



# 低电压、双路SPDT、 音频静音开关，可提供负摆幅

## 概述

MAX4762-MAX4764/MAX4764A/MAX4765 是双路 SPDT (单刀/双掷) 开关，可提供负摆幅信号，使得低于地电位的信号无失真通过。这些模拟开关工作于 +1.8V 至 +5.5V 单电源，导通电阻只有 0.6Ω，非常适合音频信号的切换。

MAX4763/MAX4765 内部包含一个比较器，可以用于耳机检测或静音/播放控制。MAX4764/MAX4764A/MAX4765 包含一个内部旁路开关，用来对连接在 NO 端或 NC 端的电容自动放电。这就降低了切换预先充电的节点之间的音频信号时出现的杂音。

这些 SPDT 开关提供节省空间的 μMAX®、TDFN、薄型 QFN 和 UCSP™ 封装。工作在扩展级温度范围：-40°C 至 +85°C。

## 应用

蜂窝电话  
PDA 与手持式设备  
笔记本电脑  
MP3 播放器

## 特性

- ◆ 允许低至  $V_{CC} - 5.5V$  的负信号无失真通过
- ◆ 用于耳机或静音检测的比较器 (MAX4763/MAX4765)
- ◆ 内置旁路电阻，可以减小杂音 (MAX4764/MAX4764A/MAX4765)
- ◆ 低导通电阻 ( $R_{ON}$ )  
+2.7V 供电时仅 0.6Ω
- ◆ 0.25Ω 导通电阻平坦度
- ◆ 0.05Ω 导通阻抗匹配度
- ◆ +1.8V 至 +5.5V 供电
- ◆ -70dB 串扰 (100kHz)
- ◆ -65dB 关断隔离 (100kHz)
- ◆ 总谐波失真为 0.01%
- ◆ 提供 μMAX、TDFN、薄型 QFN 和 UCSP 封装

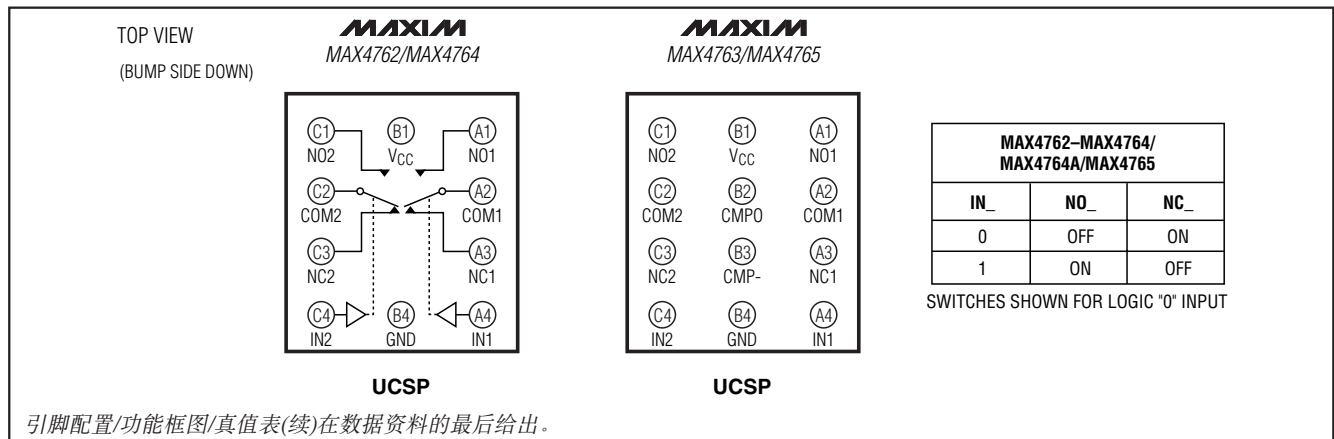
## 订购信息

PART	TEMP RANGE	PIN-PACKAGE	TOP MARK
MAX4762ETB	-40°C to +85°C	10 TDFN	ACG
MAX4762EUB	-40°C to +85°C	10 μMAX	—
MAX4762EBC-T	-40°C to +85°C	12 UCSP-12	ABU

μMAX 是 Maxim Integrated Products, Inc. 的注册商标。  
UCSP 是 Maxim Integrated Products, Inc. 的商标。

订购信息 (续) 在数据资料的最后给出。  
选型指南在数据资料的最后给出。

## 引脚配置/功能框图/真值表



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## ABSOLUTE MAXIMUM RATINGS

(All voltages referenced to GND.)

V <sub>CC</sub> , IN <sub>-</sub> , CMP <sub>-</sub> .....	-0.3V to +6.0V
COM <sub>-</sub> , NO <sub>-</sub> , NC <sub>-</sub> .....	(V <sub>CC</sub> - 6V) to (V <sub>CC</sub> + 0.3V)
CMPO.....	-0.3V to (V <sub>CC</sub> + 0.3V)
Closed-Switch Continuous Current COM <sub>-</sub> , NO <sub>-</sub> , NC <sub>-</sub> .....	±150mA
Open-Switch Continuous Current NO <sub>-</sub> , NC <sub>-</sub> (MAX4764/MAX4764A/MAX4765).....	±30mA
Peak Current COM <sub>-</sub> , NO <sub>-</sub> , NC <sub>-</sub> (pulsed at 1ms, 50% duty cycle).....	±300mA
Peak Current COM <sub>-</sub> , NO <sub>-</sub> , NC <sub>-</sub> (pulsed at 1ms, 10% duty cycle).....	±400mA
Continuous Power Dissipation (T <sub>A</sub> = +70°C) 10-Pin TDFN (derate 24.4mW/°C above +70°C).....	1951mW
10-Pin μMAX (derate 5.6mW/°C above +70°C).....	444mW

12-Bump UCSP (MAX4762/MAX4764) (derate 5.6mW/°C above +70°C).....	449mW
12-Bump UCSP (MAX4763/MAX4765) (derate 6.5mW/°C above +70°C).....	519mW
12-Pin Thin QFN (derate 16.9mW/°C above +70°C).....	1349mW
ESD Method 3015.7.....	±2kV
Operating Temperature Range.....	-40°C to +85°C
Junction Temperature.....	+150°C
Storage Temperature Range.....	-65°C to +150°C
Lead Temperature (soldering, 10s).....	+300°C
Bump Temperature (soldering) Infrared (15s).....	+220°C
Vapor Phase (60s).....	+215°C

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## ELECTRICAL CHARACTERISTICS

