



Quick Start Guide

SABRE Board for Smart Devices

Based on the i.MX 7Dual Applications Processor

SMART APPLICATION BLUEPRINT FOR
RAPID ENGINEERING (SABRE)



Quick Start Guide

GET TO KNOW SABRE BOARD FOR SMART DEVICES BASED ON THE i.MX 7DUAL

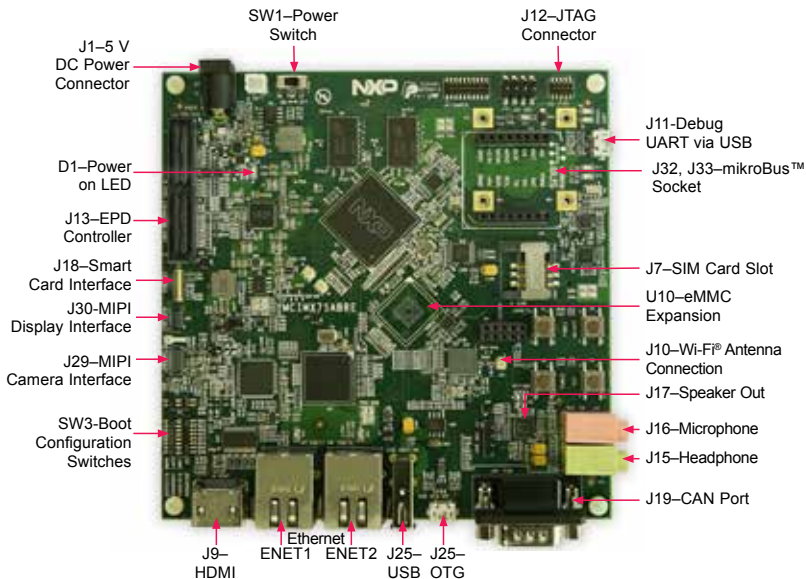


Figure 1. Top View of the i.MX 7Dual SABRE board

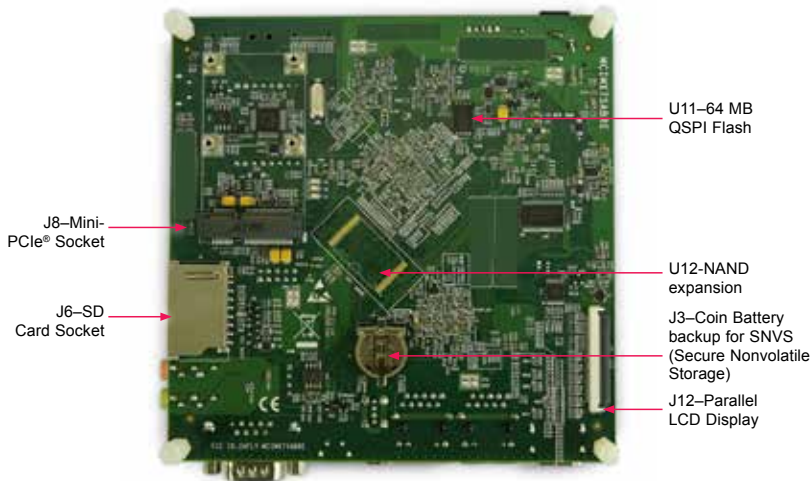


Figure 2. Bottom View of the i.MX 7Dual SABRE board

GET TO KNOW SABRE BOARD FOR SMART DEVICES BASED ON THE i.MX 7DUAL PROCESSOR

The Smart Application Blueprint for Rapid Engineering (SABRE) board for smart devices introduces developers to NXP's new heterogenous multi-processing solution: the i.MX 7Dual applications processor with two ARM® Cortex®-A7 cores and a single ARM Cortex-M4 core.

The development kit provides an out-of-box working demonstration to power-on and run an operating system from an SD card, exercising the features on the SABRE board. SABRE design information, including documentation and hardware schematics, is available at www.nxp.com/iMX7DSABRE.

Software board support packages (BSP) for Linux® and Android™ reference links are provided at www.nxp.com/iMXtools.

FEATURES

The following features are available with the i.MX 7Dual SABRE board for smart devices:

- i.MX 7Dual applications processor
 - Two ARM Cortex-A7 cores operating up to 1 GHz
 - Single ARM Cortex -M4 core operating up to 200 MHz
- Onboard memory and expansion:
 - 1 GB DDR3, 533 MHz
 - eMMC expansion footprint
 - NAND flash expansion footprint
 - QSPI flash expansion footprint
- Power management
 - PF3000 PMIC
- Display/Camera connectors
 - Expansion port for EPDC (Electrophoretic display controller)
 - Port for Parallel LCD display
 - Port for HDMI display
 - Port for MIPI DSI display
 - Port for MIPI CSI CMOS sensor (camera)
- Wireless
 - 802.11 a/b/g/n/ac Wi-Fi on board
 - Bluetooth® V4.0 + EDR on board
- Audio CODEC
- Connectivity
 - Dual 1 Gigabit Ethernet on board
 - 1 SD socket for boot code
 - 1 mikroBus socket
 - 1 USB host connector
 - 1 micro USB OTG connector
 - Full Mini PCIe socket
 - SIM card slot
 - CAN (DB-9)
- Debug
 - UART via USB port
 - 10-pin standard JTAG connector
- Sensor fusion
 - Accelerometer, magnetometer, gyroscope
 - Barometer, altimeter

STEP-BY-STEP INSTRUCTIONS

This section describes how to use the SABRE board for smart devices and the components in the box. This section also describes the PC requirements to develop applications using the SABRE board for smart devices.

