Appendix-B LTE NB-IoT Band 2

Effective (Isotropic) Radiated Power Output Data for NB1

Test Result

Band	OpMode	SCS	BW	Modulation	Channel	Tones	Power (dBm)	EIRP (dBm)	Limit (dBm)	Verdict
Band2	Stand-Alone	3.75kHz	0.18	BPSK	18601	1@0	21.94	23.53	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18601	1@0	21.90	23.49	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	18601	1@47	21.83	23.42	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18601	1@47	21.84	23.43	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	18876	1@0	21.55	23.14	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	21.51	23.1	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	18876	1@47	21.53	23.12	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@47	21.49	23.08	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	19199	1@0	21.84	23.43	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	19199	1@0	21.95	23.54	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	19199	1@47	21.89	23.48	33	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	19199	1@47	21.82	23.41	33	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18601	1@0	20.81	22.4	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18601	1@0	20.85	22.44	33	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18601	1@11	20.79	22.38	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18601	1@11	20.79	22.38	33	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18876	1@0	21.63	23.22	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	1@0	21.68	23.27	33	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18876	1@11	21.59	23.18	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	1@11	21.59	23.18	33	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	19199	1@0	22.12	23.71	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19199	1@0	22.17	23.76	33	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	19199	1@11	22.07	23.66	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19199	1@11	22.08	23.67	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18601	3@3	21.99	23.58	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	3@3	21.66	23.25	33	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19199	3@3	21.99	23.58	33	PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

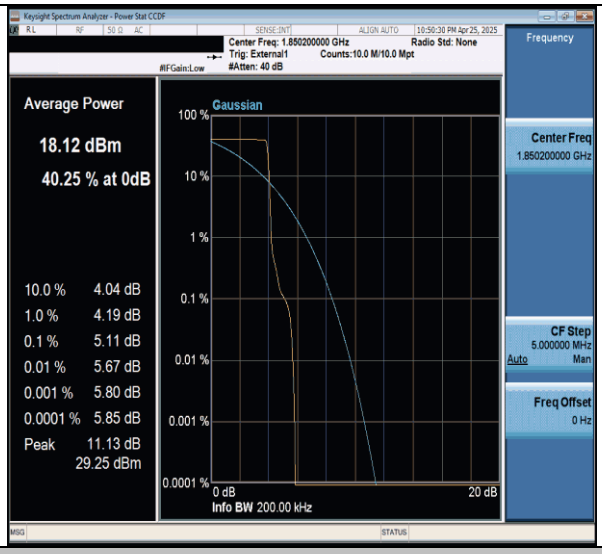
Peak-to-Average Ratio(CCDF) for NB1

Test Result

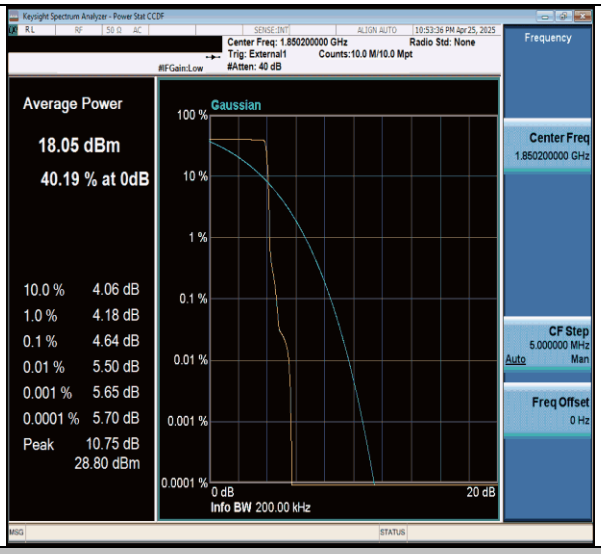
Band	OpMode	SCS	BW	Modulation	Channel	Tones	Result (dBm)	Limit (dBm)	Verdict
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18602	1@0	5.11	<=13	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18602	1@47	4.64	<=13	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	5.12	<=13	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@47	4.65	<=13	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	19198	1@0	5.1	<=13	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	19198	1@47	4.68	<=13	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18602	1@0	6.6	<=13	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18602	1@11	6.59	<=13	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	1@0	6.57	<=13	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	1@11	6.58	<=13	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19198	1@0	6.55	<=13	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19198	1@11	6.54	<=13	PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

