

FSA2268 / FSA2268T 低电压及拥有高达 16kV ESD 的二通道 单刀双掷 (0.4Ω) 模拟开关

特点

- 0.4Ω 典型导通电阻 (+3.0V 供电电压)
- 0.25Ω 最大 R_{ON} 平坦度 (+3.0V 供电电压)
- -3db 带宽: > 50MHz
- 在扩展的控制信号电平范围内拥有低漏电流
- 无铅 10-管脚 μMLP (1.4 x 1.8mm) 的封装
- 共用端口的断电保护
- 宽广的 V_{CC} 操作范围: 1.65 到 4.3V
- 人体电流模式 JEDEC: JESD22-A114
 - I/O 接地: 13.5kV
 - 电源接地: 16.0kV
- 在 FSA2268T 中拥有噪音消除终端电阻

应用

- 手机, PDA (掌上电脑), 数码相机和笔记本电脑
- 液晶显示器, 电视及机顶盒

总述

FSA2268 是一种高性能, 二通道单刀双掷模拟开关并拥有超低 R_{ON} 0.4Ω (典型值) 的特点。FSA2268 可以在 V_{CC} 从 1.65V 到 4.3V 这么宽广的范围里工作, 并被设计成先断后通的操作。它的选择输入端口是 TTL 兼容的。


即使在控制电压低于 V_{CC} 情况下 FSA2268 拥有非常低的静态电流, 这一特性可以用最小的电池消耗来实现与基带处理器通用 I/O 之间的直接接口从而满足手机的应用。

FSA2268T 集成了终端电阻当信号有超调或串扰耦合时可以消除噪音, 也就是说“爆音最小化”。

重要注解

欲知更多其它具体的操作信息, 请联系 analogswitch@fairchildsemi.com

订购信息

零件编号	表面标记	 Eco Status	封装说明
FSA2268UMX	GF	Green	10-引脚, 方型超薄 (UMLP), 1.4 x 1.8mm, 0.4mm pitch
FSA2268TUMX	GH	Green	10-引脚, 方型超薄 (UMLP), 1.4 x 1.8mm, 0.4mm pitch
FSA2268L10X	GH	Green	10-引脚, MicroPak™, 1.6mm

 For Fairchild's definition of Eco Status, please visit: http://www.fairchildsemi.com/company/green/rohs_green.html.

模拟符号

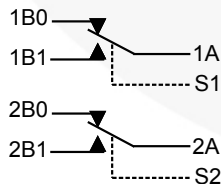


图 1. FSA2268

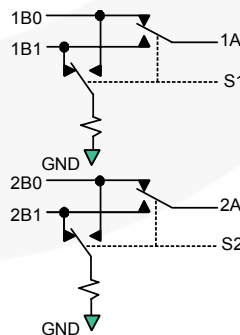


图 2. FSA2268T (含有抗扰终端电阻)

管脚分配图

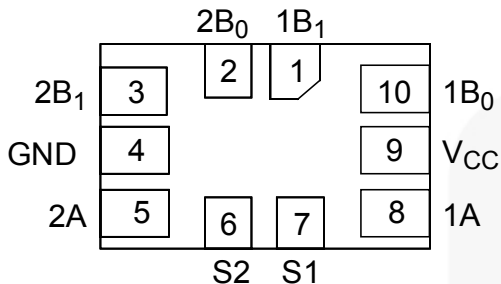


图 3. 10-管脚UMLP (俯视图)

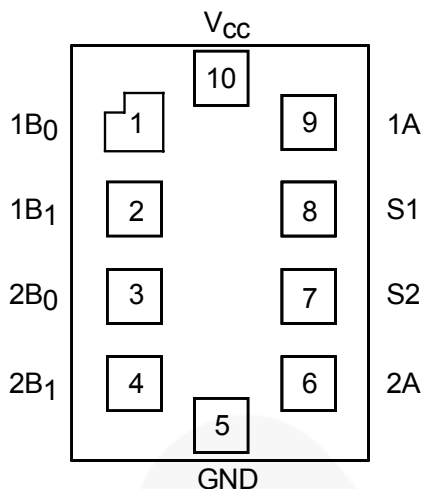


图 4. 10-管脚 Micropak™

管脚描述

管脚号 UMLP	管脚号MicroPak™	名称	描述
1	2	1B ₁	数据端口
2	3	2B ₀	数据端口
3	4	2B ₁	数据端口
4	5	GND	接地
5	6	2A	数据端口
6	7	S2	开关选择脚
7	8	S1	开关选择脚
8	9	1A	数据端口
9	10	V _{CC}	供电电压
10	1	1B ₀	数据端口

