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## FSA2367 — 低导通电阻(0.75Ω) 三通道SPDT负电压音频源开关

### 特点

- 在扩展控制电压范围内 ( $V_{IN}=2.6V$ ,  $V_{CC}=4.3V$ ), 最大  $I_{CCT}$  电流为  $10\mu A$
- $C_{ON}$  电容  $55pF$  (典型值)
- 典型导通电阻 ( $R_{ON}$ ) 为  $0.75\Omega$
- 1A,2A,3A 端口的负向音频电压可达  $-2V$
- -3db 带宽:  $>150 MHz$
- 低功耗 (最大  $1\mu A$ )
- 1A/2A/3A 管脚 ( $I_{IN} < 2\mu A$ ) 具有断电功能
- 无铅封装 14 管脚 TSSOP 及 DQFN

### 应用

- 手机, PDA, 数码像机及笔记本电脑
- 液晶监控器, 电视机及机顶盒

### 总述

FSA2367是一种三通道单刀双掷 (3x SPDT) 多路转换开关, 它在单对选择脚的控制下可访问3个双通道的数据或音频源. FSA2367在其管脚1A,2A和3A上具有一个专用电路可实现电源关断功能. 去除Vcc上的电源且在1A/2A/3A管脚上保持电压, 可实现最小的电流泄漏至数据管脚1A/2A/3A内. 同时FSA2367具有非常低的静态电流可延长电池寿命. 低静态电流特点可服务于移动手持装置, 通过其它可直接与基带处理器通用I/O口直接连接. 典型应用包括在便携式及用户应用装置, 如手机, 数码像机及带HUB或控制器的笔记本内用作开关.

### 重要注解

欲知其它详情, 请联系

analogswitch@fairchildsemi.com

### 订货信息

元件编号	表面标记	Eco Status	封装说明
FSA2367BQX	2367	Green	14引脚 DQFN封装, 2.5 x 3.0mm, JEDEC MO-241
FSA2367MTCX	FSA2367	RoHS	14引脚 TSSOP, 4.4mm宽, JEDEC MO-153

For Fairchild's definition of Eco Status, please visit: [http://www.fairchildsemi.com/company/green/rohs\\_green.html](http://www.fairchildsemi.com/company/green/rohs_green.html).

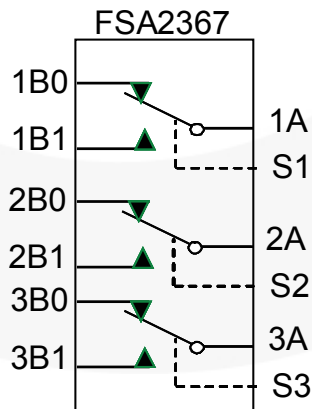


图1. 模拟表达符号

### 管脚分配图

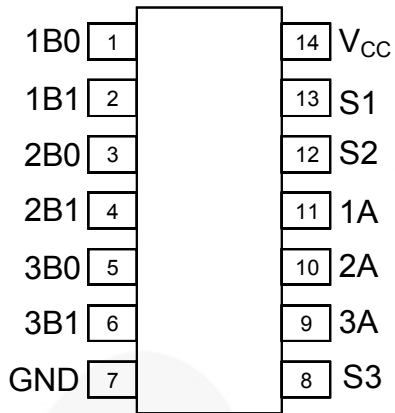


图2. TSSOP-14  
(顶视图)

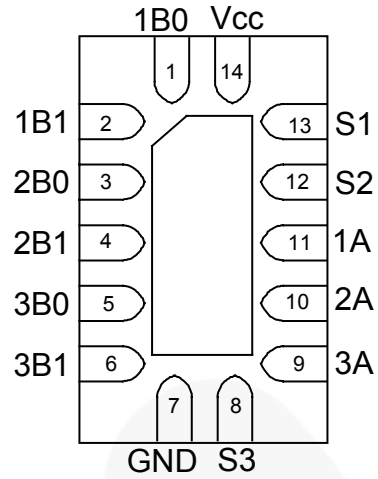


图3. DQFN-14  
(顶视图)

### 管脚描述

名称	描述
S1, S2, S3	开关控制选择
1A, 2A, 3A	数据总线(共用)
1Bn, 2Bn, 3Bn	多路源输入

### 真值表

S1, S2, S3	功能
低电平	1B0=1A; 2B0=2A; 3B0=3A
高电平	1B1=1A; 2B1=2A; 3B1=3A

## 最大绝对额定值

超出绝对最大额定值会破坏设备,设备会不工作或者说不建议设备在和超过建议的工作条件下被操作. 另外, 过长的暴露在超过建议工作条件下会影响设备的可靠性. 这种绝对最大额定值仅仅是极端额定值.

