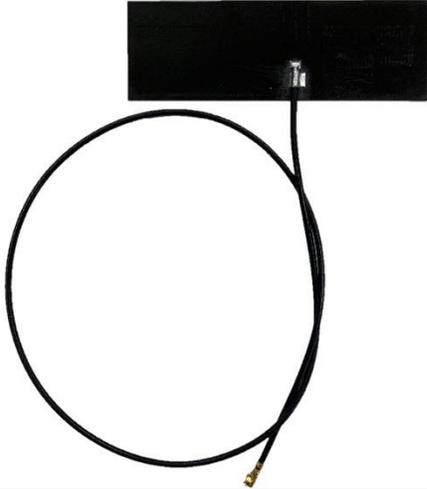


Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz



Features & Applications:

- 4G LTE All Band
- Nb-IoT, LTE CAT M1
- Omnidirectional radiation
- PCB radiator + Coaxial cable
- IPEX Connector
- RoHS compliant
- Mounting with included adhesive tape

ELECTRICAL SPECIFICATIONS @ 25°C

General Specifications

Antenna type	Nominal Impedance	Polarization	Radiation pattern	Power withstanding
Dipole	50Ω	Vertical / Linear	Omni	1W
Frequency (MHz)	698-960; 1710-2170; 2300-2700			
Return Loss (dB)	-5~-10			
Peak Gain (dBi)	4.5			
Efficiency (%)	698-960 MHz >25% 1710-2170 MHz >40% 2300 - 2690 MHz >30%			

MECHANICAL SPECIFICATIONS

BTPA0061204G0C4Axx

Dimension (Length x Width)	Material	Color	Cable type	Connector Type	Cable length
61 x20 x 0.4 mm	PCB	Black	1.37 coaxial cable	IPEX Compatible	See PN list

ENVIRONMENTAL SPECIFICATIONS

BTPA0061204G0C4Axx

Storage Temperature	Operating Temperature	Ingress Protection	RoHS Compliant
-30/+75° C	-20/+65° C	N/A	Yes

This document covers all product variants of the following product family:

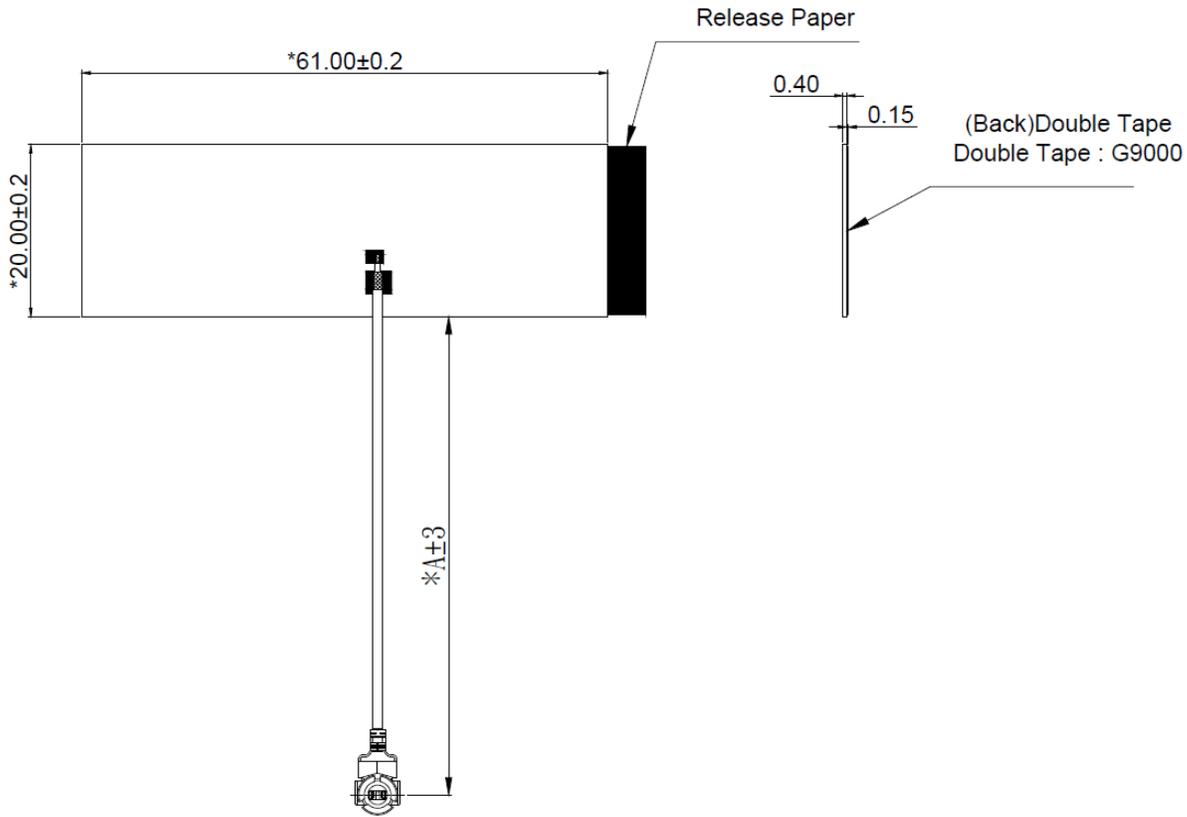
PART NUMBER	Cable Type Length	Connector Type
BTPA0061204G0C4A02	312.3mm, Ø1.37mm OD cable	IPEX Compatible
BTPA0061204G0C4A03	200mm, Ø1.37mm OD cable	IPEX Compatible
BTPA0061204G0C4A04	100mm, Ø1.37mm OD cable	IPEX Compatible

Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

Mechanical Drawing

BTPA0061204G0C4Axx

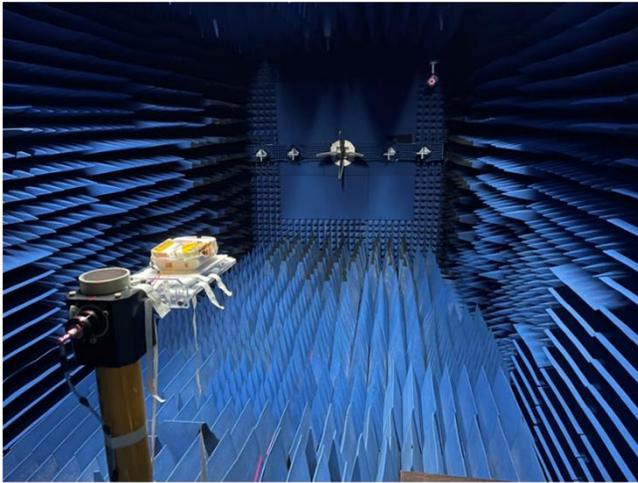


Dimensions: inches (mm) Unless otherwise specified, all tolerances are ± 0.020 (0.5mm)

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

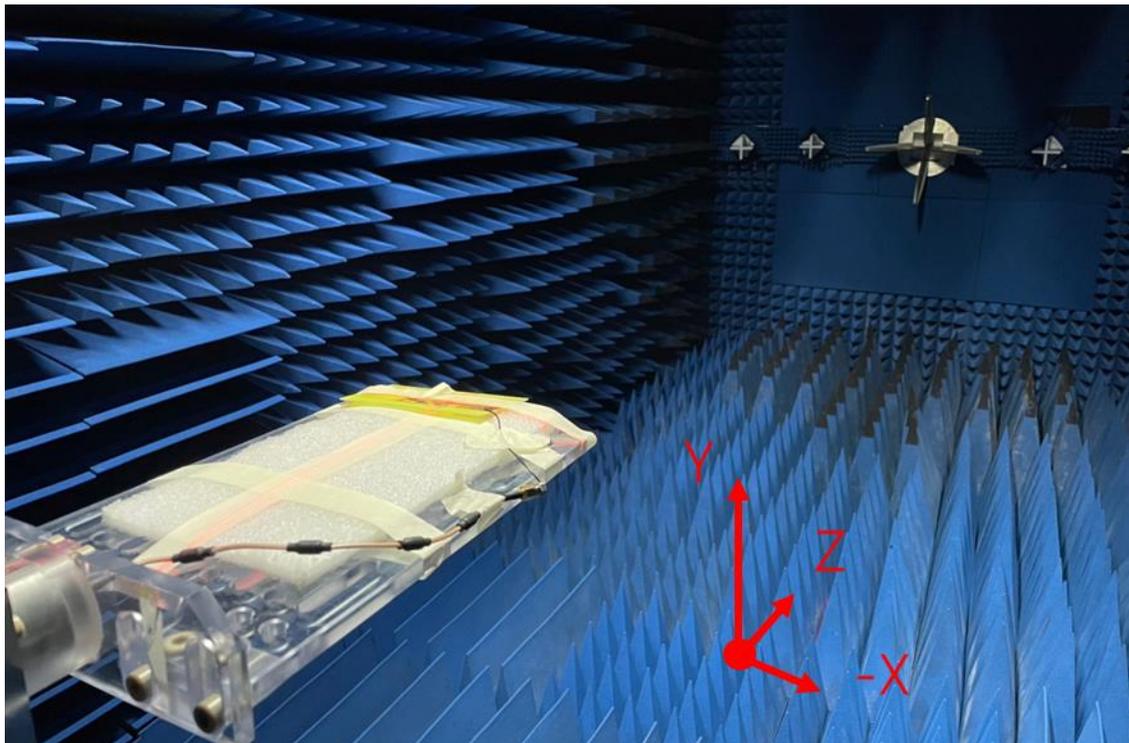
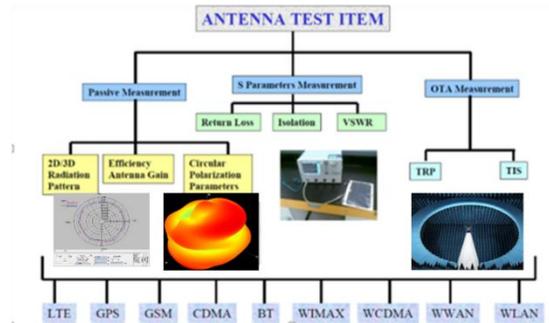
General / Chamber Setup



