC Output Current	5.0 mA

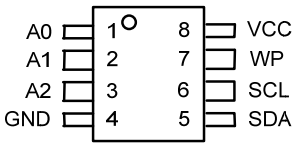
*NOTICE: Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Packaging Type

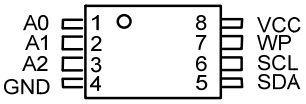
PDIP8



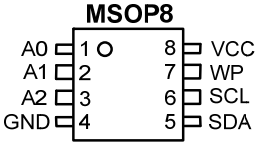
SOP 8



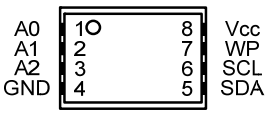
TSSOP8



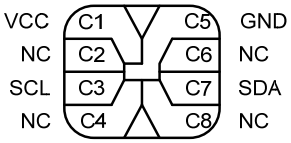
MSOP8



TDFN8



Module package (8 Pin)

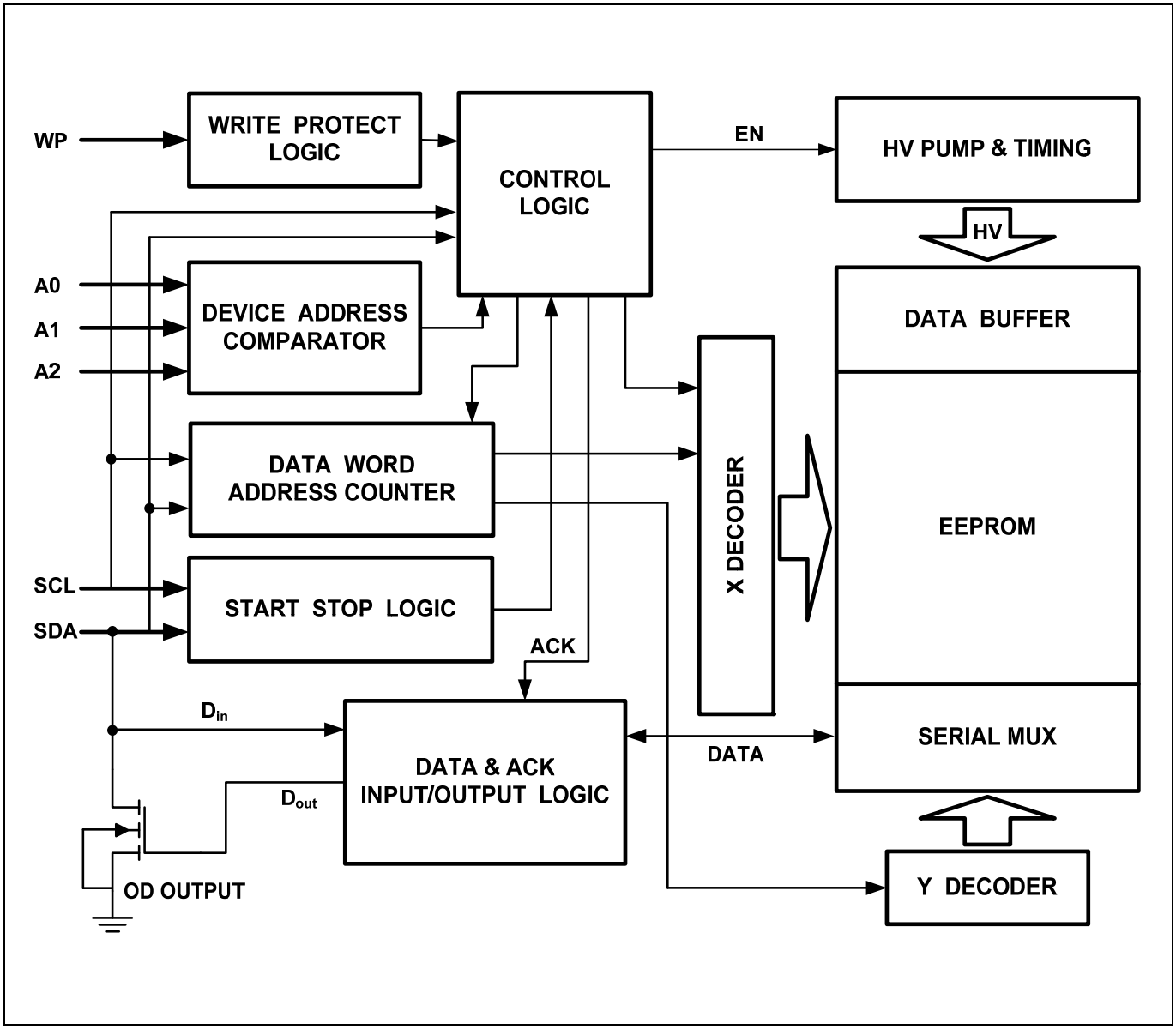


Pin Configurations

Pin Name	Function
A0~A2	Device Address Inputs
SDA	Serial Data Input/Output
SCL	Serial Clock Input
WP	Write Protect
V_{CC}	Power Supply
GND	Ground
NC	Not Connect

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Figure 1. Block Diagram



深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Pin Description

SERIAL CLOCK (SCL): The SCL input is used to positive edge clock data into each EEPROM device and negative edge clock data out of each device.

SERIAL DATA (SDA): The SDA pin is bi-directional for serial data transfer. This pin is open-drain driven and may be wire-ORed with any number of other open-drain or open-collector devices.

DEVICE/PAGE ADDRESSES (A2, A1, A0): The A2, A1 and A0 pins are device address inputs that are hardwired or left not connected for hardware compatibility with other FM24CXX devices. When the pins are hardwired, as many as eight 256K devices may be addressed on a single bus system (device addressing is discussed in detail under the Device Addressing section). If the pins are left floating, the A2, A1 and A0 pins will be internally pulled down to GND if the capacitive coupling to the circuit board V_{CC} plane is <3pF, if coupling is >3pF, FMSH recommends connecting the address pins to GND.

WRITE PROTECT (WP): The FM24C256A has a Write Protect pin that provides hardware data protection. The WP pin allows normal write operations when connected to ground (GND). When the Write Protect pin is connected to $V_{CC,}$ all write operations to the memory are inhibited.

Write Protect Description

WP Pin Status	Part of the Memory Protected
	FM 24C256A
WP=V_{CC}	Full (256K) Memory
WP=GND	Normal Read/Write Operations

Memory Organization

FM24C256A, 256K SERIAL EEPROM: Internally organized with 512 pages of 64 bytes each. Random word addressing requires a 15-bit data word address.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Pin Capacitance

SYMBOL	PARAMETER	CONDITIONS	Max	Units
C_{IN} (1)	Input Capacitance	V_{IN} = 0V, f = 1MHz	6	pF
C_{OUT} (1)	Output Capacitance	V_{OUT} = 0V, f = 1MHz	8	pF

Note: 1. This parameter is characterized and is not 100% tested.

DC Characteristics

Applicable over recommended operating range from: T_A = -40°C to +85°C, V_{CC} = +1.7V to +5.5V, (unless otherwise noted).

