MINEWSEMI

Bluetooth LE Module

ME52BS01

Datasheet

V 1.0.0

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Version Note

Version	Details	Contributor(s)	Date	Notes
1.0.0	First edit	Michelle, Leo	2024.05.06	

Part Number

Model	Hardware Code
ME52BS01	8N58TI

Click the icon to view and download the latest product documents electronically.
https://en.minewsemi.com/file/ME52BS01-TLSR8258_Datasheet_K_EN.pdf

ME52BS01-TLSR8258

Cost-effective, Bluetooth 5.3 module with optional PCB/IPEX antennas

The ME52BS01 is a highly flexible, ultra-low power, cost-effective wireless BLE 5.3 module based on the TLSR8258. Its powerful 32-bit RISC-V processor has a maximum frequency of 48Mhz. In addition, it also comes with 512kB FLASH program space, 64 KB RAM and other powerful supporting resources to provide a perfect solution for Bluetooth connection. The hardware supports the development of BLE, BLE mesh, IEEE 802.15.4, Zigbee, 2.4GHz proprietary protocols, etc.

FEATURES

- Bluetooth 5.3
- High Cost Performance
- Support Optional PCB Antenna, IPEX Antenna

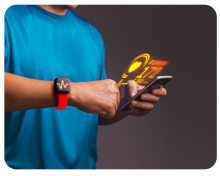
KEY PARAMETER

ME52BS01			
Chip Model	TLSR8258	**Antenna**	PCB/IPEX(MHF 1)
Module Size	20×12.7×2mm	**GPIO**	14
Flash	512KB	**RAM**	64KB
Receiving Sensitivity	-96dBm	**Transmission Power**	-45 ~ +10dBm
Current(TX)	0dBm-4.8mA	**Current(RX)**	5.3mA

APPLICATION

Smart home

Intelligent light control



Smart wearable device

Consumer electronics

Intelligent medical care

Smart agriculture

Security equipment

Automotive equipment

Sports and fitness equipment

Instrumentation

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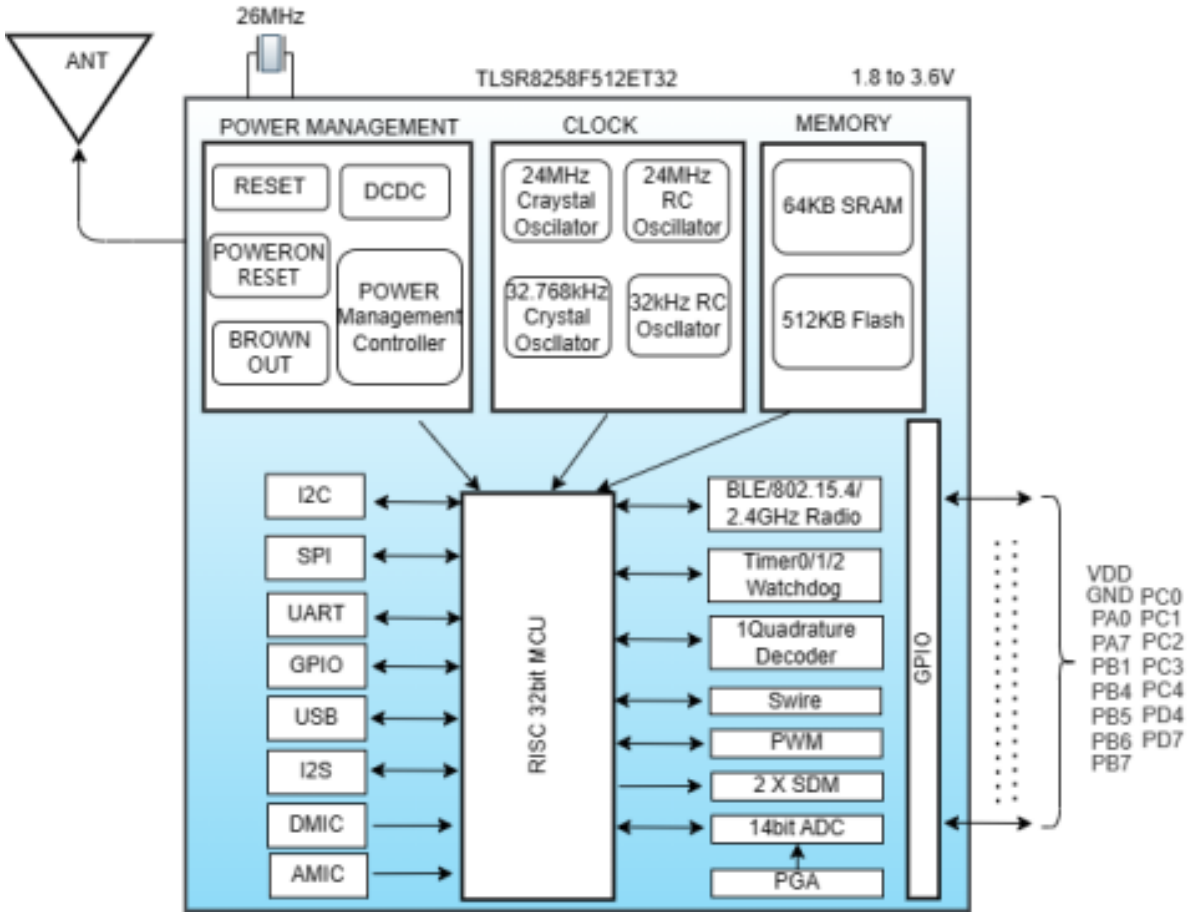
1 BLOCK DIAGRAM