TRC Chamber



S11 measurements were taken with Agilent E5071C ENA, 9kHz- 8.5GHz

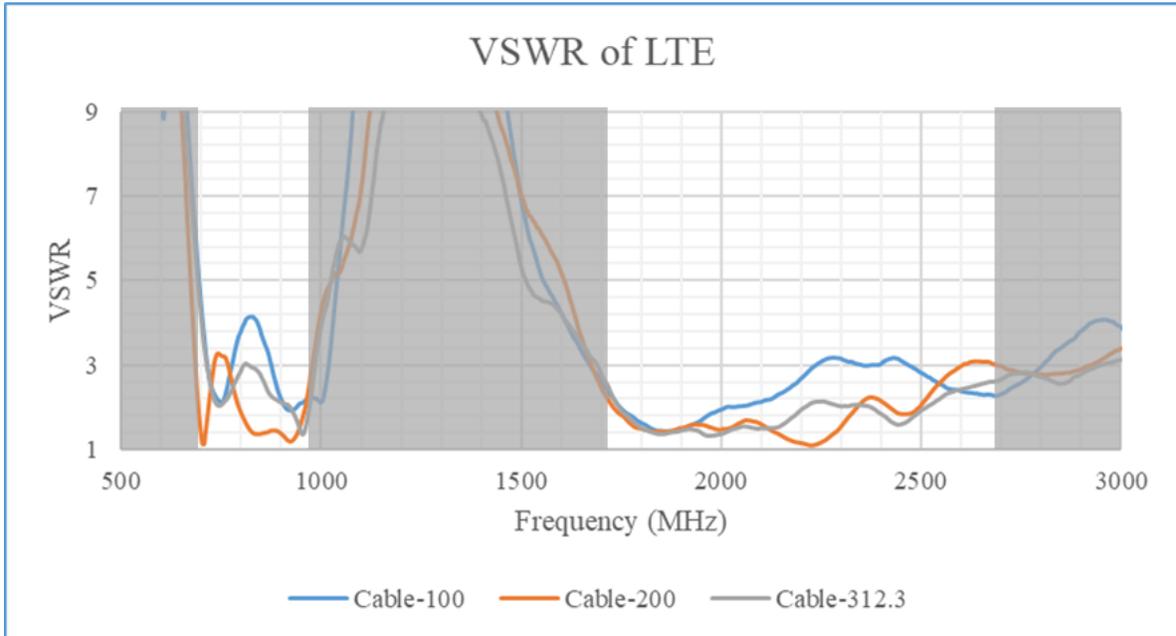


Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

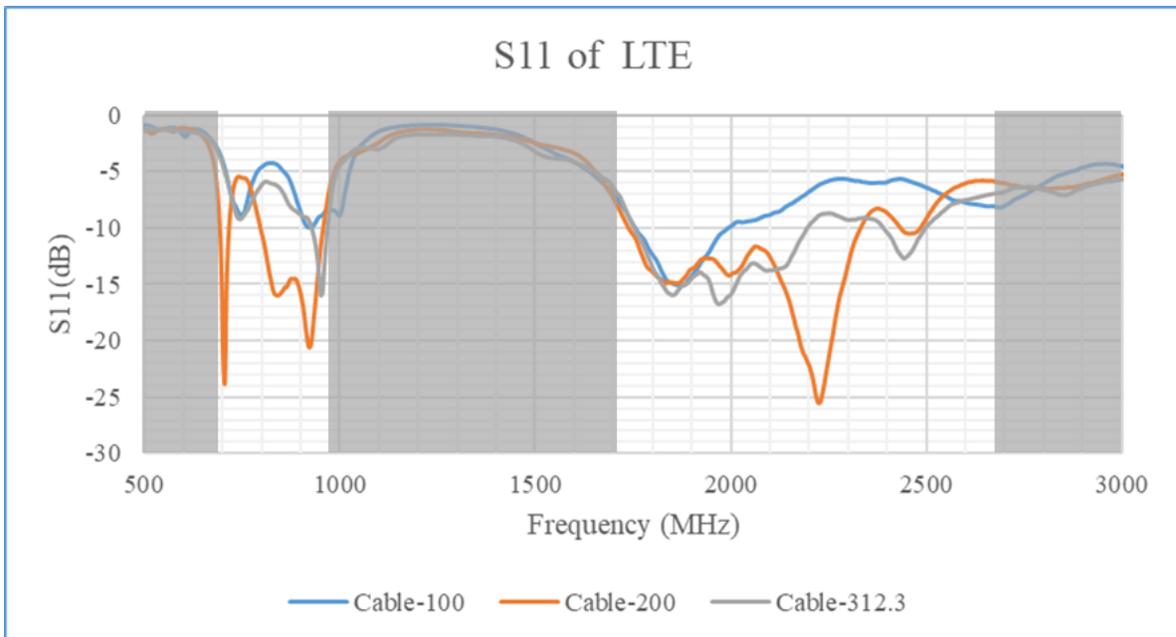
Test Setup Charts - VSWR

Test data



Charts - Return loss

Test data

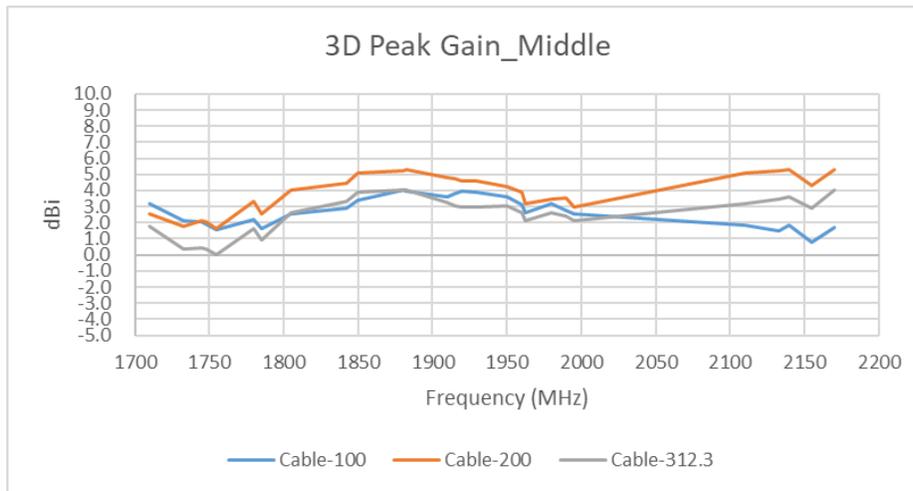
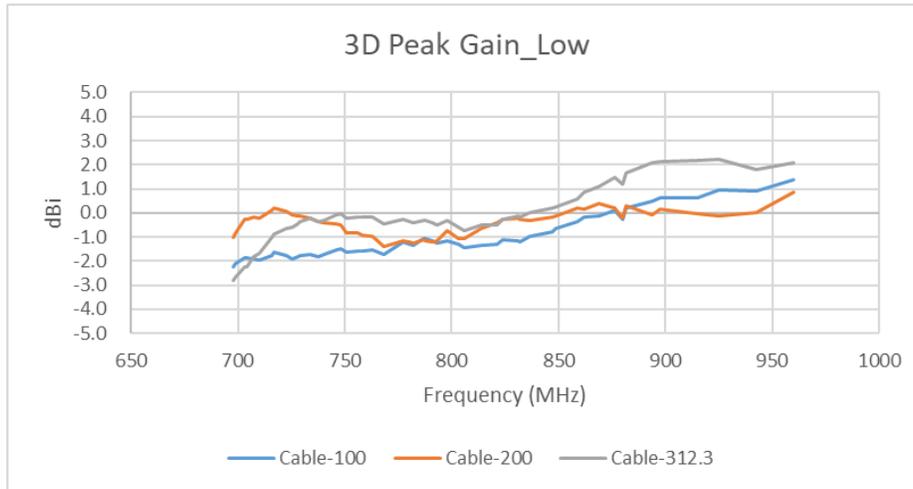


Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

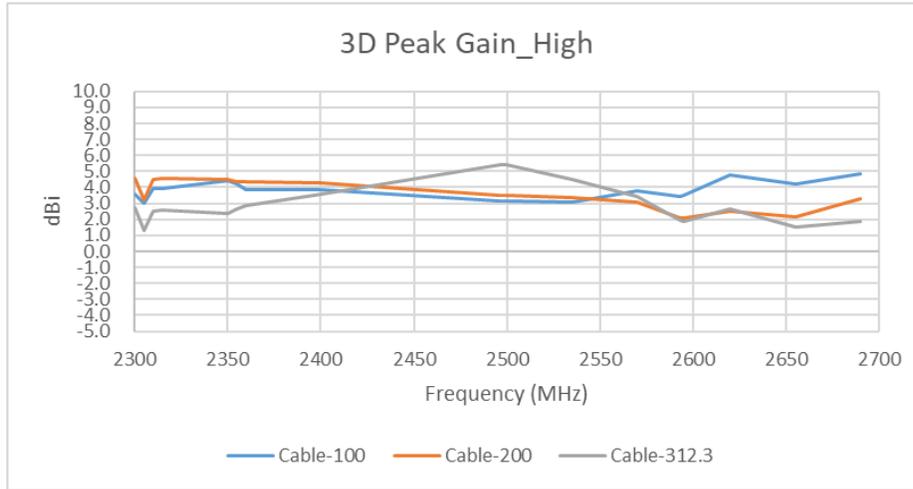
Charts – Max Gain dBi

Test data



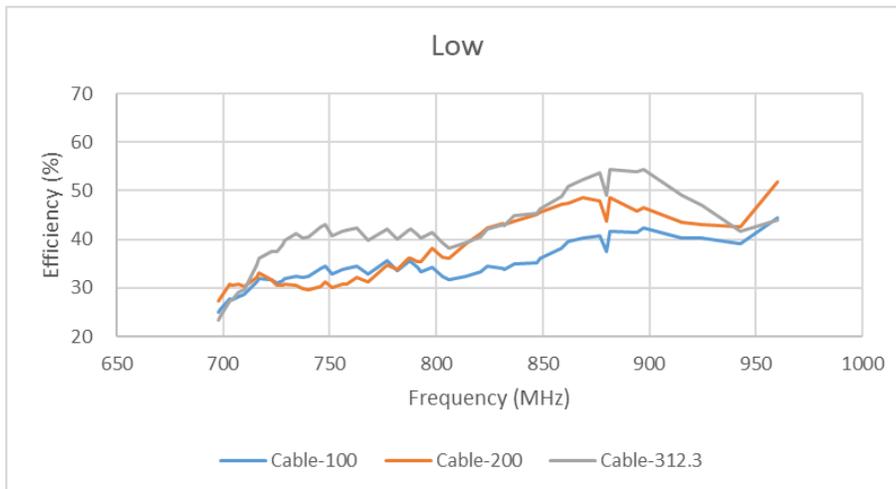
Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz



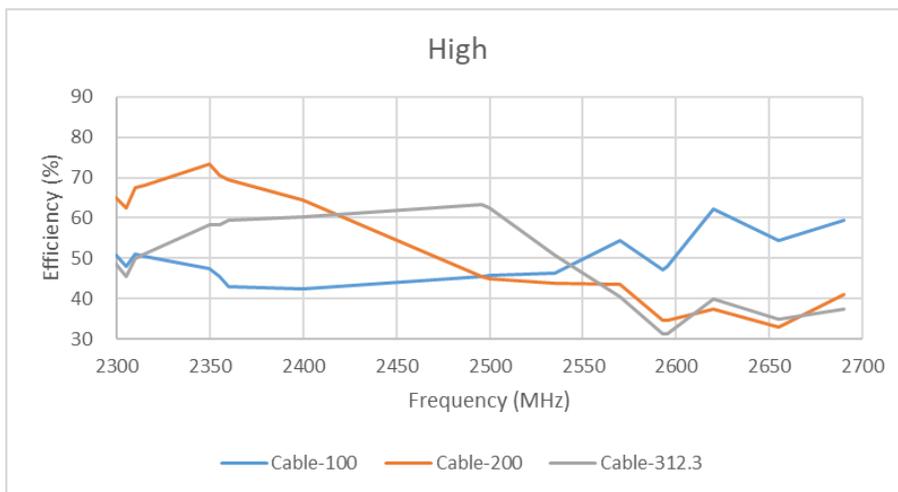
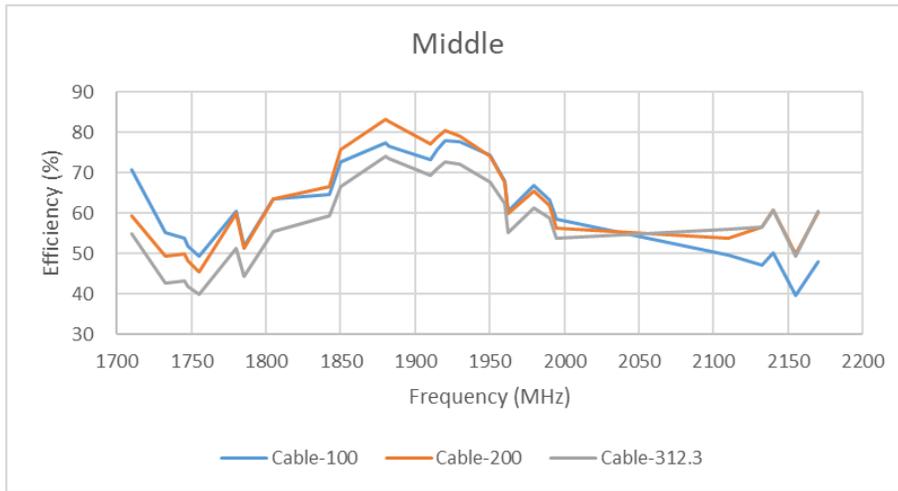
Charts - Efficiency

Test data



Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

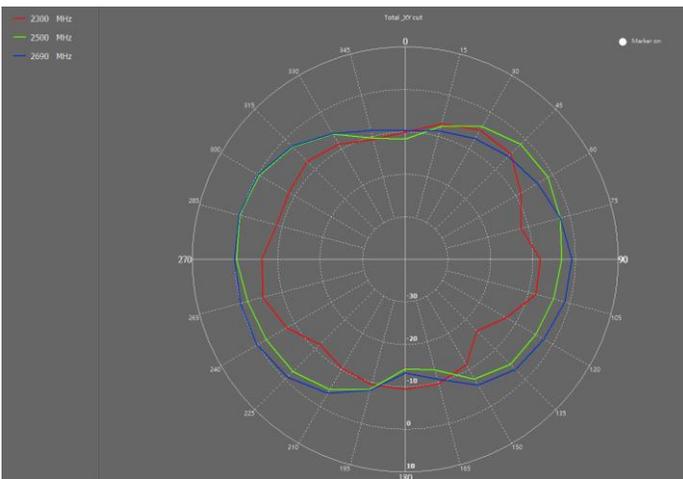
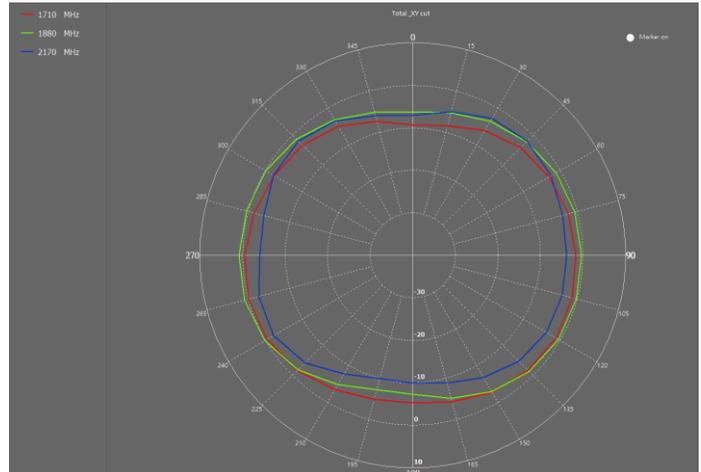
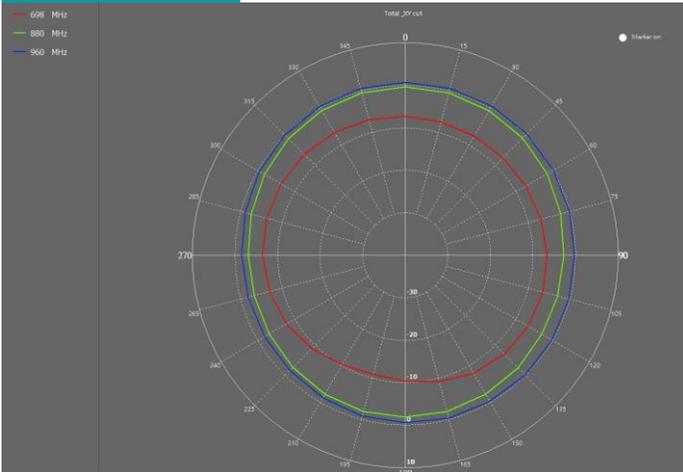


Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Radiation Pattern – Cable 100mm
Frequency(MHz): 698~2700. Pattern Field: XY Cut(Theta=90)

Test data



	Max value	Min value	Average
698(MHz)	-6.28 dB	-10.97 dB	-7.62 dB
880(MHz)	-0.37 dB	-3.30 dB	-1.88 dB
960(MHz)	0.71 dB	-1.89 dB	-0.36 dB

	Max value	Min value	Average
1710(MHz)	-0.10 dB	-9.33 dB	-3.67 dB
1880(MHz)	0.83 dB	-7.29 dB	-2.59 dB
2170(MHz)	-2.00 dB	-10.01 dB	-4.8 dB