表达符号	参数		最小值	最大值	单位
V <sub>CC</sub>	供电电压		-0.5	6.0	V
V <sub>SW</sub>	开关输入/输出电压 <sup>(1)</sup>	1Bn, 2Bn, 3Bn	V <sub>CC</sub> -5.5	V <sub>CC</sub> -0.3	V
		1A, 2A ,3A Pins	V <sub>CC</sub> -5.5	V <sub>CC</sub> -0.3	V
V <sub>CNTRL</sub>	控制输入电压 <sup>(1)</sup>	S0, S1端口	-0.5	6.0	V
I <sub>IK</sub>	输入钳位二极管电流		-50		mA
I <sub>SW</sub>	开关I/O 电流(连续)			350	mA
I <sub>SWPEAK</sub>	峰值开关电流 (脉冲持续时间1ms, <10%占空系数)			500	mA
P <sub>D</sub>	功耗 at 85°C	DQFN-14		2.5	μW
		TSSOP-14		2.5	μW
T <sub>STG</sub>	保存温度范围		-65	+150	°C
T <sub>J</sub>	最高结点温度			+150	°C
T <sub>L</sub>	导线温度 焊接	焊接, 10秒		+260	°C
ESD	人体电流模式(JEDEC: JESD22-A114)	所有管脚		5500	kV
		I/O to GND		8000	
		VCC to GND		8000	
	充放电模式 (JEDEC: JESD22-C101)			2000	kV

注:

- 如输入及输出二极管电流额定值均达到时则可能会超出输入及输出负额定值.

## 推荐工作条件

推荐工作条件表中定义的是实际元件工作的条件. 推荐工作条件指定用于保证实现数据表规范的最佳性能. Fairchild 建议不得超出以上值或设计至最大绝对额定值.

表达符号	参数		最小值	最大值	单位
V <sub>CC</sub>	供电电压		2.7	4.3	V
V <sub>S0:S1</sub>	控制输入电压		0	V <sub>CC</sub>	V
V <sub>SW</sub>	开关输入/输出电压		V <sub>CC</sub> -5.5	V <sub>CC</sub> -0.3	
T <sub>A</sub>	操作温度		-40	85	°C
θ <sub>JA</sub>	热阻(大气)			145	°C/W

## DC 电气特性

如未另外说明均为25°C下的标准值.

表达符号	参数	条件	V <sub>CC</sub> (V)	T <sub>A</sub> = - 40°C to +85°C			单位
				最小	典型	最大	
	模拟信号范围			V <sub>CC</sub> - 5.5		V <sub>CC</sub>	V
V <sub>IK</sub>	钳位二极管电压	I <sub>IN</sub> = -18mA	3.0			-1.2	V
V <sub>IH</sub>	控制输入高电平		2.7至3.6	1.2			V
			3.6至4.3	1.5			
V <sub>IL</sub>	控制输入低电平		2.7至3.6			0.5	V
			3.6至4.3			0.7	
I <sub>IN</sub>	控制输入漏电流	V <sub>IN</sub> = 0 至 V <sub>CC</sub>	4.3			±1	μA
I <sub>OFF</sub>	断开漏电流(共用端口 1A, 2A, 3A)	共用端口(1A, 2A, 3A) V <sub>SW</sub> = 0 至 4.3V V <sub>CC</sub> = 0V	0			±10	μA
I <sub>NO(OFF)</sub>	1Bn, 2Bn, 3Bn端口的断开漏电流	1Bn, 2Bn, 3Bn = 0.5V, V <sub>CC</sub> - 0.5V, 1A, 2A, 3A = 0.5V, V <sub>CC</sub> - 0.5V, 见图8	4.3	-250	10	250	nA
I <sub>NC(ON)</sub>	1Bn, 2Bn端口的导通漏电流	1Bn, 2Bn, 3Bn = 浮动 1A, 2A, 3A = 0.5V, V <sub>CC</sub> - 0.5V, 见图10	4.3	-250	10	250	nA
R <sub>ON</sub>	开关导通电阻 <sup>(2)</sup>	1Bn或2Bn或3Bn = 0V, 0.7V, 2.0V, 2.7V; I <sub>ON</sub> = -100mA, 见图9	2.7		0.75	2.00	Ω
ΔR <sub>ON</sub>	□导通电阻 <sup>(3)</sup>	1Bn 或2Bn或3Bn = 0.7V, I <sub>ON</sub> = -100mA	2.7		0.50		Ω
R <sub>FLAT(ON)</sub>	导通电阻平坦度 <sup>(4)</sup>	1Bn或2Bn或3Bn = 0V, 0.7V, 2.0V, 2.7V; I <sub>ON</sub> = -100mA	2.7至4.3		0.23	0.40	Ω
I <sub>CC</sub>	静态工作电流	V <sub>SW</sub> = 0 或V <sub>CC</sub> , I <sub>OUT</sub> = 0	4.3			500	nA
I <sub>CC(T)</sub>	不同控制电压及V <sub>CC</sub> 增加时I <sub>CC</sub> 相应的增加量	V <sub>CNTRL</sub> = 2.6V	4.3		2.2	10.0	μA
		V <sub>CNTRL</sub> = 1.8V			6.5	15.0	

注:

- 在开关指定电流下, 通过测量管脚1Bn(2Bn, 3Bn)和1A(2A, 3A)之间的电压降获得. 导通电阻由两管脚上较低的电压决定.
- 由特性保证.
- 平坦度定义为指定范围内导通电阻最大值与最小值之间的差值.