真值表

控制输入, S _n	功能
逻辑低	nB0 连接nA (FSA2268/2268T); nB1 接地 (FSA2268T)
逻辑高	nB1 连接nA (FSA2268/2268T); nB0 接地 (FSA2268T)

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 _{CC}	供电电压		-0.5	5.5	V
V _{SW}	开关输入/输出电压 ⁽¹⁾	1B0, 1B1, 2B0, 2B1, 1A, 2A 管脚	-0.5	V _{CC} + 0.3	V
		T版本, nBn 管脚断开	0	1.4	
V _{IN}	控制输入电压 ⁽¹⁾	S1, S2	-0.5	5.5	V
I _{IK}	输入钳位二极管电流			-50	mA
I _{SW}	开关输入/输出电流 (连续)			350	mA
I _{SWPEAK}	峰值开关电流 (脉冲持续时间1ms, <10%占空系统)			500	mA
T _{STG}	保存温度范围		-65	+150	°C
T _J	最高结温			+150	°C
T _L	引线温度 (焊接,10秒)			+260	°C
MSL	湿度敏感性			1	等级
ESD	人体电流模式, JEDEC: JESD22-A114	I/O 接地		13.5	kV
		电源接地		16.0	
		其它各管脚		9.0	
	充放电模式, JEDEC: JESD22-C101		2.0		

注解:

1. 如输入及输出二极管电流额定值均到达时, 则可能会超出输入及输出的负额定值.

建议工作条件

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 _{CC}	供电电压	1.65	4.30	V
V _{IN}	控制输入电压	0	V _{CC}	V
V _{SW}	开关I/O 电压	0	V _{CC}	V
T _A	工作温度	-40	+85	°C

DC电气特性

若无另外规定，所有数值均在25°C下测定。

表达符号	参数	条件	V _{CC} (V)	T _A =+25°C			T _A =-40 to +85°C		单位	
				最小值	典型值	最大值	最小值	最大值		
V _{IH}	输入高电平		3.6 to 4.3				1.7		V	
			2.7 to 3.6				1.5			
			2.3 to 2.7				1.4			
			1.65 to 1.95				0.9			
V _{IL}	输入低电平		3.6 to 4.3					0.7	V	
			2.7 to 3.6					0.5	V	
			2.3 to 2.7					0.4		
			1.65 to 1.95					0.4		
I _{IN}	控制输入漏电流 (S1,S2)	V _{IN} =0 to V _{CC}	1.65 to 4.3				-0.5	0.5	μA	
I _{NO(OFF)} , I _{NC(OFF)} FSA22268	nB0 和 nB1端口断开漏电流	nA=0.3V, V _{CC} =0.3V nB0 or nB1=V _{CC} - 0.3V, 0.3V, or Floating 图 6	1.95 to 4.3	-10		10	-50	50	nA	
I _{NC(OFF)} FSA22268T	nB0 和 nB1端口断开漏电流 (带有终端电阻)	nA=0.3V, nB0 or nB1=0V or Floating, 图 6	1.95 to 4.3	-10		10	-50	50	μA	
I _{A(ON)}	nA导通漏电流	nA=0.3V, V _{CC} =0.3V nB0 or nB1=V _{CC} - 0.3V, 0.3V, or Floating, 图 7	1.95 to 4.3	-20		20	-100	100	nA	
I _{OFF} FSA22268	断开漏电流 (1A, 2A共同端口)	Common Port (1A, 2A), V _{IN} =0V to 4.3V, V _{CC} =0V nB0, nB1=Floating	0V					±1	μA	
I _{OFF} FSA22268T	断开漏电流 (1A, 2A共同端口)	Common Port (1A, 2A), V _{IN} =0V to 4.3V, V _{CC} =0V nB0, nB1=0V or Floating	0V					±40	μA	
R _{ON}	开关导通电阻 ^{(2),(5)}		I _{ON} =100mA, nB0 or nB1=0.7V, 3.6V, 图 5	4.30		0.30			0.50	Ω
			I _{ON} =100mA, nB0 or nB1=0.7V, 2.3V, 图 5	3.00		0.40			0.55	
			I _{ON} =100mA, nB0 or nB1=0V, 0.7V, 1.6V, 图 5	2.30		0.52				
			I _{ON} =100mA, nB0 or nB1=0V, 0.7V, 1.65V, 图 5	1.65		1.00				
ΔR _{ON}	Delta口导通电阻口 ^{(3),(5)}	I _{ON} =100mA, nB0 or nB1=0.7V	4.30		0.04			0.13	Ω	
			3.00		0.06			0.13		
			2.30		0.12					
			1.65		1.00					

