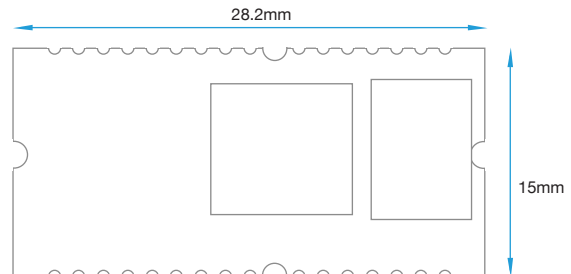
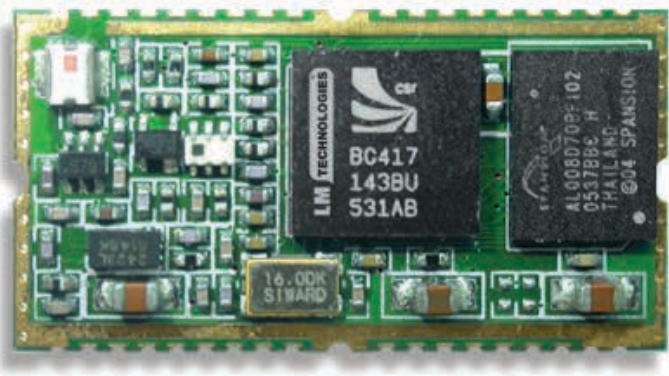




# LM072 Bluetooth 2.0 / 2.1 + EDR Serial Data Module

Class 1 BC04, 8MB Flash, Up to 100m

Product LM072  
 Part No 072-0110  
 Revised 03/MAR/2015



## Features

- Bluetooth standard v2.0 and BT v2.1 + EDR specification
- SPP firmware supported by default.
- CSR Bluecore BC04 chipset
- 802.11 Coexistence supported
- RoHS compliant
- External Antenna
- Extensive Technical Support available
- Support for encryption data and authentication
- Low Cost Solution
- Low Power, Robust Design
- AT Command Set provided for module configuration
- Small outline: 28.2mm x 15mm x 2.8mm
- Class 1 radio - Output power +18 dBm
- 100m range in open space

## Applications

- Serial Communications
- Medical Devices
- Domestic and Industrial Applications
- Embedded Devices
- Remote Monitoring and Control
- GPS, POS, Barcode Readers
- Payment Terminals



## Overview

LM072 is LM Technologies Ltd Class 1 Bluetooth Data module with external antenna. This module is a CSR Bluecore 4 (BC04) chip based surface mount module available with Bluetooth Serial Port Profile (SPP) firmware.

This module is ideal for adding long range wireless connectivity to embedded products. The module acts as a standalone unit (i.e. it does not need a host to drive it) and can interface with embedded microcontrollers via UART.

It operates over a voltage range of 3.0 V to 3.6 V and gives excellent performance over a distance of 70-100 m with external antenna. This is a tried and tested module also used in other LM best selling products like LM048 and LM058 serial adapter as well as LM400 and LM410 Data Modules.



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## Packaging Options

### Individual BT2.1

Part No 072-0110

LM072 with BT2.1 + EDR firmware

### Tray BT2.1

Part No 072-0112

LM072 with BT2.1 + EDR firmware

### Tape & Reel BT2.1

Part No 072-0111

LM072 with BT2.1 + EDR firmware

### Individual BT2.0

Part No 072-0125

LM072 with BT2.0 + EDR firmware

### Tray BT2.0

Part No 072-0126

LM072 with BT2.0 + EDR firmware

### Tape & Reel BT2.0

Part No 072-0127

LM072 with BT2.0 + EDR firmware

- User Guides, Manuals and Wdcomm Configuration Software available to download via our website - <http://www.lm-technologies.com/support/downloads>