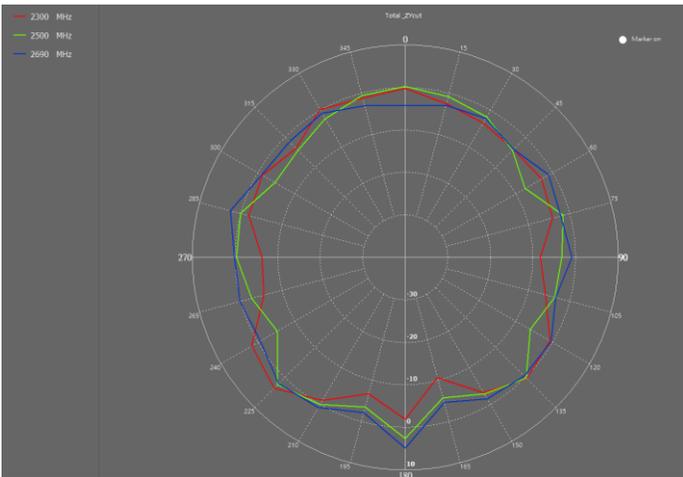
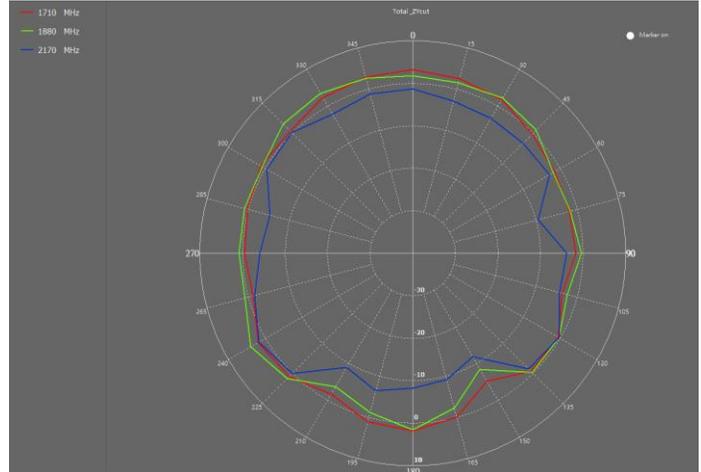
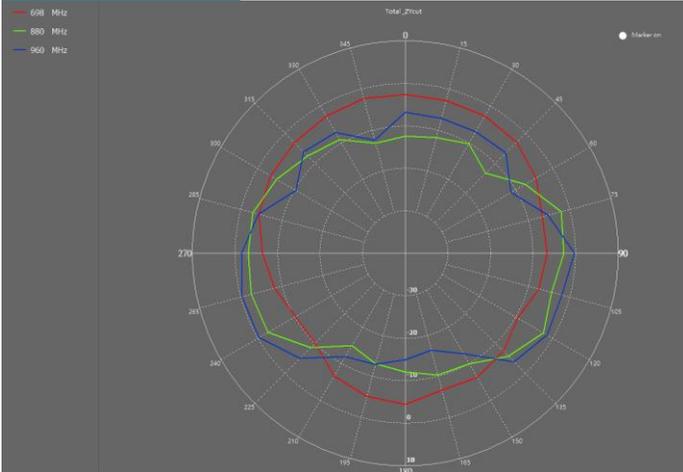
	Max value	Min value	Average
2300(MHz)	-4.81 dB	-16.29 dB	-9.14 dB
2500(MHz)	0.30 dB	-14.22 dB	-5.23 dB
2700(MHz)	0.44 dB	-13.22 dB	-4.56 dB

Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

Radiation Pattern – Cable 100mm
Frequency(MHz): 698~2700. Pattern Field: ZY Cut(Phi=90)

Test data



	Max value	Min value	Average
698(MHz)	-2.28 dB	-10.29 dB	-5.55 dB
880(MHz)	-2.06 dB	-14.95 dB	-8.02 dB
960(MHz)	-0.23 dB	-16.44 dB	-7.34 dB

	Max value	Min value	Average
1710(MHz)	3.17 dB	-5.24 dB	0.11 dB
1880(MHz)	4.00 dB	-8.43 dB	0.19 dB
2170(MHz)	1.70 dB	-11.86 dB	-3.97 dB

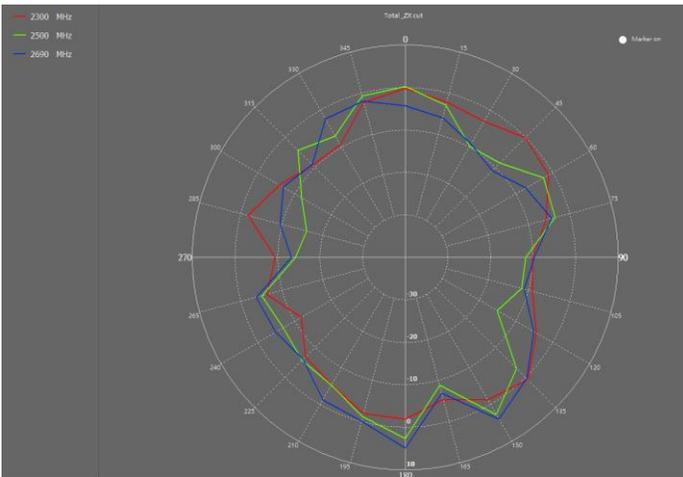
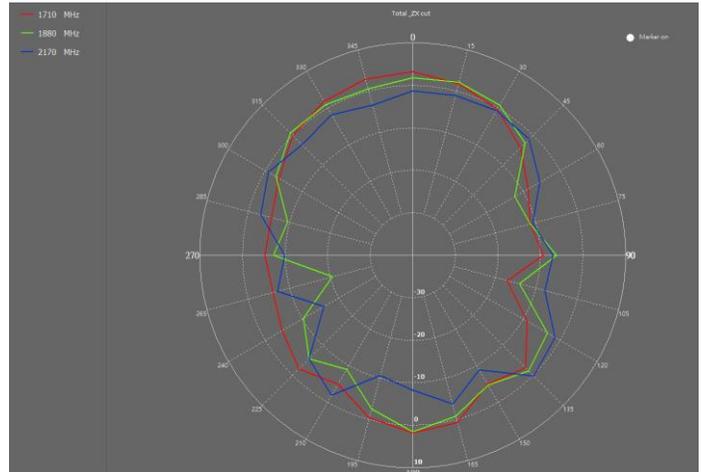
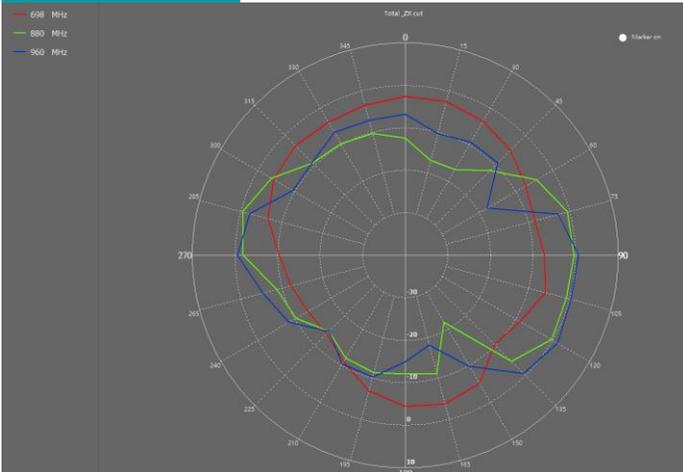
	Max value	Min value	Average
2300(MHz)	3.60 dB	-10.76 dB	-2.90 dB
2500(MHz)	2.55 dB	-7.50 dB	-2.16 dB
2700(MHz)	4.83 dB	-4.62 dB	-0.90 dB

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Radiation Pattern – Cable 100mm
Frequency(MHz): 698~2700. Pattern Field: ZX Cut(Phi=0)

Test data



	Max value	Min value	Average
698(MHz)	-2.61 dB	-13.86 dB	-6.81 dB
880(MHz)	-0.32 dB	-21.81 dB	-8.77 dB
960(MHz)	1.35 dB	-18.16 dB	-7.88 dB

	Max value	Min value	Average
1710(MHz)	3.17 dB	-17.04 dB	-3.48 dB
1880(MHz)	2.16 dB	-20.53 dB	-4.60 dB
2170(MHz)	0.24 dB	-15.95 dB	-5.19 dB

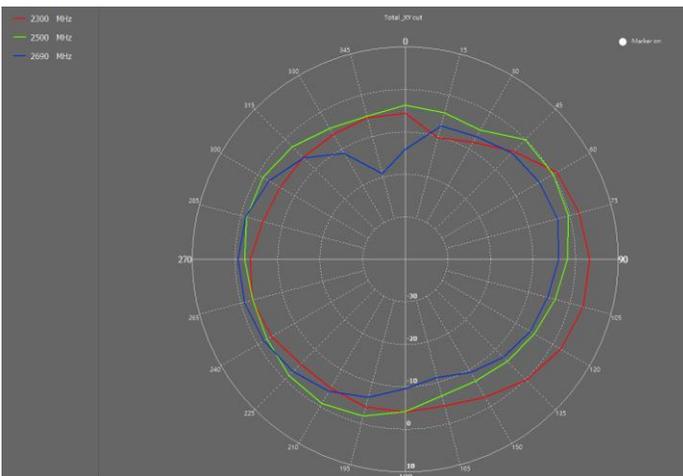
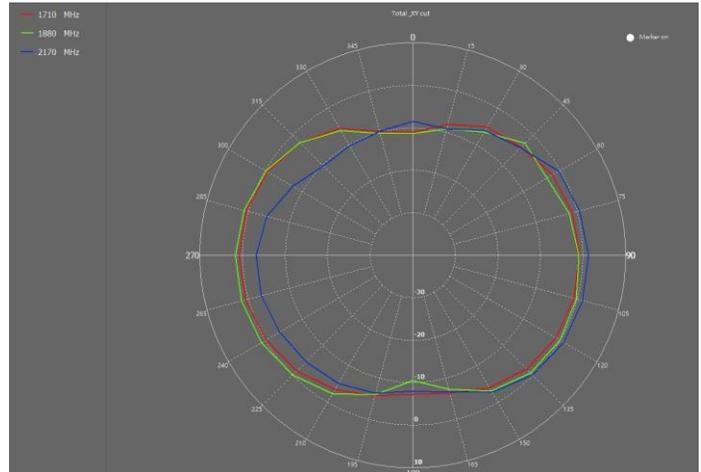
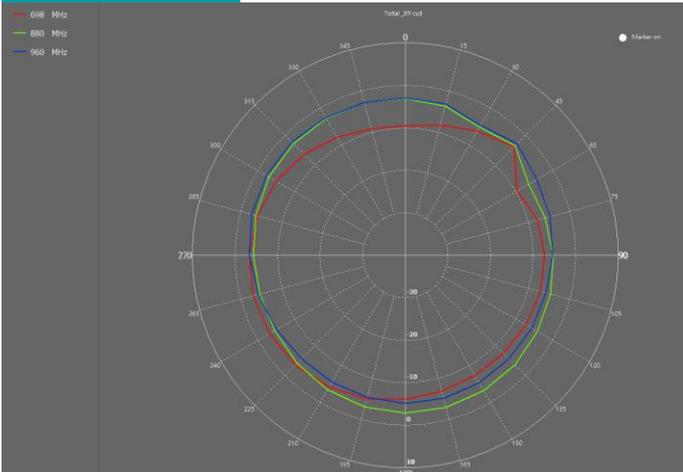
	Max value	Min value	Average
2300(MHz)	0.73 dB	-11.74 dB	-4.67 dB
2500(MHz)	2.69 dB	-16.06 dB	-5.93 dB
2700(MHz)	4.83 dB	-13.22 dB	-4.84 dB

Series:

PULSE P/N: **BTPA0061204G0C4Axx** – 698 to 2700MHz

Radiation Pattern – Cable 200mm
Frequency(MHz): 698~2700. Pattern Field: XY Cut(Theta=90)

Test data



	Max value	Min value	Average
698(MHz)	-3.11 dB	-9.67 dB	-6.39 dB
880(MHz)	-2.74 dB	-6.52 dB	-3.89 dB
960(MHz)	-2.33 dB	-5.75 dB	-4.25 dB

	Max value	Min value	Average
1710(MHz)	0.79 dB	-11.14 dB	-3.74 dB
1880(MHz)	1.68 dB	-11.38 dB	-3.70 dB
2170(MHz)	1.29 dB	-10.30 dB	-4.79 dB

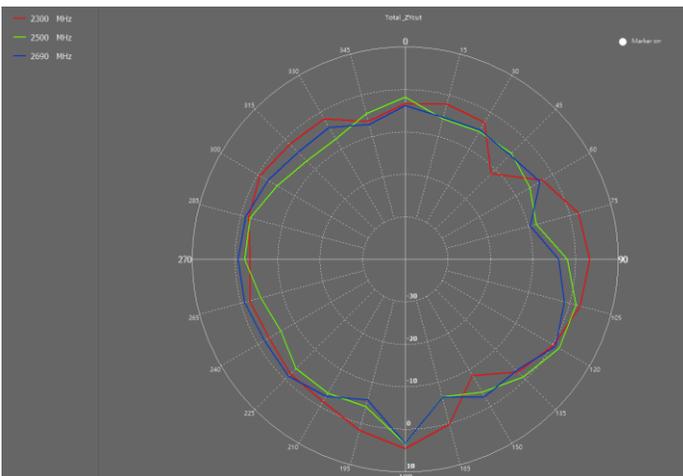
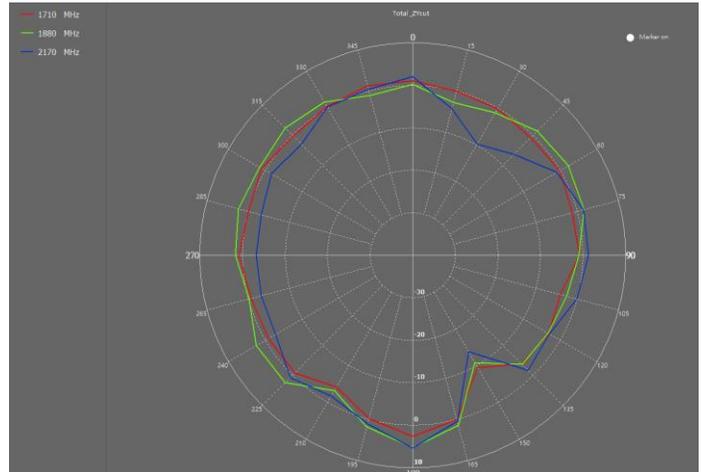
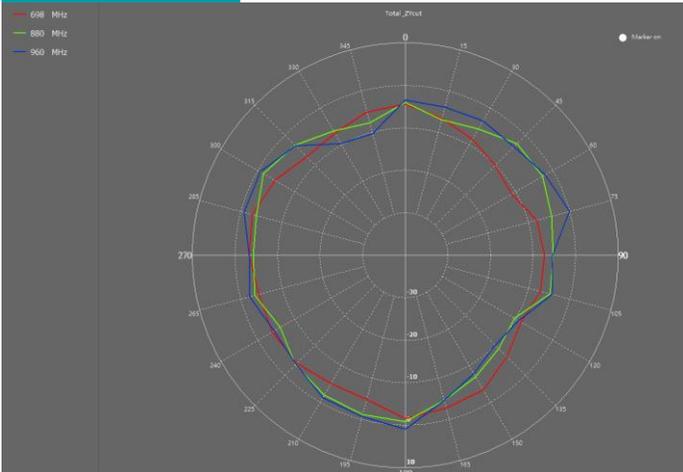
	Max value	Min value	Average
2300(MHz)	3.31 dB	-10.35 dB	-3.46 dB
2500(MHz)	0.16 dB	-6.99 dB	-3.12 dB
2700(MHz)	-0.70 dB	-19.07 dB	-6.56 dB

Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

Radiation Pattern – Cable 200mm
Frequency(MHz): 698~2700. Pattern Field: ZY Cut(Phi=90)

Test data



	Max value	Min value	Average
698(MHz)	-1.62 dB	-11.15 dB	-5.61 dB
880(MHz)	-0.91 dB	-10.39 dB	-4.52 dB
960(MHz)	0.87 dB	-10.32 dB	-3.91 dB

	Max value	Min value	Average
1710(MHz)	2.56 dB	-9.45 dB	-0.87 dB
1880(MHz)	5.26 dB	-10.79 dB	0.14 dB
2170(MHz)	5.29 dB	-13.79 dB	-1.63 dB

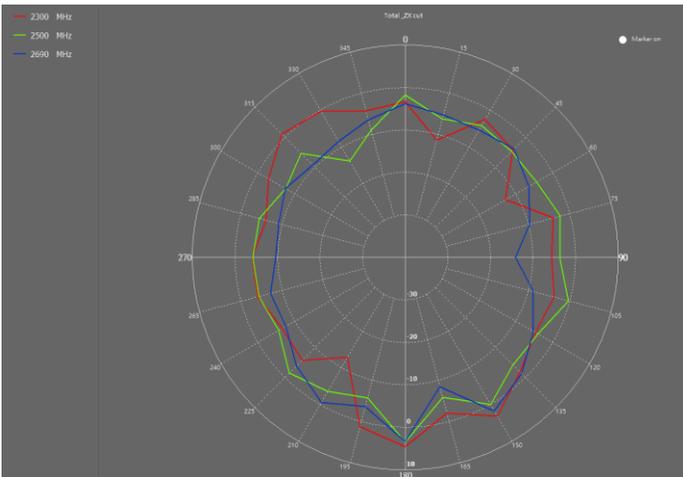
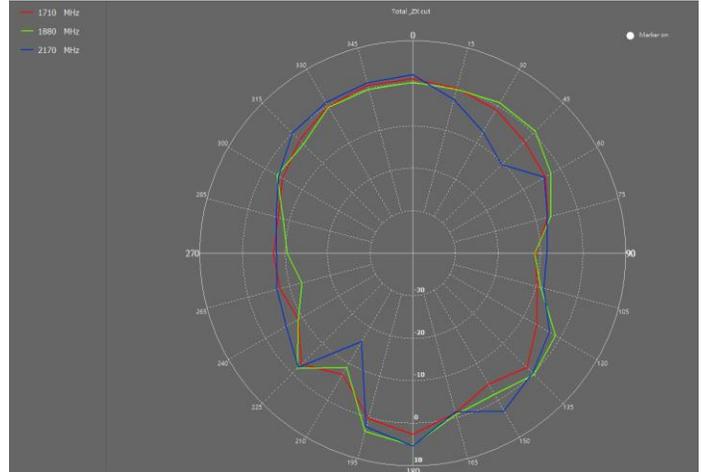
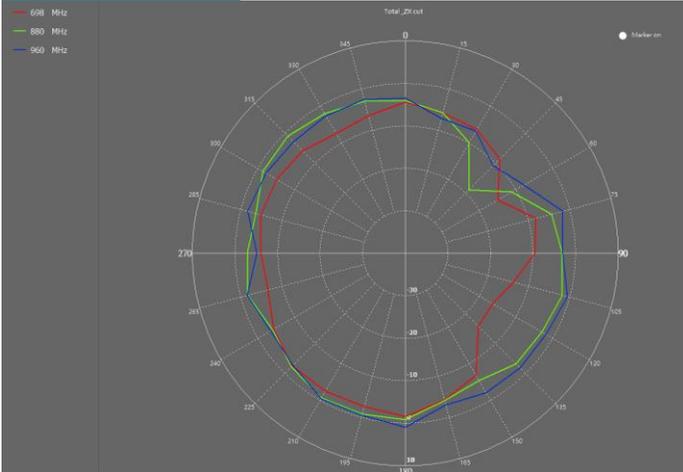
	Max value	Min value	Average
2300(MHz)	4.57 dB	-11.56 dB	-1.57 dB
2500(MHz)	3.47 dB	-8.11 dB	-3.46 dB
2700(MHz)	3.26 dB	-9.58 dB	-3.01 dB

Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

Radiation Pattern – Cable 200mm
Frequency(MHz): 698~2700. Pattern Field: ZX Cut(Phi=0)

Test data



	Max value	Min value	Average
698(MHz)	-1.62 dB	-16.34 dB	-6.91 dB
880(MHz)	-0.73 dB	-18.94 dB	-4.03 dB
960(MHz)	0.87 dB	-10.80 dB	-2.99 dB

	Max value	Min value	Average
1710 (MHz)	2.56 dB	-11.14 dB	-3.65 dB
1880(MHz)	5.26 dB	-13.01 dB	-3.03 dB
2170(MHz)	5.29 dB	-15.99 dB	-3.28 dB

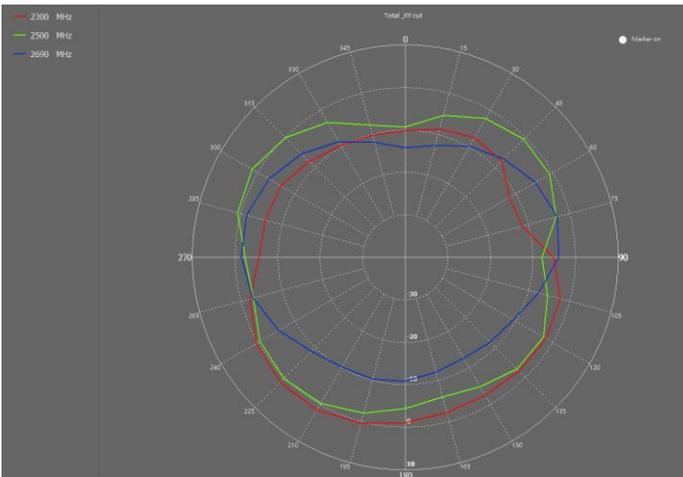
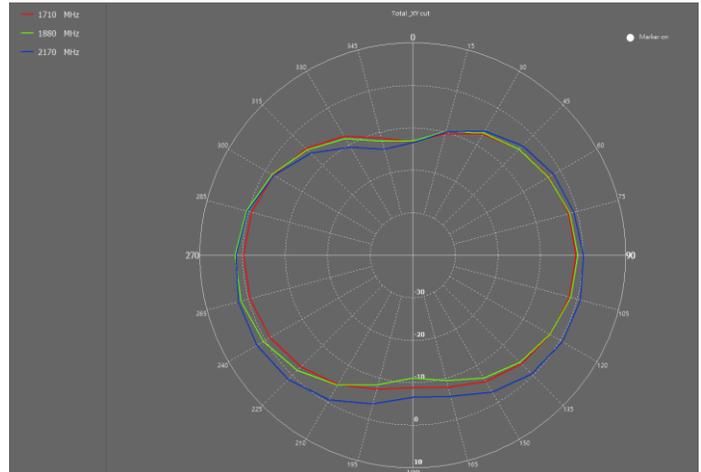
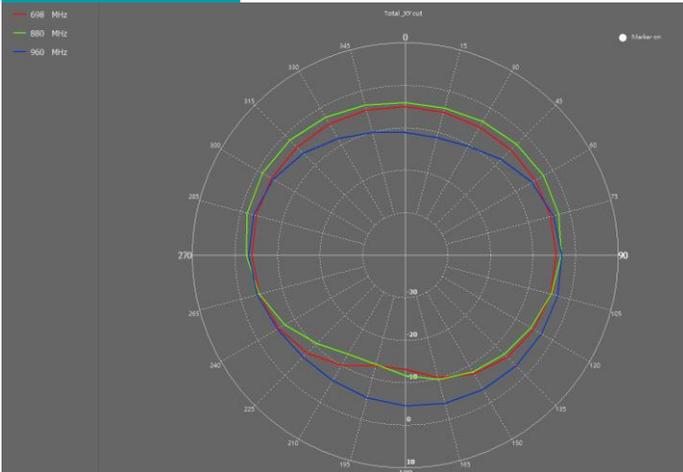
	Max value	Min value	Average
2300(MHz)	4.57 dB	-12.81 dB	-3.57 dB
2500(MHz)	3.47 dB	-13.87 dB	-4.02 dB
2700(MHz)	3.26 dB	-14.15 dB	-5.53 dB

Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

Radiation Pattern – Cable 312.3mm
Frequency(MHz): 698~2700. Pattern Field: XY Cut(Theta=90)

Test data



	Max value	Min value	Average
698(MHz)	-3.78 dB	-13.10 dB	-6.08 dB
880(MHz)	-1.24 dB	-13.45 dB	-5.48 dB
960(MHz)	-2.98 dB	-11.34 dB	-5.92 dB

	Max value	Min value	Average
1710(MHz)	-0.26 dB	-13.31 dB	-5.23 dB
1880(MHz)	1.74 dB	-13.14 dB	-5.11 dB
2170(MHz)	2.36 dB	-14.15 dB	-3.74 dB

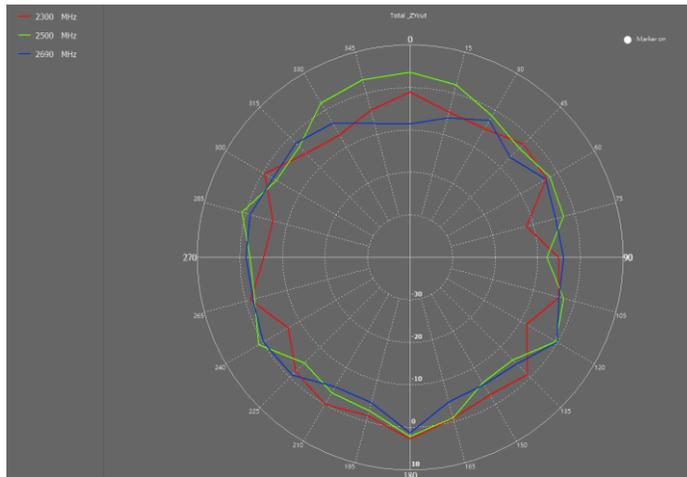
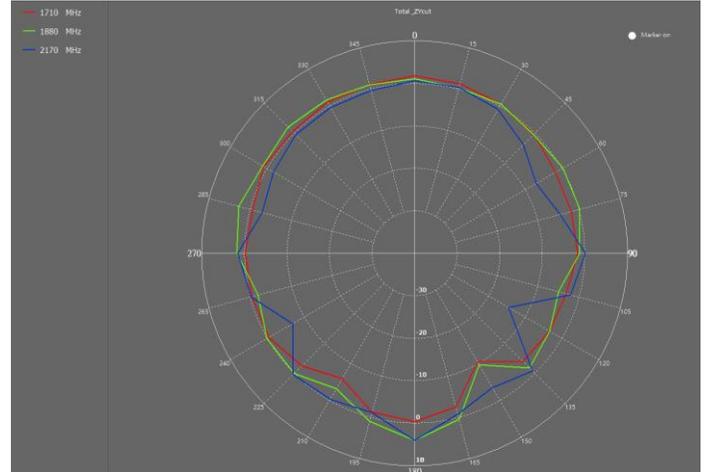
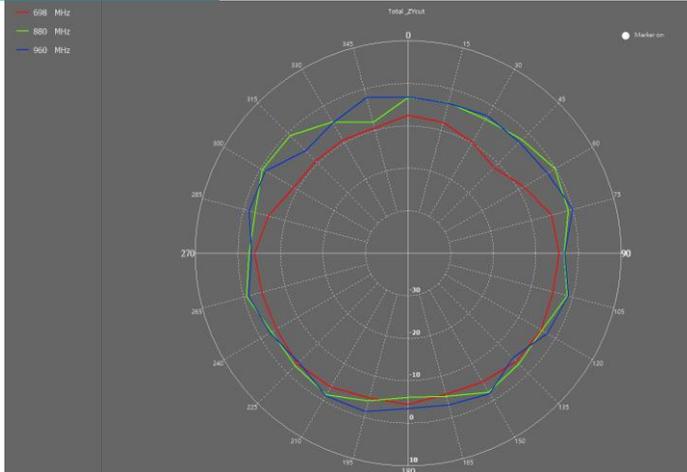
	Max value	Min value	Average
2300(MHz)	1.53 dB	-11.73 dB	-5.18 dB
2500(MHz)	1.45 dB	-9.36 dB	-3.30 dB
2700(MHz)	-1.42 dB	-14.27 dB	-8.22 dB

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Radiation Pattern – Cable 312.3mm
Frequency(MHz): 698~2700. Pattern Field: ZY Cut(Phi=90)