Continued on following page...

DC电气特性 (续)

若无另外规定，所有数值均在25°C下测定。

表达符号	参数	条件	V _{CC} (V)	T _A =+25°C			T _A =-40°C to +85°C		单位
				最小值	典型值	最大值	最小值	最大值	
R _{FLAT(ON)}	导通电阻的平坦度 ^{(4),(5)}	I _{OUT} =100mA, nB0 or nB1=0V to V _{CC}	4.30					0.25	Ω
			3.00					0.25	
			2.30		0.5				
			1.65		0.6				
R _{TERM}	内部终端电阻 ⁽⁶⁾				200				Ω
I _{CC}	静态工作电流	V _{IN} =0 or V _{CC} , I _{OUT} =0	4.30	-100		100	-500	500	nA
I _{CCT}	控制输入时I _{CC} 相应的增加量	Input at 2.6V	4.30		3			7	μA
		Input at 1.8V			7			15	

注解:

2. 导通电阻由开关指定电流下A、B管脚之间的电压降决定。
3. $\Delta R_{ON} = R_{ON\ max} - R_{ON\ min}$ 在相同V_{CC}、温度及电压下测得。
4. 平坦度定义为各种条件指定范围内ON电阻最大值与最小值之间的差值。
5. 由特性保证而非产品试验, for V_{CC}=1.65-3.00.
6. 由特性保证而非产品试验。

AC电气特性

若无另外规定, 有数值均在 $V_{CC}=3.3V$ 和 $25^{\circ}C$ 下测定。

表达符号	参数	条件	V_{CC} (V)	$T_A=+25^{\circ}C$			$T_A=-40^{\circ}C$ to $+85^{\circ}C$		单位	图号
				最小值	典型值	最大值	最小值	最大值		
t_{ON}	开启时间	nB0 or nB1=1.5V, $R_L=50\Omega$, $C_L=35pF$	3.6 to 4.3			55	15	60	ns	图 8 图 9
			2.7 to 3.6			60	15	65		
			2.3 to 2.7			65	15	70		
			1.65 to 1.95		70					
t_{OFF}	关闭时间	nB0 or nB1=1.5V, $R_L=50\Omega$, $C_L=35pF$	3.6 to 4.3			30	5	35	ns	图 8 图 9
			2.7 to 3.6			35	5	40		
			2.3 to 2.7			40	5	45		
			1.65 to 1.95		40					
t_{BBM}	先断后开时间	nB0 or nB1=1.5V, $R_L=50\Omega$, $C_L=35pF$	3.6 to 4.3		15		2		ns	图 10
			2.7 to 3.6		15		2			
			2.3 to 2.7		15		2			
			1.65 to 1.95		16		2			
Q	电荷注入	$C_L=1.0nF$, $V_S=0V$, $R_S=0\Omega$	1.65 to 4.3		25				pC	图 14
OIRR	断开隔离	$f=100kHz$, $R_L=50\Omega$, $C_L=0pF$	1.65 to 4.3		-70				dB	图 12
Xtalk	非相邻通道串扰	$f=100kHz$, $R_L=50\Omega$, $C_L=0pF$	1.65 to 4.3		-70				dB	图 13
BW	-3db 带宽	$R_L=50\Omega$, $C_L=0pF$	1.65 to 4.3		>50				MHz	图 11
THD	总谐波失真	$f=20Hz$ to $20kHz$, $R_L=32\Omega$, $V_{IN}=2V_{pp}$	1.65 to 4.3		.06				%	图 17

