

GOXO-149 - SM OCXO					
Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass
0402 X7R	Body	Ni	7440-02-0	0.240	50.00
	Body	Ni	7440-02-0	0.240	50.00
0603 X7R	Body	Ni	7440-02-0	1.510	33.33
	Body	Ni	7440-02-0	1.510	33.33
	Body	Ni	7440-02-0	1.510	33.33
0805 - G	Substrate	Al2O3	1344-28-1	4.198	50.00
	Substrate	Al2O3	1344-28-1	4.198	50.00
0805 X5R	Body	Ni	7440-02-0	0.670	100.00
3.2x5.0mm Strip Crystal	Ceramic + Seam Seal + Ag	Al2O3	1344-28-1	24.506	61.05
	Ceramic + Seam Seal + Ag	SiO2	14808-60-7	1.730	4.31
	Ceramic + Seam Seal + Ag	Cr2O3	1308-38-9	0.952	2.37
	Ceramic + Seam Seal + Ag	TiO2	13463-67-7	0.030	0.07
	Ceramic + Seam Seal + Ag	W	7440-33-7	0.588	1.46
	Ceramic + Seam Seal + Ag	Ni	7440-02-0	1.233	3.07
	Ceramic + Seam Seal + Ag	Au	7440-57-5	0.137	0.34
	Ceramic + Seam Seal + Ag	Fe	7439-89-6	2.128	5.30
	Ceramic + Seam Seal + Ag	Co	7440-48-4	0.711	1.77
	Ceramic + Seam Seal + Ag	Ag	7440-22-4	0.304	0.76
	Ceramic + Seam Seal + Ag	Cu	7440-50-8	0.050	0.12
	Crystal	SiO2	14808-60-7	0.244	0.61
	Crystal Electrode	Ag	7440-22-4	0.001	0.00
	Kovar	Ni	7440-02-0	2.180	5.43
	Kovar	Co	7440-48-4	1.269	3.16
Kovar	Fe	7439-89-6	4.076	10.15	
403 X7R	Body	BaTiO3	12047-27-7	1.100	50.00
	Body	BaTiO3	12047-27-7	1.100	50.00
404 X7R	Termination	Cu	7440-50-8	0.025	50.00
	Termination	Cu	7440-50-8	0.025	50.00
405 X7R	Termination	Ni	7440-02-0	0.013	50.00
	Termination	Ni	7440-02-0	0.013	50.00
406 X7R	Termination	Sn	7440-31-5	0.019	50.00
	Termination	Sn	7440-31-5	0.019	50.00
604 X7R	Body	BaTiO3	12047-27-7	4.440	33.33
	Body	BaTiO3	12047-27-7	4.440	33.33
	Body	BaTiO3	12047-27-7	4.440	33.33
605 X7R	Termination	Cu	7440-50-8	0.109	33.33
	Termination	Cu	7440-50-8	0.109	33.33
	Termination	Cu	7440-50-8	0.109	33.33
606 X7R	Termination	Ni	7440-02-0	0.021	33.33
	Termination	Ni	7440-02-0	0.021	33.33

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Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass
606 X7R	Termination	Ni	7440-02-0	0.021	33.33
607 X7R	Termination	Sn	7440-31-5	0.021	33.33
	Termination	Sn	7440-31-5	0.021	33.33
	Termination	Sn	7440-31-5	0.021	33.33
806 - G	Substrate	SiO2	14808-60-7	0.127	50.00
	Substrate	SiO2	14808-60-7	0.127	50.00
806 X5R	Body	BaTiO3	12047-27-7	15.750	100.00
807 - G	Conductor Layer	Ag	7440-22-4	0.146	50.00
	Conductor Layer	Ag	7440-22-4	0.146	50.00
807 X5R	Termination	Cu	7440-50-8	0.261	100.00
808 - G	Conductor Layer	Pd	7440-53-3	0.007	100.00
808 X5R	Termination	Ni	7440-02-0	0.017	100.00
809 - G	Conductor Layer	PbO	1317-36-8	0.028	50.00
	Conductor Layer	PbO	1317-36-8	0.028	50.00
809 X5R	Termination	Sn	7440-31-5	0.118	100.00
810 - G	Conductor Layer	SiO2	14808-60-7	0.012	50.00
	Conductor Layer	SiO2	14808-60-7	0.012	50.00
811 - G	Conductor Layer	B2O3	1303-86-2	0.009	50.00
	Conductor Layer	B2O3	1303-86-2	0.009	50.00
812 - G	Resistive Layer	RuO2	12036-10-1	0.016	50.00
	Resistive Layer	RuO2	12036-10-1	0.016	50.00
813 - G	Resistive Layer	PbO	1317-36-8	0.011	50.00
	Resistive Layer	PbO	1317-36-8	0.011	50.00
814 - G	Resistive Layer	SiO2	14808-60-7	0.004	50.00
	Resistive Layer	SiO2	14808-60-7	0.004	50.00
815 - G	Resistive Layer	B2O3	1303-86-2	0.002	50.00
	Resistive Layer	B2O3	1303-86-2	0.002	50.00
816 - G	Resistive Layer	Al2O3	1344-28-1	0.002	50.00
	Resistive Layer	Al2O3	1344-28-1	0.002	50.00
817 - G	Coating Layer	PbO	1317-36-8	0.042	50.00
	Coating Layer	PbO	1317-36-8	0.042	50.00
818 - G	Coating Layer	SiO2	14808-60-7	0.035	50.00
	Coating Layer	SiO2	14808-60-7	0.035	50.00
819 - G	Coating Layer	B2O3	1303-86-2	0.021	50.00
	Coating Layer	B2O3	1303-86-2	0.021	50.00
820 - G	Coating Layer	Al2O3	1344-28-1	0.009	50.00
	Coating Layer	Al2O3	1344-28-1	0.009	50.00
821 - G	Ni Plating	Ni	7440-02-0	0.087	50.00

