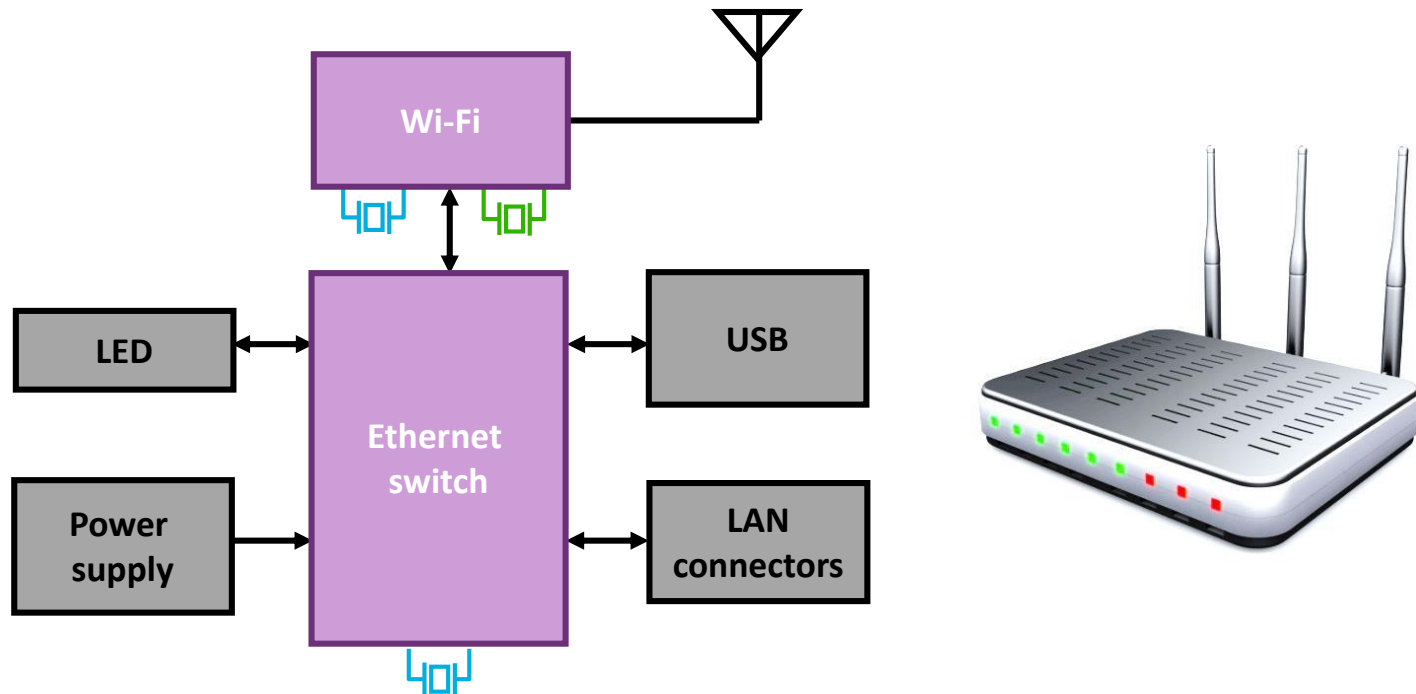




# Contents

<u>AP Router</u>	<u>BT-Headphone</u>	<u>BT-Speaker</u>	<u>BT-Tracker</u>
<u>E-cigarette</u>	<u>ESL</u> (Electronic Shelf Label)	<u>Industry Automation</u>	<u>Healthcare</u>
<u>HEMS</u>	<u>M2M</u>	<u>OTT</u> (Over The Top)	<u>Payment Terminal</u>
<u>Security Camera</u>	<u>Small Cell</u>	<u>Smart Card</u>	<u>Smart Lighting</u>
<u>Smart Meter</u>	<u>Smart Phone</u>	<u>Smart Speaker</u>	<u>SSD</u>
<u>TV</u>	<u>VR AR</u>	<u>Walkie-Talkie</u>	<u>Wearable Device</u>