电容

表达符号	参数	条件	V_{CC} (V)	$T_A=+25^{\circ}C$			单位	图号
				最小值	典型值	最大值		
C_{IN}	控制端输入电容	$f=1MHz$	0		1.5		pF	图 15
C_{OFF}	B 端断开电容	$f=1MHz$	3.3		30		pF	图 15
C_{ON}	A 端导通电容	$f=1MHz$	3.3		120		pF	图 16

测试框图

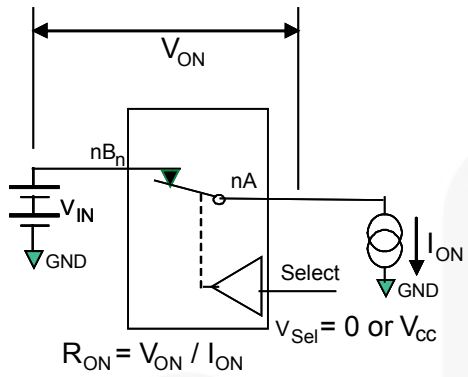
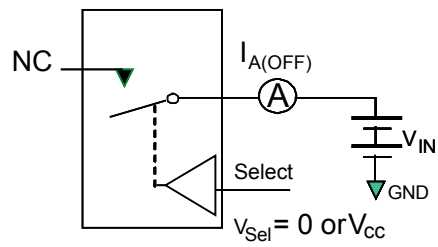


图 5. 导通电阻



**Each switch port is tested separately.

图 6. 断开漏电流(端口分开测试)

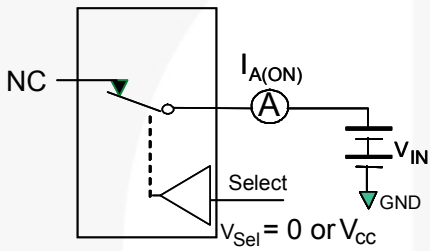


图 7. 导通漏电流

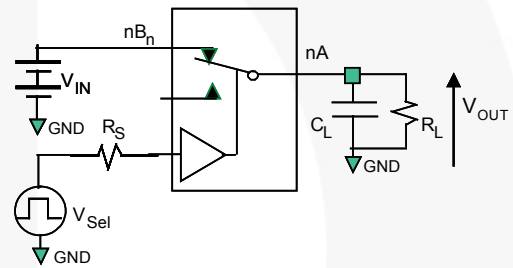


图 8. 测试电路负载

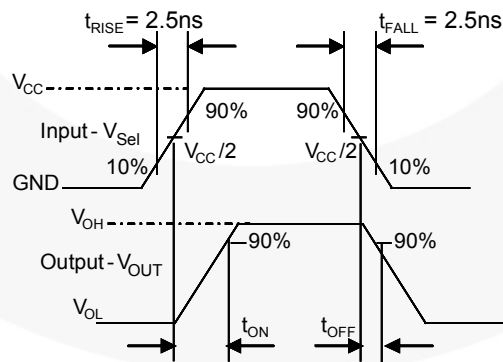


图 9. 开启/关闭波形

测试框图 (续)

