

FCC Regulatory Certification (ABR)

Test Guide - Rev. 3.0





Table of Contents

1 Murata RF Test Resources	4
2 Flashing Manufacturing Firmware	4
3 Hardware Setup	4
4 Software Setup	6
5 Wi-Fi RF Test	9
5.1 Continuous Transmit Test	10
5.2 Carrier Wave Test	12
5.3 Receive Test	12
6 Murata ABR RF Test Script	13
6.1 Install Dependencies	13
6.2 Install Python 2.7	13
6.3 Install Expect	13
6.4 Update Environment Variables	14
6.5 Download Murata ABR RF Test Script Files	14
6.6 Run the script	15
6.6.1 Script Flow	16
6.6.2 Automation Option in the Script	17
7 Appendix A: Sample output of Murata ABR RF Test Script	18
8 Acronyms	20
9 References	21
9.1 Murata Type ABR Module Landing Page	21
9.2 Murata Type ABR mikroBUS™ Flashing Guide	21
9.3 Murata Type ABR mikroBUS™ EVB Quick Start Guide	21
9.4 FCC Regulatory Certification Guide	21
9.5 Murata's Community Forum Support	21
Revision History	22

Figures

Figure 1: Hardware Setup Block Diagram	4
Figure 2: Complete Hardware Setup	5
Figure 3: Device Manager Window	5
Figure 4: Device Manager Window	6
Figure 5: Install SDK	7
Figure 6: Import Example	7
Figure 7: Run Example Application	8



Figure 8: Resume Debug	8
Figure 9: Stop Example Application	8
Figure 10: LabTool Folder	9
Figure 11: Configure LabTool	9
Figure 12: Test LabTool Command Execution	10
Figure 13: Expect Installation in Cygwin	14
Figure 14: Update Environment	14
Figure 15: Murata RF Test Script Flow for Type ABR	16

Tables

Table 1: Document Conventions	3
Table 2: Murata RF Test Resources	4
Table 3: Continuous Transmit Test Commands	10
Table 4: Supported Data Rates	11
Table 5: Carrier Wave Test Commands	12
Table 6: Receive Test Commands	12
Table 7: Acronyms	20



About This Document

This document provides some lab test procedures for Federal Communications Commission (FCC) Part 15C regulatory certification for Murata Type ABR module based on NXP MW320 chipset.

This document does not cover other regulatory certification tests required for FCC such as unintentional radiation or RF exposure test. Details for complete regulatory certification tests are available from regulatory test lab.

Audience & Purpose

This document is targeted towards Regulatory Certification test engineers of NXP i.MX application processor-based solutions, running Linux operating system.

Document Conventions

Table 1 describes the document conventions.

Table 1: Document Conventions

Conventions	Description
	Warning Note Indicates very important note. Users are strongly recommended to review.
i	Info Note Intended for informational purposes. Users should review.
6	Menu Reference Indicates menu navigation instructions. Example: Insert→Tables→Quick Tables→Save Selection to Gallery F
⊏7	External Hyperlink This symbol indicates a hyperlink to an external document or website. Example: Embedded Artists AB 다가 Click on the text to open the external link.
Ľ	Internal Hyperlink This symbol indicates a hyperlink within the document. Example: References ビ Click on the text to open the link.
Console input/output or code snippet	Console I/O or Code Snippet This text <i>Style</i> denotes console input/output or a code snippet.
<pre># Console I/O comment // Code snippet comment</pre>	 Console I/O or Code Snippet Comment This text Style denotes a console input/output or code snippet comment. Console I/O comment (preceded by "#") is for informational purposes only and does not denote actual console input/output. Code Snippet comment (preceded by "//") may exist in the original code.



1 Murata RF Test Resources

The following table lists the resources provided by Murata for easier certification tests. These resources are referred to at various places in this document.

Table 2: Murata RF Test Resources

Item	Description
lpcxpresso55s69_murata_abr_bridge_uart.zip ⊑	BT UART passthrough example project
Murata_ABR_RF_Test_Tool.py ⊏ 7	Murata RF Test Script for Type ABR module
Murata_ABR_RF_Test_Helper_Tool.exp	Murata RF Test Script helper file used by Murata RF Test Tool.

2 Flashing Manufacturing Firmware

A manufacturing firmware needs to be flashed on the Murata Type ABR module before regulatory tests can be performed.