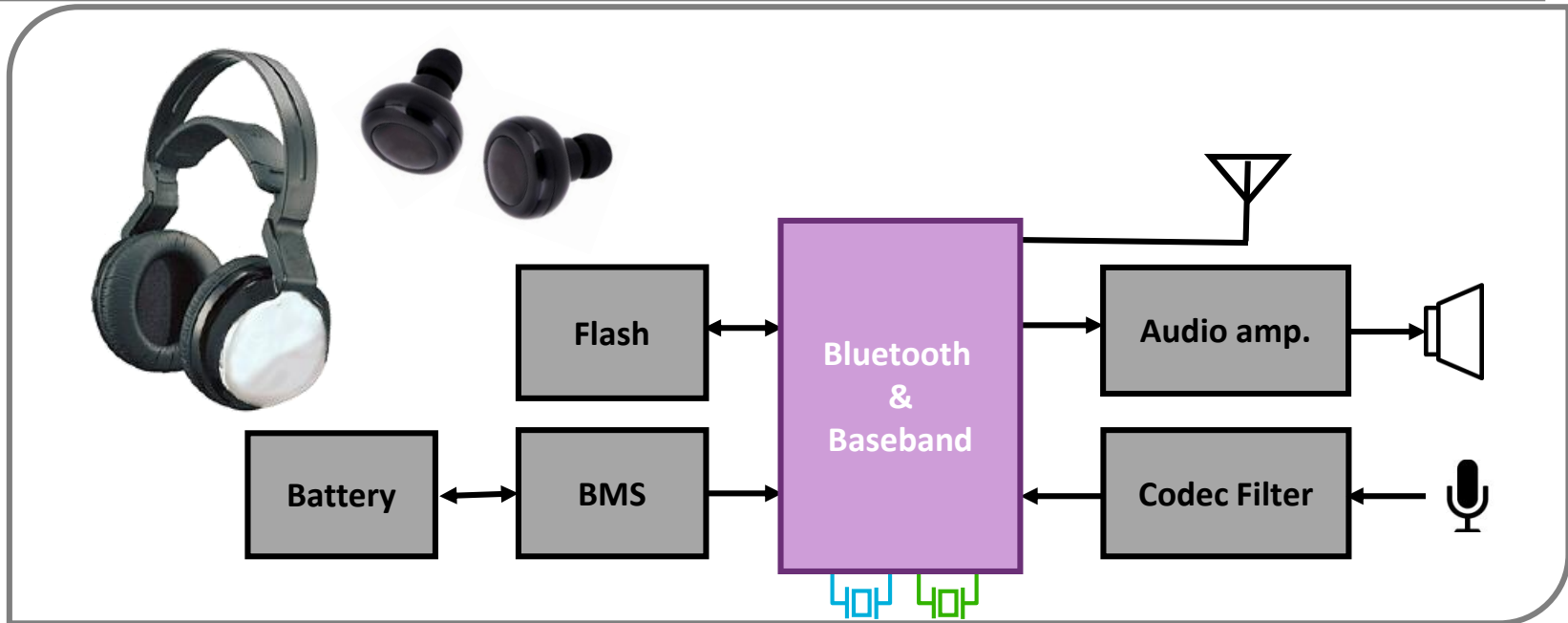
# Timing Devices in Wi-Fi AP Router





Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For Wi-Fi®



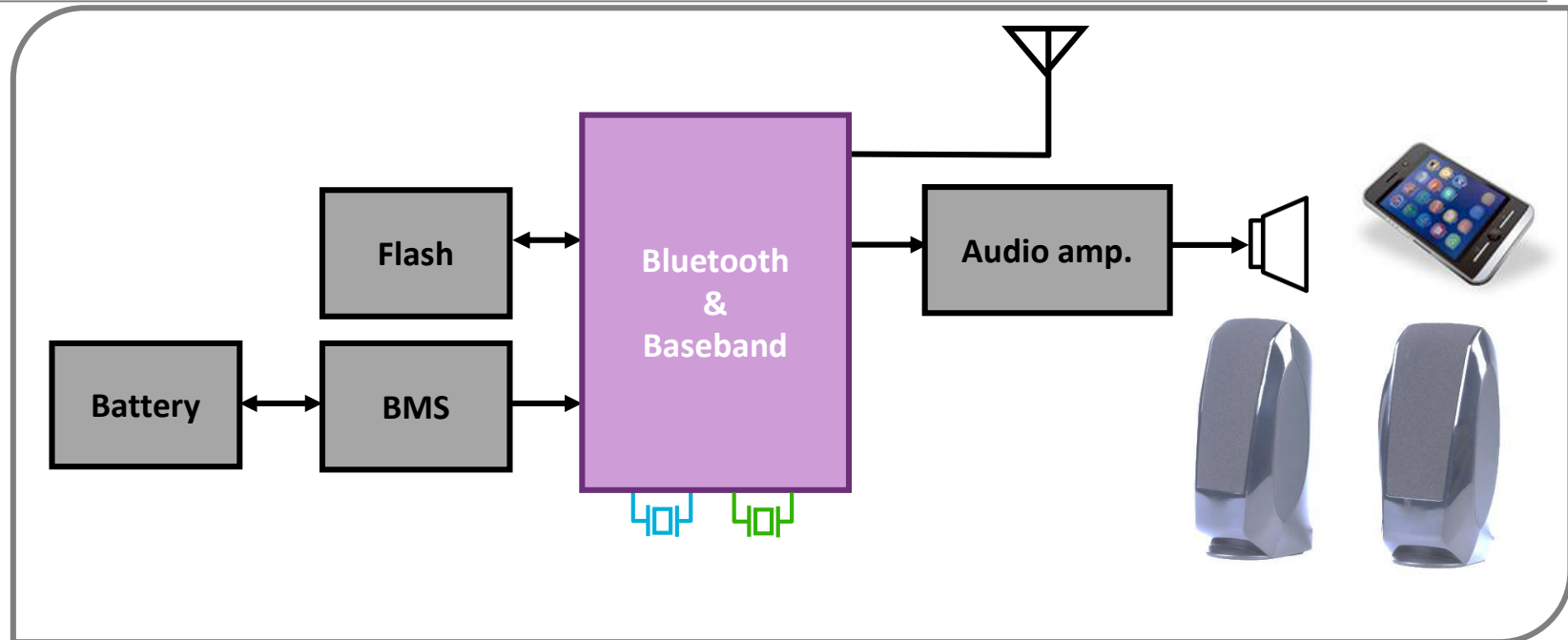
# Timing Devices in Bluetooth Headphone





Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-H series</a>	24 MHz / 26 MHz / 32 MHz	For Bluetooth®
	1.6 x 1.2 mm	<a href="#">XRCFD series</a>	26 MHz	
		<a href="#">XRCMD series</a>	32 MHz / 40 MHz	
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	32 MHz / 40 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	



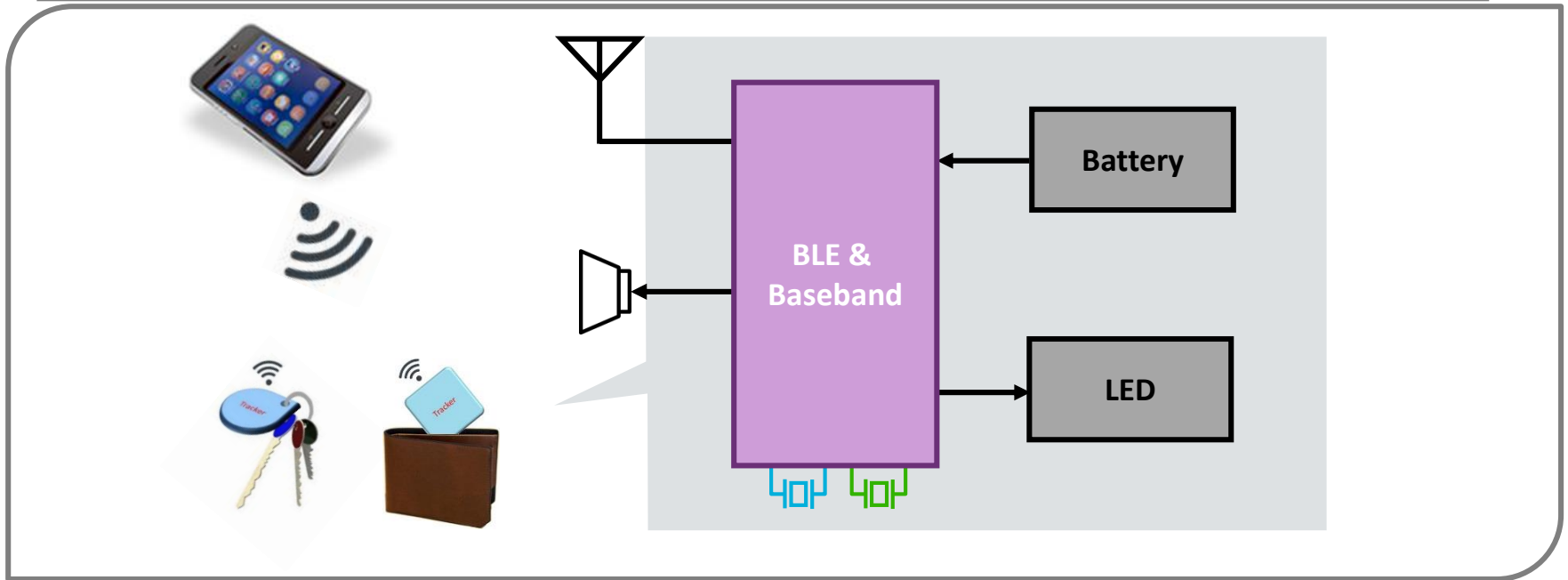
# Timing Devices in Bluetooth Speaker






Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-H series</a>	24 MHz / 26 MHz / 32 MHz	For Bluetooth®
	1.6 x 1.2 mm	<a href="#">XRCFD series</a>	26 MHz	
		<a href="#">XRCMD series</a>	32 MHz / 40 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	



# Timing Devices in Bluetooth Tracker

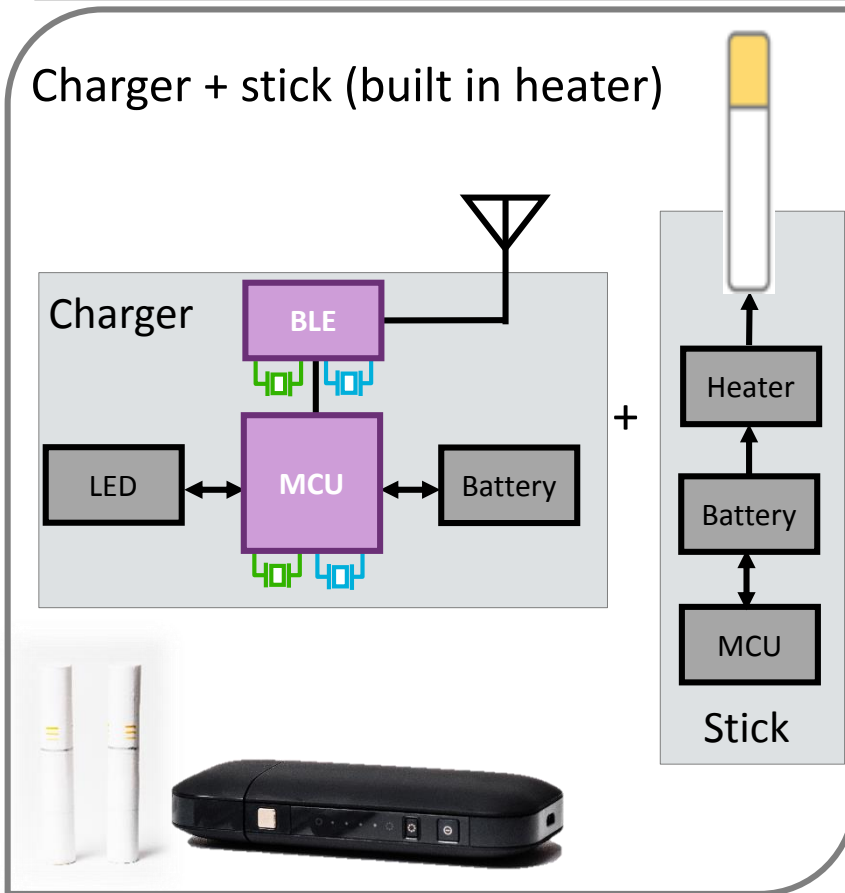


Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	32 MHz	For BLE
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	32 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper
	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	

