

Appendix E Measured Fluid Dielectric Parameters

Operator: Ti tle: Ti me: 16: 30: 42 Date: 12/12/16 Comments: Program=3601 Sweep mode=2050 Number of points=100 Start Frequency=2400000000.000000 Stop Frequency=2500000000.000000 Data Sensitivity=1 e' ' frequency data sens 1.479882 52.046103 14.348244 2400000000 14.348491 1.479442 52.054583 2401010101 2402020202 52.048391 14.367058 1.479685 2403030303 52.050285 14. 367999 1.479385 2404040404 52.044896 14.363056 1.479087 52.038027 1.479195 2405050505 14. 374968 1.47904 52.026028 14. 370732 2406060606 14. 36648 14. 371041 14. 378554 14. 383862 2407070707 52.01407 1.478883 2408080808 52.013108 1.478717 52.015807 2409090909 1. 47855 52.008252 1.478524 2410101010 2411111111 52.008034 14. 395012 1.478495 14.392978 1.478196 2412121212 52.006358 2413131313 52.01204 14.396792 1.47789 2414141414 51. 998678 14. 409412 1.478138 52.004347 14.413194 1.477836 2415151515 2416161616 52.002719 14.411146 1.477536 2417171717 51.995256 14. 416407 1.47751 51. 993635 14.414326 2418181818 1. 477211 2419191919 51.993524 14. 425423 1.47718 1.476882 2420202020 51. 991911 14. 423348 51.974987 14.433001 1.477132 2421212121 51. 98289 242222222 14. 426474 1. 476559 51.973297 2423232323 14. 426977 1.476465 2424242424 51.968816 14. 428529 1.476303 14. 417964 51. 982951 51. 982557 2425252525 1.475522 2426262626 14. 425748 1.47542 51.978467 14. 430594 1.475326 2427272727 2428282828 51.978753 14. 429926 1.475026 2429292929 51.956873 14.453469 1.475683 2430303030 51. 959667 14.445813 1.475185 51.956723 2431313131 14. 445521 1. 474952 51.972792 14.451328 1.474506 2432323232 2433333333 51.96037 14.455486 1.47455 2434343434 51.976826 14.464536 1.474172 51.967318 2435353535 14. 465019 1. 47408 51.955314 14.472397 1.474193 2436363636 51.968024 1.473484 14.463554 2437373737 51. 954235 14.469518 2438383838 1.473594 2439393939 51.952485 14.479 1.473566 2440404040 51.955364 14. 471321 1.473064 51.965227 14.466138 1.472488 2441414141 1. 472322 2442424242 51.962755 14.469082 2443434343 51.950557 14.488121 1.472702 51.957886 14.489844 1.472335 2444444444 2445454545 51.943105 14.500892 1.472582 51.966064 2446464646 14.494068 1. 471733

51.949359

51.945492

51.94083

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1.471643

1.471549

1.471321

14.488756

14.491618

14.49345

2.45 Body fluid 2450505051 51.939756 14.519249 1.471692 2451515152 51.951044 14. 512159 1.471054 51.956255 14.509139 1.470616 2452525253 51.933602 14.522788 2453535354 1.471068 51.949794 14.528317 2454545455 1.470628 14. 523221 245555556 51.944786 1.470332 1. 469895 51.950011 14. 520143 2456565657 51.94377 1.470001 2457575758 14. 531773 2458585859 51.933474 14.510684 1.469445 51.921556 2459595960 14. 529612 1.469821 51.944314 14.53429 1.469243 2460606061 2461616162 51. 936488 14. 532863 1.469082 51. 936019 14.537091 2462626263 1. 468918 51.923714 2463636364 14. 526221 1.46863 51.927356 14.510022 1.467929 2464646465 14. 543226 2465656566 51.933891 1.468289 2466666667 51. 923189 14.545437 1.46827 51.924788 2467676768 14. 53943 1.467839 51. 928058 2468686869 14. 546491 1. 467671 51. 936186 2469696970 14.539675 1.467102 51.919078 2470707071 14.542691 1.467214 2471717172 51.915826 14.550525 1.467187 51. 915427 2472727273 14.554707 1. 467025 51.918722 2473737374 14.561732 1. 466858 2474747475 51.920355 14.555717 1.466428 2475757576 51.926529 14.559048 1.466125 51.925338 2476767677 14.556703 1.465828 2477777778 51.920163 14. 574722 1.466066 51.911601 1.465779 2478787879 14. 566675 2479797980 51. 916121 14.556929 1.465212 51.906482 2480808081 14.565592 1.465319 51.899795 14. 558949 2481818182 1.465029 51.901346 14.564476 2482828283 1.464863 2483838384 51.887187 14. 56379 1.464843 14.577213 51.891428 2484848485 1.46481 2485858586 51.896362 14. 570729 1.464312 2486868687 51.884096 14. 571454 1. 464289 1.464127 2487878788 51.881997 14. 574117 14.571708 2488888889 51.880891 1.463833 14.573401 2489898990 51.873732 1.46374 14.575203 2490909091 51.878156 1. 463441 14.581008 2491919192 51.864942 1.463552 2492929293 51.855523 14.578014 1.463397 2493939394 51.857709 14.575141 1.463034 2494949495 51.844108 14. 577687 1. 463078 2495959596 51. 8411 14. 585398 1.463051 51.83442 2496969697 14.590314 1.463026 14. 586784 14. 593172 2497979798 51.816728 1.463009 2498989899 51. 823492 1. 462776 14.591715 2500000000 51.827546 1.462411 Operator: Title:

Ti me: 11: 33: 29 Date: 11/30/16 Comments:

Program=3601 Sweep mode=2050 Number of points=100 Start Frequency=240000000.000000 Stop Frequency=2500000000.000000 Data Sensitivity=1

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2401010101	35. 763713	12. 390278	1. 903663
2402020202	35. 732719	12. 381081	1. 904225
2403030303	35. 707571	12. 362328	1. 904226
2404040404	35. 707324	12. 376806	1. 904192
2405050505	35. 707894	12. 385505	1. 903936
2406060606	35. 720096	12. 385486	1. 902887
2407070707	35. 73688	12. 405376	1. 902273
2408080808	35. 75323	12. 407419	1. 901109
2409090909	35. 730603	12. 402431	1. 901435
2410101010	35. 708402	12. 394502	1. 901653
2411111111	35. 68871	12. 389892	1. 901868
2412121212	35. 678974	12. 388181	1. 901737
2413131313	35. 689959	12. 396815	1. 901023
2414141414	35. 70468	12. 410426	1. 900304
2415151515	35. 716098	12. 426518	1. 899811
2416161616	35. 729968	12. 425195	1. 898653
2417171717	35. 726461	12. 421419	1. 898179
2418181818	35. 686559	12. 424332	1. 899523
2419191919	35. 664002	12. 40897	1. 899524
2420202020	35. 659713	12. 410955	1. 899274
2421212121	35. 65958	12. 425353	1. 89924
242222222	35. 676755	12. 421521	1. 897859
2423232323	35. 694018	12. 438347	1. 897135
2424242424	35. 705481	12. 454358	1. 896644
2425252525	35. 68544	12. 442371	1. 896637
2426262626	35. 66463	12. 436135	1. 896851
2427272727	35. 646319	12. 433198	1. 897063
2428282828	35. 630507	12. 433559	1. 897272
2429292929	35. 630356	12. 427269	1. 896578
2430303030	35. 63732	12. 444059	1. 896311
2431313131	35. 648763	12. 449699	1. 895492
2432323232	35. 658129	12. 449152	1. 894563
2433333333	35. 654409	12. 468861	1. 894861
2434343434	35. 636082	12. 455649	1. 894745
2435353535	35. 620288	12. 445705	1. 894622
2436363636	35. 60908	12. 445222	1. 894602
2437373737	35. 607371	12. 450462	1. 894351
2438383838	35. 610189	12. 454863	1. 893873
2439393939	35. 615898	12. 459656	1. 893281
2440404040	35. 625344	12. 469361	1. 892684
2441414141	35. 629813	12. 472508	1. 892095
2442424242	35. 611168	12. 462217	1. 892085
2443434343	35. 602561	12. 475276	1. 892391
244444444	35. 591781	12. 471919	1. 892264
2445454545	35. 581027	12. 468555	1. 892135
2446464646	35. 585986	12. 479058	1. 891765
2447474747	35. 591262	12. 476424	1. 890956
2448484848	35. 592969	12. 489416	1. 890808
2449494949	35. 587513	12. 479458	1. 890235