Please refer to the Murata Type ABR mikroBUS Flashing Guide \Box^{\sharp} document for the instructions. The procedure requires a Windows® 10 host machine, NXP LPC-Link2 $\Box^{?}$ debug probe and NXP LPCXpresso55S69 Development Board $\Box^{?}$.

3 Hardware Setup

Refer to the **Figure 1** to connect the Type ABR module to the Windows host machine as well as the NXP LPCXpresso55S69 Development Board ¹. The LPCXpresso55S28 ¹ and LPCXpresso55S16 ¹ development boards are also supported.



Figure 1: Hardware Setup Block Diagram



The steps are as given below.

- Connect the Type ABR MikroBUS EVB on the LPC55S69-EVK board on the MikroBUS connector.
- Connect the NXP LPC55S69-EVK (Port P6 marked "Debug Link") to the Windows host via a USB port.

The full setup is shown in **Figure 2**.

Figure 2: Complete Hardware Setup



• Check in the device manager for confirmation and note the COM port number (COM17 in **Figure 3**).

Figure 3: Device Manager Window





4 Software Setup

In this section the software setup process is explained. All related screens are listed at the end of the section. Please click on the links for the figures to refer.

- 2. Obtain the LPC55S69 MCUXpresso SDK 2.10.0 or later from this link 2. Make sure to click Select All (marked in Figure 4) to select all components while configuring the SDK.
- 3. Download the Murata BT UART passthrough example project \Box and extract.
- 4. Run MCUXpresso. Drag and drop the downloaded SDK in the IDE to install as shown in Figure 5.
- 5. Import the downloaded example lpcxpresso55s69 murata abr bridge uart from file system as shown in Figure 6.
- 6. Run debug in the IDE as marked in Figure 7.
- 7. Once Debug is selected, the debug process starts and then stops after a second or two. Once the debug is halted click **Resume Debug** icon as shown in Figure 8.
- 8. At this point, the Type ABR module is ready for RF testing.
- 9. Once the RF testing is complete, click Stop Debug on the MCUXpresso IDE to terminate the example application as marked in Figure 9.

NKP MCUXpresso	SDK Buil	der			0 • • •
SDK Dachteant EULD EDK Modevarv (8) Kennber (8) Kennber (8) Devce Parametrics Devce Parametrics Administraction	Buil General Develops Deactors	d SDK for LPC) e a downloadable SDK archive e Environment Settings here wit repart here and example here wit repart here and example here and repart here and example here and repart here and example here and the source of the source of the here and the source of the source of the source of the here and the source of the source of the source of the here and the source of the source of the source of the here and the source of the source of the source of the source of the here and the source of the source of the source of the source of the here and the source of the source of the source of the source of the here and the source of the so	Corresso55569	presso Tools. d Projects	SDK 2.10.0 (released 202 Version 07-15)
A Notifications	Filter b	Name, Category, or Description		Select All	Unselect All
Preferences		Name	Category	Description	Dependencies
MOUNTResse IDE	22	muticore	Middeware	Mutticore Software Development Kit	
MCUXpresss Config Tools	52	SDMMC Stack	Modeware	Stack supporting SD. MINC. SDIO	
Critine data		CMSIS DSP Library	CMSIS DSP LID	CMSIS DSP Software Library	
MCUXpress Secure Provisioning Tool		Embedded Wizard GUI	Modeware	Embedded Wizard GUI from TARA Systems	
		emillin	Middeware	emV/in graphics library	
	D	Essential Audio Processing Library	Modeware	Audio processing blocks for enhancing the tonal and spatial (more)	
	-	Fath	Montevant	FAT Far Somer stark	
		Azure RTO5		Azure RTDS	~
		FreeRTOS		Real-time operating system for microcontrollers from Amazon	~
*				Download SDK	
Privacy Policy Terms	of Use Cont	act Accessibility			021 NOP Semiconductors. All rights re

