ISSUE	ORIGINATOR	DETAILS OF CHANGE	DATE
A	W.Janisch	This specification serves to re-release the Motorola 1202897W18 specification as a Motorola Mobility Specification. The overall text of the original specification was simplified. Additional detail was provided on "Misc." reporting requirements, BFR&PVC& Tin containing substance limits were amended, exemptions were provided for the use of DBT and BFR's, and Annex E was added to provide a comprehensive list of Motorola defined Exemptions to substance limits found in Appendix C.	01 April 2011
B	W.Janisch	This revision serves to modify Supplier reporting requirement which will include the use of IPC1752A data reporting and requires Suppliers to apply multiple Exemptions provided in Annex E for the following new Compliance Sections: RoHS, I, II, V, and Surface. Links to Motorola reporting tools and training material were updated and additional guidance is provided on the use of "Misc." data reporting, and the use of Cr and Ni in the surface of products.	01 December 2011
C	Jason Chen	Remove legacy business information and expired RoHS exemptions; add Prop 65 and low halogen regulations; specify RoHS 2 and W18 (surface); integrate WPA REACH and Conflict Mineral requirement; remove cobalt from W18(surface).	19 Jan 2017
D	Jason Chen	Adding chlorinated flame retardants and phosphorus flame retardants into section 5; separately add REACH SVHC/Authorization/Restriction link; update RoHS exemptions and surface exemptions.	19 Feb 2020
E	Jason Chen	Add China VOC substances, update RoHS exemptions, Update Expire Date	22 October 2020

1. SCOPE:

This specification sets forth Motorola Mobility LLC ("Motorola") materials disclosure requirements for items and materials used in the manufacture and delivery of products to Motorola customers. The list of substances that Motorola has targeted for exclusion, reduction or reporting is contained in Appendix A.

2. DEFINITIONS:

Assembly - An Assembly is a collection of components and materials that are not intended to be disassembled or cannot reasonably be disassembled without the use of a specialized tool by the end user. Products are considered as assemblies.

Banned Substances - These substances are not allowed for use at any level unless noted as an exemption in the acceptance criteria.

CAS Number – or CAS (Chemical Abstract Service) Registry Number (CASRN) is a unique number identifying chemical substances. CASRNs, assigned by the CAS Registry, a division of the American Chemical Society, are the only method in existence for identifying discrete substances. CASRNs may be obtained from raw material suppliers or directly from the CAS Registry.

Controlled Substances - These substances are limited for use in the manufacturing process or in certain applications at the levels specified in Appendix C.

EEE – Electrical and Electronic Equipment

Homogeneous Material - A material, as defined by the European Union Technical Adaptation Committee, that cannot be mechanically disjointed into different materials; homogenous materials are materials “of uniform composition throughout.” Ceramics, glass, metals, alloys, paper, board, resins, coatings are provided as examples. The term “mechanically disjointed” would mean “that the materials can be, in principle, separated by mechanical actions such as for example: unscrewing, cutting, crushing, grinding and abrasive processes.”

The following examples are provided:

- A plated lead frame has two materials, the plating material and the lead frame, that must be independently evaluated for controlled materials.
- A plastic cover is a "homogeneous material" if it consists of one type of plastic that is not coated with, or has attached to it or inside it, any other kinds of materials. In this case, the Maximum Concentration Values (MCV) of the RoHS directive would apply to the plastic.
- An electric cable that consists of metal wires surrounded by non-metallic insulation materials is an example of a "non-homogeneous material," because the different materials could be separated by mechanical processes. In this case the MCVs would apply to each of the separated materials individually.
- A semiconductor package contains many homogeneous materials, including plastic molding material, tin-electroplating coatings on the lead frame, the lead frame alloy and gold-bonding wires.

Motorola IPC Creator - is a The Motorola IPC Creator is a spreadsheet-based tool for creating an IPC 1752A Homogeneous Material Declaration (Class D) in XML format. Its basic functions are to load a Motorola XML request header, enter and edit material content information and generate an output XML file suitable for submission to Motorola. Instructions and material declaration examples on how to complete this form can be found here:

https://www.motorola.com/us/about/corporate-responsibility-materials-disclosure#reportable-material-disclosure

Intentionally Added - “Intentionally Added” shall mean “deliberately utilized in the formulation of a material or part where its continued presence is desired in the final product to provide a specific characteristic, appearance or quality”. Intentionally Added substances and materials can occur at any point in the supply chain, i.e. a sub-tier supplier may add a material or substance that a tier 1 supplier must report to Motorola. Further, catalysts introduced during processing are always considered to be intentionally added materials. The use of recycled materials as feedstock for the manufacture of new products, where some portion of the recycled materials may contain amounts of regulated metals, is not to be considered as intentionally added.

Material - A “Material” is made up of one or more “Substances”. Note: Very few materials are composed of only one substance (e.g., all metals contain other substances at low concentrations either as unintentional contaminants or purposely introduced alloying agents).

Part - A Part is any item or assembly that a supplier sells to Motorola that is incorporated into Motorola’s products.

Reportable Substances - These substances are not currently banned but must be reported for other purposes.

Reporting Threshold - Concentration level which defines the limit equal to or above which the presence of a substance or material must be reported.