(V<sub>CC</sub> = +2.7V to +5.5V, T<sub>A</sub> = -40°C to +85°C, unless otherwise noted. Typical values are at V<sub>CC</sub> = +3.0V, T<sub>A</sub> = +25°C, unless otherwise noted.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>ANALOG SWITCH</b>						
Analog Signal Range (Note 2)	V <sub>NO-</sub> , V <sub>NC-</sub> , V <sub>COM-</sub>		V <sub>CC</sub> - 5.5		V <sub>CC</sub>	V
On-Resistance (Notes 3 and 4)	R <sub>ON(NC)</sub> , R <sub>ON(NO)</sub>	V <sub>CC</sub> = 2.7V; V <sub>NC-</sub> or V <sub>NO-</sub> = V <sub>CC</sub> - 5.5V, -1V, 0V, 1V, 2V, V <sub>CC</sub> ; I <sub>COM-</sub> = 100mA	T <sub>A</sub> = +25°C	0.6	0.85	Ω
			T <sub>A</sub> = T <sub>MIN</sub> to T <sub>MAX</sub>		0.95	
On-Resistance Match Between Channels (Notes 3, 4, and 5)	ΔR <sub>ON</sub>	V <sub>CC</sub> = 2.7V, V <sub>NC-</sub> or V <sub>NO-</sub> = 0V, I <sub>COM-</sub> = 100mA	T <sub>A</sub> = +25°C	0.05	0.1	Ω
			T <sub>A</sub> = T <sub>MIN</sub> to T <sub>MAX</sub>		0.15	
On-Resistance Flatness (Notes 4 and 6)	R <sub>FLAT(NC)</sub>	V <sub>CC</sub> = 2.7V; V <sub>NC-</sub> or V <sub>NC-</sub> = -1V, 0V, 1V, 2V, V <sub>CC</sub> ; I <sub>COM-</sub> = 100mA	T <sub>A</sub> = +25°C	0.25	0.4	Ω
			T <sub>A</sub> = T <sub>MIN</sub> to T <sub>MAX</sub>		0.45	
Shunt Switch Resistance	R <sub>SH</sub>	MAX4764/MAX4764A/MAX4765 only, I <sub>NO-</sub> or I <sub>NC-</sub> = 10mA, V <sub>CC</sub> = 2.7V	T <sub>A</sub> = T <sub>MIN</sub> to T <sub>MAX</sub>	25	50	Ω
NO <sub>-</sub> , NC <sub>-</sub> Off-Leakage Current (Notes 8 and 9)	I <sub>NO-(OFF)</sub> , I <sub>NC-(OFF)</sub>	MAX4762/MAX4763 only (Note 7), V <sub>CC</sub> = 2.7V, switch open; V <sub>NC-</sub> or V <sub>NO-</sub> = -2.5V, +2.5V; V <sub>COM-</sub> = +2.5V, -2.5V	T <sub>A</sub> = +25°C	-2	+2	nA
			T <sub>A</sub> = T <sub>MIN</sub> to T <sub>MAX</sub>	-10	+10	
COM <sub>-</sub> On-Leakage Current (Notes 8 and 9)	I <sub>COM-(ON)</sub>	V <sub>CC</sub> = 2.7V, switch closed; V <sub>NC-</sub> or V <sub>NO-</sub> = -2.5V, +2.5V, or floating; V <sub>COM-</sub> = -2.5V, +2.5V, or floating	T <sub>A</sub> = +25°C	-6	+6	nA
			T <sub>A</sub> = T <sub>MIN</sub> to T <sub>MAX</sub>	-50	+50	

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## ELECTRICAL CHARACTERISTICS (continued)

( $V_{CC} = +2.7V$  to  $+5.5V$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless otherwise noted. Typical values are at  $V_{CC} = +3.0V$ ,  $T_A = +25^{\circ}C$ , unless otherwise noted.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
<b>DYNAMIC CHARACTERISTICS</b>						
Turn-On Time	$t_{ON}$	$V_{CC} = 2.7V$ , $V_{NO} = 1.5V$ ; for $NO_{-}$ , $V_{IN_{-}} = 0V$ to $V_{CC}$ ; for $NC_{-}$ , $V_{IN_{-}} = V_{CC}$ to $0V$ ; $R_L = 300\Omega$ , $C_L = 35pF$ , Figure 2	$T_A = +25^{\circ}C$	25	80	ns
			$T_A = T_{MIN}$ to $T_{MAX}$		80	
			$T_A = T_{MIN}$ to $T_{MAX}$ (MAX4764A)	225	500	
Turn-Off Time	$t_{OFF}$	$V_{CC} = 2.7V$ , $V_{NC} = 1.5V$ ; for $NO_{-}$ , $V_{IN_{-}} = V_{CC}$ to $0V$ ; for $NC_{-}$ , $V_{IN_{-}} = 0V$ to $V_{CC}$ ; $R_L = 300\Omega$ , $C_L = 35pF$ , Figure 2	$T_A = +25^{\circ}C$	20	70	ns
			$T_A = T_{MIN}$ to $T_{MAX}$		70	
			$T_A = T_{MIN}$ to $T_{MAX}$ (MAX4764A)	225	500	
Break-Before-Make Time Delay	$t_D$	$V_{CC} = 2.7V$ , $V_{N_{-}} = 1.5V$ , for $NO_{-}$ , $V_{IN_{-}} = V_{CC}$ to $0V$ ; for $NC_{-}$ , $V_{IN_{-}} = 0V$ to $V_{CC}$ ; $R_L = 300\Omega$ , $C_L = 35pF$ , Figure 3	$T_A = +25^{\circ}C$	1	7	ns
Charge Injection	Q	$V_{COM_{-}} = 0V$ , $C_L = 1.0nF$ , Figure 4		150		pC
Off-Isolation (Note 10)	$V_{ISO}$	$f = 100kHz$ , $V_{COM_{-}} = 1V_{RMS}$ , $R_L = 50\Omega$ , $C_L = 5pF$ , Figure 5		-65		dB
Crosstalk	$V_{CT}$	$f = 100kHz$ , $V_{COM_{-}} = 1V_{RMS}$ , $R_L = 50\Omega$ , $C_L = 5pF$ , Figure 5		-70		dB
Power-Supply Rejection Ratio	PSRR	$f = 10kHz$ , $V_{COM_{-}} = 1V_{RMS}$ , $R_L = 50\Omega$ , $C_L = 5pF$		60		dB
On-Channel -3dB Bandwidth	BW	Signal = $0dBm$ , $R_L = 50\Omega$ , $C_L = 5pF$ , Figure 5		27		MHz
Total Harmonic Distortion	THD	$f = 20Hz$ to $20kHz$ , $V_{COM_{-}} = 0.5V_{P-P}$ , DC Bias = 0, $R_L = 32\Omega$		0.01		%
$NO_{-}$ , $NC_{-}$ Off-Capacitance	$C_{NO_{-}(OFF)}$ $C_{NC_{-}(OFF)}$	$f = 1MHz$ , $V_{COM_{-}} = 0.5V_{P-P}$ , DC Bias = 0, Figure 6		50		pF
COM On-Capacitance	$C_{COM_{-}(ON)}$	$f = 1MHz$ , $V_{COM_{-}} = 0.5V_{P-P}$ , DC Bias = 0, Figure 6		200		pF
<b>DIGITAL I/O (IN<sub>-</sub>)</b>						
Input-Logic High Voltage	$V_{IH}$	$V_{CC} = 2.7V$ to $3.6V$	1.4			V
		$V_{CC} = 4.2V$ to $5.5V$	2.0			
		$V_{CC} = 2.7V$ to $5.5V$ (MAX4764A only)	1.6			
Input-Logic Low Voltage	$V_{IL}$	$V_{CC} = 2.7V$ to $3.6V$		0.5		V
		$V_{CC} = 4.2V$ to $5.5V$		0.8		
		$V_{CC} = 2.7V$ to $5.5V$ (MAX4764A only)		0.5		
Input Leakage Current	$I_{IN}$	$V_{IN_{-}} = 0V$ or $V_{CC}$	-1		+1	$\mu A$
<b>COMPARATOR (MAX4763/MAX4765)</b>						
Comparator Threshold				$V_{CC} / 3$		V

MAX4762-MAX4764/MAX4764A/MAX4765

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### ELECTRICAL CHARACTERISTICS (continued)

( $V_{CC} = +2.7V$  to  $+5.5V$ ,  $T_A = -40^{\circ}C$  to  $+85^{\circ}C$ , unless otherwise noted. Typical values are at  $V_{CC} = +3.0V$ ,  $T_A = +25^{\circ}C$ , unless otherwise noted.) (Note 1)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNITS
Comparator Output High Voltage		$I_{SOURCE} = 1mA$	$V_{CC} - 0.4V$			V
Comparator Output Low Voltage		$I_{SINK} = 1mA$			0.4V	V
Comparator Input Leakage Current		$V_{CMP-} = 0$ to $2.7V$	-100		+100	nA
Comparator Switching Time		$V_{CC} = 2.7V$ , $V_{CMP-} = 0V$ to $V_{CC}$ , from 50% of $V_{CMP-}$ to 50% of $V_{CMPO}$		1	2	$\mu s$
<b>POWER SUPPLY</b>						
Power-Supply Range	$V_{CC}$		1.8		5.5	V
Supply Current	I+	$V_{CC} = 5.5V$ , $V_{IN-} = 0V$ or $V_{CC}$	MAX4763/MAX4765	5	10	$\mu A$
			MAX4762/MAX4764/ MAX4764A	0.01	1	
		$V_{CC} = 5.5V$ , $V_{IN-} = 1.8V$	MAX4764A	5	10	
		$V_{CC} = 4.2V$ , $V_{IN-} = 1.8V$ (Note 11)	MAX4764A	2	5	

**Note 1:** UCSP and TDFN parts are 100% tested at  $T_A = +25^{\circ}C$  only, and guaranteed by design over the specified temperature range. Thin QFN parts are 100% tested at  $T_A = +85^{\circ}C$  only, and guaranteed by design over the specified temperature range.