2 ELECTRICAL SPECIFICATION

Parameter	Values	Notes
Working Voltage	1.8V-3.6V	To ensure RF work, supply voltage suggest not lower than 2.3V
Working Temperature	-40℃~+85℃	Storage temperature is -40℃~+105℃
Transmission Power	-45 ~ +10dBm	Configurable
Current(RX)	5.3mA	RF receiving current under 1Mbps pattern
Current(TX)	4.8mA	RF transmission current under 0dB pattern
Module Dimension	20*12.7*2mm	
Quantity of IO Port	14	

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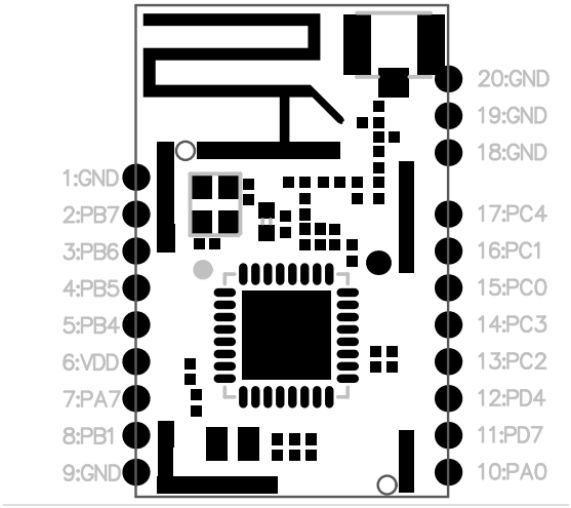
3 PIN DESCRIPTION



4 PIN DEFINITION

Pin Number	Symbol	Type	Definition
1/9/18/19/20	GND	Negative power supply	GND
2	PB7	Digital I/O	I/O pin multiplexing,UART_RX / GPIO PB7;
3	PB6	Digital I/O	I/O pin multiplexing,UART_RTS / GPIO PB6
4	PB5	Digital I/O	I/O pin multiplexing, GPIO PB5
5	PB4	Digital I/O	I/O pin multiplexing,, GPIO PB4
6	VDD	Power Positive	Power supply, 1.7V-3.6V with this pin
7	PA7	Digital I/O	I/O pin multiplexing, Single wire slave / GPIO PA7
8	PB1	Digital I/O	I/O pin multiplexing,UART_TX / GPIO PB1
10	PA0	Digital I/O	I/O pin multiplexing,UART_RX / GPIO PA0
11	PD7	Digital I/O	I/O pin multiplexing, GPIO PD7
12	PD4	Digital I/O	I/O pin multiplexing, GPIO PD4
13	PC2	Digital I/O	I/O pin multiplexing,(optional) 32kHz crystal output / GPIO PC2
14	PC3	Digital I/O	I/O pin multiplexing,(optional) 32kHz crystal input/UART_RX / GPIO PC3
15	PC0	Digital I/O	I/O pin multiplexing,GPIO PC0
16	PC1	Digital I/O	I/O pin multiplexing,GPIO PC1
17	PC4	Digital I/O	I/O pin multiplexing,GPIO PC4

Notice: The I/O pin multiplexing is only partially defined as an example. For more detailed pin multiplexing definitions, please refer to the chip specifications.

