针对音频应用的 2 X 2 交叉点开关

查询样品: TS3A26746E

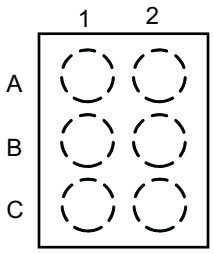
特性

- 针对接地 **(GND)** 开关的超低 $R_{导通}$（典型值 **80mΩ**）
- 针对麦克风 **(MIC)** 开关的 $R_{导通}$小于 **10Ω**
- **3.0V** 至 **3.6V V+** 运行
- 控制输入符合 **1.8 V** 逻辑要求
- **6** 焊锡凸点，**0.5mm** 焊球间距芯片级 **(CSP)** 封 **(1.45mm × 0.95mm × 0.5mm)**
- 锁断性能超过 **100mA**（符合 **JESD 78**，**II** 类规范的要求）
- 静电放电 **(ESD)** 性能测试符合 **JESD 22** 标准
  - **2000V** 人体模型（**A114-B**，**II** 类）
  - **500V** 充电器件模型 **(C101)**
- **ESD** 性能 **(SLEEVE**，**RING2)**
  - **±8kV** 接触放电 **(IEC 61000-4-2)**

应用范围

- 手机
- 掌上电脑 **(PDA)**
- 便携式仪表
- 数码相机
- 便携式导航器件

引脚分配



说明

TS3A26746E 是一款 2 × 2 交叉点开关，此开关被用来在耳机连接器上交替接地及 MIC 连接。 接地开关具有不足 0.1Ω 的超低 $R_{导通}$以大大降低其上的电压压降，从而可防止耳机接地基准电压意外升高。 该开关状态可通过 SEL 输入进行控制。 当 SEL 为高电平时，GND 被连接至 RING2，而 MIC 被连接至 SLEEVE。 当 SEL 为低时，GND 被连接至 SLEEVE，而 MIC 则被连接至 RING2。 SEL 输入上的内部 100k 上拉电阻器可设定开关的缺省状态。

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

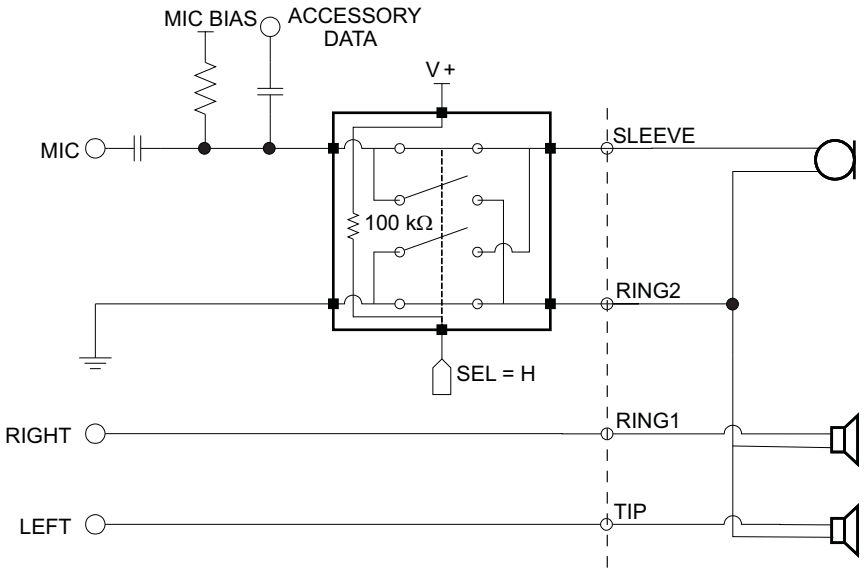


Figure 1. Standard Headphone Configuration (SEL=H)

