

PART INFORMATION

Mfg Item Number	MMA8451QR1
Mfg Item Name	QFN 16ld COL3*3*1.0 P0.5

SUPPLIER

Company Name	Freescale Semiconductor Inc
Company Unique ID	14-141-7928
Response Date	2018-05-24
Response Document ID	003ZK50001S619A1.30
Contact Name	Freescale Semiconductor Inc
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DECLARATION

EU RoHS	Yes
Pb Free	No
HalogenFree	Yes
Plating Indicator	e3
EU RoHS Exemption(s)	7c-l

MANUFACTURING

Mfg Item Number	MMA8451QR1
Mfg Item Name	QFN 16ld COL3*3*1.0 P0.5
Version	ALL
Weight	0.033400
UoM	g
Unit Volume	EACH
J-STD-020 MSL Rating	1
Peak Processing Temperature	260 C
Max Time at Peak Temperature	40 seconds
Number of Processing Cycles	3

RoHS	
RoHS Directive	2011/65/EU
RoHS Definition	RoHS Definition: Quantity limit of 0.1% by mass (1000 PPM) of homogeneous material for: Lead (Pb), Mercury, Hexavalent Chromium, Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE) and quantity limit of 0.01% by mass (100 PPM) of homogeneous material of Cadmium
RoHS Legal Definition	Please indicate whether any homogeneous material (as defined by the RoHS Directive, EU 2011/65/EU and implemented by the laws of the European Union member states) of the part(s) identified on this form contains lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls and/or polybrominated diphenyl ethers (each a RoHS restricted substance) in excess of the applicable quantity limit identified below. If a homogeneous material within the part(s) contains a RoHS restricted substance in excess of an applicable quantity limit, please indicate below which, if any, RoHS exemption you believe may apply. If the part is an assembly with lower level components, the declaration shall encompass all such components. Supplier certifies that it gathered the information it provides in this form using appropriate methods to ensure its accuracy and that such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products with European Union member state laws that implement the RoHS Directive. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part(s), and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part(s), the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Suppliers liability and the Companys remedies for issues that arise regarding information the Supplier provides in this form. In the absence of such written agreement, the warranty rights and/or remedies of Suppliers Standard Terms and Conditions of Sale applicable to such part(s) shall apply.
RoHS Declaration	4 - Item(s) does not contain RoHS restricted substances per the definition above except for selected exemptions
Supplier Acceptance	Accepted
Signature	Daniel Binyon
Exemption List Version	2012/51/EU
Exemptions in this part	7c-I: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
List of Freescale Accepted Exemptions	<p>6(a) : Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0.35% lead by weight</p> <p>6(b) : Lead as an alloying element in aluminium containing up to 0.4% lead by weight</p> <p>6(c) : Copper alloy containing up to 4% lead by weight</p> <p>7(a) : Lead in high melting temperature type solders (i.e. lead-based alloys containing 85% by weight or more lead)</p> <p>7(b) : Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission, and network management for telecommunications</p> <p>7(c)-I : 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</p> <p>7(c)-II : Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher</p> <p>7(c)-III : Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC</p> <p>7(c)-IV : Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors</p> <p>15 : Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages</p>