**AC电气特性**如未另外说明均为25°C,  $V_{CC}=3.3V$ 下的标准值.

表达符号	参数	条件	$V_{CC}$ (V)	$T_A=-40^{\circ}C$ 至 $+85^{\circ}C$			单位
				最小值	典型值	最大值	
$t_{ON}$	开启时间, S至输出	$V_{Bn}=1.5V, R_L=50\Omega,$ $C_L=35pF$ 图10, 图12	2.7至4.3		45	60	ns
$t_{OFF}$	关闭时间, S至输出	$V_{Bn}=1.5V, R_L=50\Omega,$ $C_L=35pF$ 图10, 图12	2.7至4.3		25	45	ns
$t_{PD}$	传播延迟 <sup>(0)</sup>	$R_L=50\Omega, C_L=5pF$ 图10, 图13	3.3		0.25		ns
$t_{BBM}$	先断后通 <sup>(0)</sup>	$R_L=50\Omega, C_L=35pF$ $V_{IN1}=V_{IN2}=V_{IN3}=1.5V$ 图11	2.7至4.3	1	6		ns
Q	电荷注入	$R_{GEN}=0\Omega, C_L=100pF,$ $R_L=OPEN; V_{GEN}=0V$ 图 14	2.7至4.3		9		pC
OIRR	断开隔离	$f=100\text{ kHz}, R_L=50\Omega$ 图4, 图16	2.7至4.3		-70		dB
Xtalk	非相邻串扰	$f=100\text{ kHz}, R_L=50\Omega$ 图5, 图17	2.7至 4.3		-100		dB
THD	总谐波失真	$R_L=600\Omega, V_{SW}=0.5V_{pp},$ $f=20\text{ Hz to }20\text{kHz}$ 图20	2.7至4.3		0.01		%
BW	-3db带宽	$R_L=50\Omega, C_L=0, 5pF$ 图6, 图15	2.7至4.3		150		MHz

注:

5. 由特性保证而非产品试验.

**电容**

表达符号	参数	条件	$T_A=-40^{\circ}C$ 至 $+85^{\circ}C$			单位
			最小值	典型值	最大值	
$C_{IN}$	控制脚输入电容	$V_{CC}=0V$		2.5		pF
$C_{ON}$	A/B导通电容	$V_{CC}=3.3, f=1\text{MHz}$ 图19			55	
$C_{OFFB}$	端口1Bn, 2Bn, 3Bn断开电容	$V_{CC}=3.3, f=1\text{MHz}$ 图18			16	
$C_{OFFA}$	端口 1A, 2A, 3A 断开电容	$V_{CC}=3.3, f=1\text{MHz}$ 图18			20	