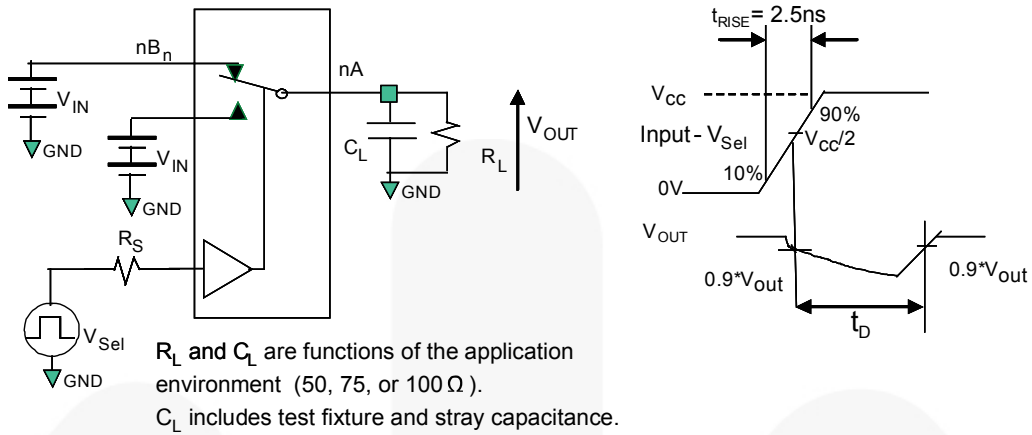


图 10. 先关后开间隔时间

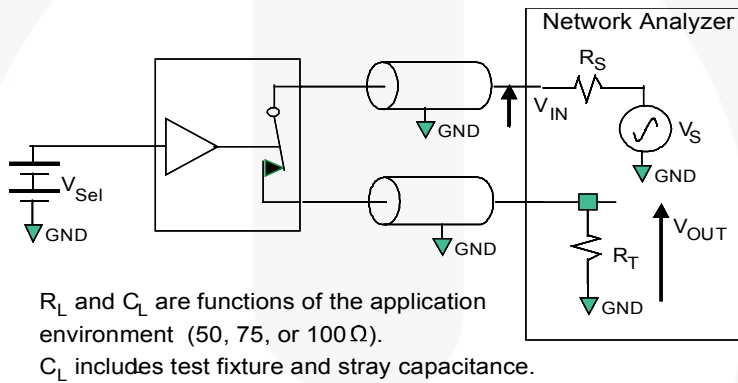


图 11. 带宽

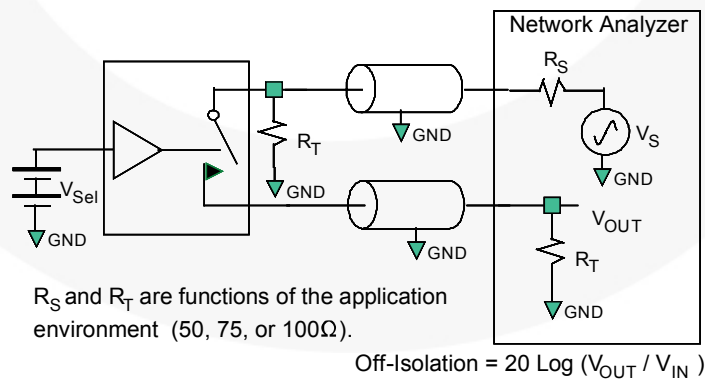


图 12. 线路断开Off 隔离

测试框图 (续)

