



LIMESAR has been developed by **SATIMO** to measure liquid dielectric properties (complex permittivity and conductivity). The kit allows ensuring that properties of the liquid remain compliant over the time to the applicable standards. **LIMESAR** can be integrated to **OPENSAR SW**, which means that the last measured values can be automatically updated for further SAR measurements.

➤ Product category:

- Liquid measurement kit

➤ Function:

- Assess the dielectric properties of SAR and CTIA liquids

➤ User profile:

- SAR bench users

➤ Related standard:

- IEEE 1528; FCC OET Bulletin 65 (Ed. 97-01) supplement C; IEC 62209-1/ IEC 62209-2; EN 50361:2001; EN 50383

➤ Related software:

- OPENSAR and CALISAR

➤ Related equipment:

- SAR liquids, CTIA liquids

➤ Included equipment:

- Liquid measurement probe, RF cable, 3 bottles, 1 vice

➤ Additional required equipment:

- Vector Network Analyzer, SMA female calibration kit



- **LIMESAR** can be used with any Network Analyzer available on the market.
- **LIMESAR** probe can measure the entire frequency band up to 6 GHz.

LIMESAR IS COMPLIANT WITH THE APPLICABLE STANDARDS

1 The probe



- The contact probe is open-ended coaxial transmission line sections.
- It measures the reflection coefficient with respect to the open-circuit end, using a network analyzer.
- It is wide band.

2 The software

Frequency (MHz)	Epsilon'	Epsilon''	Signe (S/m)	IEC/IEEE Standard (Peak Load)
810.00	41.99	18.63	0.85	± Epsilon' 0.05 % ± Epsilon'' 0.05 %
820.00	41.92	18.87	0.86	± Epsilon' 0.05 % ± Epsilon'' 0.05 %
830.00	41.79	18.79	0.87	± Epsilon' 0.04 % ± Epsilon'' 0.05 %
840.00	41.67	18.92	0.88	± Epsilon' 0.04 % ± Epsilon'' 0.05 %
850.00	41.42	18.22	0.88	± Epsilon' 0.15 % ± Epsilon'' 0.05 %
860.00	41.46	18.09	0.91	± Epsilon' 0.15 % ± Epsilon'' 0.05 %
870.00	41.19	18.15	0.93	± Epsilon' 0.14 % ± Epsilon'' 0.05 %
880.00	41.28	18.15	0.94	± Epsilon' 0.13 % ± Epsilon'' 0.05 %
890.00	40.32	18.29	0.95	± Epsilon' 1.46 % ± Epsilon'' 0.16 %
900.00	40.91	18.33	0.97	± Epsilon' 1.41 % ± Epsilon'' 0.16 %
910.00	40.84	18.30	0.98	± Epsilon' 1.54 % ± Epsilon'' 0.16 %
920.00	40.84	18.40	0.99	± Epsilon' 1.56 % ± Epsilon'' 0.16 %
930.00	40.58	18.51	1.01	± Epsilon' 1.88 % ± Epsilon'' 0.17 %
940.00	40.32	18.60	1.02	± Epsilon' 2.48 % ± Epsilon'' 0.18 %
950.00	40.37	18.48	1.03	± Epsilon' 2.68 % ± Epsilon'' 0.17 %
960.00	40.08	18.54	1.04	± Epsilon' 2.78 % ± Epsilon'' 0.17 %
970.00	40.01	18.61	1.05	± Epsilon' 2.83 % ± Epsilon'' 0.17 %

- It includes information on calibration and parameters of the VNA for the applicable frequency band
- It determines the measurement value in function of the frequency
- It updates automatically the values in the OPENSAR SW or exports the values in a text file
- It gives directly the deviation from the target value in order to quickly verify that the liquid properties are within the acceptable range (IEC, IEEE, FCC.....)



PROBE CALIBRATION

- Calibration of the VNA in Short-Open-Load (less sensitive to phase error during liquid measurements)
- Calibration according to 2 standards: air and deionised water
- No short circuit is used