DATA SHEET

GPRS512C

512K-Bit Serial RAM

DEC. 25, 2009

Version 1.2

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512K-BIT SERIAL RAM

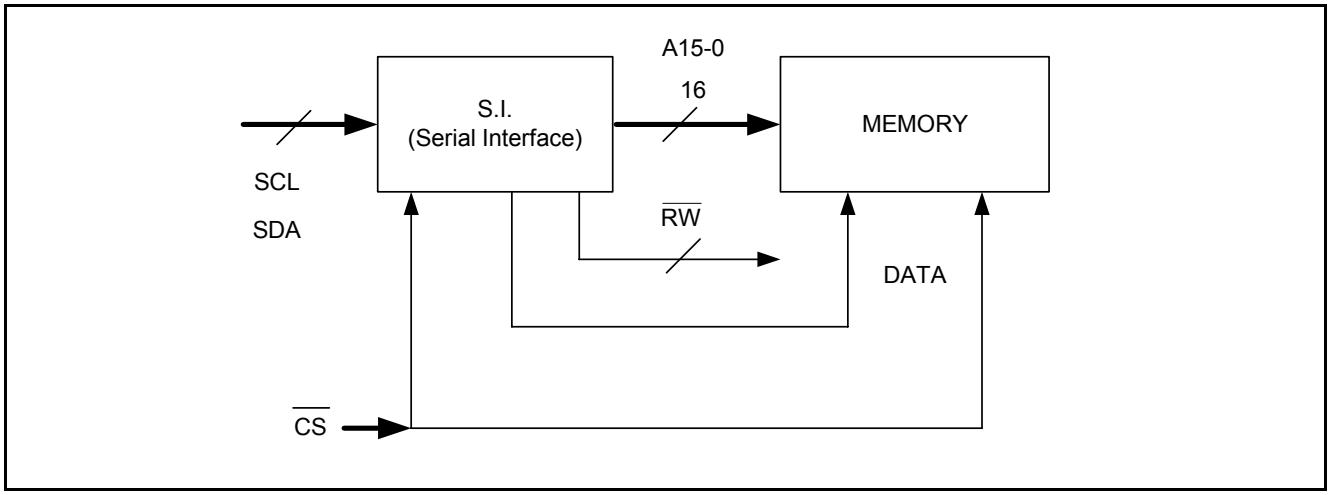
1. GENERAL DESCRIPTION

The GPRS512C is a low power 512K-bit serial static RAM. It is ideal for applications requiring long operating time or non-volatile storage with back-up batteries. The output port is a 3-state output that allows easy expansion of memory capacity.

2. FEATURES

- Fast Access time ---- 250ns @ VDD = 3.0V
- Low supply current ---- operation:
  250μA (Typ.) @ VDD = 3.0V and F_{SCL} = 2.0MHz
  Standby: 5μA (Typ.)
- Completely static ---- two-pin access
- Single power supply ---- 2.4V to 3.6V
- Non-volatile storage with back-up batteries