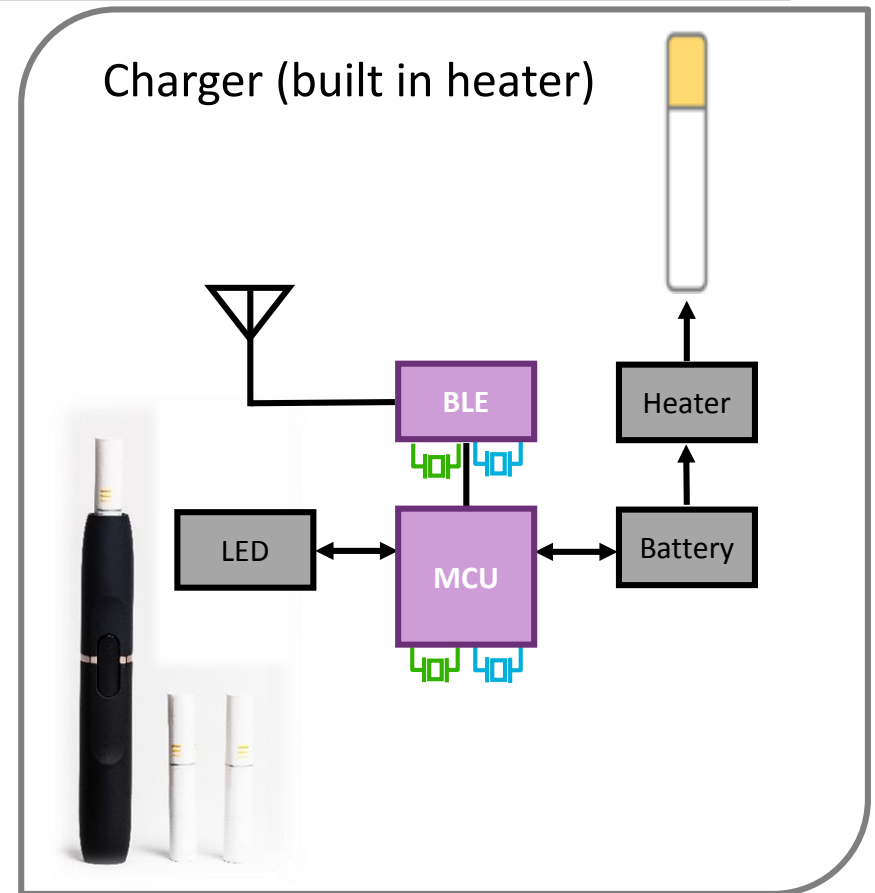




# E-cigarette (heater type)

## Charger + stick (built in heater)



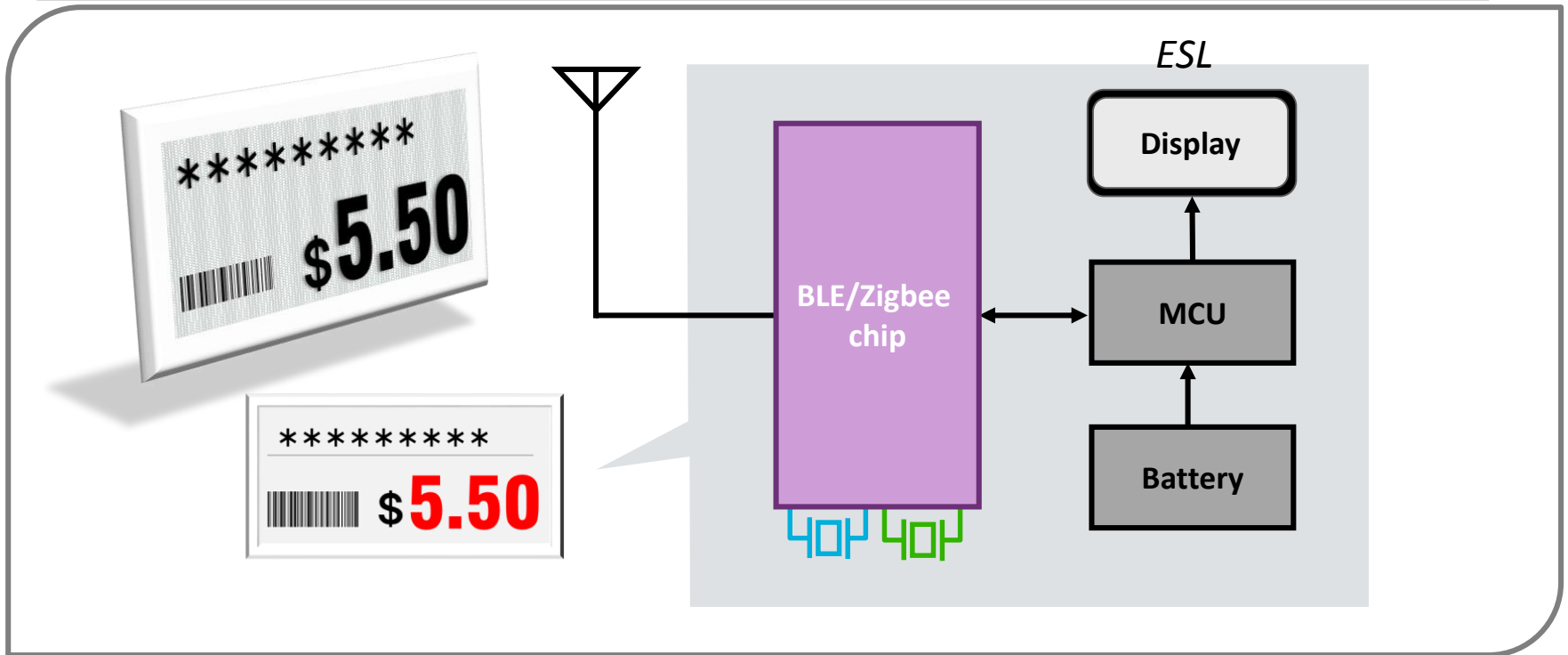
## Charger (built in heater)





Type	Size	Murata Timing Device / Frequency		Function
 <b>Crystal unit</b>	2.0 x 1.6 mm	<u>XRCGB-F-L series</u> <u>XRCGB-F-M series</u>	16 to 48 MHz	MCU
		<u>XRCGB-F-P series</u>	16 MHz / 32 MHz	BLE
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<u>WMRAG series</u>	32.768 kHz	MCU, BLE



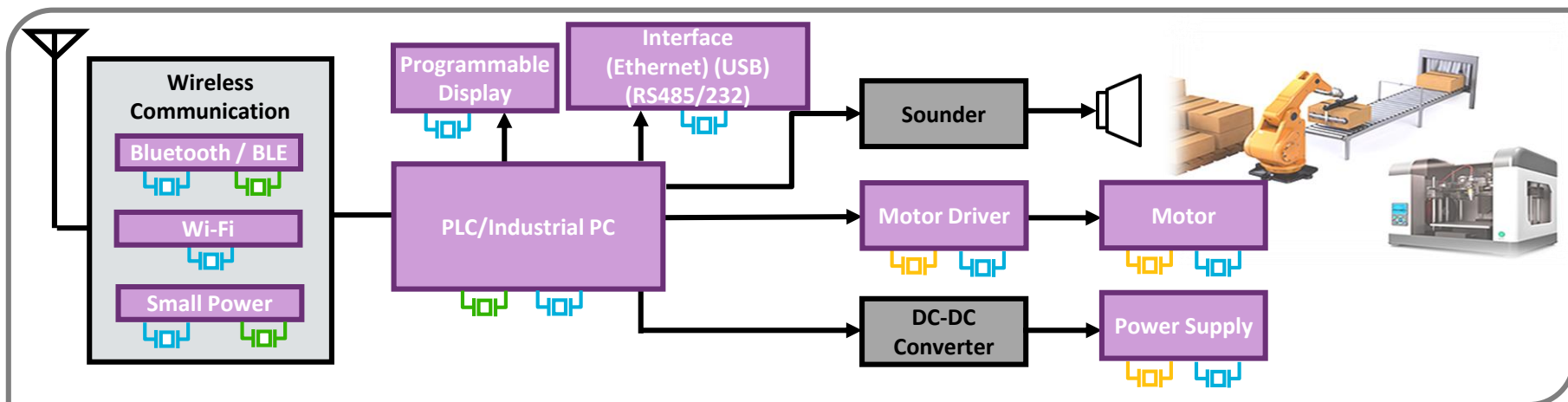
# Timing Devices in ESL (Electronic Shelf Label)







Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE / ZigBee®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	32 MHz	For BLE / ZigBee®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	32 MHz	For BLE
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE / ZigBee®



# Timing Devices in Industry Automation

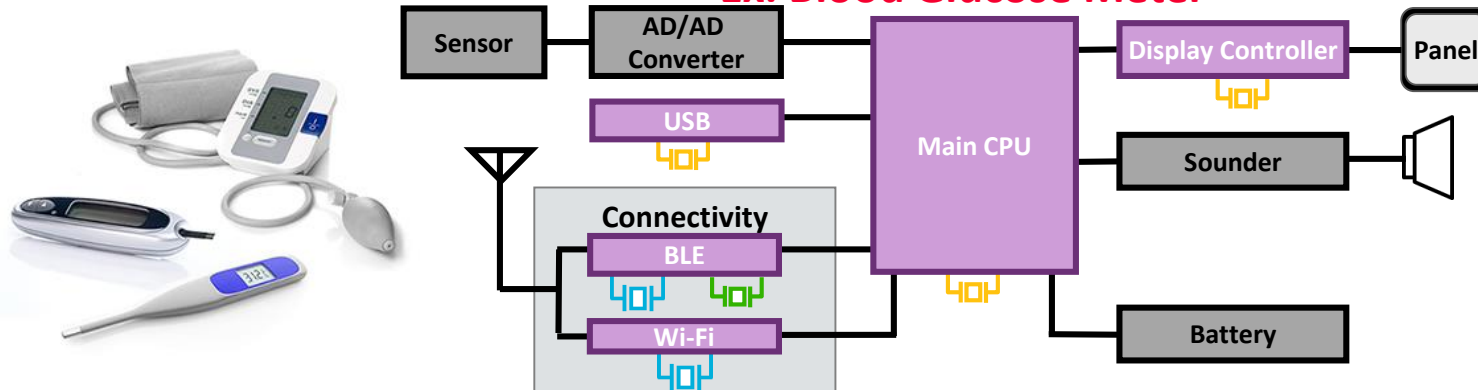






Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Power supply
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	For Motor
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	16 to 50 MHz	For Ethernet®, USB, PLC, Display, Motor driver, Motor, Power Supply
		<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE
		<a href="#">XRCGB-F-H series</a>	24 MHz / 26 MHz / 32 MHz	For Bluetooth, LPWA
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	26 to 48 MHz	For Wi-Fi®, Bluetooth®, LPWA
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	For Wi-Fi®
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE , LPWA ,PLC
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper



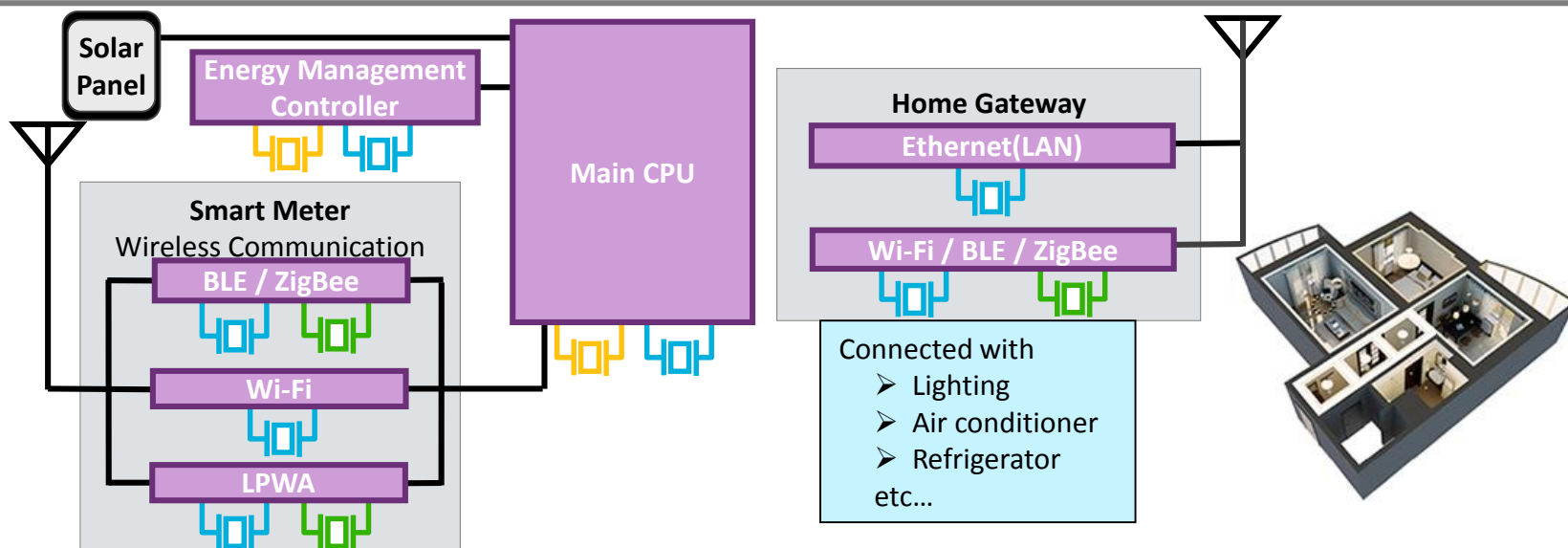
# Timing Devices in Healthcare applications




## Ex. Blood Glucose Meter



Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Main CPU
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	For USB For Display Controller
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	32 MHz 37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz 32 MHz	For BLE
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper
	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	

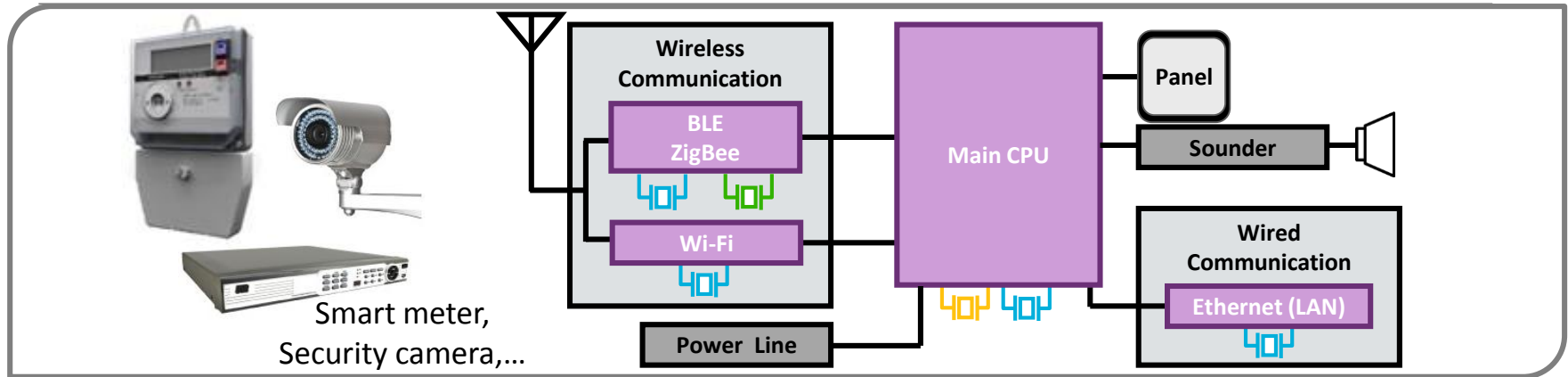
# Timing Devices in Home Energy Management System (HEMS)







Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Main CPU
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
		<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE, ZigBee®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®, LPWA
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	For Wi-Fi®
			32 MHz	For BLE, LPWA
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE, ZigBee®, LPWA



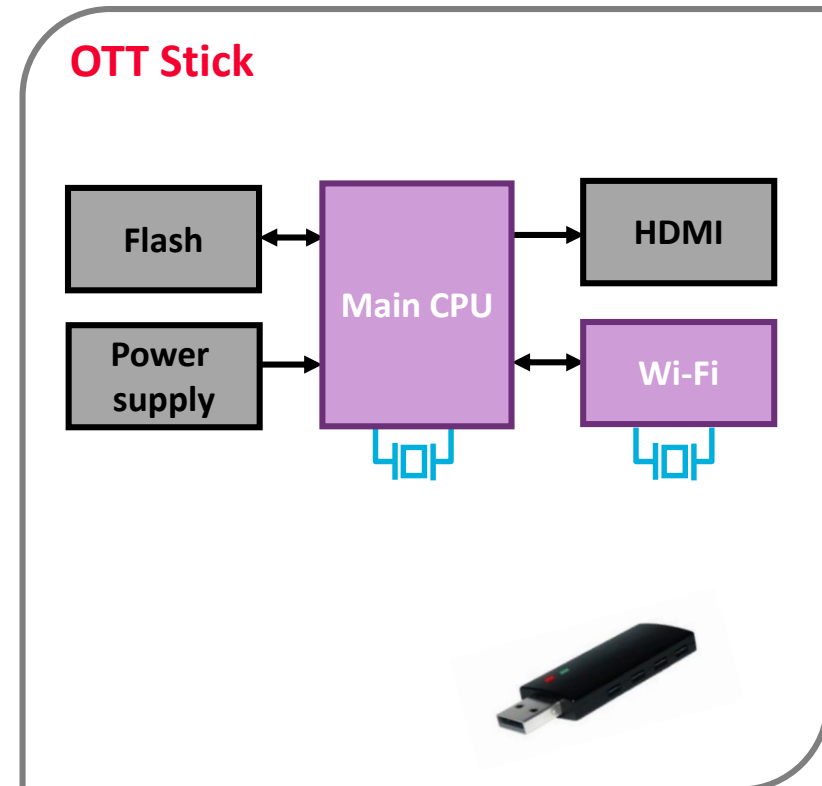
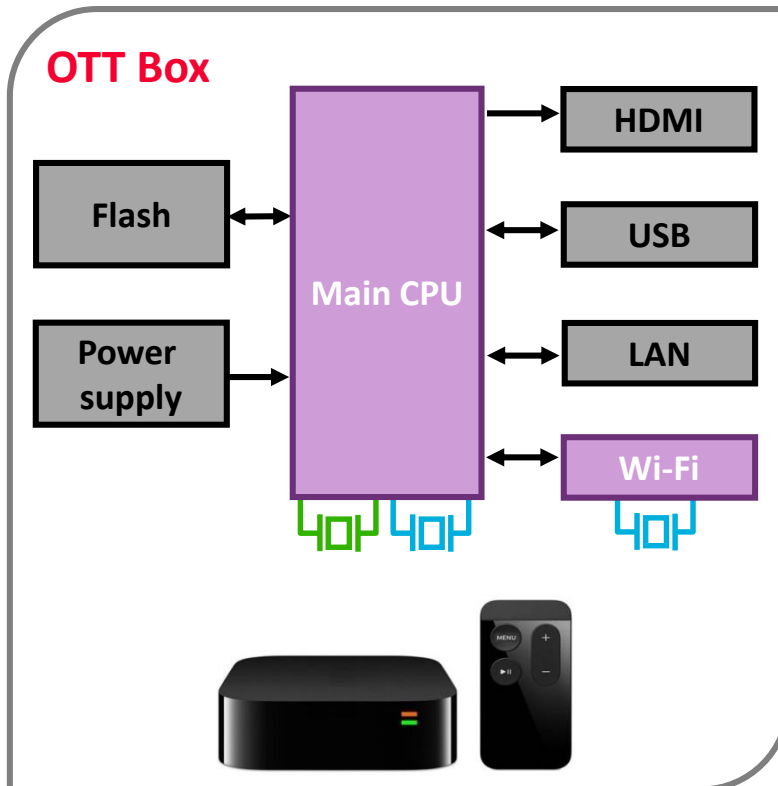
# Timing Devices in M2M





