



PK1151 (v1.0) November 22, 2021

# 100% Material Declaration Data Sheet for Virtex UltraScale+ HBM FPGA FSVA3824

Average Weight : 48.2356 g

Component	Substance Description	CAS # or Description	% of component	Use in product	Component weight / substance weight ( in grams)	Component % of total
Silicon die	Silicon	7440-21-3	100.0000	basis	1.441592	2.989%
					1.441592	
Micro-bump	Copper	7440-50-8	54.8000	metal	0.034311	0.071%
	Nickel	7440-02-0	22.6851	metal	0.018802	
	Tin	7440-31-5	21.8717	metal	0.007783	
	Silver	7440-22-4	0.6431	metal	0.007504	
					0.000221	
					<b>0.063269</b>	<b>0.131%</b>
Micro-bump underfill	Amorphous silica	trade secret	46.8682	Filler	0.029653	
	Amine compound	trade secret	20.8360	Glue	0.013183	
	Epoxy resin compound-A	trade secret	15.6270	Glue	0.009887	
	Epoxy resin compound-B	trade secret	15.6270	Glue	0.009887	
	Epoxy resin compound-C	trade secret	1.0418	Glue	0.000659	
					<b>0.136471</b>	<b>0.283%</b>
Mold compound	Silica filler	trade secret	86.0215	Filler	0.117394	
	Epoxy resin	trade secret	8.6022	Glue	0.011739	
	Hardener resin	trade secret	5.3763	Glue	0.007337	
					<b>0.334669</b>	<b>0.694%</b>
Interposer die	Silicon	7440-21-3	100.0000	basis	0.334669	
					<b>0.140250</b>	<b>0.291%</b>
C4 Bump	Copper	7440-50-8	80.0000	metal	0.112200	
	Tin	7440-31-5	19.6400	metal	0.027545	
	Silver	7440-22-4	0.3600	metal	0.000505	
					<b>0.098983</b>	<b>0.205%</b>
Solder Paste	Tin	7440-31-5	96.5000	metal	0.095519	
	Silver	7440-22-4	3.0000	metal	0.002969	
	Copper	7440-50-8	0.5000	metal	0.000495	
					<b>1.110698</b>	<b>2.303%</b>
C4 Underfill	Bisphenol F/epichlorohydrin copolymer	9003-36-5	24.0000	basis	0.266568	
	Phenolic resin	trade secret	19.0000	basis	0.211033	
	Bisphenol A type liquid epoxy resin	25068-38-6	4.0000	basis	0.044428	
	Amine type accelerator	trade secret	5	basis	0.055535	
	Silicon dioxide	60676-86-0	44.1	basis	0.489818	
	Carbon black	1333-86-4	0.9	basis	0.009996	
	Additives	trade secret	3	Additive	0.033321	
				<b>17.594759</b>	<b>36.477%</b>	
Stiffener Ring	Nickel	7440-02-0	10.5000	Stiffener ring	1.847450	
	Manganese	7439-96-5	2.0000	Stiffener ring	0.351895	
	Chromium	7440-47-3	20.0000	Stiffener ring	3.518952	
	Iron	7439-89-6	66.3400	Stiffener ring	11.672363	
	Other	trade secret	1.1600	Stiffener ring	0.204099	
				<b>0.276021</b>	<b>0.572%</b>	
Stiffener Ring Adhesive	Silicon	Confidential	80	Main material	0.220817	
	Others	Confidential	20	Main material	0.055204	
				<b>2.372020</b>	<b>4.918%</b>	
Solder Ball	Tin	7440-31-5	96.5	Main material	2.288999	
	Silver	7440-22-4	3	Main material	0.071161	
	Copper	7440-50-8	0.5	Main material	0.011860	
					<b>0.029000</b>	<b>0.060%</b>
Capacitor 1	Ceramic	66402-68-4	34.0000	Dielectric	0.009860	
	Nickel	7440-02-0	18.1000	Inner Electrode	0.005249	
	Copper	7440-50-8	41.1000	Terminal Electrode	0.011919	
	Nickel	7440-02-0	3.4000	Electroplating	0.000986	
	Tin	7440-31-5	3.4000	Electroplating	0.000986	
				<b>0.048810</b>	<b>0.101%</b>	
Capacitor 2	Barium oxide	1304-28-5	7.5400	Ceramic element	0.003680	
	Titanium dioxide	13463-67-7	3.7700	Ceramic element	0.001840	
	Ceramics, misc	trade secret	1.2600	Ceramic element	0.000615	
	Copper	7440-50-8	2.9800	Outer electrode	0.001455	
	Glass (diboron trioxide, boric)	1303-86-2	0.0700	Outer electrode	0.000034	
	Glass (silicon dioxide)	7631-86-9	0.2700	Outer electrode	0.000132	
	Nickel	7440-02-0	0.1900	Ni plating layer	0.000093	
	Nickel	7440-02-0	83.3600	Inner electrode	0.040688	
	Tin	7440-31-5	0.5600	Tin plating	0.000273	
				<b>0.029153</b>	<b>0.060%</b>	
Capacitor 3	Ceramic	66402-68-4	22.7480	Dielectric	0.006632	
	Nickel	7440-02-0	30.7470	Inner Electrode	0.008964	
	Copper	7440-50-8	41.1260	Terminal Electrode	0.011989	
	Nickel	7440-02-0	2.0000	Electroplating	0.000583	
	Tin	7440-31-5	3.3800	Electroplating	0.000985	
				<b>24.525074</b>	<b>50.844%</b>	
Substrate	Copper	7440-50-8	38.670	Metal	9.483886	
	Tin	7440-31-5	0.104	Metal	0.025598	
	Core	N/A	43.757	Core	10.731500	
	ABF	N/A	16.538	Dielectric	4.056000	
	Solder Mask	N/A	0.930	Solder Mask	0.228090	

## Revision History

Date	Version	Description of Revisions
11/22/2021	1.0	Initial Xilinx release.

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