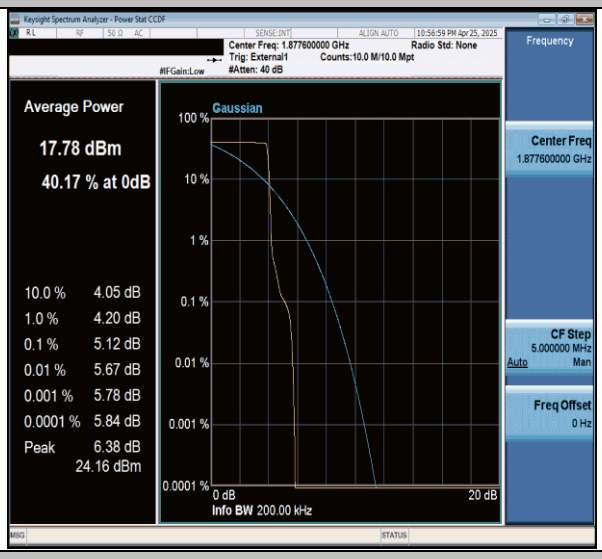
Test Graphs



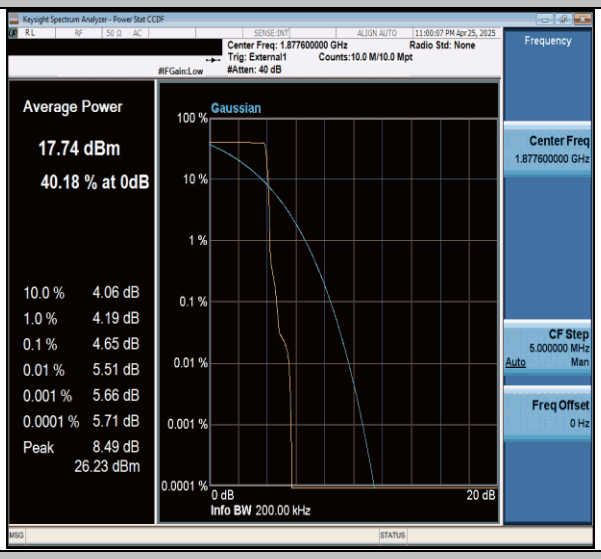
Band2-0.18-QPSK-18602-PASS



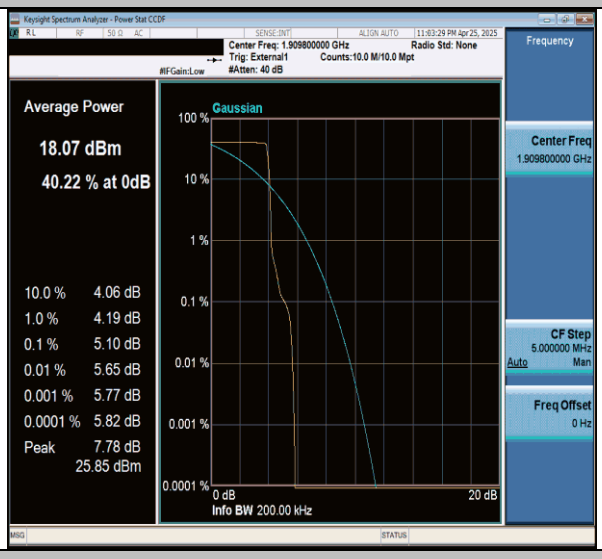
Band2-0.18-QPSK-18602-PASS



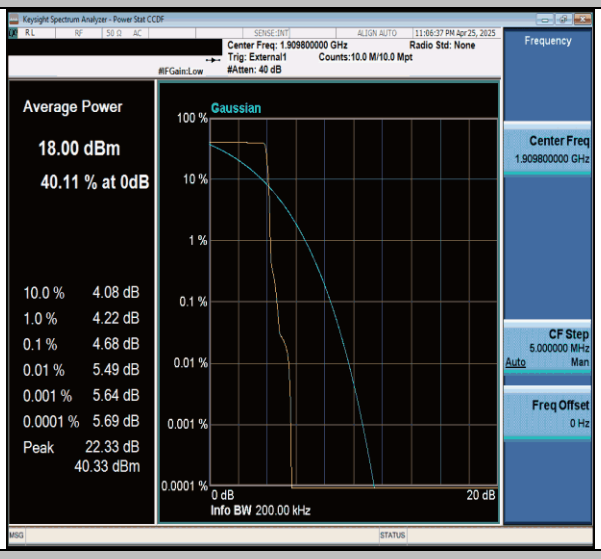
Band2-0.18-QPSK-18876-PASS



Band2-0.18-QPSK-18876-PASS

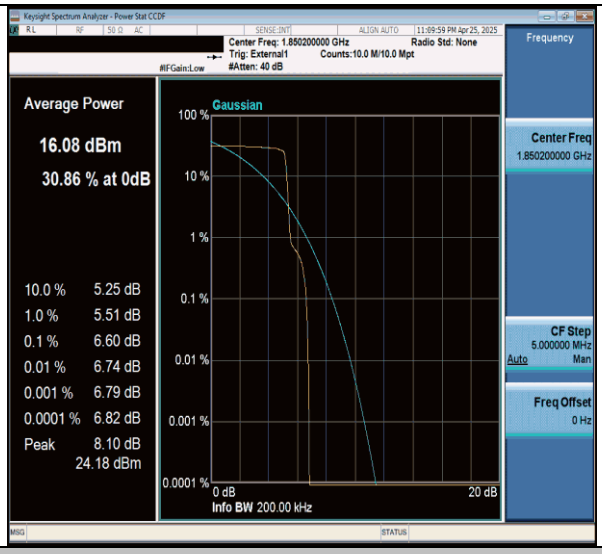


Band2-0.18-QPSK-19198-PASS

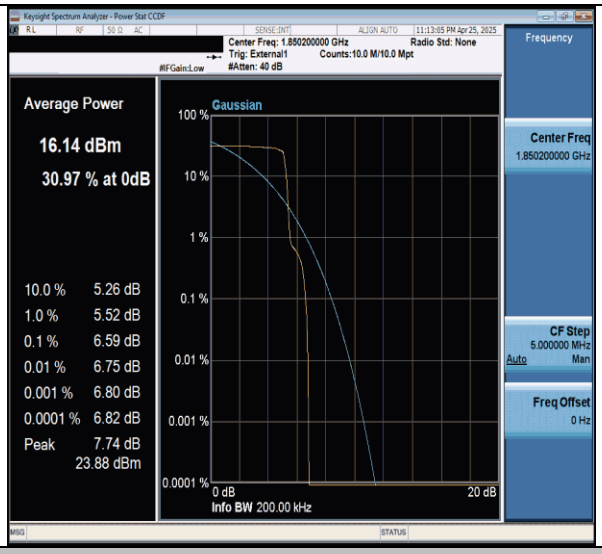


Band2-0.18-QPSK-19198-PASS

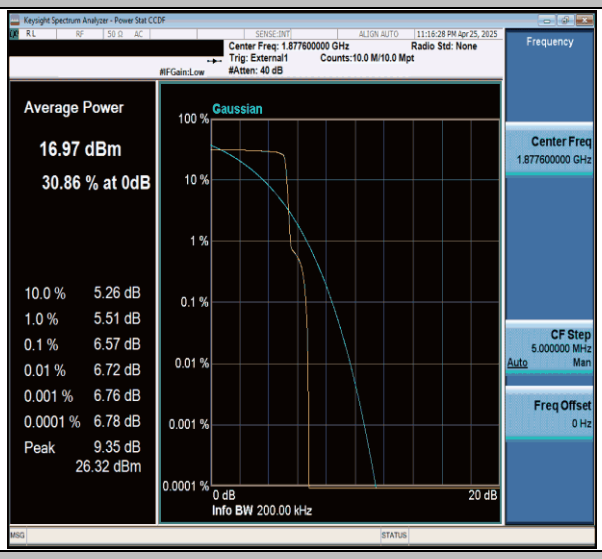
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.



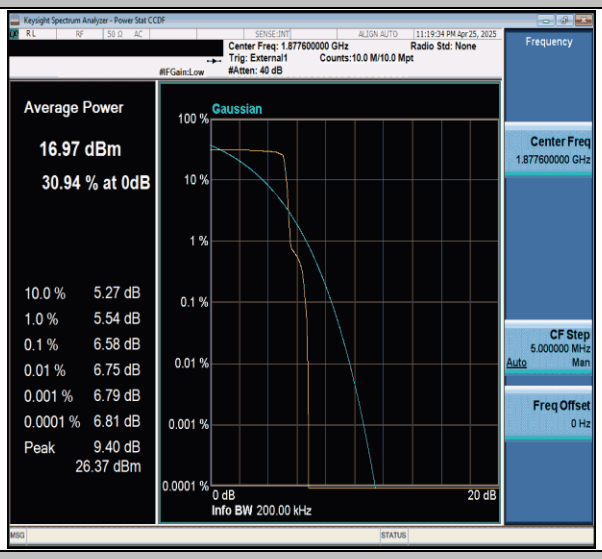
Band2-0.18-QPSK-18602-PASS



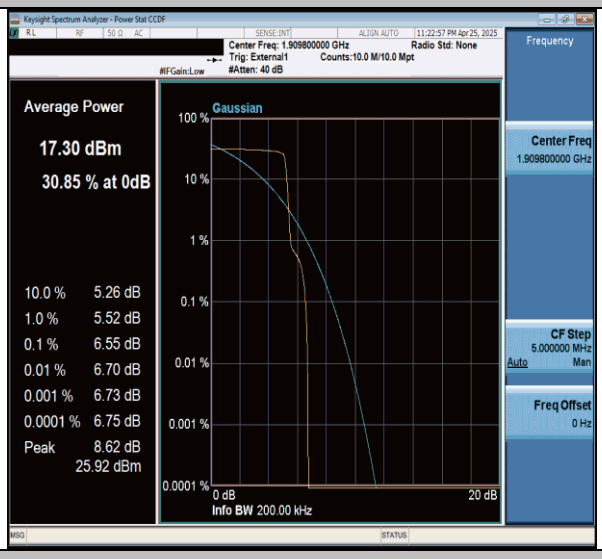
Band2-0.18-QPSK-18602-PASS



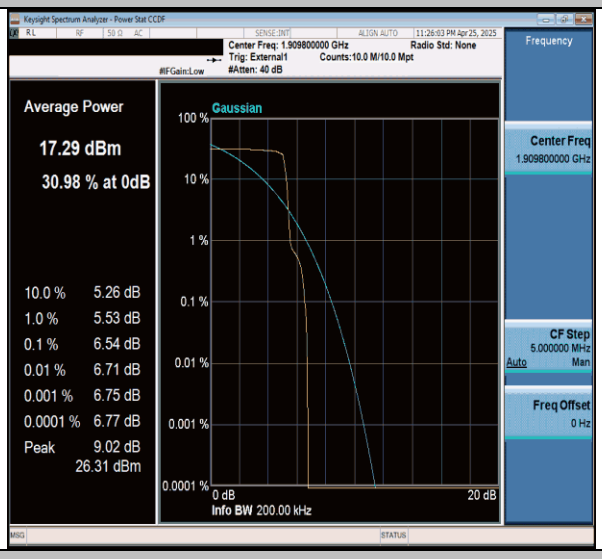
Band2-0.18-QPSK-18876-PASS



Band2-0.18-QPSK-18876-PASS



Band2-0.18-QPSK-19198-PASS



Band2-0.18-QPSK-19198-PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

Emission Bandwidth for NB1

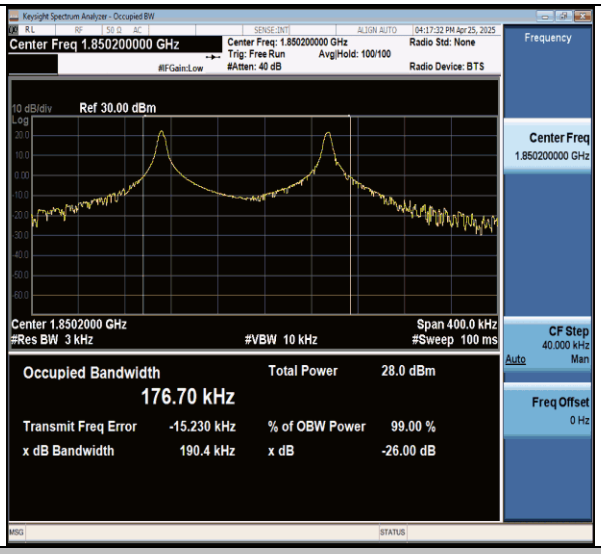
Test Result

Band	OpMode	SCS	BW	Modulation	Channel	Tones	OBW(MHz)	EBW(MHz)	Verdict
Band2	Stand-Alone	3.75kHz	0.18	BPSK	18602	1@0	0.17705	0.1934	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18602	1@0	0.17670	0.1904	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	18876	1@0	0.17757	0.1941	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	0.17744	0.1924	PASS
Band2	Stand-Alone	3.75kHz	0.18	BPSK	19198	1@0	0.17816	0.1963	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	19198	1@0	0.17740	0.1924	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18602	1@0	0.12713	0.1036	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18602	1@0	0.11815	0.1163	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18602	12@0	0.19432	0.2265	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18602	12@0	0.19198	0.2125	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18876	1@0	0.12285	0.1125	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	1@0	0.11896	0.1151	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	18876	12@0	0.19529	0.2254	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	0.19377	0.2146	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	19198	1@0	0.13010	0.1183	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19198	1@0	0.11958	0.1143	PASS
Band2	Stand-Alone	15kHz	0.18	BPSK	19198	12@0	0.19167	0.2228	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	19198	12@0	0.19213	0.2156	PASS

