

音频应用的 2 X 2 交叉点开关

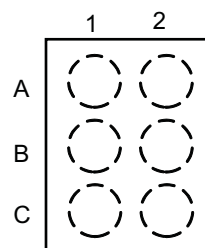
 查询样品: [TS3A26746E](#)

特性

- 小于 **80-m Ω** GND 开关的超低 R_{ON}
- 小于 **10 Ω** MIC 开关的 R_{ON}
- **3.0 V 至 3.6 V V+** 工作
- 控制输入符合 **1.8 V** 逻辑要求
- **6 凸点、0.5 毫米间距 CSP 封装 (1.45 毫米 × 0.95 毫米 × 0.5 毫米)**
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 - 闭锁性能超过 **100 mA**, 符合 **JESD 78 Class II** 标准
- **ESD 性能等级超过 JESD 22 规范 2000 V 人体模型 (A114-B、Class II) 500 V 充电器件模型 (C101)**
 - **ESD 性能 (SLEEVE、RING2) ±8 kV 接触放电 (IEC 61000-4-2)**

应用

- 手机
- **PDA**
- 便携式仪表
- 数码相机
- 便携式导航设备



引脚分配

	1	2
A	SEL	V+
B	MIC	SLEEVE
C	GND	RING2

说明

TS3A26746E 是一款 2 × 2 交叉点开关, 其可通过耳机连接器与接地及 MIC 链接进行互换。接地开关具有不足 0.1 Ω 的超低 R_{ON} , 可为其最大限度地降低电压压降, 从而可防止耳机接地参考电压意外升高。该开关可通过 SEL 输入进行状态控制。SEL 为高时, GND 连接至 RING2; MIC 连接至 SLEEVE。SEL 为低时, GND 连接至 SLEEVE, 而 MIC 则连接至 RING2。SEL 上的内部 100k 上拉电阻器可设置为开关默认状态。

订购信息

T _A	封装 ⁽¹⁾		可订购部件号	正面标记
-40°C 至 85°C	YZP - WCSP	卷带封装	TS3A26746EYZPR	7N

(1) 封装图示、标准包装数量、散热数据、符号以及 PCB 设计指南: www.ti.com/sc/package。



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These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

TYPICAL APPLICATION BLOCK DIAGRAM

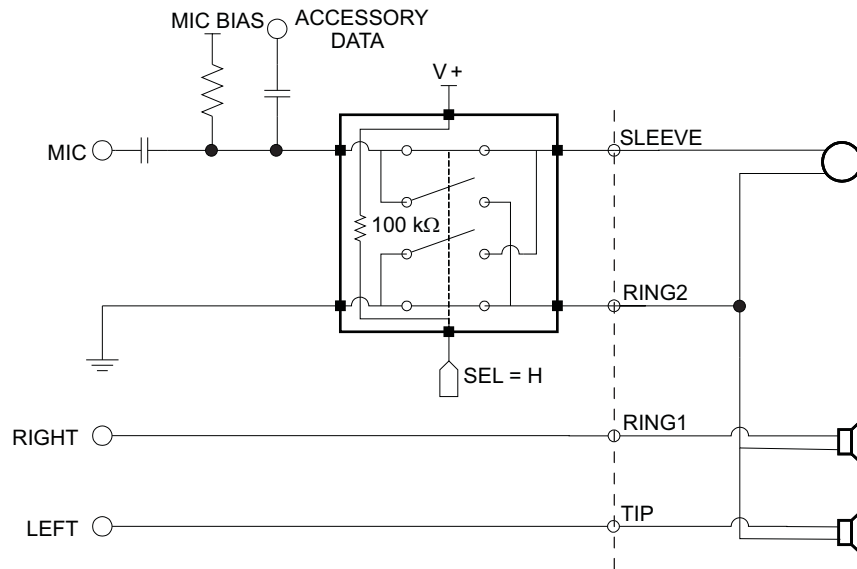


Figure 1. Standard Headphone Configuration (SEL=H)