Test data



	Max value	Min value	Average
698(MHz)	-3.17 dB	-11.43 dB	-6.20 dB
880(MHz)	-0.15 dB	-8.10 dB	-3.06 dB
960(MHz)	0.06 dB	-5.86 dB	-2.67 dB

	Max value	Min value	Average
1710(MHz)	1.79 dB	-10.47 dB	-1.39 dB
1880(MHz)	4.02 dB	-9.68 dB	-0.20 dB
2170(MHz)	4.03 dB	-14.48 dB	-1.67 dB

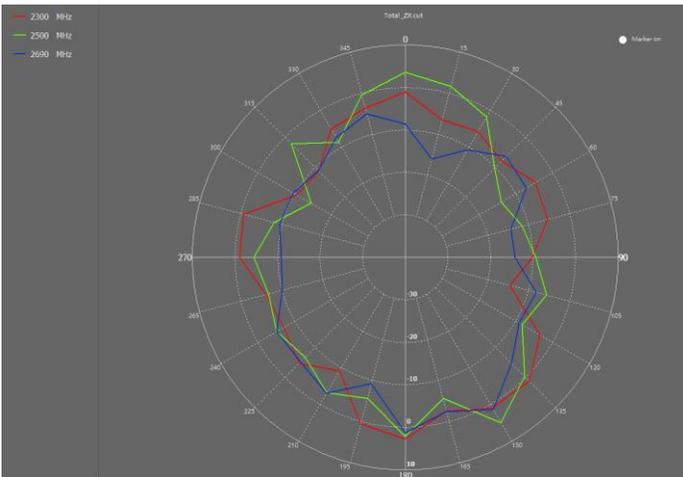
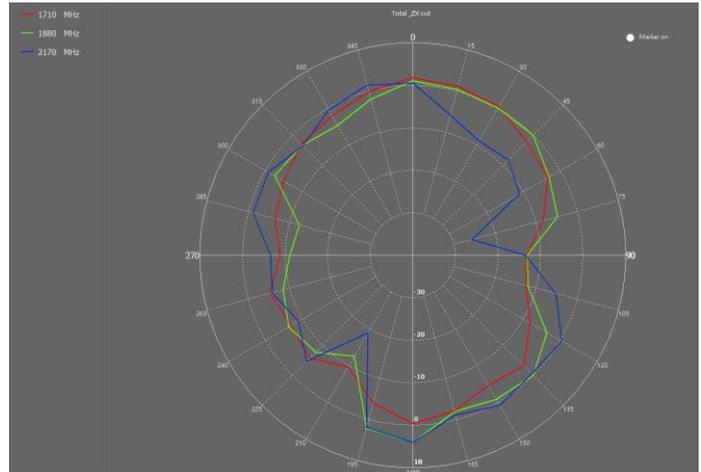
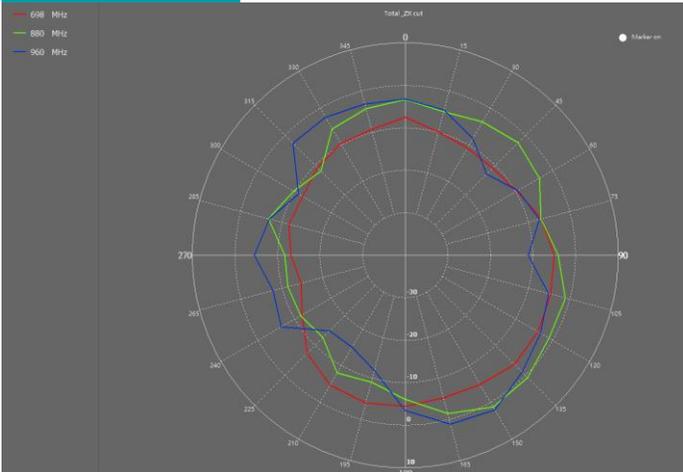
	Max value	Min value	Average
2300(MHz)	2.69 dB	-11.65 dB	-3.42 dB
2500(MHz)	3.51 dB	-7.93 dB	-1.58 dB
2700(MHz)	1.34 dB	-8.67 dB	-3.30 dB

Series:

PULSE P/N: *BTPA0061204G0C4Axx* – 698 to 2700MHz

Radiation Pattern – Cable 312.3mm
Frequency(MHz): 698~2700. Pattern Field: ZX Cut(Phi=0)

Test data



	Max value	Min value	Average
698(MHz)	-3.79 dB	-14.65 dB	-8.10 dB
880(MHz)	1.21 dB	-12.73 dB	-5.87 dB
960(MHz)	2.03 dB	-15.01 dB	-6.31 dB

	Max value	Min value	Average
1710(MHz)	1.79 dB	-13.31 dB	-4.50 dB
1880(MHz)	4.02 dB	-13.14 dB	-3.97 dB
2170(MHz)	4.03 dB	-25.51 dB	-4.72 dB

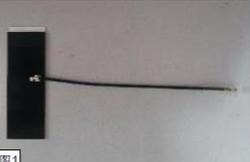
	Max value	Min value	Average
2300(MHz)	2.69 dB	-14.57 dB	-4.55 dB
2500(MHz)	4.85 dB	-14.48 dB	-4.75 dB
2700(MHz)	1.35 dB	-16.07 dB	-7.39 dB

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz



Standard Operation Sheet/标准操作指南

Part Name/No. 产品名称/编号:	Process Name 工序名称:	Revision 版本:	Effective Date 生效日期:	Change Description 变更内容:	PE	QE	PRD
BTPA0061204G0C4Axx系列 标准天线	包装	A	2024/1/31	Initial release			
Standard Work Layout/标准操作工位:							
							
Step	Description of Work Content/操作内容描述			Step	Description of Work Content/操作内容描述		
1	将50pcs产品装入1个PE袋内，端子套上防尘帽，贴上PE袋标签，封口。如图1-3所示。			3	将外箱底部用透明胶带封好，再将40袋装满天线的PE袋共2000pcs天线放入外箱内，并用透明胶带封好口。如图5-6所示。		
2	用热焊封口机将PE袋封口，如图4所示。			4	将外箱标签贴附在外箱的左上角，标签位置及内容如图5所示。		
Critical Points&Tool Information/操作要点及夹具信息					Tool&Critical Parameter/夹具与重点参数检查		
1.只有受过培训和确认合格的员工可以执行本操作。 2.假如发生异常问题，联系线负责人，维护人或主管。 3.在打包作业之前，操作员必须确认打包的数量是否正确。包装外箱上产品的代号必须与工单上的一致。					Tool required(使用工具): Tool Type(夹具型号): Safety Device(安全设备):		

Form No. : QP8.5.2-03 30.08.2021 Confidential

Doc.No/文件编号:WI-SZHS-D4540-S05

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

The Following samples were submitted and identified on behalf of the client as:

<u>Sample Name/样品名称</u>	: BTPA0061204G0C4AXX-2321P		
<u>Sample Quantity/样品数量</u>	: 30Pcs		
<u>Date Submitted/申请日期</u>	: 2023.11.17		
<u>Test Period/测试周期</u>	: 2023.11.20-----2023.11.29		
<u>Test Request/测试要求</u>	测试条件	样品编号	数量
	1. Cold Storage test 冷藏测试	#1~#5	5Pcs
	2. Dry Heat Storage test 热储存测试	#6~#10	5Pcs
	3. Damp Heat Cyclic test 湿热循环测试	#11~#15	5Pcs
	4. Temperature Cycling test 温度周期变化	#16~#20	5Pcs
	5. Thermal shock test 冷热冲击试验	#21~#25	5Pcs
	6. Salt mist test 盐雾测试	#26~#30	5Pcs
<u>Test Method/测试方法</u>	: Pulse Standard/普尔思标准	√	
	: Customer Request/客户标准		
<u>Test Result/测试结果</u>	: Please refer to next page.	PASS	
<u>Conclusion/结论</u>	NA		
<u>Suggestion/建议</u>	NA		

Maggie Wu(吴沛嫻)/RD

NA

HE HUAMING

Applicant by
申请人 QE/ME

Tel:
联系电话

Approval by:
确认人/LAB

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Test Result--- Cold Storage test 冷藏测试

<u>Sample Name</u>	: BTPA0061204G0C4AXX-2321P	
<u>Sample No.</u>	: 5Pcs(#1~#5)	
<u>Test Ambient</u>	: Temperature: 24.2°C	
	: Humidity:35%RH	
<u>Sample Reception</u>	: Fig.1	
<u>Test Condition Setup</u>	1.Room Temperature -40 degrees within 2 hours 2.Storage for 16 hours at -40 degrees; 3.-40 degrees room temperature within 2 hours	
<u>Test Process</u>	: Fig.2	
<u>Photos After Test</u>	: Fig.3	
<u>Test Result</u>	: 试验后样品外观无异常.	
<u>Final Result</u>	: OK	√
	: NG	
<u>Confirmed by</u>	: HU CHUNJIE	
<u>Date</u>	: 2023.11.21	

Series:

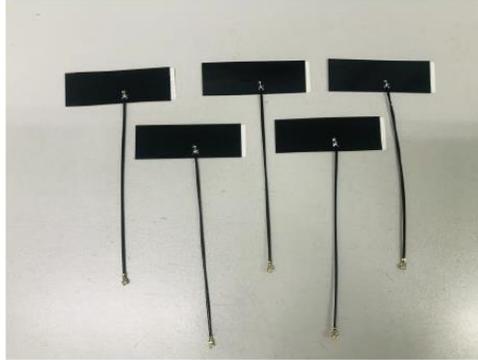
PULSE P/N: *BTPA0061204G0C4Axx – 698 to 2700MHz*

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Fig.1: Appearance photos of the samples before test.



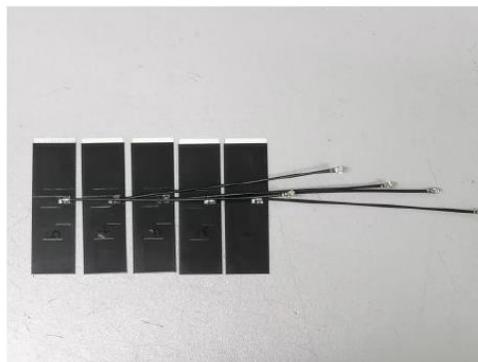
Sample No.: 2311031-#1~#5

Fig.2: Photo of samples in test process.



Sample No.: 2311031-#1~#5

Fig.3: Appearance photos of the samples after test.



Sample No.: 2311031-#1~#5

.....THE END.....

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Test Result--- Dry Heat Storage test 热储存测试

<u>Sample Name</u>	: BTPA0061204G0C4AXX-2321P	
<u>Sample No.</u>	: 5Pcs(#6~#10)	
<u>Test Ambient</u>	: Temperature: 24.2°C	
	: Humidity:35%RH	
<u>Sample Reception</u>	: Fig.1	
<u>Test Condition Setup</u>	1.Room Temperature 85 degrees within 2 hours 2.Storage for 16 hours at 85 degrees; 3.85 degrees room temperature within 2 hours	
<u>Test Process</u>	: Fig.2	
<u>Photos After Test</u>	: Fig.3	
<u>Test Result</u>	: 试验后样品外观无异常.	
<u>Final Result</u>	: OK	√
	: NG	
<u>Confirmed by</u>	: HU CHUNJIE	
<u>Date</u>	: 2023.11.21	

Series:

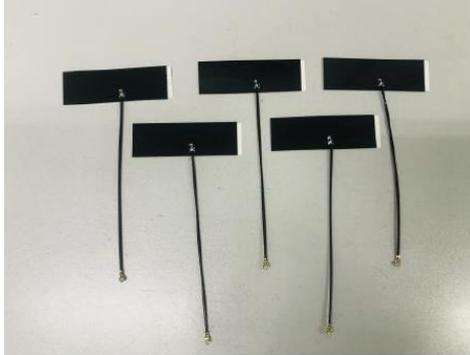
PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Fig.1: Appearance photos of the samples before test.



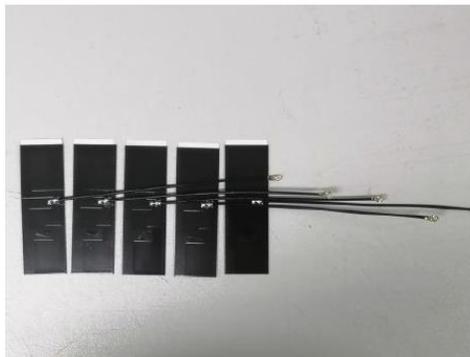
Sample No.: 2311031-#6-#10

Fig.2: Photo of samples in test process.



Sample No.: 2311031-#6-#10

Fig.3: Appearance photos of the samples after test.



Sample No.: 2311031-#6-#10

..... THE END.....

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Test Result--- Damp Heat Cyclic test 湿热循环测试

<u>Sample Name</u>	: BTPA0061204G0C4AXX-2321P	
<u>Sample No.</u>	: 5Pcs(#11~#15)	
<u>Test Ambient</u>	: Temperature: 24.2°C	
	: Humidity:35%RH	
<u>Sample Reception</u>	: Fig.1	
<u>Test Condition Setup</u>	95% RH @ +25°C for 12 h and 55°C for 12h. in 6 cycles (= 6 days)	
<u>Test Process</u>	: Fig.2	
<u>Photos After Test</u>	: Fig.3	
<u>Test Result</u>	: 试验后样品外观无异常.	
<u>Final Result</u>	: OK	√
	: NG	
<u>Confirmed by</u>	: HE HUAMING	
<u>Date</u>	: 2023.11.28	

Series:

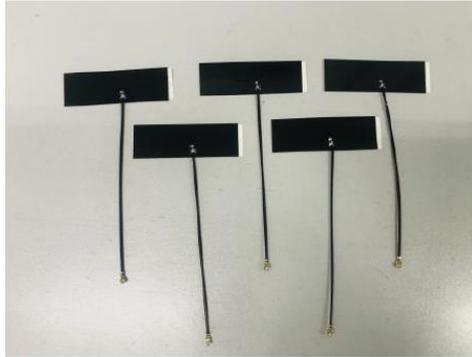
PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Fig.1: Appearance photos of the samples before test.



