

User's Manual of SD-Link11g

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When you design a system with this product, please use the product within the absolute ratings, the assured operating voltage range and the assured temperature range. If you use the product exceeding these specifications, C-guys, Inc. does not liable for all risks from such use. And even if you use the products within these specifications, please design with fault tolerance not to infringe any kinds of law for the product performance.
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1. 適用範囲 (Applicable Scope)

本仕様書はシイガイズ株式会社製IEEE802.11b/g準拠無線LAN SDカードについて適応します。
This specifications apply to the IEEE802.11b/g compliant wireless LAN SD card designed by C-guys Inc.

2. 仕様変更について (Change of Specification)

本仕様書の記載事項で、疑義が生じた場合は、貴社と弊社で両者誠意をもって解決をはかるものとします。また、外観、性能及び安全規格に関わる変更は事前協議の対象とします。
Mutual agreement between the relevant companies is required in order to change these product specifications. Prior consultation between the relevant companies is also necessary in order to change any items related to appearance, or safety standards.

3. 製品概要 (Summary of Product)

本製品は、IEEE802.11b/gに準拠した無線LANカードです。また、日本・アメリカ・ヨーロッパ主要国の電波規制に準拠しています。
This product is IEEE802.11b/g compliant wireless LAN card. It is also compliant with the following standards in Japan, US and EU countries.

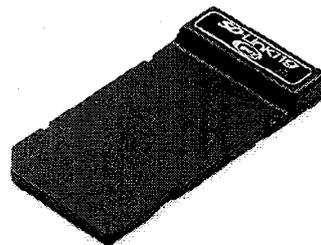
No	Item	Specifications		
		Japan	USA	EU
		ARIB STD-T66 高度化小電力データ通信システム	FCC Part 15 Subpart C	EN300 328-2
1	Compliant	IEEE802.11b/g		
2	Frequency	2412~2472MHz	2412~2462MHz	2412~2472MHz
3	channel	1~13ch	1~11ch	1~13ch
4	Spacing	5MHz		
5	Speed & Modulation	802.11b: DSSS 11/5.5Mbps:CCK, 2Mbps:DQPSK, 1Mbps:DBPSK 802.11g: OFDM 54/48Mbps:64QAM, 36/24Mbps:16QAM, 18/12Mbps:QPSK 9/6Mbps:BPSK		

3.1 適応関連規格 (Adapted Standards)

- SDカード仕様書パートE1 SDIOカード仕様書 バージョン1.0/1.1 に準拠
It is based on the SD Card Specification Part E1 SDIO Card Specification Version 1.0/1.1
- IEEE802.11b/g 無線LAN MAC・物理層仕様書
IEEE802.11b/g Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications.
- RoHS指令準拠 (RoHS order conformity)

3.2 形態 (Shape)

付図2 外形寸法図 参照
Refer to the appendix 2: Dimension
寸法 47 x 24 x 2.1 mm



4. 使用上の注意 (Note)

本SDIOカードは、CMOS-LSI、ICを使用しており、静電気により破壊することがありますので、静電気を印加しないように注意してください。
Do not apply static electricity to this product. If it did it may damage the SD-Link11b/g because this product contains CMOS-LSI and IC inside.

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5. 製品仕様 (Product Specification)

5. 1 絶対最大定格・環境仕様 (Absolute Maximum Ratings/Environmental Characteristics)

項目 (Item)	Max.	単位 (unit)
電源電圧 (Power Supply)	+3.6	V
入力端子電圧 (Input Voltage)	+3.6	V
使用温度範囲 (Operating Temperature Range)	0 to 65	°C
使用湿度範囲 (Operating Humidity range)	35 to 85	%RH
保存温度範囲 (Storage Temperature Range)	-20 to 75	°C
保存湿度範囲 (Storage Humidity Range)	35 to 95	% RH

5. 2 電源 (Power Supply)

No	項目 (Items)	仕様 (Specification)
1	供給電圧 (Supply Voltage)	DC+3.3V±0.3V
2	消費電流 (常温25°C) (Current Consumption at 25°C)	Transmit: 284 mA Ave. Receive: 284 mA Ave.
3	スタンバイ時消費電流 (Standby Current)	Power Save: 194 mA Ave. *Just connects with AP, 65/100msec beacon duration

5. 3 高周波特性 (RF Characteristics)

5. 3. 1 IEEE802.11b/g準拠 RF特性 (供給電圧: 3.3V±0.3V、常温)

(Items compliant with IEEE802.11b/g specification.

