

# SURFACE VEHICLE STANDARD

**SAE** J551-12

REV.  
 SEP96

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Submitted for recognition as an American National Standard

## VEHICLE ELECTROMAGNETIC IMMUNITY—ON-BOARD TRANSMITTER SIMULATION

**Foreword**—This SAE Standard adopts, with only editorial changes, ISO DIS 11451-3: Road vehicles—Electrical disturbances by narrowband radiated electromagnetic energy—Vehicle test methods—Part 3: On-board transmitter simulation.

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## SAE J551-12 Revised SEP96

**1. Scope**—This part of SAE J551 specifies on-board transmitter simulation test methods and procedures for testing passenger cars and commercial vehicles. The electromagnetic disturbances considered in this part of SAE J551 are limited to continuous narrow band electromagnetic fields.

SAE J551-1 specifies general, definitions, practical use, and basic principles of the test procedure.

### 2. References

**2.1 Applicable Documents**—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J551-1—Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles and Devices (60 to 18 GHz)

SAE J551-2—Test Limits and Methods of Measurement of Radio Disturbance Characteristics of Vehicle, Motorboats, and Spark-Ignited Engine-Driven Devices Broadband, 30 kHz to 1000 MHz

**3. Test Conditions**—This test is performed in the laboratory or, where national regulations permit, at an Open Area Test Site (OATS).

**3.1 Test Temperature and Supply Voltage**—Heat is generated in the test facility when the vehicle is operated during the performance of the test. Sufficient cooling must be provided to ensure that the engine does not overheat.

The ambient temperature in the test facility shall be recorded if it is outside the range of  $23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ .

For tests that require the vehicle engine to be running, the electrical charging system shall be functional. For tests where the vehicle engine is not required to be running, the battery voltage shall be maintained above 12.2 V and 24.4 V for 12 V and 24 V systems, respectively.

**3.2 Frequency Range**—The frequency range of the test method is 1.8 to 1300 MHz.

**3.3 Modulation**—If a transmitter according to Table 1 is used, use the built-in modulation type. If alternate method of 4.2.1 is used and no values are agreed between the users of this document, then the following shall be used:

- a. No Modulation (CW)
- b. 1 kHz sine-wave amplitude modulation (AM) 80%

**3.4 Dwell Time**—At each frequency, the DUT shall be exposed to the test levels for the minimum response time needed to control the DUT. In all cases, this minimum time of exposure shall be as shown in Equation 1:

$$t_{\min} = 2\text{ s} \quad (\text{Eq.1})$$

**3.5 Frequency Steps**—Within the limitation of the equipment, the standard following maximum frequency step sizes applies as shown in Table 2.