

## Environmental Management and Materials Information

Product Content Information for: DS4412U+

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### Qualifications [Top](#)

<b>Lead-Free Qualified</b>	No
<b>REACH</b>	Under Assessment
<b>RoHS Qualified</b>	No
<b>Green</b>	No
<b>Moisture Sensitivity Level</b>	<a href="#">Not Available - Contact Us</a>
<b>Flammability Meets UL-94 (V-0 Rating)</b>	No

### Package Description [Top](#)

**Package Code**

**Package Type**

**Package Option**

**Footprint Area (mm<sup>2</sup>)**

**Pin Count**

**Unit Weight in Grams**

### Chemical Composition Summary [Top](#)

#### [Maxim NIA/NIU Substance List \(PDF, 24k\)](#)

Substance	CAS Number	Amount (grams)	% of Unit Weight
Aluminum (Al)	7429-90-5		
Antimony (Sb <sub>2</sub> O <sub>3</sub> )	1309-64-4		

BCB Resin	
Bromine (Br)	7726-95-6
Carbon (C)	7440-44-0
Carbon Black	1333-86-4
Ceramic (BaTiO <sub>3</sub> )	12047-27-7
Chromium (Cr)	7440-47-3
Cobalt (Co)	7440-48-4
Copper (Cu)	7440-50-8
Gold (Au)	7440-57-5
Indium (In)	7440-74-6
Insulator (Polyimide)	
Insulator Film	
Iron (Fe)	7439-89-6
FeO <sub>2</sub>	12411-15-36
Lead (Pb)	7439-92-1
Magnesium (Mg)	7439-95-4
Manganese (Mn)	7439-96-5
MnO <sub>3</sub>	
Nickel (Ni)	7440-02-0
NiPdAu	
Nickel-V (NiV)	
Palladium (Pd)	7440-05-3
Phosphorus (P)	7723-14-0
Silica (SiO <sub>2</sub> )	11126-22-0
Silicon (Si)	7440-21-3
Silver (Ag)	7440-22-4
Solder Mask	
Solder Paste	
Spheron Polymer Passivation	
Sulfur (S)	7704-34-9
Tin (Sn)	7440-31-5
Titanium (Ti)	7440-32-6
Titanium-W (TiW)	
Tungsten (W)	7440-33-7
Vanadium (V)	7440-62-2
Zinc (Zn)	7440-66-6
ZnO	1314-13-2

**Detailed Package Component Data** [Top](#)**Backside Laminate****Summary**

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Epoxy/Acrylic Resin			

**Base/Lid Components****Summary**

Base Material

Lid/Cap Material

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Base Weight			
Lid Weight			

**Bond Wire Components****Summary**

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Gold (Au)			
Aluminum (Al)			

**Bump Components****Summary**

Bump Assembler

Bump Material

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Lead (Pb)			
Tin (Sn)			
Copper (Cu)			

Insulator (Polyimide)  
 Silver (Ag)  
 UBM (Ti)  
 RDL (Cu)  
 Nickel (Ni)

**Copper Post**

**Summary**

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Copper

**Die Attach Epoxy Components**

**Summary**

Die Attach Material

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Aromatic Amine  
 Copper (Cu)  
 Diester  
 Epoxy  
 Functionalized Ester  
 Functionalized Urethane  
 Indium (In)  
 Lactone  
 Lead (Pb)  
 Polymeric  
 Polyoxypropylenediamine  
 Resin  
 Silver Filler (Ag)  
 Tin (Sn)  
 Other

**Die Coat Components**

**Summary**

### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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BCB Resin

### Heat Slug Components

#### Summary

#### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Heat Slug

Epoxy

Copper (Cu)

Other

### Laminate Components

#### Summary

#### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Copper (Cu)

Gold (Au)

Nickel (Ni)

Solder Mask

### Lead Finish/Plating Components

#### Summary

Lead Finish Plating

Assembly Lead Finish Process

#### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Lead (Pb)

Tin (Sn)

NiPdAu

Gold (Au)

Nickel (Ni)

## Lead Frame Components

### Summary

Lead Frame Material

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Aluminum (Al)			
Carbon (C)			
Chromium (Cr)			
Cobalt (Co)			
Copper (Cu)			
Gold (Au)			
Iron (Fe)			
Lead (Pb)			
Magnesium (Mg)			
Manganese (Mn)			
Nickel (Ni)			
Palladium (Pd)			
Phosphorus (P)			
Silicon (Si)			
Silver (Ag)			
Sulfur (S)			
Tin (Sn)			
Zinc (Zn)			
Zirconium (Zr)			