Substance - A "Substance" is a chemical element, compound, or polymer and has a CAS number. For example: stainless steel is a material typically composed of the following substances: Iron; Carbon; Manganese; Silicon; Chromium; Nickel; and others. The polymer Polycarbonate is a "Substance" because there is a CAS number (25037-45-0) for it. Lexan is the brand name for a Material. Lexan is not a "Substance" because it includes other constituents in addition to the Polycarbonate Substance and because it does not have a CAS number.

Substance Concentration – Concentration shall be expressed in parts per million (ppm) The formula for parts per million (ppm) is 1,000,000 * mass substance / mass of the homogeneous material. Concentrations are unit-less, for example 100 ppm = 0.01% = 100 mg/kg.

Sub-Tier Supplier - Any company selling or providing a material or part that is incorporated into Motorola products but is not directly sold to Motorola.

Supplier - The Company selling or providing a material part, or assembly to Motorola that Motorola intends to use in its products. Supplier, tier 1 supplier, and vendor are used interchangeably.

3. MOTOROLA'S RESPONSIBILITIES:

It is the responsibility of Engineering or personnel who prepare component and/or specifications/contracts to:

3.1. Ensure the appropriate reference to this specification on all prints for Motorola Items as follows:

3.1.1. All prints, specifications and contracts for Motorola parts must include a reference to the **1202897W18-MD.**

3.1.2. Print notes must include a reference to the appropriate section in Appendix C applicable to the Motorola Item, and should detail any exemptions which will be permitted.

3.1.3. Print notes shall include the **1202897W18-MD** reference without revision.

3.1.4. Recommended language for use in prints:

"Supplier must provide all required information and comply with Motorola's Controlled and Reportable Materials Disclosure 1202897W18-MD requirements. MOTOROLA WILL NOT QUALIFY PARTS THAT DO NOT MEET THE APPROPRIATE ACCEPTANCE CRITERIA AS OUTLINED IN APPENDIX C."

3.2. Ensure that materials and parts specified for designs comply with this specification, including OEM materials and parts.

4. SUPPLIER'S RESPONSIBILITIES:

It is the responsibility of all suppliers to:

4.1. Comply with the reporting requirements detailed in Clause 5 of this specification for all parts and assemblies. Note that the specific acceptance criteria are defined by Appendix C as dictated by the specific Motorola Business.

4.2. The Motorola Mobility IPC Creator tool is recommended to declare Controlled and Reportable substances.

4.3. Material content data reported should be the worst case if more than one bill of material or production operation exists.

4.4. Cascade the requirements in this specification to their sub-tier suppliers. Sub-tier supplier data input is a must for complete material and substance data determination.

4.5. Report any change to the material content of an approved part or assembly by re-submitting an updated report using Motorola Mobility IPC Creator and complying with all other applicable Motorola change control requirements.

4.6. Motorola may allow the use of IPC1752A Class A Declaration (non-homogeneous material), in specific limited applications. The supplier must receive prior authorization from the in-business product compliance organization to report using any format other than the IPC1752A Declaration Class D (homogeneous material).

4.7. Completion of this report and submission to Motorola constitutes a testament that all the information is true and correct to the best of the supplier's knowledge.

4.8. Supplier agrees to notify Motorola of any changes to the product that could affect compliance and or material or substance makeup of the part as required under Motorola PCN process.

5. REPORTING:

Material content data reported by suppliers is not shared outside of Motorola at the part level (unless required for compliance or certification). Motorola reserves the right to use supplier material content data to report the material content of our products to our customers or regulatory agencies, without revealing supplier information unless required by law.

When a lab analysis is used to determine the composition of a homogeneous material, it should be performed per international standards, such as those currently under development by the IEC. Note: Material assay is not intended to fulfill all requirements of this specification.

5.1. Reporting instructions are as follows:

5.1.1. Report 100% of all homogeneous materials that are in the part or assembly.

Note: Motorola requires the reporting of all inks, adhesives, plating, and paints as homogeneous materials; regardless of the medium onto which they are printed this includes adhesives on labels and tapes.

5.1.2. Report all Controlled and Reportable Substances with concentrations in excess of the reporting thresholds noted in Appendix A as contained within each homogenous material.

- Example: A eutectic Sn/Pb solder coating is used as a finish on a capacitor. This would require reporting the Pb concentration based on the weight of that coating. Because this is a eutectic solder, the concentration of Pb is well known at 37%. In other cases, the weight of the homogeneous material (in this case Sn/Pb) would have to be known to calculate the concentration.

5.1.3. Apply appropriate exemptions from Appendix E if a compliance threshold is exceeded. This may require the application of multiple exemptions to a single substance if the substance category has overlapping restrictions in different Compliance sections outlined in Appendix C. (e.g. Section RoHS

and Section V). Exemptions must be appropriate to the use of the substance in a material. (e.g. Lead solder exemption must not be used for lead in the ceramic of electronic components)

5.1.4. When reporting the composition of homogenous materials, the use of "MISC" (Miscellaneous) may be used for a substance when none of the Banned, Controlled, and Reportable substances per Appendix A of this specification are present in the material above the reporting thresholds. Reporting "MISC" at a material level is not acceptable and can only exceed 10% by weight in a single homogeneous material under the following circumstances:

5.1.4.1. The actual CAS# or Name is known but cannot be reported due to Intellectual Property (IP) reasons. In this case, the supplier must provide a certification from the manufacturer of the material in question that the substance(s) are known but cannot be reported for IP reasons, and that none of the Banned, Controlled, and Reportable substances per Appendix A of this specification are present in the material above the reporting thresholds. As an alternative, an MSDS or material laboratory reports may be acceptable subject to review and approval by Motorola. Note, a RoHS only lab report is not sufficient to demonstrate compliance with W18 requirements.