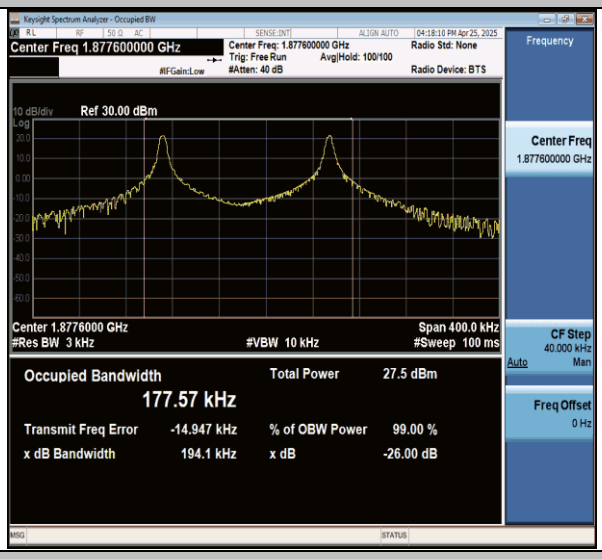
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

Test Graphs

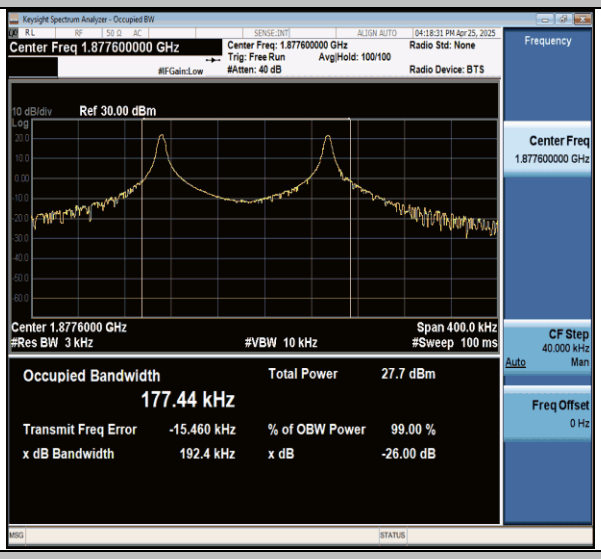
Band2-0.18-BPSK-18602-PASS



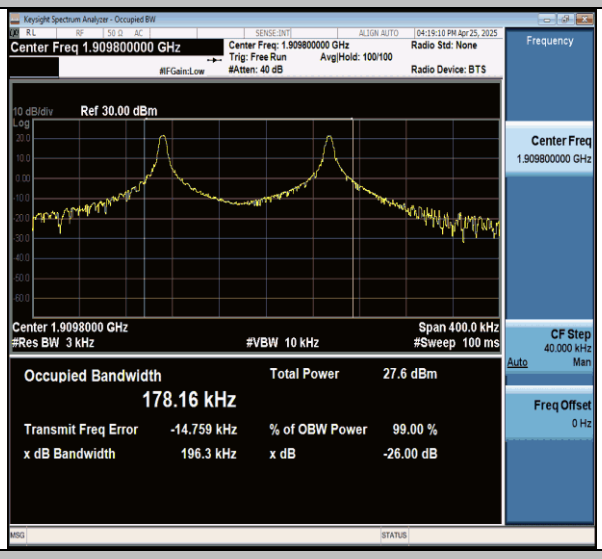
Band2-0.18-QPSK-18602-PASS



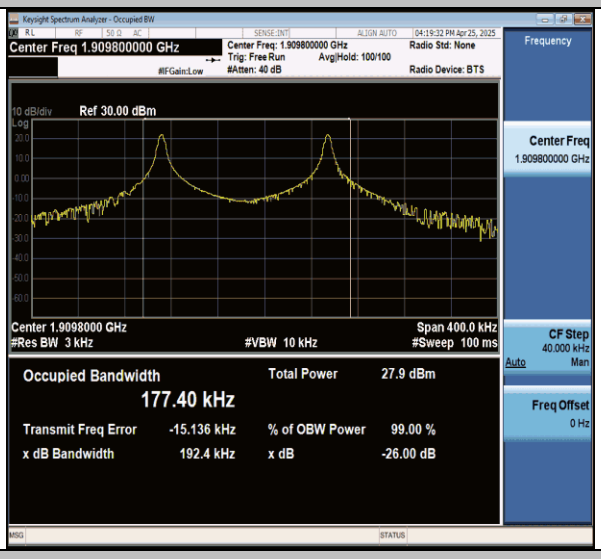
Band2-0.18-BPSK-18876-PASS



Band2-0.18-QPSK-18876-PASS

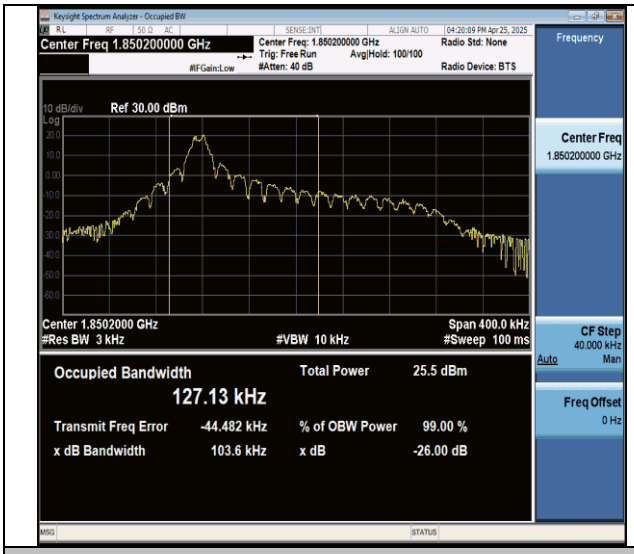


Band2-0.18-BPSK-19198-PASS

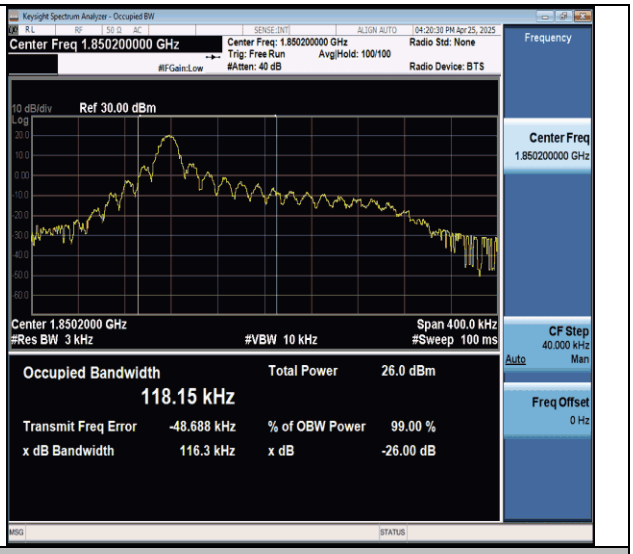


Band2-0.18-QPSK-19198-PASS

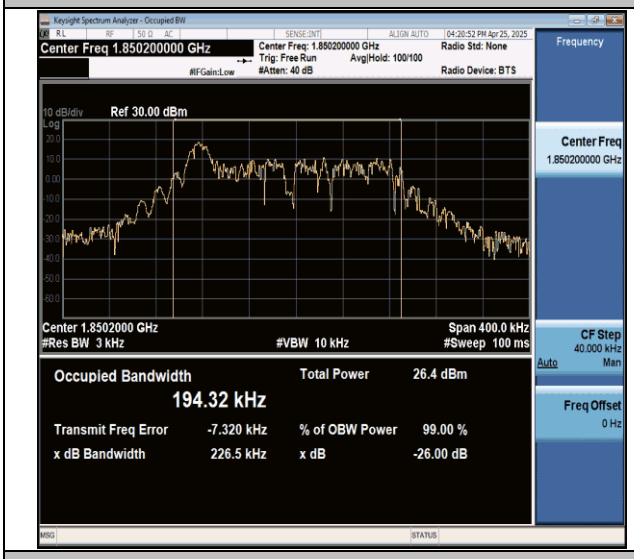
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.



