Application Note for SDC-MSD10AG

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Contents

Abstract:

This document is a technical application note describing the high-performance Summit SDC-MSD10AG. This document is intended to assist OEMs with integration of the Summit embedded wireless LAN module, SDC-MSD10AG.

Data Sheet:

System Interface	4-bit SDIO with Molex 54722-0607 60-pin connector, which mates to Molex 55560-0607 60-pin connector
Antenna interface	external
Chipset	Broadcom BCM4318E
Input Power Requirements	3.3 VDC +/- 5%
Typical Power Consumption (at maximum transmit power setting)	Transmit: 300mA Receive: 260mA Standby: 10mA
Operating Temperature	-22° to 167°F (-30° to 75°C)
Operating Humidity	10 to 90% (non-condensing)
Length	32mm
Width	35mm
Thickness	4.5mm
Weight	0.3 oz (9 g)
Mounting	60-pin connector
Network Standards	IEEE 802.11a, 802.11b, 802.11d, 802.11g, 802.11h, 802.11i
Network Architecture Types	Infrastructure and ad hoc
Frequency Band	2.4 to 2.4897 GHz 5.15 to 5.35 GHz (FCC) 5.470 to 5.725 GHz (FCC) 5.725 to 5.85 GHz (FCC) 5.15 to 5.35 GHz (ETSI) 5.47 to 5.725 (ETSI) 5.15 to 5.25 GHz (TELEC)
Wireless Media	Direct Sequence-Spread Spectrum (DSSS) Orthogonal Frequency Divisional Multiplexing (OFDM)
Media Access Protocol	Carrier sense multiple access with collision avoidance (CSMA/CA)
Data Rates Supported	1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, 54 Mbps

Modulation	BPSK @ 1, 6 and 9 Mbps QPSK @ 2, 12 and 18 Mbps CCK @ 5.5 and 11 Mbps 16-QAM @ 24 and 36 Mbps 64-QAM @ 48 and 54 Mbps
Regulatory Domain Support	FCC (Americas, Parts of Asia and Middle East) ETSI (Europe, Middle East, Africa and Parts of Asia) TELEC (Japan)
Non-overlapping Channels	FCC: 22 (802.11a), 3 (802.11g) ETSI: 22 (802.11a), 3 (802.11g) TELEC 4 (802.11a), 3 (802.11g)
Transmit Power Settings *Maximum transmit power will vary according to individual country regulations. All values nominal, +/-1.5dBm*	802.11a OFDM: 13 dBm 802.11b DSSS: 18 dBm 802.11g OFDM: 15 dBm
Typical Receiver Sensitivity	802.11a: 6 Mbps: -85 dBm 9 Mbps: -82 dBm 12 Mbps: -79 dBm 18 Mbps: -77 dBm 24 Mbps: -74 dBm 36 Mbps: -69 dBm 48 Mbps: -67 dBm 54 Mbps: -66 dBm 802.11b: 1 Mbps: -96 dBm 2 Mbps: -93 dBm 5.5 Mbps: -92 dBm 11 Mbps: -90 dBm 802.11g: 6 Mbps: -91 dBm 9 Mbps: -90 dBm 12 Mbps: -88 dBm 18 Mbps: -86 dBm 24 Mbps: -83 dBm 36 Mbps: -78 dBm 48 Mbps: -75 dBm 54 Mbps: -73 dBm
Delay Spread	600 ns @ 1 Mbps 500 ns @ 2 Mbps 400 ns @ 5.5 Mbps 400 ns @ 6 Mbps 400 ns @ 9 Mbps 200 ns @ 11 Mbps 350 ns @ 12 Mbps 350 ns @ 18 Mbps 250 ns @ 24 Mbps 250 ns @ 36 Mbps 150 ns @ 48 Mbps 150 ns @ 54 Mbps

