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## PART 0 SAR CHAR REPORT

Applicant Name:

Samsung Electronics Co., Ltd. 129, Samsung-ro, Maetan dong, Yeongtong-gu, Suwon-si Gyeonggi-do, 16677, Korea

#### Date of Testing: 02/16/22 – 03/07/22 Test Site/Location: PCTEST Lab, Columbia, MD, USA Document Serial No.: 1M2202030012-06.A3L

## FCC ID:

## A3LSMS901E

# **APPLICANT:**

## SAMSUNG ELECTRONICS CO., LTD

Report Type: Application Type: DUT Type: Model(s): Permissive Change(s) Date of Original Certification: Part 0 SAR Characterization Class II Permissive Change Portable Handset SM-S901E/DS, SM-S901E See FCC Change Document 01/04/2022

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Test results reported herein relate only to the item(s) tested.

Randy Ortanez President



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## 1 DEVICE UNDER TEST

### 1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 66 (AWS)	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n5 (Cell)	Voice/Data	826.5 - 846.5 MHz
NR Band n66 (AWS)	Voice/Data	1712.5 - 1777.5 MHz
NR Band n25 (PCS)	Voice/Data	1852.5 - 1912.5 MHz
NR Band n2 (PCS)	Voice/Data	1852.5 - 1907.5 MHz
NR Band n41	Voice/Data	2506.02 - 2679.99 MHz
NR Band n77 DoD	Voice/Data	3455.01 - 3544.98 MHz
NR Band n77	Voice/Data	3705 - 3975 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
U-NII-4	Voice/Data	5845 - 5885 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

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This device uses the Qualcomm<sup>®</sup> Smart Transmit feature to control and manage transmitting power in real time and to ensure the time-averaged RF exposure is in compliance with the FCC requirement at all times for 2G/3G/4G/5G WWAN operations. Additionally, this device supports WLAN/BT/NFC technologies, but the output power of these modems is not controlled by the Smart Transmit algorithm.

### 1.2 Time-Averaging for SAR

This device is enabled with Qualcomm<sup>®</sup> Smart Transmit algorithm to control and manage transmitting power in real time and to ensure that the time-averaged RF exposure from 2G/3G/4G/5G Sub-6 NR WWAN is in compliance with FCC requirements. This Part 0 report shows SAR characterization of WWAN radios for 2G/3G/4G/5G Sub-6 NR. Characterization is achieved by determining P<sub>Limit</sub> for 2G/3G/4G/5G Sub-6 NR that corresponds to the exposure design targets after accounting for all device design related uncertainties, i.e., SAR\_design\_target (< FCC SAR limit) for sub-6 radio. The SAR characterization is denoted as SAR Char in this report. Section 1.3 includes a nomenclature of the specific terms used in this report.

The compliance test under the static transmission scenario and simultaneous transmission analysis are reported in Part 1 report. The validation of the time-averaging algorithm and compliance under the dynamic (time-varying) transmission scenario for WWAN technologies are reported in Part 2 report (report SN could be found in Section 1.4 - Bibliography).

Technology	Term	Description
	Plimit	Power level that corresponds to the exposure design target (SAR design target) after accounting for all device
00/00/40/50		design related uncertainties
2G/3G/4G/5G	P <sub>max</sub>	Maximum tune up output power
Sub-0 INK	SAR_design_target	Target SAR level < FCC SAR limit after accounting for all
		device design related uncertainties
	SAR Char	Table containing <i>Plimit</i> for all technologies and bands

### 1.3 Nomenclature for Part 0 Report

### 1.4 Bibliography

Report Type	Report Serial Number
RF Exposure Part 1 Original Test Report	1M2109290114-01.A3L (Rev2)
RF Exposure Part 1 Test Report	1M2202030012-05.A3L
RF Exposure Part 2 Test Report	1M2202030012-07.A3L
RF Exposure Compliance Summary Report	1M2202030012-08.A3L

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## **2** SAR AND POWER DENSITY MEASUREMENTS

### 2.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density ( $\rho$ ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 2-1).

Equation 2-1 SAR Mathematical Equation

SAP =	d	dU	$-\frac{d}{d}$	dU
SAN -	dt	dm)	$-\overline{dt}$	$\left( \overline{\rho dv} \right)$

#### SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

σ	=	conductivity of the tissue-simulating material (S/m)
ρ	=	mass density of the tissue-simulating material (kg/m <sup>3</sup> )
E	=	Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

### 2.2 SAR Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013:

- 1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 2-1) and IEEE 1528-2013.
- 2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.



Figure 2-1 Sample SAR Area Scan

3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume

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size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 2-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):

a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 2-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).

b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points ( $10 \times 10 \times 10$ ) were obtained through interpolation, in order to calculate the averaged SAR.

c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

<b>-</b>	Maximum Area Scan	Maximum Zoom Scan	Maximum Zoom Sca n Resolution (m		Maximum Zoom Scan Spatial		Minimum Zoom Scan
Frequency Resolution (mm) (Δx <sub>area</sub> , Δy <sub>area</sub> )		(Δx <sub>200m</sub> , Δy <sub>200m</sub> )	Uniform Grid	G	raded Grid	(x,y,z)	
			∆z <sub>zoom</sub> (n)	$\Delta z_{zoom}(1)^*$	Δz <sub>zoom</sub> (n>1)*		
≤2 GHz	≤ 15	≤8	≤ 5	≤4	$\leq 1.5^*\Delta z_{zoom}(n-1)$	≥ 30	
2-3 GHz	≤ 12	≤ 5	≤ 5	≤4	≤ 1.5*Δz <sub>zoom</sub> (n-1)	≥ 30	
3-4 GHz	≤12	≤ 5	≤ 4	≤3	$\leq 1.5^*\Delta z_{zoom}(n-1)$	≥ 28	
4-5 GHz	≤ 10	≤ 4	≤3	≤2.5	$\leq 1.5^*\Delta z_{zoom}(n-1)$	≥ 25	
5-6 GHz	≤ 10	≤ 4	≤2	≤2	$\leq 1.5^*\Delta z_{zoom}(n-1)$	≥ 22	

Table 2-1 Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04\*

\*Also compliant to IEEE 1528-2013 Table 6

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## **3** SAR CHARACTERIZATION

### 3.1 DSI and SAR Determination

This device uses different Device State Index (DSI) to configure different time averaged power levels based on certain exposure scenarios. Depending on the detection scheme implemented in the smartphone, the worst-case SAR was determined by measurements for the relevant exposure conditions for that DSI. Detailed descriptions of the detection mechanisms are included in the operational description.

When 1g SAR and 10g SAR exposure comparison is needed, the worst-case was determined from SAR normalized to 1g or 10g SAR limit.

The device state index (DSI) conditions used in Table 3-1 represent different exposure scenarios.

DSI and Corresponding Exposure Scenarios						
Scenario	Description	SAR Test Cases				
Head (DSI = 2)	<ul> <li>Device positioned next to head</li> <li>Receiver Active</li> </ul>	Head SAR per KDB Publication 648474 D04				
Hotspot mode (DSI = 3)	<ul> <li>Device transmits in hotspot mode near body</li> <li>Hotspot Mode Active</li> </ul>	Hotspot SAR per KDB Publication 941225 D06				
Phablet Grip (DSI=1 or 4)	<ul> <li>Device is held with hand and grip sensor is triggered</li> <li>Grip sensor triggered or earjack is active</li> </ul>	Phablet SAR per KDB Publication 648474 D04 & KDB Publication 616217 D04				
Phablet (DSI = 0)	<ul> <li>Device is held with hand and grip sensor is not triggered</li> <li>Distance grip sensor not triggered</li> </ul>	Phablet SAR per KDB Publication 648474 D04 & KDB Publication 616217 D04				
Body-worn (DSI = 0)	<ul> <li>Device being used with a body-worn accessory</li> </ul>	Body-worn SAR per KDB Publication 648474 D04				

Table 3-1 DSI and Corresponding Exposure Scenarios

## 3.2 SAR Design Target

SAR\_design\_target is determined by ensuring that it is less than FCC SAR limit after accounting for total device designed related uncertainties specified by the manufacturer (see Table 3-2).