5.1.4.2. In all cases, Motorola reserves the right to reject a supplier submission that is lacking sufficient evidence to demonstrate compliance.

5.1.4.3. Misc. substances must be reported as CAS# = "SYSTEM" and substance name = "MISC., NOT TO DECLARE". Any deviation from this exact text will result in an unknown CAS# error upon submission.

5.1.5. The supplier is responsible to ensure that any units used are consistent and provide an accurate accounting of the substance concentration.

Finally, do not confuse Acceptance Criteria and the related exemptions with reporting requirements. Reporting a substance or material is always required even if it is exempt or meets the Part Acceptance Criteria. For example, lead in ceramics must be reported.

6. PART ACCEPTANCE CRITERIA:

Motorola will assign a compliance status for parts based on the acceptance criteria of the various sections of Appendix C. This status will determine the acceptability of parts for use. Motorola requires all parts to meet the acceptance criteria as outlined in Appendix C unless granted a formal waiver as defined in the internal exception policies (e.g.- for some spare and replacement parts, customer specification required parts, specific markets, etc.). This applies to parts that reference this specification and the corresponding acceptance criteria of this specification. Please note that compliance with multiple sections is required for every part/product.

Note that reporting per this specification is always required, regardless if the acceptance criteria is met.

7. CHANGE MANAGEMENT

The organization shall control planned changes and review the consequences of unintended changes, taking action to mitigate any adverse effects, as necessary.

8. APPROVALS:

Organization	Approver Name	Approver Signature	Date

Regulatory Affairs - Global	Paul Didcott		6-Nov-2020
MBG Regulatory Compliance	Jeff Narducci		6-Nov-2020

8. APPENDICES:

Appendix A: Banned, Controlled and Reportable Substances

Motorola defines the following minimum Reporting Thresholds for the following Banned, Controlled or Reportable Substance families. Please reference Section V of Appendix C to obtain compliance Acceptance Thresholds, and reference Appendix E for exemptions to those Thresholds as noted.

Substances	Motorola Category	Reporting Threshold (ppm at a homogenous level unless otherwise indicated)
Asbestos, asbestos compounds	Banned	0
Chlorofluorocarbons and halons (Class I and II ozone depleting Chemicals). Must also be reported used in any processing of a part	Banned	0
Dimethylfumerate or dimethylformamide	Banned	0
Halogenated dioxins and furans	Banned	0
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF6)	Banned	0
Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-imethylethyl)-	Banned	0
Polychlorobiphenyls and derivatives (PCBs)	Banned	0
Polychloroterphenyls and derivatives (PCTs)	Banned	0
REACH Annex XVII	Banned	0
Alkyl Hydrocarbon	Controlled	100
Alkyl nitrite	Controlled	100
Anthracene	Controlled	100
Antimony and antimony compounds	Controlled	100
Aromatic compounds as monomers (except where listed separately)	Controlled	100
Arsenic and arsenic compounds	Controlled	100
Azo Dyes in leathers and textiles	Controlled	1
Barium and barium compounds	Controlled	100

Brominated Flame Retardants (other than PBBs or PBDEs) (e.g. Tetrabromobisphenol-A)	Controlled	100
Chlorinated flame retardants	Controlled	100
Chromium and chromium compounds	Controlled	100
Cobalt and cobalt compounds, except cobalt dichloride	Controlled	100
Cobalt dichloride	Controlled	10
Cadmium and cadmium compounds	Controlled	10
Chromium (VI) compounds	Controlled	100
Chromium (VI) compounds in leather and textiles	Controlled	1
Ethylene Glycol, its Ether and its acetate	Controlled	1
Formaldehyde	Controlled	100
Halogenated hydrocarbon	Controlled	100
Latex and latex compounds	Controlled	100
Lead and lead compounds	Controlled	100
Lead in cable jackets	Controlled	100
Mercury and mercury compounds that are intentionally added	Controlled	1
Methanol	Controlled	100
2-Methyloxirane	Controlled	100
1-Methyl-2-pyrrolidone (NMP)	Controlled	100
Naphthalene	Controlled	50
2-nitropropane	Controlled	100
Nickel and nickel compounds	Controlled	100
Naphthalene	Controlled	100
Perfluoro alkyl sulfonates (PFAS), and derivatives (including PFOS)	Controlled	100