典型特性

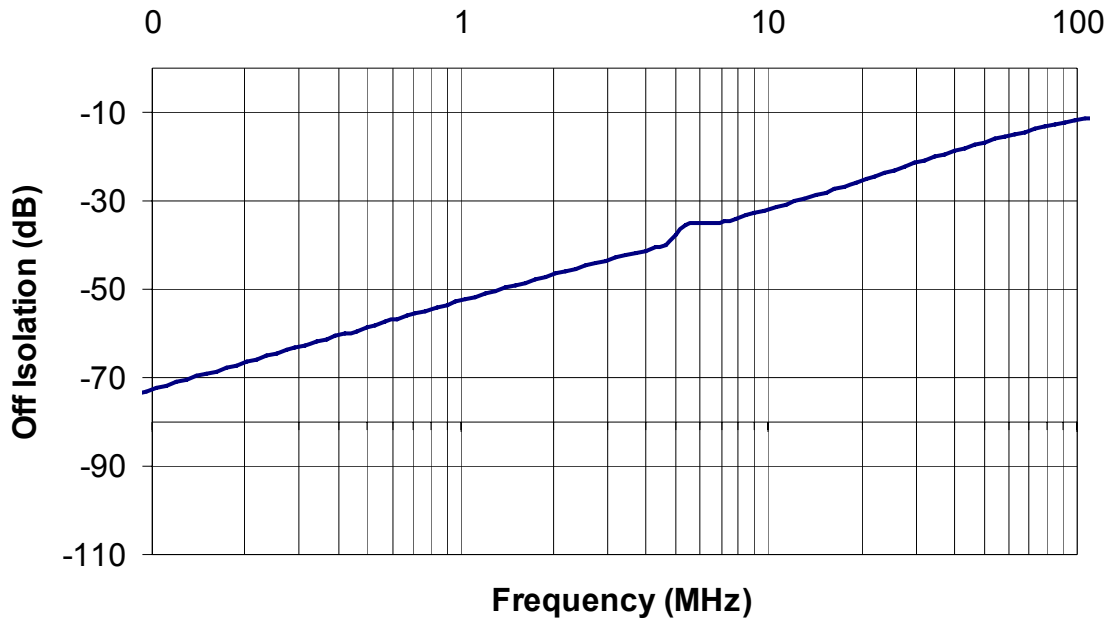


图4. 断开隔离度  $V_{CC}=3.3V$ ,  $C_L=0pF$

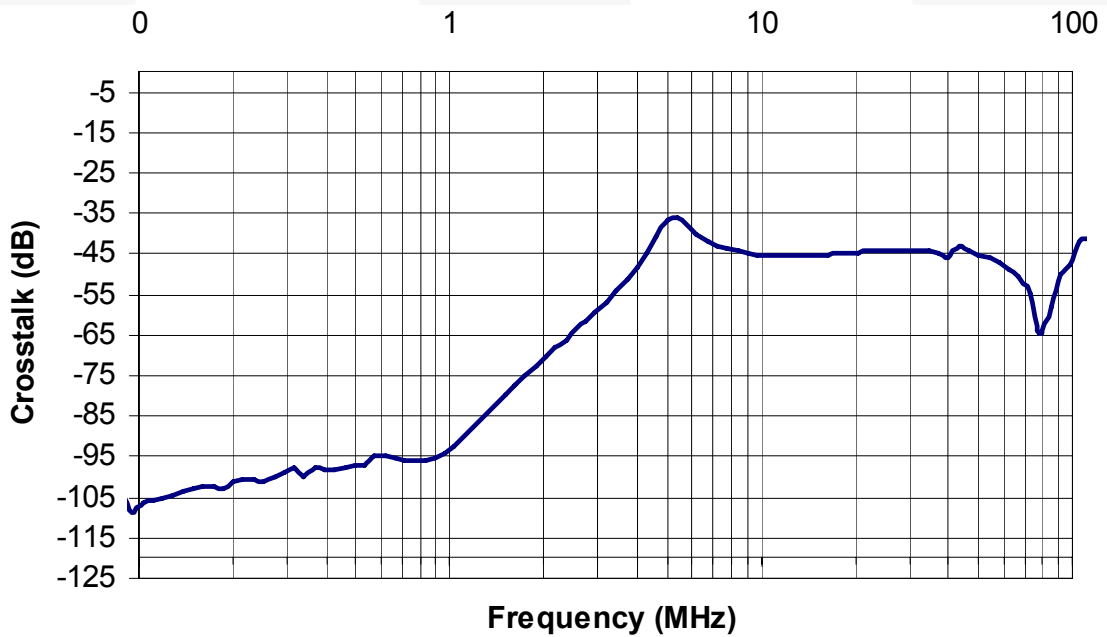


图5. 非相邻串扰  $V_{CC}=3.3V$ ,  $C_L=0pF$

典型特性 (续)

