eMarker Chip for USB Type-C Cables

Hynetek Semiconductor Co., Ltd.

HUSB332B

ADVANCE INFORMATION

FEATURES

- USB Type-C 2.1 and PD 3.1 Compliant
  - USB-IF Certified. TID: 6773
  - Support SOP' Communication
  - Integrated Transceiver (BMC PHY)
  - Support Both Structured VDM Version 1.0 and 2.0
- High Integration
  - Embedded Both Side Ra Resistors
  - Embedded Both Side VCONN Diodes
- Different Package Options:
  - DFN2×2-6L
  - DFN2×2-8L
  - DFN2×3-8L
  - WLCSP-6B
- Support 3 Times Programming
- Compatible with CC Wire Programming Tools
- 28 V High Voltage Tolerance on CC, VCONN1 and VCONN2 Pins
- Support Thunderbolt 3 and USB4™ 40 Gbps Data Communication
- Encryption Commands Supported for Vendor Identification
- ±8 kV HBM ESD on CC, VCONN1 and VCONN2 pins

APPLICATIONS

USB Type-C Cable ID

USB4™ Passive Cable

GENERAL DESCRIPTION

The HUSB332B is a USB Type-C eMarker for Cable ID applications. It is compliant with USB Type-C Specification Revision 2.1. It is also compliant to USB Power Delivery 3.1 and USB4™ Specification.

Powered from VCONN1 or VCONN2, the HUSB332B can determine to act as SOP'. The built-in OTP can be programmed through CC line or I^2C bus so that it will be flexible for in-system programming.

There are a set of encryption commands implemented in the HUSB332B which can response to the Host or Device in an encrypted ways. It is helpful for the system to identify each other before entering any mode.

The HUSB332B operates over a wide supply range of 2.7 V to 5.75 V. It is available in DFN2×2-6L, DFN2×2-8L, DFN2×3-8L and WLCSP-6B packages. It is rated over the -40°C to +85°C temperature range.