F



Figure 5: Install SDK

ABR test - MCUXpresso IDE	- 0 X
e Edit Navioate Search Project ConfigTools Run (RDS Analysis Window Help
	• 0 • 9 • 1 • 4 • 1 1 1 1 1 0
IN HIS SALE VIN DES	B. 8121 B G A 12 101 - 81 - 60 0 - 0 - 1M
the man as a set of the set of the set of the	
Proje	
- 0 × 1	
~ O	
мни 📮 🐴 🗹 👸 🛄	
izname New Properties Select	
New Open	
5 0 Smb107	
O p search Drc	
^ Name	
SDK 2 10 0 LPCXovesto55569.zip	
v <>	
(II) #C	
Quickstart	🕅 h. 🗄 🗇 h. 🔮 h. 🔤 C. 🧶 h. 🔛 L. 🖷 De. % OH. 😬 🗆
	Pillortalled SDVr
MCUXpresso IDE - Quickstart Panel	to instanted solids
	To install an SDK, simply drag and drop an SDK (zip file/folder) int the "Installed SDKs' view. [*
Create or import a project	Installed SDKs Available Boards Available Devices
New project	Name SDK Version Manifest Version Location
💓 💹 Import SDK example(s)	
(g) Import project(s) from file system	
>	¢ >

Figure 6: Import Example

File	Edit S	ource Refactor	Navigate S	earch Proiect]								
_	New		_ ,	Alt+Shift+N >									
	Onen Fil	le											
6	Open Pr	ojects from File Sy	ystem										
	Recent F	les		>									
	Close Fr	🔀 Import Proje	cts from File Sy	stem or Archive							_		×
	Close A	Income Development	from Ello Curt	ana an Anabina									
ren.	Sauce	This wizard analy	zes the content of	of your folder or an	chive file to find	d projects and im	port them in the IDE						<u> </u>
	Save Ac	inis inizara analy						-					
	Save All	Import courses									livester	Archive	
"LEJ	Revert	import source:									irectory	Archive	E
		type filter text									Sel.	ect All	
	Nove	Folder		X Import Projects	from File Syster	m or Archive							
	Kename			Import Projects fr	om File System	or Archive							
ŝ.	Convort			This wizard analyze	s the content of yo	our folder or archive f	ile to find projects and	import them in the IDE.					
	Conven			Import source:	Work\Projects\\	Murata\Forum\Invest	igations\ABR\Incynress	co55s69 murata abr bridge u	art\lncvnress	o55s69 usart polli		ton	Archive
				import source:	. (Work (Projects (i	violata (i orani (invest	igations (Abit (ipexpress	sossass_marata_abr_bridge_a	arcipexpress	oppion_usart_poin		tory	Archive
	l	Close newly in	mported projects	type filter text								Selec	t All
				Folder				Import as				<u>D</u> esele	ect All
				✓ Ipcxpresso:	0569_usart_polling	9		Eclipse project					
											1 of	f 1 selected	
												<u>H</u> ide already	open projects
				Close newly imp	orted projects upo	on completion							
				Search for neste	t configurators to: d projects								
				☐ Detect and <u>c</u> onf	igure project natu	res							
				Working sets									
				Add projec <u>t</u> to	o working sets								Ne <u>w</u>
				Working sets:								\sim	S <u>e</u> lect
											Show othe	r specialized	import wizards
											<u>show othe</u>	rspecialized	import wizards
				0					< <u>B</u> a	ick <u>N</u> ext	t> <u>E</u> i	nish	Cancel



Figure 7: Run Example Application

MCUXpresso IDE - Quickstart Panel Project: lpcxpresso55s69_usart_polling [Debug]	
▼ Create or import a project	
New project New project Import SDK example(s) Import project(s) from file system	
✓ Build your project	
Suild	
✓ Debug your project	💽 - 🔛 - 🔜 -
Terminate, Build and Debug	
✓ Miscellaneous	

Figure 8: Resume Debug

_usart_polling/source/usart_polling.c - MCUXpresso IDE											
vigate	Se <u>a</u> rch	<u>P</u> roject	Config	Tools	<u>R</u> un	Analy	sis Fre	eRTOS	<u>W</u> indow	<u>H</u> el	р
: 🗳 😂		۵ 🕨	10 🔳	N 3	•	_P_	R. R	()	ji 🖷 🤋		R :-
erals+ 🚦	የት Regist	ters 救 I	aults				🎋 Deb	ug 🛛			
		E 🕏	7 🖶	ay	X -	80	► LS	ا 🎛 🖌	pcxpresso	55s69_	usart_
455						^					

