CM6114

Advance Information

Single-Channel Transient Voltage Suppressor

ON Semiconductor®

http://onsemi.com

WLCSP4
CASE 567CB

Product Description

The CM6114 is an *Application Specific Integrated Passive*™ (ASIP™) component in a 2 x 2, 4−bump, 0.4 mm pitch, CSP form factor. This device is designed for:

- Fuse
- Transient Voltage Suppression (TVS)
- Electrostatic Discharge Protection
- Electrical Overstress Protection

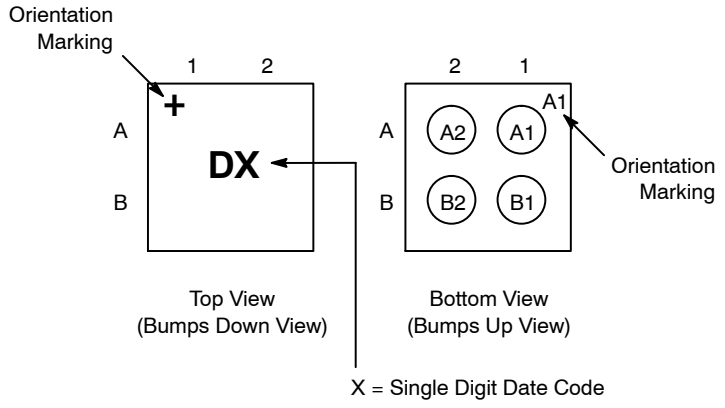
Features

- 4−Bump, 0.8 mm X 0.8 mm Footprint Chip Scale Package (CSP)
- These Devices are Pb−Free and are RoHS Compliant

Table 1. PIN DESCRIPTIONS

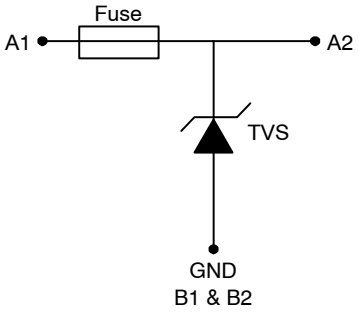
4−bump CSP Package	
Pin	**Description**
A1	Fuse Terminal 1
A2	TVS Channel / Fuse Terminal 2
B1 and B2	Device Ground

PACKAGE / PINOUT DIAGRAMS



4−Bump CSP Package

ELECTRICAL SCHEMATIC



MARKING DIAGRAM

D = CM6114
X = Single Digit Date Code

ORDERING INFORMATION

Device	Package	Shipping†
CM6114	WLCSP4 (Pb−Free)	10,000/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

This document contains information on a new product. Specifications and information herein are subject to change without notice.

ELECTRICAL SPECIFICATIONS AND CONDITIONS

Table 2. PARAMETERS AND OPERATING CONDITIONS

Parameter	Rating	Units
Storage Temperature Range	−55 to +150	°C
Operating Temperature Range	−30 to +85	°C

Table 3. ABSOLUTE RATINGS

Parameter	Rating	Units
Failing to nonconductive, I^2t − from **A1** pin to device ground (Maximum I_{PP} value using 10/1000 μs pulse). See Notes 1 and 2.	4	A
Failing to nonconductive, I^2t − from **A2** pin to device ground (Maximum I_{PP} value using 10/1000 μs pulse). See Notes 1 and 2.	100	A

1. The device must not burn to open−circuit, when the value is below maximum I_{PP}.
2. This parameter is characterized at 25°C using an ON Semiconductor−specific test board.

