

Subject: The dielectric parameters of liquid
Date: Sun, 15 Sep 2002 00:48:54 +0900
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Dear Dennis,

Thanks for your quick and kindly advice.
I am Mr.Maeno, a responsible person of EMC Head Office Division.

I would like to explain the dielectric parameters of liquid.

1. Our Calibration Certificate'sheets require the following conditions
Permittivity 38.3 +/-5%
\$B! (J Conductivity 1.90 +/-10%
2. The requirement of Supplement C OET Bulletin 65(for Head)
Permittivity 39.2 +/-5%
\$B! (J Conductivity 1.80 +/-5%
+/-10% can be used when precise tissue recipes are not available.
3. Our measured result
Permittivity 36.9
Conductivity 1.98
- 3.1 The tolerance against the Certificate'sheet
Permittivity -3.7%
\$B! (J Conductivity +4.2%
Both parameters are within the specific tolerance.
- 3.2 The tolerance against OET Bulletin 65
Permittivity -5.9%
\$B! (J Conductivity +10.0%
Both parameters are within +/-10%.
4. The specification of the liquid in this test
Permittivity 37.7
\$B! (J Conductivity 1.89
The value of Permittivity already reaches -3.8%.
The value of Conductivity already reaches +5% limit of OET 65.

We can get only the liquid which is made by S&P company at this time.
Therefore I think the +/-10% rule will be applied.

Thanks and best regards,

Tetsuo Maeno
A-PEX International Co.Ltd.

The data of the liquid is as follows,
S&P company
Receipt of the liquid: July 24, 2002
HSL 2450
P/N: SL AHH 245 AA
CHARGE:020724_1-3

f(MHz) Permittivity Conductivity

2400	37.8	1.82
2450	37.7	1.89
2500	37.3	1.95

HI Kanako

The Sar number would be the w/kg number found to be worse case during measurements.

As to the dielectric parameters of the liquid, to some degree you can relax the permitivity, but the conductivity should be withing +/- 5%. Also, the temperature needs to be within +/-2 degrees C from the temperature where the dielectric was measured.

OET 65 states - It has been reported that a 5% tolerance in tissue parameters may not be easily achieved at certain frequencies. Under such circumstances, 10% tolerance may be used until more precise tissue recipes are available.

However, please remember that 2450MHz is a frequency given in the tissue parameter guide of 1528 draft 6.5

If any relaxation of tolerance is done, you need to explain why the results should be considered viable.

Thanks
Dennis