

BL3336-P Product Manual V1.2

Version	Date	Note
1.0	5/4/2018	Preliminary version
1.1	6/20/2018	Modified parameters including output power and current
1.2	10/12/2018	Modified some parameters

Features

- a. Support IEEE802.11 b/g/n standards
- b. Support WEP, WPA and WPA2 encryption
- c. Support UART/PWM/ADC/GPIO/I2C interfaces
- d. Support STA/AP/AP+STA modes
- e. Support SmartConfig
- f. Support TLS/SSL and mDNS protocols
- g. Support PCB antenna
- h. 3.3V power supply

1. Product Overview (Hardware)

The module supports 802.11b/g/n and it is capable for communication with other devices via UART. The module integrates radio transceiver, MAC, baseband, all Wi-Fi protocols, configurations and network stack. It can be widely used in applications like smart home devices, remote monitoring devices and medical care instruments.

The module integrates an ARM Cortex- M4F speed up to 125MHz with 256KB SRAM and 2MB flash.

1.1 Basic Radio Specification

1.1.1 WLAN parameter

Radio range	2.412 GHz - 2.462 GHz
Wireless standards	IEEE 802.11 b/g/n
Radio output	802.11b :14dBm $\pm$ 2dBm 802.11g :13dBm $\pm$ 2dBm 802.11n:12dBm $\pm$ 2dBm
Antenna type	Internal: PCB antenna
	External: Not supported
Receiving sensitivity	802.11b<-83dBm@11Mbps 802.11g<-72dBm@54Mbps 802.11n<-71dBm@MCS7
Stack	IPv4, TCP/UDP/FTP/HTTP/HTTPS/TLS/mDNS
Data rate (max)	11M@802.11b, 54M@802.11g, MCS7@802.11n
Security	Encryption standard: Open/WEP-Open/WPA/WPA2 Encryption algorithm: WEP64/WEP128/TKIP/AES

1.1.2 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Units
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Ts	Storage temperature	-40	125	°C
TA	Ambient operating temperature	-10	80	°C
Vdd	Supply voltage	3.0	3.6	V
Vio	Voltage on IO pin	0	3.3	V

1.1.3 DC Voltage and current

Specifications	Min.	Typ.	Max.	Units
VDD	3	3.3	3.6	V
VIL(input low voltage)	0		0.8	V
VIH(input high voltage)	2		3.6	V
VOL(output low voltage)	0		0.4	V
VOH(output high voltage)	2.4		3.6	V
RPU		75		KΩ
RPD		75		KΩ
Io	8		24	mA
RX current			150	mA
Max current			380	mA

1.1.4 IEEE802.11b mode

ITEM	Specification
Modulation Type	DSSS / CCK
Frequency range	2412MHz~2472MHz
Channel	CH1 to CH13
Data rate	1, 2, 5.5, 11Mbps

TX Characteristics	Min	Typical	Max.	Unit
	.			
Power@11Mbps		17		dBm
Frequency Error	-10		+10	ppm
EVM@11Mbps			-21	dB
Transmit spectrum mask				
Pass				

RX Characteristics	Min	Typical	Max.	Unit
	.			
Minimum Input Level Sensitivity				

11Mbps (FER $\leq$ 8%)			-83	dBm
Maximum Input Level (FER $\leq$ 8%)				dBm

1.1.5 IEEE802.11g mode

ITEM	Specification
Modulation Type	OFDM
Frequency range	2412MHz~2472MHz
Channel	CH1 to CH13
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps

TX Characteristics	Min	Typical	Max.	Unit
	.			
Power@54Mbps		14		dBm
Frequency Error	-10		+10	ppm
EVM@54Mbps			-29	dB
Transmit spectrum mask				
Pass				

RX Characteristics	Min	Typical	Max.	Unit
	.			
Minimum Input Level Sensitivity				
54Mbps			-70	dBm
Maximum Input Level (FER $\leq$ 10%)				dBm

1.1.6 IEEE802.11n 20MHz bandwidth mode

ITEM	Specification
Modulation Type	OFDM
Frequency range	2412MHz~2472MHz
Channel	CH1 to CH13
Data rate	MCS0/1/2/3/4/5/6/7

TX Characteristics	Min	Typical	Max.	Unit
Power@HT20, MCS7		13.5		dBm
Frequency Error	-10		+10	ppm
EVM@HT20, MCS7			-29	dB
Transmit spectrum mask				
Pass				

