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APN Content Level	BASIC	INTERMEDIATE	✓	ADVANCED	Confidentiality	Public	✓	Private
Hardware Compatibility	Product Line	AirPrime	Series	Q26xx	SL6087			
				WMPxx				
Software Compatibility	Series		OASIS 2.30 and above					



1 Version

Application Notes may be updated over their lifetime. To ensure you design with the correct version, please check the application notes page in www.sierrawireless.com for latest versions.

2 Introduction

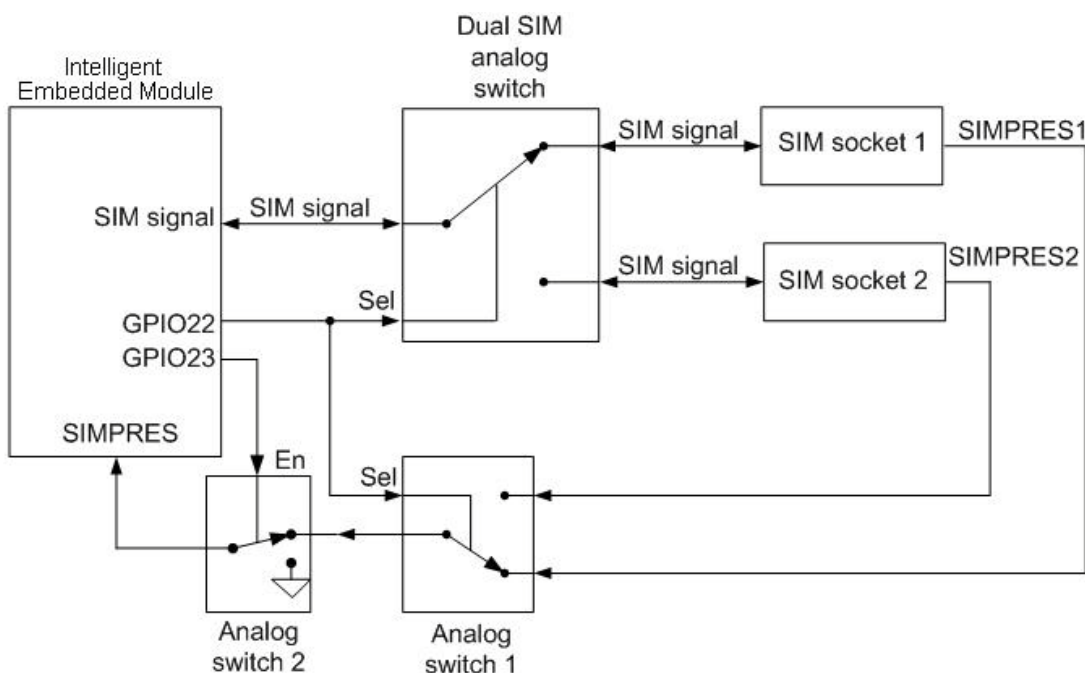
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3 Application Note Description

This application note describes how to design a Dual SIM solution. This function is used to switch between two SIMs. Two GPIOs are used to control the hardware switching between two SIMs.

4 System Description

4.1 Block Diagram



Dual SIM analog switch is used to switch the SIM signal from the Intelligent Embedded Module to the SIM socket 1 or the SIM socket 2. To implement the SIM remove feature, analog switch 1 is used to switch the SIMPRES signal to SIM socket 1 or SIM socket 2. GPIO22 is used for the selection.

To facilitate switch between two SIMs, set GPIO23 output logic high to enable the pull-low of the embedded module SIMPRES pin, which means SIM removed. After then, toggle the GPIO22 logic. Finally, set GPIO23 output logic low to disable the pull-low of the SIMPRES pin.

Refer to section 4.2 AT Command Settings.

4.2 AT Command Settings

In general, no SIM socket is selected for the initial use. Hence, GPIO22 and GPIO23 must be configured to select a particular SIM socket (refer to sections 4.2.1 or 4.2.2). Resetting the Embedded Module is required for activation.

Switching between SIM socket 1 and SIM socket 2 is required after the embedded module is powered ON, please refer to section 4.2.3 for the AT command setting sequence. Resetting the Embedded Module is not required for activation.