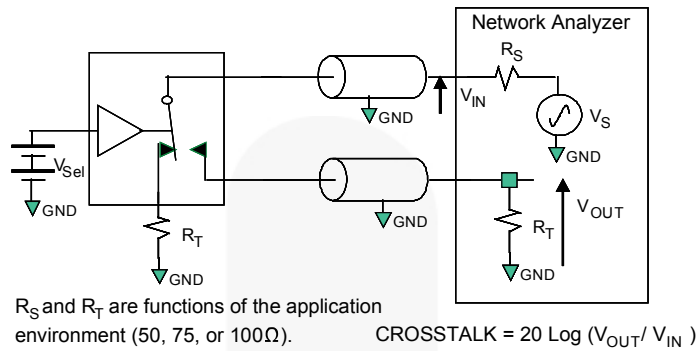


图 13. 相邻通道间的串扰

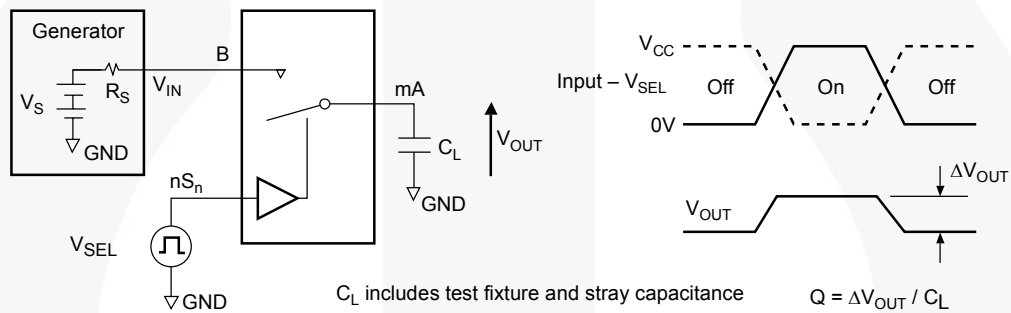


图 14. 电荷注入测试