## General Specification

Chipset	CSR Bluecore 4 BC04
Power Classification	Class 1
Module Type	Surface Mount SMT
Bluetooth Specification	Bluetooth 2.0 and Bluetooth 2.1 + EDR
Frequency	2402 - 2480 MHz
Data Rate	Up to 3 Mbps in HCI Mode
Range	Up to 100m in open space
Rx Sensitivity	-82 dBm typical
Antenna	External Antenna
Voltage operation	3.0V - 3.6V
Average Current Consumption (Receiving Data)	114 mA
Power Output	+18 dBm
Default Firmware	v4.55 (BT2.0), v6.18 (BT2.1)
Size	28.2mm x 15mm x 2.8mm
Bluetooth Profile	Serial Port Profile (SPP)
Interface	UART
Serial Parameters	Default 19200, 8 N 1
UART lines	TxD, RxD, GND, CTS, RTS
Baud Rates	1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2/230.4/460.8/921.6 kbps
Configuration	AT Command Set
Flash Memory	8MB
RoHS Compliant	Yes
Certifications	CE, FCC, BQB



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## Pin Assignments

Pin	Name	Type	Description
1	GND	Ground	Common Ground
2	PVCC	Power	Power Amp. Power supply (3.3V)
3	AIO 0	I/O	Programmable Input / Output
4	AIO 1	I/O	Programmable Input / Output
5	PIO 0	I/O	Programmable Input / Output
6	PIO 1	I/O	Programmable Input / Output
7	PIO 2	I/O	Programmable Input / Output
8	PIO 3	I/O	Programmable Input / Output
9	PIO 4	I/O	Programmable Input / Output
10	GND	Ground	Common Ground
11	PIO 5	I/O	Programmable Input / Output
12	PIO 6	I/O	Programmable Input / Output
13	PIO 7	I/O	Programmable Input / Output
14	PIO 8	I/O	Programmable Input / Output
15	PIO 9	I/O	Programmable Input / Output
16	RESET	CMOS Input	Reset Input of Module, Active Low
17	VCC	Power	Module input Supply, 3.3V DC
18	GND	Ground	Common Ground
19	GND	Ground	Common Ground
20	USB_DP	I/O	USB Data Plus
21	USB_DN	I/O	USB Data Minus
22	PCM_SYNC	I/O	Synchronous Data Sync
23	PCM_IN	CMOS Input	Synchronous Data Input
24	PCM_OUT	CMOS Output	Synchronous Data Output
25	PCM_CLK	I/O	Synchronous Data Clock
26	UART_RX	CMOS Input	UART Data Input
27	UART_TX	CMOS Output	UART Data Output
28	UART_RTS	CMOS Output	UART Request to Send (Active Low)
29	GND	Ground	Common Ground
30	UART_CTS	CMOS Input	UART Clear to Send (Active Low)
31	SPI_MOSI	CMOS Input	Serial Peripheral Interface Data Input
32	SPI_CSB	CMOS Input	Chip Select for Serial Peripheral Interface (Active Low)
33	SPI_CLK	CMOS Input	Serial Peripheral Interface Clock
34	SPI_MISO	CMOS Output	Serial Peripheral Interface Data Output
35	PIO 11	I/O	Programmable Input Output
36	PIO 10	I/O	Programmable Input Output
37	RF_IO	Analogue	Antenna Interface
38	GND	Ground	Common Ground