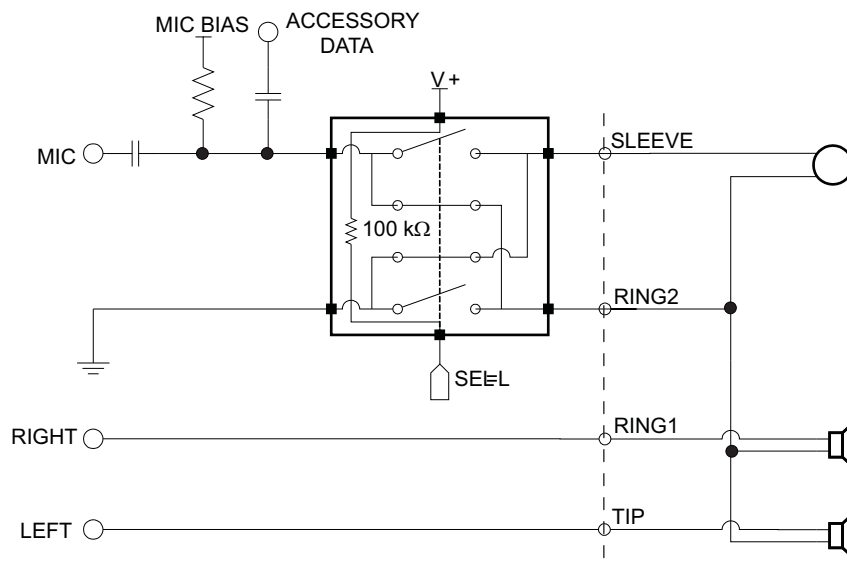


Figure 2. Alternate Headphone Configuration (SEL=L)

PIN FUNCTIONS

BALL #	PIN		DESCRIPTION
	NAME	TYPE	
A1	SEL	Input	Control Input
A2	V+	Power	Supply Voltage
B1	MIC	I/O	MIC
B2	SLEEVE	I/O	Sleeve Connection on Headphone Jack
C1	GND	Ground	Ground
C2	RING2	I/O	2 nd Ring Connection on Headphone Jack

Table 1. FUNCTION TABLE

SEL	MIC to SLEEVE, GND to RING2	MIC to RING2, GND to SLEEVE
L	OFF	ON
H	ON	OFF

TS3A26746E

ZHCS135A – 2月 2011 年 – REVISED 5月 2011 年

www.ti.com.cn
ABSOLUTE MAXIMUM RATINGS^{(1) (2)}

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
V ₊	Supply voltage range ⁽³⁾		-0.3	4.0	V
V _{MIC} V _{SLEEVE} V _{RING2}	Analog voltage range ⁽³⁾		-0.3	4.0	V
I _K	Analog port diode current	V _{MIC} , V _{SLEEVE} , V _{RING2} < 0 V	-50		mA
V _I	Digital input voltage range		-0.3	4.0	V
I _{IK}	Digital input clamp current ⁽³⁾	V _I < 0 V	-50		mA
I ₊	Continuous current through V ₊			100	mA
I _{GND}	Continuous current through GND		-100		mA
θ _{JA}	Package thermal impedance ⁽⁴⁾	YZP package		102	°C/W
T _{stg}	Storage temperature range		-65	150	°C

- (1) Stresses above these ratings may cause permanent damage. Exposure to absolute maximum conditions for extended periods may degrade device reliability. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those specified is not implied.
- (2) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum.
- (3) All voltages are with respect to ground, unless otherwise specified.
- (4) The package thermal impedance is calculated in accordance with JESD 51-7.

ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY⁽¹⁾

 V₊ = 3 V to 3.6 V, T_A = -40°C to 85°C (unless otherwise noted)

PARAMETER	TEST CONDITIONS	T _A	V ₊	MIN	TYP	MAX	UNIT
MIC SWITCH							
V _{MIC} , V _{SLEEVE} , V _{RING2}	Analog signal range			0		V+	V
r _{on}	ON-state resistance	0 ≤ V _{SLEEVE} or V _{RING2} ≤ V ₊ , I _{MIC} = -32 mA	Switch ON	25°C	3 V	5 8	Ω
				Full		10	
r _{on(flat)}	ON-state resistance flatness	0 ≤ V _{SLEEVE} or V _{RING2} ≤ V ₊ , I _{MIC} = -32 mA	Switch ON	25°C	3 V	1 2.3	Ω
				Full		2.5	
I _{SLEEVE(OFF)} , I _{RING2(OFF)}	SLEEVE, RING2 OFF leakage current	V _{SLEEVE} or V _{RING2} = 1 V, V _{MIC} = 3 V, or V _{SLEEVE} or V _{RING2} = 3 V, V _{MIC} = 1 V	Switch OFF	25°C	3.6 V	-0.5 0.05 0.5	μA
				Full		-2	
I _{MIC(OFF)}	MIC OFF leakage current	V _{SLEEVE} or V _{RING2} = 3 V, V _{MIC} = 1 V, or V _{SLEEVE} or V _{RING2} = 1 V, V _{MIC} = 3 V	Switch OFF	25°C	3.6 V	-1 0.1 1	μA
				Full		-2	
I _{SLEEVE(ON)} , I _{RING2(ON)}	SLEEVE, RING2 ON leakage current	V _{SLEEVE} or V _{RING2} = 1 V, V _{MIC} = Open, or V _{SLEEVE} or V _{RING2} = 3 V, V _{MIC} = Open	Switch ON	25°C	3.6 V	-2 0.5 2	μA
				Full		-2	
I _{MIC(ON)}	MIC ON leakage current	V _{SLEEVE} or V _{RING2} = Open V, V _{MIC} = 1 V, or V _{SLEEVE} or V _{RING2} = Open, V _{MIC} = 3 V	Switch ON	25°C	3.6 V	-2 0.5 2	μA
				Full		-2	
GND SWITCH							
r _{on}	ON-state resistance	I _{SLEEVE} or I _{RING2} = +32 mA, V _{GND} = 0 V, I _{GND} = -32 mA	Switch ON	25°C	3 V	0.08 0.09	Ω
				Full		0.11	
I _{SLEEVE(OFF)} , I _{RING2(OFF)}	SLEEVE, RING2 OFF leakage current	V _{SLEEVE} or V _{RING2} = 3V and V _{GND} = 0 V	Switch OFF	25°C	3.6 V	-0.5 0.05 0.5	μA
						Full	
I _{SLEEVE(PWROFF)} , I _{RING2(PWROFF)}	SLEEVE, RING2 OFF leakage current	V _{SLEEVE} or V _{RING2} = 0 to 3.6 V and V _{GND} = 0 V	Switch OFF	25°C	0 V	-1 0.5 1	μA
						Full	
DIGITAL CONTROL INPUTS (SEL)							

- (1) The algebraic convention, whereby the most negative value is a minimum and the most positive value is a maximum

ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY⁽¹⁾ (continued)
 $V_+ = 3\text{ V to }3.6\text{ V}$, $T_A = -40^\circ\text{C to }85^\circ\text{C}$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS	T_A	V_+	MIN	TYP	MAX	UNIT
V_{IH}	Input logic high		Full	3.6 V	1.2		3.6	V
V_{IL}	Input logic low		Full	3.6 V	0		0.4	V
I_{IH}	Input logic high leakage current	$V_I = V_+$	25°C	3.6 V	-1	0.05	1	μA
			Full		-2		2	
I_{IL}	Input logic low leakage current	$V_I = 0\text{ V}$	25°C	3.6 V	-38	-36	-34	μA
			Full		-45		-30	

ELECTRICAL CHARACTERISTICS FOR 3.3 V SUPPLY⁽¹⁾ (continued)