3. BLOCK DIAGRAM

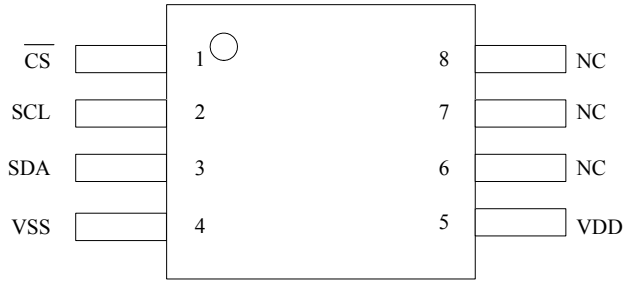


4. SIGNAL DESCRIPTIONS

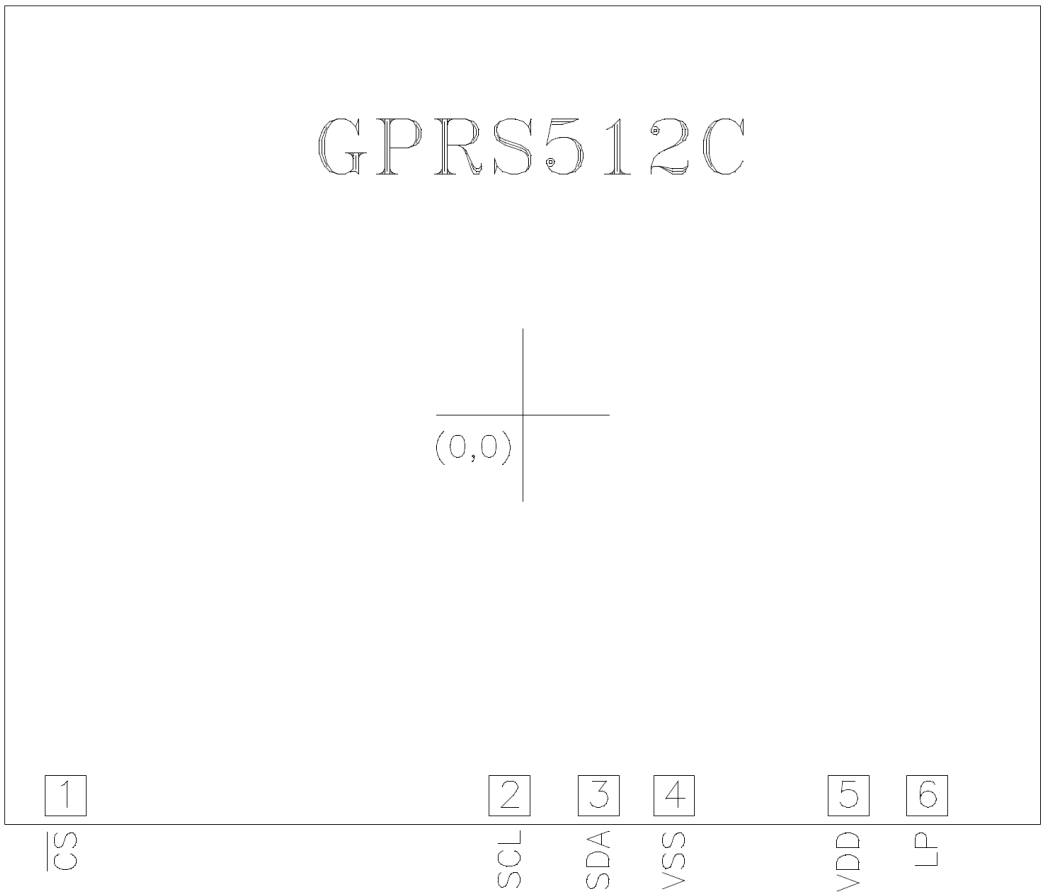
Mnemonic	PIN No.	Type	Description
$\overline{CS}$	1	I	Chip select - Enable 512K
SCL	2	I	Serial clock input
SDA	3	I/O	Serial Input / Output data
VSS	4	I	Ground
VDD	5	I	Power input
LP	6	O	Must be floating

4.1. PIN Configuration

SOP 8



4.2. PAD Assignment



This IC substrate should be connected to VSS

Note1: To ensure that the IC functions properly, please bond all of VDD and VSS pins.
Note2: The 0.1μF capacitor between VDD and VSS should be placed to IC as close as possible.

5. ELECTRICAL SPECIFICATIONS

5.1. Absolute Maximum Ratings

Characteristics	Symbol	Ratings
DC Supply Voltage	V_+	< 4.0V
Input Voltage Range	V_{IN}	-0.5V to V_+ + 0.5V
Operating Temperature	T_A	-10 ^{0}C to +60 ^{0}C
Storage Temperature	T_{STO}	-50 ^{0}C to +150 ^{0}C

Note: Stresses beyond those given in the Absolute Maximum Ratings table may cause operational errors or damage to the device. For normal operational conditions see AC/DC Electrical Characteristics.

5.2. DC Characteristics (VDD = 2.4V - 3.6V, T_A = 0℃ to 70℃)

Characteristics	Symbol	Limit			Unit	Test Condition
		Min.	Typ.	Max.		
Input Low Current	I_{IL}	-1.0	-	1.0	μA	V_{IN} = 0 to VDD
Output Low Current	I_{OL}	-1.0	-	1.0	μA	Chip disable
Output High Voltage	V_{OH}	2.0	-	-	V	I_{OH} = 100μA
Output Low Voltage	V_{OL}	-	-	0.4	V	I_{OL} = 400μA
Standby Current	I_{STBY}	-	5.0	-	μA	Chip disable
Operating Current	I_{DD}	-	0.25	1.0	mA	F_{SCL} = 2.0MHz, no load