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{CC}	Supply Voltage		1.7		5.5	V
I_{CC1}	Supply Current	V_{CC} = 5.0V, Read at 400KHz		0.4	1.0	mA
I_{CC2}	Supply Current	V_{CC} = 5.0V, Write at 400KHz		2.0	3.0	mA
I_{SB1}	Standby Current	V_{CC} = 1.7V, V_{IN} = V_{CC}/ V_{SS}			1.0	µA
I_{SB2}	Standby Current	V_{CC} = 5.5V, V_{IN} = V_{CC}/ V_{SS}			6.0	µA
I_{LI}	Input Leakage Current	V_{IN} = V_{CC}/V_{SS}		0.10	3.0	µA
I_{LO}	Output Leakage Current	V_{OUT} = V_{CC}/ V_{SS}		0.05	3.0	µA
V_{IL} 1	Input Low Level		-0.6		V_{CC} x 0.3	V
V_{IH} 1	Input High Level		V_{CC} x 0.7		V_{CC} + 0.5	V
V_{OL2}	Output Low Level 2	V_{CC} = 3.0V, I_{OL} = 2.1 mA			0.4	V
V_{OL1}	Output Low Level 1	V_{CC} =1.7V, I_{OL} = 0.15 mA			0.2	V

Note: 1. V_{IL} min and V_{IH} max are reference only and are not tested.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

AC Characteristics

Applicable over recommended operating range from: T_A = -40°C to +85°C, V_{CC} = +1.7V to +5.5V, CL = 100 pF (unless otherwise noted). Test conditions are listed in Note 2.

Symbol	Parameter	1.7-volt		2.5-volt		5.5-volt		Units
		Min	Max	Min	Max	Min	Max	
f_{SCL}	Clock Frequency, SCL		400		1000		1000	kHz
t_{LOW}	Clock Pulse Width Low	1.3		0.40		0.4		µs
t_{HIGH}	Clock Pulse Width High	0.6		0.40		0.4		µs
t_I [1]	Noise Suppression Time		100		50		50	ns
t_{AA}	Clock Low to Data Out Valid	0.05	0.9	0.05	0.55	0.05	0.55	µs
t_{BUF} [1]	Time the bus must be free before a new transmission can Start	1.3		0.5		0.5		µs
$t_{HD.STA}$	Start Hold Time	0.6		0.25		0.25		µs
$t_{SU.STA}$	Start Setup Time	0.6		0.25		0.25		µs
$t_{HD.DAT}$	Data In Hold Time	0		0		0		µs
$t_{SU.DAT}$	Data In Setup Time	100		100		100		ns
t_R	Inputs Rise Time [1]		0.3		0.3		0.3	µs
t_F	Inputs Fall Time [1]		300		100		100	ns
$t_{SU.STO}$	Stop Setup Time	0.6		0.25		0.25		µs
t_{DH}	Data Out Hold Time	50		50		50		ns
t_{WR}	Write Cycle Time		5		5		5	ms
Endurance [1]	3.3V, 25°C, Page Mode	1,000,000						Write Cycles

Notes: 1. This parameter is characterized and is not 100% tested.

2. AC measurement conditions:

RL (connects to V_{CC}): 1.3 kΩ

Input pulse voltages: 0.3 V_{CC} to 0.7 V_{CC}

Input rise and fall times: ≤ 50 ns

Input and output timing reference voltages: 0.5 V_{CC}

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Device Operation

CLOCK and DATA TRANSITIONS: The SDA pin is normally pulled high with an external device. Data on the SDA pin may change only during SCL low time periods (refer to Figure 4). Data changes during SCL high periods will indicate a start or stop condition as defined below.

START CONDITION: A high-to-low transition of SDA with SCL high is a start condition which must precede any other command (refer to Figure 5).

STOP CONDITION: A low-to-high transition of SDA with SCL high is a stop condition. After a read sequence, the stop command will place the EEPROM in a standby power mode (refer to Figure 5).

ACKNOWLEDGE: All address and data words are serially transmitted to and from the EEPROM in 8-bit words. The EEPROM sends a zero during the ninth clock cycle to acknowledge that it has received each word.

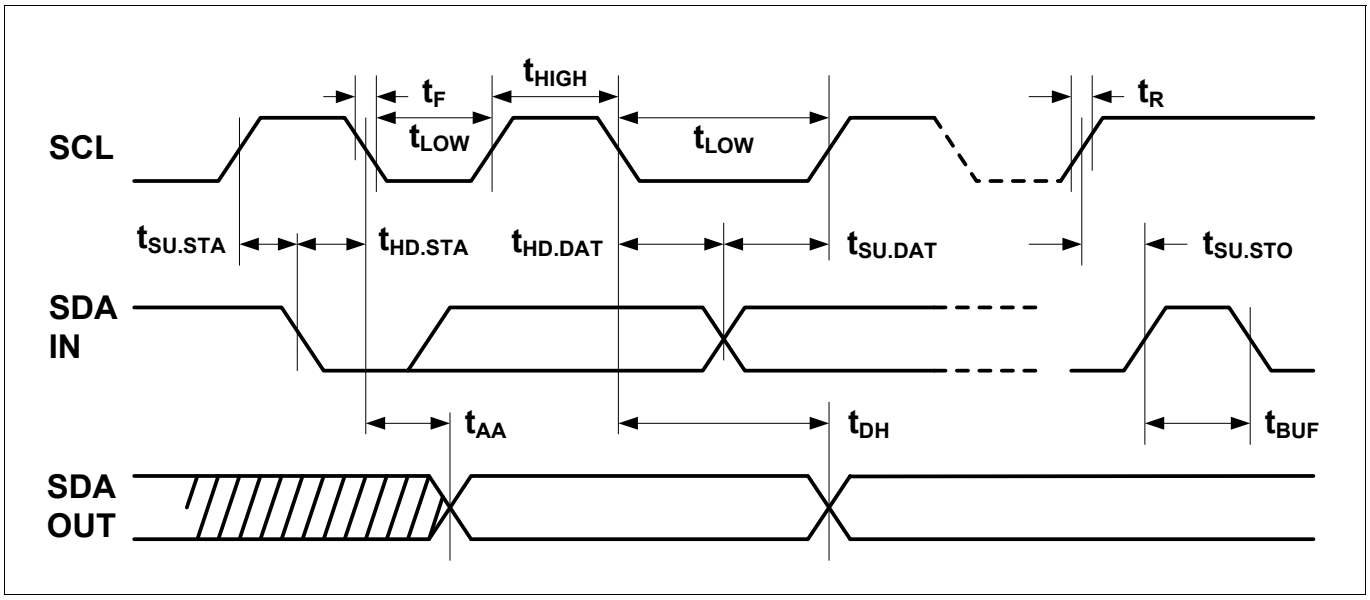
STANDBY MODE: The FM24C256A features a low-power standby mode which is enabled: (a) upon power-up and (b) after the receipt of the stop bit and the completion of any internal operations.

Memory RESET: After an interruption in protocol, power loss or system reset, any 2-wire part can be reset in following these steps:

1. Clock up to 9 Cycles,
2. Look for SDA high in each cycle while SCL is high and then,
3. Create a start condition as SDA is high.