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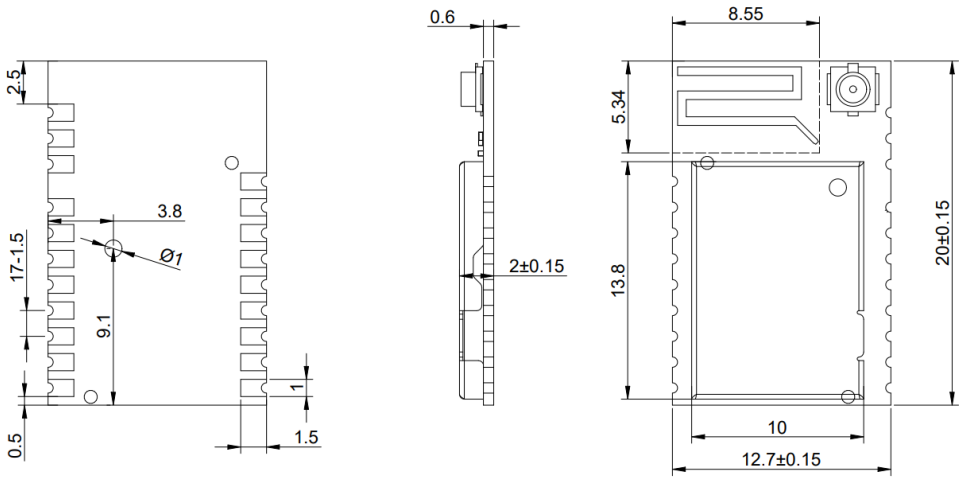
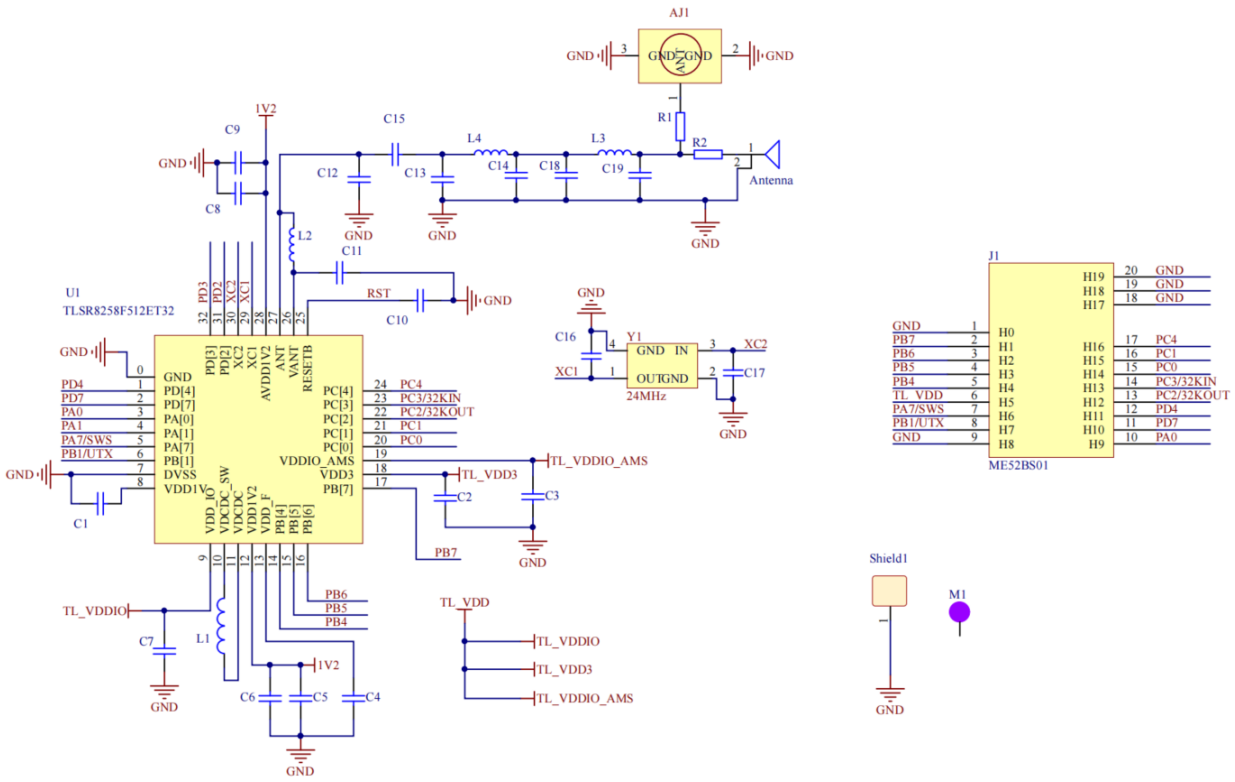
5 MECHANICAL DRAWING