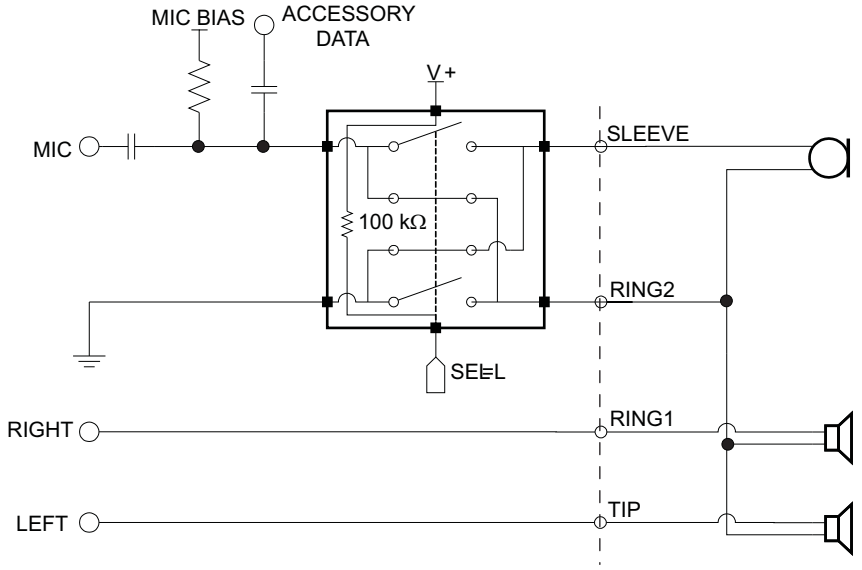
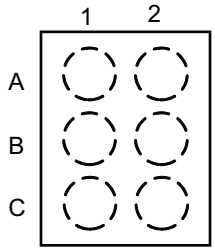


Figure 2. Alternate Headphone Configuration (SEL=L)

PINOUT



TERMINAL ASSIGNMENTS

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

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	2nd 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

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		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		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		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		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		–1		1	
$I_{SLEEVE(PWROFF)}$, $I_{RING2(PWROFF)}$		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		–10		10	

(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 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
DIGITAL CONTROL INPUTS (SEL)									
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 V		25°C	3.6 V	–38	–36	–34	µA
				Full		–45		–30	
DYNAMIC									
t_{ON}	Turn-on time	$V_{MIC} = V_+$, R_L = 50 Ω	C_L = 35 pF	25°C	3.3 V		150	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	ns
				Full	3 V to 3.6 V			15	
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

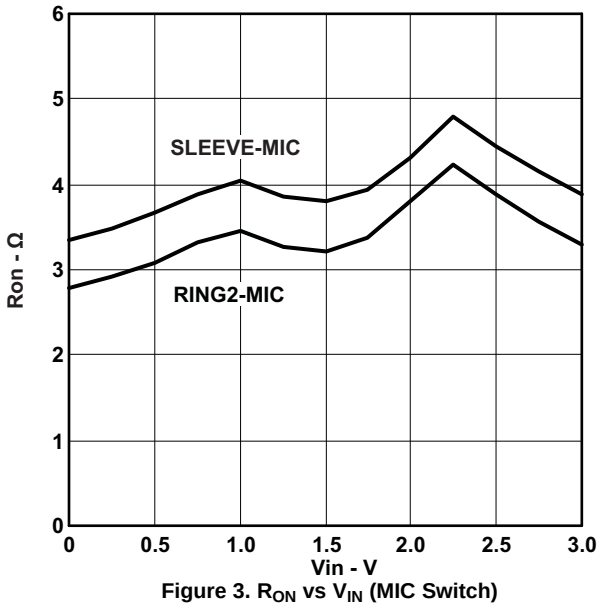
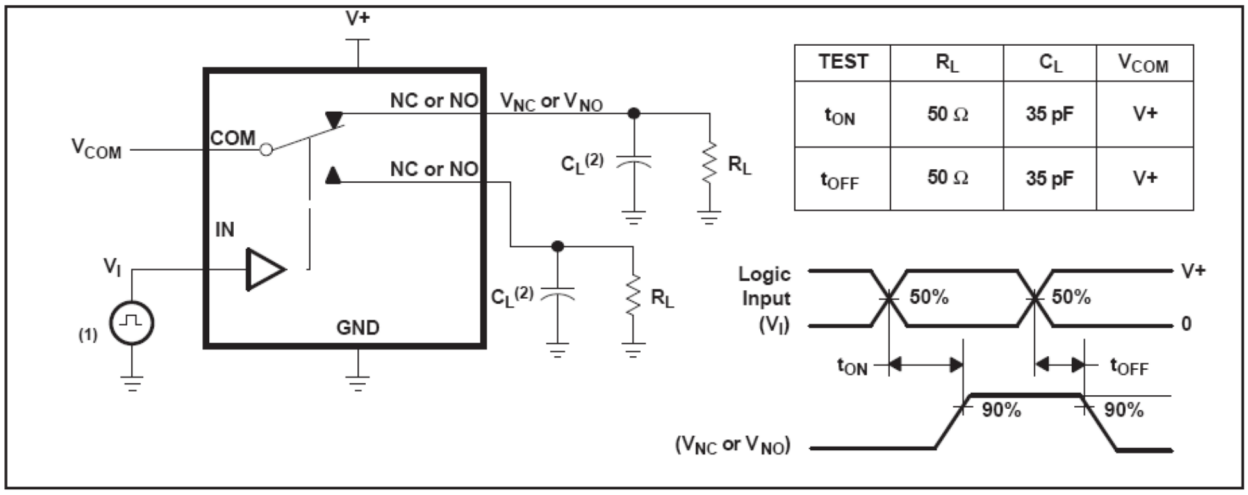