TYPICAL APPLICATION CIRCUIT

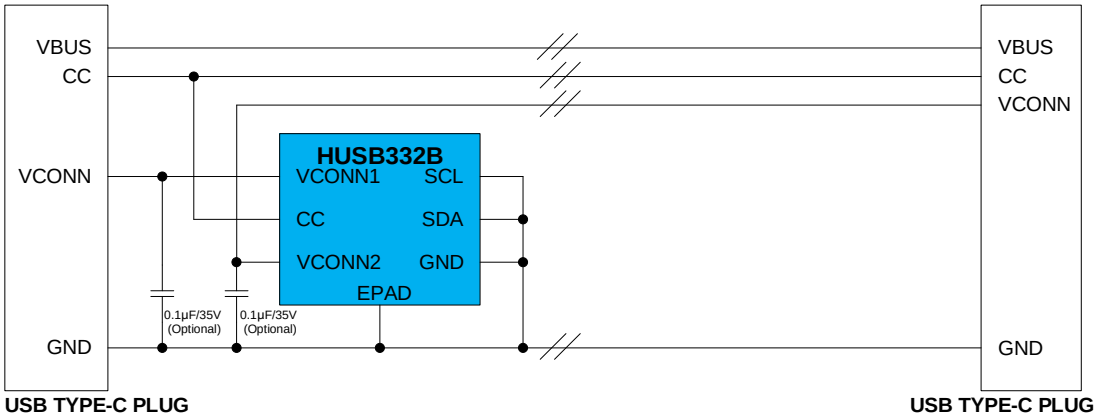

Figure 1. Typical Application Circuit

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REVISION HISTORY

Version	Date	Owner	Descriptions
Rev. 0.0	12/01/2021	Yingyang Ou	Initial version

ADVANCE INFORMATION

PIN CONFIGURATION AND FUNCTION DESCRIPTIONS

TOP VIEW

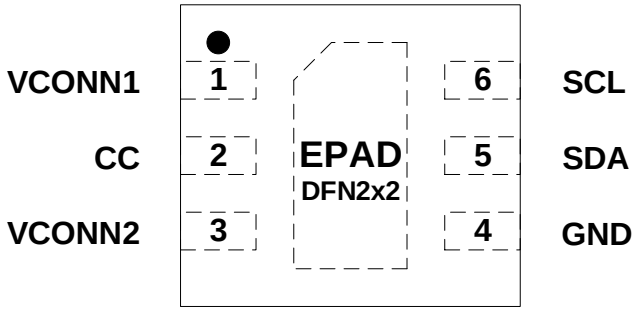

Figure 2. HUSB332B_XXXDA Pin Assignment

Table 1. HUSB332B_XXXDA Pin Function Descriptions

Pin No.	Pin Name	Type	Description
1	VCONN1	P	The input pin supplied from VCONN.
2	CC	D	USB Type-C CC line input and output.
3	VCONN2	P	The input pin supplied from the other side VCONN.
4	GND	A	Ground.
5	SDA	D	This Pin is Only Used for Debug. Please connect it to ground.
6	SCL	D	This Pin is Only Used for Debug. Please connect it to ground.

TOP VIEW

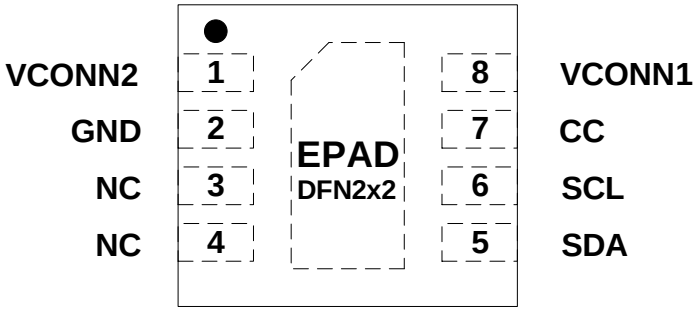

Figure 3. HUSB332B_XXXDB Pin Assignment

Table 2. HUSB332B_XXXDB Pin Function Descriptions

Pin No.	Pin Name	Type	Description
1	VCONN2	P	The input pin supplied from the other side VCONN.
2	GND	A	Ground.
3,4	NC	A	Not Connected. It is recommended to connect it to ground..
5	SDA	D	This Pin is Only Used for Debug. Please connect it to ground.
6	SCL	D	This Pin is Only Used for Debug. Please connect it to ground.
7	CC	D	USB Type-C CC line input and output.
8	VCONN1	P	The input pin supplied from VCONN.

ADVANCE INFORMATION

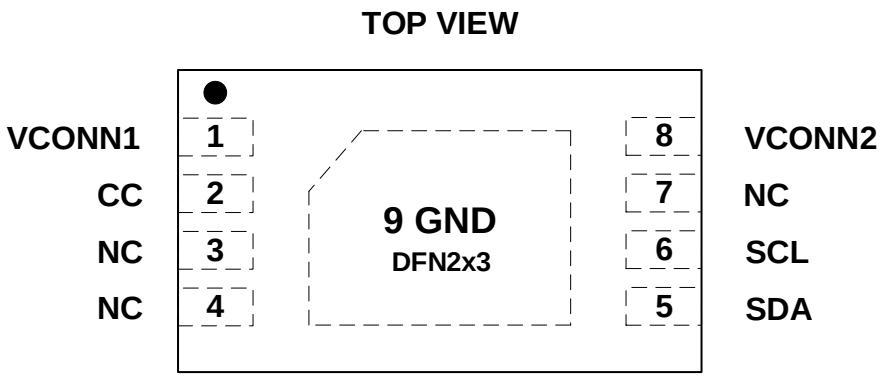

Figure 4. HUSB332B_XXXEB Pin Assignment

Table 3. HUSB332B_XXXEB Pin Function Descriptions

Pin No.	Pin Name	Type	Description
1	VCONN1	P	The input pin supplied from VCONN.
2	CC	D	USB Type-C CC line input and output.
3,4,7	NC	A	Not Connected. It is recommended to connect it to ground..
5	SDA	D	This Pin is Only Used for Debug. Please connect it to ground.
6	SCL	D	This Pin is Only Used for Debug. Please connect it to ground.
8	VCONN2	P	The input pin supplied from the other side VCONN.
9	GND	A	Ground.