V₊ = 3 V to 3.6 V, T_A = –40°C to 85°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS		T _A	V ₊	MIN	TYP	MAX	UNIT
DYNAMIC									
t _{ON}	Turn-on time	V _{MIC} = V ₊ , R _L = 50 Ω	C _L = 35 pF	25°C	3.3 V	150	200	200	ns
				Full	3 V to 3.6 V		250		
t _{OFF}	Turn-off time	V _{MIC} = V ₊ , R _L = 50 Ω	C _L = 35 pF	25°C	3.3 V	5	10	15	ns
				Full	3 V to 3.6 V				
t _{BBM}	Break-before-make time	V _{MIC} = V ₊		25°C	3.3 V	70		330	ns
				Full	3 V to 3.6 V			330	
C _{MIC}	MIC capacitance	SEL=High	25°C	3.3 V	100	140		pF	
		SEL=Low	25°C	3.3 V	100	140		pF	
C _{SLEEVE}	SLEEVE / RING2 capacitance	SEL=High	25°C	3.3 V	100	140		pF	
		SEL=Low	25°C	3.3 V	100	140		pF	
C _I	Digital input capacitance	V _I = V ₊ or 0 V	25°C	3.3 V	4.0			pF	
THD	Total harmonic distortion	R _L = 1k Ω, V = 30 mVPP	f = 20 Hz to 20 kHz	25°C	3.3 V	0.01%			
SUPPLY									
V ₊	Power Supply Voltage					3.0	3.3	3.6	V
I ₊	Positive supply current	V _I = V ₊	25°C	3.6 V	0.01	1		μA	
			Full			5			
		V _I = 0 V	25°C		40	41		μA	
			Full			50			

OPERATIONAL CHARACTERISTICS

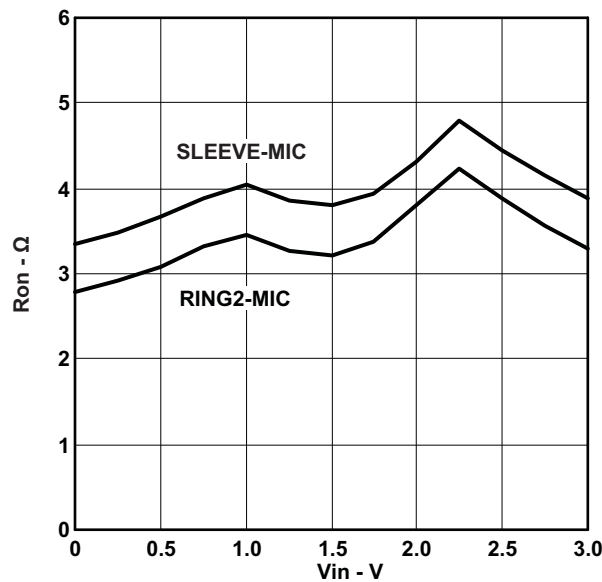
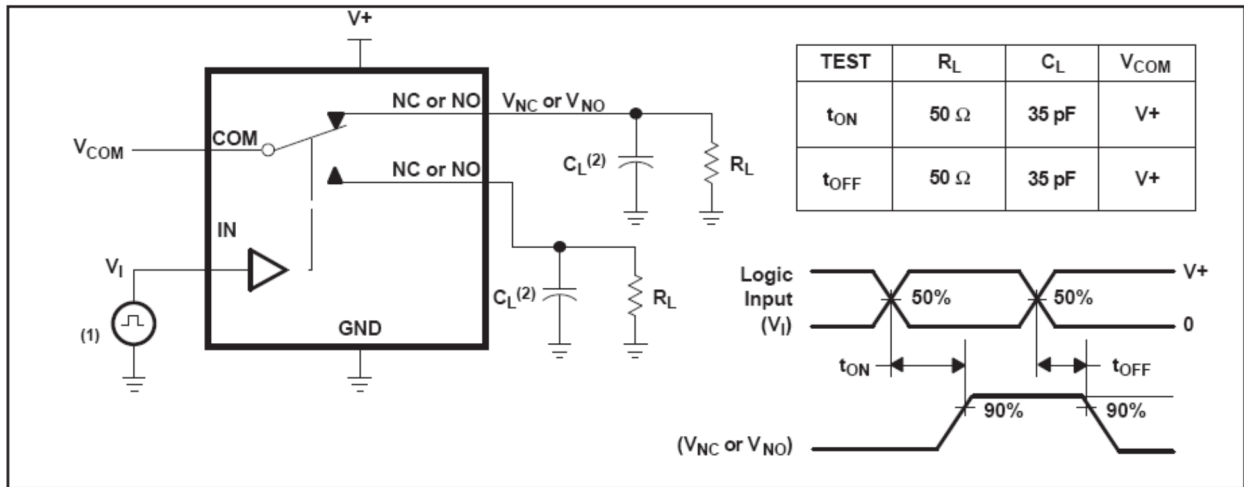