Default unit: mm Default tolerance: ±0.15

Notice: The recommended pad size is 2.0*1mm with a pad extension of 0.5mm

6 ELECTRICAL SCHEMATIC



Notice: Before placing an order, please confirm the specific configuration required with the salesperson.

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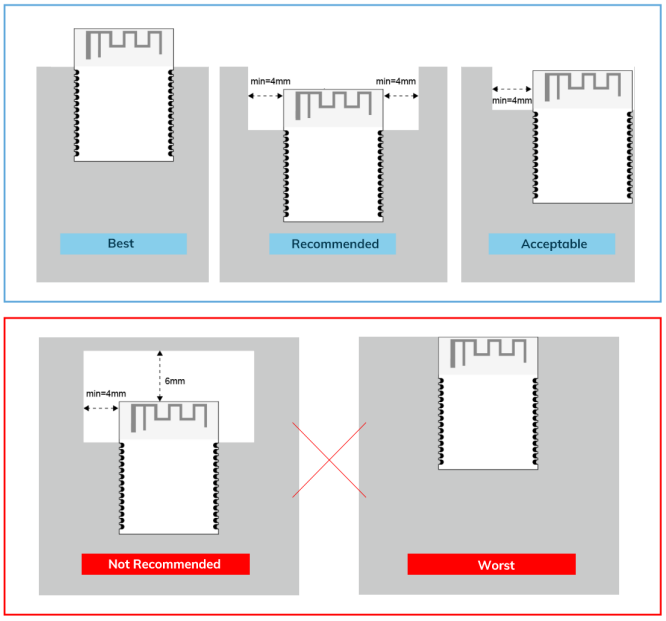
7 PCB LAYOUT

There should be no GND plane or metal cross wiring in the module antenna area, and components should not be placed nearby. It is best to make a hollow or clear area, or place it on the edge of the PCB board.

Notice: Refer to examples as below, and highly suggest to use the first design and the adjustment of modules antenna design according to the first wiring.

Layout Notes:

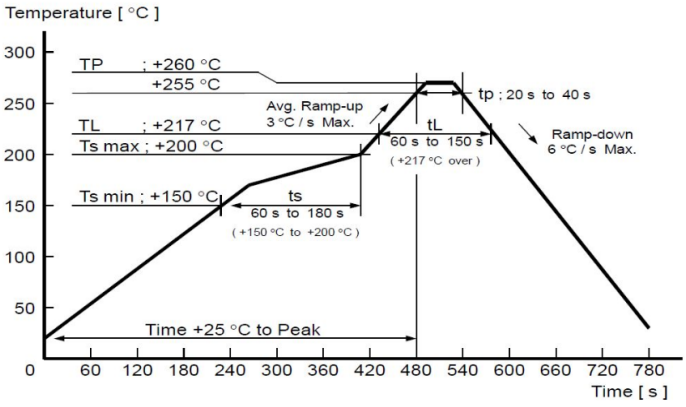
1) Preferred Module antenna area completely clearance and not be prevented by metals, otherwise it will influence antenna's effect (as above DWG. indication).
2) Cover the external part of module antenna area with copper as far as possible to reduce the main board's signal cable and other disturbing.
3) It is preferred to have a clearance area of 4 square meter or more area around the module antenna (including the shell) to reduce the influence to antenna.
4) Device should be grounded well to reduce the parasitic inductance.
5) Do not cover copper under module's antenna in order to avoid affect signal radiation or lead to transmission distance affected.
6) Antenna should keep far from other circuits to prevent radiation efficiency reduction or affects the normal operation of other lines.
7) Module should be placed on edge of circuit board and keep a distance away from other circuits.
8) Suggesting to use magnetic beads to insulate module's access power supply.



