Anritsu envision:ensure

New WLAN Applications for EVs Appearance of Wireless Charging

— Wireless Charging Requiring Communications Technologies —

Wireless Connectivity Test Set MT8862A

Previously, vehicle WLAN communications have been used mainly for in-vehicle infotainment, but with the appearance of electric vehicles (EVs), WLAN technology is expected to play a key role in EV functions.
As the name suggests, electric vehicles use electricity as the energy source, meaning that recharging the built-in battery cannot be avoided. Although a gasoline vehicle can run out of fuel, recovering from loss of electrical power in an EV requires much more time and effort to fully recharge the battery compared to filling with gasoline, and the battery charge must always be high enough to prevent the risk of being unable to drive due to loss of battery power.
Electric vehicles are charged generally using a wired connection between a charging station and the vehicle. However, each time the EV is charged, a long cable must be pulled from the charging station and connected to the vehicle, which is quite hard work, especially in bad weather, such as rain and snow , but cannot be avoided depending on the remaining battery capacity.
To make EV battery charging easier, wireless charging systems that do not require charging cables have been developed. WLAN is one of the technologies that make it up.

Communications Requirements at Fast Charging

The long recharging time is a major issue for EVs. Recharging time from a household power socket at 100 V to 200 V depends partly on the journey distance but requires 7 to 14 hours (for a journey of 160 km), because EVs, unlike gasoline cars, cannot charge the battery in minutes. Normal charging is effective method to satisfy electric power, but it is worked only within a situation that a car is parked for a long time jut like through all night. Therefore normal charging is unsuitable for replenishing the energy consumed during reaching outing destination. and it is not enough to avoid a risk of running out of charge.

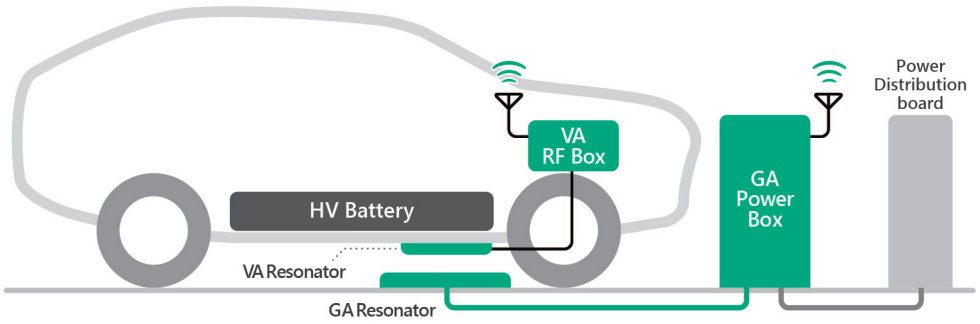
Types of Charging Infrastructure

Type of Recharging Station		Normal Recharging			Fast Charging
		Household Power Socket		Pole-Type Normal Recharge Station	
		100 V	200 V	200 V	
					
Charge Time	Driving Distance 160 km	About 14 hours	About 7 hours		About 30 minutes
	Driving Distance 80 km	About 8 hours	About 4 hours		About 15 minutes

Source: METI Website (Excerpt and translate to English)
https://www.meti.go.jp/policy/automobile/evphv/what/charge/index.html

To solve this problem, fast charging systems have been developed, such as CHAdeMO, Combined Charging System (CCS), and GB/T; of these, the CCS technologies focus on wireless charging.
In the fast charging system, the car and charger must communicate to charge the battery quickly while suppressing battery deterioration; the communication is also used for user authentication and billing. Wired charging systems use communication technologies such as Controller Area Network (CAN), Power Line Communication (PLC), and CCS which specifies IEEE 802.11n WLANs for wireless charging. The CCS communication protocol uses the international ISO 15118 standard.

ISO 15118 Wireless Charging System



Published ISO 15118 Standard

ISO 15118 Road vehicles - Vehicle to grid communication interface -
- Part 1: General information and use-case definition
- Part 2: Network and application protocol requirements
- Part 3: Physical and data link layer requirements
- Part 4: Network and application protocol conformance test
- Part 5: Physical layer and data link layer conformance test
- Part 8: Physical layer and data link layer requirements for wireless communication
- Part 20: 2nd generation network and application protocol requirements

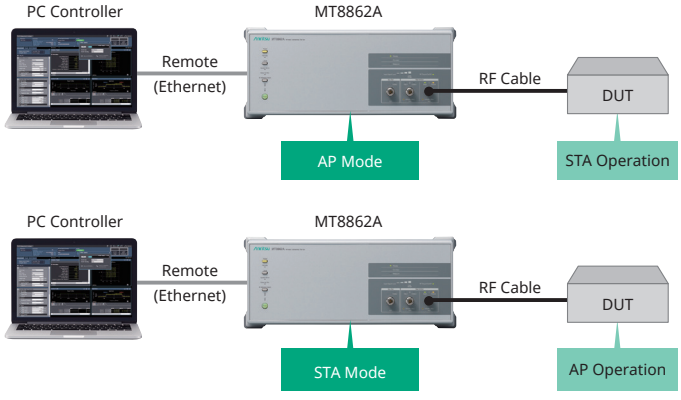
WLAN Performance Evaluation

RF TRx Measuring Instrument with Built-in WLAN

The Wireless Connectivity Test Set MT8862A supports IEEE802.11b/a/g/n/ac/ax tests of wireless characteristics; it is a useful instrument for design and quality evaluation of the wireless equipment forming part of wireless recharging systems.

Easy-to-Configure Measurement Environment

The MT8862A simulates access points (AP) and stations (STA) to establish the DUT network connection using IEEE802.11a/b/g/n/ac/ax standard WLAN protocol messaging. It requires no special tools or control to establish the connection and RF measurements are made using general WLAN communications procedures with no need to set-up a special measurement environment.



IEEE802.11n TRx Characteristics Test Items and Section

Measurement Item	802.11n
Transmit power levels	20.3.20.3
Transmit spectrum mask	20.3.20.1
Transmit center frequency tolerance	20.3.20.4
Symbol clock frequency tolerance	20.3.20.6
Transmitter center frequency leakage	20.3.20.7.2
Transmitter spectral flatness	20.3.20.2
Transmitter constellation error	20.3.20.7.3
Transmitter modulation accuracy test	20.3.20.7.4
Receiver minimum input level sensitivity	20.3.21.1
Adjacent channel rejection	20.3.21.2
Nonadjacent channel rejection	20.3.21.3
Receiver maximum input level	20.3.21.4

Ordering Information

Please specify the model/order number, name and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model	Name	Remarks
MT8862A	Wireless Connectivity Test Set	Main Unit
MT8862A-001	RF Frequency 2.4 GHz, 5 GHz*1	Requires Options
MX886200A	WLAN Measurement Software*2	Optional software, for IEEE 802.11b/g/a/n TRx evaluation
MX886200A-001	WLAN 802.11ac Option*3	Optional software, for IEEE 802.11ac TRx evaluation
MX886200A-002	WLAN 802.11ax Option*3	Optional software, for IEEE 802.11ax TRx evaluation
MX886200A-020	WLAN Security Function*3	Optional software, supports WEP, WPA-Personal, WPA2-Personal security

*1: Requires MT8862A; *2: Requires MT8862A-001; *3: Requires MX886200A