5.3. AC Characteristics (VDD = 2.4V - 3.6V, T_A = 0℃ to 70℃)

Test Condition V_{IH} = VDD, V_{IL} = 0V

Input Rise and Fall Times = 10ns

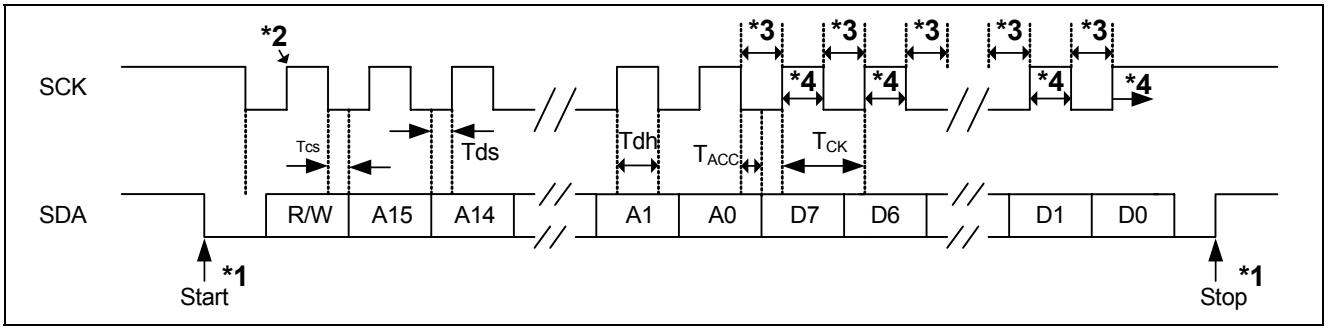
I/O Timing Reference Level = 1.5V

Output Load: C_{LOAD} = 50pF

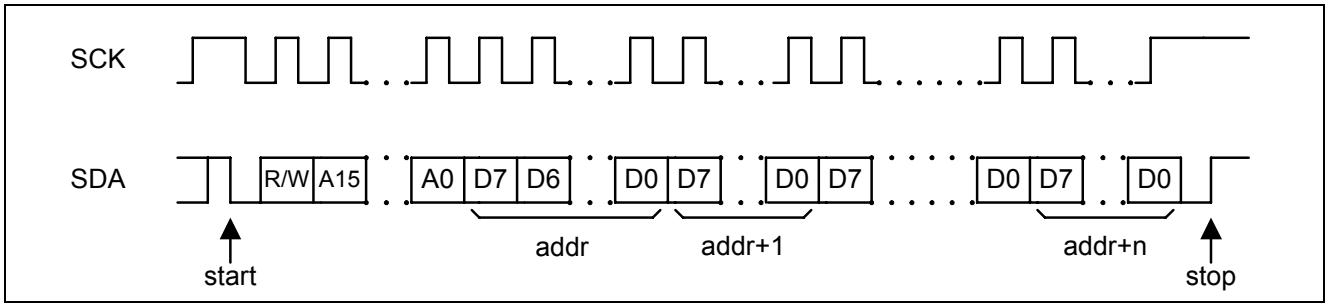
Characteristics	Symbol	Limit			Unit	Test Condition
		Min.	Typ.	Max.		
SCL Setup Time	T_{CS}	100	-	-	ns	
SDA Setup Time	T_{DS}	100	-	-	ns	
SDA Hold Time	T_{DH}	10	-	-	ns	
Access Time	T_{ACC}	-	-	700	ns	VDD = 2.4V
		-	-	250	ns	VDD = 3.0V
SCL Period	T_{CK}	2000	-	-	ns	VDD = 2.4V
		500	-	-	ns	VDD = 3.0V

5.4. Timing Diagram

5.4.1. Serial Interface



5.4.2. Successive Operation



Note*1: Definition of start/stop command

Start Operation	SCL="H" and SDA changes from "H" to "L".
Stop Operation	SCL="H" and SDA changes from "L" to "H", or when $\overline{CS}$="H".