Table 3-2           SAR_design_target Calculations						
SAR_design_target						
SAR_design_target< SAR_regulatory_limit $\times 10^{\frac{-Total Uncertainty}{10}}$						
1g SAR 10g SAR (W/kg) (W/kg)						
Total Uncertainty	1.0 dB	Total Uncertainty	1.0 dB			
SAR_regulatory_limit	1.6 W/kg	SAR_regulatory_limit	4.0 W/kg			
SAR_design_target	1.0 W/kg	SAR_design_target	2.5 W/kg			

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### 3.3 SAR Char

SAR test results corresponding to *Pmax* for each antenna/technology/band/DSI can be found in Appendix A.

*Plimit* is calculated by linearly scaling with the measured SAR at the Ppart0 to correspond to the *SAR\_design\_target*. When *Plimit < Pmax*, *Ppart0* was used as Plimit in the Smart Transmit EFS. When *Plimit > Pmax* and *Ppart0*=Pmax, calculated *Plimit* was used in the Smart Transmit EFS. All reported SAR obtained from the Ppart0 SAR tests was less than *SAR\_Design\_target*+1 dB Uncertainty. The final *Plimit* determination for each exposure scenario corresponding to *SAR\_design\_target* are shown in Table 3-3.

Device State Index (DSI)	PLimit Determination Scenarios
0	<ul> <li>The worst-case SAR exposure is determined as maximum SAR normalized to the limit among:</li> <li>1. Body Worn SAR</li> <li>2. Extremity SAR measured at 9, 7 and 13 mm spacing for back, front, bottom respectively</li> <li>3. Extremity SAR measured at 0 mm for top, left, and right surfaces</li> </ul>
1 or 4	<i>Plimit</i> is calculated based on 10g Extremity SAR at 0 mm for back, front, top bottom, right and left surfaces
2	Plimit is calculated based on 1g Head SAR
3	Plimit is calculated based on 1g Hotspot SAR at 10 mm

Table 3-3 PLimit Determination

#### Note:

For DSI = 0,  $P_{limit}$  is calculated by:

 $P_{limit} = \min\{P_{limit} \text{ corresponding to 1g Body Worn SAR evaluation at 15 mm spacing,}\}$ 

 $P_{limit}$  corresponding to 10g Extremity SAR evaluation at 7~13 mm spacing,

*P*<sub>*limit*</sub> corresponding to 10g Extremity SAR evaluation at 0 mm for top, left, & right surfaces}

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Table 3-4 SAR Characterizations

Exposure Senario			Body-Worn	Phablet Max	Phablet Reduced	Head	Hotspot	Earjack	Maximum
Averaging Volume			1g	10g	10g	1g	1g	10g	Tune-Up Output
			15 mm	9, 7, 13, 0 mm	0 mm	0 mm	10 mm	0 mm	Power*
Spacing			2						-
DSI		• .	0	0	I	2	3	4	
Technology/Band	Antenna	Group							Pmax
GSM 850	Δ		20	<del>9</del> .0	28.9	29.6	27.1	28.9	25.3
GSM 1900	Δ	A (0)	24	5.8	17.8	30.4	17.8	17.8	22.5
LIMTS 850	Δ	A (0)	28	8.0	25.5	29.1	25.5	25.5	24.5
UMTS 1750	A	AGO	24	5.2	19.0	30.7	19.0	19.0	23.0
UMTS 1900	A	AGO	20	5.1	19.0	31.2	19.0	19.0	23.7
LTE Band 12/17	A	AGO	28	8.8	27.0	33.7	27.0	27.0	23.5
LTE Band 13	A	AG0	29	9.8	26.5	31.0	26.5	26.5	23.5
LTE Band 26/5 (Cell)	A	AG0	29	9.2	25.7	29.9	25.7	25.7	23.0
LTE Band 66/4 (AWS)	А	AG0	26.1		18.3	30.8	18.3	18.3	22.8
LTE Band 4 (AWS)	F	AGI	21.2		21.2	16.0	16.0	21.2	21.0
LTE Band 25/2 (PCS)	А	AG0	20	5.7	18.0	30.6	18.0	18.0	22.5
LTE Band 41 (PC3)	В	AG0	20	5.2	20.0	34.7	20.0	20.0	22.0
LTE Band 41 (PC2)	В	AG0	20	5.2	20.0	34.7	20.0	20.0	21.9
NR Band n5 (Cell)	Α	AG0	28	8.4	26.0	30.6	26.0	26.0	23.0
NR Band n66 (AWS)	Α	AG0	24	4.6	20.0	30.2	20.0	20.0	24.0
NR Band n66 (AWS)	F	AGl	22	2.1	22.1	18.0	22.1	22.1	22.0
NR Band n25/2 (PCS)	А	AG0	24	4.7	18.5	30.8	18.5	18.5	23.5
NR Band n41 SRS 1	F	AGl	18	8.0	18.0	18.0	18.0	18.0	24.0
NR Band n41 SRS 2	В	AG0	14	4.0	14.0	14.0	14.0	14.0	20.0
NR Band n41 SRS 3	Е	AGl	13	3.0	13.0	13.0	13.0	13.0	19.0
NR Band n41 SRS 4	D	AG0	10	0.5	10.5	10.5	10.5	10.5	16.5
NR Band n77 DoD SRS 1	G	AGl	17	7.5	17.5	13.0	17.5	17.5	23.5
NR Band n77 DoD SRS 2	С	AG0	13	3.0	13.0	13.0	13.0	13.0	19.0
NR Band n77 DoD SRS 3	Н	AGl	15	5.5	15.5	11.0	15.5	15.5	21.5
NR Band n77 DoD SRS 4	D	AG0	13	3.0	13.0	13.0	13.0	13.0	19.0
NR Band n77 SRS 1	G	AGl	17	7.5	17.5	13.0	17.5	17.5	23.5
NR Band n77 SRS 2	С	AG0	13	3.0	13.0	13.0	13.0	13.0	19.0
NR Band n77 SRS 3	Н	AGI	15	5.5	15.5	11.0	15.5	15.5	21.5
NR Band n77 SRS 4	D	AG0	13	3.0	13.0	13.0	13.0	13.0	19.0

#### Notes:

- For all modes/bands, when Hotspot Mode (DSI=3) and Extremity sensor (DSI=1) are triggered at the same time, DSI=3 takes priority, thus the *P*<sub>limit</sub> for DSI=3 is set to be less or equal to *P*<sub>limit</sub> for DSI=1.
- 2. When  $P_{max} < P_{limit}$ , the DUT will operate at a power level up to  $P_{max}$ .
- 3.  $P_{limit}$  for DSI=1 and DSI =4 are the same.
- 4. For all bands on AG1, when RCV is active, DSI=2 takes priority over all levels.