**Note 2:** Signals on COM\_, NO\_, or NC\_ exceeding  $V_{CC}$  are clamped by internal diodes. Limit forward-diode current to maximum current rating.

**Note 3:** Thin QFN and UCSP are guaranteed by design; not production tested.

**Note 4:**  $I_{COM}$  for UCSP is 10mA.

**Note 5:**  $\Delta R_{ON} = R_{ON(MAX)} - R_{ON(MIN)}$ .

**Note 6:** Flatness is defined as the difference between the maximum and minimum value of on-resistance as measured over the specified analog signal ranges.

**Note 7:** MAX4764/MAX4765 have an internal shunt switch when in off-state, which determines OFF current.

**Note 8:** Leakage parameters are 100% tested at maximum-rated hot operating temperature and guaranteed by design at  $T_A = +25^{\circ}C$ .

**Note 9:** UCSP parts are guaranteed by design.

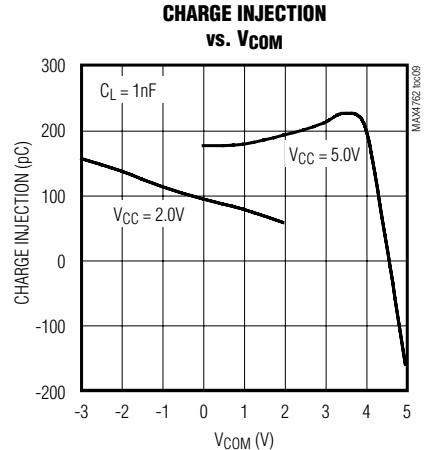
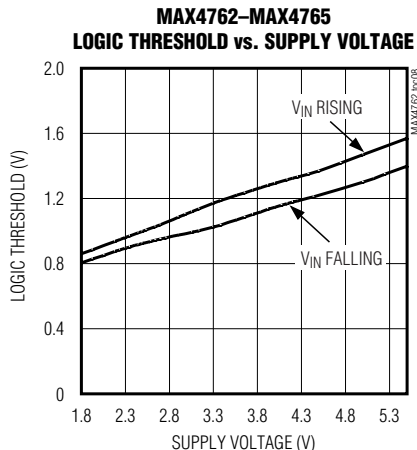
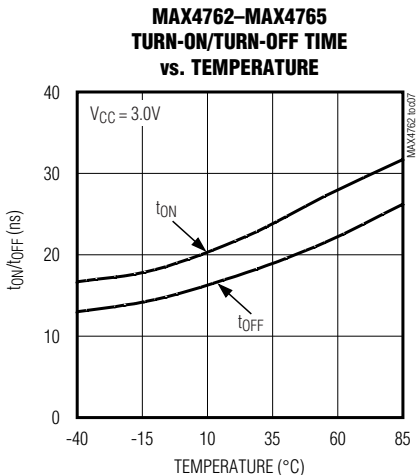
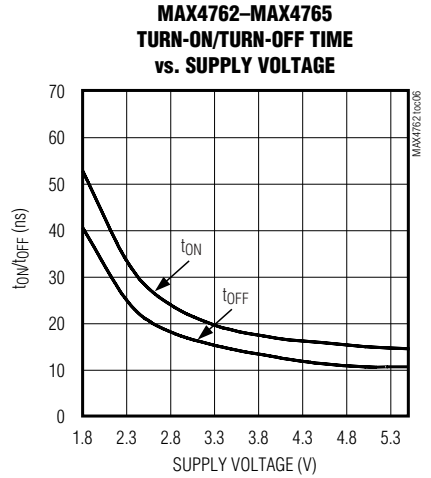
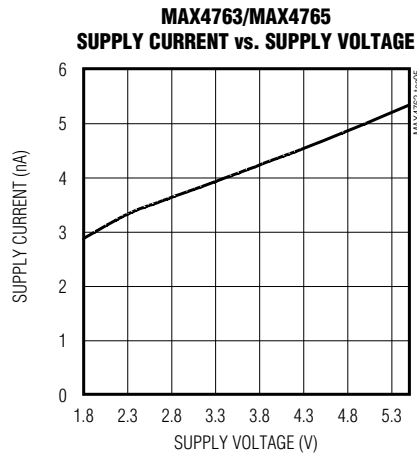
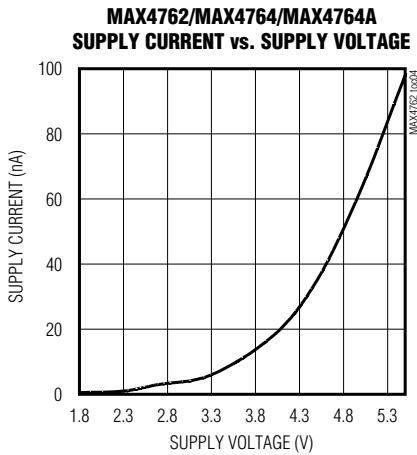
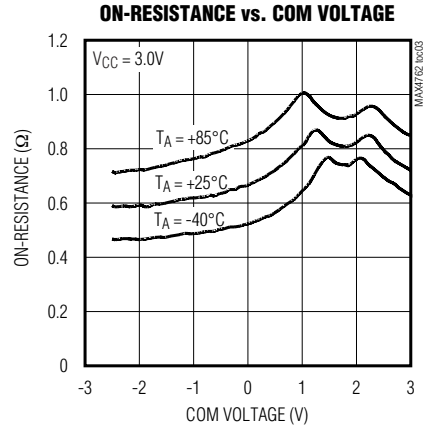
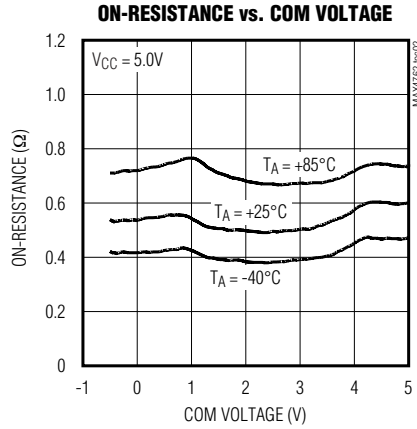
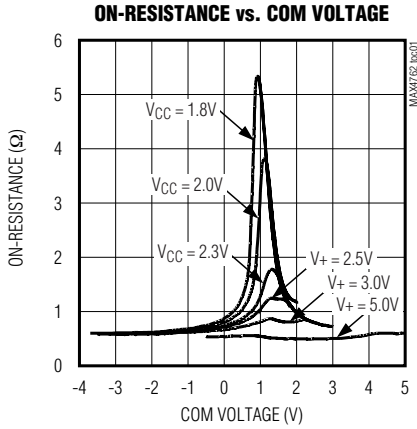
**Note 10:** Off-isolation =  $20\log_{10}(V_{COM} / V_{NO})$ ,  $V_{COM}$  = output,  $V_{NO}$  = input to off switch.

# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

典型工作特性

( $V_{CC} = 3.0V$ ,  $T_A = +25^\circ C$ , unless otherwise noted.)