Figure 9: Stop Example Application

55s69_usart_polling/source/usart_polling.c - MCUXpresso IDE								
r <u>N</u> avigate Se <u>a</u> rc	h <u>P</u> roject ConfigTo	ols <u>R</u> un	Analysis	FreeRTOS				
• 🔜 💝 💝 🗄 🚍	! ≈ ⊪ 🛄 🖬 3	N 3. P	.r. =	. I 🕩 🚺				
eripherals+ 1010 Reg	gisters 🔺 Faults			🛚 Debug 🛛				
	🖻 😫 🏹 🖶	🍫 🗙 🛨	8	Ipcxpres:				
ple_43455			^					
perf_43455				and many test				
r i i 45015				rearrine IVI				



5 Wi-Fi RF Test

The LabTool software from NXP is used to configure the Type ABR module in manufacturing mode to run RF tests. The steps to follow are given below.

- 1. Download the LabTool application (contact NXP for access).
- 2. Unzip the downloaded package and navigate to the **LabTool** folder. The unzipped folder contents are shown in **Figure 10**.
- 3. Open the SetUp.ini file and edit the COM port number of the LPC55S69-EVK. Also change the baud rate to 115200 as shown in **Figure 11**.
- 4. Open the LabTool. Click on "DutApiWiFiMW30XBrdigeUart.exe" file. Issue command 88 (Get FW version) and 11 (Get channel) to check if the LabTool is working properly. A successful command execution is indicated by a status value with all 0s. An unsuccessful command execution will have nonzero status value (0x00000001 to 0xFFFFFFF) and will return invalid data. This could indicate a problem with communication with the DUT, incorrect firmware, no firmware download, wrong version of labtool/firmware etc. Refer to Figure 12 for command line information.
- 5. Terminate the LabTool session by executing command 99.

Figure 10: LabTool Folder

MFG-MW30X_MW32X-MF-WIFI-BRG-FC18-WIN-X86-2.1.0.16-14.1.36.p140 > labtool				
•	Name	Date modified	Туре	Size
ŕ.	AddCaIDLL.dll	3/11/2019 2:06 PM	Application extension	1,004 KB
	DutApiWiFiMW30XBrdigeUart.exe	3/11/2019 2:08 PM	Application	140 KB
	DutApiWiFiMW30XDII_BRIDGE_UART.dll	3/11/2019 2:08 PM	Application extension	320 KB
	DutApiWiFiMW30XDII_BRIDGE_UART.lib	3/11/2019 2:08 PM	LIB File	132 KB
	SetUp.ini	3/9/2021 3:18 PM	Configuration settings	1 KB
	Test.txt	3/10/2021 6:39 PM	Text Document	109 KB
	WlanCalData_ext.conf	3/11/2019 2:06 PM	CONF File	1 KE

Figure 11: Configure LabTool





Figure 12: Test LabTool Command Execution

Version: Date:	2.1.0.14 Mar 11 2019 (12:08:15)
Note:	
Name:	DutApiClass
Interface:	EtherNet
Date:	Mar 11 2019 (12:07:36)
Note:	
\\.\COM17 DutIf_InitConne	ection: 0
	W87xx (802.11a/g/b/n) TEST MENU
Enter option: 88 DLL Version : 27 LabTool Version: FW Version: 14 SOC: 0001 BBP: 9F RF: 48 OR Version: Enter option: 12 DutIf_GetRfChar RF Channel: 6 Enter option:	1.0.14 2.1.0.14 1.36.115 Mfg Version: 2.0.0.31 11 00 10 0.3 Customer ID: 0 nel 0x00000000 2437.0 MHz)

5.1 Continuous Transmit Test

The following LabTool commands listed in **Table 3** must be executed to perform the Continuous Transmit Test.

Table	3:	Continuous	Transmit	Test	Commands

#	Command	Description
1	35	Stop previous test (if any)
2	12 <channel></channel>	Set channel.
3	22 <channel> <tx power=""> <data modulation=""></data></tx></channel>	Set channel (repeat) and TX power. The last argument indicates data modulation type: • 0 = CCK • 1 = OFDM
4	35 1 <data rate=""></data>	Start test.
5	35	For valid values of data rate, please refer to Table 4
#	Command	Stop test



Table 4: Supported Data Rates

Wi-Fi standard	Data Rate	ID
11b	1 Mbps	1
	2 Mbps	2
	5.5 Mbps	3
	11 Mbps	4
11g	6 Mbps	6
	9 Mbps	7
	12 Mbps	8
	18 Mbps	9
	24 Mbps	10
	36 Mbps	11
	48 Mbps	12
	54 Mbps	13
11n	HT_MCS0	15
	HT_MCS1	16
	HT_MCS2	17
	HT_MCS3	18
	HT_MCS4	19
	HT_MCS5	20
	HT_MCS6	21
	HT_MCS7	22

Given below is a sample output of running Continuous Transmit Test for channel = 6, TX power = 17 dBM and data rate = 11 Mbps.