Page 1

2.45 head fluid 35.580995 2450505051 12.48838 1.890317 2451515152 35. 57392 12.479661 1.889856 12.479951 2452525253 35.568579 1.889609 2453535354 35. 553064 12.490579 1.890143 2454545455 35. 560069 12.496916 1.889554 245555556 35.569492 12.496274 1.888632 35.559285 12.500306 2456565657 1.888719 35.558846 12.496854 2457575758 1.88814 2458585859 35.549515 12.50537 1.888335 12.49742 2459595960 35. 548221 1.887649 35.539201 12.492823 1.887408 2460606061 2461616162 35. 533623 12.5062 1.887598 35. 536548 12.510496 1.887125 2462626263 2463636364 35. 534615 12. 518523 1.886984 12.518037 35. 523598 2464646465 1.886965 12.516574 2465656566 35.527311 1.886272 12.515608 2466666667 35. 523676 1.885914 2467676768 35. 516419 12.519985 1.885889 2468686869 35. 515273 12. 52225 1.885531 12.515924 2469696970 35. 515269 1.884843 2470707071 35. 50431 12.515436 1.884822 2471717172 35. 505292 12.523791 1.884569 2472727273 12.528918 35. 503788 1. 884319 12.526693 2473737374 35.5018 1. 883853 2474747475 35.499824 12.524465 1.883386 2475757576 35.504068 12.530321 1.88291 2476767677 35. 495128 12.525734 1.882671 2477777778 35. 486451 12. 54152 1.883082 35. 480745 12.534435 2478787879 1.882624 2479797980 35. 47681 12.536295 1.882377 2480808081 35. 481074 12.542129 1.881902 2481818182 35. 480367 12. 541511 1.881435 35.473957 12.540143 2482828283 1.881192 2483838384 35. 469299 12.547706 1.881163 35. 457182 12.545596 2484848485 1.881147 35. 462944 12.53998 2485858586 1.880238 35. 455829 1.880211 2486868687 12.544323 2487878788 35. 443737 12.542213 1.880195 35. 441316 12.532644 1.879515 2488888889 12. 528277 2489898990 35. 445485 1.878716 12.531372 2490909091 35.440004 1.878579 2491919192 35. 425458 12. 526056 1.878565 2492929293 35.418745 12.527522 1.878432 2493939394 35. 409551 12.525786 1.878303 2494949495 35. 4103 12. 536889 1. 878159 2495959596 35. 413014 12.543913 1.877798 35. 413617 2496969697 12.544875 1.877331 2497979798 35. 40621 12.55204 1.877414 2498989899 12.553707 35. 412511 1.876724 2500000000 35. 403878 12. 559268 1.876808 Operator:
Title:
Time: 16: 21: 16
Date: 12/12/16
Comments:

Program=3601
Sweep mode=20
Number of poi
Start Frequency
Stop Frequency
Data Sensitiv
frequency
5700000000
5701006711

Program=3601 Sweep mode=2050 Number of points=150 Start Frequency=5700000000.000000 Stop Frequency=5850000000.000000 Data Sensitivity=1