Table 4. ELECTRICAL OPERATING CHARACTERISTICS (Note 1)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
R	Resistance A1 − A2	B1 and B2 floating; T_A = 25°C (Note 2)			50	mΩ
R_{OPEN}	Resistance after open fuse	B1 and B2 floating; T_A = 25°C	1			MΩ
t_{FUSE}	Fusing time	B1 and B2 floating; I = 5 A; T_A = 25°C (Note 3)			100	ms
t_{LIFE}	Fuse life time	B1 and B2 floating; I = 2 A; T_A = 25°C (Notes 3 and 4)	4000			Hours
I_{OFF}	Stand−off quiescent current	From A1 pin to B1 and B2 pins; Stand−off voltage V_{OFF} = 8 V; T_A = 25°C			100	nA
V_{BR}	Break down voltage	From A1 pin to B1 and B2 pins; Break down current I_{BR} = 15 mA	10			V
V_{CL}	Clamping voltage during transient	From A1 pin to B1 and B2 pins; Clamping current I_{CL} = 1 A (Note 5)			13.5	V
V_F	Forward voltage	From A1 pin to B1 and B2 pins; Forward current I_F = 850 mA			1.3	V
C_{L1}	Line capacitance	V_{BIAS} = 0 V		280		pF
C_{L2}		V_{BIAS} = 5 V; T_A = 25°C	108	135		pF
V_{ESD}	ESD protection peak discharge Voltage at **A1 pin or A2 to B1 and B2** a) Contact Discharge per IEC 61000−4−2 standard b) Air Discharge per IEC 61000−4−2 standard	T_A = 25°C (Note 6)	 ±30 ±30			kV
f_C	Minimum attenuation Freq = 80 MHz − 1 GHz Freq = 1 − 4 GHz	R_{SOURCE} = R_{LOAD} = 50 Ω T_A = 25°C		 12 20		dB

1. All parameters specified for T_A = −30°C to 85°C unless otherwise noted.
2. This parameter is measured using low current to avoid self−heating.
3. These parameters are characterized using ON Semiconductor−specific test boards.
4. Fuse is considered failed when its resistance is higher than 1 Ω.
5. Transient: 8 x 20 μs current pulse.
6. Standard IEC 61000−4−2 with $C_{Discharge}$ = 150 pF, $R_{Discharge}$ = 330 Ω.

RF CHARACTERISTICS

T_A = 25°C, 50 Ω Environment

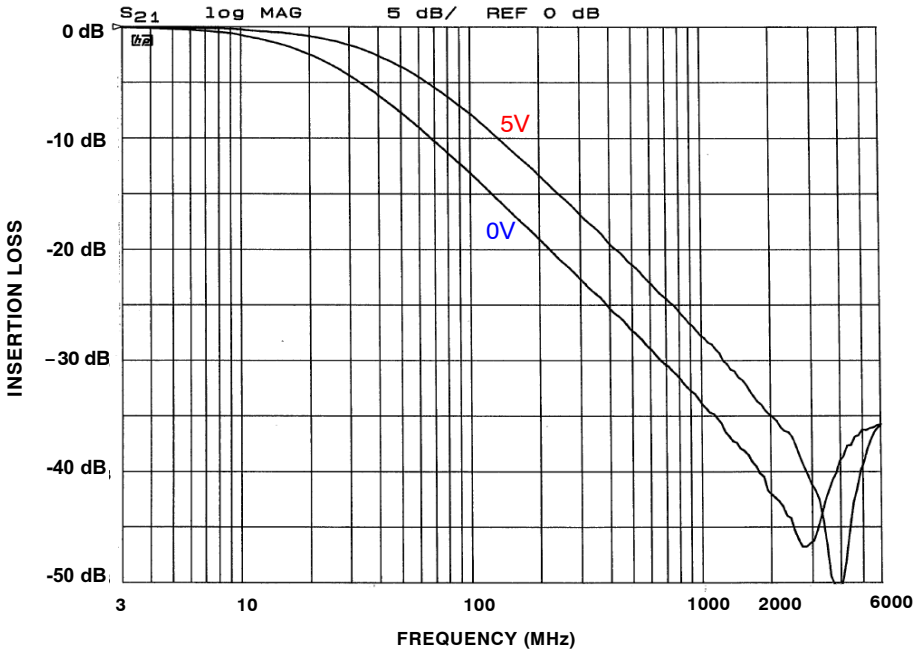


Figure 1. Insertion Loss (0 V and 5 V Bias)