_____ W87xx (802.11a/g/b/n) TEST MENU _____ Enter option: 35 DutIf AdjustPcktSifs: 0x0000000 Enter option: 12 6 DutIf SetRfChannel: 0x0000000 RF Channel: 6 (2437.0 MHz) Enter option: 22 6 17 0 DutIf SetRfChannel: 0x0 DutIf SetRfPowerCal: 0x0 Enter option: 35 1 4 DutIf AdjustPcktSifs: 0x0000000 TRPC ID: 1 Enter option: 35 DutIf_AdjustPcktSifs: 0x0000000



5.2 Carrier Wave Test

The following LabTool commands must be executed to perform the Carrier Wave Test.

Table 5: Carrier Wave Test Commands

#	Command	Description
1	35	Stop previous test (if any)
2	12 <channel></channel>	Set channel.
3	22 <channel> <tx power=""> <data modulation=""></data></tx></channel>	Set channel (repeat) and TX power. The last argument indicates data modulation type: • 0 = CCK • 1 = OFDM
4	18 1	Start test.
5	18	Stop test

Given below is a sample output of running Carrier Wave Test for channel = 11 and TX power = 15 dBM.



5.3 Receive Test

The following LabTool commands must be executed to perform the Receive Test. The first number is the command ID, the remaining are parameters.

#	Command	Description
1	35	Stop previous test (if any)
2	12 <channel></channel>	Set channel.
3	31	Start test by clearing received packets.
4	32	Stop test. Get and clear Rx packet count.

Table 6: Receive Test Commands

Given below is a sample output of running Receive Test for channel = 6.

```
W87xx (802.11a/g/b/n) TEST MENU
Enter option: 35
DutIf_AdjustPcktSifs: 0x0000000
Enter option: 12 6
```



```
DutIf_SetRfChannel: 0x0000000

RF Channel: 6 (2437.0 MHz)

Enter option: 31

DutIf_ClearRxPckts: 0x00000000

Enter option: 32

DutIf_GetRxPckt: 0x00000000

GetRxPckt:

Rx Packet 288

Multi Cast 288

Err Count 785
```

6 Murata ABR RF Test Script

Murata has simplified the RF testing steps by providing an easy-to-use python script that can be run on the Windows host (via Cygwin). Steps for downloading and invoking the script are detailed here.

6.1 Install Dependencies

The Murata ABR RF Test Script uses python and expect software to automate the tests. These can be installed on Windows using the Cygwin platform.

- 1. Download Cygwin for x86 32-bit system □⁷ or 64-bit system □⁷ and execute.
- 2. Select the option Install from Internet.
- 3. Select the option Direct Connection.
- 4. Select any mirror you want to use (E.g., https://mirror.clarkson.edu).
- 5. Do not select any package for first install.
- 6. Complete the install.
- 7. Open Cygwin terminal and add the following line at the end of the /etc/fstab file.

```
none /cygdrive binary,noacl,posix=0,user 0 0
```

You can also add it manually by opening the file (c:\cygwin\etc\fstab) assuming Cygwin has been installed at C:\cygwin location.

6.2 Install Python 2.7

Download and install Python 2.7 from here □. This document assumes Python 2.7.18 is being used.

6.3 Install Expect

Run the Cygwin installation program again (as downloaded in Section 5.4.1
<sup>
□</sup>) and add the expect package.