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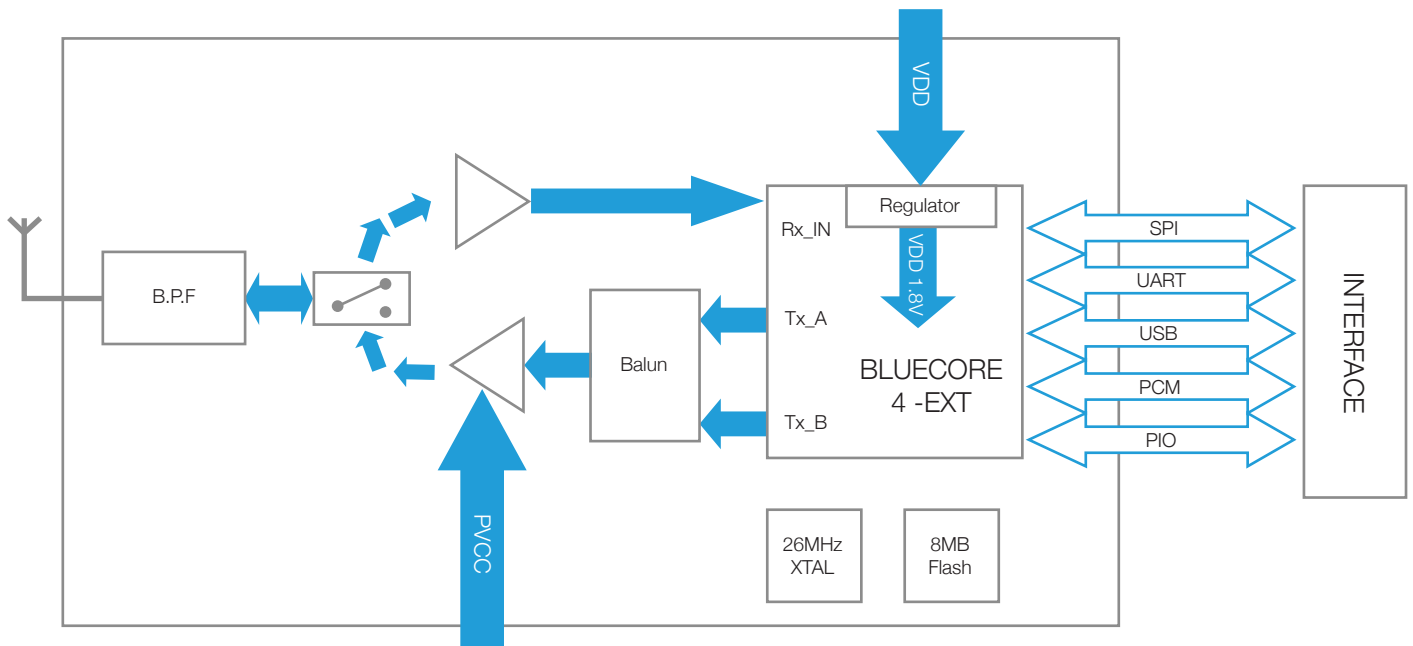
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## General Electrical Specification

Parameter	Description	Min	Typical	Max	Units
Carrier Frequency	-	2.402	-	2.480	GHz
RF Output Power	Measured with 50Ω ant	15	16.5	18	dBm
Rx Sensitivity	-	-	-88	-86	dBm
Load Impedance	No abnormal oscillation	-	-	5:1	-
Input Low Voltage	RESET, UART, GPIO, PCM	-0.3	-	0.8	DCV
Input High Voltage	RESET, UART, GPIO, PCM	0.7VDD	-	VDD+0.3	DCV
Output Low Voltage	UART, GPIO, PCM	-	-	0.4	DCV
Output High Voltage	UART, GPIO, PCM	VDD-0.4	-	-	DCV
Average Current Consumption	Receive DM1	-	114	-	mA

## Block Diagram



Note: USB and PCM interface are not handled by LM firmware at present

## Factory Settings

The factory settings of the COM Port are as follows:

Baud Rate 19200 bps  
 Data Bits 8  
 Parity None  
 Stop Bits 1  
 Flow Control Hardware (BT2.0) or None (BT2.1)