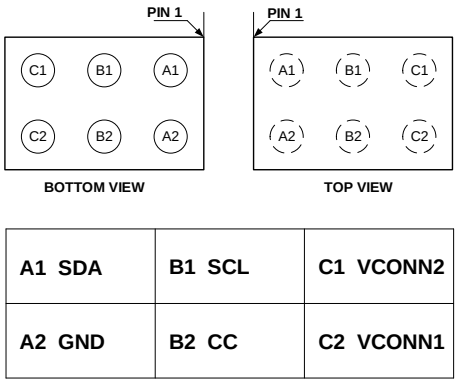

Figure 5. HUSB332B_XXXXX Pin Assignment

Table 4. HUSB332B_XXXXX Pin Function Descriptions

Pin No.	Pin Name	Type	Description
C2	VCONN1	P	The input pin supplied from VCONN.
B2	CC	D	USB Type-C CC line input and output.
C1	VCONN2	P	The input pin supplied from the other side VCONN.
A2	GND	A	Ground.
A1	SDA	D	This Pin is Only Used for Debug. Please connect it to ground.
B1	SCL	D	This Pin is Only Used for Debug. Please connect it to ground.

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FUNCTIONAL BLOCK DIAGRAM

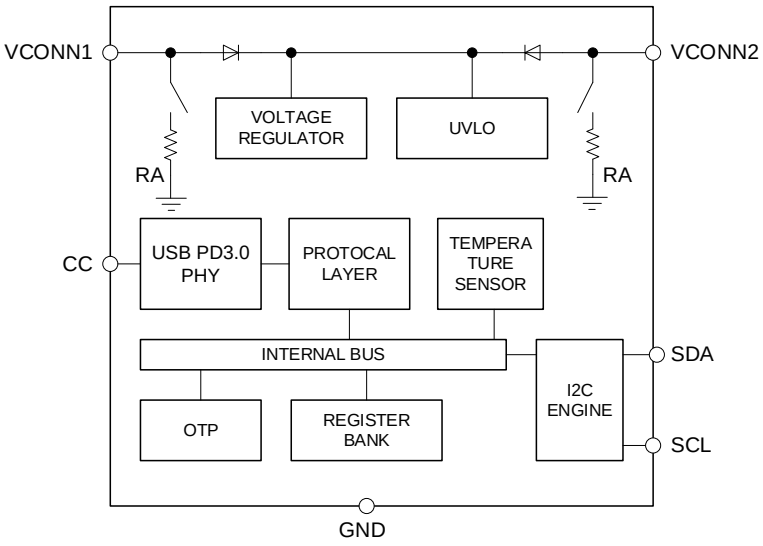

Figure 6. HUSB332B Functional Block Diagram

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TYPICAL APPLICATION CIRCUITS