Bus Timing

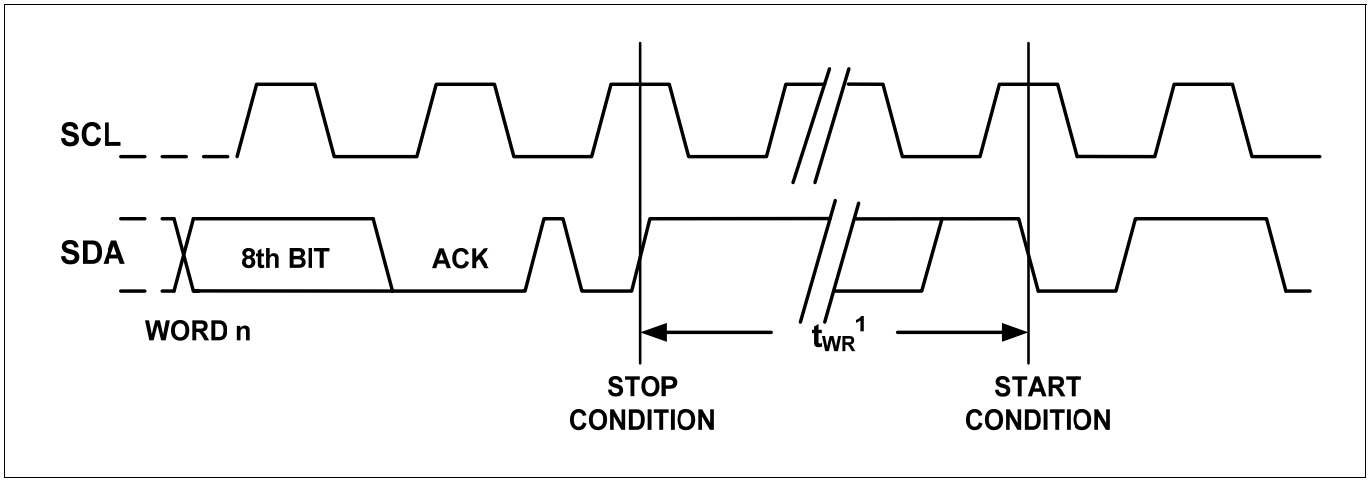
Figure 2. SCL: Serial Clock, SDA: Serial Data I/O



深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Write Cycle Timing

Figure 3. SCL: Serial Clock, SDA: Serial Data I/O



Note: 1. The write cycle time t_{WR} is the time from a valid stop condition of a write sequence to the end of the internal clear/write cycle.

Figure 4. Data Validity

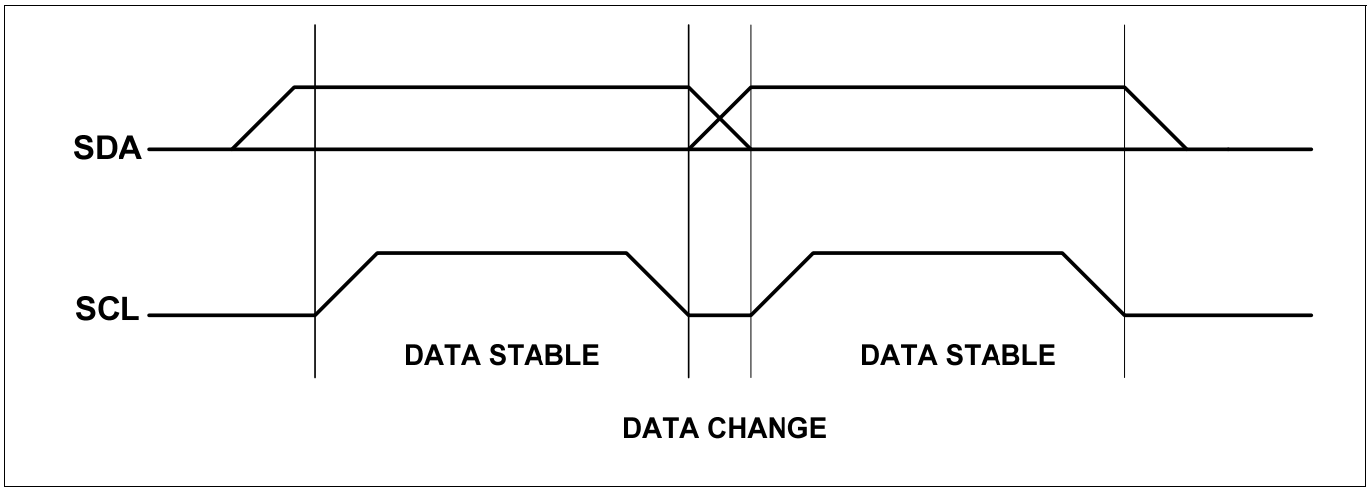
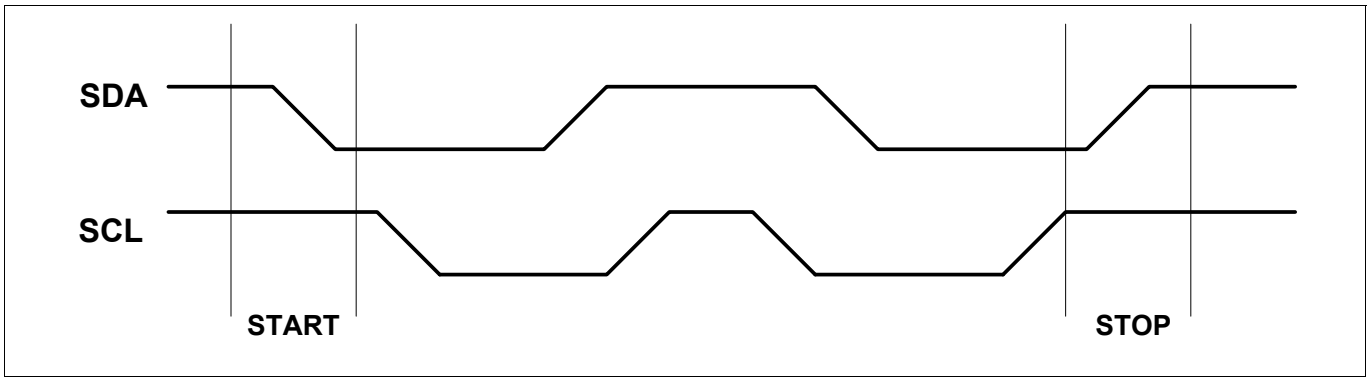
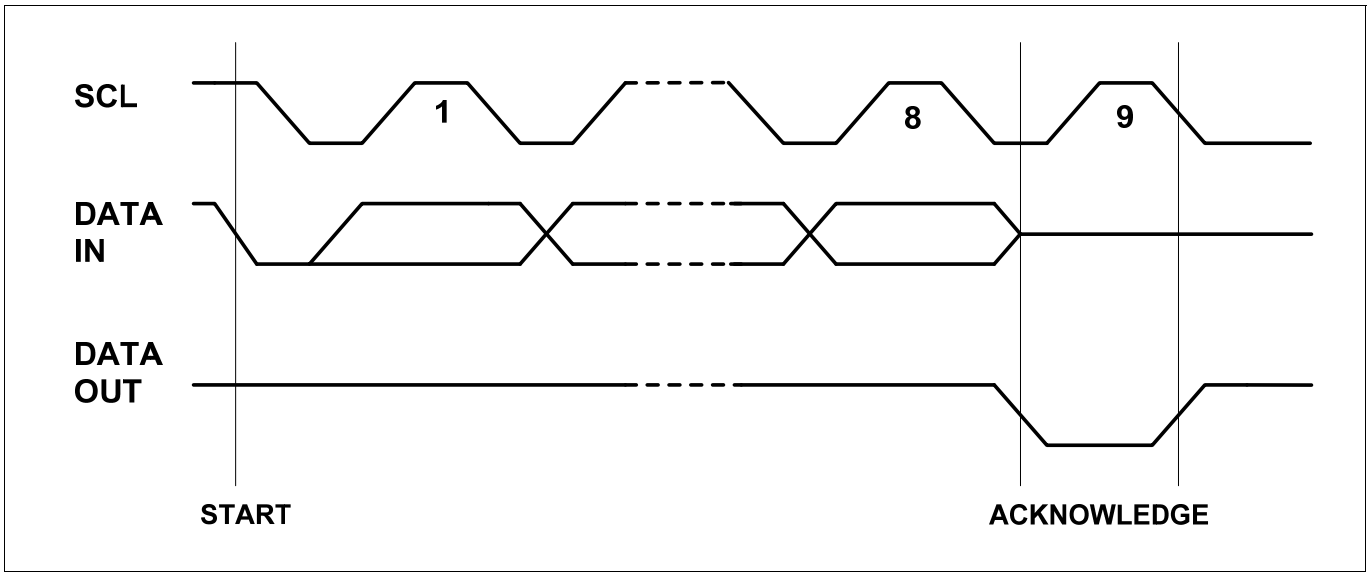