Note*2: Definition of R/W command

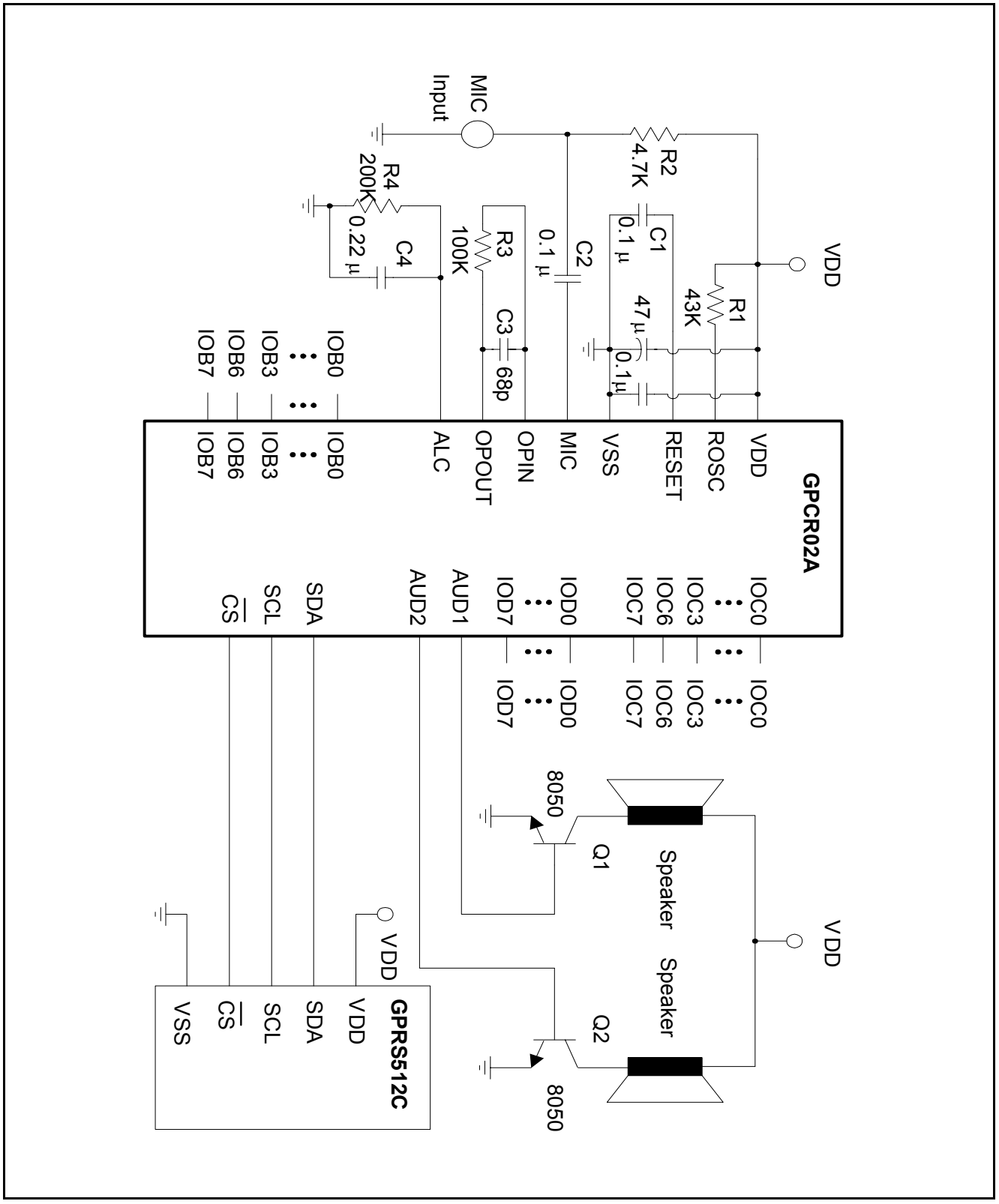
Write Operation	R/W="L" at SCL rising edge
Read Operation	R/W="H" at SCL rising edge

Note*3: Master terminal of Serial Interface (SIF) must keep Hi-Z to avoid bus contention.

