

FEATURES

- 5 V at 55 mA output for an HDMI +5 V requirement
- For hot plug detect with HDMI Tx
- 3.3 V at 60 mA output
- Lithium battery input: 2.5 V to 4.5 V
- Short-circuit limitation: 100 mA
- 3 × 4 array WLCSP package
- Package footprint: 3 mm² (2 mm × 1.5 mm)
- Package height: 0.5 mm

APPLICATIONS

- Cellular phones with HDMI/DVI output
- Companion chip with HDMI Tx
- Portable media players (PMPs)
- Mobile internet devices
- Digital still cameras

GENERAL DESCRIPTION

The AD9394 uses charge pump technology to provide the power required to drive 55 mA of 5 V for HDMI interface requirements.

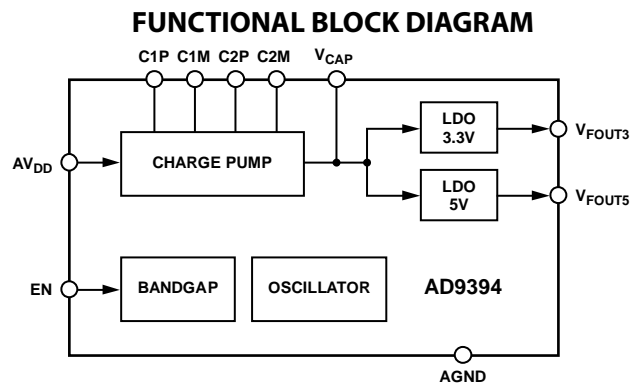


Figure 1.

08591-001

Rev. 0

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REVISION HISTORY

1/10—Revision 0: Initial Version

SPECIFICATIONS

Table 1.

Parameter	Min	Typ	Max	Unit	Test Conditions
INPUT VOLTAGE, AV_{DD}	2.5		4.5	V	
Enable Pin (EN), V_{IH}	1.4		AV_{DD}	V	
Enable Pin (EN), V_{IL}	0		0.4	V	
SUPPLY CURRENT					
I_{AVDD}		65		mA	$I_{LDO3} = 60 \text{ mA}, AV_{DD} > 4.1 \text{ V}$
		125		mA	$I_{LDO3} = 60 \text{ mA}, AV_{DD} \leq 4.1 \text{ V}$
		130		mA	$I_{LDO5} = 55 \text{ mA}, I_{LDO3} = 10 \text{ mA}, AV_{DD} > 3.4 \text{ V}$
		195		mA	$I_{LDO5} = 55 \text{ mA}, I_{LDO3} = 10 \text{ mA}, AV_{DD} \leq 3.4 \text{ V}$
SHORT-CIRCUIT LOAD CURRENT					
V_{FOUT5} Load Compliance	4.8	5.0	5.2	V	55 mA load
V_{FOUT3} Load Compliance ¹	3.0	3.3	3.6	V	60 mA load
SHUTDOWN CURRENT			2	μA	EN = low
V_{FOUT5} RIPPLE			50	mV	
V_{FOUT3} RIPPLE			50	mV	
LDO3 Shutdown of LDO5 ¹	10		20	mA	

¹ LDO3 current in excess of 10 mA may shut down LDO5 output.

AD9394

ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$, unless otherwise noted.

Table 2.

Parameter	Rating
Supply Voltage, V_{DD}	5.0 V
Operating Temperature Range	-40°C to $+85^\circ\text{C}$
Storage Temperature Range	-65°C to $+150^\circ\text{C}$
Junction Temperature	150°C
Power Dissipation	0.7 W

Stresses above those listed under Absolute Maximum Ratings may cause permanent damage to the device. This is a stress rating only; functional operation of the device at these or any other conditions above those indicated in the operational section of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

THERMAL CHARACTERISTICS

Table 3. Thermal Resistance

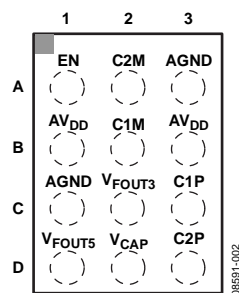
Package Type	θ_{JA}	Unit
3×4 Array WLCSP Package	65	$^\circ\text{C}/\text{W}$

ESD CAUTION



ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features patented or proprietary protection circuitry, damage may occur on devices subjected to high energy ESD. Therefore, proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