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## 4 EQUIPMENT LIST

#### For SAR measurements

Manufacture r	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	E44048	Spectrum Analyzer	N/A	N/A	N/A	MY45113242
1	544300	550 Vertex Clear I One enters	2/44/2022	Annual	2/44/2022	10/12/02/22/05
Agilent	E4438C	ESG Vector Signal Generator	2/14/2022	Annual	2/14/2023	MY42082385
Agilent	E4438C	ESG Vector Signal Generator	12/20/2021	Biennial	12/20/2022	MY45090700
Agilant	NE1 93 A	MVC Vector Signal Conceptor	6/34 /3034	Annual	6/34/2022	10/47/20002
Agreen	NOIGEA	www.vector.signal.denerator	9/21/2021	Annual	9/21/2022	11114/420003
Agilent	N5182A	MXG Vector Signal Generator	6/15/2021	Annual	6/15/2022	MY47420800
Agilant	875.2EC	S-Parameter Vector Network Analyzer	2/11/2022	Annual	2/11/2028	MM40003841
Agreen	8/3363	3-Parameter vector Network Analyzer	411/2022	Annual	411/2023	11140003041
Agilent	8753ES	S-Parameter Vector Network Analyzer	12/17/2021	Annual	12/17/2022	MY40000670
Agilent	E55150	Wireless Communications Test Set	5/6/2021	Annual	5/6/2022	GB 44400850
					JU OF LOLL	00-11-00000
Agilent	E5515C	Wireless Communications Test Set	1/14/2020	Triennial	1/14/2023	GB43304447
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB45170454
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Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433974
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433972
Ancitas	10.0051	Down shietor	4/34/3034	Annual	4/24/2022	1251001
Annicsu	IVIL2490A	Powertweter	4/21/2021	Annual	4/21/2022	1331001
Anritsu	ML2496A	Power Meter	2/11/2022	Annual	2/11/2023	1405003
Anritsu	MA2411B	Pulse Power Sensor	9/21/2021	Annual	9/21/2022	1339008
Annicad	10024110	Fulse Forwer Selisor	3/21/2021	Annual	3/21/2022	100000
Anritsu	MA2411B	Pulse Power Sensor	8/10/2021	Annual	8/10/2022	1207364
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	9/26/2021	Annual	9/26/2022	6201524637
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	8/10/2021	Annual	8/10/2022	6262150000
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	5/21/2021	Annual	5/21/2022	6201144419
Anritsu	MT8821C	Radio Communication Analyzer MT8821C	4/14/2021	Annual	4/14/2022	6261895213
Anritsu	MT8000A	Radio Communication Test Station	8/2/2021	Annual	8/2/2022	6272337439
Ancitau	MT8000A	Padio Communication Test Station	8/2/2021	Annual	e/2/2022	6777227429
Amritisu	IVIT BUUUA	kaulo communication resustation	0/2/2021	Annual	9/2/2022	02/200/408
Anritsu	MT8000A	Radio Communication Test Station	8/2/2021	Annual	8/2/2022	6272337436
Apritor	MA2/105A	USB Power Sensor	10/20/2021	Annual	10/20/2022	1344545
6011620	100004100M	0.00 1 000 01 3011301	24 24 2021	en lugi	19 20/ 2022	204040
Anritsu	MA24105A	USB Power Sensor	9/20/2021	Annual	9/20/2022	1349511
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670623
Control Common	4253	Long Stom Theorematics	10/35/2020	Plan alal	10/28/2022	2006200233
control company	4555	Long Scem i hermometer	10/28/2020	orennia	10/28/2022	2000/0655
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670635
Control Company	4040	Therm / Clock/ Humiditut tenitor	2/28/2040	Rigginial	CPT	1701 54977
control company	4040	menny clock humany wonitor	420/2010	biennia	CDI	1/01318/2
Control Company	4040	Therm./ Clock/ Humidity Monitor	2/28/2018	Biennial	CBT	170151893
Control Company	4040	Therm / Clock/ Humidity Monitor	2/23/2021	Annual	2/23/2022	16057/018
control company	4040	menny clock namary wonter	423/2021	Annual	423/2022	1000/4410
Keysight Technologies	N 6705B	DC Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	3/4/2022	Annual	3/4/2023	US46470561
inclusion in the second second second	1157207				3/ 4/ 2023	
MCL	BW-N6W5+	6d B Attenuator	CBT	N/A	CBT	1139
Mini-Circuits	VLF-6000+	Low Pass Filter DC to 6000 MHz	CBT	N/A	CBT	N/A
A fini diamite	10.5 0000	Law Dava Silas - Dit as CORD & Lin	7/5/2024	Annual	7/6/2022	24.624
Mini-circuits	VLF-6000+	LOW Pass Filter DC to 6000 MHZ	//6/2021	Annual	7/6/2022	51654
Mini-Circuits	BW-N 20W5+	DC to 18GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CRT	N /A
Wint-circuits	NUP-1200F	LOW Pass Filter DC to 1000 MHz	CDI	N/A	CDI	N/A
Mini-Circuits	N LP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	B\A6N20\A/5	Power Attenuator	CBT	N/A	CRT	1226
Winn- cir cur c	010-1120110	ForerAttendator	COI	IN/A	001	1220
Mini-Circuits	ZUDC10-83-5+	Directional Coupler	CBT	N/A	CBT	2050
			001			
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Nard a Nard a	4772-3 BW-S3W2	Atten uator (3dB) Atten uator (3dB)	CBT	N/A N/A	CBT CBT	9406
Nard a Nard a Rohde & Schwarz	4772-3 BW-S3W2 CMW500	Attenuator (3dB) Attenuator (3dB) Wideband Radio Communication Tester	CBT CBT 2/21/2022	N/A N/A Annual	CBT CBT 2/21/2023	9406 120 164948
Narda Narda Rohde & Schwarz	4772-3 BW-S3W2 C MW500	Attenuator (3dB) Attenuator (3dB) Wideband Radio Communication Tester	CBT CBT 2/21/2022	N/A N/A Annual	CBT CBT 2/21/2023	9406 120 164948
Narda Narda Rohde & Schwarz Rohde & Schwarz	4772-3 BW-53W2 CMW500 CMW500	Atten uator (3d8) Atten uator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester	CBT CBT 2/21/2022 2/17/2022	N/A N/A Ann ual Ann ual	CBT CBT 2/21/2023 2/17/2023	9406 120 164948 161662
Narda Narda Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz	4772-3 BW-53W2 CMW500 CMW500 CMW500	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester	CBT CBT 2/21/2022 2/17/2022 12/2/2021	N/A N/A Ann ual Ann ual Ann ual	CBT CBT 2/21/2023 2/17/2023 12/2/2022	9406 120 164948 161662 166462
Narda Narda Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz	4772-3 BW-S3W2 CMW500 CMW500 CMW500 CMW500	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021	N/A N/A Annual Annual Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022	9406 120 164948 161662 166462
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz	4772-3 BW-53W2 C MW500 C MW500 C MW500 C MW500 C MW500	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021	N/A N/A Ann ual Ann ual Ann ual Ann ual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022	9406 120 164948 161662 166462 116743
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-S3W2 C MW500 C MW500 C MW500 C MW500 C MW500 DAK-3.5	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022	N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023	9406 120 164948 1651662 166462 116743 1278
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG	4772-3 BW-53W2 C MW500 C MW500 C MW500 C MW500 C MW500 DAK-3.5 DAK5-3.5	Attenuator (3d8) Attenuator (3d8) Wideban Radio Communication Tester Wideban Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Bortable Dielectric Assessment Xit	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021	N/A N/A Annual Annual Annual Annual Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022	9406 120 164948 161662 166462 116743 1278 1041
Narda Narda Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG	4772-3 BW-53W2 C MW500 C MW500 C MW500 C MW500 C MW500 DAK-3.5 DAK5-3.5	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021	N/A N/A Annual Annual Annual Annual Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022	9405 120 154948 161662 166452 116743 1278 1041
Narda Narda Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG	4772-3 BW-53W2 C MM500 C MM500 C MM500 C MM500 DAK-3.5 DAK5-3.5 DAK5-3.5 MAIA	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021 N/A	N/A N/A Annual Annual Annual Annual Annual N/A	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A	9006 120 164948 161662 166462 116743 1278 1041 1379
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG	4772-3 BW-53W2 C MW500 C MW500 C MW500 C MW500 DAK-3.5 DAK5-3.5 MAIA DI900V2	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 Mtrk SAR Diole	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021 N/A 10/22/2021	N/A N/A Annual Annual Annual Annual N/A Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022	9406 120 154948 161662 165462 116743 1278 1041 1379 5d/080