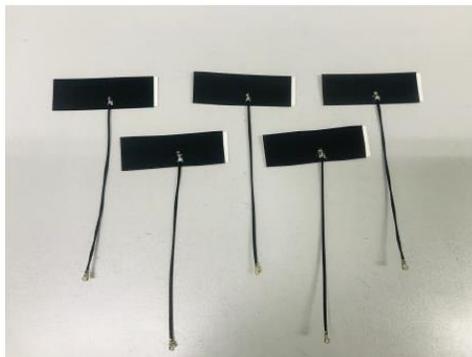
Sample No.: 2311031-#11~#15

Fig.2: Photo of samples in test process.



Sample No.: 2311031-#11~#15

Fig.3: Appearance photos of the samples after test.



Sample No.: 2311031-#11~#15

..... THE END.....

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Test Result--- Temperature Cycling test 温度周期变化

<u>Sample Name</u>	: BTPA0061204G0C4AXX-2321P	
<u>Sample No.</u>	: 5Pcs(#16~#20)	
<u>Test Ambient</u>	: Temperature: 24.2°C	
	: Humidity:35%RH	
<u>Sample Reception</u>	: Fig.1	
<u>Test Condition Setup</u>	1.Room Temperature to -40 degrees (2hours) 2.Storage for 2 hours at -40 degrees 3.-40 degrees to 85 degrees (2hours) 4.Storage for 2 hours at 85 degrees 5.85 degrees to -40 degrees (2hours) 6.Repeat from 2 to 5 for 5 times 7.-40 degrees increase to room temperature within 2 hours	
<u>Test Process</u>	: Fig.2	
<u>Photos After Test</u>	: Fig.3	
<u>Test Result</u>	: 试验后样品外观无异常.	
<u>Final Result</u>	: OK	√
	: NG	
<u>Confirmed by</u>	: HE HUAMING	
<u>Date</u>	: 2023.11.29	

Series:

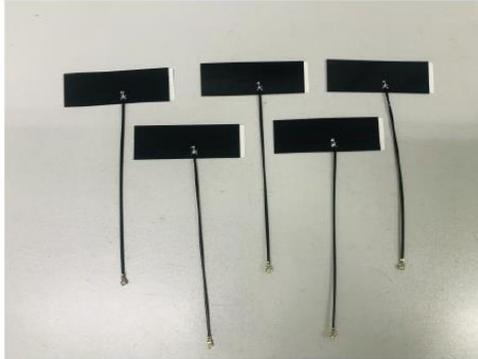
PULSE P/N: *BTPA0061204G0C4Axx – 698 to 2700MHz*

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Fig.1: Appearance photos of the samples before test.



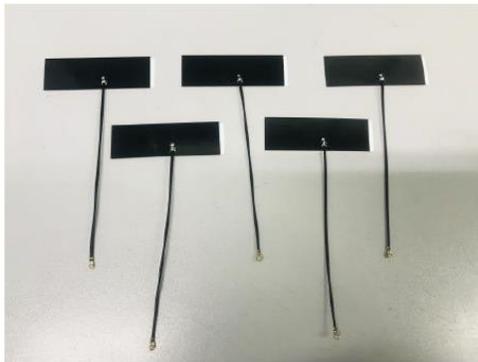
Sample No.: 2311031-#16~#20

Fig.2: Photo of samples in test process.



Sample No.: 2311031-#16~#20

Fig.3: Appearance photos of the samples after test.



Sample No.: 2311031-#16~#20

..... THE END.....

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Test Result--- Thermal shock test 冷热冲击试验

<u>Sample Name</u>	: BTPA0061204G0C4AXX-2321P	
<u>Sample No.</u>	: 5Pcs(#21~#25)	
<u>Test Ambient</u>	: Temperature: 24.2°C	
	: Humidity:35%RH	
<u>Sample Reception</u>	: Fig.1	
<u>Test Condition Setup</u>	65°C /-35°C, 30min(hot)/20min(cold).50min per cycle,20cycles.	
<u>Test Process</u>	: Fig.2	
<u>Photos After Test</u>	: Fig.3	
<u>Test Result</u>	: 试验后样品外观无异常.	
<u>Final Result</u>	: OK	√
	: NG	
<u>Confirmed by</u>	: HU CHUNJIE	
<u>Date</u>	: 2023.11.23	

Series:

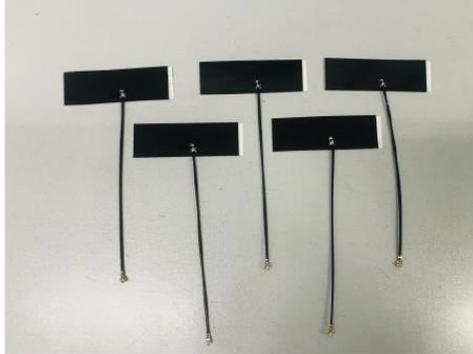
PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Fig.1: Appearance photos of the samples before test.



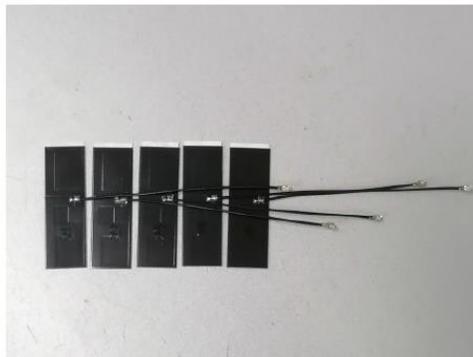
Sample No.: 2311031-#21~#25

Fig.2: Photo of samples in test process.



Sample No.: 2311031-#21~#25

Fig.3: Appearance photos of the samples after test.



Sample No.: 2311031-#21~#25

.....THE END.....

Series:

PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Test Result--- Salt mist test 盐雾测试

<u>Sample Name</u>	: BTPA0061204G0C4AXX-2321P	
<u>Sample No.</u>	: 5Pcs(#26~#30)	
<u>Test Ambient</u>	: Temperature: 24.2°C	
	: Humidity:35%RH	
<u>Sample Reception</u>	: Fig.1	
<u>Test Condition Setup</u>	a) 5% NaCl spray for 24 h (with simulated phone cover), @ +35°C,+95% RH	
<u>Test Process</u>	: Fig.2	
<u>Photos After Test</u>	: Fig.3	
<u>Test Result</u>	: 试验后样品外观无异常.	
<u>Final Result</u>	: OK	√
	: NG	
<u>Confirmed by</u>	: HU CHUNJIE	
<u>Date</u>	: 2023.11.21	

Series:

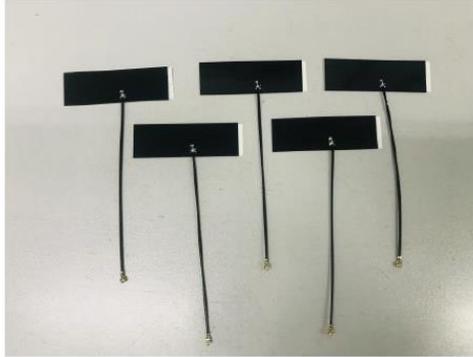
PULSE P/N: BTPA0061204G0C4Axx – 698 to 2700MHz

Reliability Test Report

Report No.: SZ-HS-ETR-2311031

Date: 2023/11/29

Fig.1: Appearance photos of the samples before test.



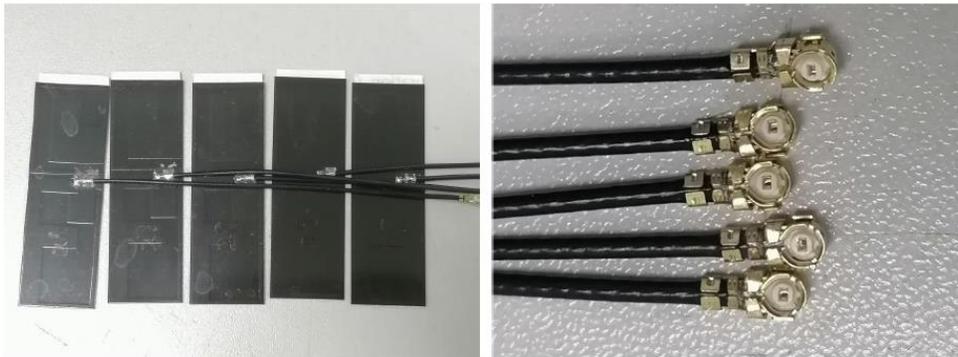
Sample No.: 2311031-#26~#30

Fig.2: Photo of samples in test process.



Sample No.: 2311031-#26~#30

Fig.3: Appearance photos of the samples after test.



Sample No.: 2311031-#26~#30

.....THE END.....

Series:

PULSE P/N: **BTPA0061204G0C4Axx** – 698 to 2700MHz



REACH Declaration

(In accordance to EC 1907/2006)

Pulse Electronics manufactures products at Pulse Operations or with selected Manufacturing Partners

Subject Part Number(s):
TWA4215xx
BTPA0061204G0C4Axx

Pulse as a supplier of article, hereby declares, that part numbers reviewed does not contain any of the substances currently in the candidate list of substances of very high concern (SVHC) at concentrations above 0.1% weight by weight of the Article.

	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	4,4'- Diaminodiphenylmethane (MDA)	101-77-9	202-974-4	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Synthetic Resin	81-15-2	201-329-4	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins)	85535-84-8	287-476-5	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Anthracene	120-12-7	204-371-1	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Benzyl butyl phthalate (BBP)	85-68-7	201-622-7	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Bis (2-ethylhexyl)phthalate (DEHP)	117-81-7	204-211-0	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Bis(tributyltin)oxide (TBTO)	58-35-9	200-268-0	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Cobalt dichloride	7646-79-9	231-589-4	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Diarsenic pentaoxide	1303-28-2	215-116-9	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	Diarsenic trioxide	1327-53-3	215-481-4	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	Dibutyl phthalate (DBP)	84-74-2	201-557-4	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	Hexabromocyclododecane (HBCDD) and all major diastereoisomers identified: Alpha-hexabromocyclododecane Beta-hexabromocyclododecane Gamma-hexabromocyclododecane	25637-99-4	247-148-4 and 221-695-9 (134237-50-6) (134237-51-7) (134237-52-8)	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	Lead hydrogen arsenate	7784-40-9	232-064-2	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14	Sodium dichromate	7789-12-0/ 10588-01-9	234-190-3 (7789-12-0 and 10588-01-9)	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15	Triethyl arsenate	15606-95-8	427-700-2	28.10.2008	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	2,4-Dinitrotoluene	121-14-2	204-450-0	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Anthracene oil	90640-80-5	292-602-7	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Anthracene oil, anthracene-low	90640-82-7	292-604-8	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Anthracene oil, anthracene paste	90640-81-6	292-603-2	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Anthracene oil, anthracene paste, anthracene fraction	91995-15-2	295-275-9	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Anthracene oil, anthracene paste, distn. lights	91995-17-4	295-278-5	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Diisobutyl phthalate	84-69-5	201-553-2	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Lead chromate	7758-97-6	231-846-0	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Lead chromate molybdate sulphate red (C.I. Pigment Red 104)	12656-85-8	235-759-9	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	Lead sulfochromate yellow (C.I. Pigment Yellow 34)	1344-37-2	215-693-7	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	Pitch, coal tar, high temp.	-	266-028-2	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	Tris(2-chloroethyl)phosphate	115-96-8	204-118-5	13.01.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Acrylamide	79-06-1	201-173-7	30.03.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Trichloroethylene	79-01-6	201-167-4	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Boric acid	10043-35-3 / 11113-50-1	233-139-2 / 234-343-4	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Disodium tetraborate, anhydrous	1303-96-4/ 1330-43-4/ 12179-04-3	215-540-4	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Tetraboron disodium heptaoxide, hydrate	12267-73-1	235-541-3	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Potassium dichromate	7778-50-9	231-906-6	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Ammonium dichromate	95/7789	232-143-1	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Potassium chromate	7789-00-6	232-140-5	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Sodium chromate	11/3/7775	231-889-5	18.06.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Cobalt(II) sulphate	10124-43-3	233-334-2	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Cobalt(II) dinitrate	10141-05-6	233-402-1	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Cobalt(II) carbonate	513-79-1	208-169-4	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Cobalt(II) diacetate	71-48-7	200-755-8	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Series:

PULSE P/N: **BTPA0061204G0C4Axx** – 698 to 2700MHz

5	2-Methoxyethanol	109-86-4	203-713-7	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	2-Ethoxyethanol	110-80-5	203-804-1	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Chromium trioxide	1333-82-0	215-607-8	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Chromic acid, Oligomers of chromic acid and dichromic acid, Dichromic acid	7738-94-5 - 13530-68-2	231-801-5 - 236-881-5	15.12.2010	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
1	2-Ethoxyethyl acetate	111-15-9	203-839-2	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Strontium chromate	7789-06-2	232-142-6	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	1,2-Benzenedicarboxylic acid, di-C7-11-branched and linear alkyl esters(DHNP)	68515-42-4	271-084-6	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Hydrazine	302-01-2 /7803-57-8	206-114-9	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	1-methyl-2-pyrrolidone	872-50-4	212-828-1	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	1,2,3-trichloropropane	96-18-4	202-486-1	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	1,2-Benzenedicarboxylic acid, di-C6-8-branched alkyl esters, C7-rich(DIHP)	71888-89-6	276-158-1	20.6.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
1	Lead styphnate	15245-44-0	239-290-0	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Lead diazide	13424-46-9	236-542-1	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Lead dipicrate	6477-64-1	229-335-2	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Phenolphthalein	77-09-8	201-004-7	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	2,2'-Dichloro-4,4'-methylenedianiline	101-14-4	202-918-9	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	N,N-dimethylacetamide (DMAC)	127-19-5	204-826-4	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trilead diarsenate	3687-31-8	222-979-5	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Calcium arsenate	7778-44-1	231-904-5	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Arsenic acid	7778-39-4	231-901-9	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	Bis(2-methoxyethyl) ether	111-96-6	203-924-4	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	1,2-Dichloroethane	107-06-2	203-458-1	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	4-(1,1,3,3-Tetramethylbutyl)phenol; 4-tert-octyl phenol	140-66-9	205-426-2	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	2-Methoxyaniline; o-Anisidine	90-04-0	201-963-1	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14	Bis(2-methoxyethyl) phthalate	117-82-8	204-212-6	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15	Formaldehyde, oligomeric reaction products with aniline (technical MDA)	25214-70-4	500-036-1	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16	Zirconia Aluminosilicate Refractory Ceramic Fibres(Zr-RCF)*	-	-	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17	Aluminosilicate Refractory Ceramic Fibres(RCF)*	-	-	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
18	Pentazinc chromate octahydroxide	49663-84-5	256-418-0	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19	Potassium hydroxyoctaoxodizincatedichromate	11103-86-9	234-329-8	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20	Dichromium tris(chromate)	24613-89-6	246-356-2	19.12.2011	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
1	1,2-bis(2-methoxyethoxy)ethane (TEGDME; triglyme)	112-49-2	203-977-3	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1,2-dimethoxyethane; ethylene glycol dimethyl ether (EGDME)	110-71-4	203-794-9	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Diboron trioxide	1303-86-2	215-125-8	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Formamide	75-12-7	200-842-0	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Lead(II) bis(methanesulfonate)	17570-76-2	401-750-5	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	1,3,5-tris(oxiranylmethyl)-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (TGIC)	2451-62-9	219-514-3	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	1,3,5-tris[(2S and 2R)-2,3-epoxypropyl]-1,3,5-triazine-2,4,6-(1H,3H,5H)-trione (β-TGIC)	59653-74-6	423-400-0	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	4,4'-bis(dimethylamino)benzophenone (Michler's ketone)	90-94-8	202-027-5	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	N,N,N',N'-tetramethyl-4,4'-methylenedianiline (Michler's base)	101-61-1	202-959-2	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	[4-[[4-anilino-1-naphthyl][4-(dimethylamino)phenyl]methylene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Blue 26)	2580-56-5	219-943-6	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	[4-[4,4'-bis(dimethylamino) benzhydrylidene]cyclohexa-2,5-dien-1-ylidene]dimethylammonium chloride (C.I. Basic Violet 3)	548-62-9	208-953-6	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	4,4'-bis(dimethylamino)-4''-(methylamino)trityl alcohol	561-41-1	209-218-2	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	α,α-Bis[4-(dimethylamino)phenyl]-4 (phenylamino)naphthalene-1-methanol (C.I. Solvent Blue 4)	6786-83-0	229-851-8	18.06.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
1	Bis(pentabromophenyl) ether (decabromodiphenyl ether; DecaBDE)	1163-19-5	214-604-9	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Pentacosafuorotridecanoic acid	72629-94-8	276-745-2	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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3	Tricosafuorododecanoic acid	307-55-1	206-203-2	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Henicosafuoroundecanoic acid	2058-94-8	218-165-4	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Heptacosafuorotetradecanoic acid	376-06-7	206-803-4	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated <i>[covering well-defined substances and UVCB substances, polymers and homologues]</i>	-	-	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	4-Nonylphenol, branched and linear <i>[substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof]</i>	-	-	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Diazeno-1,2-dicarboxamide (C,C'-azodi(formamide))	123-77-3	204-650-8	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Cyclohexane-1,2-dicarboxylic anhydride [1], cis-cyclohexane-1,2-dicarboxylic anhydride [2], trans-cyclohexane-1,2-dicarboxylic anhydride [3] <i>[The individual cis- [2] and trans- [3] isomer substances and all possible combinations of the cis- and trans-isomers [1] are covered by this entry]</i>	85-42-7 13149-00-3 14166-21-3	201-604-9 236-086-3 238-009-9	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	Hexahydromethylphthalic anhydride, Hexahydro-4-methylphthalic anhydride, Hexahydro-1-methylphthalic anhydride, Hexahydro-3-methylphthalic anhydride	25550-51-0 19438-60-9 48122-14-1 57110-29-9	247-094-1 243-072-0 256-356-4 260-566-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	Methoxyacetic acid	625-45-6	210-894-6	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
12	1,2-Benzenedicarboxylic acid, dipentylester, branched and linear	84777-06-0	284-032-2	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
13	Diisopentylphthalate (DIPP)	605-50-5	210-088-4	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
14	N-pentyl-isopentylphthalate	776297-69-9	-	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
15	1,2-Diethoxyethane	629-14-1	211-076-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
16	N,N-dimethylformamide	68-12-2	200-679-5	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
17	Dibutyltin dichloride (DBTC)	683-18-1	211-670-0	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
18	Acetic acid, lead salt, basic	51404-69-4	257-175-3	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19	Trilead bis(carbonate)dihydroxide	1319-46-6	215-290-6	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20	Lead oxide sulfate	12036-76-9	234-853-7	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21	[Phthalato(2-)]dioxotrilead	69011-06-9	273-688-5	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22	Dioxobis(stearato)trilead	12578-12-0	235-702-8	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
23	Fatty acids, C16-18, lead salts	91031-62-8	292-966-7	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24	Lead bis(tetrafluoroborate)	13814-96-5	237-486-0	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25	Lead cyanamidate	20837-86-9	244-073-9	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26	Lead dinitrate	10099-74-8	233-245-9	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
27	Lead monoxide (lead oxide)	1317-36-8	215-267-0	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28	Orange lead (lead tetroxide)	1314-41-6	215-235-6	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
29	Lead titanium trioxide	12060-00-3	235-038-9	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30	Lead titanium zirconium oxide	12626-81-2	235-727-4	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
31	Pentalead tetraoxide sulphate	12065-90-6	235-067-7	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
32	Pyrochlore, antimony lead yellow	8012-00-8	232-382-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33	Silicic acid (H ₂ SiO ₃), barium salt (1:1), lead-doped	68784-75-8	272-271-5	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34	Silicic acid, lead salt	11120-22-2	234-363-3	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35	Sulfurous acid, lead salt, dibasic	62229-08-7	263-467-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36	Tetraethyllead	78-00-2	201-075-4	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37	Tetralead trioxide sulphate	12202-17-4	235-380-9	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38	Trilead dioxide phosphonate	12141-20-7	235-252-2	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39	Furan	110-00-9	203-727-3	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
40	Methyloxirane (Propylene oxide)	75-56-9	200-879-2	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41	Diethyl sulphate	64-67-5	200-589-6	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
42	Dimethyl sulphate	77-78-1	201-058-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43	3-ethyl-2-methyl-2-(3-methylbutyl)-1,3-oxazolidine	143860-04-2	421-150-7	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44	Dinoseb (6-sec-butyl-2,4-dinitrophenol)	88-85-7	201-861-7	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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45	4,4'-methylenedi-o-toluidine	838-88-0	212-658-8	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
46	4,4'-oxydianiline and its salts	101-80-4	202-977-0	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47	4-Aminoazobenzene	60-09-3	200-453-6	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
48	4-methyl-m-phenylenediamine (toluene-2,4-diamine)	95-80-7	202-453-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
49	6-methoxy-m-toluidine (p-cresidine)	120-71-8	204-419-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
50	Biphenyl-4-ylamine	92-67-1	202-177-1	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
51	o-aminoazotoluene	97-56-3	202-591-2	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
52	o-Toluidine	95-53-4	202-429-0	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
53	N-methylacetamide	79-16-3	201-182-6	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
54	1-bromopropane(n-propyl bromide)	106-94-5	203-445-0	19.12.2012	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name		CAS No.	EC No.	Date of inclusion	YES	NO
1	Cadmium	7440-43-9	231-152-8	20.06.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Cadmium oxide	1306-19-0	215-146-2	20.06.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Dipentyl phthalate(DPP)	131-18-0	205-017-9	20.06.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	4-Nonylphenol, branched and linear, ethoxylated [substances with a linear and/or branched alkyl chain with a carbon number of 9 covalently bound in position 4 to phenol, ethoxylated covering UVCB- and well-defined substances, polymers and homologues, which include any of the individual isomers and/or combinations thereof]	-	-	20.06.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Ammonium pentadecafluorooctanoate (APFO)	3825-26-1	223-320-4	20.06.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Pentadecafluorooctanoic acid (PFOA)	335-67-1	206-397-9	20.06.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name		CAS No.	EC No.	Date of inclusion	YES	NO
1	Cadmium sulphide	1306-23-6	215-147-8	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate) (C.I. Direct Red 28)	573-58-0	209-358-4	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Disodium 4-amino-3-[[4'-(2,4-diaminophenyl)azo][1,1'-biphenyl]-4-yl]azo]-5-hydroxy-6-(phenylazo)naphthalene-2,7-disulphonate (C.I. Direct Black 38)	1937-37-7	217-710-3	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Dihexyl phthalate	84-75-3	201-559-5	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Imidazolidine-2-thione (2-imidazoline-2-thiol)	96-45-7	202-506-9	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Lead di(acetate)	301-04-2	206-104-4	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Trixylyl phosphate	25155-23-1	246-677-8	16.12.2013	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name		CAS No.	EC No.	Date of inclusion	YES	NO
1	Cadmium chloride	10108-64-2	233-296-7	16.06.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	1,2-Benzenedicarboxylic acid, dihexyl ester, branched and linear	68515-50-4	271-093-5	16.06.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Sodium peroxometaborate	7632-04-4	231-556-4	16.06.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Sodium perborate; perboric acid, sodium salt	-	239-172-9; 234-390-0	16.06.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name		CAS No.	EC No.	Date of inclusion	YES	NO
1	2-benzotriazol-2-yl-4,6-di-tertbutylphenol (UV-320)	3846-71-7	223-346-6	17.12.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (DOTE)	15571-58-1	239-622-4	17.12.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	reaction mass of 2-ethylhexyl 10-ethyl-4,4-dioctyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate and 2-ethylhexyl 10-ethyl-4-[[2-(2-ethylhexyl)oxy]-2-oxoethyl]thio]-4-octyl-7-oxo-8-oxa-3,5-dithia-4-stannatetradecanoate (reaction mass of DOTE and MO)	-	-	17.12.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	2-(2H-benzotriazol-2-yl)-4,6-ditertpentylphenol (UV-328)	25973-55-1	247-384-8	17.12.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Cadmium fluoride	7790-79-6	232-222-0	17.12.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Cadmium sulphate	10124-36-4, 31119-53-6	233-331-6	17.12.2014	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	1,2-benzenedicarboxylic acid, di-C6-10-alkyl esters; 1,2-benzenedicarboxylic acid, mixed decyl and hexyl and octyl diesters with ≥ 0.3% of dihexyl phthalate (EC No. 201-559-5)	68515-51-5 68648-93-1	271-094-0 272-013-1	15.06.2015	<input type="checkbox"/>	<input type="checkbox"/>
	2	5-sec-butyl-2-(2,4-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [1], 5-sec-butyl-2-(4,6-dimethylcyclohex-3-en-1-yl)-5-methyl-1,3-dioxane [2] [covering any of the individual stereoisomers of [1] and [2] or any combination thereof]	-	-	15.06.2015	<input type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	1,3-propanesultone	1120-71-4	214-317-9	17.12.2015	<input type="checkbox"/>	<input type="checkbox"/>
2	2,4-di-tert-butyl-6-(5-chlorobenzotriazol-2-yl)phenol (UV-327)	3864-99-1	223-383-8	17.12.2015	<input type="checkbox"/>	<input type="checkbox"/>
3	2-(2H-benzotriazol-2-yl)-4-(tert-butyl)-6-(sec-butyl)phenol(UV-350)	36437-37-3	253-037-1	17.12.2015	<input type="checkbox"/>	<input type="checkbox"/>
4	Nitrobenzene	98-95-3	202-716-0	17.12.2015	<input type="checkbox"/>	<input type="checkbox"/>
5	Perfluoronon-1-oic-acid and its sodium and ammonium salts	375-95-1 21049-39-8	206-801-3	17.12.2015	<input type="checkbox"/>	<input type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Benzo[def]chrysene	50-32-8	200-028-5	20.06.2016	<input type="checkbox"/>	<input type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	4,4'-isopropylidenediphenol Bisphenol A; BPA	80-05-7	201-245-8	12.01.2017	<input type="checkbox"/>	<input type="checkbox"/>
2	4-heptylphenol, branched and linear substances with a linear and/or branched alkyl chain with a carbon number of 7 covalently bound predominantly in position 4 to phenol, covering also UVCB- and well-defined substances which include any of the individual isomers or a combination thereof	-	-	12.01.2017	<input type="checkbox"/>	<input type="checkbox"/>
3	Nonadecafluorodecanoic acid (PFDA) and its sodium and ammonium salts Decanoic acid, nonadecafluoro-, sodium salt Ammonium nonadecafluorodecanoate Nonadecafluorodecanoic acid	3830-45-3 3108-42-7 335-76-2	221-470-5 206-400-3	12.01.2017	<input type="checkbox"/>	<input type="checkbox"/>
4	p-(1,1-dimethylpropyl)phenol	80-46-6	201-280-9	12.01.2017	<input type="checkbox"/>	<input type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Perfluorohexane-1-sulphonic acid and its salts PFHxS	-	-	07.07.2017	<input type="checkbox"/>	<input type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	1,6,7,8,9,14,15,16,17,17,18,18-Dodecachloropentacyclo[12.2.1.16,9.02,13.05,10]octadeca-7,15-diene ("Dechlorane Plus™") covering any of its individual anti- and syn-isomers or any combination thereof	-	-	15.01.2018	<input type="checkbox"/>	<input type="checkbox"/>
2	Benz[a]anthracene	56-55-3, 1718-53-2	200-280-6	15.01.2018	<input type="checkbox"/>	<input type="checkbox"/>
3	Cadmium carbonate	513-78-0	208-168-9	15.01.2018	<input type="checkbox"/>	<input type="checkbox"/>
4	Cadmium hydroxide	21041-95-2	244-168-5	15.01.2018	<input type="checkbox"/>	<input type="checkbox"/>
5	Cadmium nitrate	10022-68-1, 10325-94-7	233-710-6	15.01.2018	<input type="checkbox"/>	<input type="checkbox"/>
6	Chrysene	218-01-9, 1719-03-5	205-923-4	15.01.2018	<input type="checkbox"/>	<input type="checkbox"/>