Polybrominated biphenyls (PBBs)	Controlled	100
Polybrominated diphenyl ethers (PBDEs) (including Nonabromodiphenyl ether)	Controlled	100
Phthalates	Controlled	100
PVC and vinyl chloride monomer	Controlled	100
phosphorus flame retardants	Controlled	100
Proposition 65 List that exposes to end consumers	Controlled	1
REACH SVHC	Controlled	100
Selenium and selenium compounds	Controlled	100
Short-chain chloroparaffins – chlorinated alkanes with 10–13 carbon atoms in the chain and a minimum of 48 percent chlorine by weight	Controlled	100
Tin and tin compounds	Controlled	100
Aluminum and aluminum compounds	Reportable	100
Amines, aliphatic	Reportable	100
Aniline salts	Reportable	100
Aromatic amines and dyes	Reportable	100
Aromatic (Poly) Hydrocarbons (PAH and PCAH)	Reportable	100
4-Aminobiphenyl	Reportable	100
Beryllium and beryllium compounds	Reportable	100
Bismuth and bismuth compounds	Reportable	100
Certain short and medium chained chlorinated paraffins	Reportable	100
Copper and copper compounds	Reportable	100
Ferrosilicon and alloys	Reportable	100
Gold and compounds	Reportable	100
Halogenated aromatic compounds as monomers (including Polychlorinated Naphthalenes)	Reportable	100

Halogenates that produce acidic vapor with water	Reportable	100
Iron and iron compounds	Reportable	100
Magnesium and magnesium compounds	Reportable	100
Organic azo and azo-oxy compounds	Reportable	100
Organic halogen compounds (except where listed separately)	Reportable	100
Organic phosphorous compounds	Reportable	100
Organic silicon compounds	Reportable	100
Palladium and palladium compounds	Reportable	100
Perchlorates	Reportable	6 ppb
Perfluorocarbons	Reportable	100
Polybrominated Terphenyls	Reportable	100
Radioactive substances	Reportable	100
Rubidium and rubidium compounds	Reportable	100
Silver and silver compounds	Reportable	100
Small Fibers – All parts containing fibers or fibrils 5um (microns), or less, in diameter with a length: diameter ratio equal to or greater than 3:1	Reportable	100
Sulfur Hexafluoride	Reportable	100
Tantalum and tantalum compounds	Reportable	100
Tellurium and tellurium compounds	Reportable	100
Tetramethylthiuram disulfide (Thiram)	Reportable	100
Thallium and thallium compounds	Reportable	100
Zinc and zinc compounds	Reportable	100

Appendix B: Reserved

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Appendix C: Acceptance Criteria

Section RoHS 2: Product Acceptance Criteria

Substances	Motorola Category	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Cadmium	Controlled	100*	EU Directive 2011/65/EU (ROHS 2)
Hexavalent chromium	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2)
Lead	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2)
Mercury	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2), Swiss Ordinance on Reduction of Risk from Chemical Products, Various US states
Polybrominated biphenyls (PBBs)	Controlled	1000*	Canada Regulation, EU Directive 2011/65/EU (ROHS 2)
Polybrominated diphenyl ethers (PBDEs)	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2), Various US states
Bis (2-ethylhexyl) phthalate (DEHP)	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2)
Benzyl butyl phthalate (BBP)	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2)
Dibutyl phthalate (DBP)	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2)
Diisobutyl phthalate (DIBP)	Controlled	1000*	EU Directive 2011/65/EU (ROHS 2)

* Exemptions may apply for specific usages above the given threshold. Please refer to Appendix E for a comprehensive list of available exemptions.

Section Surface: Motorola General Product Acceptance Criteria

Substances	Motorola Category	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Arsenic and arsenic compounds	Controlled	0*	Motorola Initiative
Barium compounds	Controlled	0*	Motorola Initiative
Latex and latex compounds	Controlled	0*	Motorola Initiative
Nickel and nickel compounds	Controlled	0*	EU Regulation 1907/2006
Selenium and selenium compounds	Controlled	0*	Motorola Initiative
Chromium and Chromium compounds	Controlled	0*	Motorola Initiative
Lead and Lead compounds	Controlled	0*	Motorola Initiative
Antimony and Antimony compounds	Controlled	0*	Motorola Initiative
Cadmium and Cadmium compounds	Controlled	0*	Motorola Initiative
Mercury and Mercury compounds	Controlled	0*	Motorola Initiative

* Exemptions may apply for specific usages above the given threshold. Please refer to Appendix E for a comprehensive list of available exemptions.

Section Proposition 65: Motorola General Product Acceptance Criteria

Ethylene Glycol Monomethyl Ether and its acetate	Controlled	5	Motorola Initiative
Ethylene Glycol Monoethyl Ether and its acetate	Controlled	5	Motorola Initiative
Bisphenol A (BPA)	Controlled	300	Motorola Initiative
Lead in cable jackets	Controlled	300	Motorola Initiative
Proposition 65 list (Except the above) *	Controlled	0*	Motorola Initiative

* Latest Prop 65 regulated substances refer to this link, http://oehha.ca.gov/proposition-65/proposition-65-list

Section II: Reserved

Section III: Reserved

Section IV: Reserved

Section V: Mobile Devices Business Compliance Acceptance Criteria

The following substances that are listed cannot exceed the specified limit except where exemptions are noted. Please reference Appendix E for exemptions to thresholds if noted.