Type	SIZE	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Main CPU
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
		<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE, ZigBee®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	32 MHz 37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz 32 MHz	For BLE, ZigBee®
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE, ZigBee®, LPWA
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper
	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	



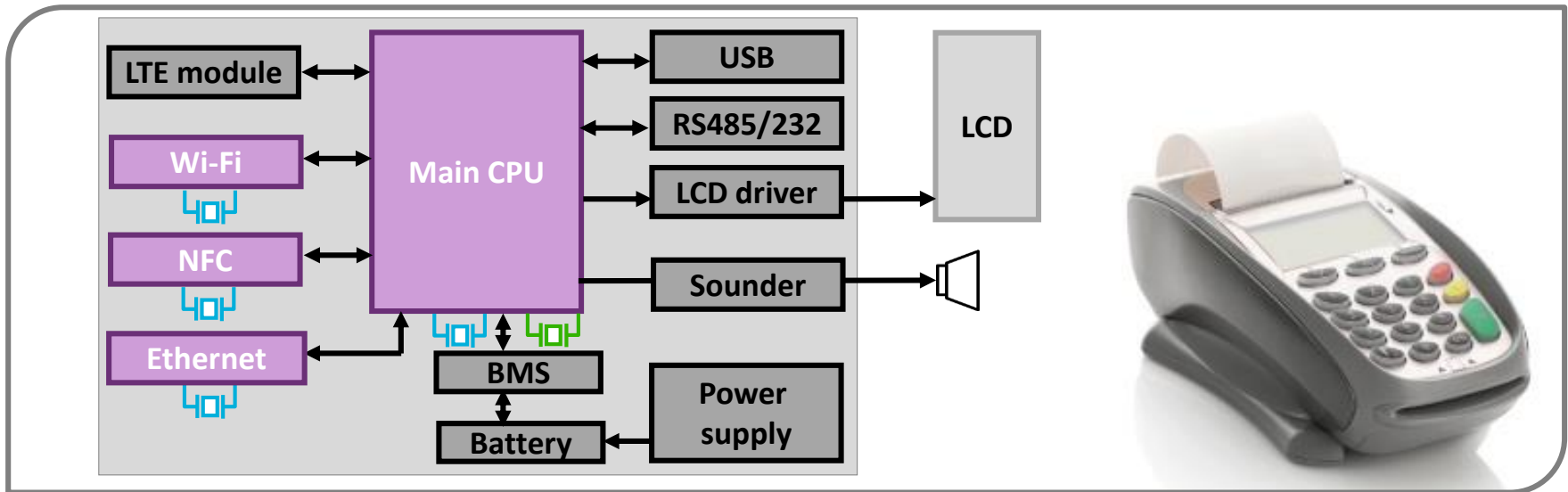
# Timing Devices in OTT (Over The Top)






Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	24 MHz	For Main CPU
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For Main CPU



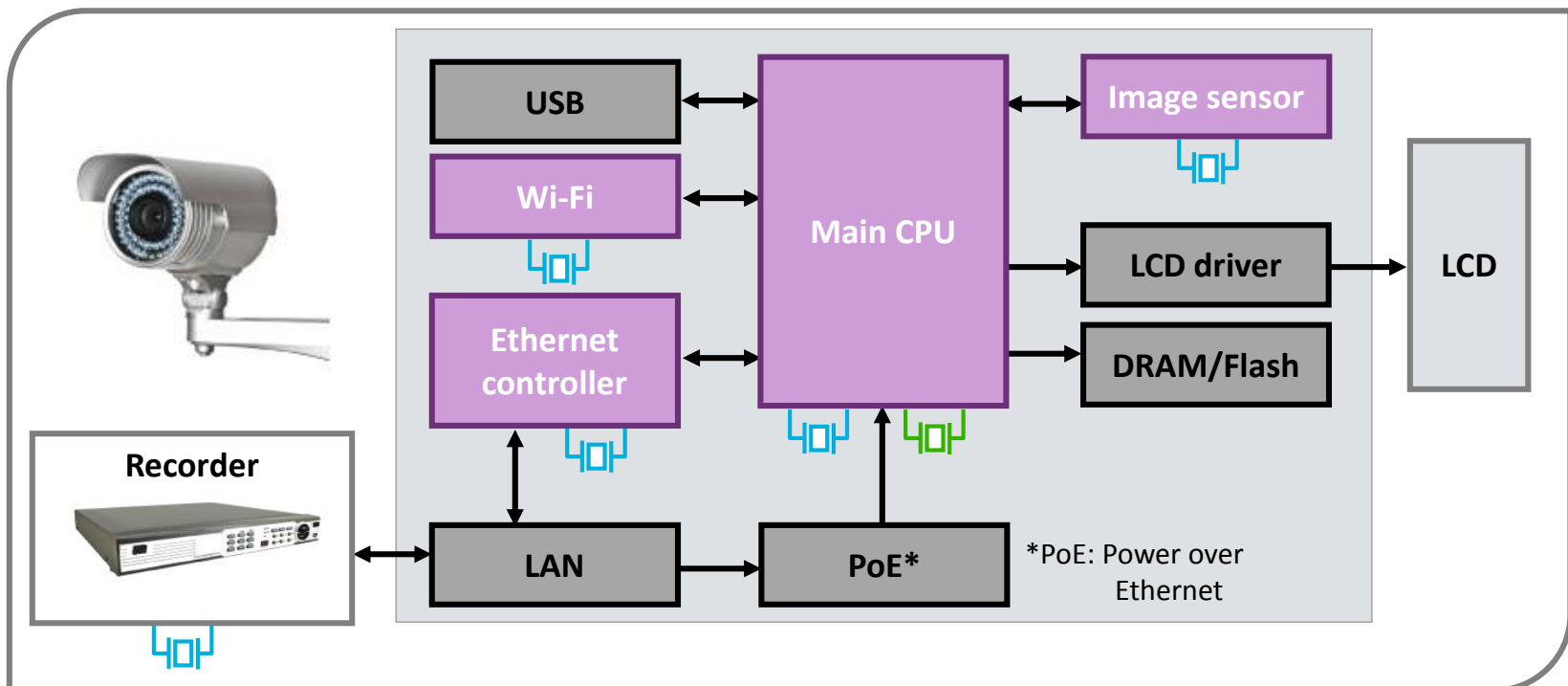
# Timing Devices in Payment Terminal





Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	24 MHz	For Main CPU
		<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
			27.12 MHz	For NFC
	1.6 x 1.2 mm	<a href="#">XRCFD series</a>	27.12 MHz	
		<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For Main CPU
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper
	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	



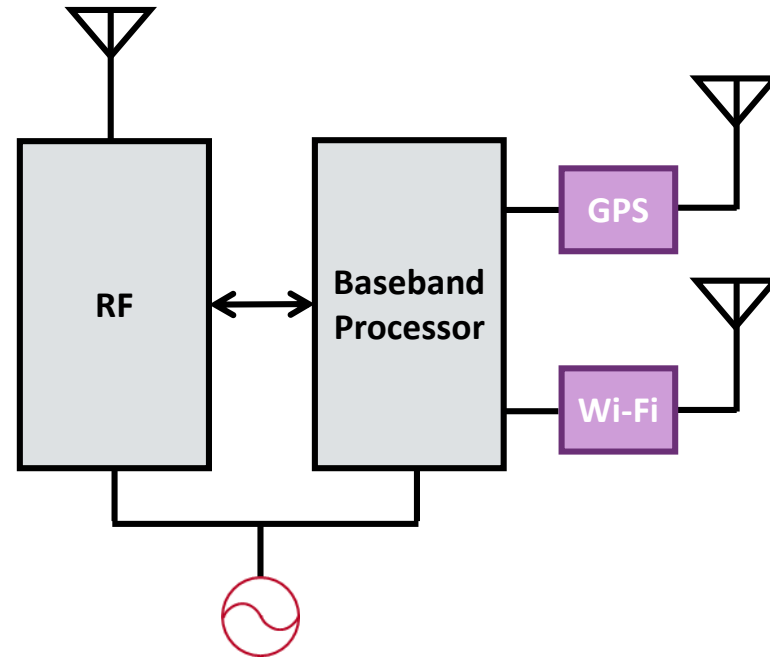
# Timing Devices in Security Camera




Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	24 MHz / 27 MHz	For Main CPU For Image Sensor
		<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For Main CPU