DEVELOPMENT KIT CONTENTS

Item	Description
Board	i.MX 7Dual SABRE board for smart devices
Power Supply	100/240 V input, 5 V/5 A output W/AC adapter
Cable	USB cable (micro-B to standard-A)
Documentation	Quick Start Guide (this document)
SD Card	Bootable Linux operating system demonstration image

Table 1: SABRE Board for Smart Devices Based on i.MX 7Dual Development Kit Contents

1 Insert SD Card

Insert the supplied SD card into the SD card slot (J6).

Note: Pay careful attention to the microSD connector as it is fragile. Slide the connector up or down, following the open and close arrows on the connector in order to place the microSD card inside and lock it in place.

2 Verify Boot Switches

By default, both of the two boot switches (SW3) are configured to zero position. With the SD inserted, the board will boot from the SD card. Without the SD card inserted, the board will be switched into serial downloader mode required by manufacturing tool (MFGTools). If any other boot source is desired, please refer to documentation at www.nxp.com/iMX7DSABRE

3 Connect to Debug UART

Connect the micro-B end of the supplied USB cable to Debug UART port (J11) and the other end of the cable to PC acting as the host terminal. Once the PC recognizes the virtual USB to UART device, it can be seen in your PC Device Manager list.

There will be 2 ports automatically configured. The first port will be the Cortex-A7 core console/debug serial port, and the second one will be for the Cortex-M4 core.

Serial port configuration: 115200 baud, 8 data bits, 1 stop bit, no parity.

Note: The PC needs a driver to enable a virtual COM port through the PC USB port.

Please consult www.ftdichip.com/Documents/InstallGuides.htm to download the correct driver.

4 Connect User Interface Devices (Optional)

Connect monitor via the HDMI connector (J9). To interact with the user interface displayed on the monitor it may be desirable to attach a keyboard and/or a mouse.

5 Connect Power Supply

Connect 5 V power supply into power jack J1 and set SW1 to the on position. When power is connected to the smart device, the board will automatically begin the boot sequence configured in Step 2.

BOOT PROCESS FOR LINUX IMAGE

During the boot process, there will be operating system status information scrolling on the terminal window of the host computer (if connected).

When the boot process is complete, the Yocto Project® operating system will be displayed on the monitor display (if connected).

To work from the terminal window on the host PC, press enter at the terminal window to get the command prompt. For the Linux operating system, use username **root** without password to log in. The Linux image will run on ARM Cortex-A7 cores. For details to run FreeRTOS™ on ARM Cortex-M4 core, please visit www.nxp.com/iMXtools.

TIPS AND PRECAUTIONS

Input power voltage is suggested to be 5 V. The over-voltage protection circuit on board will disconnect the power supply from the system in case the supply voltage is higher than 5.5 V. The user must take into account this is the maximum voltage that can be plugged into J1.

For more options and board details including connection for EPD (electronic paper display) panel, LVDS panel and antenna, please refer to documentation at www.nxp.com/iMX7DSABRE

Proper ESD precautions should be used when handling the board.

FURTHER DOCUMENTATION

- i.MX 7Dual SABRE Board schematics
- i.MX 7Dual SABRE Board BOM
- i.MX 7Dual SABRE Board gerber files
- i.MX 7Dual SABRE Board reference manual

For complete documentation, please refer to www.nxp.com/iMX7DSABRE

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

ACCESSORY PERIPHERAL BOARDS

Accessory	Features	Orderable Part Number
MIPI Display	4.26" TFT 16.7M Color 480xrgb	NXP part number: TFT3P5581-E
MIPI Camera	5 Mpixel 2592 x 1944 resolution	OV5640, multiple vendors
e-Ink Panel	6.0" TFT display with touch sensor, 800 x 600 resolution	NXP part number: IMXEBOOKDC4
Parallel LCD Panel	4.3" TFT display with resistive touchscreen 800 x 480 resolution	NXP part number: LCD8000-43T

NXP

SUPPORT

Visit i.MX community at
www.imxcommunity.org.

WARRANTY

Visit www.nxp.com/warranty for
complete warranty information.



Get Started

Further design resources
and documentation under
"Jump Start Your Design"
at www.nxp.com/iMX7DSABRE.

www.nxp.com/iMX7DSABRE

NXP and the NXP logo are trademarks of NXP B.V. All other product or service names are the property of their respective owners. ARM and Cortex are registered trademarks of ARM Limited (or its subsidiaries) in the EU and/or elsewhere. All rights reserved. © 2016–2017 NXP B.V.

Doc Number: SABRESDBIMX7DUALQSG REV 1

Agile Number: 926-28590 REV B