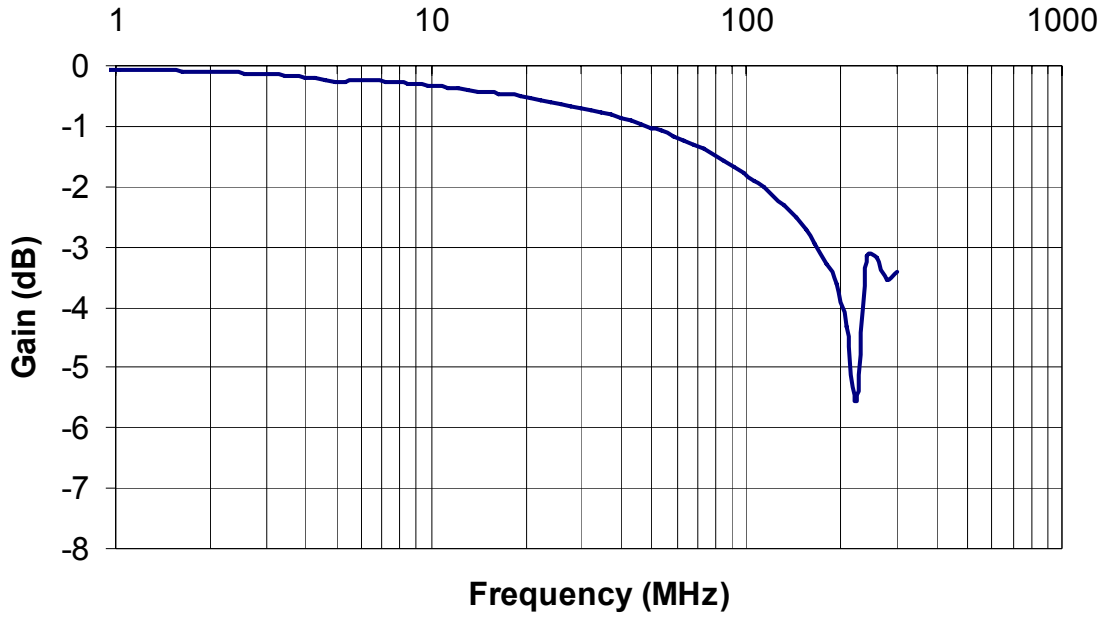


图6. 带宽在 $V_{CC}=3.3V$ ,  $C_L=0pF$

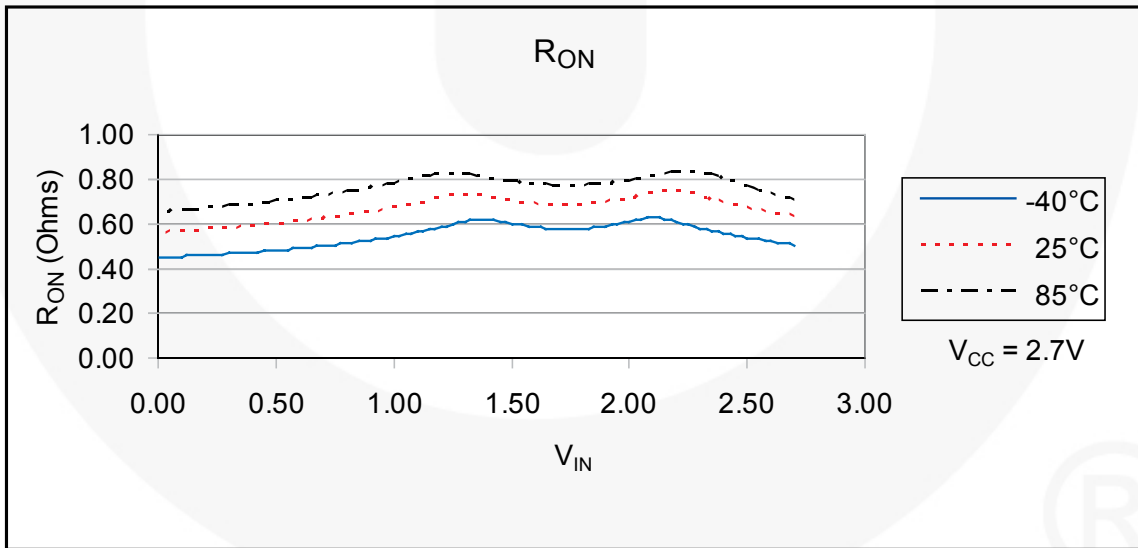
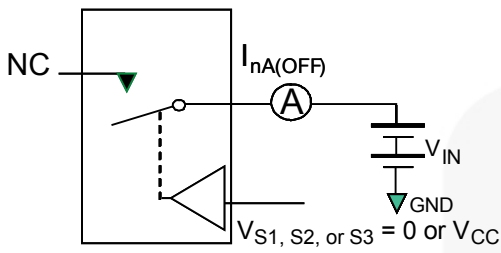


图7. 导通电阻



测试图



\*\*Each switch port is tested separately

图8. 断开漏电流

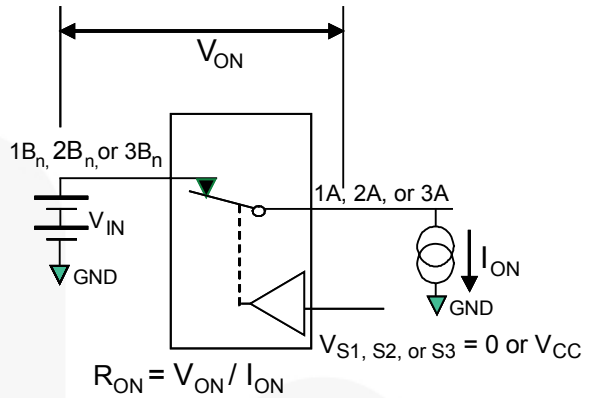
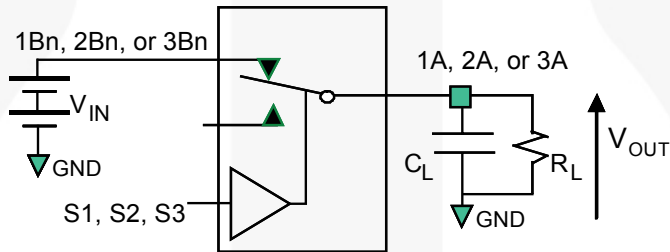
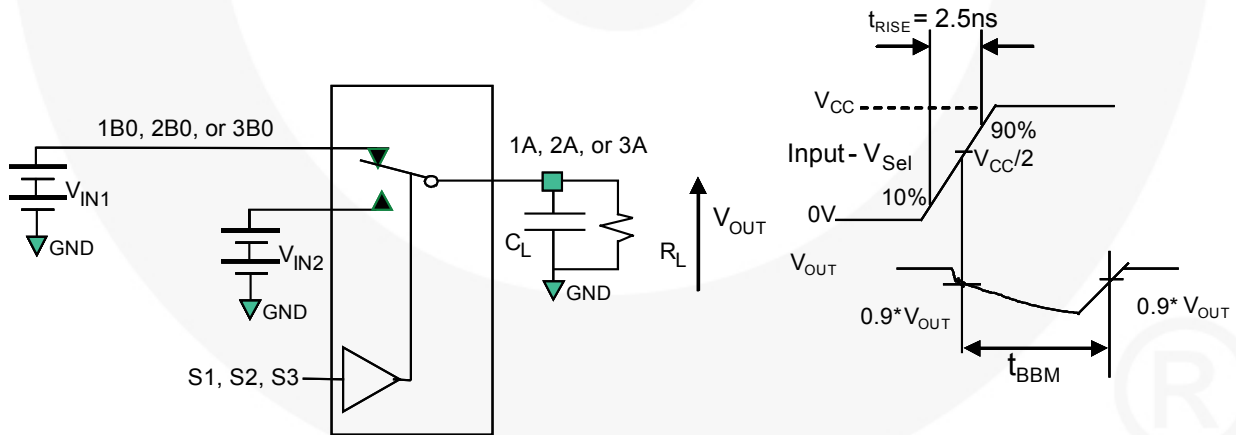