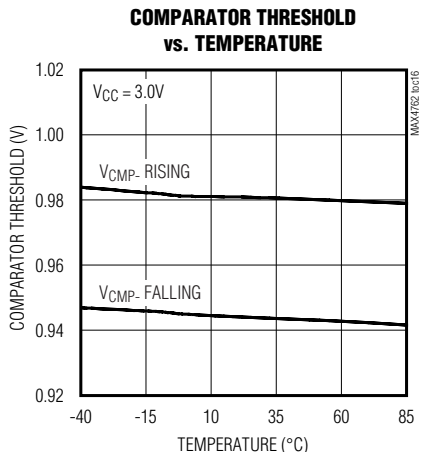
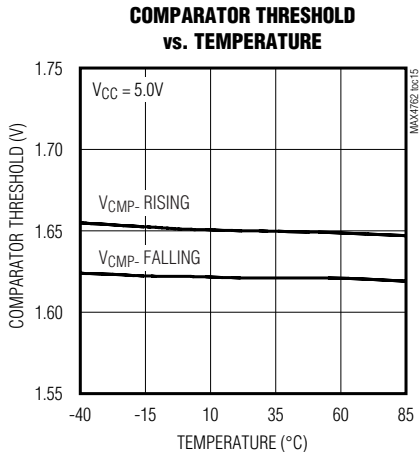
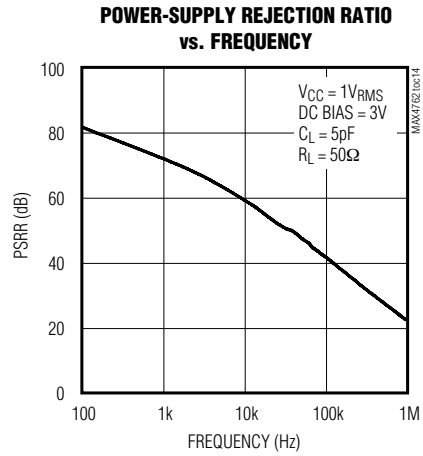
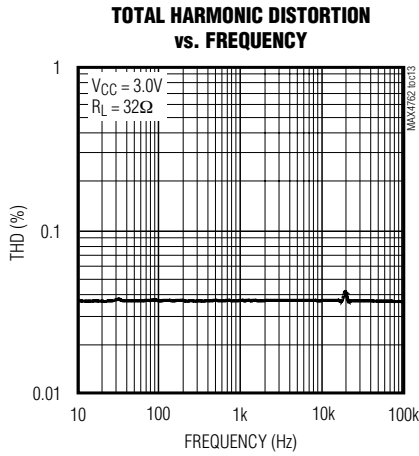
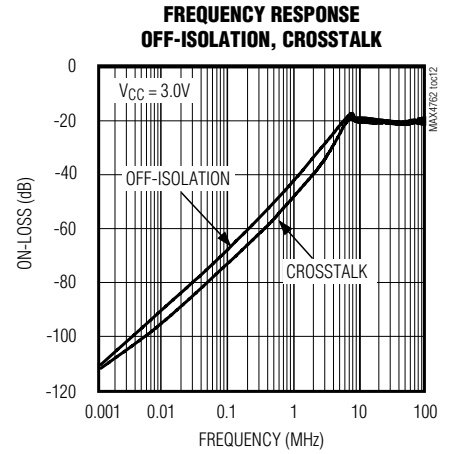
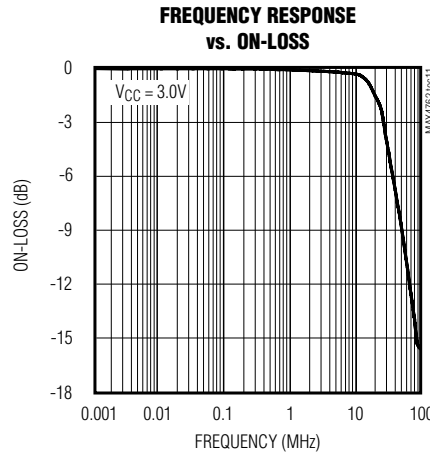
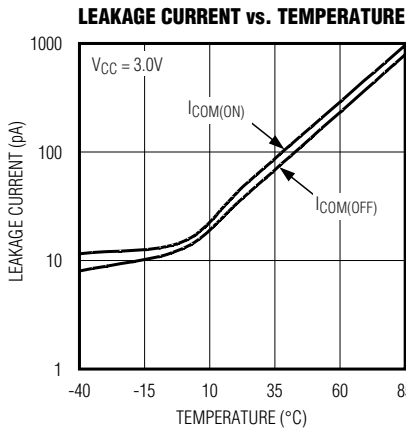
MAX4762-MAX4764/MAX4764A/MAX4765



# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

典型工作特性(续)

( $V_{CC} = 3.0V$ ,  $T_A = +25^\circ C$ , unless otherwise noted.)



# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

引脚说明(MAX4762/MAX4764/MAX4764A)

引脚		名称	功能
10- $\mu$ MAX 10-TDFN	12-UCSP		
1	B1	VCC	正电源输入。
2	A1	NO1	模拟开关1—常开端。
3	A2	COM1	模拟开关1—公共端。
4	A3	NC1	模拟开关1—常闭端。
5	A4	IN1	模拟开关1的数控输入。IN1为逻辑低电平时，COM1与NC1接通；为逻辑高电平时，COM1与NO1接通。
6	B4	GND	地。
7	C4	IN2	模拟开关2的数控输入。IN2为逻辑低电平时，COM2与NC2接通；为逻辑高电平时，COM2与NO2接通。
8	C3	NC2	模拟开关2—常闭端。
9	C2	COM2	模拟开关2—公共端。
10	C1	NO2	模拟开关2—常开端。
EP (仅对 TDFN)	—	EP	TDFN封装的裸露焊盘，接地。

引脚说明(MAX4763/MAX4765)

引脚		名称	功能
12薄型 QFN	12-UCSP		
1	A2	COM1	模拟开关1—公共端。
2	A3	NC1	模拟开关1—常闭端。
3	A4	IN1	模拟开关1的数控输入。IN1为逻辑低电平时，COM1与NC1接通；为逻辑高电平时，COM1与NO1接通。
4	B3	CMP-	比较器反相输入。
5	B4	GND	地。
6	C4	IN2	模拟开关2的数控输入。IN2为逻辑低电平时，COM2和NC2接通；为逻辑高电平时，COM2和NO2接通。
7	C3	NC2	模拟开关2—常闭端。
8	C2	COM2	模拟开关2—公共端。
9	C1	NO2	模拟开关2—常开端。
10	B2	CMPO	比较器输出。
11	B1	VCC	正电源输入。
12	A1	NO1	模拟开关1—常开端。
EP	—	EP	裸露焊盘，接地。

MAX4762-MAX4764/MAX4764A/MAX4765

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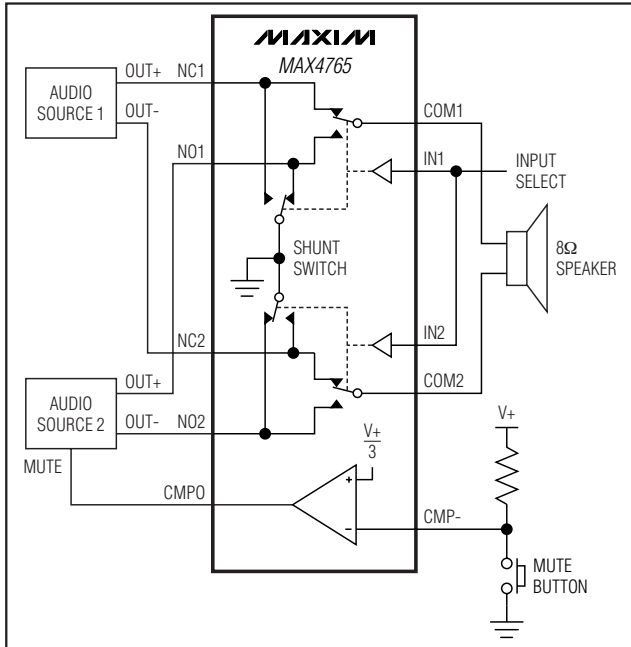


图1. 典型工作电路

### 详细说明

MAX4762-MAX4764/MAX4764A/MAX4765是低导通电阻、低电压、双路SPDT模拟开关，工作电压+1.8V至+5.5V，完全规范于标称3.0V电压下。这些器件能够处理负信号，允许低于地电位的信号无失真地通过，且具有先断后合功能。

MAX4763/MAX4765内部包含一个比较器，可用于耳机或静音检测。比较器门限由内部产生，约为 $V_{CC}$ 的 $1/3$ 。MAX4764/MAX4764A/MAX4765内置旁路开关，对连接在NO或NC端的电容进行放电。消除了切换音频信号时引起的杂音。