RX Characteristics	Min	Typical	Max.	Unit
Minimum Input Level Sensitivity				
MCS7			-69	dBm
Maximum Input Level (FER ≤ 10%)				dBm

1.1.7 IEEE802.11n 40MHz bandwidth mode

ITEM	Specification
Modulation Type	OFDM
Frequency range	2412MHz~2472MHz
Channel	CH1 to CH13
Data rate	MCS0/1/2/3/4/5/6/7

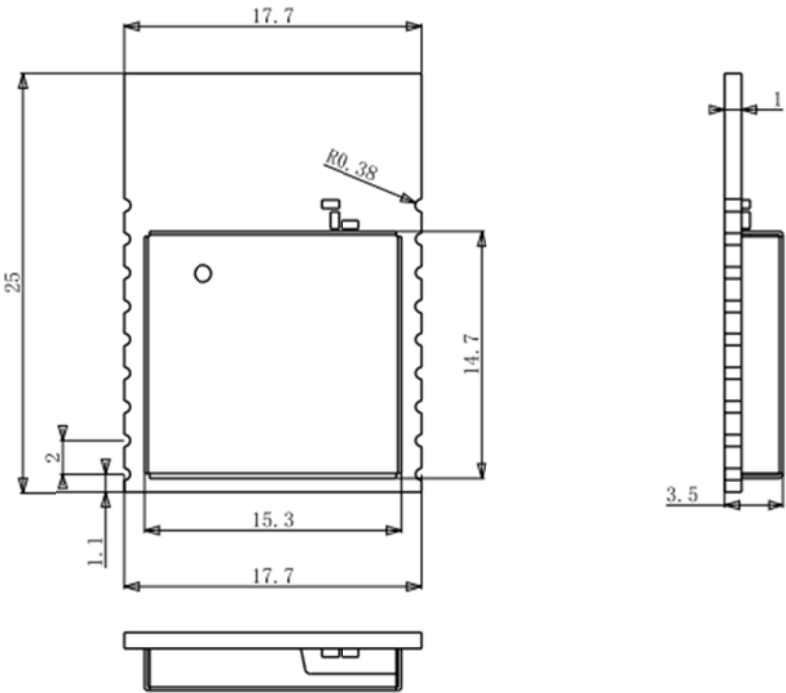
TX Characteristics	Min	Typical	Max.	Unit
Power@HT40, MCS7		13.5		dBm
Frequency Error	-10		+10	ppm
EVM@HT40, MCS7			-29	dB
Transmit spectrum mask				
Pass				

RX Characteristics	Min	Typical	Max.	Unit
Minimum Input Level Sensitivity				
MCS7			-65	dBm

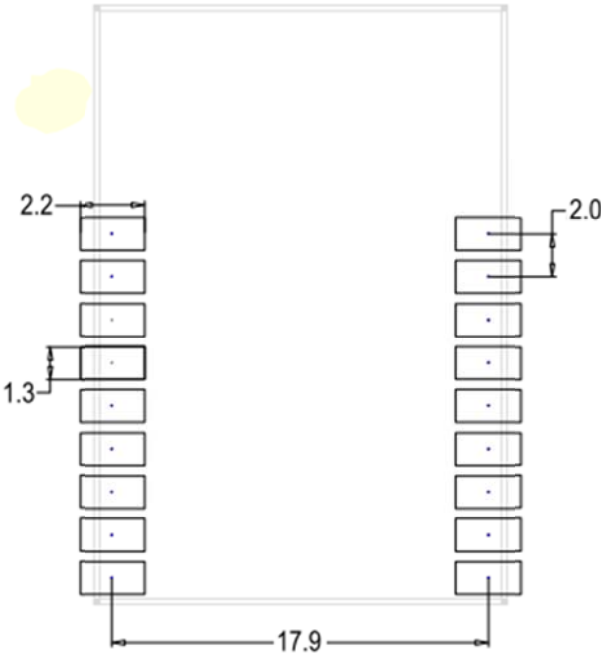
Maximum Input Level (FER $\leq$ 10%)				dBm
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1.2 Hardware Introduction