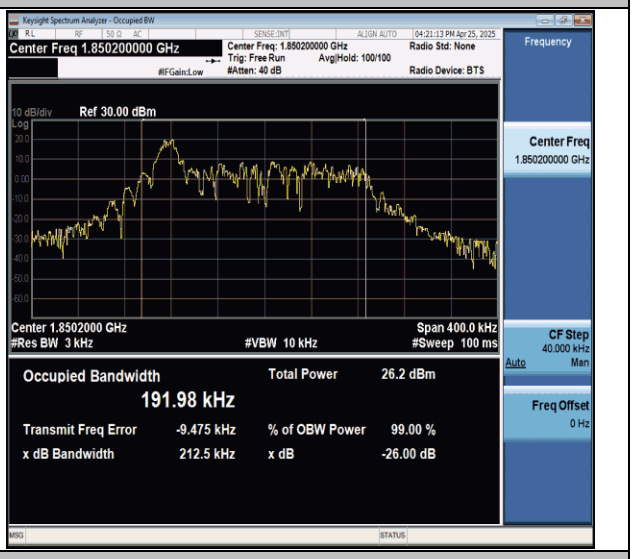
Band2-0.18-BPSK-18602-PASS



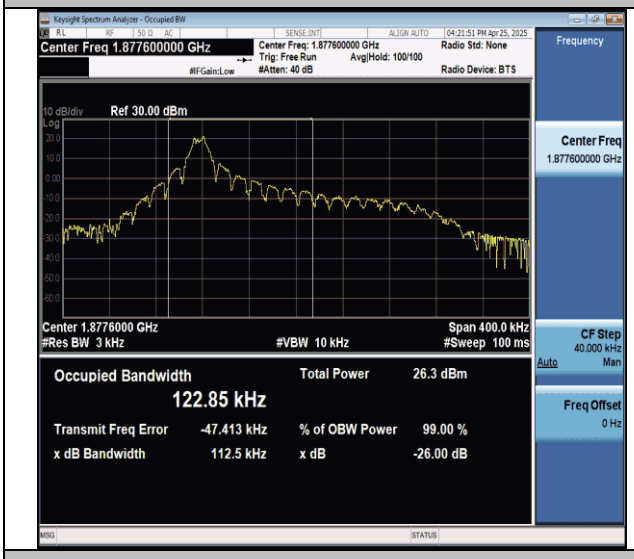
Band2-0.18-QPSK-18602-PASS



Band2-0.18-BPSK-18602-PASS



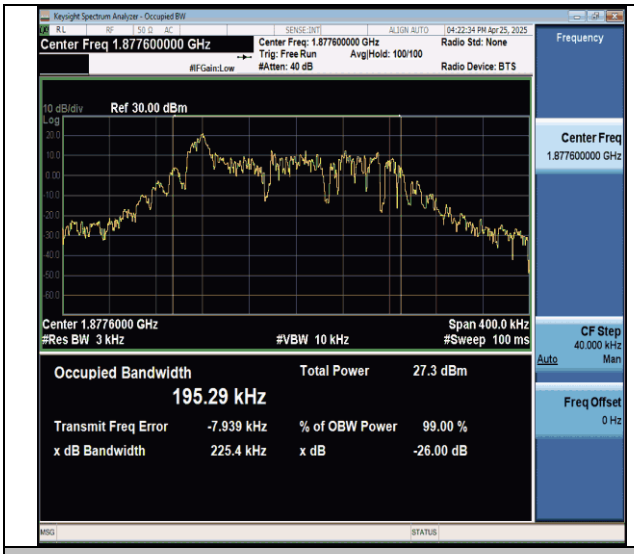
Band2-0.18-QPSK-18602-PASS



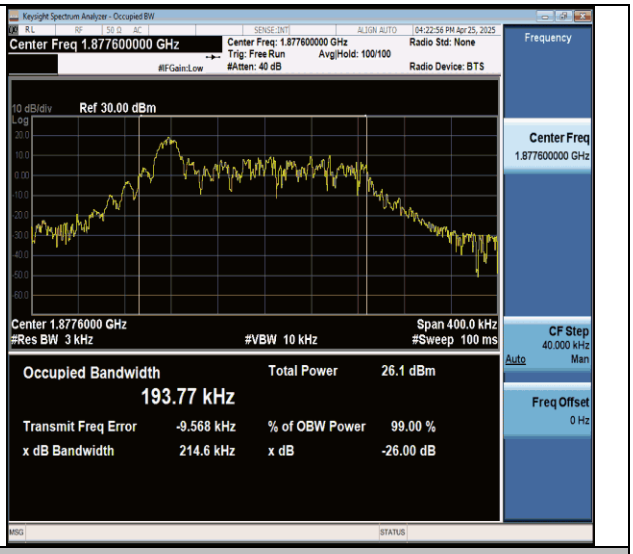
Band2-0.18-BPSK-18876-PASS

Band2-0.18-QPSK-18876-PASS

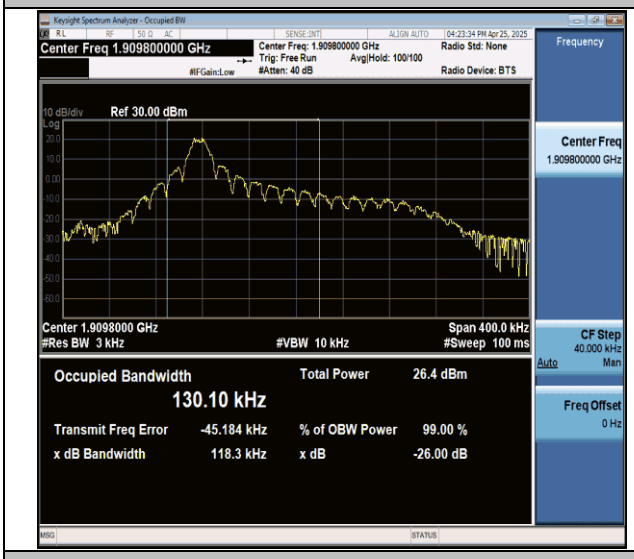
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.



Band2-0.18-BPSK-18876-PASS

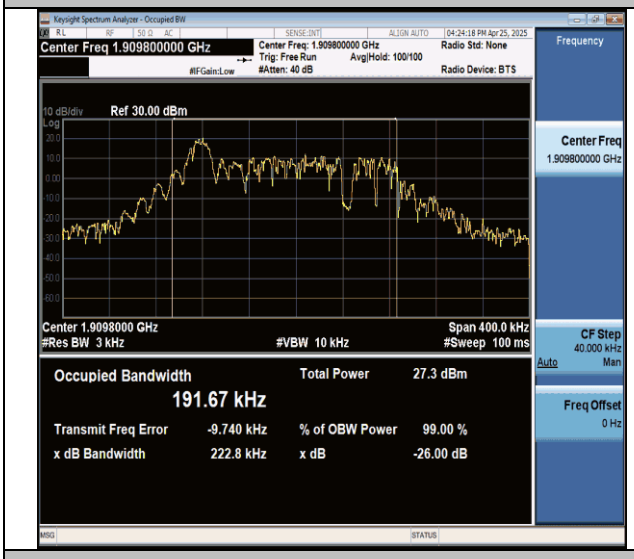


Band2-0.18-QPSK-18876-PASS

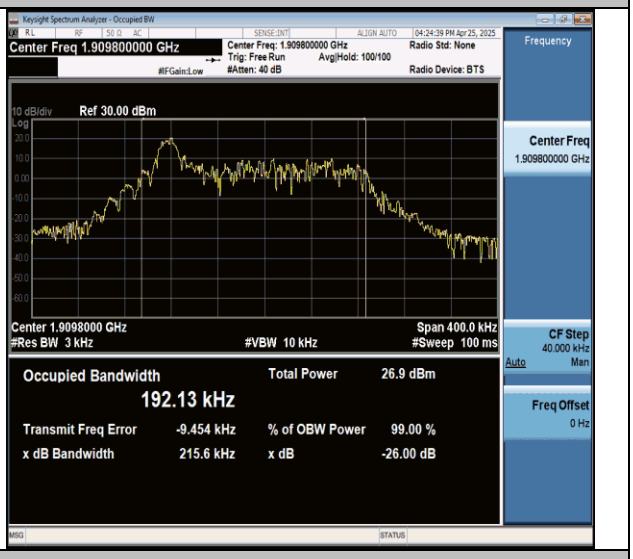


Band2-0.18-BPSK-19198-PASS

Band2-0.18-QPSK-19198-PASS



Band2-0.18-BPSK-19198-PASS

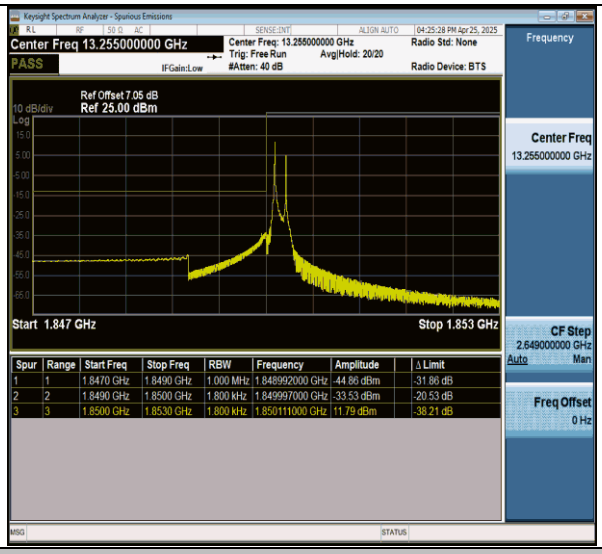


Band2-0.18-QPSK-19198-PASS

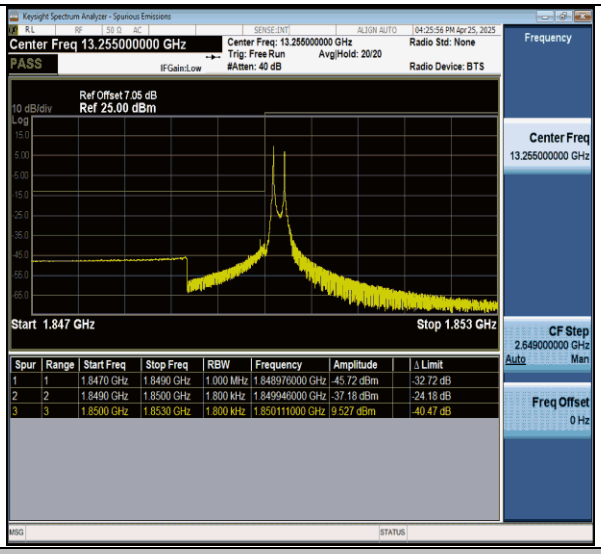
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