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 BW-53W2 C-MM/500 C-MM/500 C-MM/500 C-MM/500 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Portable Dielectric Assessment Kit No dulation and Audio Interference Analyzer 1900 MHX SAR Dipole	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021 N/A 10/22/2021 2/14/2022	N/A N/A Annual Annual Annual Annual Annual N/A Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022 2/11/2022	9006 120 154948 151662 1166452 116743 1278 1041 1379 5d080 Ed148
Narda Narda Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 BW-53W2 C-MM500 C-MM500 C-MM500 D-BK-3-5 DAK5-3.5 MAIA DI900/2 D1900/2	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole	CBT CBT 2/11/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021 N/A 10/22/2021 2/21/2022	N/A N/A Annual Annual Annual Annual N/A Annual Annual Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022 2/21/2023	9406 120 164948 16662 166462 116743 1278 1041 1379 5d 080 5d 148
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 8W-53W2 C MM/500 C MM/500 C MM/500 DAK-3.5 DAK-3.5 MAIA D1900/2 D1900/2 D1900/2	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2430 MHz SAR Dipole	CBT CBT 2/21/2022 2/17/2022 2/27/2021 10/5/2021 1/6/2022 8/18/2021 N/A 10/22/2021 2/21/2022 11/25/2021	N/A N/A Annual Annual Annual Annual Annual N/A Annual Annual Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022 2/21/2023 11/25/2022	9406 120 154948 156662 116642 116743 1278 1041 1379 5d 080 5d 148 981
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 BW-53W2 C-MW500 C-MW500 C-MW500 DAK-3.5 DAK-3.5 DAK-3.5 MAIA D1800V2 D1800V2 D1800V2 D1800V2 D1800V2	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHt SAR Dipole 1900 MHt SAR Dipole 2450 MHt SAR Dipole 2450 MHt SAR Dipole	C8T C8T 2/11/2022 2/17/2022 12/2/2021 10/5/2021 1/6/2022 8/18/2021 N/A 10/22/2021 12/21/2022 11/25/2021 12/25/2021	N/A N/A Annual Annual Annual Annual Annual N/A Annual Annual Annual Trigonial	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022 2/21/2023 11/25/2022 6/14/2022	9405 120 164948 161662 116642 116743 1278 1041 1379 5d080 5d148 981 1064
Narda Narda Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4 772-3 8W-53W2 C MM/500 C MM/500 C MM/500 D AK-3.5 D AK-	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2400 MHz SAR Dipole	CBT CBT 2/21/2022 2/17/2022 12/2/2021 10/5/2021 10/6/2022 8/18/2021 N/A 10/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/2/2021 1/2/2/2021 1/2/2021 1/2/2021	N/A N/A Annual Annual Annual Annual Annual N/A Annual Annual Annual Annual Annual	CBT CBT 2/21/2023 2/17/2023 12/2/2022 1/6/2023 N/A 10/22/2022 1/22/2022 1/25/2022 1/25/2022 6/14/2022 6/14/2022	905 120 164948 161662 116743 1278 1044 1379 5d080 5d148 981 1064
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 8W-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-3.5 MAIA DI900/2 DI900/2 DI900/2 DI900/2 DI900/2 DI900/2	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2400 MHz SAR Dipole 2600 MHz SAR Dipole	C8T C8T 2/21/2022 2/17/2021 12/2/2021 10/5/2021 N/A 10/22/2021 2/21/2022 11/25/2021 11/25/2021 4/14/2029	N/A N/A Annual Annual Annual Annual Annual Annual Annual Annual Triennial Annual	CBT CBT 2/21/2023 2/17/2023 12/27/2022 10/5/2022 14/6/2023 8/18/2022 14/27/2022 2/21/2023 14/22/2022 6/14/2022 4/14/2022	9405 120 164948 161662 165462 116743 1278 1041 1379 5d080 5d148 961 1054 1054
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4 772-3 8W-53W2 C MM/500 C MM/500 C MM/500 D AK-3.5 D AK-	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2400 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole	CBT CBT 2/21/2022 2/17/2022 12/2/2021 1/6/2022 8/15/2021 N/A 1Q/22/2021 1/22/2021 1/25/2021 1/25/2021 4/14/2021 4/14/2021	N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual N/A Ann ual Trienni al Trienni al	CBT CBT 2/21/2023 2/17/2023 2/17/2023 12/2/2022 1/6/2023 8/18/2022 1/6/2023 8/18/2022 2/21/2023 11/25/2022 6/14/2022 4/14/2022	\$406 120 154948 161662 1165482 116743 1278 1041 1379 5d 080 5d 148 981 1064 1004 10071
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 8W-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5	Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/27/2021 10/5/2021 10/5/2021 N/A 10/22/2021 2/21/2022 11/25/2021 11/25/2021 4/14/2029 4/14/2029 11/12/2019	N/A N/A Annual Annual Annual Annual Annual Annual Annual Annual Annual Triennial Triennial Biennial	CBT CBT 2/21/2023 2/17/2023 2/17/2023 10/5/2022 10/5/2022 1/6/2023 8/18/2022 2/21/2023 11/25/2022 2/21/2023 11/125/2022 4/14/2022 4/14/2022	9405 120 154948 151652 156452 116743 1278 1041 1379 50080 50148 981 1054 1004 1004 1004
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4 772-3 8W-53W2 C MW500 C MW500 C MW500 DAK-3.5 DAK	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2400 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole	C6T C6T 2/21/2022 2/17/2022 12/2/2021 1/6/2022 8/15/2021 1/6/2022 1/12/2021 1/12/2021 1/12/2021 6/14/2019 4/14/2029 1/1/12/2019 1/19/2021	N/A N/A N/n ual Ann ual Ann ual Ann ual Ann ual N/A Ann ual Triennial Ann ual Triennial Biennial	CBT CBT 2/21/2023 2/17/2023 2/17/2023 12/2/2022 1/6/2023 8/18/2022 1/6/2023 8/18/2022 2/21/2023 6/14/2022 4/14/2022 1/19/2023 1/19/2023	\$406 120 154948 161662 1165482 116743 1278 1041 1379 5d 080 5d 148 981 1064 1004 10071
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 8W-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-3.5 DAK-3.5 MAIA DI900/2 D2450/2 D2600/2 D2600/2 D3500/2 D3500/2	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole	C8T C8T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 10/5/2021 4/6/2022 8/18/2021 N/A 10/22/2021 11/25/2021 11/25/2021 11/25/2021 11/12/2020 11/12/2020	N/A N/A N/N A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Trienni al	CBT CBT 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/6/2023 8/18/2022 N/A 10/22/2022 1/25/2022 6/14/2022 11/25/2022 11/25/2022 11/12/2023 11/25/2022 11/12/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/22/2023 11/25/2022 11/22/2023 11/25/2023 1/25/202	\$406 120 154948 151652 166452 116743 1278 1074 1379 5d 080 5d 148 981 1054 1054 1054 1059 1059
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4 772-3 BW-53W2 C-MW500 C-MW500 D-AK-3.5 D-AK-3.5 D-AK-3.5 MKIA D 19800/2 D 2450/2 D 2450/2 D 2800/2 D 2800/2 D 2800/2 D 3500/2 D 3500/2 D 3500/2	Attenuator (3d8) Attenuator (3d8) Mideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole	C8T C8T 2/11/2022 2/17/2022 2/17/2022 10/5/2021 10/5/2021 10/6/2022 N/A 10/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/12/2029 2/11/2	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual N/A Ann ual Ann ual Trienni al Bienni al Trienni al Trienni al Trienni al	C8T C8T 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 N/A 10/22/2022 2/11/2023 11/25/2022 4/14/2022 4/14/2022 4/14/2022 11/12/2023 12/12/2023	9405 120 154948 155652 186452 116743 1278 1041 1379 50080 50145 981 1004 1004 1004 1005 10057
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4772-3 BW-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 3/18/2021 1/6/2022 3/18/2021 N/A 10/22/2021 1/2/2/2021 1/12/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2021 1/22/2021 1/22/2020 1	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual N/A Ann ual Ann ual Trienni al Trienni al Trienni al Trienni al	CBT CBT 2/21/2023 2/17/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022 1/22/2023 1/25/2022 1/25/2022 1/21/2023 1/21/2023 1/21/2023	\$406 120 164948 161662 116743 1278 1041 1379 5d080 5d148 691 1064 1004 1059 1059 1057
