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### Material Content Declaration (MCD) for typical internal Die/chip

#### Assumptions:

Average surface area = 3.23E-01 cm<sup>2</sup>. Many/most die have a finished thickness of 8 mil = 3.81E-02 cm. Therefore, average volume of die is 3.23E-01 x 3.81E-02 = 1.23E-02 cm<sup>3</sup>. Because the integrated circuit is ~ 1% of the finished die thickness, the average density of the die is that of crystalline silicon = 2.33 g/cm<sup>3</sup>. Therefore, the mass of an average die = 1.529E-02 grams.

Area (mil<sup>2</sup>/cm<sup>2</sup>)      50,000      3.23E-01  
Avogadros num.      6.02E+23

Primay Basic Substance	Area %	Density (gm/cm <sup>3</sup> )	MW (gm/mole)	Surf conc (cm <sup>2</sup> )	xj/thickness (um)	Conc (cm <sup>3</sup> )	Die Volume (cm <sup>3</sup> )*	Eff. Die Volume (cm <sup>3</sup> )	Atoms/die	gm/die	micro-gm/die	weight %	ppm
Arsenic	15%	2.03	74.92	1.00E+20	1.00	1.00E+16	3.23E-05	4.84E-06	4.84E+10	6.02E-12	6.02E-06	3.937E-08	3.937E-04
Boron	15%	2.34	10.81	1.00E+20	1.00	1.00E+16	3.23E-05	4.84E-06	4.84E+10	8.69E-13	8.69E-07	5.683E-09	5.683E-05
Phosphorous	15%	2.70	123.90	1.00E+18	1.00	1.00E+14	3.23E-05	4.84E-06	4.84E+08	9.96E-14	9.96E-08	6.514E-10	6.514E-06
Aluminum	40%	2.70	26.98		1.50	6.03E+22	4.84E-05	1.94E-05	1.17E+18	5.23E-05	52.30	3.420E-01	3.420E+03
Titanium	30%	4.50	47.90		0.10	5.66E+22	3.23E-06	9.68E-07	5.47E+16	4.35E-06	4.35	2.845E-02	2.845E+02
Tungsten	40%	19.35	183.85		1.00	6.34E+22	3.23E-05	1.29E-05	8.18E+17	2.50E-04	249.68	1.633E+00	1.633E+04
Silicon												balance	balance

\*chemical volume only

This semiconductor device and its homogenous materials comply with EU Directive 2002/95/EC (RoHS Directive) and with EU Directive 2002/53/EC (End-of-Life Vehicles (ELV) Directive).

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data

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