Figure 3. R_{ON} vs V_{IN} (MIC Switch)

PARAMETER MEASRUMENT INFORMATION



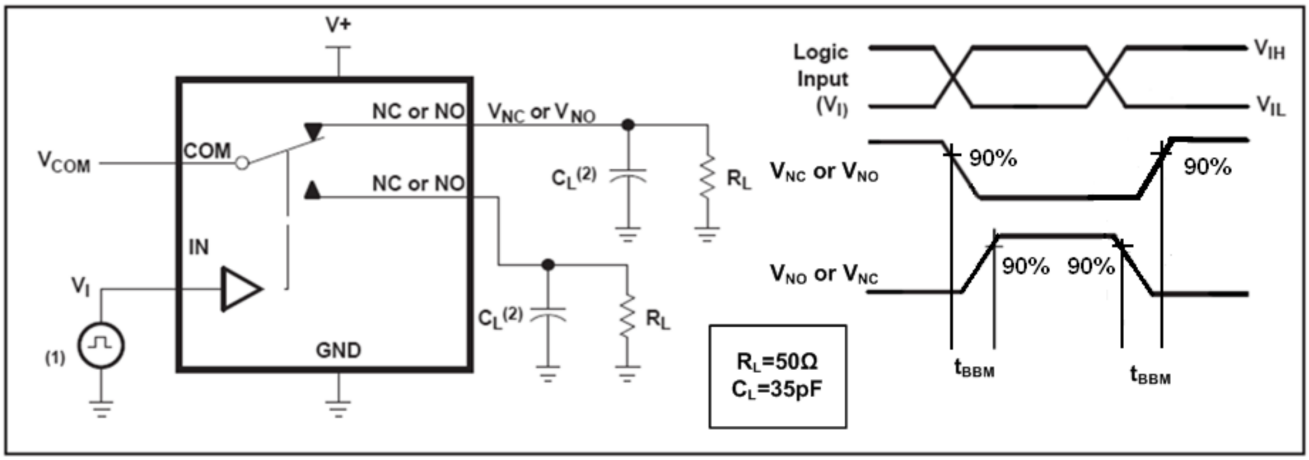
TEST	R_L	C_L	V_{COM}
t_{ON}	50 Ω	35 pF	V+
t_{OFF}	50 Ω	35 pF	V+

A. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r < 5 ns, t_f < 5 ns.