### 应用信息

#### 数控输入

无论采用何种电源电压，MAX4762-MAX4764/MAX4764A/MAX4765可接受高达+5.5V的逻辑输入。例如，在+3.3V供电时，IN<sub>1</sub>可以低至GND，也可以高至+5.5V，以保证系统混合逻辑的兼容性。满摆幅驱动IN<sub>1</sub>减小了功耗。+1.8V供电时，逻辑门限为0.5V（低电平）和1.4V（高电平）；+5V供电时，逻辑门限为0.8V（低电平）和2.0V（高电平）。

### 模拟信号电平

模拟输入信号在整个供电电压范围内变化时，MAX4762-MAX4764/MAX4764A/MAX4765的导通电阻变化很小（参见典型工作特性）。因为开关为双向，所以NO<sub>1</sub>、NC<sub>1</sub>、COM<sub>1</sub>端可以作为输入，也可以作为输出。

MAX4762-MAX4764/MAX4764A/MAX4765能够切换低至 $V_{CC} - 5.5V$ 的信号，包括地电平以下的信号，失真最小。

### 比较器(MAX4763/MAX4765)

MAX4763/MAX4765内部包含了一个比较器，可以用来检测耳机或静音。比较器的正端在内部设置为 $V_{CC}/3$ 。当比较器负端（CMP-）低于门限值时，比较器输出（CMPO）为逻辑高。当CMP-高于 $V_{CC}/3$ 时，CMPO输出为逻辑低。

$V_{CC}/3$ 的比较器门限用来检测耳机，因为耳机音频信号通常偏置在 $V_{CC}/2$ 。

### 旁路开关(MAX4764/MAX4764A/MAX4765)

MAX4764/MAX4764A/MAX4765包含一个 $100\Omega$ 的旁路开关，对连接在NC<sub>1</sub>或NO<sub>1</sub>端而没有与COM<sub>1</sub>端相连的电容自动放电。降低了切换音频信号时引起的杂音。

阶跃直流信号切换到扬声器时将引起杂音。通过对未连接端子自动放电，可以消除任何残余的直流电压，因此可以降低杂音信号。

### 供电顺序和过压保护

**注意：**加载电压不要超过绝对额定值，因为超过该值会造成器件永久性的损坏。

任何CMOS器件都建议采用一定的供电顺序。通常在加模拟信号前先加 $V_{CC}$ ，特别是在模拟信号没有限流的情况下。

### UCSP应用信息

关于UCSP结构、尺寸、载带信息、印刷电路板技术、焊盘布局、所推荐的回流温度特性、以及可靠性测试结果的最新应用数据，请参考应用笔记：UCSP—晶片级封装，可从Maxim网站：[www.maxim-ic.com.cn/ucsp](http://www.maxim-ic.com.cn/ucsp)下载。



# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

测试电路/时序图

MAX4762-MAX4764/MAX4764A/MAX4765

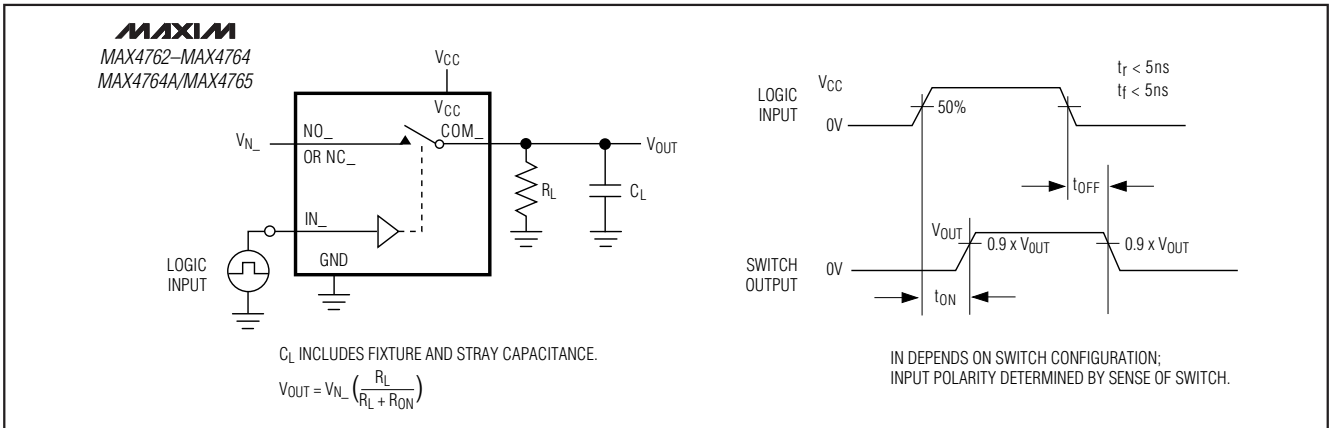


图2. 开关时间

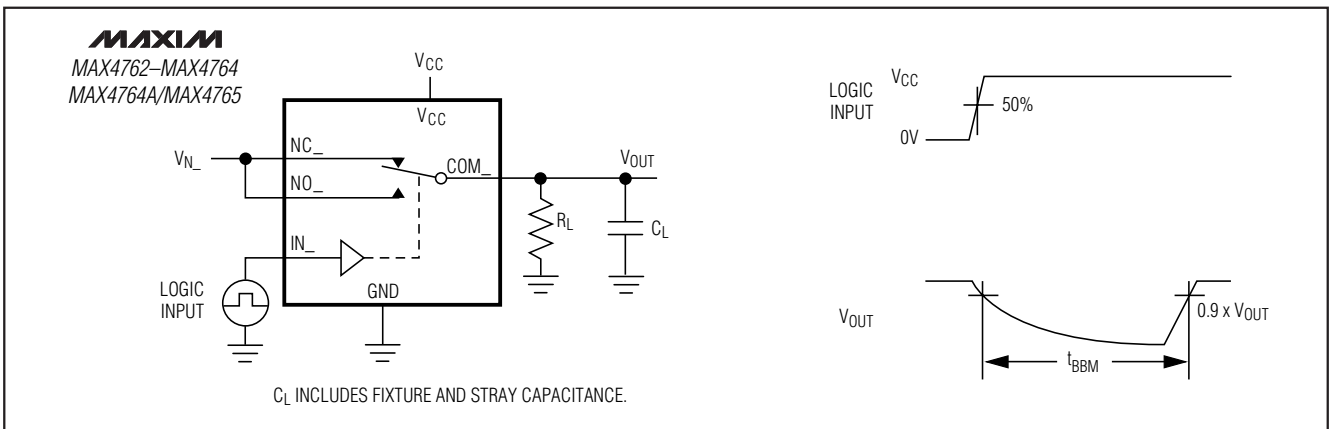


图3. 先断后合的间隔

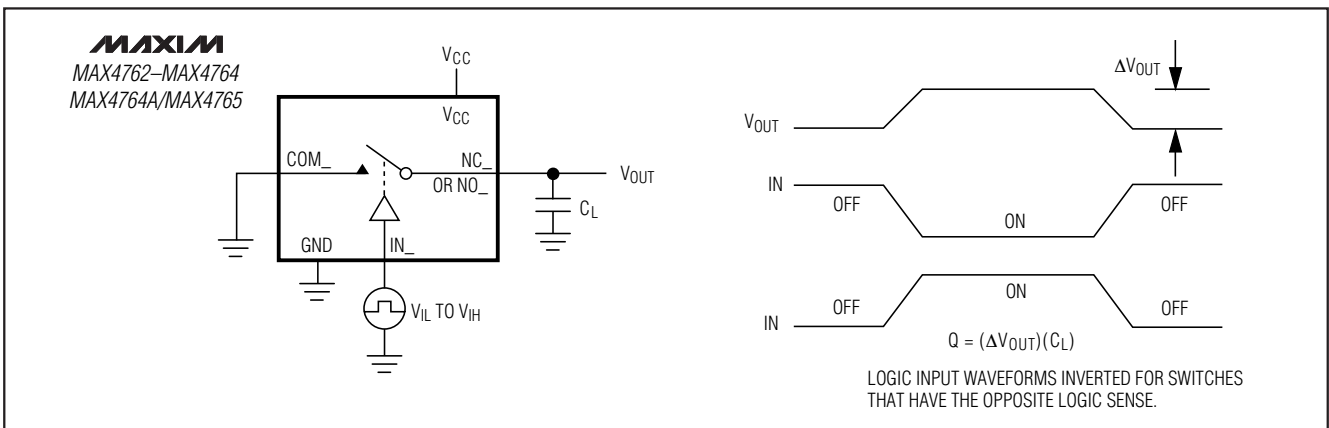


图4. 电荷注入

# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

测试电路/时序图(续)