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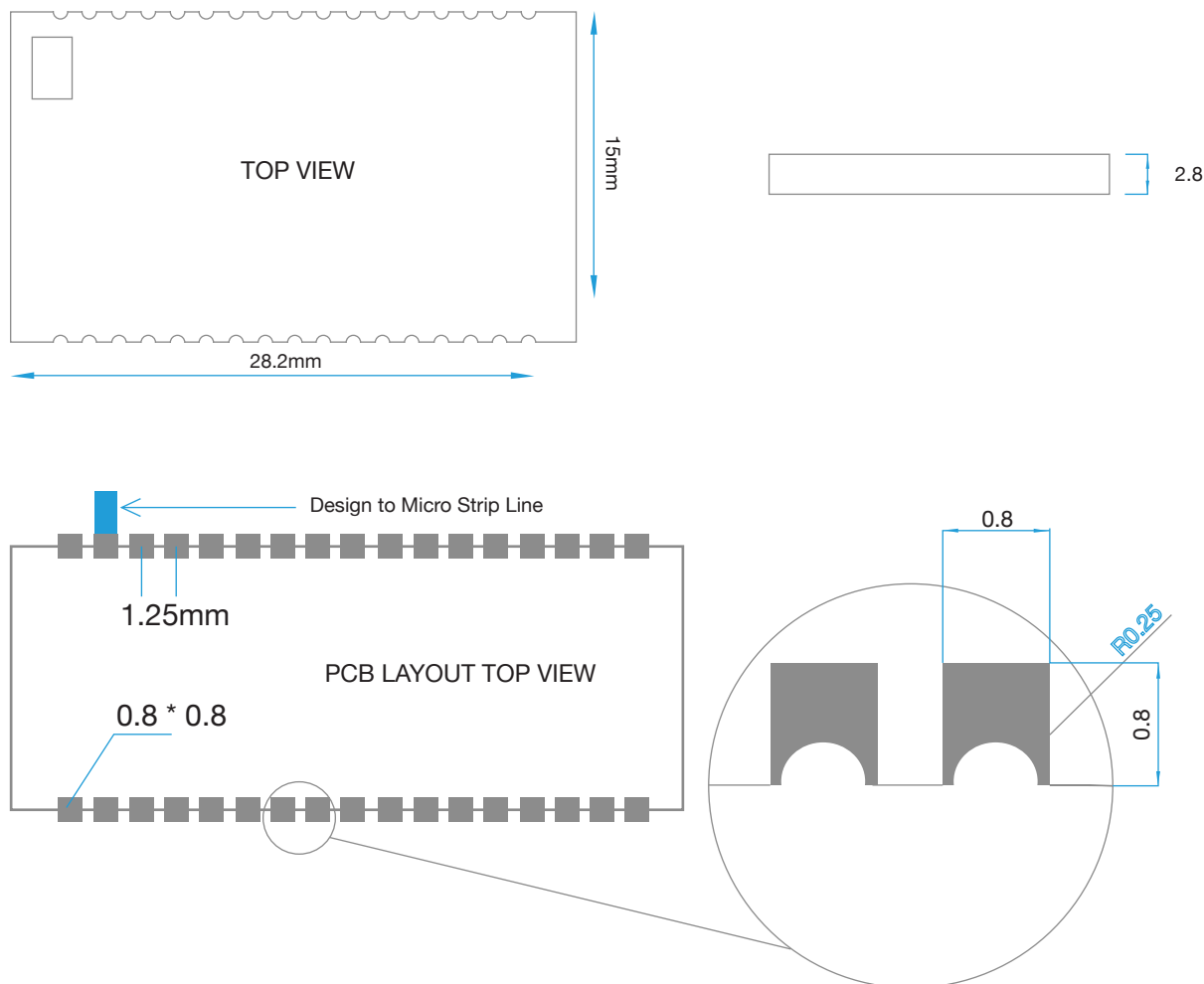
## Electrical Characteristics Absolute Maximum Ratings

Parameter	Min	Max	Units
Storage Temperature	-40	+85	°C
Supply Voltage (VDD)	+2.7	+3.6	V
Supply Voltage (PVCC)	+3.0	+3.6	V
All other pins	VSS - 0.4	VDD+0.4	V

## Electrical Characteristics Recommended Operating Conditions

Parameter	Min	Max	Units
Storage Temperature	-20	+75	°C
Supply Voltage (VDD)	+3.0	+3.3	V
Supply Voltage (PVCC)	+3.0	+3.3	V

## Dimensions All measurements in mm





## LM072 Bluetooth 2.0 / 2.1 + EDR Serial Data Module

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Product	LM072
Part No	072-0110
Revised	03/MAR/2015

### 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

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 or more 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.

#### NOTE 2

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 portable or mobile or fixed condition, this module is to be installed only in portable or mobile or fixed applications.

A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user

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

The device must not transmit simultaneously with any other antenna or transmitter.