Substances	Motorola Category	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Asbestos, asbestos compounds	Banned	-	United States Toxic Substances Control Act
Chlorofluorocarbons and halons (Class I and II ozone depleting chemicals)	Banned	-	EU Regulation (EC) No. 2037/2000; 1990 amendments of the Clean Air Act (United States)
Dimethylfumerate	Banned	-	EU Directive 2009/251/EC
Halogenated dioxins and furans	Banned	-	German Regulation
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), and Sulfur Hexafluoride (SF6)	Banned	-	EU Directive 842/2006/EC; Austrian Regulation BGBl. II No 447/2002
Phenol, 2-(2H-benzotriazol-2-yl)-4,6-bis(1,1-imethylethyl)-	Banned	-	Japanese law – Article 13 of the Law concerning the Evaluation of Chemical Substances and Regulation of their Manufacture, etc.
Polychlorobiphenyls and derivatives (PCBs)	Banned	-	Norway Regulations; Canada regulations, et al
Polychloroterphenyls and derivatives (PCTs)	Banned	-	Norway Regulations; Canada regulations, et al
Alkyl Hydrocarbon	Controlled	150000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Alkyl nitrite	Controlled	20000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Anthracene	Controlled	500	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020

Aromatic compounds as monomers (except where listed separately)	Controlled	3000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Azo Dyes in leathers and textiles	Controlled	30	EU Directive 2002/61/EC and 2003/03/EC
Brominated Flame Retardants (other than PBBs or PBDEs)	Controlled	1000*	Motorola Initiative
Chlorinated Flame Retardants	Controlled	1000*	Motorola Initiative, Swedish Chemical Tax Act (2016:1067)
Cadmium, Chromium (VI), Lead and Mercury metals and compounds in packaging	Controlled	sum of metals not to exceed 100 ppm based on total package weight	EU Regulation 94/62/EC; various US states
Cadmium and cadmium compounds in “portable” batteries	Controlled	20 ppm of the total battery cell weight.	EU Regulation 2006/66/EC
Chromium (VI) compounds in leather and textiles	Controlled	3	Germany - § 30 of the Food and Commodities Law (LMBG)
Ethylene Glycol, its Ether and its acetate	Controlled	10000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Formaldehyde	Controlled	5000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Halogenated hydrocarbon	Controlled	5000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Mercury and mercury compounds	Controlled	1000*	Swiss Ordinance on Reduction of Risk from Chemical Products, Various US states
Mercury and mercury compounds in batteries	Controlled	5 ppm of the total battery cell	EU Regulation 2006/66/ECSwiss Ordinance on Reduction of Risk from Chemical Products, Various US states
Methanol	Controlled	10000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020

2-Methyloxirane	Controlled	20000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
1-Methyl-2-pyrrolidone (NMP)	Controlled	20000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Naphthalene	Controlled	500	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
2-Nitropropane	Controlled	20000	China VOC regulation, GB 30981-2020, GB 38507-2020, GB 33372-2020 and GB 38508-2020
Phosphorus Flame Retardants	Controlled	1000*	Motorola Initiative, Swedish Chemical Tax Act (2016:1067)
PVC and vinyl chloride monomer	Controlled	1000*	Motorola Initiative
Phthalates (include)	Controlled	100*	Motorola Initiative, EU Directive 2015/863
Polybrominated biphenyls (PBBs)	Controlled	1000	Canada Regulation, Motorola Initiative
Polybrominated diphenyl ethers (PBDEs)	Controlled	1000	USA Regulation
Perfluoro alkyl sulfonates (PFAS), and derivatives (including PFOS)	Controlled	100	EU Directive 2006/122/ECEU Regulation
Short-chain chloroparaffins – chlorinated alkanes with 10–13 carbon atoms in the chain and a minimum of 48 percent chlorine by weight compounds	Controlled	1000	Norway Product Regulations FOR-2004-06-01-922/ Swiss Ordinance on Reduction of Risk from Chemical Products
Bromine (Br) in Printed Circuit Board (PCB) and substrate laminates	Controlled	900	IEC 61249-2-21
Chlorine (Cl) in Printed Circuit Board (PCB) and substrate laminates	Controlled	900	IEC 61249-2-21
Total Br+Cl in Printed Circuit Board (PCB) and substrate laminates	Controlled	1500	IEC 61249-2-21

* Exemptions may apply for specific usages above the given threshold. Please refer to Appendix E for a comprehensive list of available exemptions.

Section Conflict Minerals: Conflict Minerals Product Acceptance Criteria

Substances	Motorola Category	Acceptance Threshold (ppm at a homogenous level unless otherwise indicated)	Reference
Tin	Banned	0*	Dodd–Frank Wall Street Reform and Consumer Protection Act
Tungsten	Banned	0*	Dodd–Frank Wall Street Reform and Consumer Protection Act
Tantalum	Banned	0*	Dodd–Frank Wall Street Reform and Consumer Protection Act
Gold	Banned	0*	Dodd–Frank Wall Street Reform and Consumer Protection Act

* Exemptions may apply for the usages from non-restricted regions. Motorola suggest an EICC form to be required for all parts that contain those metals and conflict free smelters need to be identified. EICC form can be found here: www.eicc.info.