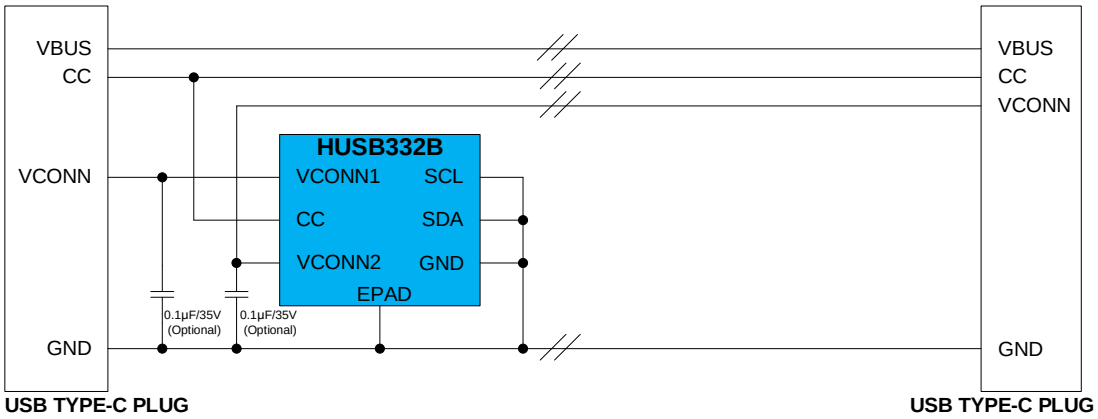

Figure 7. Typical Application

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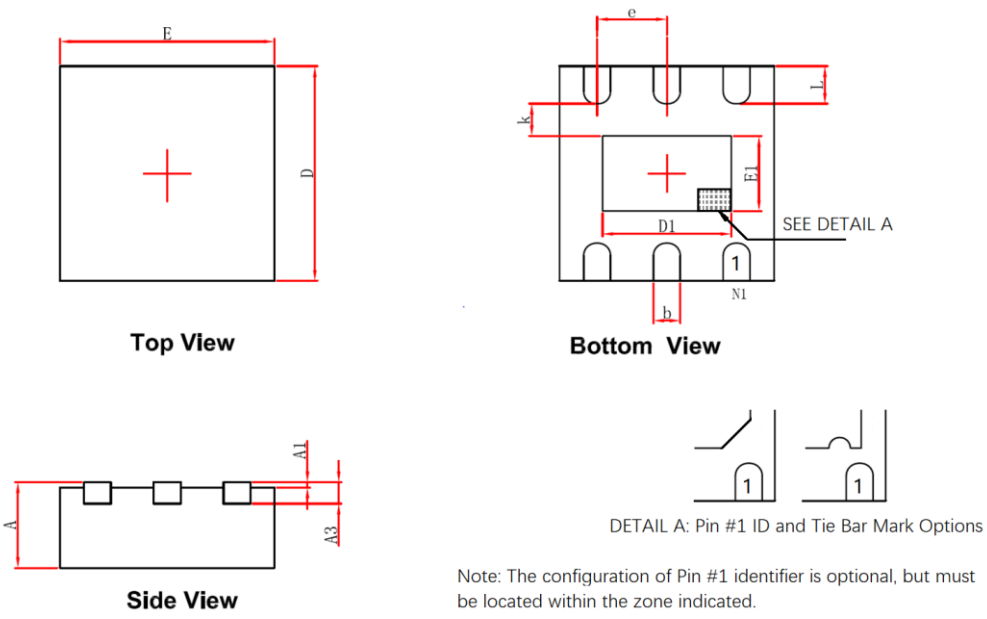
PACKAGE OUTLINE DIMENSIONS



Symbol	Millimeter	
	Min	Max
A	0.700	0.800
A1	0.000	0.050
A3	0.180	0.250
D	1.924	2.076
E	1.924	2.076
D1	1.000	1.450
E1	0.500	0.850
k	0.2MIN	
b	0.200	0.350
e	0.65TYP	
L	0.250	0.426

Figure 8. DFN2×2-6L Package, 2 mm × 2 mm Body

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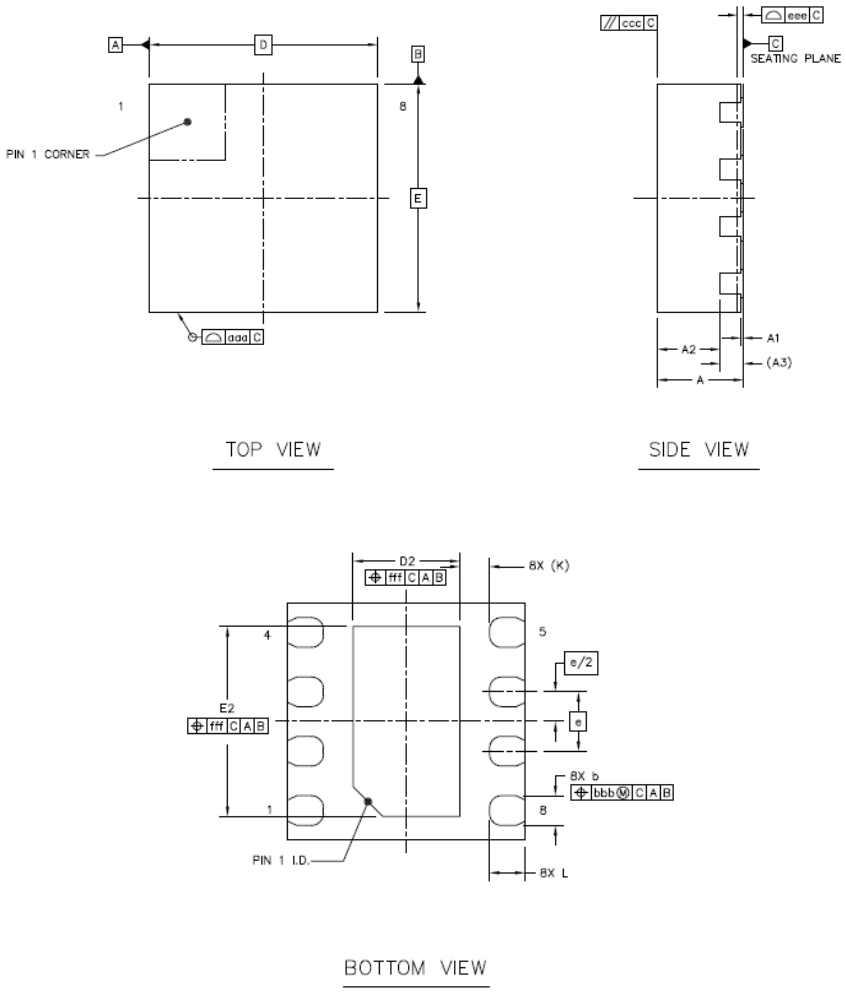