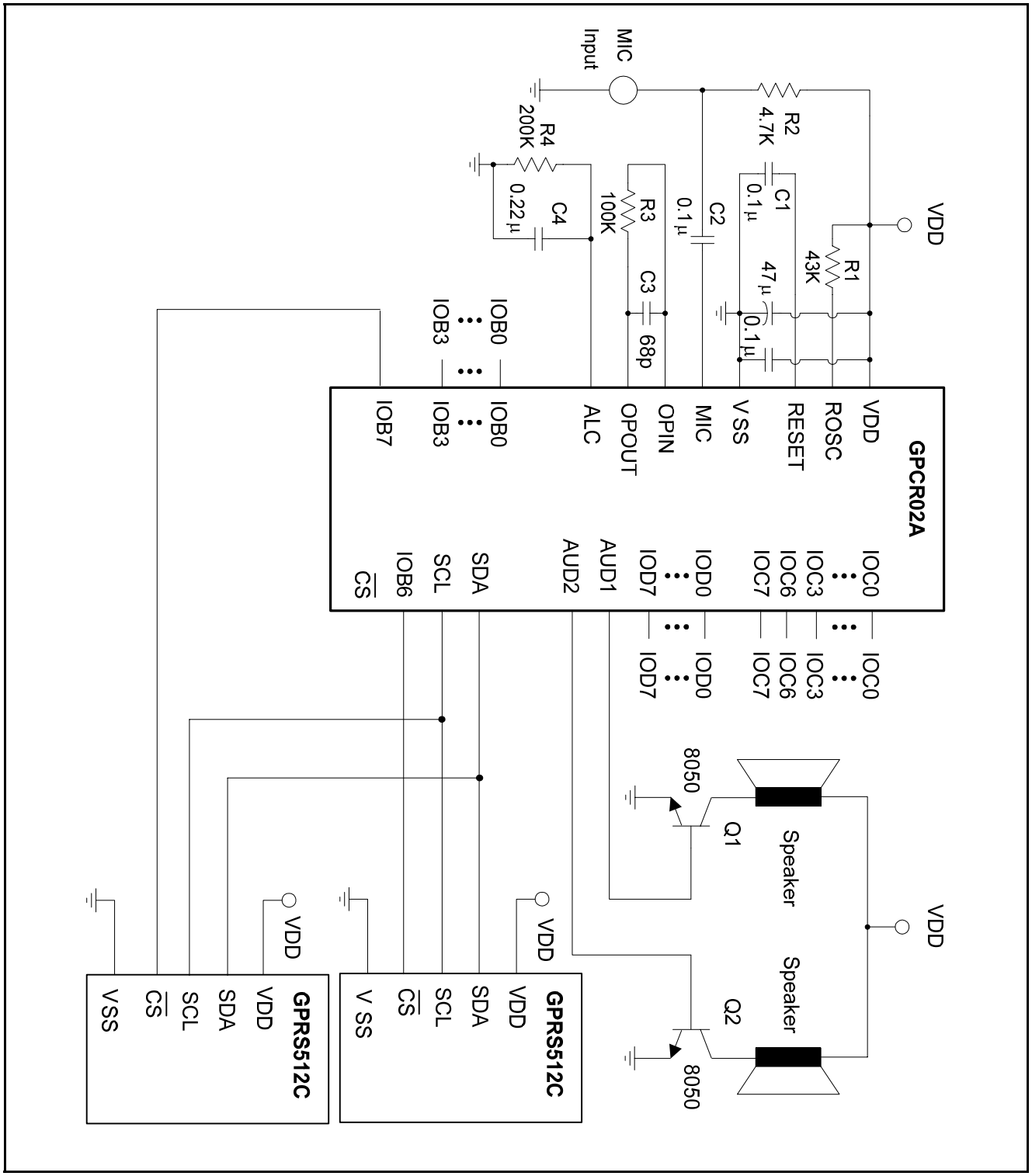
Note*4: GPRS512C (Slave terminal of SIF) will stop driving output to avoid bus contention.

6. APPLICATION CIRCUITS

6.1. Application Circuit - (1)



6.2. Application Circuit - (2)



7. PACKAGE/PAD LOCATIONS

7.1. Ordering Information

Product Number	Package Type
GPRS512C - NnnV - C	Chip form
GPRS512C - HS01x	Green Package - SOP 8 (150mil)

Note1: Code number (NnnV) is assigned for customer.

Note2: Code number (N = A-Z or 0-9, nn=00-99); version (V = A - Z).

Note3: Package form number (x = 1 - 9, serial number).