1.2.1. Mechanical Dimensions

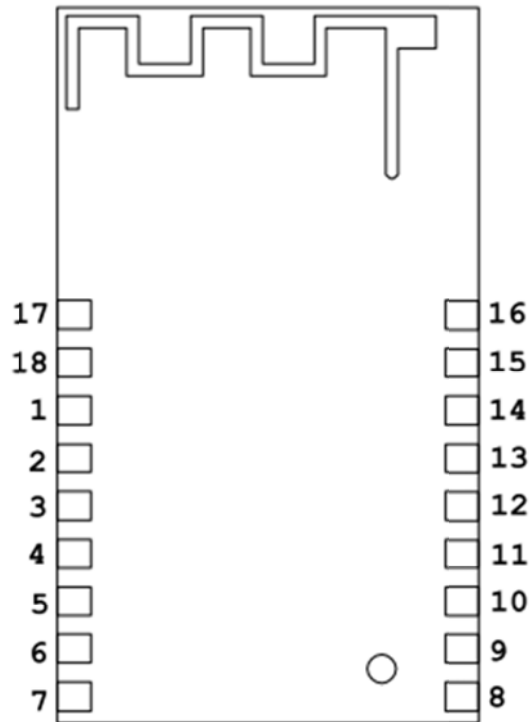


1.2.2. Recommended Pad Size



(Unit: mm)

1.2.3. Pin Definitions



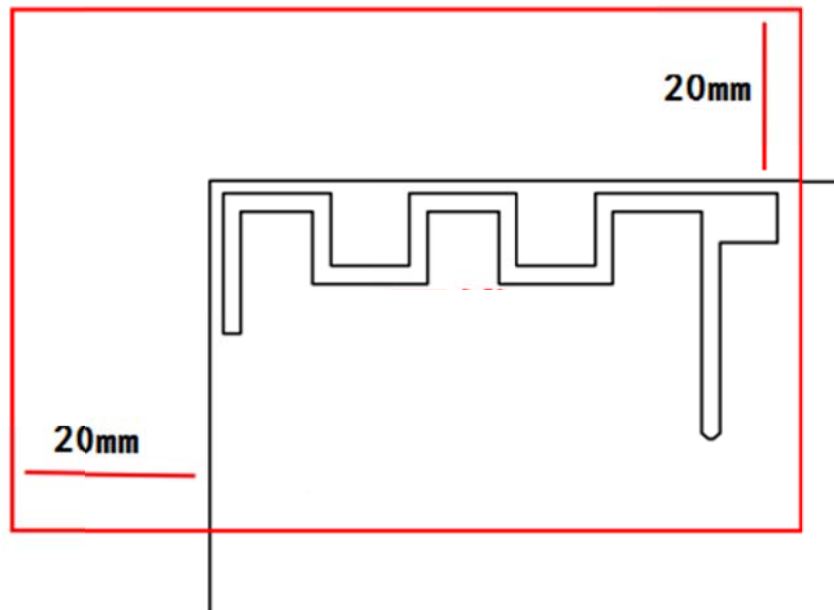
Pin	Interface	Description	Type
1	GND	GND	POWER
2	VDD	3.3V	POWER
3	NRST	HW reset	I
4	TX0	UART0 TX	O
	SPI_MOSI	SPI interface	
	GPIOA23	Support PWM0	I/O
5	RX0	UART0 RX	I
	SPI_CLK	SPI interface	
	GPIOA18		I/O
6	TX2	UART2 TX	O
	GPIOA30	Support PWM3	I/O
	I2C0_SDA	I2C interface	
7	RX2	UART2 RX	I
	GPIO29	Support PWM4	I/O
	I2C_SCL	I2C interface	
8	ADC	ADCIN	I
9	GPIOA19		I/O
	SPI_CS	SPI interface	
10	GPIOA5	Support PWM4	I/O
11	GPIOA15	Support PWM1	I/O
	SWD_DATA		I

12	GPIOA14	Support PWM0	I/O
	SWD_CLK		
13	VDD	3.3V	POWER
14	GND	GND	POWER
15	GPIOA0	Support PWM5	I/O
16	GPIOA12	Support PWM3	I/O
17	NC		
18	GPIO22	Support PWM5	I/O
	SPI_MISO	SPI interface	

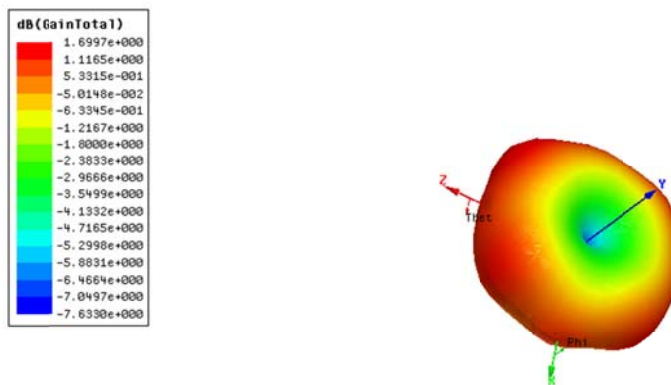
Note:

1. In default, UART0 is used for bypass communication and UART2 is used for output of debugging information. Please refer to the description in DC Characteristics for UART output current level.
2. NRST is hardware reset for the module and will be effective with VIL. Configuration information will be remained after module reset. The module is already designed with RC reset upon power-on.
3. TX and RX in UART0 are used for communication with external MCU powered by 3V. Please refer to the description in 3.3. DC Characteristics for UART output current level.
4. It is recommended to leave unused GPIOs floating.
5. Before using “General Electric” firmware, please confirm configuration LED, software reset PIN and reset current level.

1.2.3. PCB Antenna



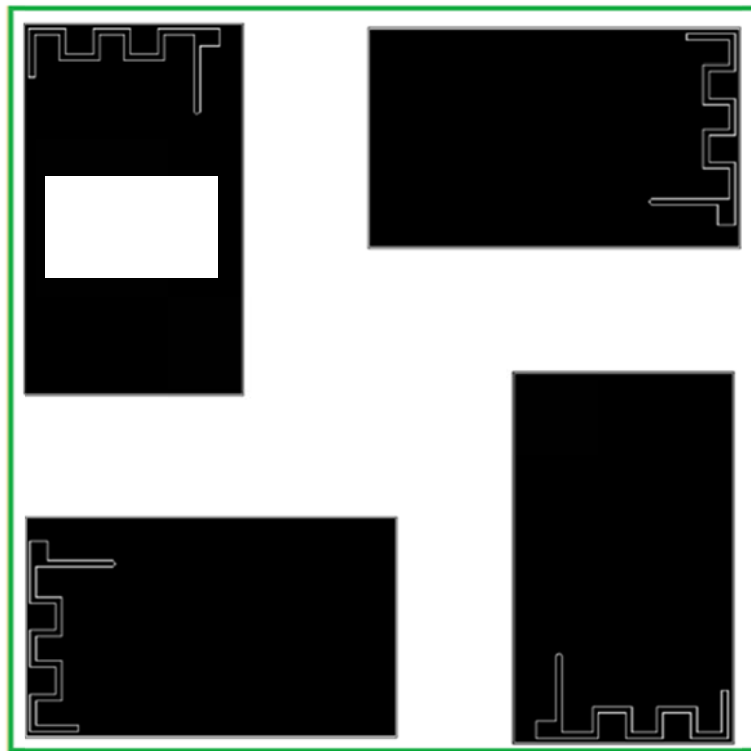
The module support PCB antenna in 2.4G~2.5G frequency with S11 port less than -10dB and antenna gain about 1.6dB.



Simulated radiation pattern of antenna gain

The following precautions should be considered during designing with PCB antenna:

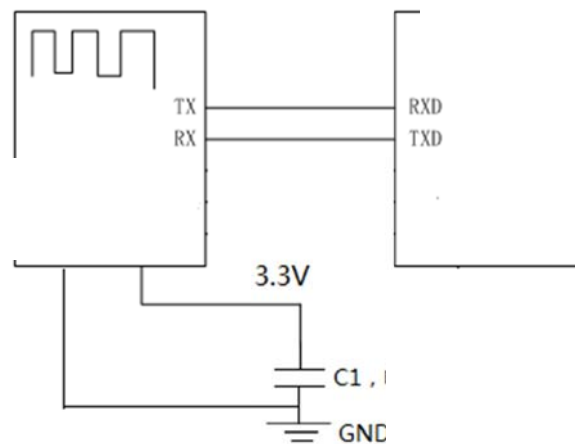
1. Do not place any electrical components or grounding in antenna area on main board and it's better to leave this area blank on PCB
2. It is recommended to not place any electrical components within 20mm range of module antenna and not design any circuit or bond copper on main board under this area.
3. Do not use the module inside any metal case or containers with metal painting
4. Keep the antenna of wifi module next to the edge of main board during design of PCB to ensure better performance of antenna, as illustrated below