Figure 13: Expect Installation in Cygwin

Not installed V Search expect	Qear		Oğeep ⊛ğest O§ma □I
ut age	Current Neur	Sin? Categories	Size Description
ped	5.453	Та	215k Tool for automating interactive applications
thon27 pexpect	Skip	Pothen	69k Python Except module
thon36-percect	Skip	Python	73k Python Expect module
thon37-pexpect	Skip	Python	73k Python Expect module
thon38pexpect	Skip	Python	75k Python Expect module

6.4 Update Environment Variables

After installations are complete, please go to Start \rightarrow View Advanced System Settings \rightarrow Environment Variables \rightarrow User Variables \rightarrow PATH \square . Double click on the PATH and add the following paths:

- Cygwin bin folder
- Python installation folder

Example: C:\cygwin64\bin;C:\Python27

Figure 14: Update Environment

ironment Variables		×	
Iser variables for Romit			
Variable	Value		
OneDrive	C:\Users\Romit\OneDrive	Edit environment variable	
OneDriveConsumer	C:\Users\Romit\OneDrive		
Path	C:\Program Files (x86)\GNU Tools ARM Embedded\4_9_2015q3\b		
TEMP	C:\Users\Romit\AppData\Local\Temp	C:\Program Files (x86)\GNU Tools ARM Embedded\4_9_2015q3\bin	New
TMP	C:\Users\Romit\AppData\Local\Temp	C:\Python27	
		%USERPROFILE%\AppData\Local\Microsoft\WindowsApps	Edit
	townships and the second secon	C:\Users\Romit\AppData\Roaming\npm	_
	<u>N</u> ew <u>E</u> dit <u>D</u> e	%USERPROFILE%\.dotnet\tools	Browse
		C:\cygwin64	
/stem variables			<u>D</u> elete
Variable	Value		
ARMLMD_LICENSE_FILE	C:\Users\Public\Documents\eSOL\eBinder\licenses\ARMCT_licer		
ComSpec	C:\WINDOWS\system32\cmd.exe		
configsetroot	C:\WINDOWS\ConfigSetRoot		Nove <u>Up</u>
DriverData	C:\Windows\System32\Drivers\DriverData		
NUMBER_OF_PROCESSORS	8		Move Down
OS	Windows_NT		
Path	C:\Program Files (x86)\Microsoft SDKs\Azure\CLI2\wbin:C:\Perl64		
	Ne <u>w</u> Ed <u>i</u> t De		Edit text
			Eure <u>r</u> extin
	OK Can		
		ОК	Cancel

6.5 Download Murata ABR RF Test Script Files



Download the Murata ABR RF Test Script Files ⊑^r – Murata ABR RF Test Tool and Murata ABR RF Test Tool Helper.

Place the downloaded Murata scripts (both Murata_ABR_RF_Test_Tool.py and Murata_ABR_RF_Test_Helper_Tool.exp) in the same folder where the LabTool application (DutApiWiFiMW30XBrdigeUart.exe) is located.

6.6 Run the script

Murata ABR RF test script performs the following tasks:

- Prompts the user to select the RF test to conduct.
- Depending on the selected test, prompts the user to select/enter the relevant parameters:
 - Channel
 - Data rate
 - TX Power
- Prompts the user to enter the test run time (in seconds).
- Provides the selected configuration for the user to review and accept.
- Executes LabTool commands on behalf of the user.

Running the script file is straightforward. Simply invoke the following command from the folder on the test platform where the scripts are located (both Murata_ABR_RF_Test_Tool.py and Murata_ABR_RF_Test_Helper_Tool.exp):

python Murata_ABR_RF_Test_Tool.py

For an example input/output sequence, refer to Appendix A: Sample output of Murata ABR RF Test Script



6.6.1 Script Flow

Figure 15 describes the user interaction flow of the script for Type ABR module.







6.6.2 Automation Option in the Script

User can provide a configuration file to the script to automate a test partly or fully. Invoke the script with '-c' switch and provide the config file name.

python Murata_ABR_RF_Test_Tool.py -c config.txt

A demo config file is given below – the parameters are self-explanatory. Supported values are same as that of the script inputs. In case a required parameter is not provided, or the value provided is not supported, the script will request the user to select/enter the parameter as per normal script operation. This allows the user to automate a test fully (by providing all required parameters), or partly (by providing parameters that will not change between tests). One additional parameter used by the config file is 'TIME' which indicates the time (in seconds) the test should run.