Supply Voltage: 3.3V±0.3V, Room Temperature)

No	項目 Items	値			単位 Unit	備考 Remarks
		MIN	TYP	MAX		
1	スプリアス発射の強度 (S purious Emission)	30MHz to 1GHz		-57	dBm	
		Above 1GHz to 12.75GHz		-48		
2	アンテナ端子インピーダンス (18.4.6.9) (Antenna Port Impedance)		50		Ω	Transmit and Receive: Single (Chip) antenna
3	空中線電力 (18.4.7.1) (Transmit Power Level)	802.11b	9	11	dBm	
		802.11g	7	9		
4	スペクトラムマスク Transmit Spectral Mask	802.11b		-31	dBr	fc-22MHz<f, f<fc-11MHz
						-51
		802.11g		-21	dBr	fc±11MHz
				-29		fc±20MHz
			-41	dBr	f<fc-30MHz, F>fc+30MHz	
5	送信中心周波数の偏差 (Transmit Center Frequency Tolerance)	-25		25	ppm	
6	チップクロック周波数の偏差 (Chip Clock Frequency Tolerance)	-25		25	ppm	
7	送信立ち上がり時間(18.4.7.6) (Transmit Power-On Ramp)			2	us	From 10% to 90%
8	送信立ち下がり時間(18.4.7.6) (Transmit Power-Off Ramp)			2	us	From 90% to 10%
9	キャリアサプレッション(18.4.7.7) (RF Carrier Suppression)			15	dB	18.4.7.7
10	最小受信感度 (Receiver Minimum Input level Sensitivity)	802.11b		-77	dBm	PER < 8% at 11Mbps.
		802.11g		-65		PER < 10% at 54Mbps
11	最大受信感度 (Receiver Maximum Input level Sensitivity)	802.11b		-10	dBm	PER < 8% at 11Mbps
		802.11g		-10		PER < 10% at 54ps
12	受信妨害波レベル (Receiver Adjacent Channel Rejection)	802.11b		-35	dBc	PER < 8% at 11Mbps.
		802.11g		-1		PER < 10% at 54Mbps

5. 3. 2 規制への認可・準拠 (Regulatory Body Approvals/Compliance)

No	Description	Country	Compliance
1	Radio Regulation	USA	FCC Part 15.247 C (FCC ID: MXF-S941212G)
2		CANADA	RSS-210 (IC ID: 3069B-WSDB101G)
3		Europe	EN300 328 (CE: CE0560!)
		Japan	ARIB STD-T66 (Telec ID: 201 NY 06215019)
4		ROC (Taiwan)	DGT (based on FCC test report)
5	Electromagnetic Compatibility	USA	FCC Part 15 B (FCC ID)
6		CANADA	ICES-003 (FCC test report is applied)
7		Europe	EN301 489-01, -17
8		Japan	Not applicable (covered by RF regulation)
9	Product safety	Europe	EN60950 (CE mark)

Others certification acquisition country: Malasia, Singapore, Korea
(Planning country: India, VietNam)

** Platform list:
Projecter, Audio system

** FCC Statement -

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

C-guys declares that SD-Link11g (FCC ID: MXF-S941212G) is limited in CH1~CH11 for 2.4 GHz by specified firmware controlled in U.S.A.

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.
- 3) The module must be completely embedded inside the final product and there is no direct access from outside to remove the module without opening the product chassis with a tool.
- 4) OEM shall not display or instruct the user how to install or remove the module.

As long as 4 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users (for example : Projecter, Audio system). The final end product must be labeled in a visible area with the following: “Contains TX FCC ID: MXF-S941212G”.

Manual Information That Must be Included

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the users manual of the end product which integrate this module.

The users manual for OEM integrators must include the following information in a prominent location “ IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

**** IC Statement –**

Operation is subject to the following two conditions:

- 1) This device may not cause interference and
- 2) This device must accept any interference, including interference that may cause undesired operation of the device.