Band Edge for NB1

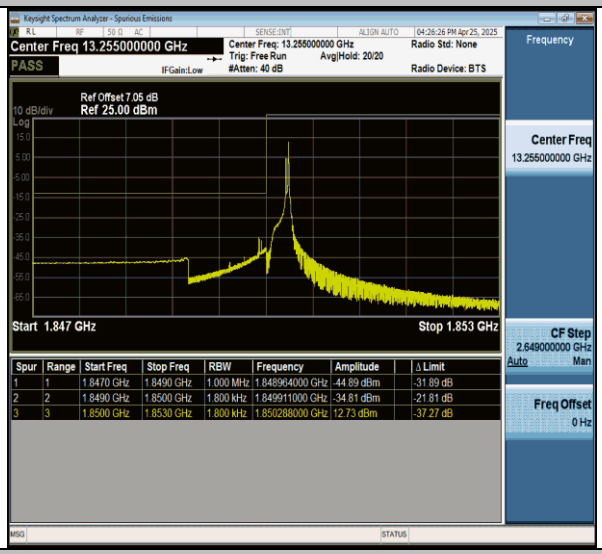
Test Graphs



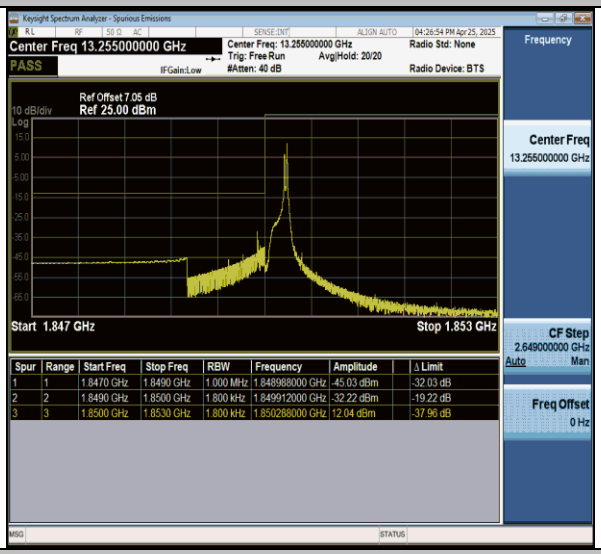
Band2_Stand-Alone_0.18_BPSK_18602_1@0_3.75kHz



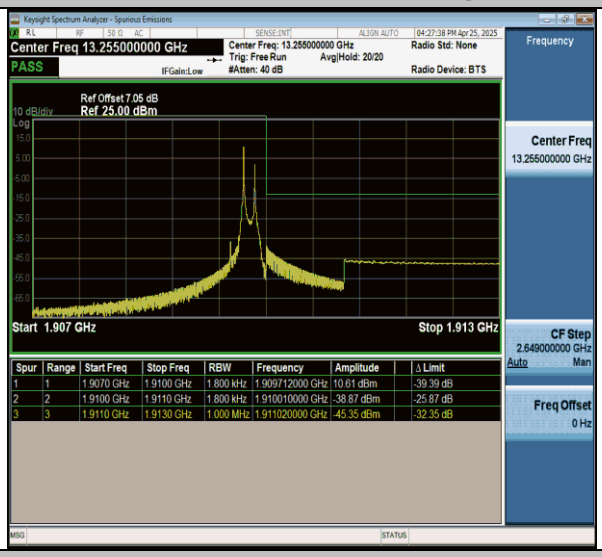
Band2_Stand-Alone_0.18_QPSK_18602_1@0_3.75kHz



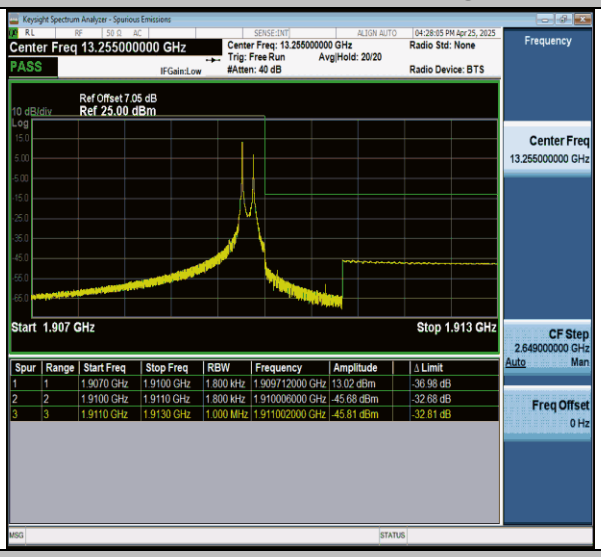
Band2_Stand-Alone_0.18_BPSK_18602_1@47_3.75kHz



Band2_Stand-Alone_0.18_QPSK_18602_1@47_3.75kHz

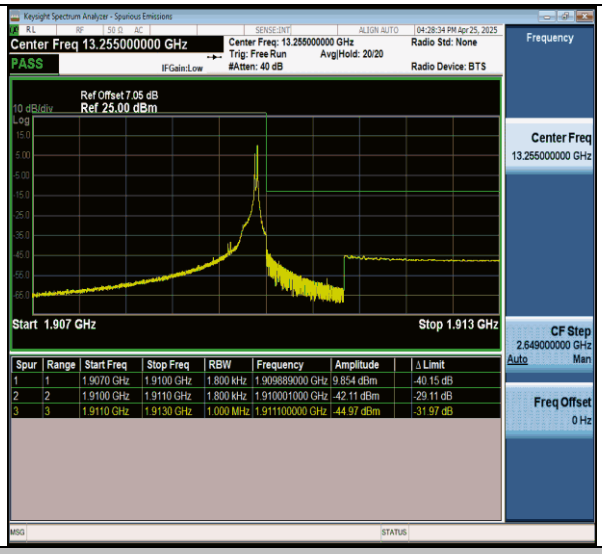


Band2_Stand-Alone_0.18_BPSK_19198_1@0_3.75kHz

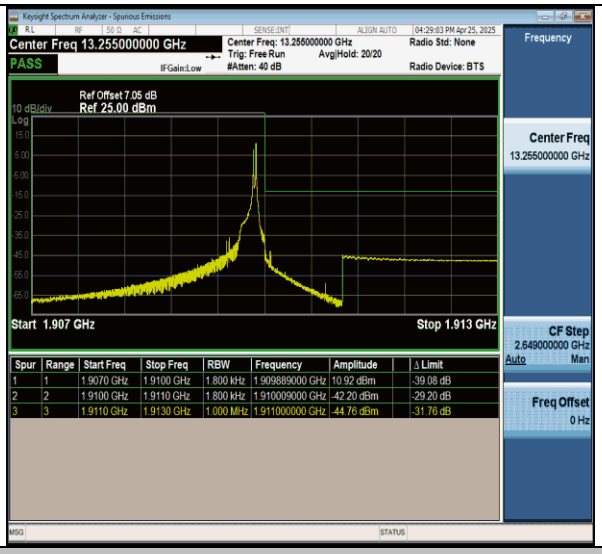


Band2_Stand-Alone_0.18_QPSK_19198_1@0_3.75kHz

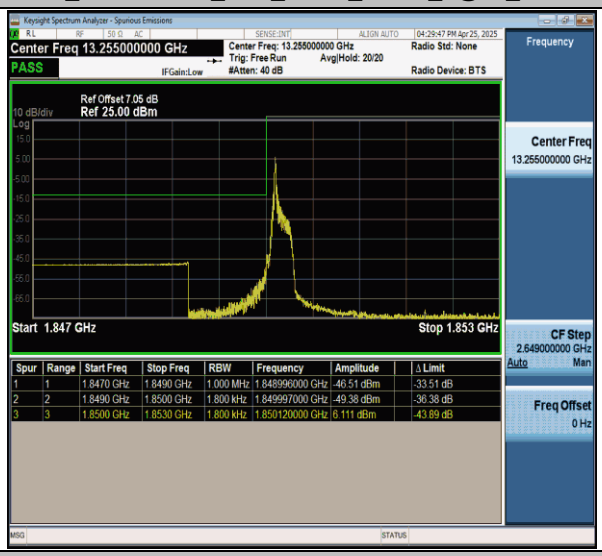
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.