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Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass
821 - G	Ni Plating	Ni	7440-02-0	0.087	50.00
822 - G	Sn Plating	Sn	7440-31-5	0.092	50.00
	Sn Plating	Sn	7440-31-5	0.092	50.00
K-700-G	Die Bond Adhesive	Ag	7440-22-4	0.000	0.00
	Die Seal (XM-060)	SiO2	14808-60-7	36.600	57.92
	Die Seal (XM-060)	C9H12O3	25550-51-0	7.625	12.07
	Die Seal (XM-060)	SiO2	14808-60-7	7.625	12.07
	Die Seal (XM-060)	C14H20O4	2386-87-0	3.660	5.79
	Die Seal (XM-060)	SiO2	14808-60-7	1.220	1.93
	Die Seal (XM-060)	SiO2 (Fibre Glass)	7631-86-9	1.220	1.93
	Die Seal (XM-060)	C21H24O4	1675-54-3	1.220	1.93
	Die Seal (XM-060)	C8H4O3	85-44-9	1.220	1.93
	Die Seal (XM-060)	Carbon Black	1333-86-4	0.610	0.97
	IC Wire	Au	7440-57-5	0.287	0.45
	IC1 K-700-G (AKM)	Al	7429-90-5	0.003	0.00
	IC1 K-700-G (AKM)	Mo	7439-98-7	0.001	0.00
	IC1 K-700-G (AKM)	Si	7440-21-3	1.896	3.00
K-727-G	Backside Coating	CaO	1305-78-8	0.112	8.52
	Backside Coating	Resin		0.060	4.57
	Bumps	Sn	7440-31-5	0.411	31.28
	Bumps	Ag	7440-22-4	0.005	0.38
	Bumps	Cu	7440-50-8	0.002	0.15
	Chip	Si	7440-21-3	0.699	53.20
	Chip	Al	7429-90-5	0.004	0.30
	Passivation	C8H8	694-87-1	0.017	1.29
	Under Bump Metallization	Cu	7440-50-8	0.002	0.15
	Under Bump Metallization	Al	7429-90-5	0.001	0.08
	Under Bump Metallization	Ni	7440-02-0	0.001	0.08
K-731-G	Chip	Si	7440-21-3	1.665	7.50
	Die Attach	Ag	7440-22-4	0.130	0.59
	Die Attach	Resin		0.030	0.14
	Die Attach	Si	7440-21-3	0.003	0.01
	Die Attach	Heterocyclic organic	0	0.003	0.01
	Lead Frame	Cu	7440-50-8	2.227	10.03
	Lead Frame	Fe	7439-89-6	0.055	0.25
	Lead Frame	Ag	7440-22-4	0.044	0.20
	Lead Frame	Zn	7440-66-6	0.003	0.01
	Mold Compound	SiO2 (Fibre Glass)	7631-86-9	15.944	71.83
	Mold Compound	Resin		0.859	3.87
	Mold Compound	Resin		0.859	3.87
	Mold Compound	Carbon Black	1333-86-4	0.053	0.24
	Wire Bond	Au	7440-57-5	0.044	0.20