Security	**Standards** Wireless Equivalent Privacy (WEP) Wi-Fi Protected Access (WPA) IEEE 802.11i (WPA2) **Encryption** Wireless Equivalent Privacy (WEP, RC4 Algorithm) Temporal Key Integrity Protocol (TKIP, RC4 Algorithm) Advanced Encryption Standard (AES, Rijndael Algorithm) **Encryption Key Provisioning** Static (40-bit and 128-bit lengths) Pre-Shared (PSK) Dynamic **802.1X Extensible Authentication Protocol Types** EAP-FAST EAP-TLS PEAP-GTC PEAP-MSCHAPv2 LEAP
Operating Systems Supported	Windows Mobile 6.1, 6, 5.0, and (Pocket PC) 2003 Windows CE 6.0, 5.0, and 4.2 Windows XP Professional and Embedded For other operating systems including Linux, please contact Summit.
Compliance	FCC Regulatory Domain: FCC Subpart B, Class B FCC Subpart C Part 15.247, 15.207 ANSI C63.4-2003 ETSI Regulatory Domain: EN 300 328 EN 301 489 EN 60590 EN 50371 EU 2002/95/EC (RoHS)
Certifications	
Warranty	**Limited Lifetime**

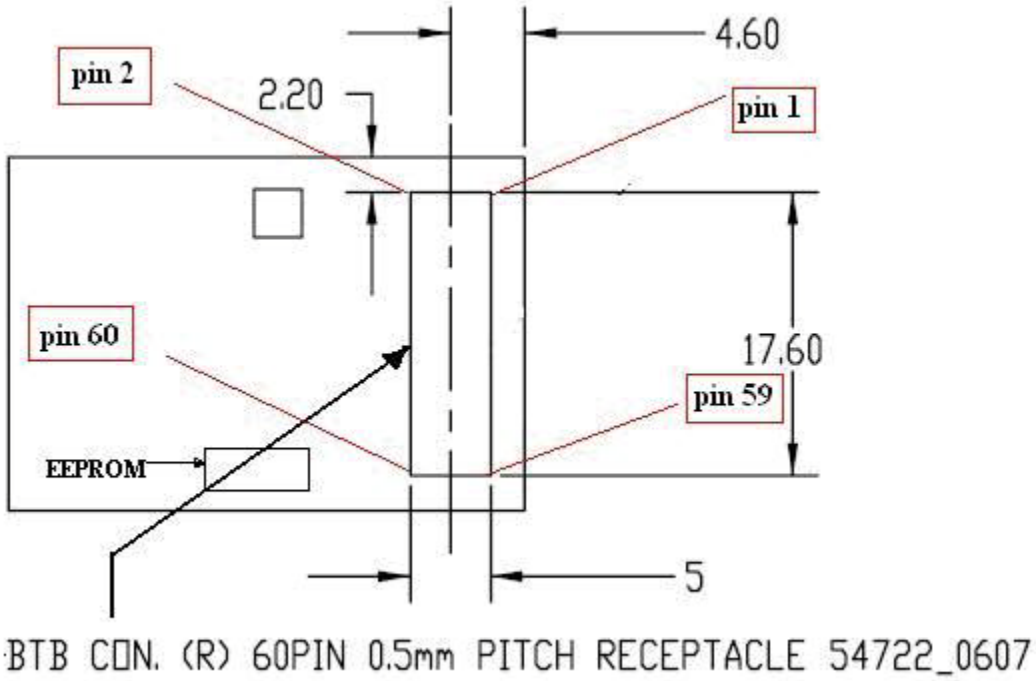
Pin Definitions and Eng. Notes:

Pin Definitions and Engineering Notes for Summit MSD10AG (Summit MCF10AG as an SDIO Radio Module)

Connector Overview

MCF10AG/MSD10AG connector: Molex 54722-0607 60-pin connector

Mating connector (on board): Molex 55560-0607 60-pin connector



Engineering Notes

Important notes from Summit Engineering:

- Memory mode access: Although the Broadcom 4318E chip is capable of using memory mode or I/O access, the Summit driver uses memory mode only and does not support I/O mode access to the CF interface.
- Bluetooth coexistence: BT coexistence can be turned on or off in the SROM using the Summit Manufacturing Utility, or SMU. BT coexistence is through a simple two-wire interface:
  - WLAN_ACTIVE is driven by the Summit radio and is asserted when the transmitter of the Summit radio is active.
  - BT_ACTIVE is an input to the Summit radio. The Summit radio will not transmit if BT_ACTIVE is asserted. The Summit radio expects the Bluetooth radio to assert (raise high) BT_ACTIVE when it is transmitting and to refrain from transmitting when WLAN_ACTIVE is asserted.

  A Summit customer must provide any “glue” logic between the Summit radio and the Bluetooth radio to make sure that the interface is utilized properly.

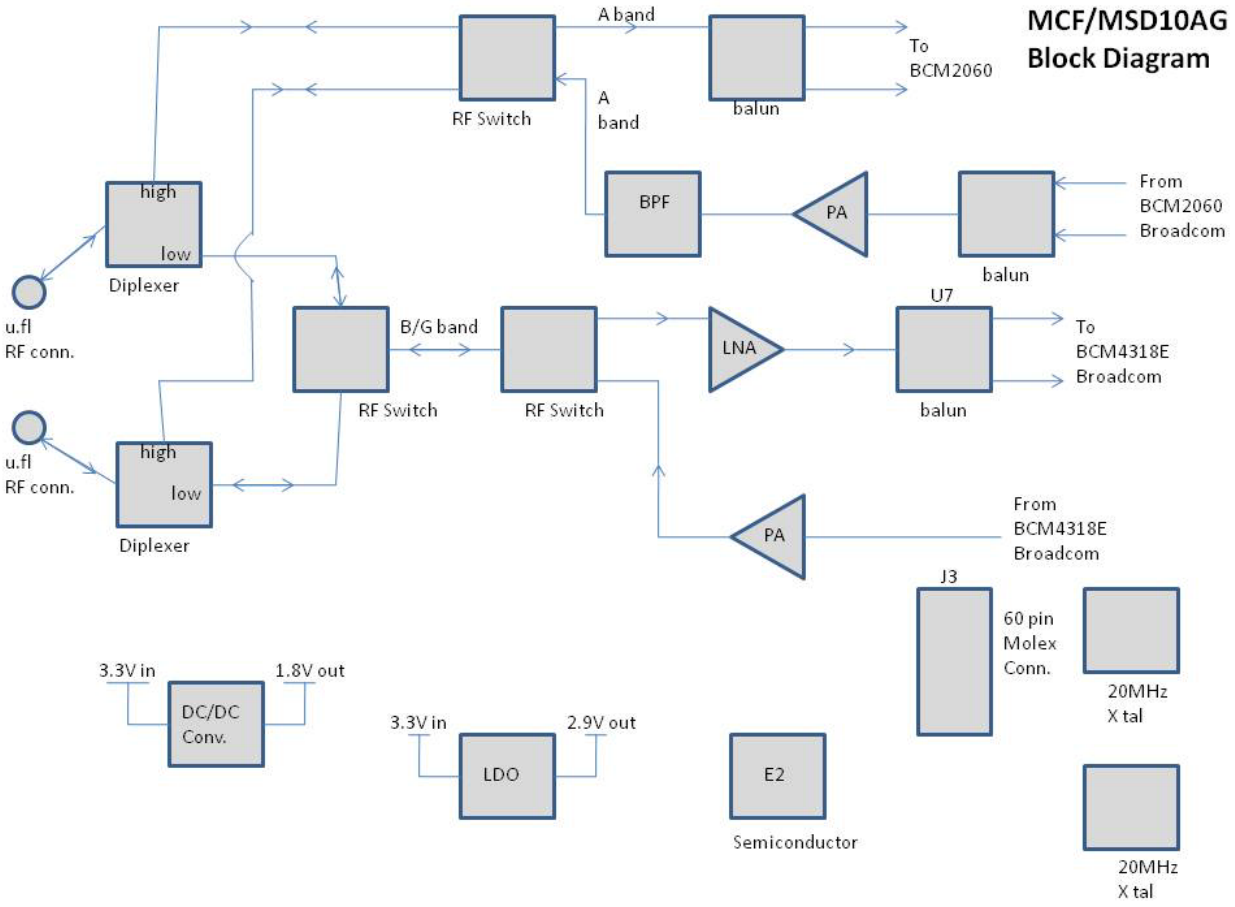
Pin Definitions and Notes

Pin Number	Name	Description
1	Ground	Ground
2	Slot0_data3	Data bus, bit 3
3	Slot0_data4	Data bus, bit 4
4	Slot0_data5	Data bus, bit 5
5	Slot0_data6	Data bus, bit 6
6	Slot0_data7	Data bus, bit 7
7	Slot0_nCE1	Enable for even-numbered address bytes. Active low.
8	Slot0_addr10	Address bus, bit 10
9	Slot0_nOE	Memory access output enable. Active low.
10	Slot0_addr9	Address bus, bit 9
11	Slot0_addr 8	Address bus, bit 8
12	Slot0_addr7	Address bus, bit 7
13	VCC_ Slot0	3.3V Module Power
14	Slot0_addr6	Address bus, bit 6
15	Slot0_addr5	Address bus, bit 5
16	Slot0_addr4	Address bus, bit 4
17	Slot0_addr3	Address bus, bit 3
18	Slot0_addr2	Address bus, bit 2
19	Slot0_addr1	Address bus, bit 1
20	Slot0_addr0	Address bus, bit 0
21	Slot0_data0	Data bus, bit 0
22	Slot0_data1	Data bus, bit 1
23	Slot0_data2	Data bus, bit 2