Figure 5. Start and Stop Definition



深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Figure 6. Output Acknowledge



Device Addressing

The 256K EEPROM device requires a 8-bit device address word following a start condition to enable the chip for a read or write operation (refer to Figure 7).

The device address word consists of a mandatory one, zero sequence for the first four most significant bits as shown. This is common to all the EEPROM devices.

The 256K EEPROM uses the three device address bits A2, A1, A0 to allow as many as eight devices on the same bus. These bits must compare to their corresponding hard-wired input pins. The A2, A1 and A0 pins use an internal proprietary circuit that biases them to a logic low condition if the pins are allowed to float.

The Module package device address word also consists of a mandatory one, zero sequence for the first four most significant bits. The next 3 bits are all zero.

The eighth bit of the device address is the read/write operation select bit. A read operation is initiated if this bit is high and a write operation is initiated if this bit is low.

Upon a compare of the device address, the EEPROM will output a zero. If a compare is not made, the device will return to a standby state.

NOISE PROTECTION: Special internal circuitry placed on the SDA and SCL pins prevent small noise spikes from activating the device.

DATA SECURITY: The FM24C256A has a hardware data protection scheme that allows the user to write protect the entire memory when the WP pin is at V_{CC}.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Write Operations

BYTE WRITE: A write operation requires two 8-bit data word address following the device address word and acknowledgment. Upon receipt of this address, the EEPROM will again respond with a zero and then clock in the first 8-bit data word. Following receipt of the 8-bit data word, the EEPROM will output a zero and the addressing device, such as a microcontroller, must terminate the write sequence with a stop condition. At this time the EEPROM enters an internally-timed write cycle, $t_{WR,}$ to the nonvolatile memory. All inputs are disabled during this write cycle and the EEPROM will not respond until the write is complete (refer to Figure 8).

PAGE WRITE: The 256K EEPROM is capable of 64-byte page writes.

A page write is initiated the same way as a byte write, but the microcontroller does not send a stop condition after the first data word is clocked in. Instead, after the EEPROM acknowledges receipt of the first data word, the microcontroller can transmit up to 63 more data words. The EEPROM will respond with a zero after each data word received. The microcontroller must terminate the page write sequence with a stop condition (refer to Figure 9).

The data word address lower six bits are internally incremented following the receipt of each data word. The higher data word address bits are not incremented, retaining the memory page row location. When the word address, internally generated, reaches the page boundary, the following byte is placed at the beginning of the same page. If more than 64 data words are transmitted to the EEPROM, the data word address will “roll over” and previous data will be overwritten.

ACKNOWLEDGE POLLING: Once the internally timed write cycle has started and the EEPROM inputs are disabled, acknowledge polling can be initiated. This involves sending a start condition followed by the device address word. The read/write bit is representative of the operation desired. Only if the internal write cycle has completed will the EEPROM respond with a zero allowing the read or write sequence to continue.

Read Operations

Read operations are initiated the same way as write operations with the exception that the read/write select bit in the device address word is set to one. There are three read operations: current address read, random address read and sequential read.

CURRENT ADDRESS READ: The internal data word address counter maintains the last address accessed during the last read or write operation, incremented by one. This address stays valid between operations as long as the chip power is maintained. The address “roll over” during read is from the last byte of the last memory page to the first byte of the first page. The address “roll over” during write is from the last byte of the current page to the first byte of the same page.

Once the device address with the read/write select bit set to one is clocked in and acknowledged by the EEPROM, the current address data word is serially clocked out. The microcontroller does not respond with an input zero but does generate a following stop condition (refer to Figure 10).

RANDOM READ: A random read requires a “dummy” byte write sequence to load in the data word address. Once the device address word and data word address are clocked in and acknowledged by the EEPROM, the microcontroller must generate another start condition. The microcontroller now initiates a current address read by sending a device address with the read/write select bit high. The EEPROM acknowledges the device address and serially clocks out the data word. The microcontroller does not respond with a zero but does generate a following stop condition (refer to Figure 11).

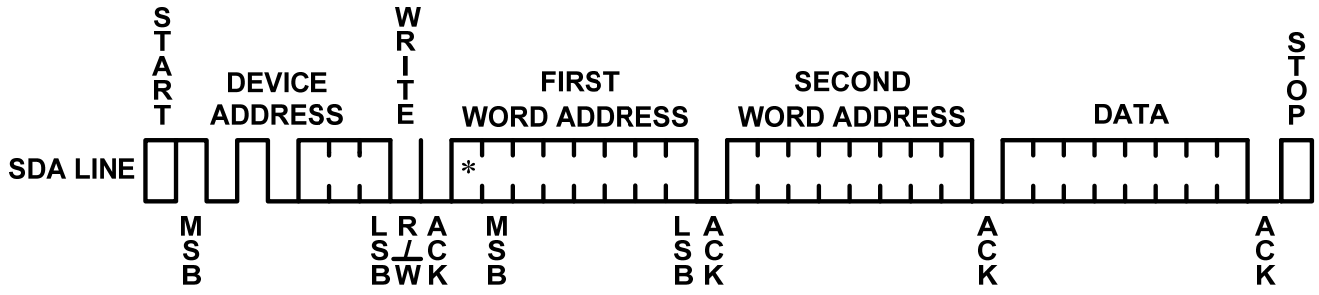
SEQUENTIAL READ: Sequential reads are initiated by either a current address read or a random address read. After the microcontroller receives a data word, it responds with an acknowledge. As long as the EEPROM receives an acknowledge, it will continue to increment the data word address and serially clock out sequential data words. When the memory address limit is reached, the data word address will “roll over” and the sequential read will continue. The sequential read operation is terminated when the microcontroller does not respond with a zero but does generate a following stop condition (refer to Figure 12).