8 REFLOW AND SOLDERING

1) Do SMT according to above reflow oven temperature deal curve. Max. Temperature is 260℃;
Refer to IPC/JEDEC standard; Peak TEMP<260℃; Times: ≤2 times, suggest only do once reflow soldering on module surface in case of SMT double pad involved. Contact us if special crafts involved.

2) Suggesting to make 0.2mm thickness of module SMT for partial ladder steel mesh, then make the opening extend 0.8mm
3) After unsealing, it cannot be used up at one time, should be vacuumed for storage, couldn't be exposed in the air for long time. Please avoid getting damp and soldering-pan oxidizing. If there are 7 to 30 days interval before using online SMT, suggest to bake at 65-70 ℃ for 24 hours without disassembling the tape.
4) Before using SMT, please adopt ESD protection measure.



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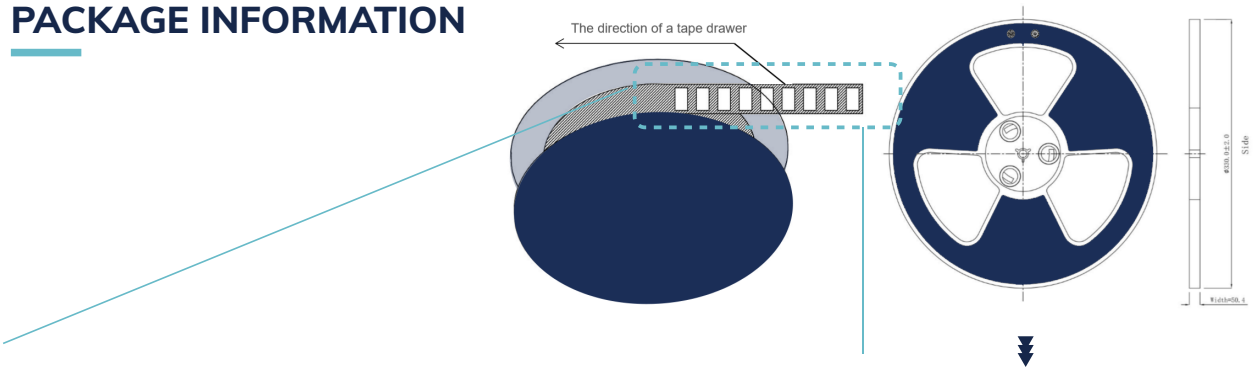
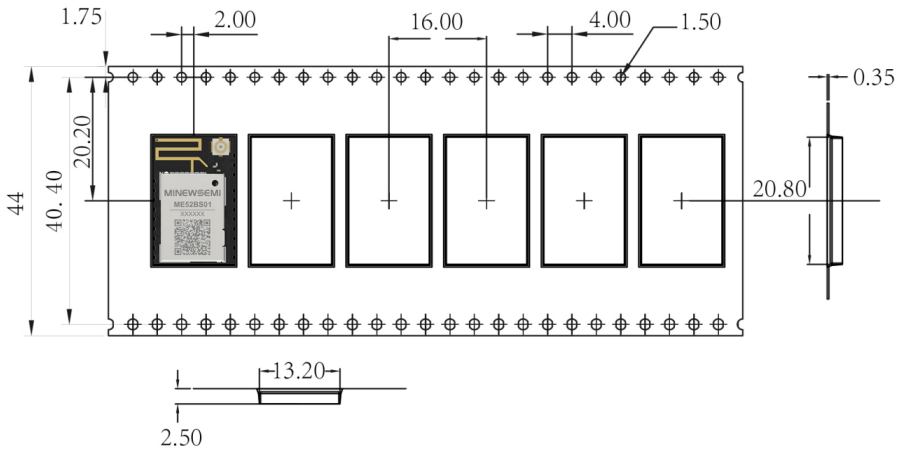
9 PACKAGE INFORMATION





