

Company		DUNS#	URL For Additional Information
National Semiconductor		04-147-2986	http://www.national.com/analog/quality/green

Contact	Title	Phone	Email
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Part Number	MSL Rating	Peak Body Temp C	MaxTime(Sec)	Cycles	Unit Type
LM311H SL42034	1	NA	NA	NA	Each

Document Date	Contains Lead(Pb) - NOT European RoHS NOT China RoHS Compliant.	Weight (mg)	Does NOT Contain Halogens
01-17-2012		971.01	

Material Composition Declaration for Electronic Products

Item	Weight (mg)	Component	CAS#	Weight (mg)	Item-ppm	Part-ppm
Ext. LeadFinish	9.030	Sn	7440-31-5	5.689	630,000	5,859
		Pb	7439-92-1	3.341	370,000	3,441
Stand-off	61.000	Al2O3	1344-28-1	61.000	1,000,000	62,821
Lid	309.500	Ni	7440-02-0	309.500	1,000,000	318,741
Eyelet	266.000	Fe	7439-89-6	143.640	540,000	147,929
		Ni	7440-02-0	77.140	290,000	79,443
		Co	7440-48-4	45.220	170,000	46,570
Leads	178.800	Fe	7439-89-6	96.552	540,000	99,435
		Ni	7440-02-0	51.852	290,000	53,400
		Co	7440-48-4	30.396	170,000	31,304
Glass	132.000	SiO2	60676-86-0	106.392	806,000	109,569
		B2O3	1303-86-2	17.160	130,000	17,672
		Na2O	12401-86-4	5.280	40,000	5,438
		Al2O3	1344-28-1	3.168	24,000	3,263
Plating1	10.400	Ni	7440-02-0	10.400	1,000,000	10,711
Plating2	1.900	Au	7440-57-5	1.900	1,000,000	1,957
Chip	1.350	Si	7440-21-3	1.342	994,000	1,382
		Al	7429-90-5	0.008	6,000	8
Die Attach	1.010	Au	7440-57-5	0.990	980,000	1,020
		Si	7440-21-3	0.020	20,000	21
Wires	0.017	Al	7429-90-5	0.017	1,000,000	18

Note: The device content disclosed herewith is approximate and is based on engineering estimates only. It has not been verified through analytical testing.

Additionally, the following should be noted:

- One or more dopant materials may be present in the silicon die at sub-ppm levels to provide semiconductor properties.
- Epoxy resin components listed are generic and may or may not be the specific compound used, which is considered proprietary.

RoHS Material Composition Declaration

RoHS Directive 2002/95/EC	RoHS Definition: Quantity limit of 0.1% by mass (1000 PPM) in 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 for Cadmium
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Subject to the limitations below, National Semiconductor Corporation ("National") certifies the following information as of the document date.

- National products designated "ROHS Compliant" comply with the European Unions Directive on the Restriction of the Use of Hazardous Substances 2002/95/EC ("RoHS"). Certain National products contain lead in RoHS exempt applications 7(a) or 7(c)-I.
- National products do not contain and are not manufactured with ozone depleting compounds.
- National products do not contain substances identified by the European Chemical Agency ("ECHA") as substances of very high concern ("SVHC") per REACH Regulation (EC) No 1907/2006. National also complies with use restrictions as stipulated in Annex XVII of REACH.
- National products are manufactured in conformance with National specifications (SC)CSP-9-111C1 Supplier Environmental Requirements for Materials and Products and (SC)CSP-9-111S2 Banned and Reportable Substances.
- National's list of banned and reportable substances and management system is based on the current version of the Joint Industrial Guide, JIG-101.

National has taken commercially reasonable steps to provide representative and accurate information but may not have independently verified information provided or conducted chemical analysis of incoming materials. Equivalent compliant materials may have been substituted for those stated herein. Material concentrations are the maximum expected concentration of the substance in the device and may not represent the actual concentration. National and its suppliers consider certain limited information to be confidential and thus CAS numbers and other limited information may not be available for release. Nationals Standard Terms and Conditions of Sale apply to any issue arising out of or in connection with the information provided herein unless otherwise provided by a written contract signed by both parties.

NATIONAL ACCEPTS NO DUTY TO NOTIFY USERS OF THIS DECLARATION OF UPDATES OR CHANGES TO THIS DECLARATION.

John L. Conn
John L. Conn
Vice President Quality

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Banned Substance Monitoring

Part Number		Document Date
LM311H	SL42034	01-17-2012

Contains Lead(Pb) - NOT European RoHS Compliant.

NOT China RoHS Compliant.

Item#	Material	Cd	CrVI	Pb	Hg	PBB	PBDE	Cl	Br	Ref#
1	CHIP	<1	<1	<1	<30	<10	<10	<75	<50	1000
2	EPOXY	<2	<2	<2	<2	<5	<5	<50	<50	32
3	EXTLF	<2	N/D	367077	<2	<5	<5	<50	<50	57
4	HEADER	<2	<2	<2	<2	<5	<5	N/A	N/A	672
5	WIRE	<2	N/D	<2	<2	<5	<5	N/A	N/A	604

* Cd: Cadmium, CrVI: Hexavalent Chromium, Pb: Lead, Hg: Mercury, NA: Not Applicable

* Unless otherwise noted, units are in PPM (parts-per-million)

Ref#	3rd Party Analysis (available upon request, subject to a non-disclosure agreement)
1000	Analysis on 01/24/2011 by Balazs as per Report# 11-00322-00
32	Analysis on 04/29/2011 by SGS per Report# LPCI/04433(B)/11
57	Analysis on 04/29/2011 by SGS per Report# LPCI/04327(B)/11
672	Analysis on 04/29/2011 by SGS per Report# LPCI/04430(B)/11
604	Analysis on 04/29/2011 by SGS per Report# LPCI/04451(B)/11

部件名称 Part	有毒有害物质或元素 Toxic and harmful substances or elements					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
集成电路 Integrated Circuit	X	○	○	○	○	○

○ : 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006标准规定的限量要求以下。

○ : Indicates that this hazardous substance contained in all homogeneous materials of this part is below the limit requirement in SJ/T 11363-2006.

X : 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006标准规定的限量要求。

X : Indicates that this hazardous substance contained in at least one of the homogeneous materials of this part is above the limit requirement in SJ/T 11363-2006.

美国国家半导体的产品不会含有镉、汞、六价铬、多溴联苯(PBB)和二苯醚(PBDE)。

National Semiconductor's products will not contain cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs) and diphenyl ether (PBDE).



环保使用期限(epup) 是指以符号在这里展出. 环保使用期限(epup)的有效期只有当产品使用范围以内的数据表中的规格.

The Environmental Protection Use Period (EPUP) is defined by the symbol shown here. The Environmental Protection Use Period (EPUP) is valid only when product is used within the limits of the data sheet specifications.