

Environmental Management and Materials Information

Product Content Information for: DG412FEUE+

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Qualifications [Top](#)

Lead-Free Qualified	No
REACH	Under Assessment
RoHS Qualified	No
Green	No
Moisture Sensitivity Level	Not Available - Contact Us
Flammability Meets UL-94 (V-0 Rating)	No

Package Description [Top](#)

Package Code

Package Type

Package Option

Footprint Area (mm²)

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 ₂ O ₃)	1309-64-4		

BCB Resin	
Bromine (Br)	7726-95-6
Carbon (C)	7440-44-0
Carbon Black	1333-86-4
Ceramic (BaTiO ₃)	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 ₂	12411-15-36
Lead (Pb)	7439-92-1
Magnesium (Mg)	7439-95-4
Manganese (Mn)	7439-96-5
MnO ₃	
Nickel (Ni)	7440-02-0
NiPdAu	
Nickel-V (NiV)	
Palladium (Pd)	7440-05-3
Phosphorus (P)	7723-14-0
Silica (SiO ₂)	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
Maxfilm			

Mold Compound Components

Summary

Mold Material

Resin Type

Component Weight

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

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
FeO₂
MnO₃
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>