B. C_L includes probe and jig capacitance.

Figure 4. Turn-On (t_{ON}) and Turn-Off Time (t_{OFF})

PARAMETER MEASRUMENT INFORMATION (continued)



A. C_L includes probe and jig capacitance.

B. All input pulses are supplied by generators having the following characteristics: PRR ≤ 10 MHz, Z_O = 50 Ω, t_r < 5 ns, t_f < 5 ns.

Figure 5. Break-Before-Make Time (t_{BBM})

REVISION HISTORY

Changes from Revision B (November 2011) to Revision C	Page
• 用整个文档替换 1 页预览。	1

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TS3A26746EYZPR	ACTIVE	DSBGA	YZP	6	3000	RoHS & Green	SNAGCU	Level-1-260C-UNLIM	-40 to 85	7N	Samples

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.
Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

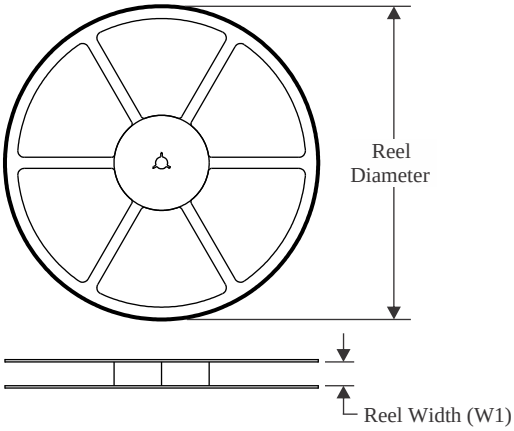
(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

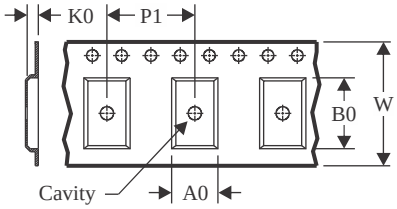
(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

TAPE AND REEL INFORMATION

REEL DIMENSIONS

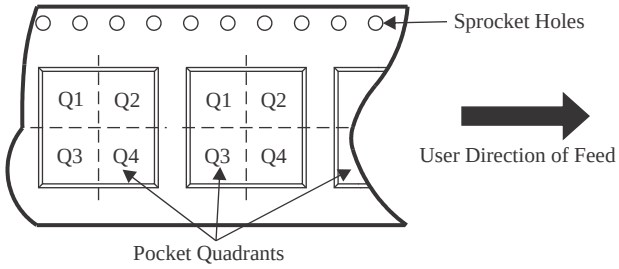


TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

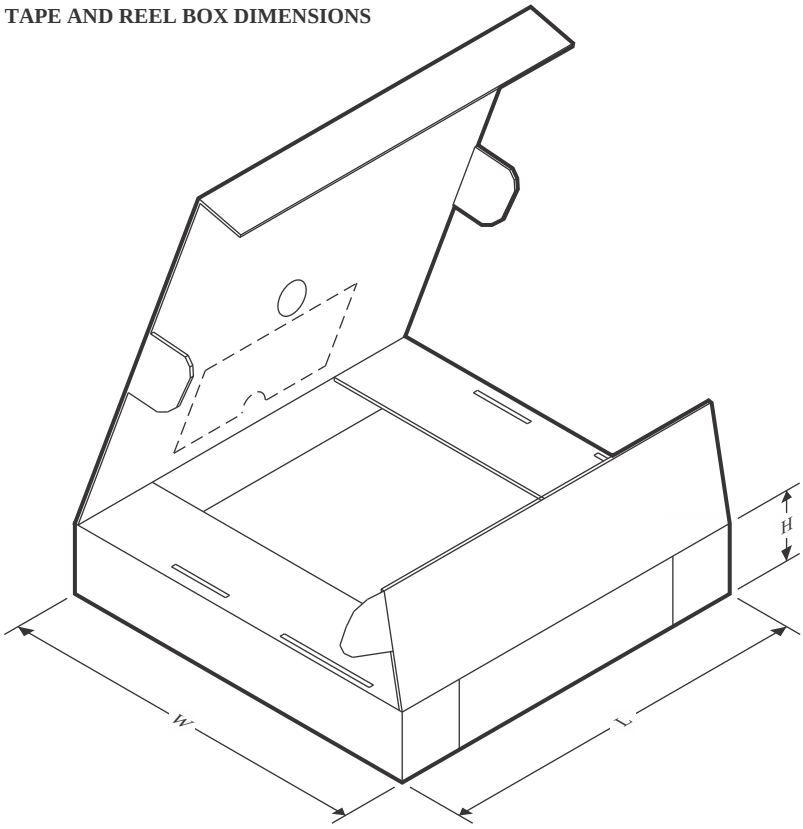
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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

