



**Package Material Composition and Mass Calculation**

ASECL Confidential / Security-C

Customer : NVL  
 Package : WLCSP  
 Device Type : nRF52840-CKAA-R  
 Die Size(mm) : 3.501x3.564  
 Total Pkg. Wt (mg): 12.20

Provided By : ASECL  
 Date : 4/26/2021  
 Rev. :

	name	material composition	CAS No.	%	mg.(ave)	mg.	%	PPM
Silicon	Silicon	Silicon	7440-21-3	100%		7.90197	64.770%	647,705
Polymer 1/2	PBO (HD8820)	γ-Butyrolactone (γ-Butyrolact	96-48-0	45-55%	0.10762	0.21524	1.764%	17,643
		1-methoxy-2-propyl acetate	108-65-6	1-10%	0.01184		0.882%	8,821
		N-Methyl-2-pyrrolidone (N-Me	872-50-4	<1%	0.00108		0.097%	970
		Ethanol (Ethanol)	64-17-5	<1%	0.00108		0.009%	88
		Non regulated ingredients (N Trade secret		<=45%	0.09363		0.009%	88
						0.767%	7,675	
RDL	RDL	Titanium (Ti)	7440-32-6	100%	0.00561	0.46574	3.818%	38,175
		Copper (Cu)	7440-50-8	100%	0.46012		0.046%	460
UBM	UBM	Titanium (Ti)	7440-32-6	100%	0.00108	0.18589	1.524%	15,237
		Copper (Cu)	7440-50-8	100%	0.18482		0.009%	88
Solder Ball	SnAgCu405	Tin	7440-31-5	90-100%	2.80007	2.93201	24.033%	240,330
		Silver	7440-22-4	4%	0.11728		22.952%	229,515
		Copper	7440-50-8	0.1-3%	0.01466		0.961%	9,613
BSC Film	LC-2850	Silica	60676-86-0	60%	0.29946	0.49910	4.091%	40,910
		Epoxy Resin	Trade secret	12%	0.05989		2.455%	24,546
		Acrylic ester co-polymer	Trade secret	12%	0.05989		0.491%	4,909
		Additive	Trade secret	12%	0.05989		0.491%	4,909
		Carbon black	1333-86-4	4%	0.01996		0.164%	1,636
<b>Total</b>						<b>12.20</b>	<b>100%</b>	<b>1000000</b>

DISCLAIMER

- The above material declaration can be used only as reference in identifying the Hazardous material content of the product.
- ASE does not guarantee the Material composition accuracy as it is based on the data provided by outside sources and has not been validated.
- This material declaration does not include data from any active and passive component assembled in the package.