图9. 导通电阻



$R_L$  and  $C_L$  are functions of the application environment (see AC Tables for specific values)  
 $C_L$  includes test fixture and stray capacitance

图10. AC 试验电路负载



$R_L$  and  $C_L$  are functions of the application environment (see AC Tables for specific values)  
 $C_L$  includes test fixture and stray capacitance

图11. 先断后通间隔时间

测试图 (续)

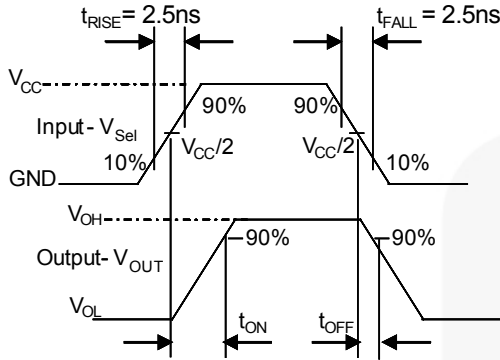


图12. 启动/ 关闭波形

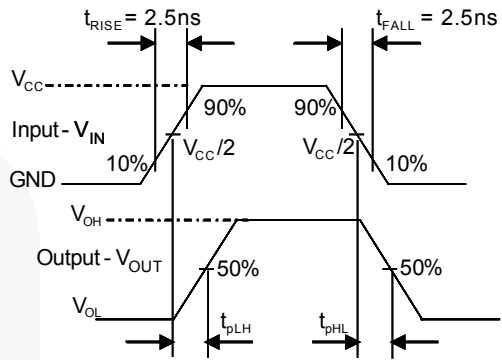


图13. 开关传播延迟波形

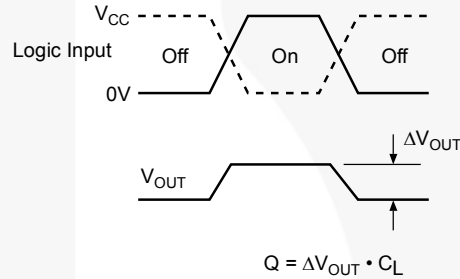
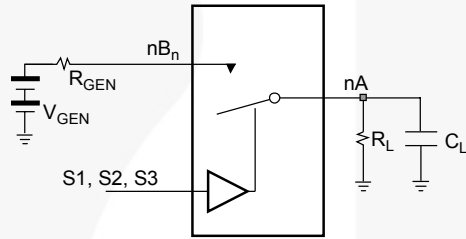
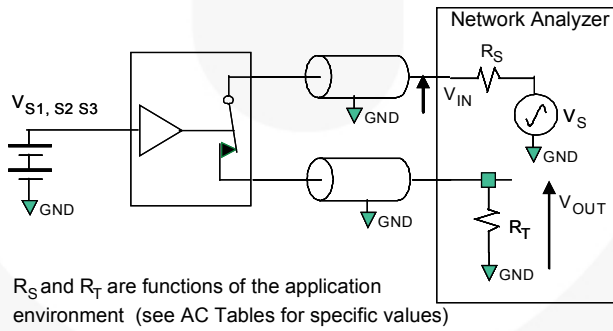
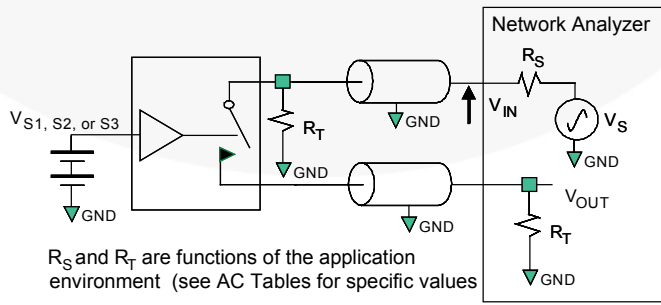


图14. 电荷注入试验( $Q = \Delta V_{OUT} * C_L$ )



$R_S$  and  $R_T$  are functions of the application environment (see AC Tables for specific values)

图15. 带宽



$R_S$  and  $R_T$  are functions of the application environment (see AC Tables for specific values)

$$\text{Off-Isolation} = 20 \text{ Log} (V_{OUT} / V_{IN})$$

图16. 通道断开隔离度

测试图 (续)