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Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG SPEAG	4 772-3 BW-53W2 C MM500 C MM500 C MM500 DAK-3.5 DAK	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Bit Mitsel 2600 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 1/6/2022 4/16/2022 4/16/2022 4/16/2021 1/2/2/2021 1/12/2019 4/14/2021 1/12/2019 1/21/2020 1/21/2020	N/A N/A N/A Annual Annual Annual Annual Annual M/A Annual Annual Triennial Triennial Triennial Biennial Biennial	CBT CBT 2/21/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 N/A 10/22/2022 2/21/2023 11/22/2022 11/12/2022 11/12/2022 11/12/2023 1/21/2023 1/21/2023 1/21/2023	\$406 120 164948 161662 116743 1278 1041 1379 5d080 5d148 981 1064 1064 1064 1064 1064 1064 1067 1067 1067 1055
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Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4 772-3 8W-53W2 C MM/500 C MM/500 C MM/500 DAK-3.5	Attenuator (3d6) Attenuator (3d6) Attenuator (3d6) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole	C6T C6T C77/2022 2/17/2022 2/17/2022 2/17/2022 1/6/2021 1/6/2022 8/18/2021 N/A 10/22/2021 1/1/2029 4/14/2021 4/14/2021 1/21/2020 1/21/2020 1/21/2020 6/10/2021	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual N/A Ann ual Ann ual Trienni al Trienni al Bienni al Bienni al Bienni al	C8T C8T 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 10/2/2022 2/21/2023 10/22/2022 2/21/2023 11/12/2022 11/12/2023 12/12/2023 10/9/2022 10/9/2022	\$406 120 154948 161662 116743 1278 1041 1379 5d080 5d148 981 1064 1074 1077 1059 1097 1067 1015 1055 1055 1073
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4 772-3 8/V-53/V2 C/M/500 C/M/500 C/M/500 DAK-3.5 D	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2400 MHz SAR Dipole 2400 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3900 MHz SAR Dipole	C8T C8T C8T 2/11/2022 2/17/2022 2/17/2022 12/2/2021 10/5/2021 8/18/2021 N/A 10/22/2021 11/25/2021 11/25/2021 11/25/2021 11/25/2021 11/12/2020 11/21/2020 11/2	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trite nni al Trite nni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al	C8T C8T 2/11/2023 2/17/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 8/18/2022 2/21/2023 1/25/2022 2/21/2023 1/125/2022 4/14/2022 1/19/2023 1/21/2024 1	\$406 120 154948 151652 1565452 116743 1278 1024 1379 5d 080 5d 148 981 1054 1071 1054 1067 1067 1067 1067 1059 1059 1059 1073
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 C-MW500 C-MW500 D-AK-35 D-AK-3-5 D-AK-3-5 MAIA D1800V2 D3450V2 D3450V2 D3500V2	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3900 MHz SAR Dipole 3900 MHz SAR Dipole	C 6T C 6T C 7 2/11/2022 2/17/2022 2/17/2022 12/2/2021 10/5/2021 10/5/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/21/2029 4/14/2021 1/12/2029 1/19/2021 1/9/2020 1/19/2021 1/9/2020 1/15/2021 1/15/2021	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual	C8T C8T 2/11/2023 2/17/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 10/22/2022 2/21/2023 11/22/2022 2/21/2023 11/22/2022 11/12/2023 11/12/2023 11/21/2023 11/12/2023 11/1	9405 120 154948 16562 165482 116743 1278 1041 1379 50680 50148 981 1064 1004 1071 1059 1057 1055 1055 1055 1055 1055 1055
Nard a Nard a Rohde & Schwarz Rohde & Schwarz SPEAG	4 772-3 8/V-53/V2 C/M/500 C/M/500 C/M/500 DAK-3.5 D	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3900 MHz SAR Dipole 3900 MHz SAR Dipole 3900 MHz SAR Dipole 3900 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 3/18/2021 N/A 10/22/2021 11/25/2021 11/25/2021 11/25/2021 11/25/2021 11/12/2020 11/12/2020 11/12/2020 11/12/2020 11/12/2021 10/9/2020 4/10/2021 10/9/2020 1/13/2021 10/9/2020 1/13/2021 10/9/2020 1/13/2021 1/13/2020 1/1	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al	C BT C BT 2/11/2023 2/17/2023 2/17/2023 12/2/2022 10/5/2022 14/6/2023 8/18/2022 N/A 10/22/2022 2/21/2023 11/25/2022 4/14/2022 11/12/2023 11/25/2022 11/12/2023 11/25/2022 11/12/2023 11/25/2022 11/12/2023 11/25/2022 11/12/2023 10/9/2022 6/10/2023 10/9/2022 7/13/2023 10/5/2022 7/13/2023 10/5/2022 10/5/2022 11/25/	\$406 120 154948 151652 166452 116743 1278 10278 10278 10278 1054 1054 1054 1059 1057 1059 1057 1059 1057 1055 1055 1055 1055
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Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Schwarz SPEAG	4 772-3 8/V-53/V2 C //W500 C //M/500 C //M/500 D AK-3.5 D AK-3.5 D AK-3.5 D AK-3.5 D AK-3.5 D 1900/2 D 2450/2 D 2500/2 D 2500/2 D 3500/2 D 35	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole 3700 MHz SAR Dipole 3900 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2021 2/22/2021 1/22/2021 2/22/2021 2/12/2021 1/12/2020 1/12/2020 1/12/2020 1/19/2021 2/17/2020 2/17/2020 2/17/2020 2/17/2020 2/17/2020 2/17/2020 2/17/2020 2/17/2020 2/17/2021 2/17/2020 2/17/20	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Thienni al Thienni al Thienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ual Ann ual Ann ual Ann ual	CBT CBT 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/6/2023 8/18/2022 N/A 10/22/2022 1/21/2023 11/25/2022 6/14/2022 11/25/2022 1/12/2023 1/12	\$406 120 154948 151652 166452 116743 1278 10278 10278 56080 56148 981 1064 1004 1071 1059 1057 1057 1057 1055 1055 1055 1073 1191 1583
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Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-4.5 DAK-	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Portable Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3500 MHz SAR Dipole 3700 MHz SAR Dipole 3700 MHz SAR Dipole 3900 MHz SAR Dipole 1900 MHz SAR Dipole	C 6T C 8T 2/11/2022 2/17/2022 2/17/2022 10/5/2021 1/6/2022 8/18/2021 N/A 10/22/2021 11/22/2021 11/22/2021 11/12/2019 11/12/2019 11/12/2019 11/12/2020 11/12/2020 11/12/2020 11/12/2020 11/12/2021 11/12/2020 11/12/2021 11/12/2020 11/12/20	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual	CBT CBT 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 10/2/2022 2/21/2023 11/22/2022 2/21/2023 11/12/2022 11/12/2023 11/1	\$406 120 164948 161662 116743 1278 1041 1379 50080 5040 5040 1054 1004 1059 1057 1059 1057 1057 1057 1055 1055 1055 1055 1055
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 CMM/500 CMM/500 CMM/500 DAK-3.5 DAK-4.5 DAK-	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3600 MHz SAR Dipole 3900 MHz SAR Dipole	C8T C8T C8T 2/11/2022 2/17/2022 2/17/2022 10/5/2021 10/6/2022 8/18/2021 N/A 10/22/2021 11/25/2021 11/25/2021 11/25/2021 11/25/2021 11/12/2029 11/25/2021 11/12/2029 11/25/2021 11/12/2029 11/12/2020 11/12/2020 11/12/2021 11/12/2020 11/1	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual	C8T C8T 2/11/2023 2/17/2023 2/17/2023 2/27/2022 10/5/2022 1/6/2023 8/18/2022 8/18/2022 6/14/2022 6/14/2022 1/12/2023 1/21/2023 1/	\$406 120 154948 151652 15652 156743 1278 1074 1379 50080 50148 981 1064 1004 1071 1059 1059 1059 1059 1059 1059 1059 105
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4 772-3 80-530/2 C MM/500 C MM/500 C MM/500 D AK-3.5 D AK-3.5 MAIA D 1800/2 D 2450/2 D 2600/2 D 2600/2 D 2600/2 D 3500/2 D	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3700 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/17/2022 2/27/2021 10/5/2021 10/5/2021 10/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/12/2020 1/12/2	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual N/A Ann ual Ann ual Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ual	C8T C8T 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 1/6/2033 10/22/2022 2/11/2023 11/22/2022 2/11/2023 11/125/2022 4/14/2022 11/12/2023 11/12	9405 120 154948 154948 15562 16542 11574 1278 1041 1379 50080 5148 981 1054 1004 1071 1059 1057 1057 1057 1057 1057 1055 1057 1055 1056 1057 1058 1056 1057 1058 1056 1057 1058 1056 1057 1058 1058 1057 1058 1058 1057 1058 1058 1058 1057 1058 1058 1058 1057 1058 1058 1057 1058 1058 1058 1057 1058 1058 1058 1057 1058 1057 1058 1058 1057 1058 1057 1058 1058 1057 1058 1058 1057 1058 1057 1058 1058 1057 1058 1058 1057 1058 1057 1058 1057 1058 1057 1058 1057 1058 1057 1058 1058 1057 1058 1057 1058 1058 1057 1058 1058 1057 1058 1058 1058 1057 1058 1057 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1058 1057 1058