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Figure 7. Device Address

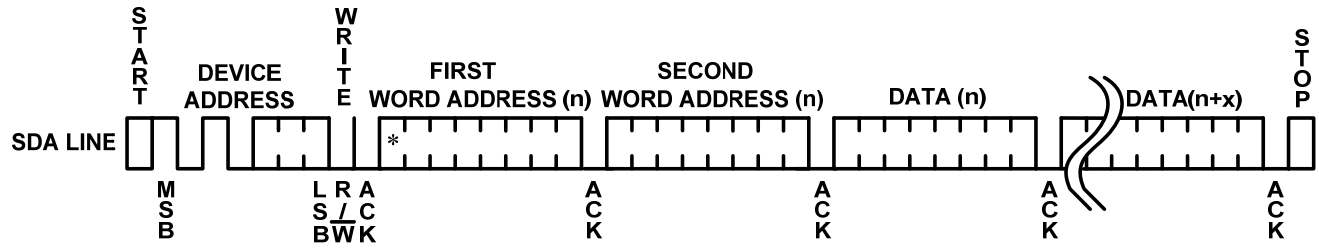
	MSB							LSB
Plastic Package	1	0	1	0	A_2	A_1	A_0	R/W
Module Package	1	0	1	0	0	0	0	R/W

Figure 8. Byte Write



Note: 1. * = *Don't CARE* bits

Figure 9. Page Write



Note: 1. * = *Don't CARE* bits

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Figure 10. Current Address Read

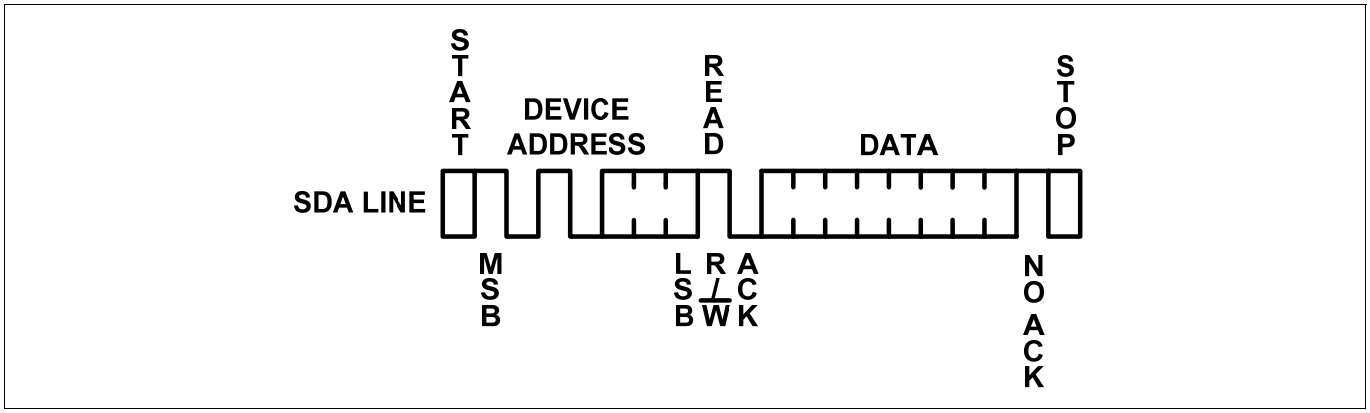
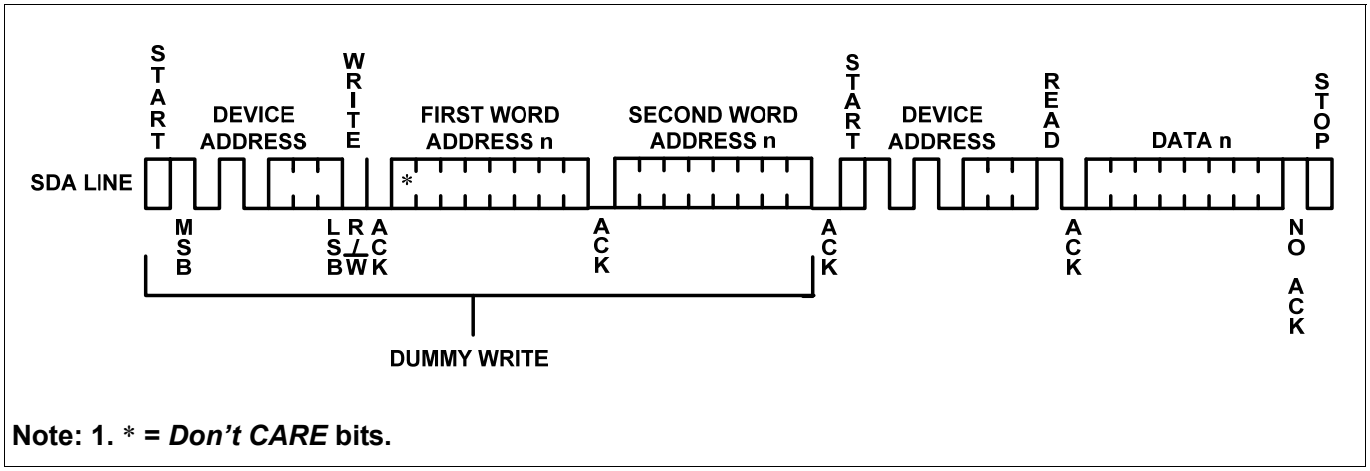
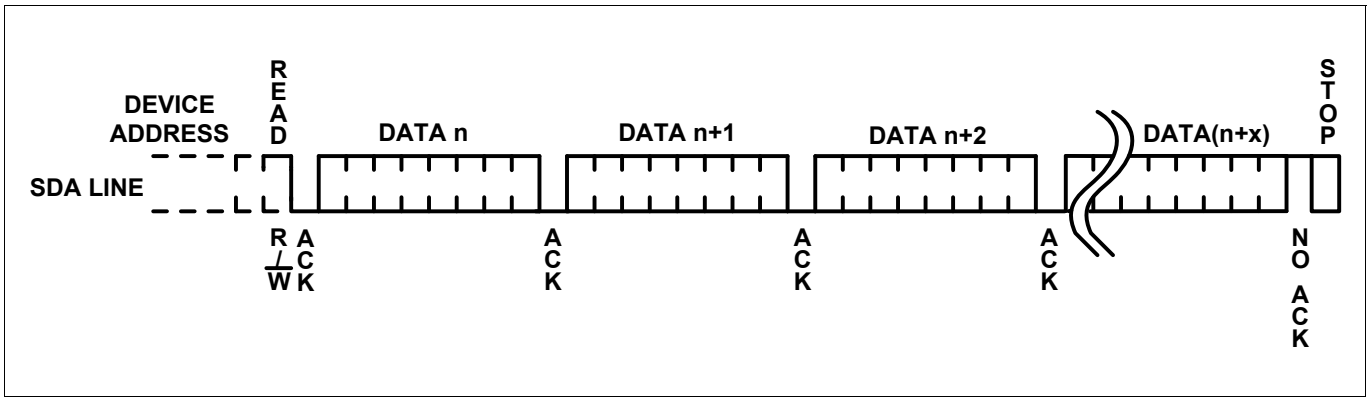


Figure 11. Random Read



Note: 1. * = *Don't CARE* bits.