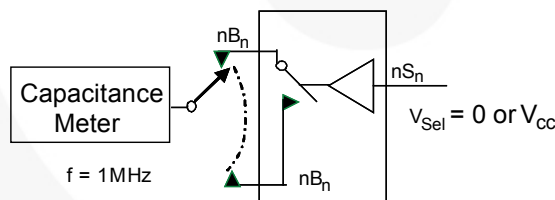


图 15. 通道断开电容

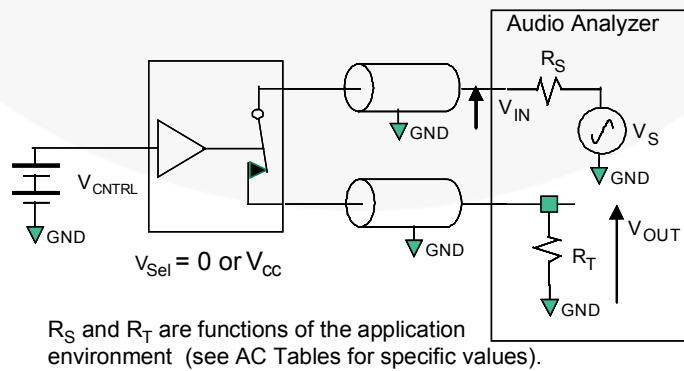
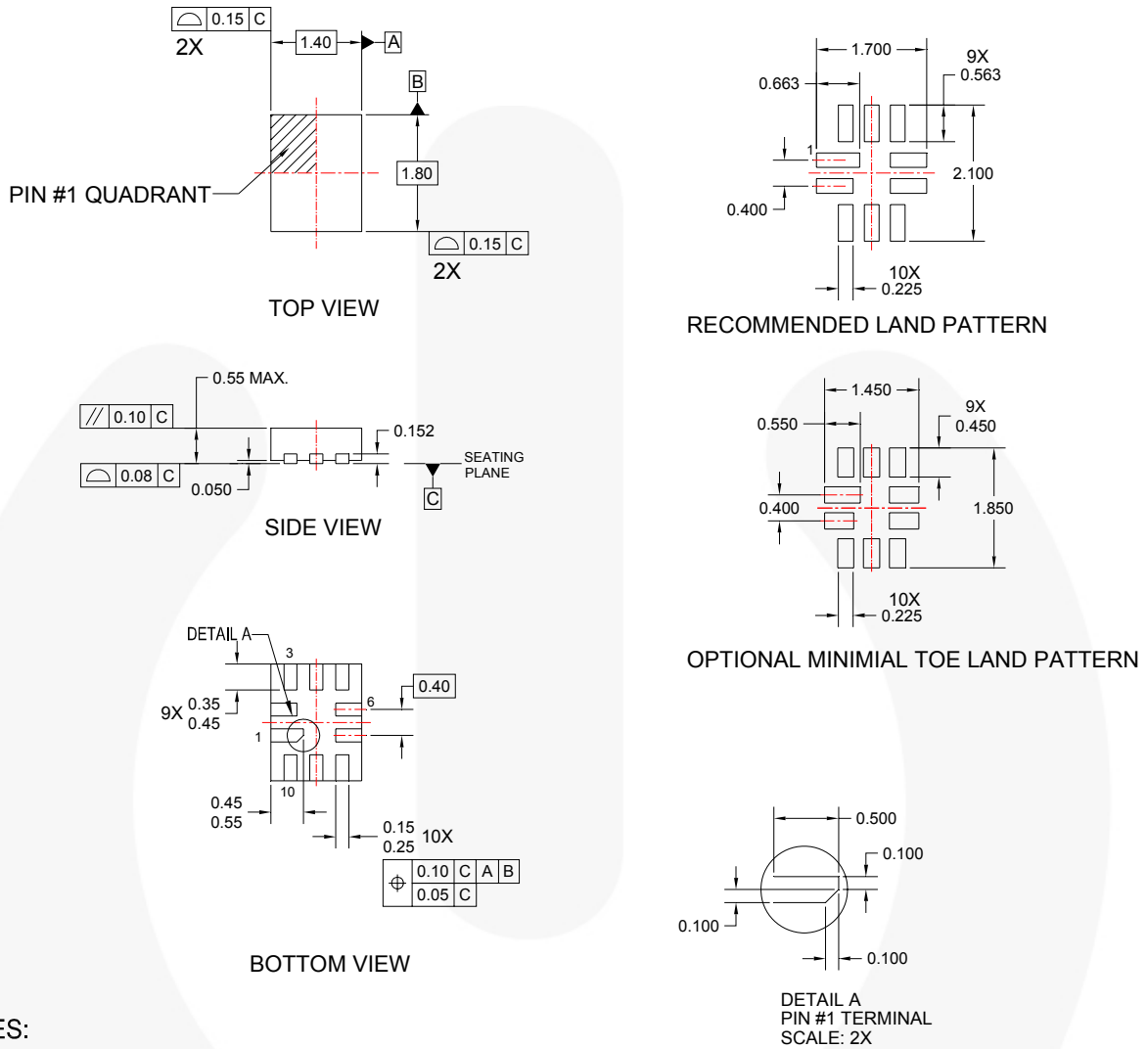