Symbol	Millimeter	
	Min	Max
A	0.700	0.800
A1	0.000	0.050
A2	0.450	0.620
A3	0.180	0.250
D	2 BSC	
E	2 BSC	
D2	0.75	0.85
E2	1.55	1.65
k	0.15	0.300
b	0.200	
e	0.5 BSC	

Figure 9. DFN2×2-8L Package, 2 mm × 2 mm Body

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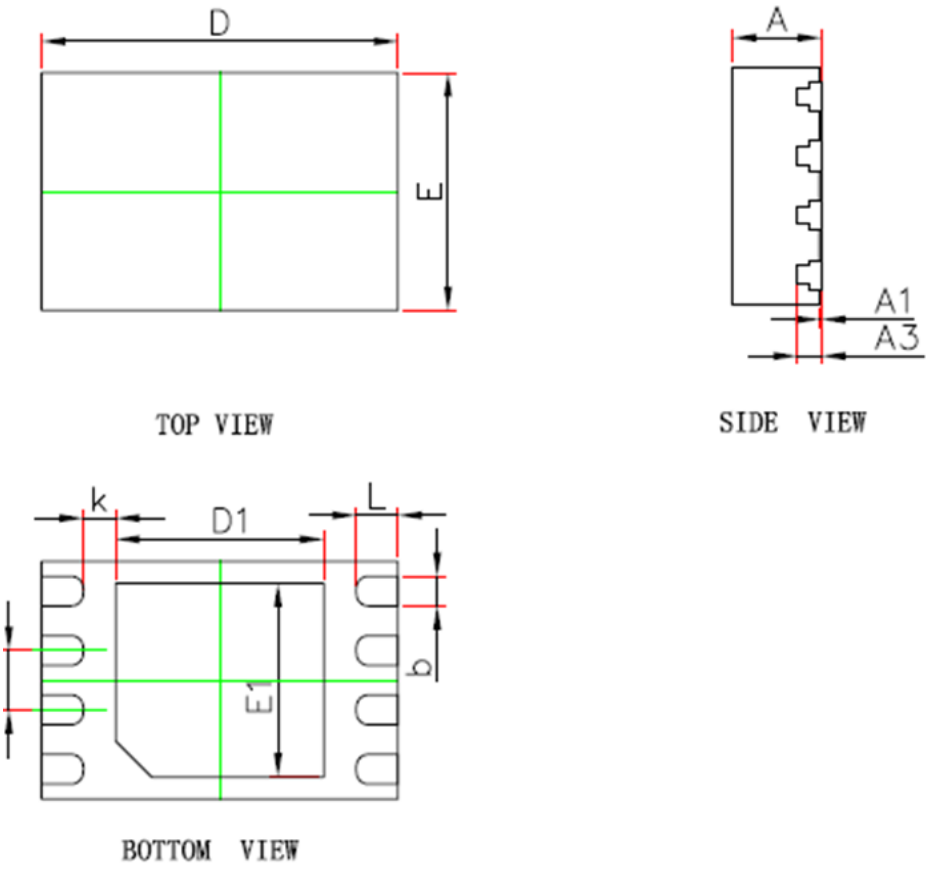
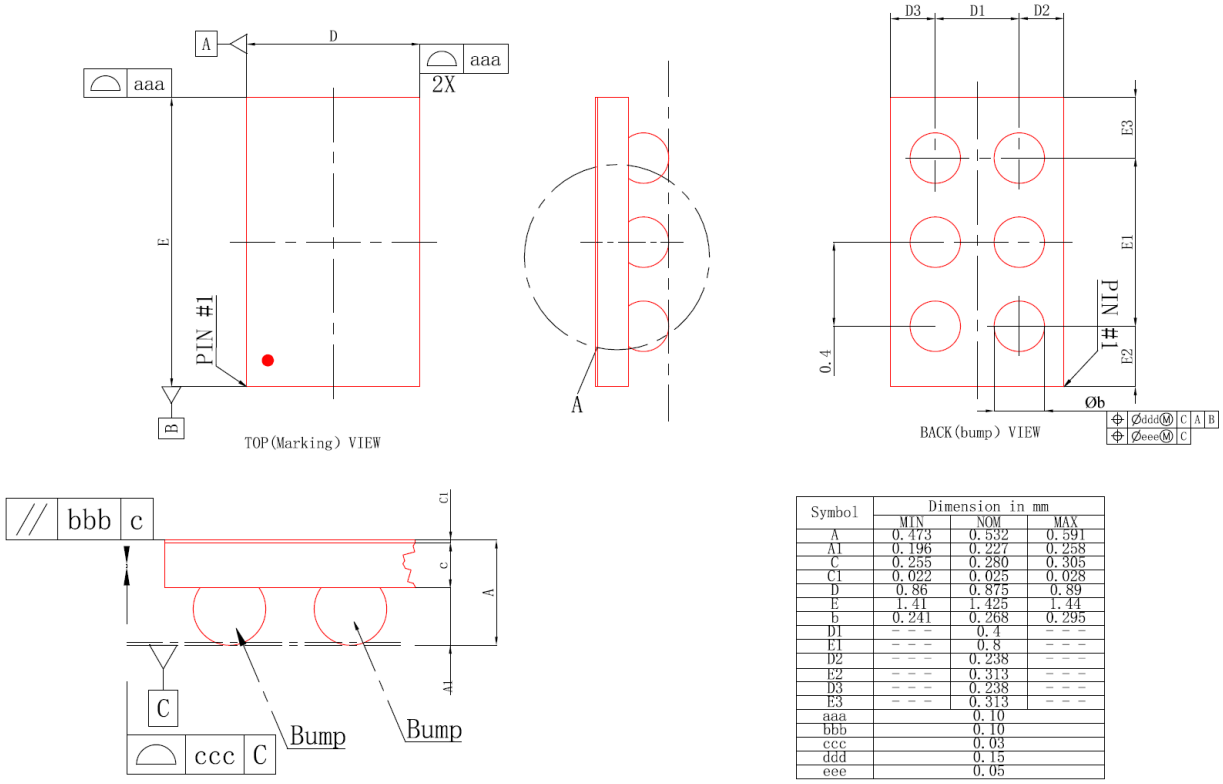
ADVANCE INFORMATION



Symbol	Millimeter	
	Min	Max
A	0.700	0.800
A1	0.000	0.050
A3	0.180	0.250
D	2.900	3.100
E	1.900	2.100
D1	1.500	1.850
E1	1.400	1.730
k	0.2MIN	
b	0.180	0.300
e	0.500BSC	
L	0.300	0.500

Figure 10. DFN2×3-8L Package, 2 mm × 3 mm Body



Symbol	Dimension in mm		
	MIN	NOM	MAX
A	0.473	0.532	0.591
A1	0.196	0.227	0.258
C	0.255	0.280	0.305
C1	0.022	0.025	0.028
D	0.86	0.875	0.89
E	1.41	1.425	1.44
b	0.241	0.268	0.295
D1	- - -	0.4	- - -
E1	- - -	0.8	- - -
D2	- - -	0.238	- - -
E2	- - -	0.313	- - -
D3	- - -	0.238	- - -
E3	- - -	0.313	- - -
aaa	0.10		
bbb	0.10		
ccc	0.03		
ddd	0.15		
eee	0.05		

Figure 11. WLCSP-6B Package, 0.94 mm × 1.465 mm Body

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