Figure 12. Sequential Read



深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Ordering Information

FM 24C 256 A -PP -C -H

Company Prefix

FM = Fudan Microelectronics Group Co.,ltd

Product Family

24C = 2-Wire Serial EEPROM

Product Density

256 = 256K-bit

Supply Voltage

A = 1.7V to 5.5V

Package Type (1)

PD = 8-pin PDIP
SO = 8-pin SOP
TS = 8-pin TSSOP
MS = 8-Pin MSOP
DN = 8-pin TDFN

M2F or M2P = 8-pin Module Package (2)

Product Carrier

U = Tube
T = Tape and Reel
R = Module Reel

HSF ID Code (3)

R = RoHS Compliant
G = RoHS Compliant, Halogen-free, Antimony-free

Note:
1. For SO, TS, DN package, MSL1 package are available, for detail please contact local sales office.
2. For the details of Module package please contact local sales office.
3. For PD, M2F, M2P package: R class only.
   For SO, TS, MS and DN package: G class only.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Part Marking Scheme

PDIP8



HSF ID Code
R = RoHS Compliant

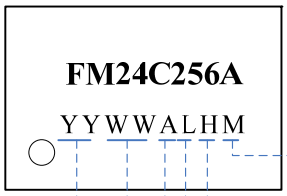
Lot Number（just with 0~9、A~Z）

Assembly's Code

Work week during which the product was molded (eg..week 12)

The last two digits of the year In which the product was sealed / molded.

SOP8



Moisture Sensitivity Level
1 = MSL1
Blank=MSL3

HSF ID Code
R = RoHS Compliant
G = RoHS Compliant, Halogen-free, Antimony-free

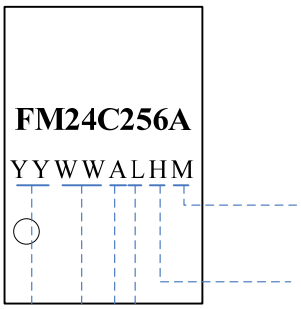
Lot Number（just with 0~9、A~Z）

Assembly's Code

Work week during which the product was molded (eg..week 12)

The last two digits of the year In which the product was sealed / molded.

TSSOP8



Moisture Sensitivity Level
1=MSL1
Blank=MSL3

HSF ID Code
R = RoHS Compliant
G = RoHS Compliant, Halogen-free, Antimony-free

Lot Number（just with 0~9、A~Z）

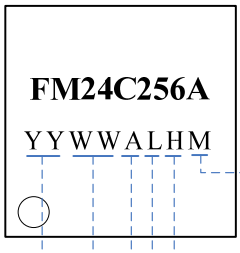
Assembly's Code

Work week during which the product was molded (eg..week 12)

The last two digits of the year In which the product was sealed / molded.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

MSOP8



Moisture Sensitivity Level
1=MSL1
Blank=MSL3

HSF ID Code
G = RoHS Compliant, Halogen-free, Antimony-free

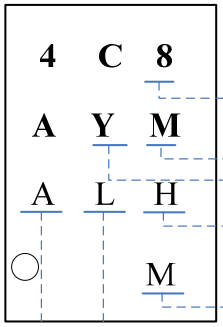
Lot Number（just with 0~9、A~Z）

Assembly's Code

Work week during which the product was molded (eg..week 12)

The last two digits of the year In which the product was sealed / molded.

TDFN8



Product Density Code

The month (hexadecimal digit) in which the product was molded.
The last one digit of year in which the product was sealed/molded.