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Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 8W-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-3.5 DAK-3.5 MAIA D1900/2 D2450/2 D2800/2 D2800/2 D3500/2	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3700 MHz SAR Dipole 3900 MHz SAR Dipole	C8T C8T C8T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 2/17/2022 3/18/2021 1/25/2021 1/25/2021 1/25/2021 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2020 3/15/2021 3/12/2021 3/12/2021 3/12/2021 3/12/2021	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ual	C8T C8T 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 10/5/2022 10/22/2022 11/25/2022 2/11/2023 11/125/2022 4/14/2022 4/14/2023 1/21/202	2406 120 15448 151662 165452 116743 1278 1278 1278 1278 1278 1278 1278 1278
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 C-MW500 C-MW500 C-MW500 DAK-3.5 DAK-3.5 MAIA D1800V2 D2450V2 D2600V2 D2600V2 D2600V2 D3500V2 D454 DAE4	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3900 MHz SAR Dipole	C 6T C 6T C 6T 2/21/2021 2/27/2021 2/27/2021 2/27/2021 10/5/2021 1/4/6/2022 N/A 10/22/2021 1/22/2021 1/22/2021 1/22/2021 1/12/2020 1/12/2020 1/19/2021 1/19/2021 1/19/2021 1/12/2021 8/16/2021 8/16/2021 8/16/2021 1/22/2021	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ual	C 6T C 8T 2/11/2023 2/17/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 1/2/2/2022 2/21/2023 1/2/25/2022 2/21/2023 1/12/2022 1/12/2023 1/12/2023 1/12/2023 1/19/2023 1/19/2023 1/19/2023 1/19/2023 1/19/2023 2/09/2022 8/16/202	9405 120 154948 15562 155482 115743 1278 1278 1278 1278 1278 1274 1278 1277 12788 1278 1278 1278 1278 1278 1278 1278 1278 1278 1278
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Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 8/V-53/V2 C/M/500 C/M/500 C/M/500 C/M/500 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK0/2 D2500/2 D2500/2 D3500/2 D464 DA64 D650 D65	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Portable Dielectric Assessment Xit Nodulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2450 MHz SAR Dipole 2450 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3601 SHz SAR Dipole 3900 MHz SAR Dipole 3902 MHz SAR Dipole 3904 SAR Picobe SAR Probe SAR Probe	C 6T C 6T C 6T C 7 2/11/2022 2/17/2022 2/17/2022 10/5/2021 10/6/2022 8/18/2021 N/A 10/22/2021 11/25/2021 11/25/2021 11/25/2021 11/25/2021 11/25/2021 11/21/2020 4/14/2019 11/21/2020 11/21/2021 11/25/2021 12/21/21/21/21/21/21/21/21/21/21/21/21/2	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ann ann ann ann ann ann ann ann ann	C6T C6T 2/11/2023 2/17/2023 2/17/2023 2/27/2022 1/6/2023 8/8/2022 1/22/2022 2/21/2023 1/22/2022 2/21/2023 1/22/2022 6/14/2022 6/14/2022 6/10/2023 1/21/2023 1/21/2023 1/21/2023 1/21/2023 1/21/2023 6/15/2022 8/4/2022	9406 120 154948 151652 155452 115743 1278 1074 1379 5060 51148 951 1054 1054 1057 1057 1057 1057 1057 1057 1057 1057 1057 1057 1057 1057 1057 1058 1057 1058 1057 1059 1057 1583 1575 1580 1575
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-3.5 MAIA DI900/2 D3500/2	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHt SAR Dipole 2400 MHt SAR Dipole 2600 MHt SAR Dipole 2600 MHt SAR Dipole 2600 MHt SAR Dipole 3500 MHt SAR Dipole 3700 MHt SAR Dipole 3700 MHt SAR Dipole 3700 MHt SAR Dipole 3700 MHt SAR Dipole 3900 MHt SAR Dipole	C 6T C 6T C 6T C 7 2/11/2022 2/17/2022 2/17/2022 10/5/2021 10/5/2021 1/22/2021 1/22/2021 1/22/2021 1/21/2022 1/21/2022 1/21/2022 1/21/2020 1/21/2020 1/21/2020 1/21/2021 1/19/2021 2/12/2021	N/A N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ann ann Ann Ann Ann Ann Ann Ann Ann	C 6T C 6T 2/11/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2032 12/2/2022 12/2/2022 2/11/2023 11/25/2022 4/14/2022 4/14/2022 4/14/2022 1/12/2023 1/21/2023 1/22/2022 1/20/202 1/20/202 1/20/2022 1/20/202 1/20/202 1/2	2406 120 154948 151652 165452 116743 1278 1044 1379 50680 56148 981 1054 1054 1054 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1018 1055 1057 1057 1057 1057 1057 1057 1057
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz Schwarz SPEAG SP	4 772-3 8/V-53/V2 C/M/S00 C/M/S00 C/M/S00 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK0/2 D2600/2 D2600/2 D3500/2 D3500/2 D3500/2 D3500/2 D3700/2 D3500/2 D3700/2 D464 DA64 D64 D65 D65 D65 D65 D65 D65 D65 D65	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Portable Dielectric Assessment Kit Nodulation and Audio Interference Analyzer 1900 MH: SAR Dipole 2450 MH: SAR Dipole 2600 MH: SAR Dipole 2600 MH: SAR Dipole 2600 MH: SAR Dipole 2600 MH: SAR Dipole 3500 MH: SAR Dipole 3900 MH: SAR Dipole 501 SAR SDipole 504 SAR Dipole 504 SAR Dipole 504 SAR Dipole 504 SAR Dipole 505 SAR Probe 548 Probe 548 Probe 548 Probe	C 6T C 6T C 6T C 7 2/11/2022 2/17/2022 2/17/2022 10/5/2021 10/6/2022 8/18/2021 N/A 10/22/2021 11/25/2021 11/25/2021 11/25/2021 11/25/2021 11/12/2020 11/12/2020 11/12/2020 11/12/2021 11/12/20	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Th'ienni al Th'ienni al Th'ienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ann ann ann ann ann ann ann ann ann	C 6T C 6T C 7 2/11/2023 2/17/2023 2/27/2022 10/5/2022 1/6/2023 8/18/2022 1/25/2022 2/21/2023 1/25/2022 4/14/2022 4/14/2022 1/11/2023 1/21/2023 1/21/2023 1/21/2023 1/21/2023 1/21/2023 1/21/2023 1/21/2022 6/10/2022 6/21/2022 6/21/2022 8/3/2022 2/20/2022 7/20/20	\$406 120 154948 151662 156743 1278 10278 10278 10278 10278 1054 1054 1054 1054 1054 1055 1057 1057 1057 1057 1057 1057 1057
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 C-MM500 C-MM500 C-MM500 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK-3.5 DAK02 D2800/2 D2800/2 D3500/	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Xit Portable Dielectric Assessment Xit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 2400 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3700 MHz SAR Dipole 3900 MHz SAR Dipole	C 6T C 6T C 6T 2/21/2022 2/17/2022 2/17/2022 2/17/2022 2/27/2021 10/5/2021 1/6/2022 1/22/2021 1/25/2021 1/25/2021 1/21/2020 1/21/2020 1/21/2020 1/21/2020 1/21/2021 3/3/3/2021 3/3/2021 3/3/3/2021 3/3/2021	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual N/A Ann ual Trienni al Trienni al Trienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Bienni al Ann ual Ann ann ann ann ann ann ann ann ann ann	C6T C6T 2/11/2023 2/17/2023 12/2/2022 10/5/2022 10/5/2022 10/5/2022 12/2/2022 12/2/2022 12/21/2023 11/25/2022 4/14/2022 4/14/2022 4/14/2022 4/14/2023 1/21/2023 1/20/2022 1/20/2022 1/20/2022 1/20/2022 1/21/2023	9406 120 154948 151662 166452 116743 1278 1044 1379 86080 56148 981 1004 1071 1059 1097 1067 1059 1077 1059 1057 1059 1059 1057 1058 1056 1057 1059 1057 1059 1057 1058 1055 1057 1057 1057 1057 1058 1533 1534 1534 1540 1558 1557 1558 1557 1557 1557 7577 7400 7577 7400
Nard a Nard a Rohde & Schwarz Rohde & Schwarz Rohde & Schwarz SPEAG	4772-3 BW-53W2 C-MW500 C-MW500 C-MW500 DAK-3.5 DAK-3.5 MAIA D1800V2 D2450V2 D2500V2 D2500V2 D2500V2 D3500V2	Attenuator (3d8) Attenuator (3d8) Attenuator (3d8) Wideband Radio Communication Tester Wideband Radio Communication Tester Wideband Radio Communication Tester Dielectric Assessment Kit Portable Dielectric Assessment Kit Modulation and Audio Interference Analyzer 1900 MHz SAR Dipole 1900 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 2600 MHz SAR Dipole 3500 MHz SAR Dipole 3900 MHZ SAR Dipole	C 6T C 6T C 6T C 7 2/11/2022 2/17/2022 2/17/2022 10/5/2021 10/6/2021 N/A 10/22/2021 1/22/2021 1/22/2021 1/22/2021 1/22/2021 1/21/2029 4/14/2021 1/12/2020 1/19/2021 1/19/2021 1/19/2021 1/19/2021 6/10/2021 6/21/2021 8/16	N/A N/A N/A Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Ann ual Trienni al Bienni al Ann ual Ann ual	C 6T C 8T 2/11/2023 2/17/2023 2/17/2023 12/2/2022 10/5/2022 1/6/2023 1/2/2/2022 2/21/2022 1/12/2022 1/12/2022 1/12/2022 1/12/2022 1/12/2022 1/12/2022 1/12/2022 1/12/2022 8/16/202 8/16/202 8/16/2022 8/16/2022 8/16/2022 8/16/2022 8	9405 120 154948 15562 155482 115743 1278 1278 1278 1278 1278 1274 1278 12 12 12 12 12 12 12 12 12 12 12 12 12 1