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7	Reaction products of 1,3,4-thiadiazolidine-2,5-dithione, formaldehyde and 4-heptylphenol, branched and linear (RP-HP) with ≥0.1% w/w 4-heptylphenol, branched and linear (4-HPbl)	-	-	15.01.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Benzene-1,2,4-tricarboxylic acid 1,2 anhydride trimellitic anhydride; TMA	552-30-7	209-008-0	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Benzo[ghi]perylene	191-24-2	205-883-8	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Decamethylcyclotrasiloxane	541-02-6	208-764-9	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	D5 Dicyclohexyl phthalate DCHP	84-61-7	201-545-9	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Disodium octaborate	12008-41-2	234-541-0	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Dodecamethylcyclohexasiloxane D6	540-97-6	208-762-8	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	Ethylenediamine EDA	107-15-3	203-468-6	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8	Lead	7439-92-1	231-100-4	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	Octamethylcyclotetrasiloxane D4	556-67-2	209-136-7	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	Terphenyl, hydrogenated	61788-32-7	262-967-7	27.06.2018	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	1,7,7-trimethyl-3-(phenylmethylene)bicyclo[2.2.1]heptan-2-one 3-benzylidene camphor; 3-BC	15087-24-8	239-139-9	15.01.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2,2-bis(4'-hydroxyphenyl)-4-methylpentane	6807-17-6	401-720-1	15.01.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Benzo[k]fluoranthene	207-08-9	205-916-6	15.01.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Fluoranthene	206-44-0; 93951-69-0	205-912-4	15.01.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5	Phenanthrene	85-01-8	201-581-5	15.01.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	Pyrene	129-00-0; 1718-52-1	204-927-3	15.01.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	2,3,3,3-tetrafluoro-2-(heptafluoropropoxy)propionic acid, its salts and its acyl halides covering any of their individual isomers and combinations thereof	-	-	16.07.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	2-methoxyethyl acetate	110-49-6	203-772-9	16.07.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	4-tert-butylphenol	98-54-4	202-679-0	16.07.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Tris(4-nonylphenyl, branched and linear) phosphite (TNPP) with ≥ 0.1% w/w of 4-nonylphenol, branched and linear (4-NP)	-	-	16.07.2019	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1	Perfluorobutane sulfonic acid (PFBS) and its salts	-	-	16.01.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	Diisohexyl phthalate	71850-09-4	276-090-2	16.01.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	2-methyl-1-(4-methylthiophenyl)-2-morpholinopropan-1-one	71868-10-5	400-600-6	16.01.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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4	2-benzyl-2-dimethylamino-4'-morpholinobutyrophenone	119313-12-1	404-360-3	16.01.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
	Dibutylbis(pentane-2,4-dionato-O,O')tin	22673-19-4	245-152-0	25.06.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Butyl 4-hydroxybenzoate	94-26-8	202-318-7	25.06.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	2-methylimidazole	693-98-1	211-765-7	25.06.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	1-vinylimidazole	1072-63-5	214-012-0	25.06.2020	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
	Diocetyl tin dilaurate, stannane, dioctyl-, bis(coco acyloxy) derivs., and any other stannane, dioctyl-, bis(fatty acyloxy) derivs. wherein C12 is the predominant carbon number of the fatty acyloxy moiety. dioctyltin dilaurate; stannane, dioctyl-, bis(coco acyloxy) derivs.	-	-	19.01.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Diocetyl tin dilaurate	3648-18-8	222-883-3	19.01.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	Stannane, dioctyl-, bis(coco acyloxy) derivs.	91648-39-4	293-901-5	19.01.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>Substance name</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>Date of inclusion</u>	<u>YES</u>	<u>NO</u>
	對十二烷基苯酚及其異構體(PDDP) Phenol, alkylation products (mainly in para position) with C12-rich branched alkyl chains from oligomerisation, covering any individual isomers and/ or combinations thereof (PDDP)	-	-	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	原硼酸鈉鹽 orthoboric acid, sodium salt	-	-	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	中鏈氯化石蠟(MCCP) (UVCB物質: 由含≥80%的碳鏈長度C14~C17的直鏈氯化烷烴組成) Medium-chain chlorinated paraffins (MCCP) UVCB substances consisting of more than or equal to 80%	-	-	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	戊二醛 glutaral	111-30-8	203-856-5	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	雙酚B 4,4'-(1-methylpropylidene)bisphenol	77-40-7	201-025-1	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	2-(4-叔丁基苯基)丙醛及其立體異構體 2-(4-tert-butylbenzyl)propionaldehyde and its individual stereoisomers	-	-	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	二溴新戊二醇(BMP) 三溴新戊醇(TBNPA) 2,3-二溴丙醇(2,3-DBPA) 2,2-bis(bromomethyl)propane-1,3-diol (BMP); 2,2-dimethylpropan-1-ol, tribromo derivative/3-bromo-2,2-bis(bromomethyl)-1-propanol (TBNPA); 2,3-dibromo-1-propanol (2,3-DBPA)	3296-90-0 36483-57-5/1522-92-5 96-13-9	221-967-7 253-057-0 202-480-9	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>
	1,4-二氧己環 1,4-dioxane	123-91-1	204-661-8	08.07.2021	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
tris(2-methoxyethoxy)vinylsilane	1067-53-4	213-934-0	17.01.2022	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S-(tricyclo(5.2.1.0 ² .6)deca-3-en-8(or 9)-yl O-(isopropyl or isobutyl or 2-ethylhexyl) O-(isopropyl or isobutyl or 2-ethylhexyl) phosphorodithioate X4261	255881-94-8	401-850-9	17.01.2022	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6,6'-di-tert-butyl-2,2'-methylene-di-p-cresol	119-47-1	204-327-1	17.01.2022	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptan-2-one covering any of the individual isomers and/or combinations thereof (4-MBC) (3E)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one EG-Nr. : - CAS-Nr. : 1782069-81-1 (1R,3E,4S)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one EG-Nr. : - CAS-Nr. : 95342-41-9 (1S,3Z,4R)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one EG-Nr. : - CAS-Nr. : 852541-25-4 (±)-1,7,7-trimethyl-3-[(4-methylphenyl)methylene]bicyclo[2.2.1]heptan-2-one EG-Nr. : 253-242-6 CAS-Nr. : 36861-47-9 (1R,4S)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one EG-Nr. : - CAS-Nr. : 741687-98-9 (1S,3E,4R)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one EG-Nr. : - CAS-Nr. : 852541-30-1 (1R,3Z,4S)-1,7,7-trimethyl-3-(4-methylbenzylidene)bicyclo[2.2.1]heptan-2-one EG-Nr. : - CAS-Nr. : 852541-21-0	1782069-81-1 95342-41-9 852541-25-4 36861-47-9 741687-98-9 852541-30-1 852541-21-0	-	17.01.2022	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
N-(hydroxymethyl)acrylamide	924-42-5	213-103-2	10.06.2022	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1,1'-(ethane-1,2-diylbisoxy)bis[2,4,6-tribromobenzene]	37853-59-1	253-692-3	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2,2',6,6'-tetrabromo-4,4'-isopropylidenediphenol	201-236-9	79-94-7	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4,4'-sulphonyldiphenol	201-250-5	80-09-1	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Barium diboron tetraoxide	237-222-4	13701-59-2	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Bis(2-ethylhexyl) tetrabromophthalate covering any of the individual isomers and/or combinations thereof	-	-	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Isobutyl 4-hydroxybenzoate	224-208-8	4247-02-3	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Melamine	203-615-4	108-78-1	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Perfluoroheptanoic acid and its salts	-	-	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
reaction mass of 2,2,3,3,5,5,6,6-octafluoro-4-(1,1,1,2,3,3,3-heptafluoropropan-2-yl)morpholine and 2,2,3,3,5,5,6,6-octafluoro-4-(heptafluoropropyl)morpholine	473-390-7	-	01.17.2023	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Substance name	CAS No.	EC No.	Date of inclusion	YES	NO
1 bis(4-chlorophenyl) sulphone	80-07-9	201-247-9	06.15.2023		<input checked="" type="checkbox"/>
2 Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide	75980-60-8	278-355-8	06.15.2023		<input checked="" type="checkbox"/>

Signature: Justin Xu

Date: 2024/1/31

Name: Justin Xu

Phone: 86 186 6228 3062

Title: QA Manager

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Series:

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Declaration of Conformity to EU RoHS Directive

Pulse Electronics Corporation
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 China
 Tel: 86-512-69206136
 P/N:
 TWA4215xx
 BTPA0061204G0C4AXX

This is to certify that the parts products listed above meet the requirements of the **RoHS Directive 2011/65/EU & Directive 2015/863 amending Annex II to RoHS 2011/65/EU** The following table lists the restricted materials and their respective allowable limits:

RoHS Restricted Substance	Allowable Limit
Cadmium and its compounds	100 ppm (0.01 weight %)
Mercury and its compounds	1000 ppm (0.1 weight %)
Hexavalent chromium and its compounds	1000 ppm (0.1 weight %)
Lead and its compounds	1000 ppm (0.1 weight %)
Polybrominated biphenyls (PBB)	1000 ppm (0.1 weight %)
Polybrominated diphenyl ethers (PBDE)	1000 ppm (0.1 weight %)
Bis(2-ethylhexyl) phthalate (DEHP)	1000 ppm (0.1 weight %)
Butyl benzyl phthalate (BBP)	1000 ppm (0.1 weight %)
Dibutyl phthalate (DBP)	1000 ppm (0.1 weight %)
Diisobutyl phthalate(DIBP)	1000 ppm (0.1 weight %)

If parts/products take advantage of any exceptions, please check which exemption(s):

1. Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):

- (a) For general lighting purposes < 30 Watts: 2.5mg
- (b) For general lighting purposes ≥ 30 Watts and < 50 Watts: 3.5mg
- (c) For general lighting purposes ≥ 50 Watts and < 150 Watts: 5mg
- (d) For general lighting purposes ≥150 Watts: 15 mg
- (e) For general lighting purposes with circular or square structural shape and tube diameter ≤17 mm: 7mg
- (f) For special purposes: 5 mg

2a. Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):

- (1) Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2) :4mg
- (2) Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5):3mg

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- (3) Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8):3.5mg
- (4) Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12):3.5mg
- (5) Tri-band phosphor with long lifetime (≥ 25,000h):5mg

- 2b. Mercury in other fluorescent lamps not exceeding (per lamp):
 - (3) Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9):15mg
 - (4) Lamps for other general lighting and special purposes (e.g. induction lamps):15mg

- 3. Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes not exceeding (per lamp):
 - (a) Short length (≤500 mm) : 3.5mg
 - (b) Medium length (> 500 mm and ≤1500 mm): 5mg
 - (c) Long length (> 1500 mm) : 13mg

- 4a. Mercury in other low pressure discharge lamps (per lamp):15mg

- 4b. Mercury in High Pressure Sodium (vapor) lamps for general lighting purposes not exceeding (per burner) in lamps with improved color rendering index Ra > 60:
 - (I) P ≤ 155 W : 30mg
 - (II) 155 < P ≤ 405 W : 40mg
 - (III) P > 405 W :40mg

- 4c. Mercury in other High Pressure Sodium (vapor) lamps for general lighting purposes not exceeding (per burner):
 - (I) P ≤ 155 W : 25mg
 - (II) 155 < P ≤405 W :30mg
 - (III) P > 405 W : 40mg

- 4e. Mercury in metal halide lamps (MH)
- 4f. Mercury in other discharge lamps for special purposes not specifically mentioned in Annex

- 5b. Lead in glass of fluorescent tubes not exceeding 0.2% by weight

- 6a. Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight
- 6b. Lead as an alloying element in aluminium containing up to 0.4% lead by weight
- 6c. Copper alloy containing up to 4% lead by weight

- 7a. Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead)

- 7c-I. Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound
- 7c-II. Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher
- 7c-IV. Lead in PZT based dielectric ceramic materials for capacitors which are part of integrated circuits or discrete semiconductors

- 8b. Cadmium and its compounds in electrical contacts

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- 9. Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0.75% by weight in the cooling solution
- 9b. Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications
- 13a. Lead in white glasses used for optical applications
- 13b. Cadmium and lead in filter glasses and glasses used for reflectance standards
- 15. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
- 17. Lead halide as radiant agent in High Intensity Discharge (HID) lamps used for professional reprography applications
- 18b. Lead as activator in the fluorescent powder (1% lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP (BaSi2O5:Pb)
- 21. Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses
- 24. Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors
- 25. Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring
- 29. Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
- 30. Cadmium alloys as electrical/mechanical solder joints to electrical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more
- 31. Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)
- 32. Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes
- 33. Lead in solders for the soldering of thin copper wires of 100 µm diameters and less in power transformers
- 34. Lead in cermet-based trimmer potentiometer elements
- 37. Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body
- 38. Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide

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41. Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines

42. Lead in bearings and bushes of diesel or gaseous fuel powered internal combustion engines applied in non-road professional use equipment;

43. Bis(2-ethylhexyl) phthalate in rubber components in engine systems, designed for use in equipment that is not intended solely for consumer use and provided that no plasticised material comes into contact with human mucous membranes or into prolonged contact with human skin and the concentration value of bis(2-ethylhexyl) phthalate does not exceed:

a) 30 % by weight of the rubber for:

(i) gasket coatings;

(ii) solid-rubber gaskets; or

(iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine.

b) 10 % by weight of the rubber for rubber-containing components not referred to in point (a).

44. Lead in solder of sensors, actuators, and engine control units of combustion engines within the scope of Regulation (EU) 2016/1628 of the European Parliament and of the Council, installed in equipment used at fixed positions while in operation which is designed for professionals, but also used by non-professional users

45. Cadmium and lead in rigid plastic profiles containing mixtures produced from polyvinyl chloride waste (hereinafter referred to as 'recovered rigid PVC'), used for electrical and electronic windows and doors, where the concentration in the recovered rigid PVC material does not exceed 0,1 % cadmium by weight (expressed as Cd metal) and/or 2 % lead by weight (expressed as Pb metal), provided that the components concerned are visibly, legibly and indelibly marked with the statement 'Contains recovered PVC'

Signature:



Date: 2024/1/31

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