HSF ID Code
G = RoHS Compliant, Halogen-free, Antimony-free

Moisture Sensitivity Level
1=MSL1

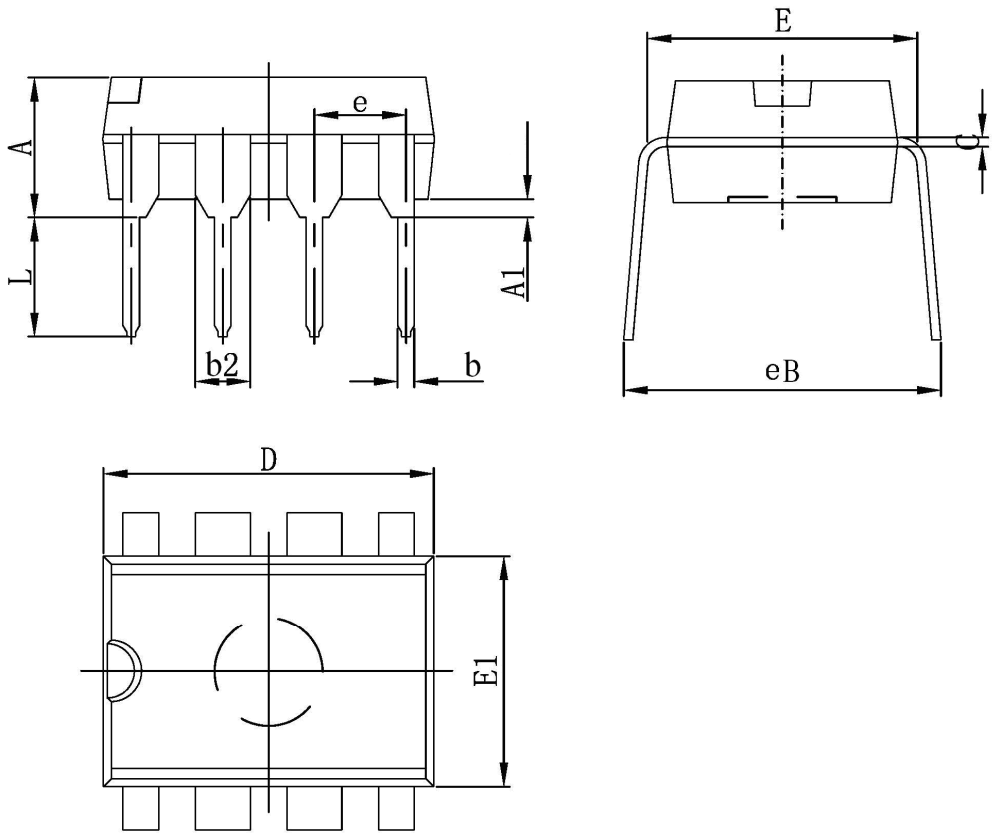
Lot Number（just with 0~9、A~Z）

Assembly's Code

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Packaging Information

PDIP 8



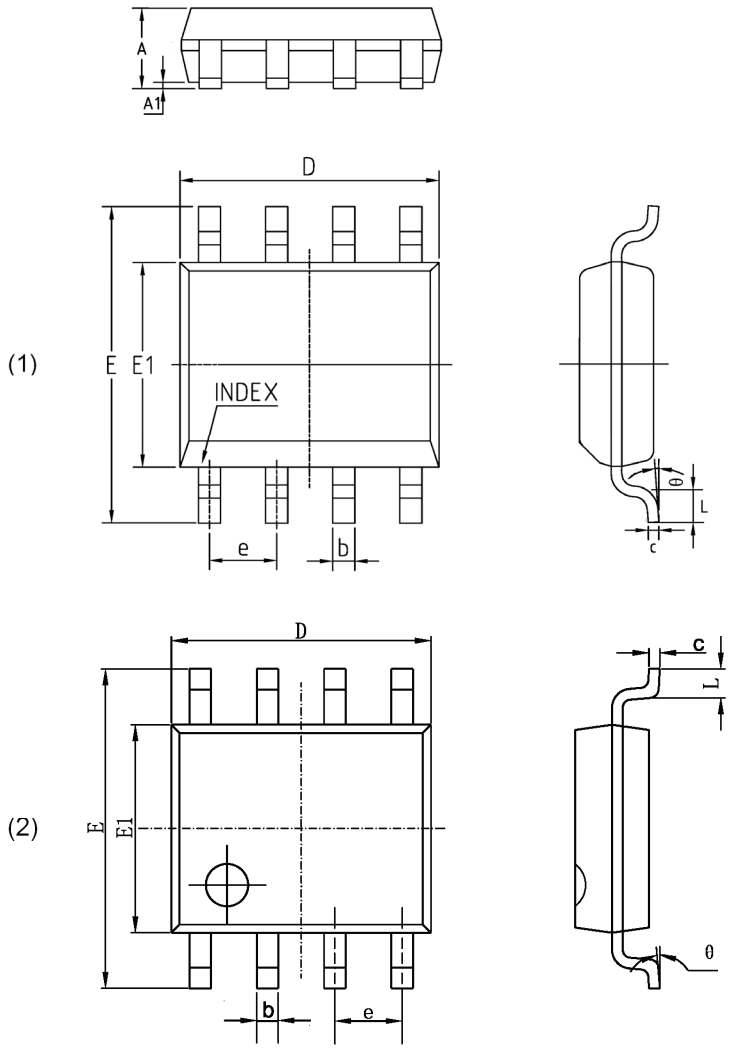
Symbol	MIN	MAX
A	---	5.000
A1	0.380	---
b	0.380	0.570
b2	1.300	1.700
C	0.200	0.360
D	9.000	10.000
E1	6.100	7.000
E	7.320	8.250
e	2.540(BSC)	
L	2.920	3.810
eB	---	10.900

NOTE:

1. Dimensions are in Millimeters.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

SOP 8



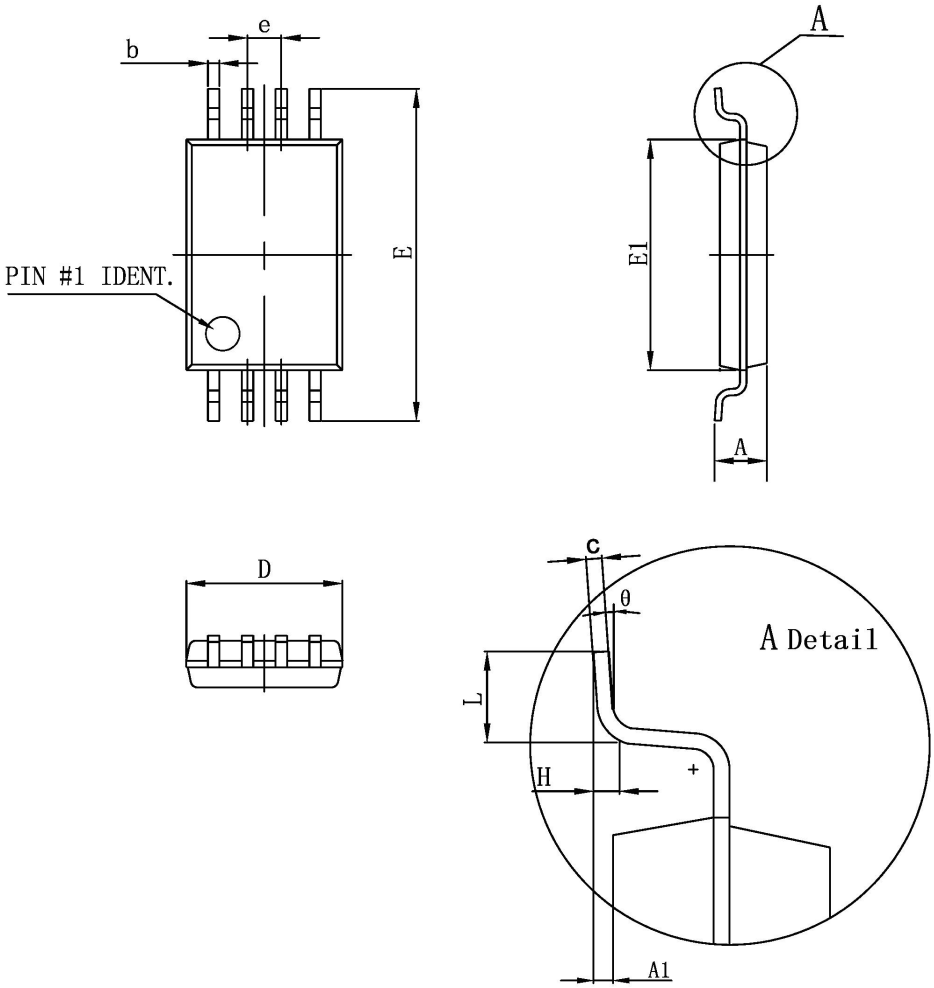
Symbol	MIN	MAX
A	1.350	1.750
A1	0.050	0.250
b	0.330	0.510
c	0.150	0.260
D	4.700	5.150
E1	3.700	4.100
E	5.800	6.200
e	1.270(BSC)	
L	0.400	1.270
θ	0°	8°

NOTE:

1. **Dimensions are in Millimeters.**

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

TSSOP8



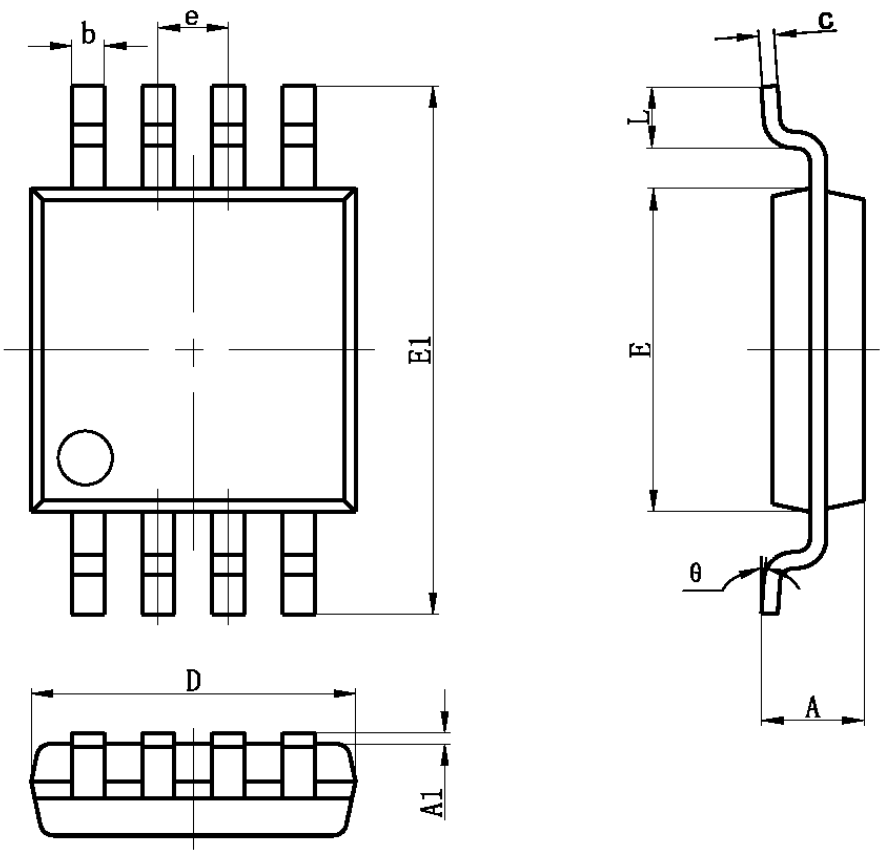
Symbol	MIN	MAX
D	2.900	3.100
E1	4.300	4.500
b	0.190	0.300
c	0.090	0.200
E	6.200	6.600
A		1.200
A1	0.050	0.150
e	0.650 (BSC)	
L	0.450	0.750
θ	0°	8°

NOTE:

1. **Dimensions are in Millimeters.**

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

MSOP8



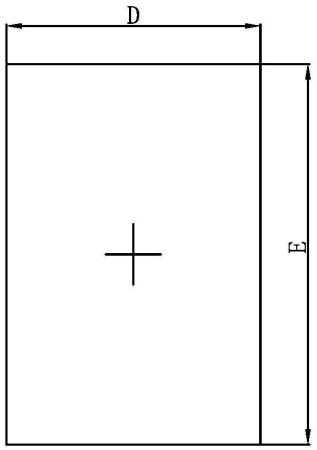
Symbol	MIN	MAX
A	0.820	1.100
A1	0.020	0.150
b	0.220	0.380
c	0.080	0.230
D	2.900	3.100
e	0.650 (BSC)	
E	2.900	3.100
E1	4.750	5.050
L	0.400	0.800
θ	0°	8°

NOTE:

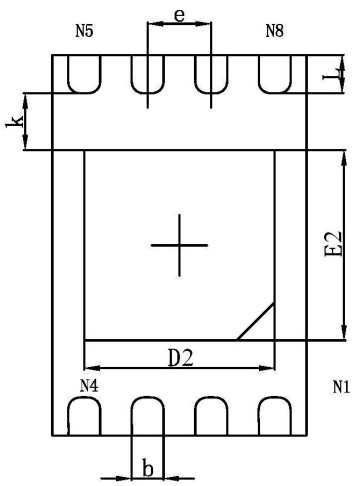
1. Dimensions are in Millimeters.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

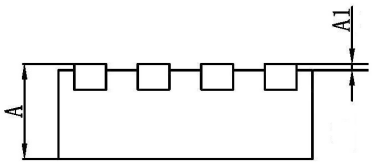
TDFN8



Top View



Bottom View



Side View

Symbol	MIN	MAX
A	0.700	0.800
A1	0.000	0.050
D	1.900	2.100
E	2.900	3.100
D2	1.400	1.600
E2	1.400	1.700
k	0.150(MIN)	
b	0.200	0.300
e	0.500(TYP)	
L	0.200	0.500

NOTE:

1. **Dimensions are in Millimeters.**

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Revision History

Version	Publication date	Pages	Paragraph or Illustration	Revise Description
1.0	May. 2011	22		Initial Document Release.
1.1	Jun. 2011	23	Ordering Information Part Marking Scheme Packaging Information	Added the MSOP8 packaging type.
1.2	Apr. 2013	23	Disclaimer Ordering Information Part Marking Scheme Packaging Information	1. Modified the Disclaimer. 2. Removed 6-Pin module package offering 3. Updated the “Ordering Information” 4. Updated the “Part Marking Scheme” 5. Updated the “Packaging Information”.
1.3	Oct. 2016	23	Ordering Information Part Marking Scheme Packaging Information	1. Updated the “Ordering Information” 2. Updated the “Part Marking Scheme” 3. Updated the “Packaging Information”.

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com

Sales and Service

Shanghai Fudan Microelectronics Group Co., Ltd.
Address: Bldg No. 4, 127 Guotai Rd,
Shanghai City China.
Postcode: 200433
Tel: (86-021) 6565 5050
Fax: (86-021) 6565 9115

Shanghai Fudan Microelectronics (HK) Co., Ltd.
Address: Unit 506, 5/F., East Ocean Centre, 98 Granville Road, Tsimshatsui East, Kowloon, Hong Kong
Tel: (852) 2116 3288 2116 3338
Fax: (852) 2116 0882

Beijing Office
Address: Room 423, Bldg B, Gehua Building,
1 QingLong Hutong, Dongzhimen Alley north Street,
Dongcheng District, Beijing City, China.
Postcode: 100007
Tel: (86-010) 8418 6608
Fax: (86-010) 8418 6211

Shenzhen Office
Address: Room.1301, Century Bldg, No. 4002, Shengtingyuan Hotel, Huaqiang Rd (North),
Shenzhen City, China.
Postcode: 518028
Tel: (86-0755) 8335 0911 8335 1011 8335 2011 8335 0611
Fax: (86-0755) 8335 9011

Shanghai Fudan Microelectronics (HK) Ltd Taiwan Representative Office
Address: Unit 1225, 12F., No 252, Sec.1 Neihu Rd.,
Neihu Dist., Taipei City 114, Taiwan
Tel : (886-2) 7721 1889 (886-2) 7721 1890
Fax: (886-2) 7722 3888

Shanghai Fudan Microelectronics (HK) Ltd Singapore Representative Office
Address : 237, Alexandra Road, #07-01 The Alexcier,
Singapore 159929
Tel : (65) 6472 3688
Fax: (65) 6472 3669

Shanghai Fudan Microelectronics Group Co., Ltd NA Office
Address :2490 W. Ray Road Suite#2
Chandler, AZ 85224 USA
Tel : (480) 857-6500 ext 18

Web Site: http://www.fmsh.com/

深圳市满度科技有限公司
Web:www.manduic.com
Tel:150-1290-5940
Email:sales@manduic.com