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Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass
K-731-G	pin plating	Sn	7440-31-5	0.278	1.25
PB-3422-G	Copper	Cr	7440-47-3	0.013	0.00
	Copper	Cu	7440-50-8	99.190	21.88
	Copper	Zn	7440-66-6	0.532	0.12
	Copper	As	7440-38-2	0.052	0.01
	Glass	Al	7429-90-5	43.902	9.68
	Glass	B	7440-42-8	8.289	1.83
	Glass	Fe	7439-89-6	0.436	0.10
	Glass	Mn	7439-96-5	2.749	0.61
	Glass	amorphous silicon	7631-86-9	72.935	16.09
	Glass	Ti	7440-32-6	0.829	0.18
	Idents	Epoxy	129915-35-1	0.074	0.02
	Resin	Epoxy	129915-35-1	167.247	36.89
	Solder Mask	Epoxy	129915-35-1	0.218	0.05
	Solder Mask	Si	7440-21-3	1.702	0.38
	Surface Finish	Co	7440-48-4	0.052	0.01
	Surface Finish	Au	7440-57-5	2.181	0.48
	Surface Finish	Pb	7439-92-1	0.026	0.01
	Surface Finish	Ni	7440-02-0	52.835	11.65
	Surface Finish	Pb	7439-92-1	0.131	0.03
R-xxx 0402 - G	Coating Layer	PbO	1317-36-8	0.013	0.35
	Coating Layer	SiO2	14808-60-7	0.004	0.11
	Coating Layer	B2O3	1303-86-2	0.002	0.05
	Coating Layer	Al2O3	1344-28-1	0.001	0.03
	Coating Layer	PbO	1317-36-8	0.013	0.35
	Coating Layer	SiO2	14808-60-7	0.004	0.11
	Coating Layer	B2O3	1303-86-2	0.002	0.05
	Coating Layer	Al2O3	1344-28-1	0.001	0.03
	Coating Layer	PbO	1317-36-8	0.013	0.35
	Coating Layer	SiO2	14808-60-7	0.004	0.11
	Coating Layer	B2O3	1303-86-2	0.002	0.05
	Coating Layer	Al2O3	1344-28-1	0.001	0.03
	Coating Layer	PbO	1317-36-8	0.013	0.35
	Coating Layer	SiO2	14808-60-7	0.004	0.11
	Coating Layer	B2O3	1303-86-2	0.002	0.05
	Coating Layer	Al2O3	1344-28-1	0.001	0.03
	Coating Layer	PbO	1317-36-8	0.013	0.35
	Coating Layer	SiO2	14808-60-7	0.004	0.11
	Coating Layer	B2O3	1303-86-2	0.002	0.05
	Coating Layer	Al2O3	1344-28-1	0.001	0.03
	Coating Layer	PbO	1317-36-8	0.013	0.35
	Coating Layer	SiO2	14808-60-7	0.004	0.11

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Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass
R-xxx 0402 - G	Coating Layer	B2O3	1303-86-2	0.002	0.05
	Coating Layer	Al2O3	1344-28-1	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	Pd	7440-53-3	0.001	0.03
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	Pd	7440-53-3	0.001	0.03
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	Pd	7440-53-3	0.001	0.03
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	Pd	7440-53-3	0.001	0.03
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Conductor Layer	Ag	7440-22-4	0.018	0.48
	Conductor Layer	Pd	7440-53-3	0.001	0.03
	Conductor Layer	PbO	1317-36-8	0.008	0.21
	Conductor Layer	SiO2	14808-60-7	0.002	0.05
	Conductor Layer	B2O3	1303-86-2	0.001	0.03
	Ni Plating	Ni	7440-02-0	0.010	0.27
Ni Plating	Ni	7440-02-0	0.010	0.27	
Ni Plating	Ni	7440-02-0	0.010	0.27	
Ni Plating	Ni	7440-02-0	0.010	0.27	
Ni Plating	Ni	7440-02-0	0.010	0.27	
Ni Plating	Ni	7440-02-0	0.010	0.27	
Resistive Layer	RuO2	12036-10-1	0.002	0.05	
Resistive Layer	PbO	1317-36-8	0.003	0.08	
Resistive Layer	SiO2	14808-60-7	0.000	0.00	
Resistive Layer	B2O3	1303-86-2	0.000	0.00	
Resistive Layer	Al2O3	1344-28-1	0.000	0.00	
Resistive Layer	RuO2	12036-10-1	0.002	0.05	