Section REACH: Product Acceptance Criteria

Substances	Motorola Category	Acceptance Threshold (ppm at product level)	Reference
REACH SVHC (Candidate)*	Controlled	1000**	EC 1907/2006
REACH Authorization*	Controlled	0**	EC 1907/2006
REACH – Restriction*	Banned / Controlled	0**	EC 1907/2006

* Latest REACH SVHC refer to https://echa.europa.eu/candidate-list-table

* Latest REACH Authorization refer to https://echa.europa.eu/authorisation-list

* Latest REACH Restriction refer to https://echa.europa.eu/substances-restricted-under-reach

** Exemptions may apply for specific usages above the given threshold. Please refer to Appendix E for a comprehensive list of available exemptions.

Appendix E: Exemptions to Motorola Compliance Acceptance Criteria

The following provides Exemptions to the Compliance Criteria found in Appendix C. These exemptions are to be applied by a Supplier in the Motorola IPC Creator file submitted to Motorola and will be reviewed by the Motorola Regulatory Compliance team prior to file acceptance. Please note for overlapping Substance categories, the suppliers must apply applicable exemptions in each exemption class.

Section RoHS: EU RoHS Exemptions*

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
CADMIUM AND CADMIUM COMPOUNDS	100	8(b)-I	07/22/2021	Cadmium and its compounds in electrical contacts
CADMIUM AND CADMIUM COMPOUNDS	100	13(b)-(II)	07/22/2021	Cadmium in striking optical filter glass types, excluding applications falling under point 39 of this annex
CADMIUM AND CADMIUM COMPOUNDS	100	13(b)-(III)	07/22/2021	Cadmium and lead in glazes used for reflectance standards
CADMIUM AND CADMIUM COMPOUNDS	100	21(a)	07/22/2021	Cadmium when used in color-printed glass to provide filtering functions, used as a component in lighting applications installed in displays and control panels of EEE
CADMIUM AND CADMIUM COMPOUNDS	100	21(b)	07/22/2021	Cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses
HEXAVALENT CHROMIUM	1000	9(a)-I	05/03/2021	Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
HEXAVALENT CHROMIUM	1000	9(a)-II	07/22/2021	Hexavalent chromium as an anti-corrosion of the cooling system in absorption refrigerators
LEAD AND LEAD COMPOUNDS	1000	5(b)	07/22/2021	Lead in glass of fluorescent tubes not exceeding 0.2% by weight
LEAD AND LEAD COMPOUNDS	1000	6(a)-I	07/22/2021	Lead as an alloying element in steel for machining purposes containing up to 0.35 percent lead by weight and in batch hot dip galvanized steel components containing up to 0.2 percent lead by weight
LEAD AND LEAD COMPOUNDS	1000	6(b)-I	07/22/2021	Lead as an alloying element in aluminum containing up to 0.4 percent lead by weight, provided it

				stems from lead-bearing aluminum scrap recycling
LEAD AND LEAD COMPOUNDS	1000	6(b)-II	05/18/2021	Lead as an alloying element in aluminum for machining purposes with a lead content up to 0.4 percent by weight
LEAD AND LEAD COMPOUNDS	1000	6(c)	07/22/2021	Copper alloy containing up to 4 percent lead by weight
LEAD AND LEAD COMPOUNDS	1000	7(a)	07/22/2021	Lead in high melting temperature type solders (i.e. lead based alloys containing 85 percent by weight or more lead)
LEAD AND LEAD COMPOUNDS	1000	7(c)-I	07/22/2021	Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound
LEAD AND LEAD COMPOUNDS	1000	7(c)-II	07/22/2021	Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher
LEAD AND LEAD COMPOUNDS	1000	7(c)-IV	07/22/2021	Lead in PZT-based (lead-zirconium-titanate) dielectric ceramic materials for capacitors which are part of integrated circuits or discrete semiconductors
LEAD AND LEAD COMPOUNDS	1000	13(a)	07/22/2021	Lead in white glasses used for optical applications
LEAD AND LEAD COMPOUNDS	1000	13(b)-(I)	07/22/2021	Lead in ion-colored optical filter glass types
LEAD AND LEAD COMPOUNDS	1000	13(b)-(III)	07/22/2021	Cadmium and lead in glazes used for reflectance standards
LEAD AND LEAD COMPOUNDS	1000	15(a)	07/22/2021	Lead in solders to complete a viable electrical connection
LEAD AND LEAD COMPOUNDS	1000	18(b)	07/22/2021	Lead as activator in the fluorescent powder (1 percent lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($BaSi_2O_5$:Pb)
LEAD AND LEAD COMPOUNDS	1000	18(b)-I	07/22/2021	Lead as activator in the fluorescent powder (1 percent lead by weight or less) of discharge lamps containing phosphors such BSP(BaSi2O5:Pb) when used in medical phototherapy equipment
LEAD AND LEAD COMPOUNDS	1000	21(c)	07/22/2021	Lead in printing inks for the application of enamels on other than borosilicate glasses