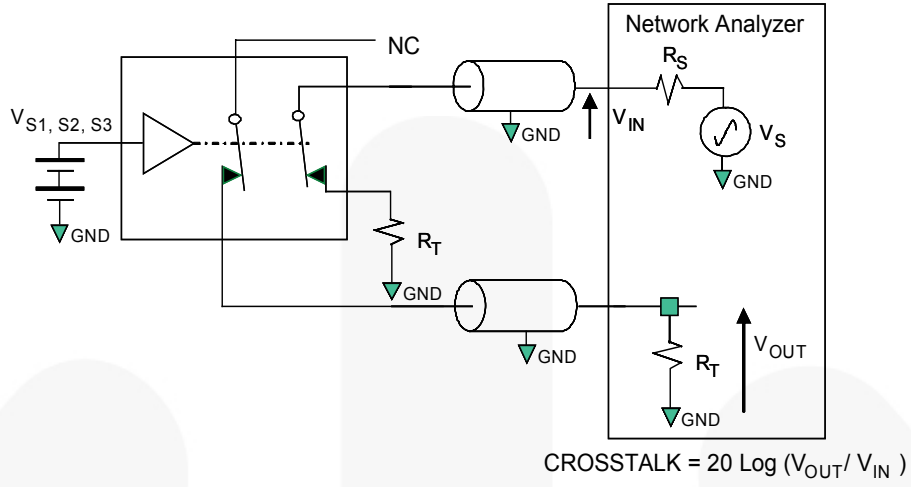


图17. 非相邻通道间的串扰

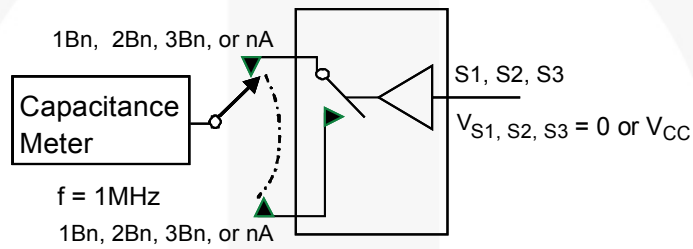


图18. 通道断开电容

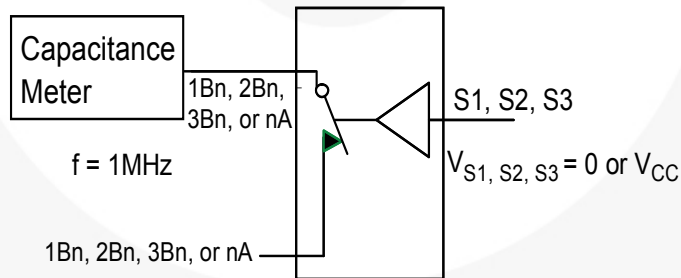


图19. 通道导通电容

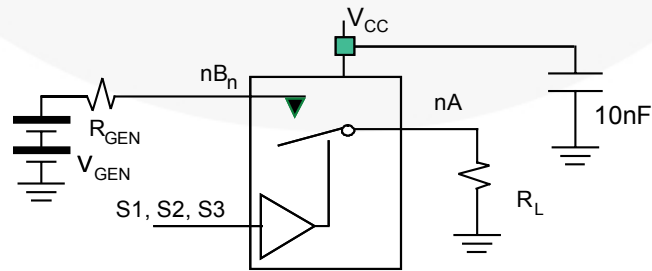
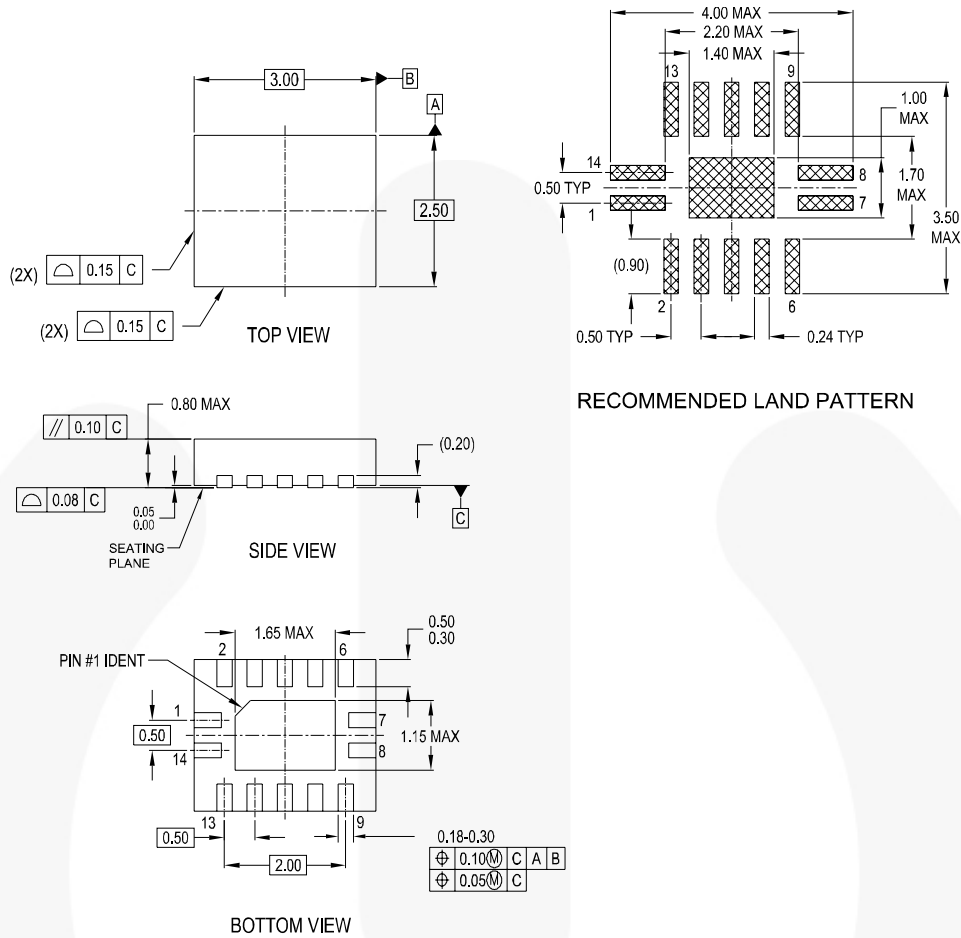