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Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass	
R-xxx 0402 - G	Resistive Layer	PbO	1317-36-8	0.003	0.08	
	Resistive Layer	SiO2	14808-60-7	0.000	0.00	
	Resistive Layer	B2O3	1303-86-2	0.000	0.00	
	Resistive Layer	Al2O3	1344-28-1	0.000	0.00	
	Resistive Layer	RuO2	12036-10-1	0.002	0.05	
	Resistive Layer	PbO	1317-36-8	0.003	0.08	
	Resistive Layer	SiO2	14808-60-7	0.000	0.00	
	Resistive Layer	B2O3	1303-86-2	0.000	0.00	
	Resistive Layer	Al2O3	1344-28-1	0.000	0.00	
	Resistive Layer	RuO2	12036-10-1	0.002	0.05	
	Resistive Layer	PbO	1317-36-8	0.003	0.08	
	Resistive Layer	SiO2	14808-60-7	0.000	0.00	
	Resistive Layer	B2O3	1303-86-2	0.000	0.00	
	Resistive Layer	Al2O3	1344-28-1	0.000	0.00	
	Resistive Layer	RuO2	12036-10-1	0.002	0.05	
	Resistive Layer	PbO	1317-36-8	0.003	0.08	
	Resistive Layer	SiO2	14808-60-7	0.000	0.00	
	Resistive Layer	B2O3	1303-86-2	0.000	0.00	
	Resistive Layer	Al2O3	1344-28-1	0.000	0.00	
	Resistive Layer	RuO2	12036-10-1	0.002	0.05	
	Resistive Layer	PbO	1317-36-8	0.003	0.08	
	Resistive Layer	SiO2	14808-60-7	0.000	0.00	
	Resistive Layer	B2O3	1303-86-2	0.000	0.00	
	Resistive Layer	Al2O3	1344-28-1	0.000	0.00	
	Sn Plating	Sn	Sn	7440-31-5	0.014	0.38
	Sn Plating	Sn	Sn	7440-31-5	0.014	0.38
	Sn Plating	Sn	Sn	7440-31-5	0.014	0.38
	Sn Plating	Sn	Sn	7440-31-5	0.014	0.38
	Sn Plating	Sn	Sn	7440-31-5	0.014	0.38
	Sn Plating	Sn	Sn	7440-31-5	0.014	0.38
	Substrate	Al2O3	Al2O3	1344-28-1	0.528	14.15
	Substrate	SiO2	SiO2	14808-60-7	0.015	0.40
Substrate	Al2O3	Al2O3	1344-28-1	0.528	14.15	
Substrate	SiO2	SiO2	14808-60-7	0.015	0.40	
Substrate	Al2O3	Al2O3	1344-28-1	0.528	14.15	
Substrate	SiO2	SiO2	14808-60-7	0.015	0.40	
Substrate	Al2O3	Al2O3	1344-28-1	0.528	14.15	
Substrate	SiO2	SiO2	14808-60-7	0.015	0.40	
Substrate	Al2O3	Al2O3	1344-28-1	0.528	14.15	
Substrate	SiO2	SiO2	14808-60-7	0.015	0.40	
Substrate	Al2O3	Al2O3	1344-28-1	0.528	14.15	
Substrate	SiO2	SiO2	14808-60-7	0.015	0.40	
S-534-G	Conductive alloy	Sn	7440-31-5	0.670	22.15	

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Sub-Assembly	Material	Substance	CAS No	Mass (mg)	Sub-Assembly % by mass
S-534-G	Conductive alloy	Ag	7440-22-4	0.030	0.99
	Conductive alloy	Cu	7440-50-8	0.005	0.17
	Silicon Chip	Si	7440-21-3	2.300	76.03
	TopSide Metal	Al	7429-90-5	0.020	0.66
S-541-G	Backside Coating	CaO	1305-78-8	0.144	7.79
	Backside Coating	Resin		0.078	4.22
	Bumps	Sn	7440-31-5	0.148	8.01
	Bumps	Ag	7440-22-4	0.002	0.11
	Bumps	Cu	7440-50-8	0.001	0.05
	Chip	Si	7440-21-3	1.443	78.08
	Chip	Al	7429-90-5	0.009	0.49
	Passivation	C8H8	694-87-1	0.022	1.19
	Under Bump Metallization	Cu	7440-50-8	0.001	0.05
XC-220	Cover	Ryton R4	0	240.000	100.00
XT-352	Ceramic body	Al2O3	1344-28-1	32.930	100.00
XT-353	Ceramic body	SiO2	14808-60-7	2.337	100.00
XT-354	Ceramic body	Cr2O3	1308-38-9	1.278	100.00
XT-355	Metallization	W	7440-33-7	0.794	100.00
XT-356	Metallization	Mo	7439-98-7	0.040	100.00
XT-357	Braze	Ag	7440-22-4	0.408	100.00
XT-358	Braze	Cu	7440-50-8	0.072	100.00
XT-359	Plating	Ni	7440-02-0	0.121	100.00
XT-360	Plating	Co	7440-48-4	0.036	100.00
XT-361	Plating	Au	7440-57-5	0.184	100.00

Total Mass: 914.636 mg

John Hems
 Quality Manager
 Email: j.hems@golledge.com