MATERIAL COMPOSITION

Homogeneous Material	Weight	SubstanceClass	Substance	CAS	Exemption	SubstanceWeight	UoM	SubPart PPM	SubPart%	ARTICLEPPM	ARTICLE%
Lead Frame Plating	0.0016						g				
Lead Frame Plating		Lead/Lead Compounds	Lead	7439-92-1		0.0000032	g	200	0.02	9	0.0009
Lead Frame Plating		Metals	Tin, metal	7440-31-5		0.0015968	g	999800	99.98	47894	4.7894
Silicon Semiconductor Die	0.0005						g				
Silicon Semiconductor Die		Solvents, additives, and other materials	Other miscellaneous substances (less than 5%)	-		0.00001	g	20000	2	299	0.0299
Silicon Semiconductor Die		Glass	Silicon, doped	-		0.00049	g	980000	98	14670	1.467
Non-Conductive Epoxy/Adhesive	0.0007						g				
Non-Conductive Epoxy/Adhesive		Solvents, additives, and other materials	Silicone modified epoxy resin	218163-11-2		0.00063003	g	900050	90.005	18863	1.8863
Non-Conductive Epoxy/Adhesive		Plastics/polymers	Phenolic Resin	125133-38-2		0.00006997	g	99950	9.995	2094	0.2094
Bonding Wire, PdCu	0.0002						g				
Bonding Wire, PdCu		Metals	Copper, metal	7440-50-8		0.00019309	g	965429	96.5429	5781	0.5781
Bonding Wire, PdCu		Metals	Gold, metal	7440-57-5		0.0000007	g	3507	0.3507	20	0.002
Bonding Wire, PdCu		Metals	Palladium, metal	7440-05-3		0.00000621	g	31064	3.1064	185	0.0185
Die Encapsulant, Halogen-free	0.0137						g				
Die Encapsulant, Halogen-free		Plastics/polymers	Proprietary Material-Other Epoxy resins	-		0.0003425	g	25000	2.5	10254	1.0254
Die Encapsulant, Halogen-free		Solvents, additives, and other materials	Carbon Black	1333-86-4		0.0000685	g	5000	0.5	2050	0.205
Die Encapsulant, Halogen-free		Plastics/polymers	Proprietary Material-Other phenolic resins	-		0.0010275	g	75000	7.5	30763	3.0763
Die Encapsulant, Halogen-free		Glass	Silicon dioxide	7631-86-9		0.0013015	g	95000	9.5	38967	3.8967
Die Encapsulant, Halogen-free		Glass	Silica, vitreous	80676-86-0		0.01096	g	800000	80	328143	32.8143
Copper Lead Frame	0.0162						g				
Copper Lead Frame		Metals	Copper, metal	7440-50-8		0.0152371	g	940562	94.0562	456215	45.6215
Copper Lead Frame		Solvents, additives, and other materials	Silicon	7440-21-3		0.00011745	g	7250	0.725	3516	0.3516
Copper Lead Frame		Metals	Iron, metal	7439-89-6		0.00002025	g	1250	0.125	606	0.0606
Copper Lead Frame		Lead/Lead Compounds	Lead	7439-92-1		0.00000507	g	313	0.0313	151	0.0151
Copper Lead Frame		Metals	Magnesium, metal	7439-96-4		0.00002835	g	1750	0.175	848	0.0848
Copper Lead Frame		Metals	Manganese, metal	7439-96-5		0.00001013	g	625	0.0625	303	0.0303
Copper Lead Frame		Nickel (external applications only)	Nickel	7440-02-0		0.0005184	g	32000	3.2	15520	1.552
Copper Lead Frame		Metals	Silver, metal	7440-22-4		0.000162	g	10000	1	4850	0.485
Copper Lead Frame		Metals	Zinc, metal	7440-66-6		0.00010125	g	6250	0.625	3031	0.3031
Pb Glass Frit Semiconductor Di	0.0005				7c-1		g				
Pb Glass Frit Semiconductor Di		Lead/Lead Compounds	Lead (II) titanate	12060-00-3		0.00000519	g	10381	1.0381	155	0.0155
Pb Glass Frit Semiconductor Di		Glass	Fibrous-glass-wool	65997-17-3		0.00000497	g	9943	0.9943	148	0.0148
Pb Glass Frit Semiconductor Di		Solvents, additives, and other materials	2,2,4-trimethyl-1,3-pentanediol-1-monoisobutyrate	25265-77-4		0.00000497	g	9943	0.9943	148	0.0148
Pb Glass Frit Semiconductor Di		Glass	Silicon, doped	-		0.00048487	g	969733	96.9733	14517	1.4517

LINKS

MCD LINK	
NXP website	http://www.nxp.com
GENERAL ENVIRONMENTAL COMPLIANCE LINKS	
RoHS signed letter	http://www.nxp.com/files/corporate/doc/support_info/NXP-ROHS-DECLARATION.pdf
China RoHS	http://www.nxp.com/about/corporate-responsibility/environmental-compliance-organization/china-rohs:ENV_CHINA_ROHS_STRATEGY
REACH signed letter	http://www.nxp.com/files/corporate/doc/support_info/NXP-REACH-STATEMENT.pdf
ELV signed letter	http://www.nxp.com/files/corporate/doc/support_info/NXP-ELV-STATEMENT.pdf
Conflict Minerals statement	http://www.nxp.com/files/corporate/doc/support_info/NXP-STATEMENT-CONFLICT-MINERALS.pdf
NXP ENVIRONMENTAL INFORMATION	
Environmental Compliance website	http://www.nxp.com/about/corporate-responsibility/environmental-compliance-organization:ABUENVPRFPRDX
FAQ	http://www.nxp.com/about/corporate-responsibility/environmental-compliance-organization/eco-product-faqs:ENVIRON_FAQ
Technical Service Request	http://www.nxp.com/support/sales-and-support:SUPPORTHOME
LINKS TO BLANK IPC1752 FORMS	
Blank IPC1752 v1.1 Form	http://www.NXP.com/files/abstract/corporate/ehs_epp/IPC-1752-2_v1.1_MCD_Template.pdf

IPC1752 XML LINKS

http://www.freescale.com/mcdfs/MMA8451QR1_IPC1752_v11.xml

http://www.freescale.com/mcdfs/MMA8451QR1_IPC1752A.xml