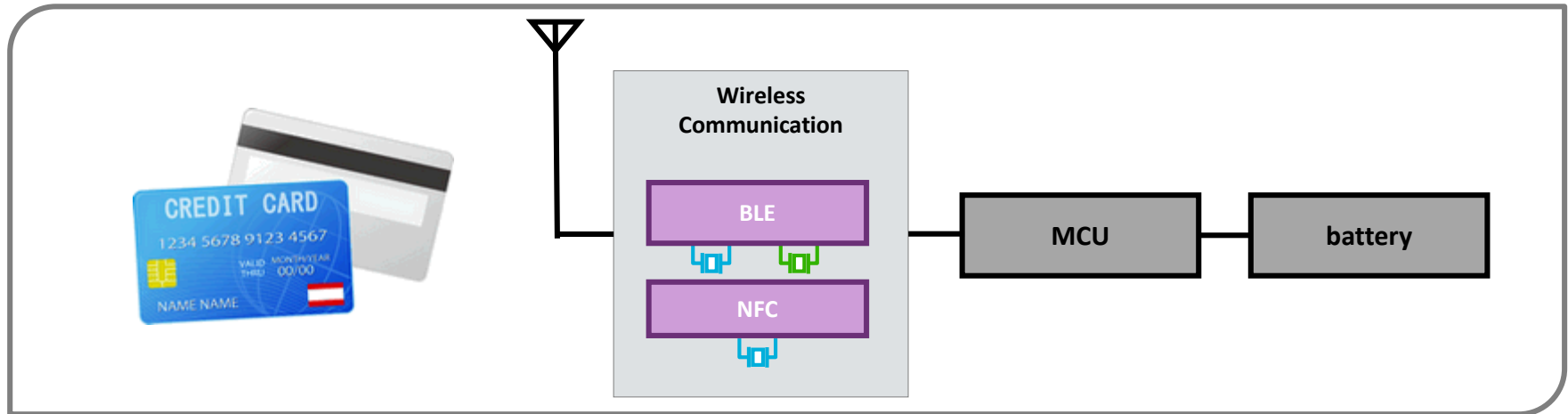
# Timing Devices in Small Cell





Type	Size	Murata Timing Devices / Frequency		Function
 <b>Precision TCXO</b>	5.0 x 3.2 mm	<a href="#">XNCLH series</a> <a href="#">XTCLH series</a>	10 to 50 MHz	For RF, Baseband




# Timing Devices in Smart Card



Type	Size	Height	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	1.6 x 1.2 mm	0.35 mm max.	<a href="#">XRCFD series</a>	27.12 MHz	For NFC
		0.33 mm max.	<a href="#">XRCMD series</a>	32 MHz	For BLE
	1.2 x 1.0 mm	0.30 mm max.	<a href="#">XRCTD series</a>	32 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	0.35 mm max.	<a href="#">WMRAG series</a>	32.768 kHz	For BLE

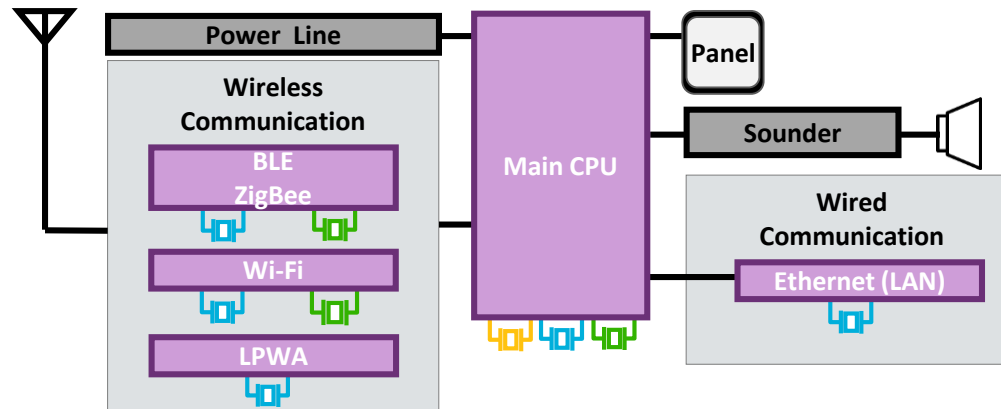
# Timing Devices in Smart Lighting







Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 MHz	For Main CPU
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 MHz / 12 MHz 16 MHz / 20 MHz	
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
		<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE, ZigBee®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	32 MHz	
			37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	For BLE
32 MHz				
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE, ZigBee®
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper



# Timing Devices in Smart Meter

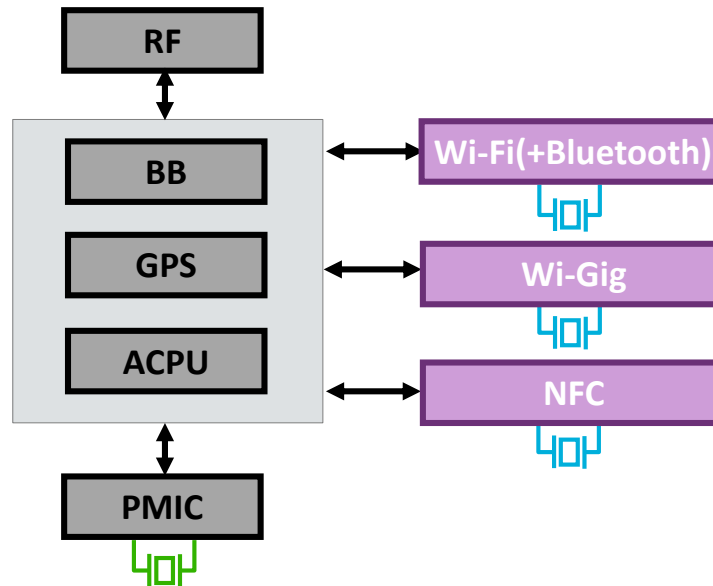




Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Main CPU
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
		<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE, ZigBee®
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®, LPWA
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz 32 MHz	For Wi-Fi® For BLE
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE, ZigBee®, LPWA, Main CPU
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper
	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	



# Timing Devices in Smart Phone

## Qualcomm Platform:

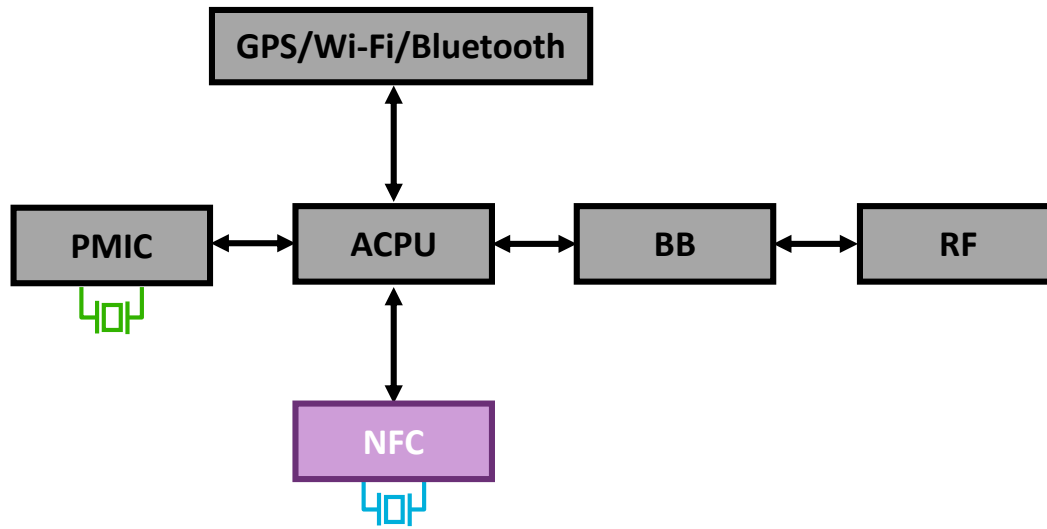




Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	27.12 MHz	For NFC
		<a href="#">XRCFD series</a>	27.12 MHz	
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	38.4 MHz / 48 MHz	For Wi-Fi®
			38.4 MHz	For Wi-Gig
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz / 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For PMIC