MECHANICAL SPECIFICATION

Table 5. VERTICAL STRUCTURE DIMENSIONS (nominal)

Ref.	Parameter	Material	Dimension
a	Die Thickness	Silicon	389 μm
h	Dielectric Layer 1	Polyimide	7 μm
j	Dielectric Layer 2	Polyimide	10 μm
d	UBM−(Ti/Cu)	Plated Cu	6.5 μm
		Sputtered Cu	0.4 μm
		Sputtered Ti	0.1 μm
e	UBM Wetting Area Diameter		240 μm
b	Bump Standoff		194 μm
f	Solder Bump Diameter after Bump Reflow		270 μm
c	Metal Pad Height	AlSiCu	1.5 μm
g	Metal Pad Diameter		60 μm
D2			0.406 mm
D1	Total Thickness		0.600 mm

Vertical Structure Specification*

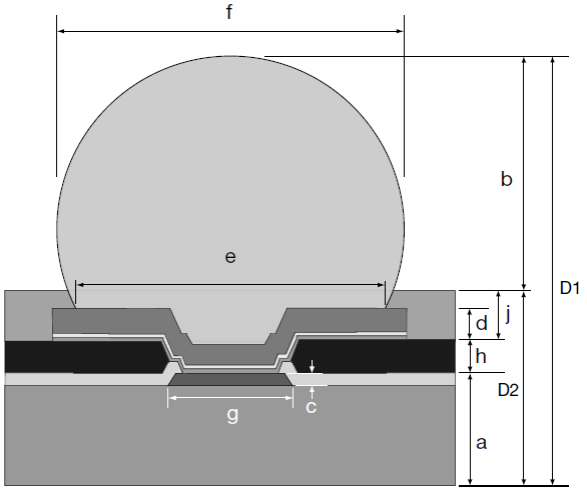
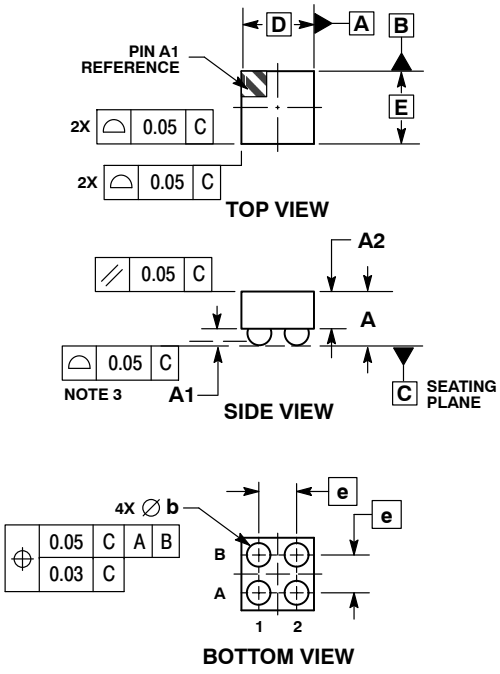


Figure 2. Sectional View

* Daisy Chain CM6040

PACKAGE DIMENSIONS

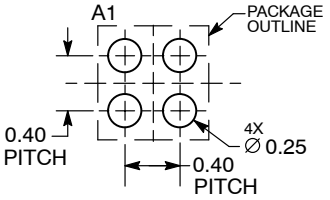
WLCSP4, 0.8x0.8
CASE 567CB−01
ISSUE O



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. COPLANARITY APPLIES TO SPHERICAL CROWNS OF SOLDER BALLS.

DIM	MILLIMETERS MIN	MAX
A	0.57	0.63
A1	0.17	0.24
A2	0.41 REF	
b	0.24	0.29
D	0.80 BSC	
E	0.80 BSC	
e	0.40 BSC	

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Application Specific Integrated Passive is a trademark of Semiconductor Components Industries, LLC (SCILLC).

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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