IMPORTANT NOTE:

IC Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

5. 4 製造業者 (Manufacturer)

製造会社名 (Company Name): Gemtek Technology Co., Ltd.

製造場所 (Place of Manufacture): 新竹工業区 新竹縣 台湾
Hukou, Hsinchu, Taiwan, R. O. C. 303

5. 5 対応OS (Supported OS)

	Specification
対応OS (Supported OS)	μ ITRON Embedded Linux Windows CE Windows XP

5. 6 PA Parameter

Nov21UpdatedPAparam_maxpwr14dbmCG-SD-Link11g-000E110000COF.bin

5. 7 暗号化・認証 (Encryption/Authentication)

暗号化 (Encryption)	認証 (Authentication)
WEP (64bit/128bit) WPA (TKIP) WPA2 (AES)	WPA-PSK

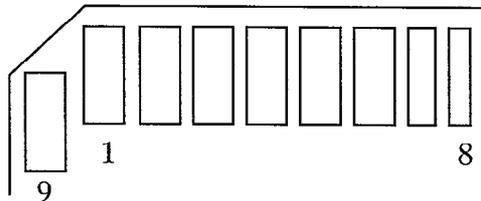
5. 8 LED動作 (Flashing of LED)

送受信状態にて、データ処理作業においてLEDが点滅します。

LED is flashing in the transmission and the receiving condition in the data processing work.

5.9 SDコネクタピンアサイン (Pin Assigment for SD Connector)

ピン (pin)	信号名 (Signal Name)	I/O	機能 (Funtion)
1	CD/DAT3	IO	Card Detect, Data Line [Bit3]
2	CMD	IO	Command/Response
3	VSS	GND	Supply Voltage Ground
4	VDD	Power	Supply Voltage
5	CLK	I	Clock
6	VSS	GND	Supply Voltage Ground
7	DAT0	IO	Data Line [Bit0]
8	DAT1	IO	Data Line [Bit1]
9	DAT2	IO	Data Line [Bit2]



5.10 レジスター (Register)

OCR Register

Bit position	OCR Value
31	Card power up status bit
30-24	reserved
23-16	All 1
15-0	All 0

RCA Register

SDメモリーカード物理仕様書 (パート1) バージョン 1.01 に記載
Described in the SD Memory Card Specification (Part 1) Version 1.01.

CCR Register

Address	Register Name
0x00	CCCR/SDIO Revision
0x01	SD Specification Revision
0x02	I/O Enable
0x03	I/O Ready
0x04	Int Enable
0x05	Int Pending
0x06	I/O Abort
0x07	Bus Interface Control
0x08	Card Capability
0x09- 0x0B	Common CIS Pointer
0x0C	Bus Suspend
0x0D	Function Select
0x0E	Exec Flags
0x0F	Ready Flags
0x10 - 0x11	FNO Block Size

FBR Register

Address	Register Name
0x200	I/O device interface code, CAS info.
0x209 - 0x20B	Pointer to Function 2 CIS
0x20C - 0x20E	Pointer to Function 2 CSA
0x20F	Data access window to Function 2 CSA
0x210 - 0x211	I/O block size for Function 2

CIS Register

Address	CIS Area
0x0001000	Function 0 SDIO Address = 0x001000 CIS Tuple Code = 21, Tuple Link = 0x02, 0c 00 CIS Tuple Code = 22, Tuple Link = 0x04, 00 00 02 32 CIS Tuple Code = 20, Tuple Link = 0x04, 92 00 01 00 CIS Tuple Code = 15, Tuple Link = 0x33 02 07 43 2d 47 75 79 73 20 53 44 20 57 4c 41 4e 00 00 53 44 2d 4c 69 6e 6b 31 31 62 00 ff Function 2 SDIO Address = 0x001069 CIS Tuple Code = 21, Tuple Link = 0x02, 0c 00 CIS Tuple Code = 22, Tuple Link = 0x1c 01 01 10 12 34 56 78 00 20 00 00 03 00 08 00 01 ff 00 08 0a 0f 01 01 01 00 00 00 00

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 お願い

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1. Please evaluate the product before usage or selling.
2. Please operate and store the device within the guideline of the acceptance spec.