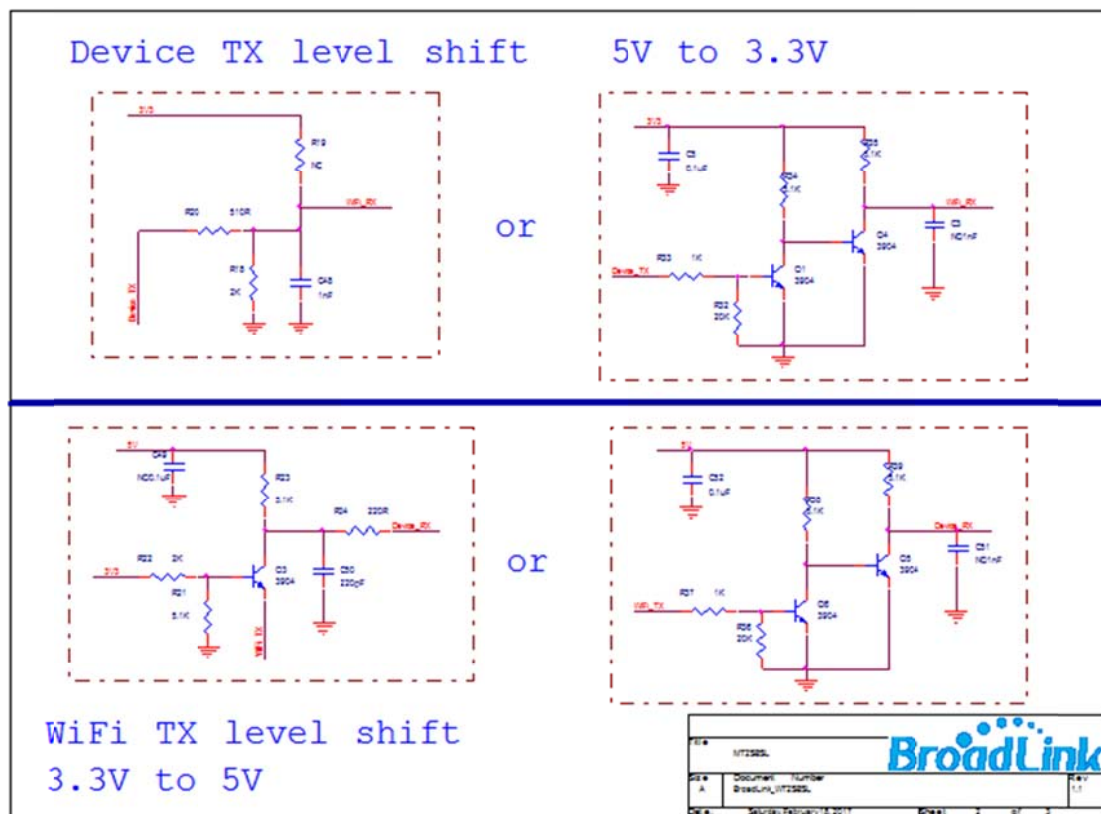
1.3. Reference Design

1.3.1. UART Interface Design

For devices with 3.3V power supply, you can directly connect the device UART port with module UART port according to the illustration.



If your device is powered by 5V, you can refer to the circuit shown in the figure below or design your own circuit for power conversion. The value of resistor can be adjusted according to actual circuit design.



1.3.2. Power Supply Requirement

If an LDO is used to supply the module with 3.3V power, C1 capacitor can be considered to be used with 10u-22u; If a DCDC is used to supply 3.3V power, C1 capacitor can be considered to be used with 22uF

It is recommended to supply the module with power higher than 400mA to ensure enough power supply to the module and avoid power down during data

The module is designed with 2x 3.3V pins. You can power the module with either pin or both pins.

FCC Warning

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.

NOTE 1: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note 1: This module certified that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3: Additional testing and certification may be necessary when multiple modules are used.

Note 4: The module may be operated only with the antenna with which it is authorized. Any antenna that is of the same type and of equal or less directional gain as an antenna that is authorized with the intentional radiator may be marketed with, and used with, that intentional radiator.

Note 5: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Supplier's Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, Hangzhou Gubei Electronics Technology Co., Ltd shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

Note 6: FCC ID label on the final system must be labeled with “Contains FCC ID: 2ACDZ-BL3336-P” or “Contains transmitter module FCC ID: 2ACDZ-BL3336-P”.

IC WARNING

This device complies with Industry Canada’s licence-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC Radiation Exposure Statement:

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with IC multi-transmitter product procedures. Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without reassessment permissive change.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionner en association avec une autre antenne ou transmetteur.

This equipment complies with IC RSS-102 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.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps.

This module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products. Additional testing and certification may be necessary when multiple modules are used.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

The final end product must be labeled in a visible area with the following "
Contains IC: 21239-BL3336P ".