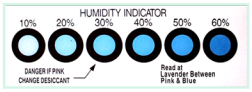
Inner carton(*5)
355*345*65mm，±5mm

Outer carton
370*358*350mm，±10mm

Remarks

General material list for FCL packaging:

Carrier tape packaging tray



Humidity Indicator
(1 pcs/bag)

Desiccant
(placed in a vacuum bag)

Vacuum bag

Inner carton(*5)
355*345*65mm，±5mm

Outer carton
370*358*350mm，±10mm

Other:

Moisture-proof label (attached to the vacuum bag)

Certification label (attached to the vacuum bag)

Outer box label

Default unit：mm Default tolerance：±0.1

Packing detail	Specification	Net weight	Gross weight	Dimension
ME52BS01	1200PCS	1200g	1996g	W=44mm，T=0.35mm

Note: Default weight tolerance all are within 10g（except the special notes）

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10 STORAGE CONDITIONS

- **Please use this product within 6 months after signing the receipt.**
  - This product should be stored without opening the package at an ambient temperature of 5~35°C and a humidity of 20~70%RH.
  - This product should be left for more than 6 months after receipt and should be confirmed before use.
  - The product must be stored in a non-corrosive gas (Cl2, NH3, SO2, NOx, etc.).
  - To avoid damaging the packaging material, do not apply any excessive mechanical shocks, including but not limited to sharp objects adhering to the packaging material and product dropping.

- **This product is suitable for MSL2 (based on JEDEC standard J-STD-020).**
  - After opening the package, the product must be stored at ≤30°C/<60%RH. It is recommended to use the product within 3-6 months after opening the package.
  - When the color of the indicator in the package changes, the product should be baked before welding.

- **Baking is not required for one year if exposure is limited to <30°C and 60%RH. Refer to MSL2 for exposure criteria for moisture sensitivity level. If exposed to (≥168h@85°C/60%RH) conditions or stored for more than one year, recommended baking conditions.**
  1. 120 +5/-5°C, 8 hours, 1 time
  Products must be baked individually on heat-resistant trays because the materials (base tape, reel tape, and cover tape) are not heat-resistant, and the packaging material may be deformed at temperatures of 120℃;
  2、90℃ +8/-0℃，24hours，1times
  The base tape can be baked together with the product at this temperature. Please pay attention to the uniformity of heat.

11 HANDLING CONDITIONS

• Be careful in handling or transporting products because excessive stress or mechanical shock may break products.
• Handle with care if products may have cracks or damages on their terminals. If there is any such damage, the characteristics of products may change. Do not touch products with bare hands that may result in poor solder ability and destroy by static electrical charge.

12 QUALITY

Cognizant of our commitment to quality, we operate our own factory equipped with state-of-the-art production facilities and a meticulous quality management system. We hold certifications for ISO9001, ISO14001, ISO27001, OHSA18001, BSCI.

Every product undergoes stringent testing, including transmit power, sensitivity, power consumption, stability, and aging tests. Our fully automated module production line is now in full operation, boasting a production capacity in the millions, capable of meeting high-volume production demands.

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13 COPYRIGHT STATEMENT

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14 RELATED DOCUMENTS

- Telink TLSR8258_Chip_Datasheet
  https://en.minewsemi.com/file/Telink TLSR8258_Chip_Datasheet_EN.pdf
- MinewSemi_Product_Naming_Reference_Manual_V1.0
  https://en.minewsemi.com/file/MinewSemi_Product_Naming_Reference_Manual_EN.pdf
- MinewSemi_Connectivity_Module_Catalogue_V2.0
  https://en.minewsemi.com/file/MinewSemi_Connectivity_Module_Catalogue_EN.pdf

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MINEWSEMI

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