Note:

- CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
- 2. Each equipment item was used solely within its respective calibration period.

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06/01/2019

#### 5 **MEASUREMENT UNCERTAINTIES**

#### **For SAR Measurements**

I						1	I	1
b	С	d	e=	f	g	h =	i =	k
			f(d,k)			c x f/e	c x g/e	
IEEE	Tol.	Prob.		Ci	Ci	1gm	10gms	
1528 Sec.	(± %)	Dist.	Div.	1gm	10 gms	ui	u <sub>i</sub>	Vi
						(± %)	(± %)	
E.2.1	7	Ν	1	1	1	7.0	7.0	~
E.2.2	0.25	Ν	1	0.7	0.7	0.2	0.2	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
E.2.2	1.3	Ν	1	0.7	0.7	0.9	0.9	~
E.2.3	2	R	1.73	1	1	1.2	1.2	×
E.2.4	0.3	Ν	1	1	1	0.3	0.3	~
E.2.4	0.25	R	1.73	1	1	0.1	0.1	~
E.2.5	4.8	R	1.73	1	1	2.8	2.8	∞
E.2.6	0.3	Ν	1	1	1	0.3	0.3	~
E.2.7	0.8	R	1.73	1	1	0.5	0.5	~
E.2.8	2.6	R	1.73	1	1	1.5	1.5	~
E.6.1	3	R	1.73	1	1	1.7	1.7	~
E.6.1	3	R	1.73	1	1	1.7	1.7	~
E.6.2	0.8	R	1.73	1	1	0.5	0.5	~
E.6.3	6.7	R	1.73	1	1	3.9	3.9	~
or E.5	4	R	1.73	1	1	2.3	2.3	~
E.4.2	3.12	Ν	1	1	1	3.1	3.1	35
E.4.1	1.67	Ν	1	1	1	1.7	1.7	5
E.2.9	5	R	1.73	1	1	2.9	2.9	×
E.6.5	0	R	1.73	1	1	0.0	0.0	~
E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	~
E.3.3	4.3	Ν	1	0.78	0.71	3.3	3.0	76
E.3.3	4.2	Ν	1	0.23	0.26	1.0	1.1	7!
E.3.4	3.4	R	1.73	0.78	0.71	1.5	1.4	~
E.3.4	0.6	R	1.73	0.23	0.26	0.1	0.1	~
E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	~
E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	~
	-	RSS			1	12.2	12.0	19
Eveneded Upgertainty (K-T)							0.4.0	+
		k-7				·)///	2/1/1	
	b         IEEE         1528         Sec.         E.2.1         E.2.2         E.2.3         E.2.4         E.2.4         E.2.4         E.2.5         E.2.6         E.2.7         E.2.8         E.2.1         E.2.3         E.2.4         E.2.5         E.2.6         E.2.7         E.2.8         E.6.1         E.6.2         E.6.1         E.6.2         E.6.1         E.6.2         E.6.3         DOT         E.4.2         E.4.1         E.2.9         E.6.5         E.3.1         E.3.3         E.3.3         E.3.4         E.3.4         E.3.4         E.3.4         E.3.4         E.3.2         E.3.2         E.3.2	b         c           IEEE 1528 Sec.         Tol. (± %)           E.2.1         7           E.2.2         0.25           E.2.3         2           E.2.4         0.3           E.2.5         4.8           E.2.6         0.3           E.2.7         0.8           E.2.8         2.6           E.6.1         3           E.6.2         0.8           E.6.3         6.7           OT         E.5           E.6.2         0.8           E.6.3         6.7           OT         E.5           E.6.3         6.7           OT         E.5           E.6.5         0           E.6.3         6.7           OT         E.5           E.6.5         0           E.6.5         0           E.3.1         7.6           E.3.3         4.3           E.3.3         4.2           E.3.4         3.4           E.3.4         3.4           E.3.2         5.0           E.3.2         5.0	b         C         d           IEEE 1528 Sec.         Tol. (± %)         Prob. Dist.           E.2.1         7         N           E.2.2         0.25         N           E.2.2         1.3         N           E.2.3         2         R           E.2.4         0.25         R           E.2.5         4.8         R           E.2.6         0.3         N           E.2.7         0.8         R           E.2.8         2.6         R           E.2.8         2.6         R           E.6.1         3         R           E.6.2         0.8         R           E.6.3         6.7         R           E.6.5         0         R           E.5         4         R           E.5         0         R           E.5         0         R           E.5         0         R           E.3.3         4.3         N	b         C         d         e= f(d,k)           IEEE 1528 Sec.         Tol. (± %)         Prob. Dist.         Div.           E.2.1         7         N         1           E.2.2         0.25         N         1           E.2.2         1.3         N         1           E.2.2         1.3         N         1           E.2.3         2         R         1.73           E.2.4         0.3         N         1           E.2.5         4.8         R         1.73           E.2.6         0.3         N         1           E.2.7         0.8         R         1.73           E.2.8         2.6         R         1.73           E.6.1         3         R         1.73           E.6.1         3         R         1.73           E.6.1         3         R         1.73           E.6.1         3         R         1.73           E.6.2         0.8         R         1.73           E.6.5         0         R         1.73           E.5         4         R         1.73           E.5         0         R <t< td=""><td>b         c         d         e= f(d,k)         f           IEEE 528         Tol. (± %)         Prob. Dist.         Ci Div.         1gm           E.2.1         7         N         1         1           E.2.2         0.25         N         1         0.7           E.2.2         1.3         N         1         0.7           E.2.3         2         R         1.73         1           E.2.4         0.3         N         1         1           E.2.4         0.3         N         1         1           E.2.4         0.3         N         1         1           E.2.5         4.8         R         1.73         1           E.2.6         0.3         N         1         1           E.2.7         0.8         R         1.73         1           E.2.8         2.6         R         1.73         1           E.6.1         3         R         1.73         1           E.6.1         3         R         1.73         1           E.6.3         6.7         R         1.73         1           E.6.3         6.7         R</td><td>b         C         d         e= f(d,k)         f         g           IEEE 528 Sec.         Tol. (±%)         Prob. Dist.         C<sub>1</sub>         C<sub>1</sub>         C<sub>1</sub>           Igm         0.0gms           E.2.1         7         N         1         1         1           E.2.2         0.25         N         1         0.7         0.7           E.2.2         1.3         N         1         0.7         0.7           E.2.4         0.25         R         1.73         1         1           E.2.4         0.3         N         1         1         1           E.2.4         0.25         R         1.73         1         1           E.2.5         4.8         R         1.73         1         1           E.4.1         3         R         1.73         1         1           E.6.1         3         R         1.73         1<!--</td--><td>b         c         d         e= f(d,k)         f         g         h= <math>c \times f/e</math>           IEEE Sec.         Tol. (± %)         Prob. Dist.         C<sub>1</sub>         C<sub>1</sub>         1gm         10 gms         u<sub>1</sub> <math>(\pm %)</math>           E.2.1         7         N         1         1         1         7         0.9           E.2.2         0.25         N         1         0.7         0.7         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9           E.2.3         2         R         1.73         1         1         1.22           E.2.4         0.3         N         1         1         0.3           E.2.4         0.25         R         1.73         1         1         0.3           E.2.4         0.25         R         1.73         1         1         0.5           E.2.4         0.3         N         1         1         1.5         1         1.5           E.2.5         4.8         R         1.73         1         1         1.5           E.6.1         3         R         1.73         1         1         1.7      <t< td=""><td>b         c         d         e= r(d,k)         f         g         h= c         i= c         i= c         x f/e         cx g/e           IEEE Sec.         Tol. (±%)         Prob. Dist.         