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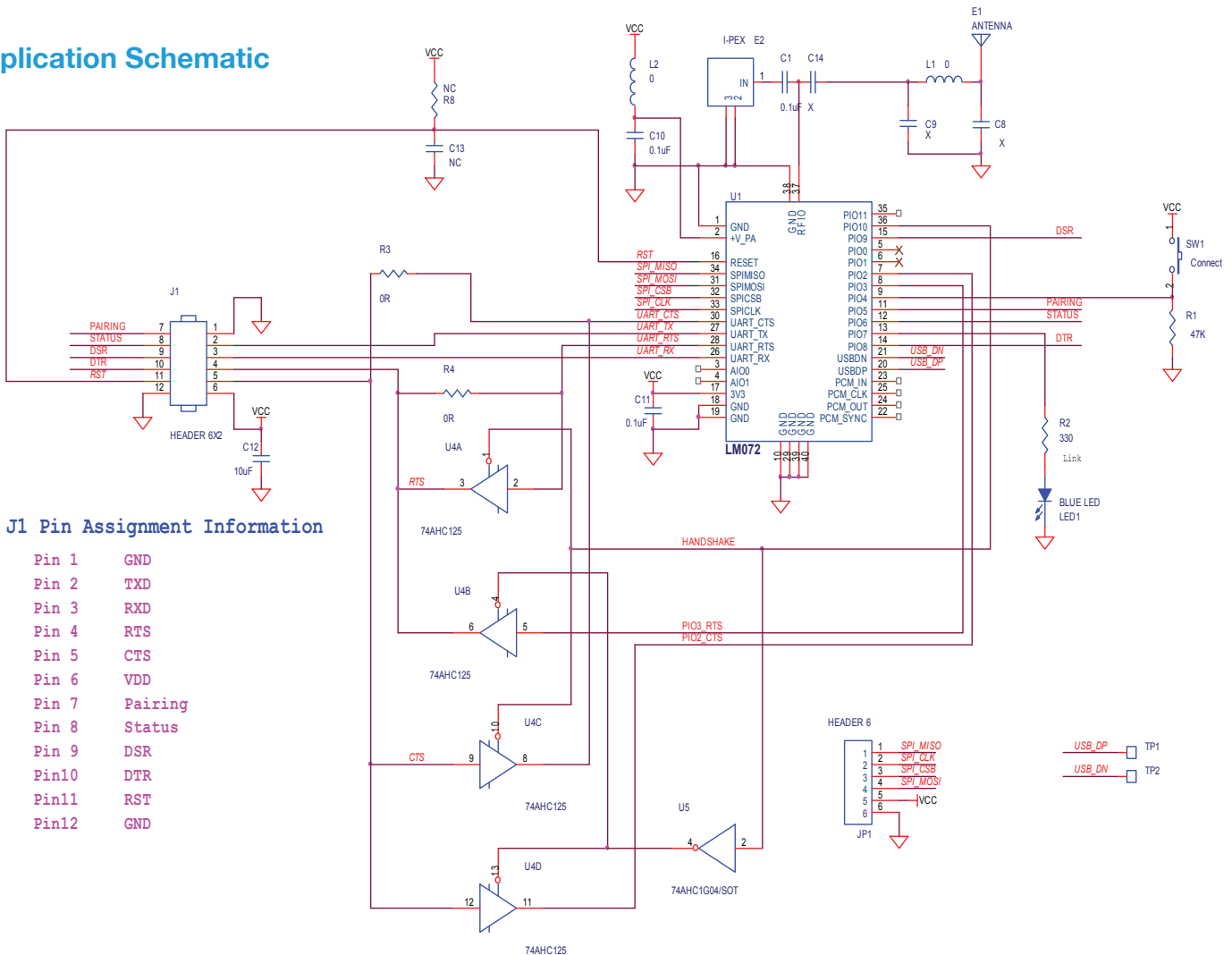
## FCC Radiation Exposure Statement (Continued)

**Note 4**  
 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 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, LM Technologies Ltd shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

**Note 5**  
 FCC ID label on the final system must be labeled with "Contains FCC ID: VVXLM072" or "Contains transmitter module FCC ID: VVXLM072".

The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the host product. LM Technologies Ltd is responsible for the compliance of the module in all final hosts.

## Application Schematic



**J1 Pin Assignment Information**

Pin 1	GND
Pin 2	TXD
Pin 3	RXD
Pin 4	RTS
Pin 5	CTS
Pin 6	VDD
Pin 7	Pairing
Pin 8	Status
Pin 9	DSR
Pin10	DTR
Pin11	RST
Pin12	GND



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## Revision History

1.0	17/12/2010	First Version
1.1	03/07/2012	Updated Datasheet
1.2	11/07/2012	Updated Datasheet
1.3	02/MAR/2015	Updated Datasheet