图 17. 总谐波失真

物理尺寸



NOTES:

- A. DIMENSIONS ARE IN MILLIMETERS.
- B. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994
- C. DRAWING FILENAME: UMLP10Arev2

图 18. 10-引脚方形超薄

[Note: click here for tape and reel specifications, available at: http://www.fairchildsemi.com/products/analog/pdf/UMLP10_TNR.pdf](http://www.fairchildsemi.com/products/analog/pdf/UMLP10_TNR.pdf)

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Physical Dimensions (Continued)

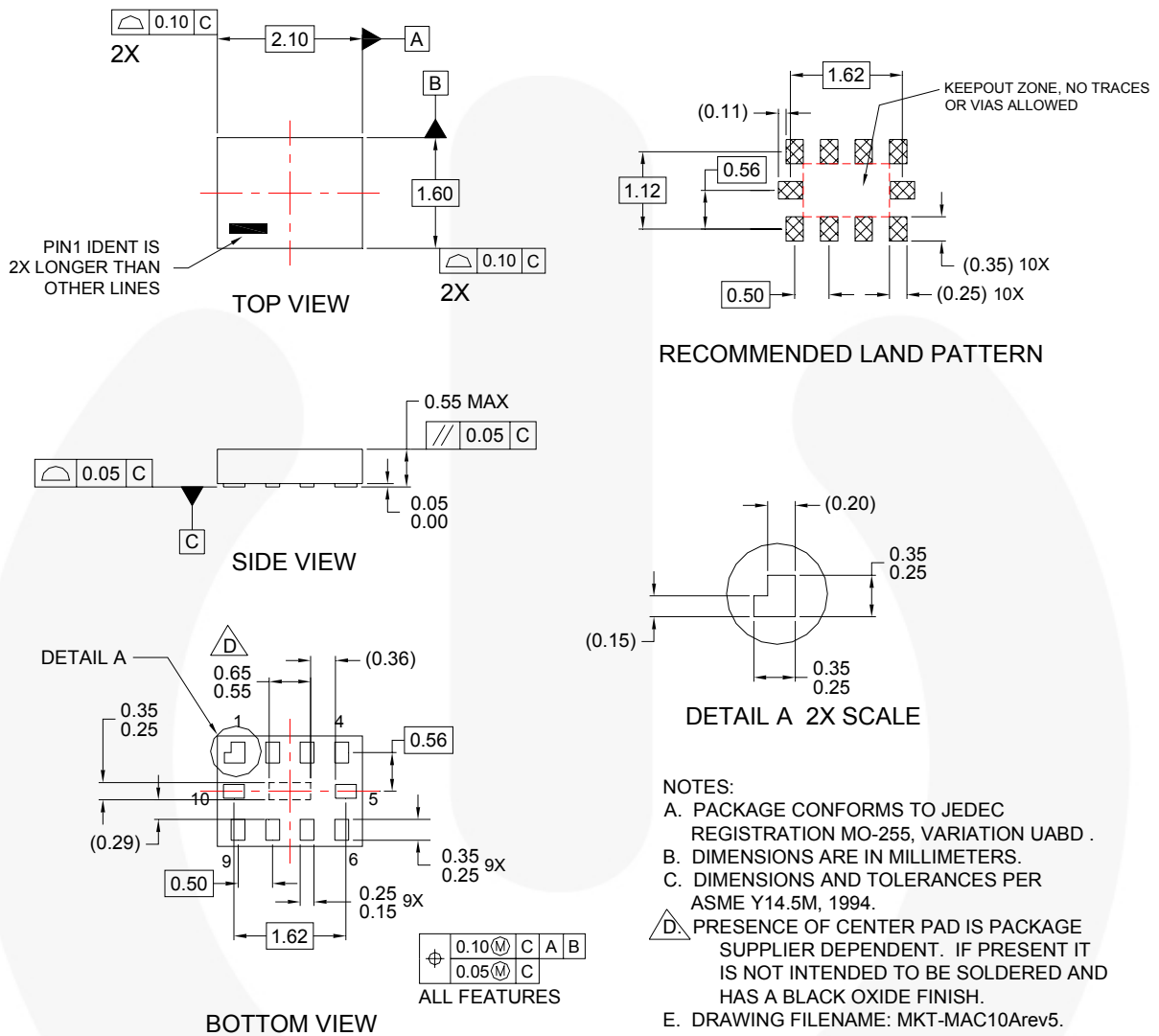


图 19. 10-引脚, MicroPak™, 1.6mm宽

[Note: click here for tape and reel specifications, available at: http://www.fairchildsemi.com/products/logic/pdf/micropak_tr.pdf](http://www.fairchildsemi.com/products/logic/pdf/micropak_tr.pdf)

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ANTI-COUNTERFEITING POLICY

Fairchild Semiconductor Corporation's Anti-Counterfeiting Policy. Fairchild's Anti-Counterfeiting Policy is also stated on our external website, www.fairchildsemi.com, under Sales Support.

Counterfeiting of semiconductor parts is a growing problem in the industry. All manufacturers of semiconductor products are experiencing counterfeiting of their parts. Customers who inadvertently purchase counterfeit parts experience many problems such as loss of brand reputation, substandard performance, failed applications, and increased cost of production and manufacturing delays. Fairchild is taking strong measures to protect ourselves and our customers from the proliferation of counterfeit parts. Fairchild strongly encourages customers to purchase Fairchild parts either directly from Fairchild or from Authorized Fairchild Distributors who are listed by country on our web page cited above. Products customers buy either from Fairchild directly or from Authorized Fairchild Distributors are genuine parts, have full traceability, meet Fairchild's quality standards for handling and storage and provide access to Fairchild's full range of up-to-date technical and product information. Fairchild and our Authorized Distributors will stand behind all warranties and will appropriately address any warranty issues that may arise. Fairchild will not provide any warranty coverage or other assistance for parts bought from Unauthorized Sources. Fairchild is committed to combat this global problem and encourage our customers to do their part in stopping this practice by buying direct or from authorized distributors.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative / In Design	Datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

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