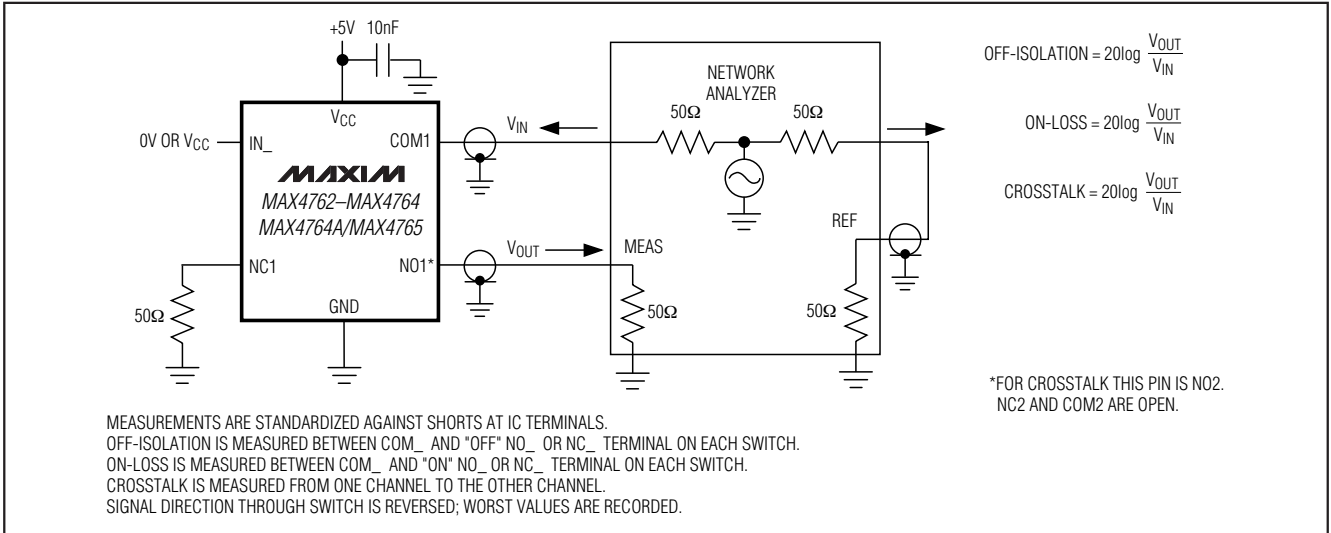


图5. 导通损耗、关断隔离和串扰

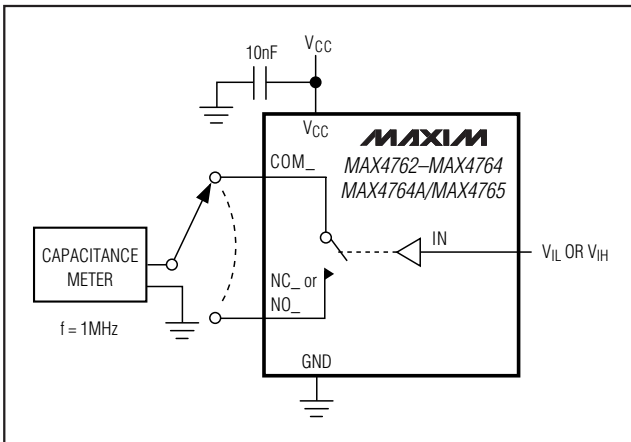
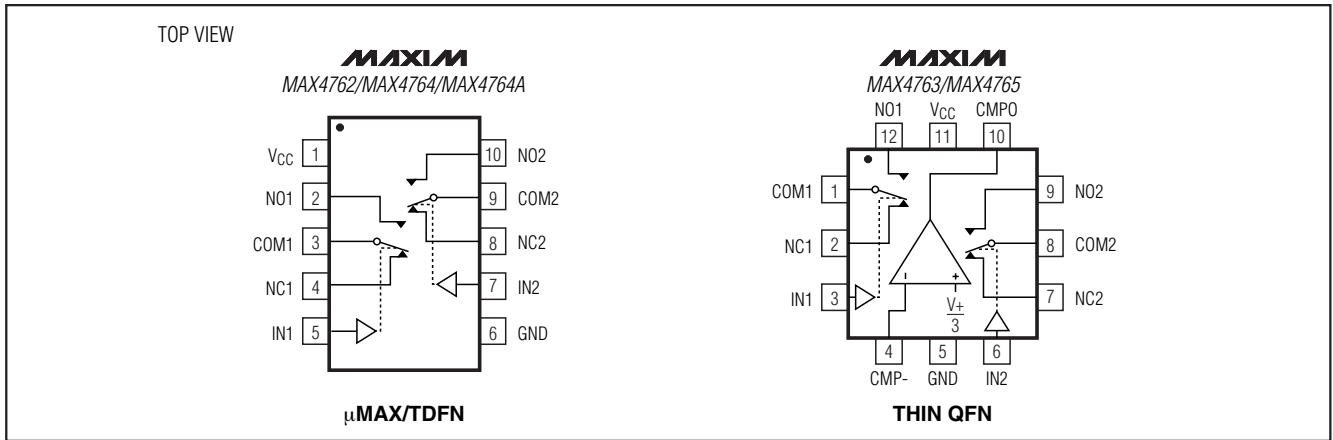


图6. 通道的开/关电容

# 低电压、双路SPDT、 音频静音开关，可提供负摆幅

引脚排列/功能框图/真值表(续)



## 选型指南

PART	COMPARATOR	SHUNT	PACKAGE SIZE (mm)
MAX4762EBC-T	No	No	1.5 x 2.0
MAX4762ETB	No	No	3.0 x 3.0
MAX4762EUB	No	No	3.0 x 5.0
MAX4763EBC-T	Yes	No	1.5 x 2.0
MAX4763ETC	Yes	No	4.0 x 4.0
MAX4764EBC-T	No	Yes	1.5 x 2.0
MAX4764ETB	No	Yes	3.0 x 3.0
MAX4764AETB	No	Yes	3.0 x 3.0
MAX4764EUB	No	Yes	3.0 x 5.0
MAX4765EBC-T	Yes	Yes	1.5 x 2.0
MAX4765ETC	Yes	Yes	4.0 x 4.0

## 订购信息(续)

PART	TEMP RANGE	PIN-PACKAGE	TOP MARK
<b>MAX4763</b> EBC-T	-40°C to +85°C	12 UCSP-12	ABS
MAX4763ETC	-40°C to +85°C	12 Thin QFN	AAED
<b>MAX4764</b> ETB	-40°C to +85°C	10 TDFN	ACH
MAX4764EUB	-40°C to +85°C	10 µMAX	—
MAX4764EBC-T	-40°C to +85°C	12 UCSP-12	ABV
<b>MAX4764A</b> ETB	-40°C to +85°C	10 TDFN	AQP
<b>MAX4765</b> EBC-T	-40°C to +85°C	12 UCSP-12	ABT
MAX4765ETC	-40°C to +85°C	12 Thin QFN	AAEE

## 芯片信息

TRANSISTOR COUNT: 769

PROCESS: BiCMOS

MAX4762-MAX4764/MAX4764A/MAX4765

# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

封装信息

(本数据资料提供的封装图可能不是最近的规格，如需最近的封装外型信息，请查询 [www.maxim-ic.com.cn/packages](http://www.maxim-ic.com.cn/packages).)