# Timing Devices in Smart Phone

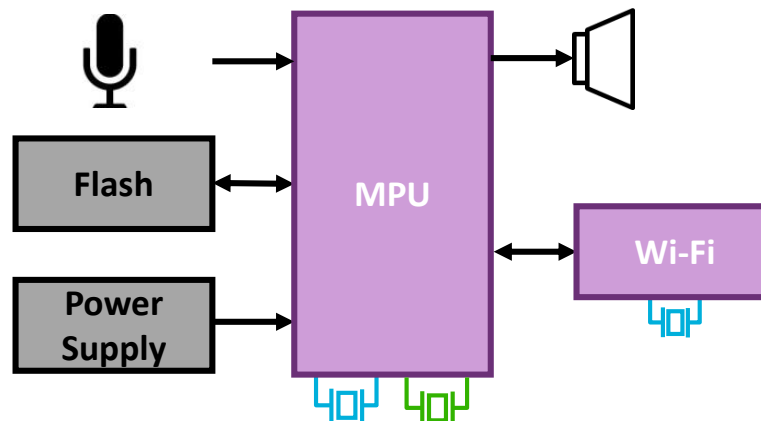
## Mediatek Platform:





Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	27.12 MHz	For NFC
	1.6 x 1.2 mm	<a href="#">XRCFD series</a>	27.12 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For PMIC



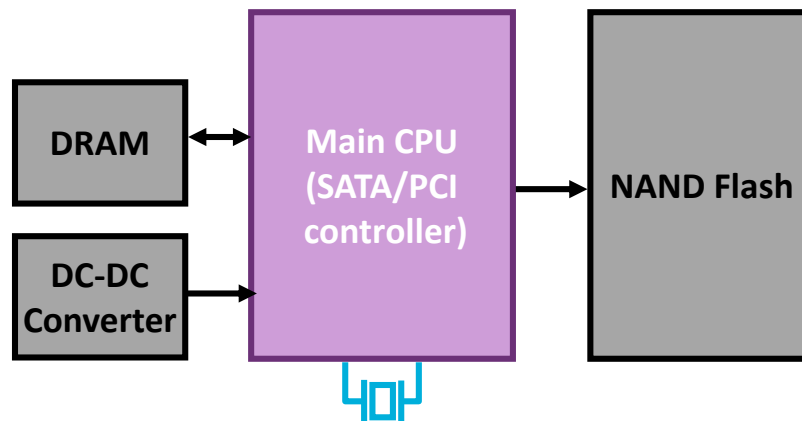
# Timing Devices in Smart Speaker




Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-M series</a>	16 to 50 MHz	For MPU
	1.6 x 1.2 mm	<a href="#">XRCMD series</a>	37.4 MHz / 38.4 MHz 40 MHz / 48 MHz	For Wi-Fi®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	37.4 MHz / 38.4 MHz 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For MPU



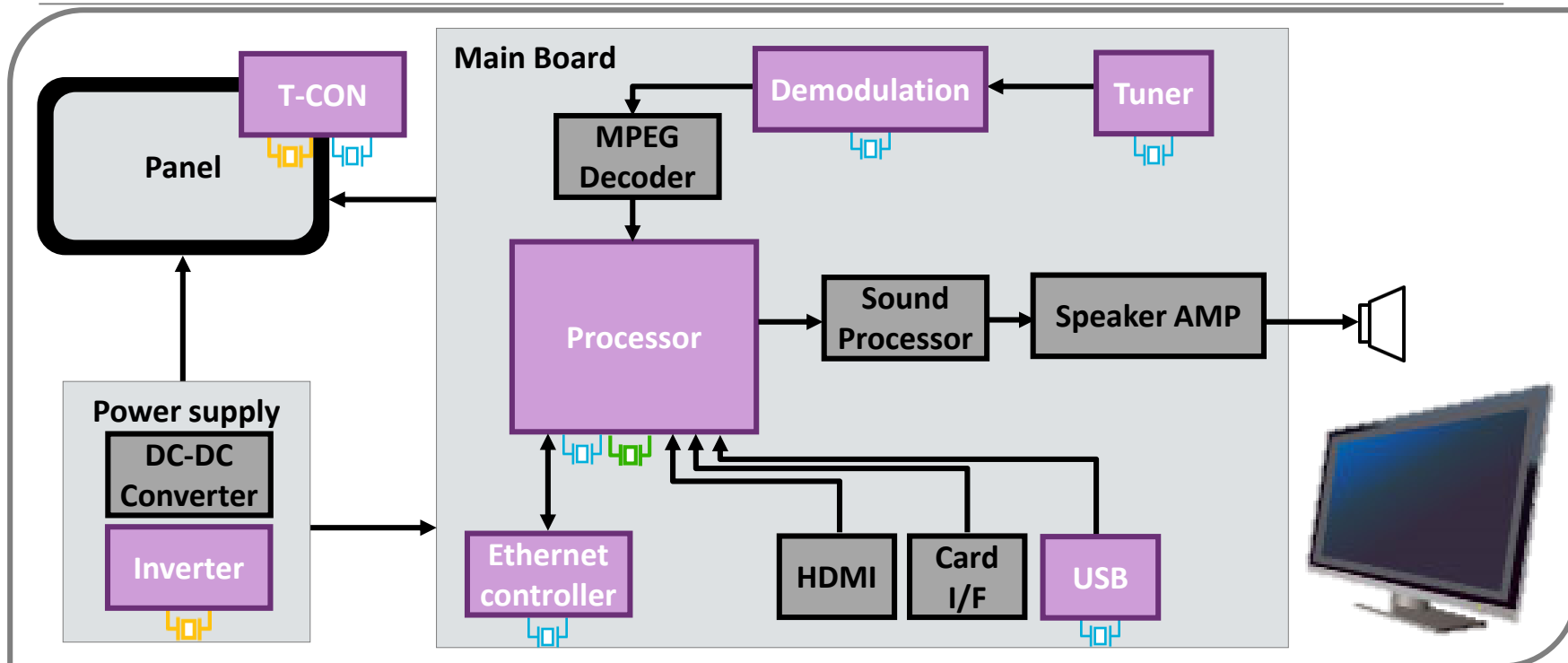
# Timing Devices in SSD






Type	Size	Murata Timing Devices / Frequency		Function
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-L / M series</a>	25 to 50 MHz	For Main CPU
	1.6 x 1.2 mm	<a href="#">XRCFD series</a>	25 MHz	
		<a href="#">XRCMD series</a>	30 MHz / 40 MHz	

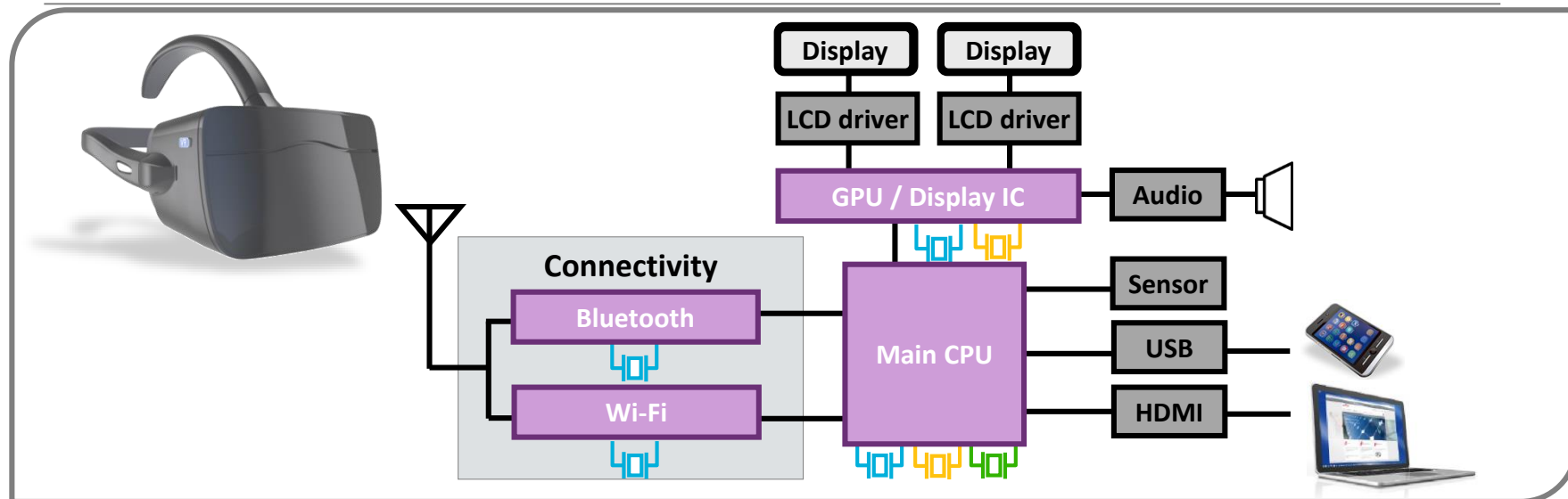






# Timing Devices in Digital TV



Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Inverter, T-CON
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 27 MHz	For Processor, Tuner, etc.
		<a href="#">XRCGB-F-M series</a>	25 MHz	For Ethernet®
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For Processor