图20. 总谐波失真

物理尺寸



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-241, VARIATION AA
- B. DIMENSIONS ARE IN MILLIMETERS
- C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994

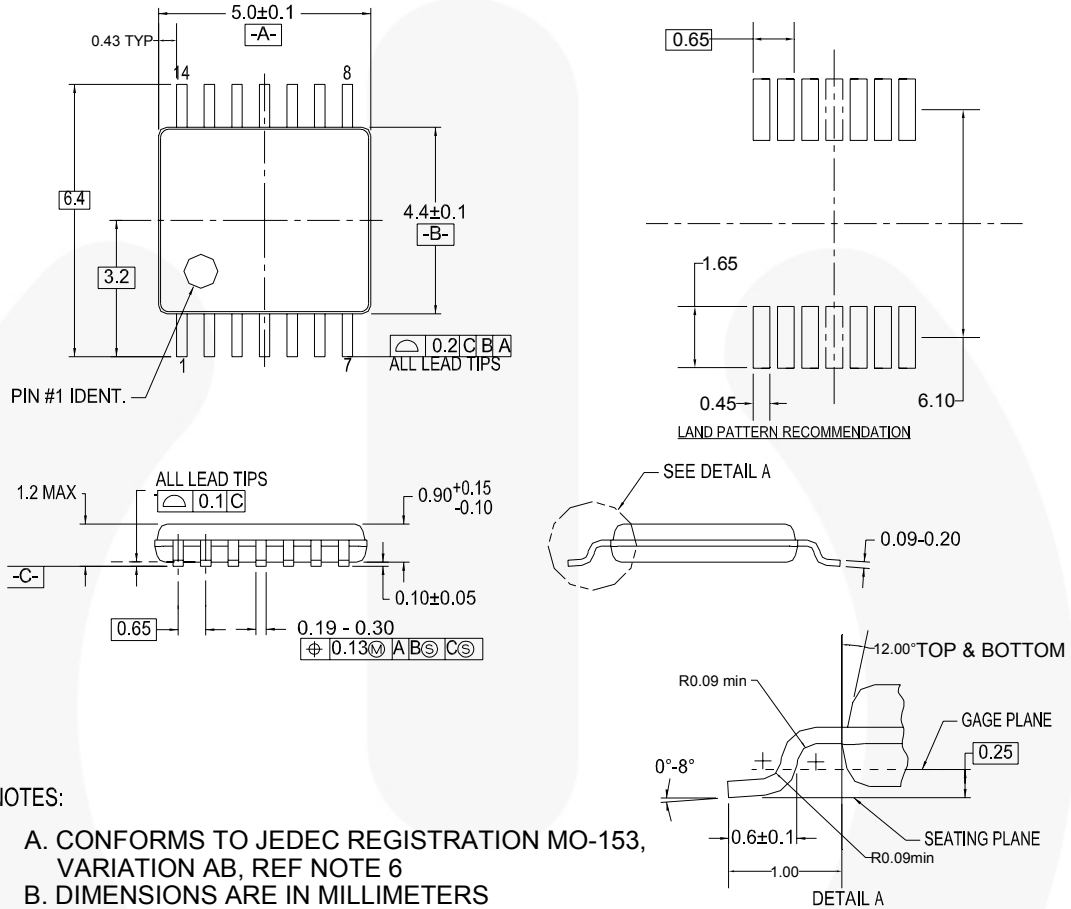
MLP14ArevA

图21. 14引脚DQFN

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

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<http://www.fairchildsemi.com/packaging/>

物理尺寸(续)



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AB, REF NOTE 6
- B. DIMENSIONS ARE IN MILLIMETERS
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS
- D. DIMENSIONING AND TOLERANCES PER ANSI Y14.5M, 1982
- E. LANDPATTERN STANDARD: SOP65P640X110-14M
- F. DRAWING FILE NAME: MTC14REV6

图21. 14-管脚TSSOP







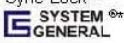
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