4.2.1 Select the SIM Socket 1 (J1)

```
at+wiom=1,"GPIO22",1,0
```

```
at+wiom=1,"GPIO23",1,0
```

```
at+wiom=4
```

4.2.2 Select the SIM Socket 2 (J2)

```
at+wiom=1,"GPIO22",1,1
```

```
at+wiom=1,"GPIO23",1,0
```

```
at+wiom=4
```

4.2.3 Switch Between SIMs During Normal Operation

```
at+wiom=1,"GPIO23",1,1
```

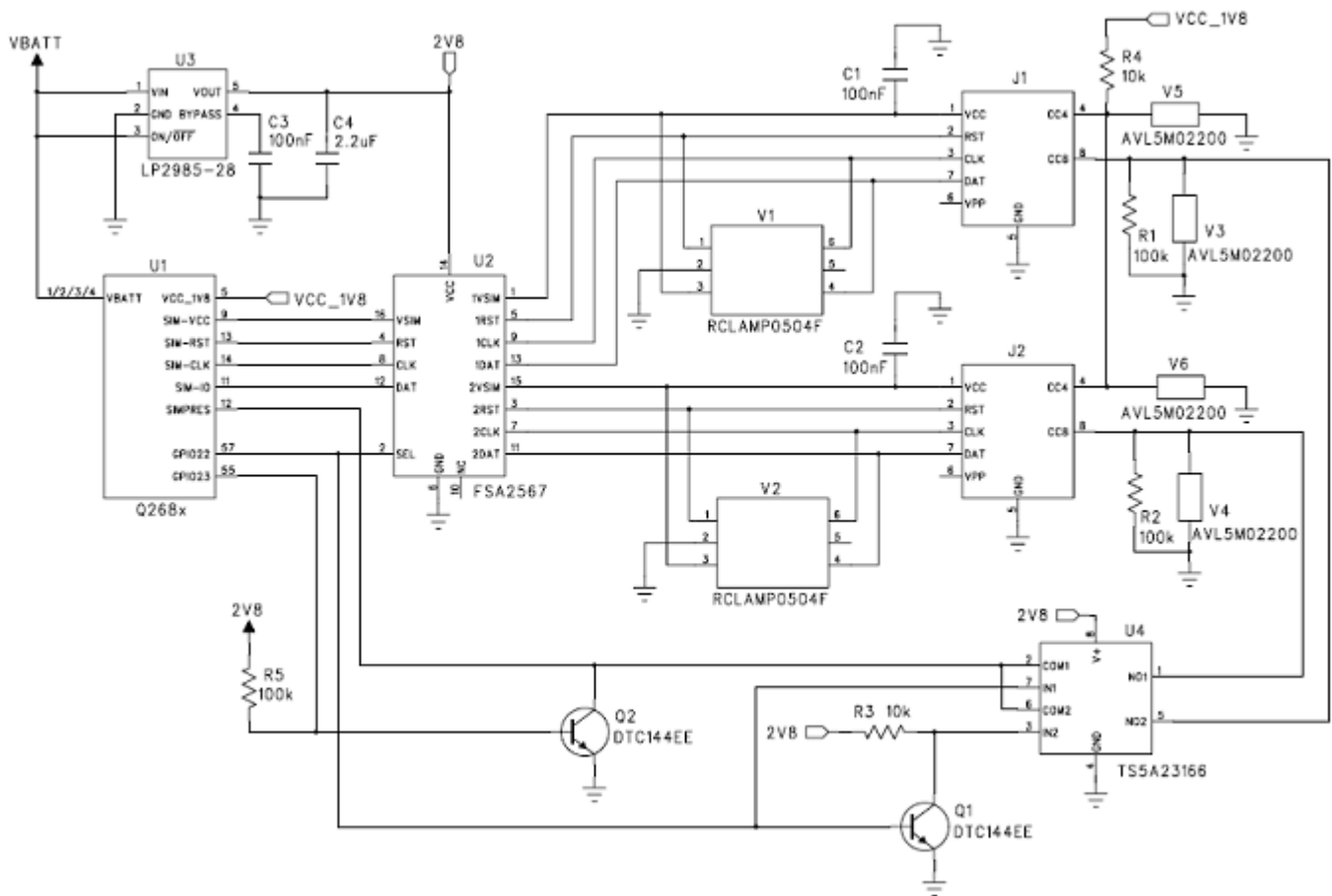
```
at+wiom=1,"GPIO22",1,x
```

```
at+wiom=1,"GPIO23",1,0
```

Note: x means 1 or 0.

1.8V and 3V SIM voltage mode (at+wfm=1,63) is enabled.

4.3 Application Schematic



4.4 Bill of Materials

Reference	Description	Supplier
U2	FSA2567	Fairchild
U3	LP2985-28	TI
U4	TS5A23166	TI
V1, V2	RCLAMP0504F	SEMTECH
Q1, Q2	DTC144EE	On-Semi
V3 ~ V6	AVL5M02200	AMOTECH
R1, R2, R5	Resistor 100kΩ 5% 1/16W 0402	ROHM
R3, R4	Resistor 10kΩ 5% 1/16W 0402	ROHM
C1, C2, C3	Ceramic Capacitor 100nF 16V Y5V +80/-20%	AVX
C4	Tantalum Capacitor 2.2uF 6.3V +/-10%	AVX
J1, J2	CCM03-3013 (6 contacts + Card Detect Switch)	ITT CANON

4.5 Design Consideration

- V1~V6, R1, R2, C1, and C2 must be placed close to the SIM socket.
- The length of the SIM traces must less than 10cm.
- SIM traces must be routed together and have ground shielding.
- Pull up resistor R5 is must.
- 5V SIM card is not supported, because level shifter for 5V SIM is not included in the schematic.

5 SIM Test

SIM electrical tests for 1.8V and 3V is compliance with 3GPP requirement.

Note: Component used and layout can affect the test results.

6 Package Deliverables

This application note is delivered as a single document:

Filename	Description
Application Note for Dual SIM - Rev3.0.pdf	Dual SIM Application Note

7 Support

For direct clients: contact your Sierra Wireless FAE

For distributor clients: contact your distributor FAE

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8 Document History

Version	Date	History
001	June 6, 2009	Creation
002	March 31, 2010	Reformatted to the rebranded SWI template.
3.0	January 10, 2012	Added SL6087. Reformatted to new document template.

9 Legal Notice

Important Notice

Due to the nature of wireless communications, transmission and reception of data can never be guaranteed. Data may be delayed, corrupted (i.e., have errors) or be totally lost. Although significant delays or losses of data are rare when wireless devices such as the Sierra Wireless modem are used in a normal manner with a well-constructed network, the Sierra Wireless modem should not be used in situations where failure to transmit or receive data could result in damage of any kind to the user or any other party, including but not limited to personal injury, death, or loss of property. Sierra Wireless accepts no responsibility for damages of any kind resulting from delays or errors in data transmitted or received using the Sierra Wireless modem, or for failure of the Sierra Wireless modem to transmit or receive such data.

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