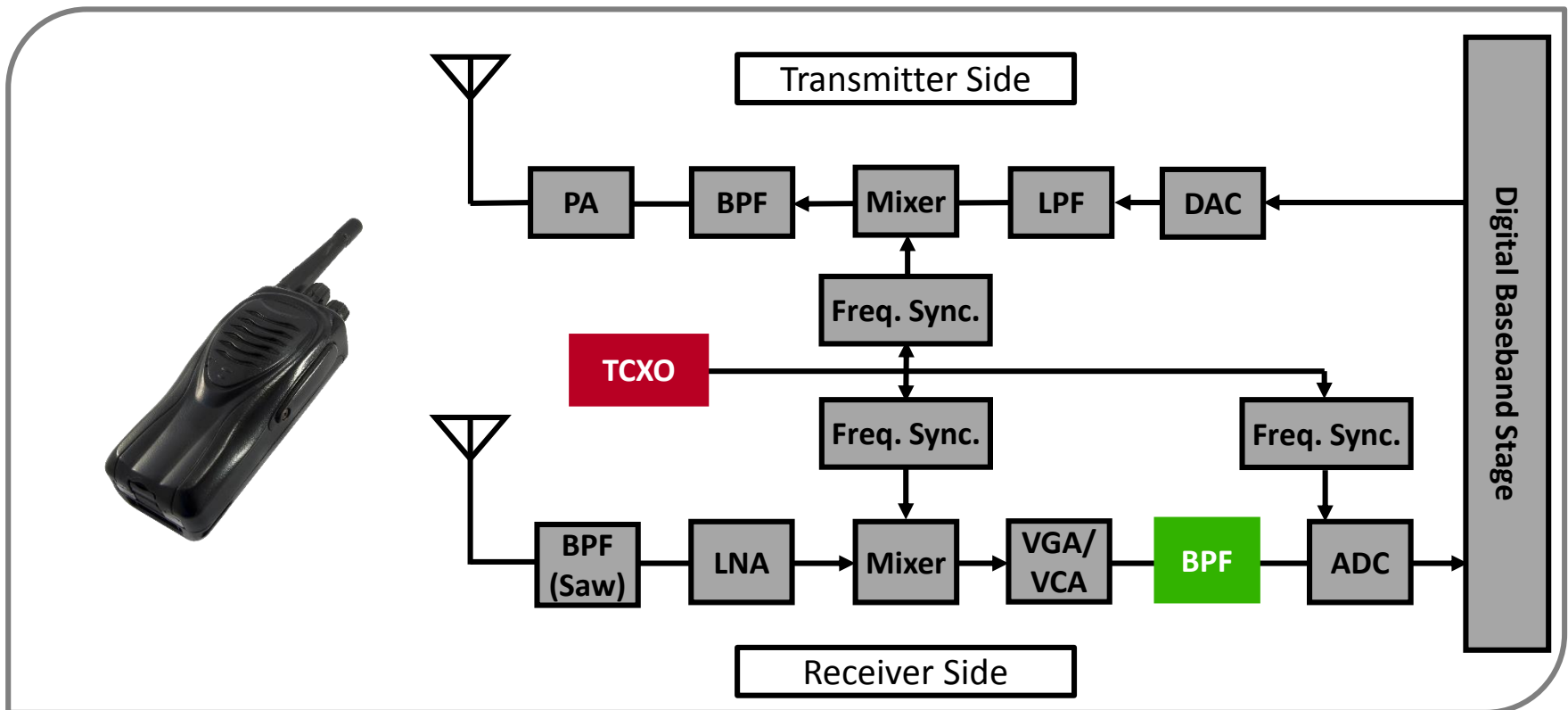
# Timing Devices in VR(Virtual Reality), AR(Augmented Reality)



Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For Main CPU, Display IC
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	
 <b>Crystal Units</b>	2.0 x 1.6 mm	<a href="#">XRCGB-F-P series</a> <a href="#">XRCGB-F-H series</a>	16 to 32 MHz 24 MHz / 26 MHz / 32 MHz	For Main CPU, Display IC
	1.6 x 1.2 mm	<a href="#">XRCFD / XRCMD series</a>	26 to 48 MHz	For Wi-Fi®, Bluetooth®
	1.2 x 1.0 mm	<a href="#">XRCTD series</a>	32 MHz / 37.4 MHz 38.4 MHz / 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For Main CPU
 <b>Piezoelectric Sounders</b>	12.0 x 12.0 mm	<a href="#">PKLCS series</a>	2 kHz / 2.4 kHz / 4 kHz	For Beeper
	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	



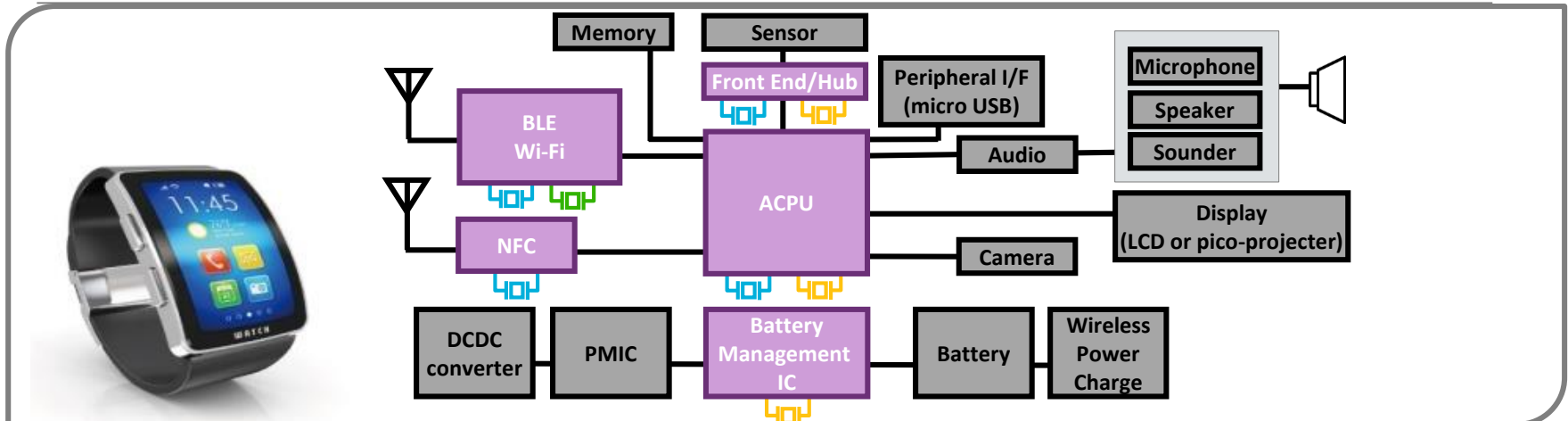
# Timing Devices in Walkie-Talkie







Type	Size	Murata Timing Devices / Frequency		Function
<b>BPF</b> <b>Crystal Filters</b>	7.0 x 5.0 mm	<a href="#">XDCAF series</a> <a href="#">XDCAH series</a> <a href="#">XDCAH series</a>	20 to 150 MHz	For IF filter
<b>TCXO</b> <b>Precision TCXO</b>	5.0 x 3.2 mm	<a href="#">XNCLH series</a> <a href="#">XTCLH series</a>	10 to 50 MHz	For oscillator



# Timing Devices in Wearable Device



Type	Size	Murata Timing Devices / Frequency		Function
 <b>Ceramic Resonators</b>	4.5 x 2.0 mm	<a href="#">CSTCR-G series</a>	4 to 7.999 MHz	For ACPU
	3.2 x 1.3 mm	<a href="#">CSTNE-G series</a> <a href="#">CSTNE-V series</a>	8 to 20 MHz	For Front End/Hub For Battery Management
 <b>Crystal Units</b>		<a href="#">XRCGB-F-M series</a>	27.12 MHz	For NFC
		<a href="#">XRCGB-F-P series</a>	16 MHz / 24 MHz / 32 MHz	For BLE, ACPU
		<a href="#">XRCGB-F-H series</a>	24 MHz / 26 MHz / 32 MHz	For Bluetooth®
		<a href="#">XRCFD series</a>	27.12 MHz	For NFC
		<a href="#">XRCMD series</a>	32 MHz / 37.4 MHz / 38.4 MHz / 40 MHz / 48 MHz	For Wi-Fi®, Bluetooth®/ BLE
		<a href="#">XRCTD series</a>	32 MHz / 37.4 MHz / 38.4 MHz / 48 MHz	
 <b>MEMS Resonator</b>	0.95 x 0.60 mm	<a href="#">WMRAG series</a>	32.768 kHz	For BLE
 <b>Piezoelectric Sounders</b>	9.0 x 9.0 mm	<a href="#">PKMCS series</a>	4 kHz	For Beeper