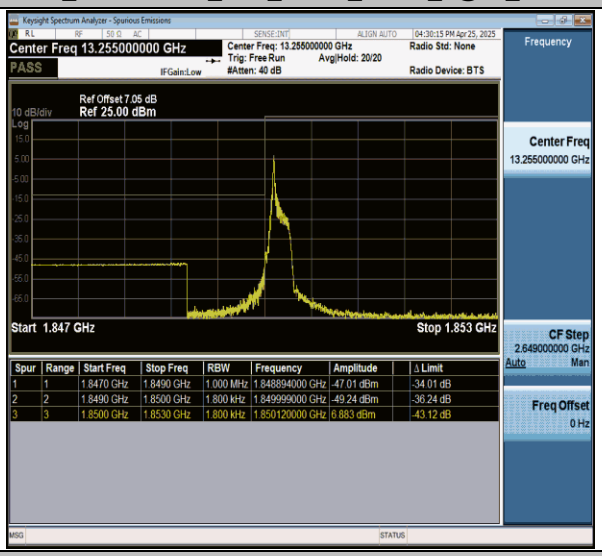
Band2_Stand-Alone_0.18_BPSK_19198_1@47_3.75kHz



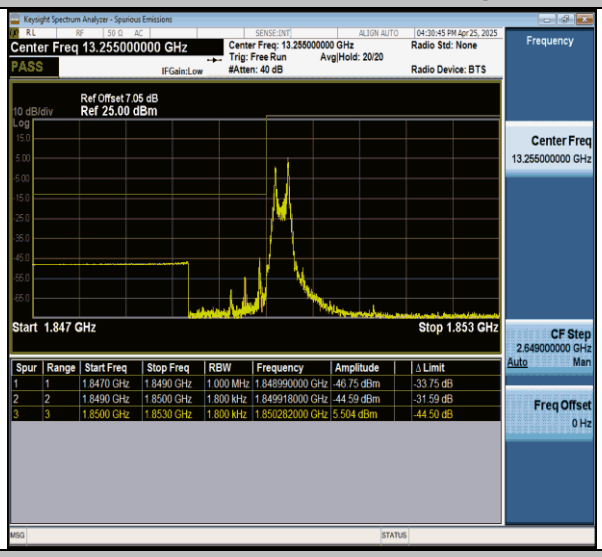
Band2_Stand-Alone_0.18_QPSK_19198_1@47_3.75kHz



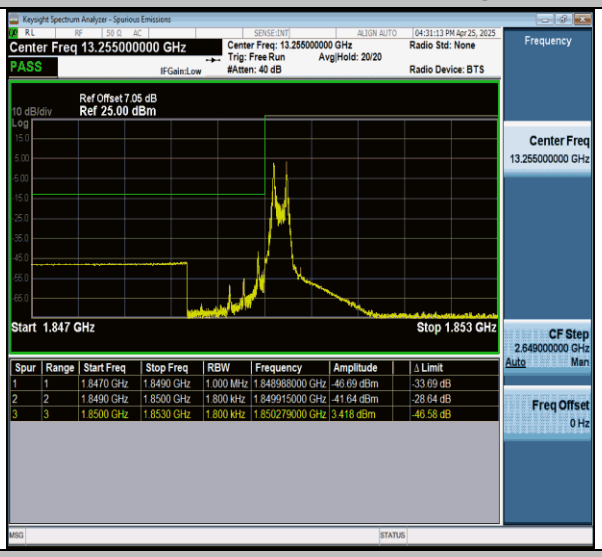
Band2_Stand-Alone_0.18_BPSK_18602_1@0_15kHz



Band2_Stand-Alone_0.18_QPSK_18602_1@0_15kHz

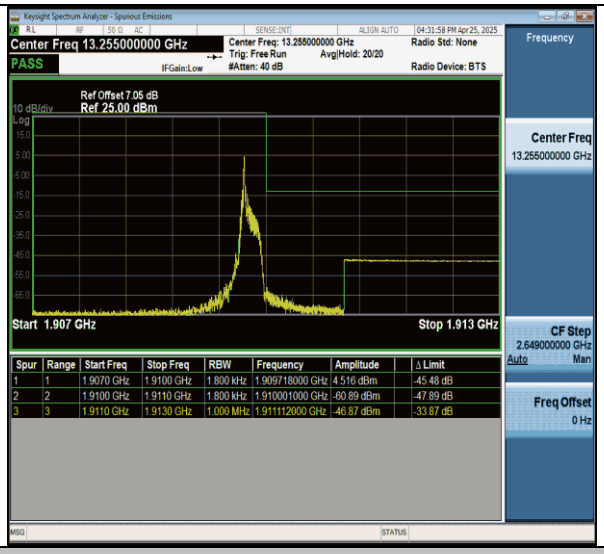


Band2_Stand-Alone_0.18_BPSK_18602_1@11_15kHz

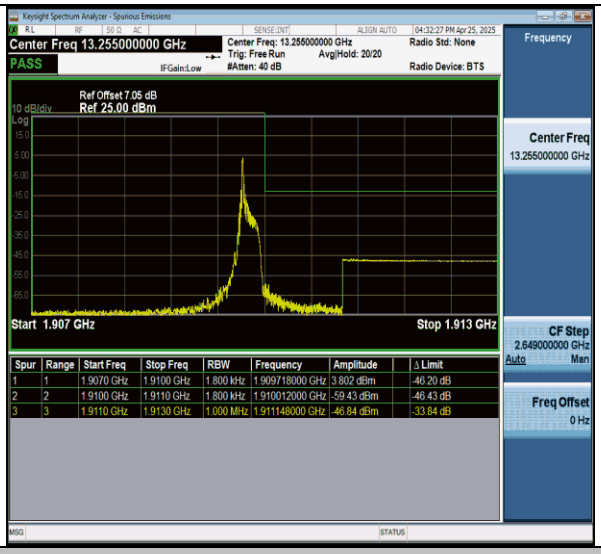


Band2_Stand-Alone_0.18_QPSK_18602_1@11_15kHz

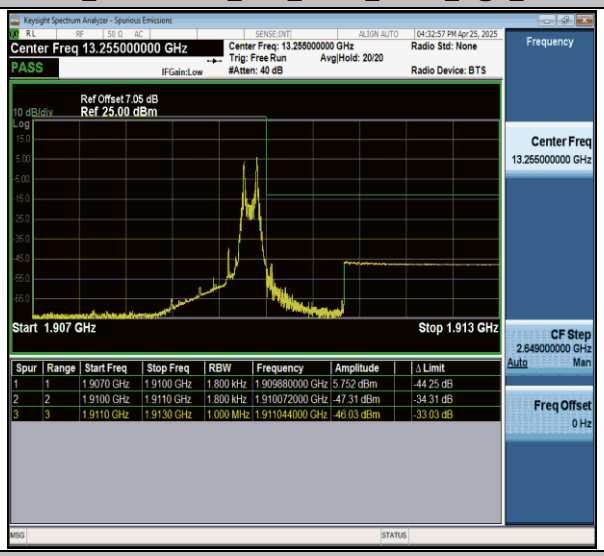
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.



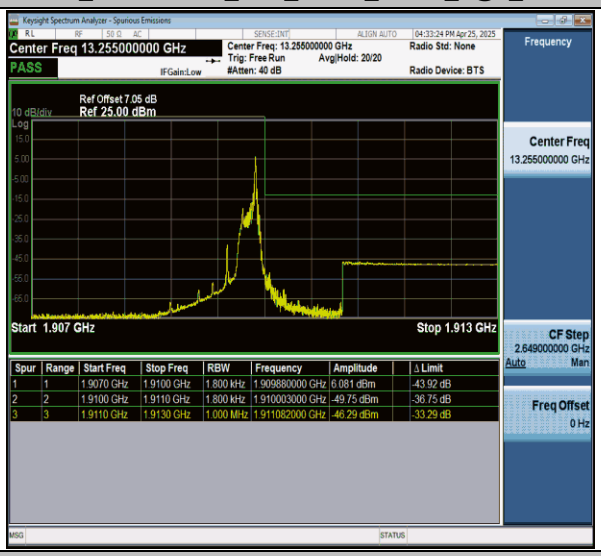
Band2_Stand-Alone_0.18_BPSK_19198_1@0_15kHz



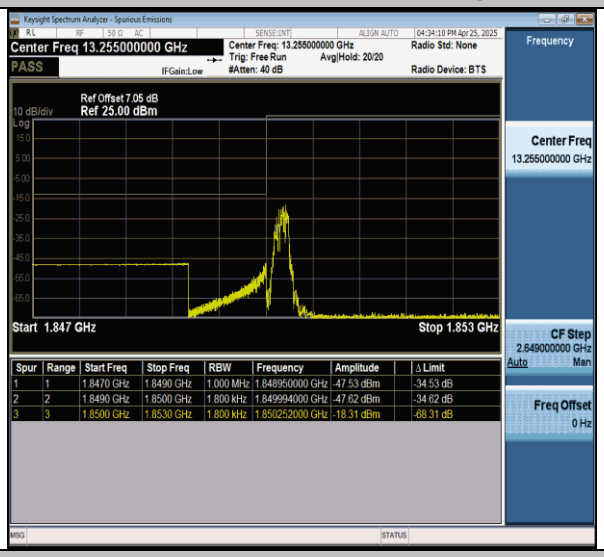
Band2_Stand-Alone_0.18_QPSK_19198_1@0_15kHz