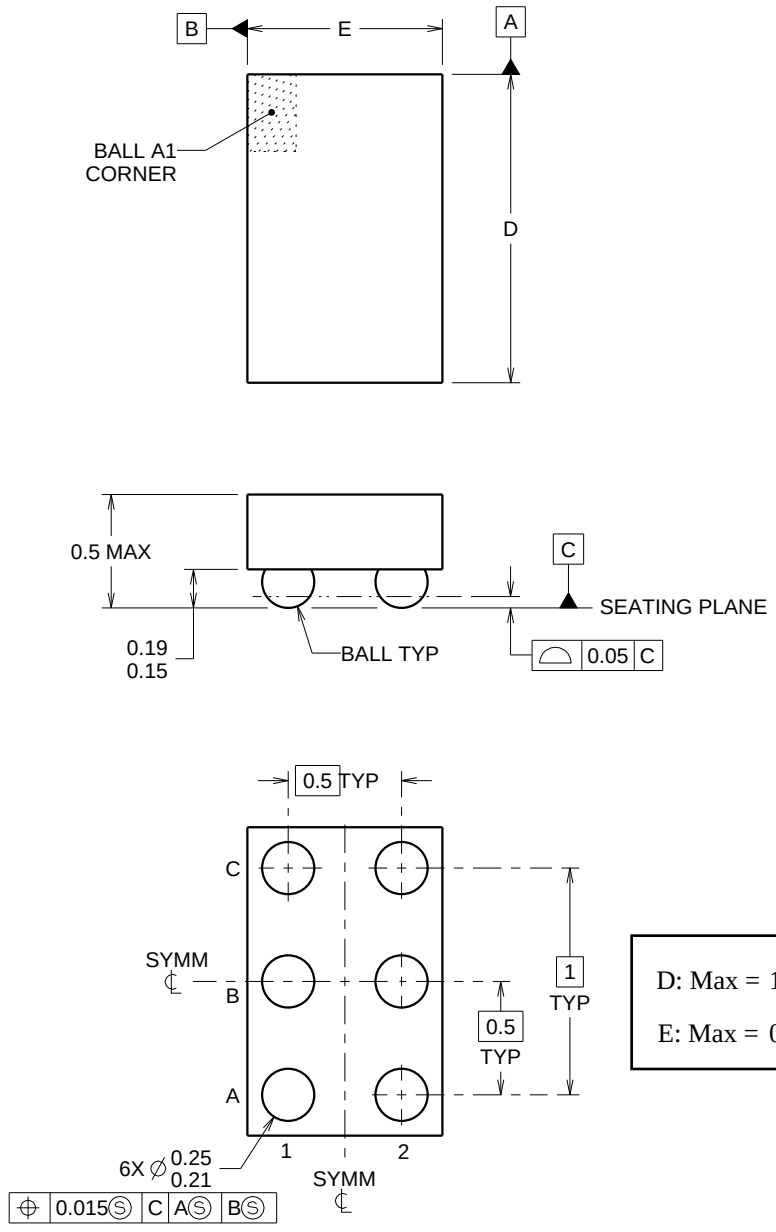
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
TS3A26746EYZPR	DSBGA	YZP	6	3000	182.0	182.0	20.0