## Maxfilm

### Summary

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Maxfilm

## Mold Compound Components

### Summary

Mold Material

Resin Type

### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Antimony (Sb <sub>2</sub> O <sub>3</sub> )			
Bromine (Br)			
Carbon Black			
Epoxy			
Epoxy Cresol Novolac			
Metal Hydroxide			
Phenol Novolac			
Silica (SiO <sub>2</sub> )			
Resin			
Other			

### Silicon Chip Components

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Silicon Chip		100	

### Spheron Polymer Passivation Components

Summary			
Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Spheron Polymer Passivation		100	

### Insulator Film Components

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Insulator Film			

### Solder Ball Components

Summary			
Component Weight			
Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Copper (Cu)			
Lead (Pb)			
Nickel (Ni)			

Silver (Ag)

Tin (Sn)

### Solder Paste Components

#### Summary

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Antimony (Sb <sub>2</sub> O <sub>3</sub> )			
Copper (Cu)			
Indium (In)			
Lead (Pb)			
Silver (Ag)			
Tin (Sn)			

### Substrate Components

#### Summary

Substrate Weight

Substrate Material

Substrate Core Material

Bromine-Free

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Copper			
Gold			
Nickel			
Substrate Core Material			
Solder Mask			
Triazol			
Other			

### UBM Components

#### Summary

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Chromium (Cr)			
Copper (Cu)			



Nickel (Ni)

Nickel-V (NiV)

Titanium (Ti)

Titanium-W (TiW)

Tungsten (W)

Vanadium (V)

**Other Component Data** [Top](#)

**Passive Component 1**

**Summary**

Material Type / PN Codes

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Passive Component 1

**Passive Component 2**

**Summary**

Material Type / PN Codes

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Passive Component 2

**Passive Component 3**

**Summary**

Material Type / PN Codes

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Passive Component 3

**Passive Component 4**

**Summary**

Material Type / PN Codes

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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## Passive Component 4

### Capacitor Components

#### Summary

#### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Ceramic (BaTiO <sub>3</sub> )			
Copper (Electrode)			

### Crystal Components

#### Summary

#### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Silver (Ag)			
Aluminum (Al)			
Gold (Au)			
Chromium (Cr)			
Lead (Pb)			
Manganese (Mn)			
Nickel (Ni)			
Cobalt (Co)			
Copper (Cu)			
Iron (Fe)			
Silicon (Si)			
Tin (Sn)			
Zinc (Zn)			
Silica (SiO <sub>2</sub> )			

### Diode Components

#### Summary

#### Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
Encapsulant (Phenolic Resin)			
Gold Wire			
Leadframe (Copper 194)			

Pellet (Chip)  
Terminal (SnAgCu)

### Optocoupler Components

#### Summary

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Die (Chip)  
Encapsulant (Phenolic Resin)  
Epoxy (Ag)  
Gold Wire  
Leadframe (Alloy 42)  
Potting Resin (Silicone)  
Terminal Plating (Sn)

### Resistor Components

#### Summary

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Component Weight

### Transformer Components

#### Summary

Component Weight

Substance	Amount (grams)	% of Component Weight	% of Unit Weight
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Copper  
FeO<sub>2</sub>  
MnO<sub>3</sub>  
ZnO

Notes:

1. Lead Form: GW - Gull Wing, TH - Through Hole.
2. Refer to product data sheet to confirm actual wire diameter.
3. 'ND' means None Detected, negligible amount present.

This part is qualified as lead-free.

Parts qualified as lead-free can be manufactured and supplied as lead-free, if and only if, the customer makes such requests to the Maxim Business Units for approval. The navigation bar on the EMMI website contains information regarding the lead-free process (e.g. MSL's, Peak reflow Temperatures, JEDEC methods, frequently asked questions and answers, lead-free package tables, and status/qualification plans for particular package types qualified as lead-free or in the qualification process).

This report was generated on 2023-06-06. For additional information, please visit the Maxim/Dallas Environmental Management and Materials Information website located at:

**<https://www.maximintegrated.com/en/emmi>**