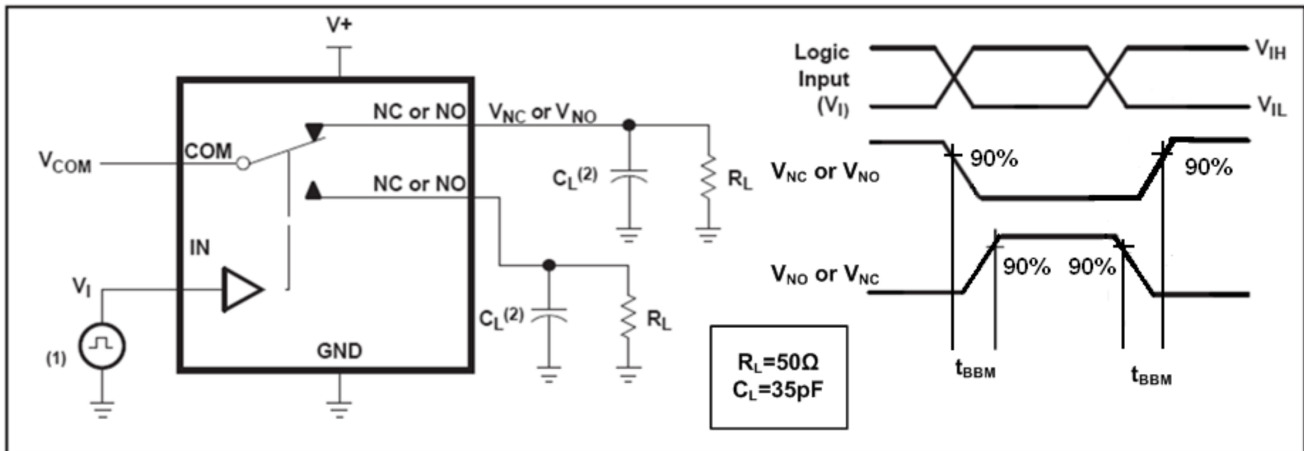
Figure 3. R_{ON} vs V_{IN} (MIC Switch)

PARAMETER MEASUREMENT INFORMATION



- A. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, ZO = 50 Ω, tr < 5 ns, tf < 5 ns.
- B. CL includes probe and jig capacitance.

Figure 4. Turn-On (tON) and Turn-Off Time (tOFF)



- A. CL includes probe and jig capacitance.
- B. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, ZO = 50 Ω, tr < 5 ns, tf < 5 ns.

Figure 5. Break-Before-Make Time (tBBM)

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/ Ball Finish	MSL Peak Temp ⁽³⁾	Samples (Requires Login)
TS3A26746EYZPR	ACTIVE	DSBGA	YZP	6	3000	Green (RoHS & no Sb/Br)	SNAGCU	Level-1-260C-UNLIM	

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

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Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
TS3A26746EYZPR	DSBGA	YZP	6	3000	180.0	8.4	1.02	1.52	0.63	4.0	8.0	Q1