**TOP VIEW**

COMMON DIMENSIONS	
A	0.62±0.05-0.08
A1	0.29±0.02
A2	0.33 REF.
b	∅0.35±0.03
D1	1.00 BASIC
E1	1.50 BASIC
e	0.50 BASIC
SD	0.00 BASIC
SE	0.25 BASIC

PKG. CODE	VARIABLE DIMENSIONS		DEPOPULATED SOLDER BALLS
	D	E	
B12-1	1.54±0.05	2.02±0.05	NONE
B12-2	1.54±0.05	2.02±0.05	B3
B12-3	1.54±0.05	2.12±0.05	NONE
B12-4	1.54±0.05	2.02±0.05	B2, B3
B12-5	1.64±0.05	2.12±0.05	B2
B12-6	1.64±0.05	2.12±0.05	B3
B12-7	1.54±0.05	2.02±0.05	B1, B3
B12-8	1.54±0.05	2.02±0.05	B2
B12-9	1.54±0.05	2.12±0.05	B2, B3
B12-10	1.54±0.05	2.02±0.05	B1, B2, B3, B4
B12-11	1.54±0.05	2.02±0.05	A2, C3

**NOTES:**

- ALL DIMENSIONS ARE IN MILLIMETERS.
- PRODUCT MARKING: NUMBER OF CHARACTERS AND LINES VARY PER PRODUCT.

**BOTTOM VIEW**

**SIDE VIEW**

PROPRIETARY INFORMATION

TITLE:  
PACKAGE OUTLINE, 4x3 UCSP

APPROVAL	DOCUMENT CONTROL NO. 21-0104	REV. F
		1/1

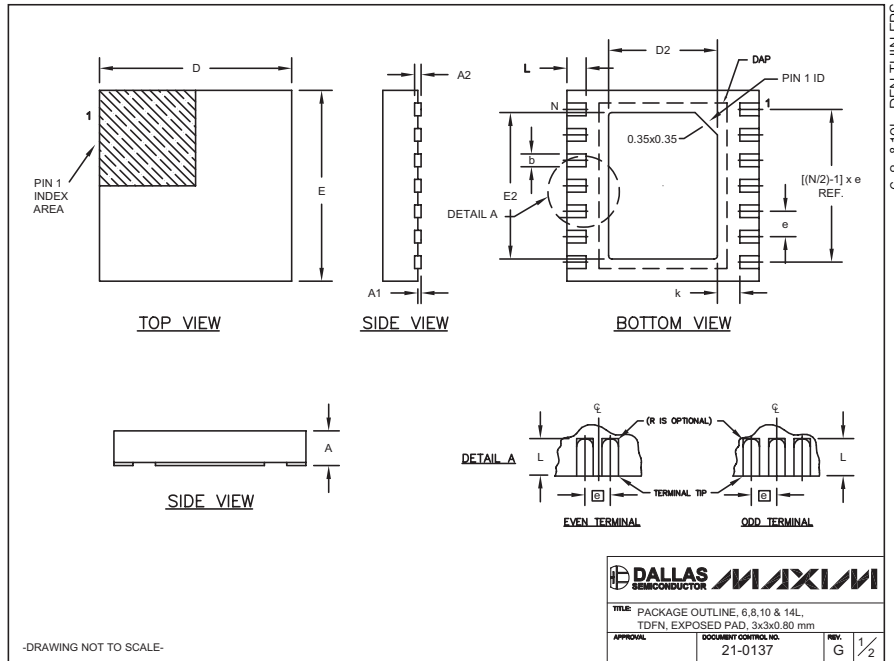
12L UCSP 4x3 EFS

# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

封装信息(续)

(本数据资料提供的封装图可能不是最近的规格，如需最近的封装外型信息，请查询 [www.maxim-ic.com.cn/packages](http://www.maxim-ic.com.cn/packages).)

MAX4762-MAX4764/MAX4764A/MAX4765



COMMON DIMENSIONS							
SYMBOL	MIN.	MAX.					
A	0.70	0.80					
D	2.90	3.10					
E	2.90	3.10					
A1	0.00	0.05					
L	0.20	0.40					
k	0.25 MIN.						
A2	0.20 REF.						

PACKAGE VARIATIONS								
PKG. CODE	N	D2	E2	e	JEDEC SPEC	b	[(N/2)-1] x e	DOWNBENDS ALLOWED
T633-1	6	1.50±0.10	2.30±0.10	0.95 BSC	MO229 / WEEA	0.40±0.05	1.90 REF	NO
T833-2	6	1.50±0.10	2.30±0.10	0.95 BSC	MO229 / WEEA	0.40±0.05	1.90 REF	NO
T833-1	8	1.50±0.10	2.30±0.10	0.65 BSC	MO229 / WEEC	0.30±0.05	1.95 REF	NO
T833-2	8	1.50±0.10	2.30±0.10	0.65 BSC	MO229 / WEEC	0.30±0.05	1.95 REF	NO
T833-3	8	1.50±0.10	2.30±0.10	0.65 BSC	MO229 / WEEC	0.30±0.05	1.95 REF	YES
T1033-1	10	1.50±0.10	2.30±0.10	0.50 BSC	MO229 / WEED-3	0.25±0.05	2.00 REF	NO
T1433-1	14	1.70±0.10	2.30±0.10	0.40 BSC	----	0.20±0.05	2.40 REF	YES
T1433-2	14	1.70±0.10	2.30±0.10	0.40 BSC	----	0.20±0.05	2.40 REF	NO

NOTES:

1. ALL DIMENSIONS ARE IN mm. ANGLES IN DEGREES.
2. COPLANARITY SHALL NOT EXCEED 0.08 mm.
3. WARPAGE SHALL NOT EXCEED 0.10 mm.
4. PACKAGE LENGTH/PACKAGE WIDTH ARE CONSIDERED AS SPECIAL CHARACTERISTIC(S).
5. DRAWING CONFORMS TO JEDEC MO229, EXCEPT DIMENSIONS "D2" AND "E2", AND T1433-1 & T1433-2.
6. "N" IS THE TOTAL NUMBER OF LEADS.
7. NUMBER OF LEADS SHOWN ARE FOR REFERENCE ONLY.

-DRAWING NOT TO SCALE-

**DALLAS SEMICONDUCTOR** **MAXIM**

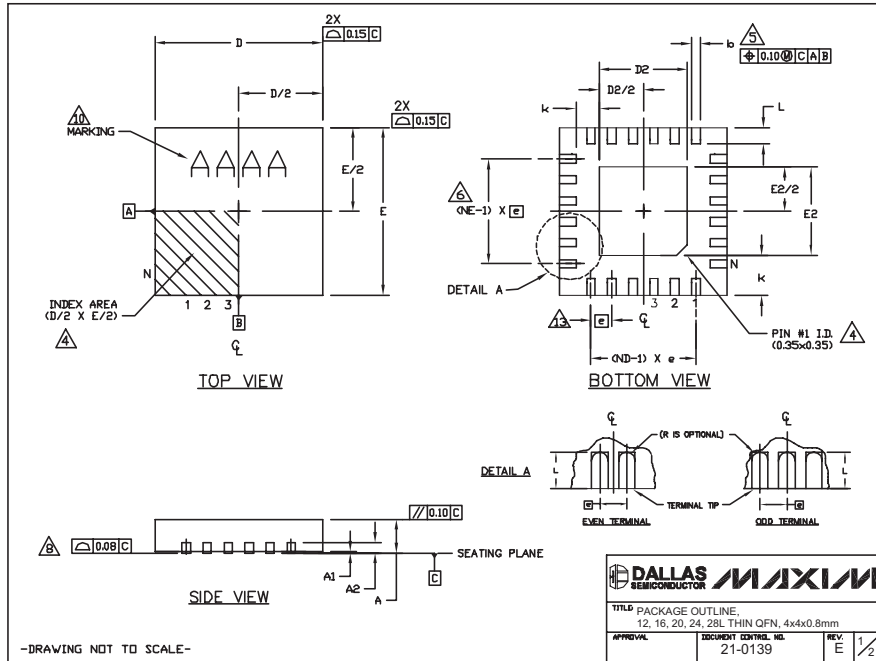
TITLE: PACKAGE OUTLINE, 6, 8, 10 & 14L, DFN, EXPOSED PAD, 3x3x0.80 mm

APPROVAL: DOCUMENT CONTROL NO. 21-0137 REV. G 2/2

# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

封装信息(续)