Band2_Stand-Alone_0.18_BPSK_19198_1@11_15kHz



Band2_Stand-Alone_0.18_QPSK_19198_1@11_15kHz

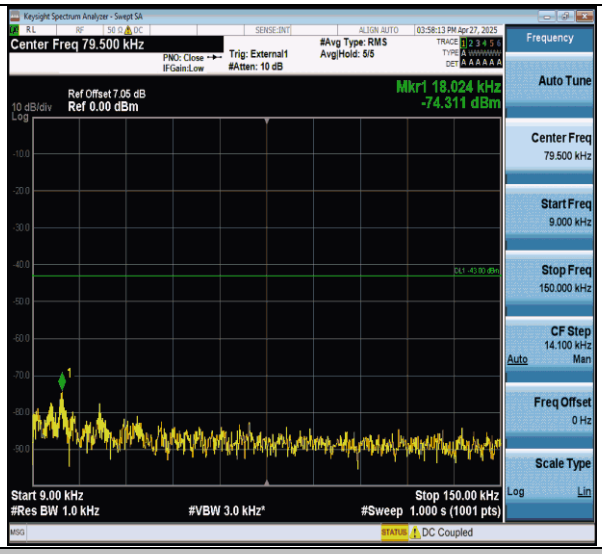


Band2_Stand-Alone_0.18_QPSK_18602_12@0_15kHz

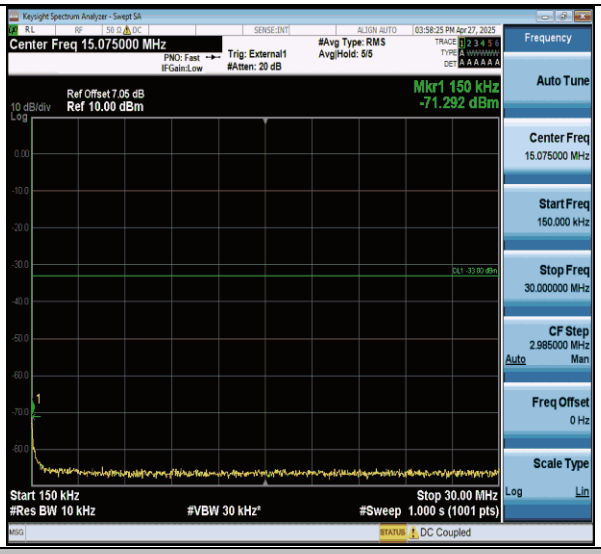
All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

Conducted Spurious Emission for NB1

Test Graphs



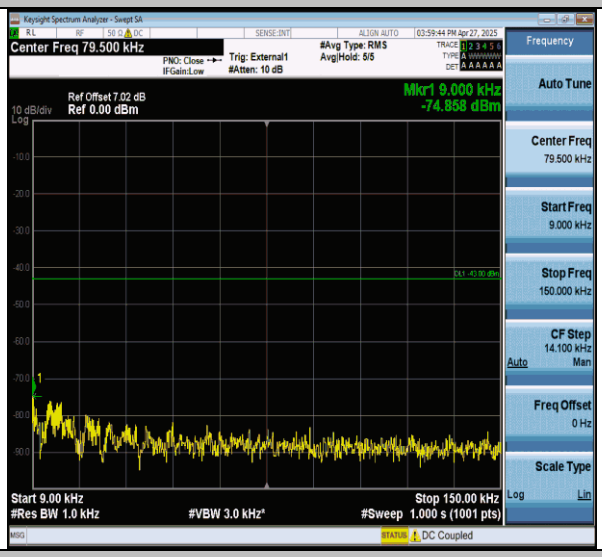
Band2-0.18-BPSK-18602-PASS



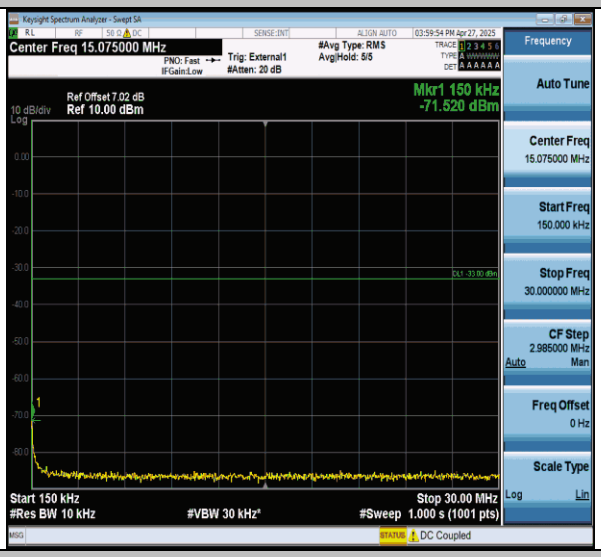
Band2-0.18-BPSK-18602-PASS

Band2-0.18-BPSK-18602-PASS

Band2-0.18-BPSK-18602-PASS

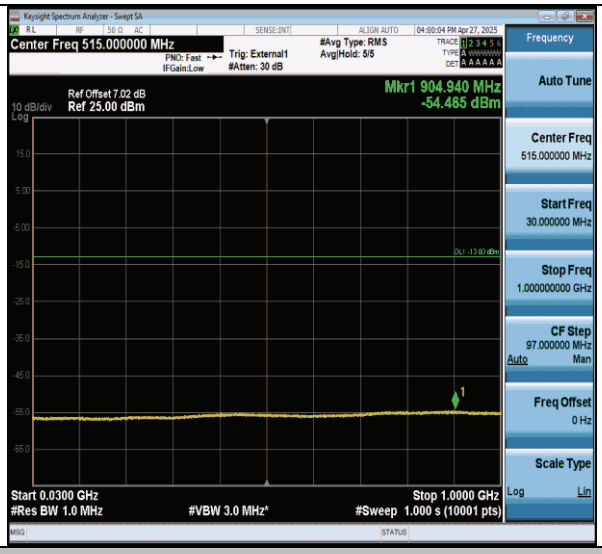


Band2-0.18-BPSK-18876-PASS



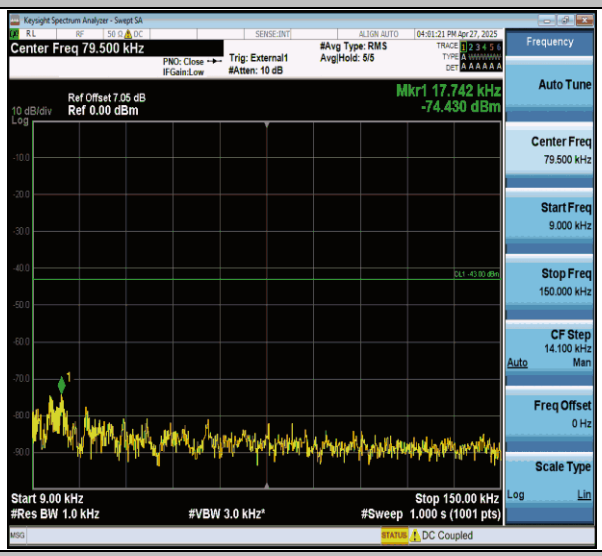
Band2-0.18-BPSK-18876-PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