TAPE AND REEL BOX DIMENSIONS

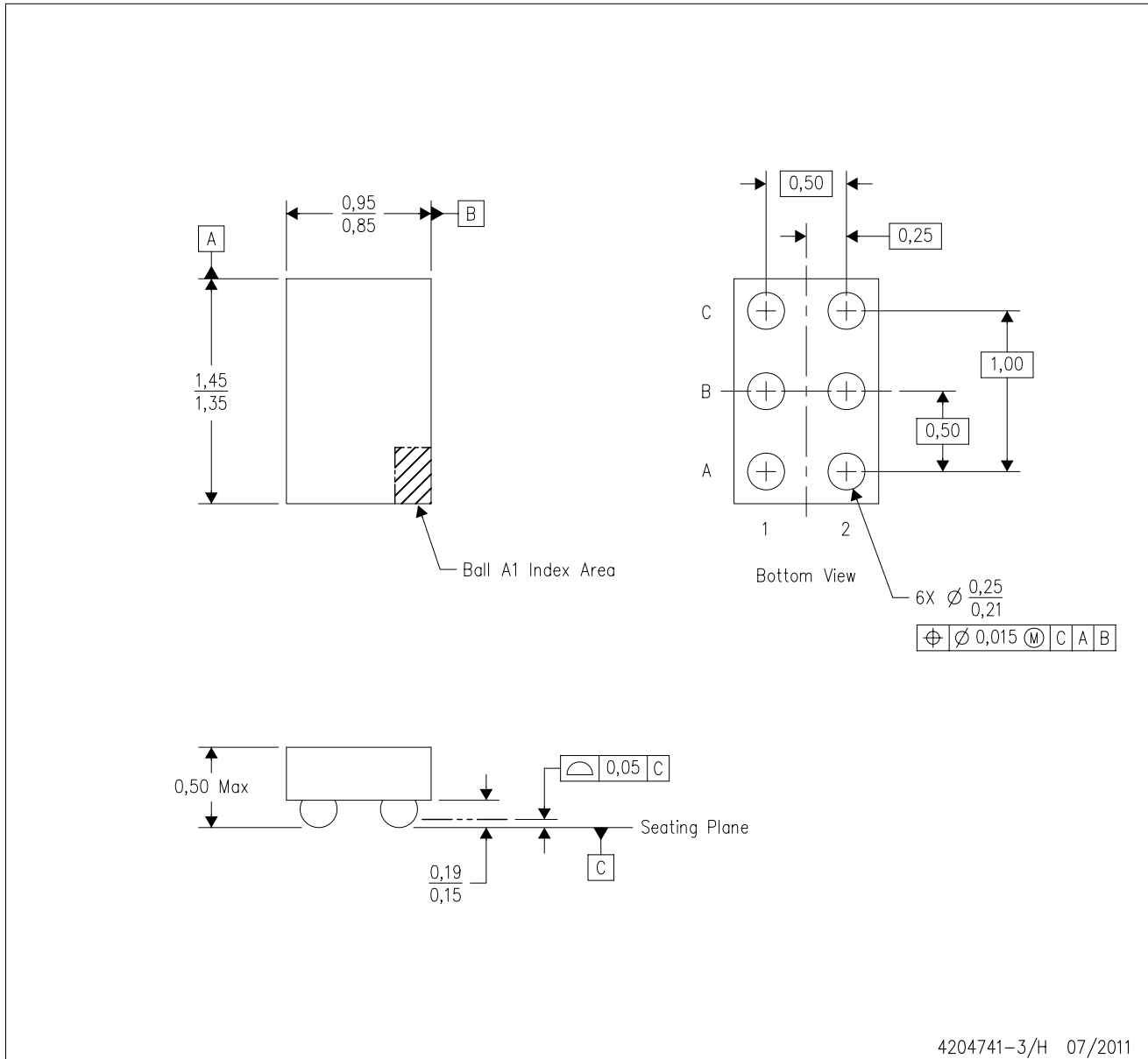


*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TS3A26746EYZPR	DSBGA	YZP	6	3000	210.0	185.0	35.0

YZP (R-XBGA-N6)

DIE-SIZE BALL GRID ARRAY



4204741-3/H 07/2011

- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
 - B. This drawing is subject to change without notice.
 - C. NanoFree™ package configuration.
 - D. This package is a Pb-free solder ball design. Refer to the 6 YEP package (drawing 4204725) for tin-lead (SnPb).

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