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COMMON DIMENSIONS															
PKG REF.	12L 4x4			16L 4x4			20L 4x4			24L 4x4			28L 4x4		
	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.
A	0.70	0.75	0.80	0.70	0.75	0.80	0.70	0.75	0.80	0.70	0.75	0.80	0.70	0.75	0.80
A1	0.0	0.02	0.05	0.0	0.02	0.05	0.0	0.02	0.05	0.0	0.02	0.05	0.0	0.02	0.05
A2	0.20 REF.			0.20 REF.			0.20 REF.			0.20 REF.			0.20 REF.		
b	0.25	0.30	0.35	0.25	0.30	0.35	0.25	0.25	0.30	0.18	0.23	0.30	0.15	0.20	0.25
D	3.90	4.00	4.10	3.90	4.00	4.10	3.90	4.00	4.10	3.90	4.00	4.10	3.90	4.00	4.10
E	3.90	4.00	4.10	3.90	4.00	4.10	3.90	4.00	4.10	3.90	4.00	4.10	3.90	4.00	4.10
e	0.80 BSC.			0.65 BSC.			0.50 BSC.			0.50 BSC.			0.40 BSC.		
h	0.25	-	-	0.25	-	-	0.25	-	-	0.25	-	-	0.25	-	-
L	0.45	0.55	0.65	0.45	0.55	0.65	0.45	0.55	0.65	0.30	0.40	0.50	0.30	0.40	0.50
N	12			16			20			24			28		
ND	3			4			5			6			7		
NE	3			4			5			6			7		
POSE VCC	VGG8			VGGC			VGGD-1			VGGD-2			VGGE		

EXPOSED PAD VARIATIONS												
PKG CODES	D2			E2			DOWN BONDS ALLOWED					
	MIN.	NDM.	MAX.	MIN.	NDM.	MAX.						
T1244-3	1.95	2.10	2.25	1.95	2.10	2.25	YES					
T1244-4	1.95	2.10	2.25	1.95	2.10	2.25	NO					
T1644-3	1.95	2.10	2.25	1.95	2.10	2.25	YES					
T1644-4	1.95	2.10	2.25	1.95	2.10	2.25	NO					
T2044-2	1.95	2.10	2.25	1.95	2.10	2.25	YES					
T2044-3	1.95	2.10	2.25	1.95	2.10	2.25	NO					
T2444-2	1.95	2.10	2.25	1.95	2.10	2.25	YES					
T2444-3	2.45	2.60	2.63	2.45	2.60	2.63	YES					
T2444-4	2.45	2.60	2.63	2.45	2.60	2.63	NO					
T2844-1	2.50	2.60	2.70	2.50	2.60	2.70	NO					

**NOTES:**

- DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
- ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.
- N IS THE TOTAL NUMBER OF TERMINALS.
- THE TERMINAL #1 IDENTIFIER AND TERMINAL NUMBERING CONVENTION SHALL CONFORM TO JEDEC 95-1 SPP-012. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL, BUT MUST BE LOCATED WITHIN THE ZONE INDICATED. THE TERMINAL #1 IDENTIFIER MAY BE EITHER A MOLD OR MARKED FEATURE.
- DIMENSION b APPLIES TO METALIZED TERMINAL AND IS MEASURED BETWEEN 0.25 mm AND 0.30 mm FROM TERMINAL TIP.
- ND AND NE REFER TO THE NUMBER OF TERMINALS ON EACH D AND E SIDE RESPECTIVELY.
- DEPOPULATION IS POSSIBLE IN A SYMMETRICAL FASHION.
- COPLANARITY APPLIES TO THE EXPOSED HEAT SINK SLUG AS WELL AS THE TERMINALS.
- DRAWING CONFORMS TO JEDEC MO220, EXCEPT FOR T2444-3, T2444-4 AND T2844-1.
- MARKING IS FOR PACKAGE ORIENTATION REFERENCE ONLY.
- COPLANARITY SHALL NOT EXCEED 0.08mm
- WARPAGE SHALL NOT EXCEED 0.10mm
- LEAD CENTERLINES TO BE AT TRUE POSITION AS DEFINED BY BASIC DIMENSION "a", ±0.05.
- NUMBER OF LEADS SHOWN ARE FOR REFERENCE ONLY.

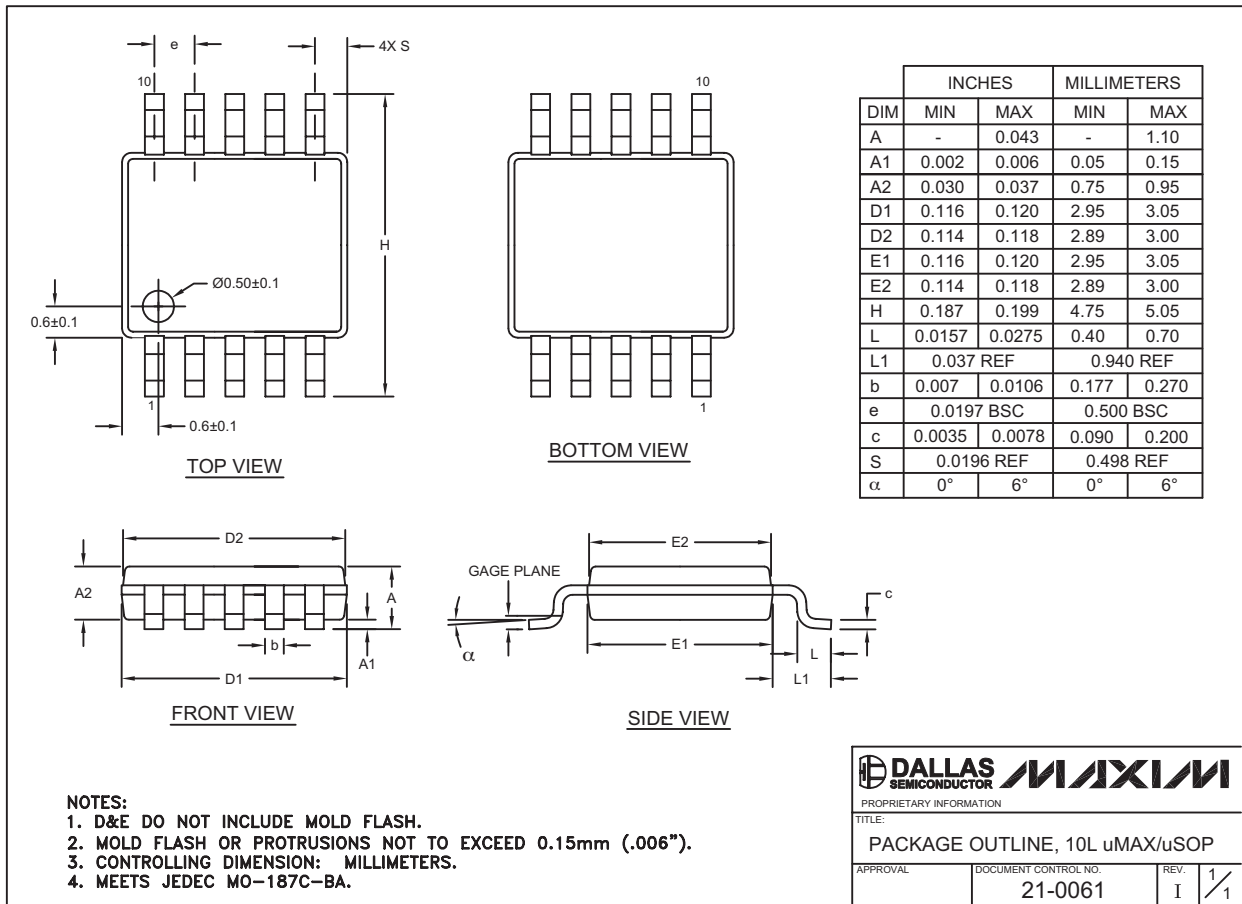
**DALLAS SEMICONDUCTOR MAXIM**  
 TITLE: PACKAGE OUTLINE, 12, 16, 20, 24, 28L THIN QFN, 4x4x0.8mm  
 APPROVAL: DOCUMENT CONTROL NO. 21-0139 REV. E 2/2

-DRAWING NOT TO SCALE-

# 低电压、双路SPDT、 音频静噪开关，可提供负摆幅

封装信息(续)

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10LUMAX.EPS

MAX4762-MAX4764/MAX4764A/MAX4765

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