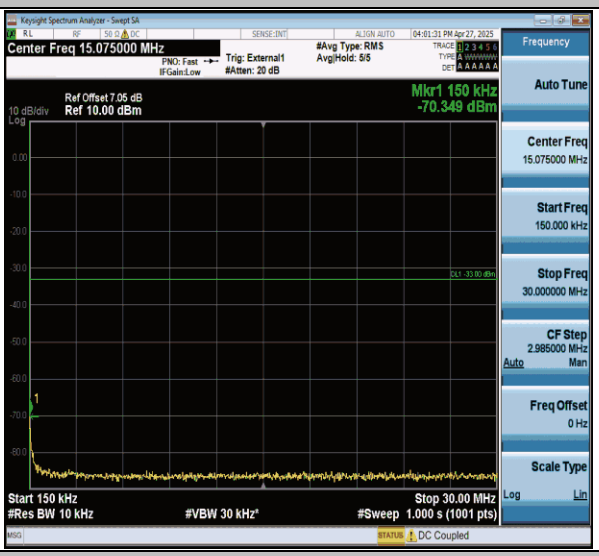


Band2-0.18-BPSK-18876-PASS

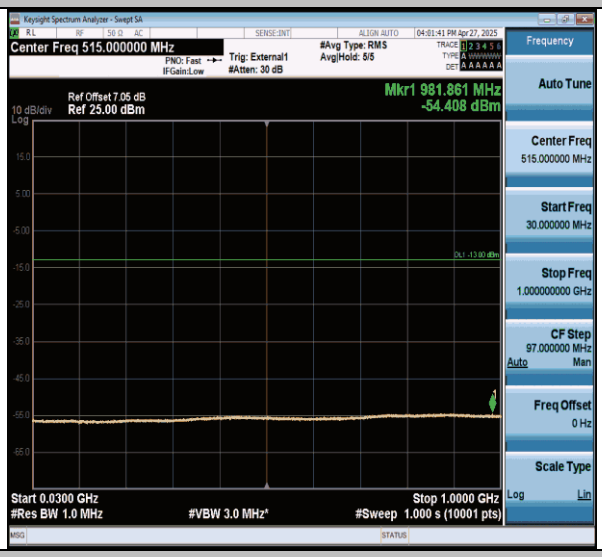
Band2-0.18-BPSK-18876-PASS



Band2-0.18-BPSK-19198-PASS



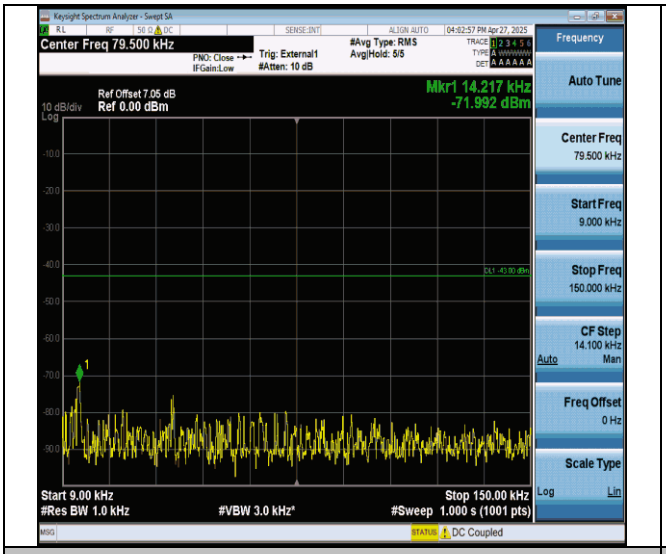
Band2-0.18-BPSK-19198-PASS



Band2-0.18-BPSK-19198-PASS

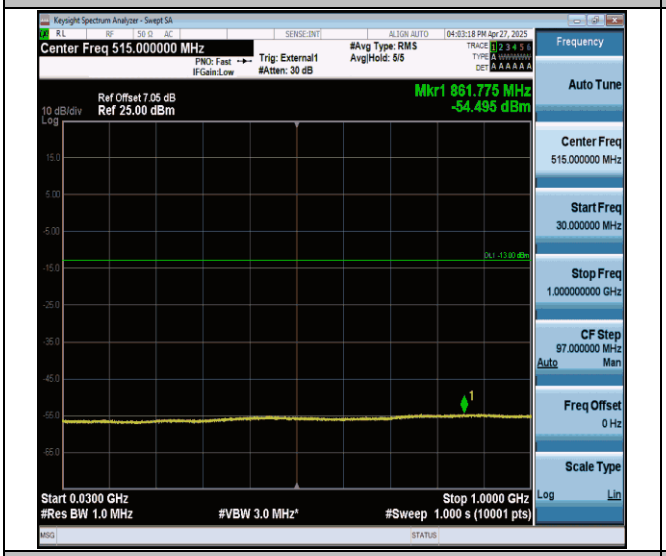
Band2-0.18-BPSK-19198-PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.



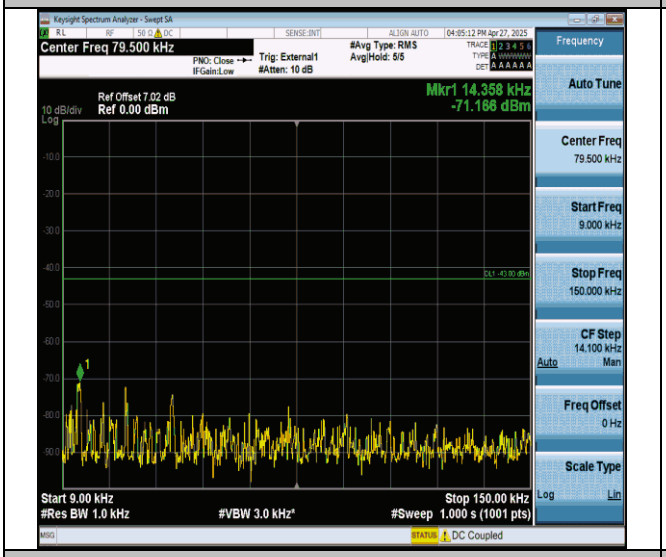
Band2-0.18-BPSK-18602-PASS

Band2-0.18-BPSK-18602-PASS



Band2-0.18-BPSK-18602-PASS

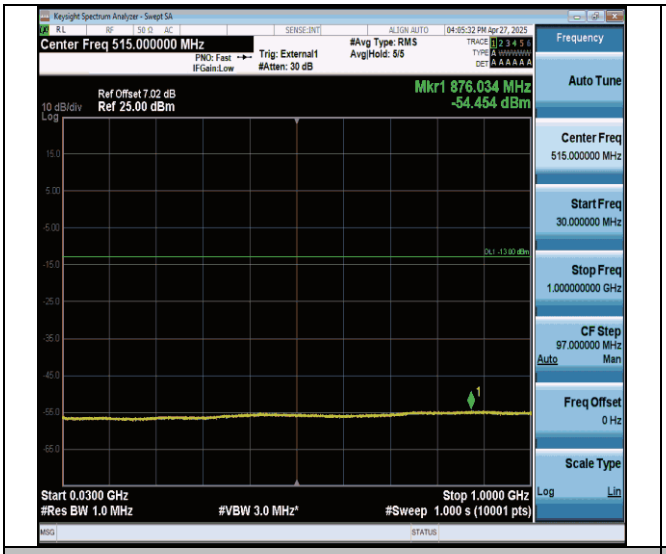
Band2-0.18-BPSK-18602-PASS



Band2-0.18-BPSK-18876-PASS

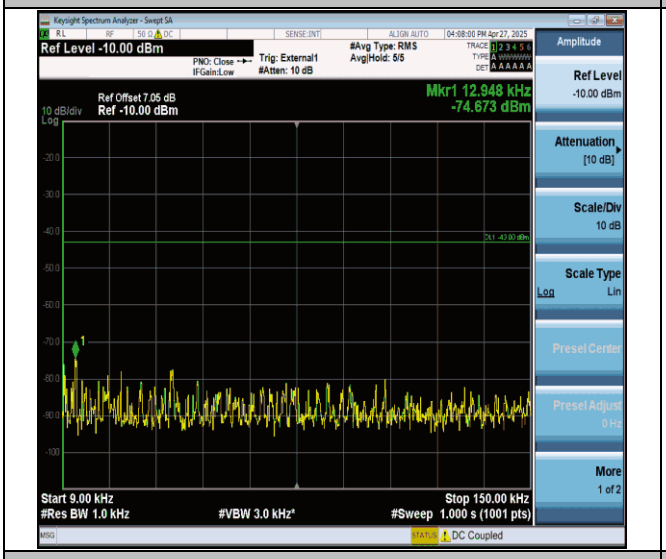
Band2-0.18-BPSK-18876-PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

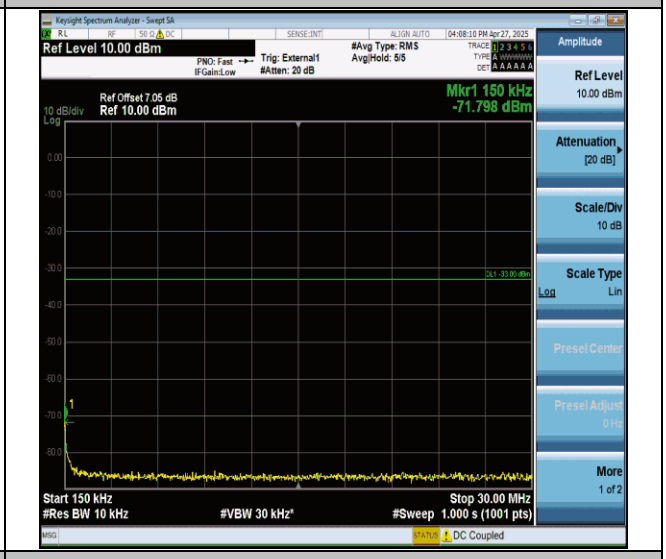


Band2-0.18-BPSK-18876-PASS

Band2-0.18-BPSK-18876-PASS



Band2-0.18-BPSK-19198-PASS



Band2-0.18-BPSK-19198-PASS

Band2-0.18-BPSK-19198-PASS

Band2-0.18-BPSK-19198-PASS

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.

Frequency Stability for NB1

Test Result

Voltage											
Band	OpMode	SCS	Bandwidth	Modulation	Channel	Tones	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Verdict
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	VN	NT	-5.10	-0.002716	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	VL	NT	-1.40	-0.000746	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	VH	NT	-3.40	-0.001811	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	VN	NT	-2.80	-0.001491	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	VL	NT	-3.00	-0.001598	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	VH	NT	-2.80	-0.001491	PASS

Temperature											
Band	OpMode	Bandwidth	Modulation	Channel	Tones	SCS	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Verdict
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	-30	-1.50	-0.000799	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	-20	-6.60	-0.003515	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	-10	-2.30	-0.001225	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	0	-2.30	-0.001225	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	10	-2.50	-0.001331	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	20	-1.90	-0.001012	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	30	-2.60	-0.001385	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	40	-6.40	-0.003409	PASS
Band2	Stand-Alone	3.75kHz	0.18	QPSK	18876	1@0	NV	50	-0.10	-0.000053	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	-30	-3.40	-0.001811	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	-20	-3.60	-0.001917	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	-10	-2.50	-0.001331	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	0	-3.00	-0.001598	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	10	-3.20	-0.001704	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	20	-2.00	-0.001065	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	30	-2.70	-0.001438	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	40	-3.30	-0.001758	PASS
Band2	Stand-Alone	15kHz	0.18	QPSK	18876	12@0	NV	50	-3.70	-0.001971	PASS

~The End~

All rights reserved. Unless otherwise specified, no part of this report may be reproduced or utilized in any part, form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from TOWE.