PIN CONFIGURATION AND FUNCTION DESCRIPTIONS



AD9394
TOP VIEW
(BALL SIDE DOWN)
Not to Scale

Figure 2. Pin Configuration

Table 4. Pin Function Descriptions

Pin No.	Mnemonic	Description
A1	EN	Enable Part. When EN=1, the part is on.
A2	C2M	Flying Capacitor. Connect with a 1 μ F capacitor to C2P (Pin D3).
A3	AGND	Ground.
B1	AVDD	Input Voltage from Battery.
B2	C1M	Flying Capacitor. Connect with a 1 μ F capacitor to C1P (Pin C3).
B3	AVDD	Input Voltage from Battery.
C1	AGND	Ground.
C2	VFOUT3	3.3 V Output. Connect with a 1 μ F capacitor to AGND.
C3	C1P	Flying Capacitor Connection.
D1	VFOUT5	5 V Output. Connect with a 1 μ F capacitor to AGND.
D2	VCAP	Charge Pump Output Voltage (~5.6 V). Connect with a 2.2 μ F capacitor to AGND.
D3	C2P	Flying Capacitor Connection.

APPLICATION SCHEMATIC

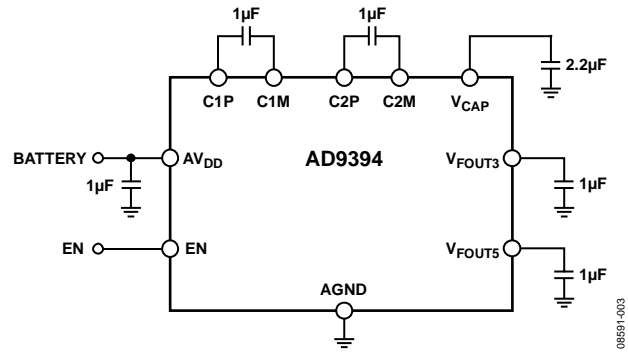


Figure 2. Application Schematic

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OUTLINE DIMENSIONS

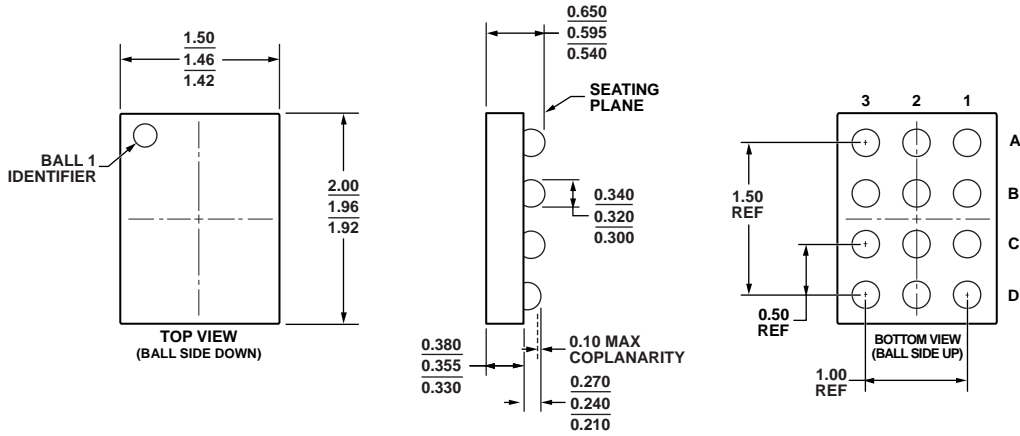
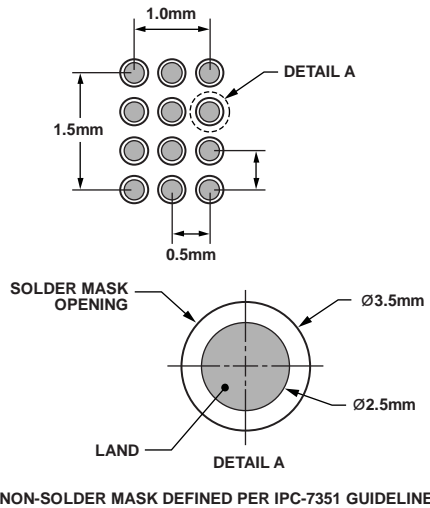


Figure 4. 12-Lead Wafer Level Chip Scale Package [WLCSP]
2 mm x 1.5 mm Body
(CB-12-2)
Dimensions shown in millimeters



NON-SOLDER MASK DEFINED PER IPC-7351 GUIDELINES
Figure 5. Recommended Solder Land Pattern

ORDERING GUIDE

Model ¹	Temperature Range	Package Description	Package Option	Branding
AD9394BCBZ-R7	-40°C to +85°C	12-Lead WLCSP	CB-12-2	L8V
EVAL-AD9394Z		Evaluation Board		

¹ Z = RoHS Compliant Part.

AD9394

NOTES