Div.         1gm         10gms         u, u, (±%)         10gms           E.2.1         7         N         1         1         1         7.0         7.0           E.2.2         0.25         N         1         0.7         0.7         0.2         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9         0.9           E.2.3         2         R         1.73         1         1         1.2         1.2           E.2.4         0.3         N         1         1         0.3         0.3           E.2.4         0.25         R         1.73         1         1         0.1         0.1           E.2.4         0.3         N         1         1         1         0.3         0.3           E.2.4         0.3         R         1.73         1         1         0.5         0.5           E.2.4         0.3         R         1.73         1         1</td></t<></td></td></t<>	b         c         d         e= f(d,k)         f           IEEE 528         Tol. (± %)         Prob. Dist.         Ci Div.         1gm           E.2.1         7         N         1         1           E.2.2         0.25         N         1         0.7           E.2.2         1.3         N         1         0.7           E.2.3         2         R         1.73         1           E.2.4         0.3         N         1         1           E.2.4         0.3         N         1         1           E.2.4         0.3         N         1         1           E.2.5         4.8         R         1.73         1           E.2.6         0.3         N         1         1           E.2.7         0.8         R         1.73         1           E.2.8         2.6         R         1.73         1           E.6.1         3         R         1.73         1           E.6.1         3         R         1.73         1           E.6.3         6.7         R         1.73         1           E.6.3         6.7         R	b         C         d         e= f(d,k)         f         g           IEEE 528 Sec.         Tol. (±%)         Prob. Dist.         C <sub>1</sub> C <sub>1</sub> C <sub>1</sub> Igm         0.0gms           E.2.1         7         N         1         1         1           E.2.2         0.25         N         1         0.7         0.7           E.2.2         1.3         N         1         0.7         0.7           E.2.4         0.25         R         1.73         1         1           E.2.4         0.3         N         1         1         1           E.2.4         0.25         R         1.73         1         1           E.2.5         4.8         R         1.73         1         1           E.4.1         3         R         1.73         1         1           E.6.1         3         R         1.73         1 </td <td>b         c         d         e= f(d,k)         f         g         h= <math>c \times f/e</math>           IEEE Sec.         Tol. (± %)         Prob. Dist.         C<sub>1</sub>         C<sub>1</sub>         1gm         10 gms         u<sub>1</sub> <math>(\pm %)</math>           E.2.1         7         N         1         1         1         7         0.9           E.2.2         0.25         N         1         0.7         0.7         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9           E.2.3         2         R         1.73         1         1         1.22           E.2.4         0.3         N         1         1         0.3           E.2.4         0.25         R         1.73         1         1         0.3           E.2.4         0.25         R         1.73         1         1         0.5           E.2.4         0.3         N         1         1         1.5         1         1.5           E.2.5         4.8         R         1.73         1         1         1.5           E.6.1         3         R         1.73         1         1         1.7      <t< td=""><td>b         c         d         e= r(d,k)         f         g         h= c         i= c         i= c         x f/e         cx g/e           IEEE Sec.         Tol. (±%)         Prob. Dist.         Div.         1gm         10gms         u, u, (±%)         10gms           E.2.1         7         N         1         1         1         7.0         7.0           E.2.2         0.25         N         1         0.7         0.7         0.2         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9         0.9           E.2.3         2         R         1.73         1         1         1.2         1.2           E.2.4         0.3         N         1         1         0.3         0.3           E.2.4         0.25         R         1.73         1         1         0.1         0.1           E.2.4         0.3         N         1         1         1         0.3         0.3           E.2.4         0.3         R         1.73         1         1         0.5         0.5           E.2.4         0.3         R         1.73         1         1</td></t<></td>	b         c         d         e= f(d,k)         f         g         h= $c \times f/e$ IEEE Sec.         Tol. (± %)         Prob. Dist.         C <sub>1</sub> C <sub>1</sub> 1gm         10 gms         u <sub>1</sub> $(\pm %)$ E.2.1         7         N         1         1         1         7         0.9           E.2.2         0.25         N         1         0.7         0.7         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9           E.2.3         2         R         1.73         1         1         1.22           E.2.4         0.3         N         1         1         0.3           E.2.4         0.25         R         1.73         1         1         0.3           E.2.4         0.25         R         1.73         1         1         0.5           E.2.4         0.3         N         1         1         1.5         1         1.5           E.2.5         4.8         R         1.73         1         1         1.5           E.6.1         3         R         1.73         1         1         1.7 <t< td=""><td>b         c         d         e= r(d,k)         f         g         h= c         i= c         i= c         x f/e         cx g/e           IEEE Sec.         Tol. (±%)         Prob. Dist.         Div.         1gm         10gms         u, u, (±%)         10gms           E.2.1         7         N         1         1         1         7.0         7.0           E.2.2         0.25         N         1         0.7         0.7         0.2         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9         0.9           E.2.3         2         R         1.73         1         1         1.2         1.2           E.2.4         0.3         N         1         1         0.3         0.3           E.2.4         0.25         R         1.73         1         1         0.1         0.1           E.2.4         0.3         N         1         1         1         0.3         0.3           E.2.4         0.3         R         1.73         1         1         0.5         0.5           E.2.4         0.3         R         1.73         1         1</td></t<>	b         c         d         e= r(d,k)         f         g         h= c         i= c         i= c         x f/e         cx g/e           IEEE Sec.         Tol. (±%)         Prob. Dist.         Div.         1gm         10gms         u, u, (±%)         10gms           E.2.1         7         N         1         1         1         7.0         7.0           E.2.2         0.25         N         1         0.7         0.7         0.2         0.2           E.2.2         1.3         N         1         0.7         0.7         0.9         0.9           E.2.3         2         R         1.73         1         1         1.2         1.2           E.2.4         0.3         N         1         1         0.3         0.3           E.2.4         0.25         R         1.73         1         1         0.1         0.1           E.2.4         0.3         N         1         1         1         0.3         0.3           E.2.4         0.3         R         1.73         1         1         0.5         0.5           E.2.4         0.3         R         1.73         1         1

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