7.2. Package Information

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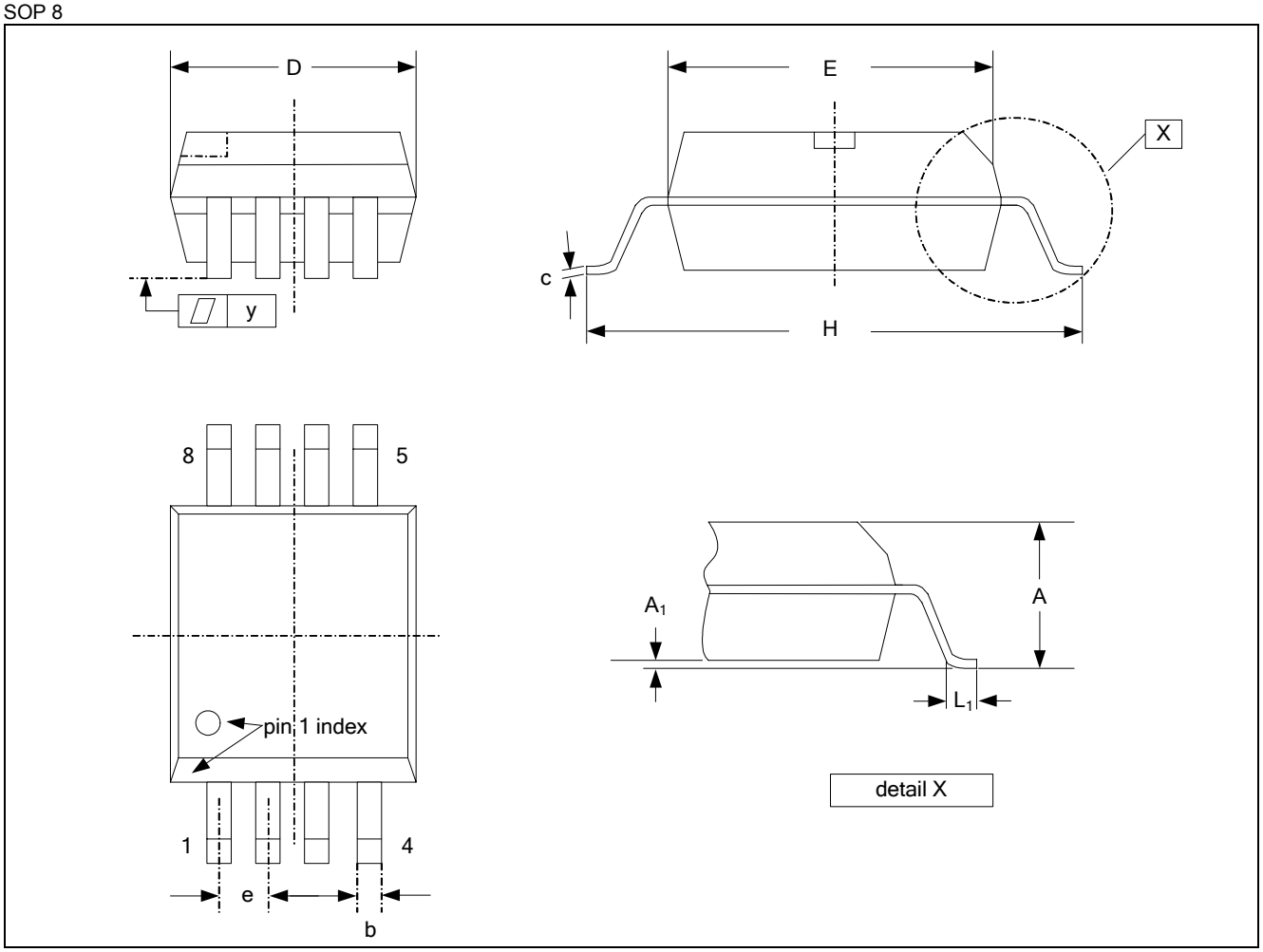

Symbol	Dimension in inch		
	Min.	Typ.	Max.
A	0.053	-	0.069
A_1	0.004	-	0.010
b	-	0.016	-
D	0.189	-	0.196
E	0.150	-	0.157
e	-	0.050	-
H	0.228	-	0.244
L_1	0.016	-	0.050
y	-	-	0.004

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9. REVISION HISTORY

Date	Revision #	Description	Page
DEC. 25, 2009	1.2	Modify 5.3. AC Characteristics.	6
AUG. 20, 2007	1.1	1. Add the PIN Configuration in section 4.1. 2. Modify the “Ordering Information” in section 7.2. 3. Add the “Package Information” in section 7.3.	4 9 10
JAN. 08, 2007	1.0	Original Note: The GPRS512C data sheet v1.0 is a continued version of SPRS512C data sheet v1.3.	10