LEAD AND LEAD COMPOUNDS	1000	24	07/22/2021	Lead in solders for the soldering to machine through hole discoidal and planar array ceramic multilayer capacitors
LEAD AND LEAD COMPOUNDS	1000	29	07/22/2021	Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC
LEAD AND LEAD COMPOUNDS	1000	32	07/22/2021	Lead oxide in seal frit used for making window assemblies for argon and krypton laser tubes
LEAD AND LEAD COMPOUNDS	1000	34	07/22/2021	Lead in cermet-based trimmer potentiometer elements
LEAD AND LEAD COMPOUNDS	1000	37	07/22/2021	Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body
LEAD AND LEAD COMPOUNDS	1000	41	03/31/2022	Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in the crankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council)
MERCURY AND MERCURY COMPOUNDS	1000	1(a)	07/22/2021	For general lighting purposes < 30 W: 2.5 mg
MERCURY AND MERCURY COMPOUNDS	1000	1(b)	07/22/2021	For general lighting purposes ≥ 30 W and < 50 W: 3.5 mg
MERCURY AND MERCURY COMPOUNDS	1000	1(c)	07/22/2021	For general lighting purposes ≥ 50 W and < 150 W: 5 mg
MERCURY AND MERCURY COMPOUNDS	1000	1(d)	07/22/2021	For general lighting purposes ≥ 150 W: 15 mg
MERCURY AND MERCURY COMPOUNDS	1000	1(e)	07/22/2021	For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 7 mg
MERCURY AND MERCURY COMPOUNDS	1000	1(f)	07/22/2021	For special purposes: 5 mg
MERCURY AND MERCURY COMPOUNDS	1000	1(g)	07/22/2021	For general lighting purposes < 30 W with a lifetime equal or above 20,000 h: 3.5 mg

MERCURY AND MERCURY COMPOUNDS	1000	2(a)(1)	07/22/2021	Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 4 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(2)	07/22/2021	Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 3 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(3)	07/22/2021	Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8): 3.5 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(4)	07/22/2021	Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 3.5 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(a)(5)	07/22/2021	Tri-band phosphor with long lifetime (≥ 25,000 h): 5 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(b)(3)	07/22/2021	Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9): 15 mg
MERCURY AND MERCURY COMPOUNDS	1000	2(b)(4)	07/22/2021	Lamps for other general lighting and special purposes (e.g. induction lamps): 15 mg
MERCURY AND MERCURY COMPOUNDS	1000	3(a)	07/22/2021	Short length (≤ 500 mm): 3.5 mg
MERCURY AND MERCURY COMPOUNDS	1000	3(b)	07/22/2021	Medium length (> 500 mm and ≤ 1,500 mm): 5 mg
MERCURY AND MERCURY COMPOUNDS	1000	3(c)	07/22/2021	Long length (> 1,500 mm): 13 mg
MERCURY AND MERCURY COMPOUNDS	1000	4(a)	07/22/2021	Mercury in other low pressure discharge lamps (per lamp): 15 mg
MERCURY AND MERCURY COMPOUNDS	1000	4(b)-I	07/22/2021	Mercury in high Pressure Sodium (vapor) lamps for general lighting purposes < 155 W with improved color rendering index Ra > 60 (after 2011: not exceeding 30 mg per lamp)

MERCURY AND MERCURY COMPOUNDS	1000	4(b)-II	07/22/2021	Mercury in high Pressure Sodium (vapor) lamps for general lighting purposes < 405 W and > 155 W with improved color rendering index Ra > 60 (> 2011: not exceeding 40 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(b)-III	07/22/2021	Mercury in high Pressure Sodium (vapor) lamps for general lighting purposes > 405 W with improved color rendering index Ra > 60 (> 2011: not exceeding 40 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(c)-I	07/22/2021	Mercury in other High Pressure Sodium (vapor) lamps for general lighting purposes < 155W (> 2011: not exceeding 25 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(c)-II	07/22/2021	Mercury in other High Pressure Sodium (vapor) lamps for general lighting purposes < 405 W and > 155 W (> 2011: not exceeding 30 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(c)-III	07/22/2021	Mercury in other High Pressure Sodium (vapor) lamps for general lighting purposes > 405 W (> 2011: not exceeding 40 mg per lamp)
MERCURY AND MERCURY COMPOUNDS	1000	4(e)	07/22/2021	Mercury in metal halide lamps (MH)
MERCURY AND MERCURY COMPOUNDS	1000	4(f)	07/22/2021	Mercury in other discharge lamps not specifically mentioned in this list

*Latest RoHS exemption can be referred here, https://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm

Section V: Global Compliance Acceptance General Exemptions

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
ARSENIC AND ARSENIC COMPOUNDS	0	502	NA	Arsenic NOT in wood products as a preservative per 2003/2/EC
AZO DYES	30	517	NA	Usage of azodyes is NOT in leather and/or textiles per EU Directive 2002/61/EC
CADMIUM AND CADMIUM COMPOUNDS	20	500	NA	Cadmium not in batteries or packaging covered by EU RoHS
COBALT DICHLORIDE	100	537	NA	Part contains Cobalt Dichloride but is not in the form of a substance or preparation (eg silica gel)
HEXAVALENT CHROMIUM	3	509	NA	In packaging, the sum of Cd, Hg, Pb and CrVI does not exceed 100 ppm based on total package mass per 94/62/EC
HEXAVALENT CHROMIUM	3	519	NA	Cr(VI) and Cr(VI) Compound not in leather and textiles per Germ“n "Food and Commodities ”aw"; up to 1000 ppm in EEE allowed per EU ROHS 2002/95/EC; heavy metals in packaging restricted under 94/62/EC
LEAD AND LEAD COMPOUNDS	70	510	NA	In packaging, the sum of Cd, Hg, Pb and CrVI does not exceed 100 ppm based on total package mass per 94/62/EC
LEAD AND LEAD COMPOUNDS	70	513	NA	Lead in Cable Jackets only, up to 300 ppm per California Prop 65
LEAD AND LEAD COMPOUNDS	70	518	NA	Lead NOT in cable jackets or packaging; covered by RoHS
MERCURY AND MERCURY COMPOUNDS	5	511	NA	In packaging, the sum of Cd, Hg, Pb and CrVI does not exceed 100 ppm based on total package mass per 94/62/EC
MERCURY AND MERCURY COMPOUNDS	5	515	NA	Mercury in batteries per EU Directive 98/101/EC not to exceed 5 ppm of total battery cell weight
MERCURY AND MERCURY COMPOUNDS	5	516	NA	Mercury in batteries per EU Directive 98/101/EC not to exceed 2% (20,000 ppm) for button cells
MERCURY AND MERCURY COMPOUNDS	5	520	NA	Mercury NOT in batteries covered by EU ROHS 2002/95/EC

Section Surface and PROPOSITION 65: Motorola Exemptions for Parts used on the Surface of a Product

Controlled Substance Category	PPM	#	Expiration Date	Exemption Description
ANTIMONY/ANTIMONY COMPOUNDS	0	528	NA	Part contains Antimony but will not have prolonged contact with skin (i.e. surface mount parts)
ANTIMONY/ANTIMONY COMPOUNDS	0	529	NA	Part contains Antimony, manufacturer certifies it meets ASTM F963-03
BARIUM AND BARIUM COMPOUNDS	0	524	NA	Part contains Barium but will not have prolonged contact with skin (i.e. surface mount parts)
BARIUM AND BARIUM COMPOUNDS	0	525	NA	Part contains Barium but the manufacturer certifies it meets ASTM F963-03
CHROMIUM AND CHROMIUM COMPOUNDS	0	522	NA	Part contains Chromium but will not have prolonged contact with skin (i.e. surface mount parts)
CHROMIUM AND CHROMIUM COMPOUNDS	0	523	NA	Part contains Chromium but the manufacturer certifies it meets ASTM F963-03 **Note: All Cr Plating is compliant with F963-03**
LATEX	0	534	NA	Part contains Latex or Prop65 non-metal but will not have prolonged contact with skin (i.e. surface mount parts)
LEAD AND LEAD COMPOUNDS	0	538	NA	Part contains Lead but will not have prolonged contact with skin (i.e. surface mount parts)
LEAD AND LEAD COMPOUNDS	0	539	NA	Part contains Lead but the manufacturer certifies it meets ASTM F963-03
NICKEL AND NICKEL COMPOUNDS	0	501	NA	Part contains Nickel, but will not have prolonged contact with skin
NICKEL AND NICKEL COMPOUNDS	0	506	NA	Part contains Nickel and could have prolonged contact with skin but the manufacturer certifies it meets EN1811, per 76/769/EEC and 94/27/EC **Note: All Ni used in stainless steel and amorphous metals is compliant with EN1811 unless sulfur content of metal is >.03%.**
SELENIUM AND SELENIUM COMPOUNDS	0	526	NA	Part contains Surface metal but will not have prolonged contact with skin (i.e. surface mount parts)

SELENIUM AND SELENIUM COMPOUNDS	0	527	NA	Part contains Surface metal or Prop65 metal manufacturer certifies it meets ASTM F963-03
MERCURY AND MERCURY COMPOUNDS	0	526	NA	Part contains Mercury but will not have prolonged contact with skin (i.e. surface mount parts)
MERCURY AND MERCURY COMPOUNDS	0	527	NA	Part contains Mercury manufacturer certifies it meets ASTM F963-03
ARSENIC AND ARSENIC COMPOUNDS	0	526	NA	Part contains Arsenic but will not have prolonged contact with skin (i.e. surface mount parts)
ARSENIC AND ARSENIC COMPOUNDS	0	527	NA	Part contains Arsenic manufacturer certifies it meets ASTM F963-03
CADMIUM AND CADMIUM COMPOUNDS	0	526	NA	Part contains Cadmium but will not have prolonged contact with skin (i.e. surface mount parts)
CADMIUM AND CADMIUM COMPOUNDS	0	527	NA	Part contains Cadmium but the manufacturer certifies it meets ASTM F963-03
PROPOSITION 65 LIST	0	534	NA	Part contains Latex or Prop65 non-metal but will not have prolonged contact with skin (i.e. surface mount parts)
PROPOSITION 65 LIST	0	526	NA	Part contains Selenium or Prop65 metal but will not have prolonged contact with skin (i.e. surface mount parts)
PROPOSITION 65 LIST	0	527	NA	Part contains Selenium or Prop65 metal manufacturer certifies it meets ASTM F963-03