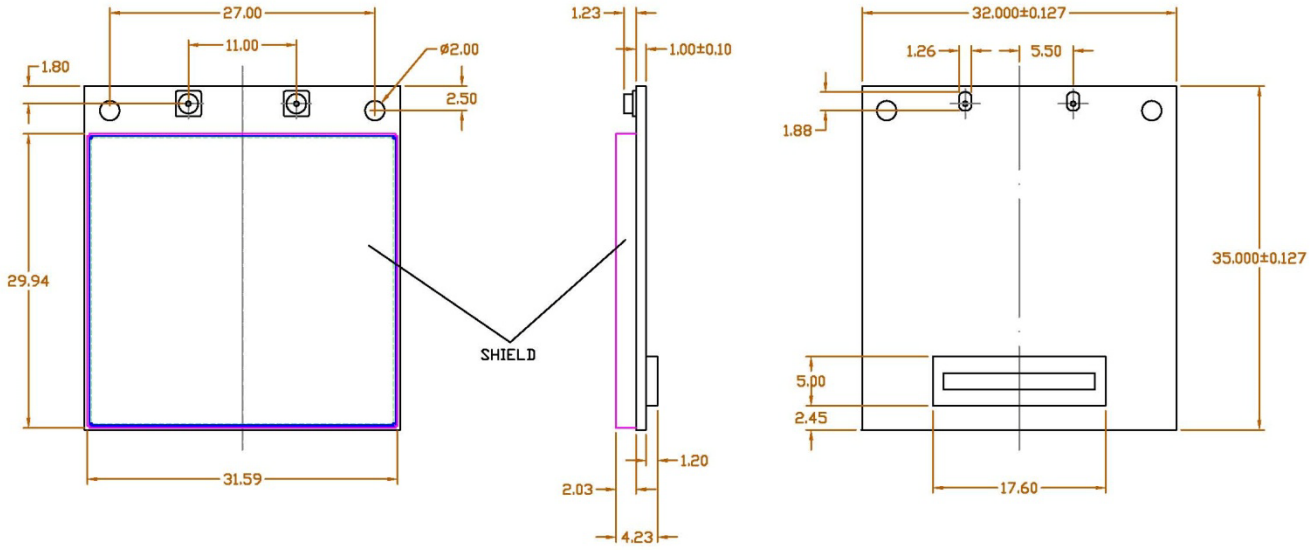
Pin Number	Name	Description
24	Slot0_nIOIS16	Current access is 16 bit. Active low.
25	Slot0_nCD2	Card Detect. Tied to ground in module.
26	BT_RXD	No Connect.
27	SDIO_DATA_2	SDIO Data 2
28	WLAN_ACTIVE	Bluetooth coexistence wireless LAN active signal.
29	VCC_ Slot0	3.3V Module Power
30	Ground	Ground
31	Ground	Ground
32	Slot0_data10	Data bus, bit 10.
33	Slot0_data9	Data bus, bit 9.
34	Slot0_data8	Data bus, bit 8.
35	Slot0_nSTSCHG	Module status change. Active low.
Pin 35 of the MCF10G is status changed for PC Card I/O mode. This signal is asserted low to alert the host to changes in the READY and Write Protect states while the I/O interface is configured. Its use is controlled by the Card Config and Status Register. Pin 35 of the MCF10G corresponds to pin 46 of the CF10G.		
36	BT_ACTIVE	Bluetooth coexistence Bluetooth active signal.
37	Slot0_nREG	Current access is to attribute memory. Active low.
38	NC	No Connect.
39	Slot0_nWAIT	Summit use only: For the MSD10G, Summit pulls this pin **low**.
40	Slot0_RESET	Card reset. Active high.
41	Slot0_nVS2	Not used. – Should be open.
42	Slot0_nLED	WLAN LED activity indicator.
43	INPACK	This signal must be inactive until the card is configured.
The Summit radio driver uses memory mode access, and Summit Engineering states that pin 43 is not		

Pin Number	Name	Description
defined or used when the driver uses memory mode access.		
44	Slot0_nIREQ	Interrupt request. Active low.
45	Slot0_nWE	Memory access write enable. Active low.
46	Slot0_nIOW	IO access write enable. Active low.
47	Slot0_nIOR	IO access read enable. Active low.
48	Slot0_nVS1	Voltage Sense. Tied to GND in module.
49	Slot0_nCE2	Enable for even numbered address bytes.
The fact that the signal on pin 49 stays "high" is normal behavior because the Summit driver uses memory mode access. It does not behave like a PIO card.		
50	Slot0_data15	Data bus, bit 15.
51	Slot0_data14	Data bus, bit 14.
52	Slot0_data13	Data bus, bit 13.
53	Slot0_data12	Data bus, bit 12.
54	Slot0_data11	Data bus, bit 11.
59	SDIO_DATA_1	SDIO Data 1
57	SDIO_DATA_0	SDIO Data 0
SDIO_CMD	SDIO Command	SDIO Command
56	SDIO_CLK	SDIO Clock
58	SDIO_DATA_3	SDIO Data 3
60	Ground	Ground

Block Diagram:


MCF/MSD10AG
Block Diagram
A band
To
BCM2060
RF Switch
A
band
balun
high
low
Diplexer
u.fl
RF conn.
BPF
PA
From
BCM2060
Broadcom
balun
U7
B/G band
LNA
To
BCM4318E
Broadcom
RF Switch
RF Switch
balun
u.fl
RF conn.
high
low
Diplexer
From
BCM4318E
Broadcom
PA
J3
60 pin
Molex
Conn.
20MHz
X tal
3.3V in
1.8V out
DC/DC
Conv.
3.3V in
2.9V out
LDO
E2
Semiconductor
20MHz
X tal

Mechanical:



FRONT BACK

Unit: mm