This config file will execute a Continuous Transmission test on Murata Type
ABR module for 2.4 GHz band on channel 6 and data rate 11 Mbps. Transmission
parameters are kept at default (packet interval = 20, packet length = 1024).

```
# Test selection option
# 1 = Continuous Transmit, 2 = Carrier Wave, 3 = Receive
TEST=1
```

```
# Channel selection option
CHANNEL=2
```

```
# Data rate selection option
RATE=11
```

```
# Time to run test (in seconds)
TIME=10
```



7 Appendix A: Sample output of Murata ABR RF Test Script

The following shows a sample output of Murata ABR RF Test Script for running Continuous Transmission test on Murata Type ABR module for channel 6 and data rate 11 Mbps. Transmission parameters are kept at default (packet interval = 20, packet length = 1024). The test is set up to run for 10 seconds.

```
$ python Murata ABR RF Test Tool.py
Murata Type ABR Regulatory Script Version 1.4
Select Test Mode
_____
 _____
| Entry | Test Mode
|-----|
 1 | Continuous Transmit |
| Carrier Wave
 2
| 3 | Receive
Select your entry for Test Mode: 1
Running Continuous Transmit test for ABR
Select Channel Number
         _____
| Entry | Channel Number | Description |
|-----|------|------|
  1 | LOW | Channel 1
2 | MID | Channel 6
2 | MID | Channel 6
3 | HIGH | Channel 11
_____
              -------
Select your entry for Channel Number: 2
Select data rate
[1, 2, 5.5, 11, 6, 9, 12, 18, 24, 36, 48, 54, 6.5, 13, 19.5, 26, 39, 52, 58.5,
651
Enter data rate: 11
Enter test run time (seconds): 10
Please verify your selection
                           | ABR
| Module
                           | Continuous Transmit test |
| Test
| Channel Number
                           | 6
                           | 11 Mbps
| Data Rate
| Transmit Power
                           | 17 dBm
                           | 10 seconds
| Runtime
     _____
Do you accept selected configurations? (Y/N): Y
Beginning...
```



spawn ./DutApiWiFiMW30XBrdigeUart.exe

```
Setting up ...
```

Starting test now ...

Waiting for 10 seconds

Transmission stopped Test complete. Test log available in Test.txt



8 Acronyms

 Table 7 describes the acronyms in this document.

Table 7: Acronyms

Acronyms	Meaning	
AP	Access Point	
EVB	Evaluation Board	
EVK	Evaluation Kit	
FCC	Federal Communications Commission	
FTDI	Future Technology Devices International Limited	
FW	Firmware	
NXP	NXP Semiconductors	
OS	Operation System	
PC	Personal Computer	
RF	Radio Frequency	
Wi-Fi	Wireless LAN: "Wi-Fi" is a registered trademark of Wi-Fi Alliance	
WLAN	Wireless Local Area Network	



9 References

This section reviews all the key reference documents that the user may like to refer to.

9.1 Murata Type ABR Module Landing Page

This landing page ☐ provides a high-level description of the module and includes all the necessary support documents.

9.2 Murata Type ABR mikroBUS™ Flashing Guide

This document □⁷ provides detailed steps of building and flashing the Murata Type ABR mikroBUS EVB with production and manufacturing firmware.

9.3 Murata Type ABR mikroBUS™ EVB Quick Start Guide

This guide \Box [?] details the process of running an example program for the Murata Type ABR module, available with MCUXpresso SDK, using the LPCXpresso55S69 Development Board \Box [?].

9.4 FCC Regulatory Certification Guide

This document \square provides general information on FCC Regulatory Certification with respect to Murata Wi-Fi/Bluetooth modules.

9.5 Murata's Community Forum Support

Murata's Community provides online support for the Murata Wi-Fi/Bluetooth modules on various i.MX platforms. Refer to this link □⁷ for existing support threads.



Revision History

Revision	Date	Author	Change Description
1.0	Oct 28, 2020	TF	Initial Release
2.0	May 20, 2022	TF	Updated to template 1.0
3.0	Nov 23, 2022	TF	Updated to template 2.0





Copyright © Murata Manufacturing Co., Ltd. All rights reserved. The information and content in this document are provided "as-is" with no warranties of any kind and are for informational purpose only. Data and information have been carefully checked and are believed to be accurate; however, no liability or responsibility for any errors, omissions, or inaccuracies is assumed.

Wi-Fi[®] is a registered trademark of Wi-Fi Alliance. The Bluetooth[®] word mark and logos are registered trademarks owned by Bluetooth SIG, Inc. Other brand and product names are trademarks or registered trademarks of their respective owners.

Specifications are subject to change without notice.