

The test was performed per:
 PORTOWORLD LETTER of 08 SEPTEMBER 2019

DIVISION OF ELECTRICAL AND ELECTRONIC MEASUREMENTS

TEST REPORT

NO. 1991101051 of 15 OCTOBER 2019

SHIELDING EFFECTIVENESS TEST

Material Tested: Samples of 5G PROTECT EMR Shields 44×44 mm²

Table 1. Test Results

No.	S A M P L E	Signal Absorption percent		Shielding Effectiveness decibell	
		SA _{pw}	SA _m	SE _{pw}	SE _m
1	5G PROTECT EMR Shield, Sample 1	99.81	99.56	27.21	22.51
2	Same, Sample 2	99.71	99.51	25.38	23.10
3	Same, Sample 3	99.89	99.60	29.59	23.98
	Average for 5G Protect EMR Shields	99.80	99.56	26.99	23.57

CONCLUSION: *The samples tested possess satisfactory electromagnetic SE parameters in the test frequency range.*

TEST DESCRIPTION

1. The test per ASTM D4935, IEEE-STD-299, FED-STD-1037, MIL-STD-188-125A, MIL-STD-461C and MIL-STD-462. Test conditions: T=22°C, RH=36%, P=101.7 kPa. Test frequency 9.375 GHz
2. The magnitudes of the plane-wave shielding effectiveness (SE_{pw}) and the magnetic shielding effectiveness (SE_m) in the table above are the average from six test runs at each of the three test samples tested. The experimental error evaluated by the partial derivatives and least squares methods does not exceed 6%. The data on the standard deviation are kept on file at CIEMS.
3. The linear arrangement of the generator and receiver antennas and the test specimens meets the requirements of MIL-STD-188-125A and the EM Performance Test Plan CIEMS-3RFRT-393001.

(continued on page 2)

4. INSTRUMENTS AND DEVICES USED

- Signal Generator Model 8592B HP (50 MHz to 22 GHz)
 - Analyzer Model 8593E HP (9 kHz to 22 GHz)
 - Gunn Diode Microwave Transmitter Model WA-9314B PSC
 - Dual Preamplifier Model 8847F HP
 - Oscilloscope Model IO-4540 HK with Amplifier Model 8347A HP
 - Antennas: HP11968C, HP11966E, HP11966F and Dipole Antenna Set HP11966H
 - Magnetic Field Pickup Coil HP11966K, Active Loop H-Field HP11966A
 - Goniometer Model 3501-08 F-DM, Starrett Dial Indicator Model 25-109 (1.25 $\mu\text{m}/\text{div}$)
 - Digital Hygrothermometer Model 63-844 MI, Barometer Model 602650 SB.
5. The equipment meets the applicable NIST, ASTM, ASME, OSHA and State requirements and was calibrated with the standards traceable to the NIST. The calibration was performed per ANSI/ASQ M1-1996, ANSI/ASO/ASQ-Q9004-2008, ISO/IEC 17025:2005, ISO 10012:2003, MIL-STD-45662, MIL-I-45208, NAVAIR-17-35-MTL-1, and CSP-1/03-93.
6. The equipment passed a periodic accuracy test in June 2019. Next test – June 2020. The next half-year calibration of the linear and angular measure instruments and weights will be performed in December 2019.

TEST ENGINEER: 29

DIVISION MANAGER:

Cynthia Smythe

Cynthia L. Smythe
csmythe@ciems.com

© 2019 CIEMS

California Institute of Electronics and Materials Science carries a full responsibility for the test results this report contains. Authenticity of this report or any part thereof is to be verified by contacting CIEMS directly or by forwarding the report to CIEMS (info@ciems.com) with an attached listing of the report's parts that create doubts in their originality.

(CIEMS File Code: PORTOW1910)