PACKAGE OUTLINE

YZP0006

DSBGA - 0.5 mm max height

DIE SIZE BALL GRID ARRAY



D: Max = 1.418 mm, Min =1.358 mm

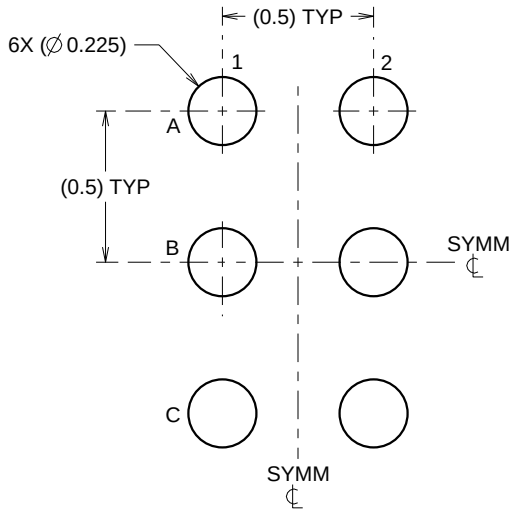
E: Max = 0.917 mm, Min =0.857 mm

4219524/A 06/2014

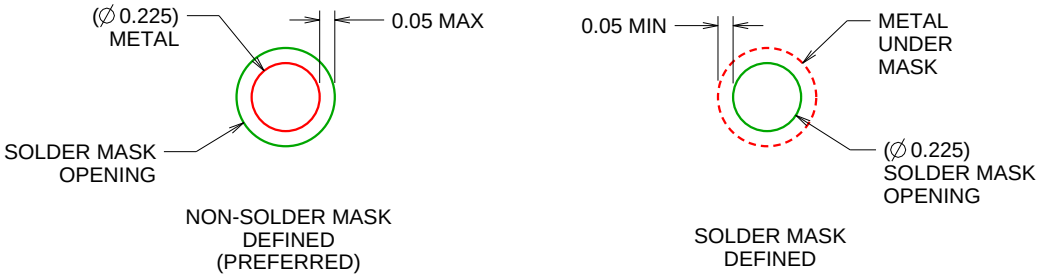
NOTES:

NanoFree Is a trademark of Texas Instruments.

1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. NanoFree™ package configuration.



LAND PATTERN EXAMPLE
SCALE:40X



SOLDER MASK DETAILS
NOT TO SCALE

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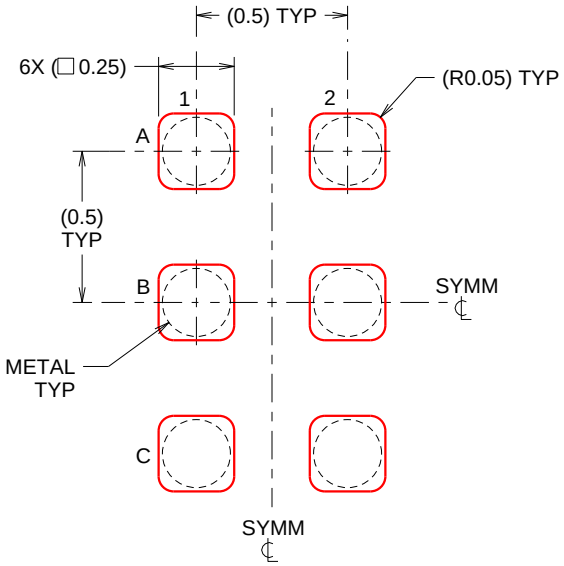
NOTES: (continued)

4. Final dimensions may vary due to manufacturing tolerance considerations and also routing constraints. For more information, see Texas Instruments literature number SBVA017 (www.ti.com/lit/sbva017).



SOLDER PASTE EXAMPLE
BASED ON 0.1 mm THICK STENCIL
SCALE:40X

4219524/A 06/2014

NOTES: (continued)

5. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release.

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