data sens 50.616968 18.988211 5700000000 1.51429 18.992649 1.514549 5701006711 50.603211 5702013423 50.596434 18.985937 1.51446 1.514703 5703020134 50.600856 18.991484 5704026846 50. 611699 19.009039 1.515302 50.600323 18. 997514 5705033557 1. 515089 50. 585581 19.013925 1.515718 5706040268 5707046980 50.606311 19.020089 1.515948 5708053691 50.604516 19.004367 1.51557 1.515813 19.009861 5709060403 50.606653 19.011959 1.516036 50.585402 5710067114 5711073826 50.594538 19.017618 1.516276 19.009464 5712080537 50.606518 1.516088 5713087248 50.596395 19.026193 1.516715 5714093960 50.604647 19.050583 1.517539 19.040613 5715100671 50.630723 1.517268 5716107383 50. 592367 19.058566 1.518015 5717114094 50.608147 19.07378 1.518538 1.517674 5718120805 50.644434 19.045504 5719127517 50.598396 19.079687 1.518925 5720134228 50. 599051 19.063653 1.51855 1.519112 50.582084 19.077734 5721140940 5722147651 50. 616626 19. 03751 1.517887 19.052023 5723154362 50.60437 1.518427 5724161074 50.622578 19.065098 1.518876 50. 597151 19.053016 5725167785 1.518684 50.576767 1.518391 5726174497 19.038676 1.518642 19.047978 5727181208 50.616408 5728187919 50.631058 19.030613 1.518169 5729194631 50.621134 19.045081 1.51872 5730201342 50.612908 19.07351 1.519716 50.629702 19.062996 5731208054 1. 51946 5732214765 50.616004 19.053817 1.519305 1.519946 5733221477 50.596661 19.070102 1. 519329 1. 519725 5734228188 50.609326 19.047661 5735234899 50. 604327 19. 057641 1. 520621 5736241611 50. 61265 19.084439 50.617216 5737248322 19.08525 1.520745 19.06209 1.520156 5738255034 50.608771 5739261745 50.628264 19.108235 1.521586 5740268456 50. 622571 19.068646 1.52052 50.627209 5741275168 19.07663 1. 520816 5742281879 50.622218 19.084146 1. 52116 1. 521165 1. 521103 5743288591 50.603636 19.079326 5744295302 50.620368 19.07587 1. 521528 5745302013 50.605916 19.085456 19.086667 5746308725 50.622399 1. 52162 50.625373 19.071044 1.521228 5747315436 5748322148 50.618164 19.078538 1. 52156 5749328859 50. 626968 19.095949 1.522167

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5758389262	50. 609358	19. 087022	1. 522788 1. 522608 1. 522323 1. 523264 1. 52291 1. 522577 1. 52275 1. 522221 1. 522045 1. 52232 1. 523198 1. 522391 1. 522626 1. 52333 1. 52281 1. 522529 1. 524228 1. 523123 1. 52362 1. 52362 1. 523864 1. 523528 1. 523864 1. 524272 1. 525367 1. 525367 1. 525367 1. 525377 1. 525377 1. 525777 1. 524375 1. 525777 1. 525777 1. 524375 1. 525777 1. 524375 1. 525777 1. 524375 1. 525777 1. 524375 1. 5257461 1. 525733 1. 526163 1. 52571 736 1. 526449 1. 527333 1. 52745 1. 527333 1. 52745 1. 527775 1. 527775 1. 527775 1. 527775 1. 527775 1. 528163 1. 527775 1. 528163 1. 527157 1. 527775 1. 528163 1. 529132 1. 52818 1. 529132 1. 52818
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5766442953	50. 600401	19. 037828	
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5772483221	50. 603215	19. 044072	
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5774496644	50. 620823	19. 086329	
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5843959732	50. 546046	19. 21851	1. 535252
5844966443	50. 53387	19. 237597	1. 535994

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Operator:
Ti tle:
Ti me: 11: 23: 24
Date: 11/29/16
Comments:
Program=3601
Sweep mode=2050
Number of points=100
Start Frequency=5700000000.000000
Stop Frequency=5800000000.000000
Data Sensitivity=1
frequency
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36.877037

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36.86044

36. 90188

data sens 15. 949242 1.506921 15.936009 1. 506386 15.94401 1.506951 15. 936926 1.506716 15.919327 1.506216 15.945712 1.506969 15.951831 1.507404 15. 947911 1.507227 15.940586 1.506646 15.965105 1.508019 15.961652 1.507677 15.942073 1.507364 15.951417 1.507917 15.944017 1.507344 15.916272 1.50633 15.927271 1.506692 15.961598 1.508251 15.925826 1.506732 15.970376 1.508519 15.969328 1.508939 15.966677 1.508491 15. 92721 1.506978 15.960485 1.508259 15.970646 1.508751 15.943937 1.507823 15.948446 1.507984 15.977678 1.508898 15.972235 1.50909 15. 97051 1.5094 15.971682 1.50909 15. 97643 1.509522 15.960103 1.508591 15.954342 1.508585 15.970446 1.509432 1. 509144 15.970146 15. 977583 1.509467 15.969836 1.509151 16.003325 1.510538 15.980912 1.509588 15.980136 1.509794 15. 994878 1.510314 15.981401 1.509706 15.980835 1.510003 15.973243 1.509765 15.973409 1.509802 15.980787 1.509954

Page 1

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1.509972

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