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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	封装说明
FSA2268UMX	GF	10-引脚, 方型超薄 (UMLP), 1.4 x 1.8mm, 0.4mm Pitch
FSA2268TUMX	GH	10-引脚, 方型超薄 (UMLP), 1.4 x 1.8mm, 0.4mm Pitch
FSA2268L10X	GH	10-引脚, MicroPak™, 1.6mm

模拟符号

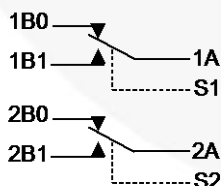


图 1. FSA2268

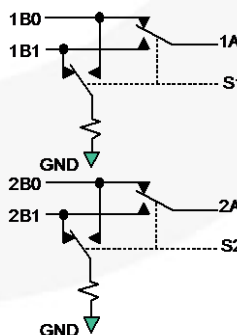


图 2. FSA2268T (含有抗扰终端电阻)

管脚分配图

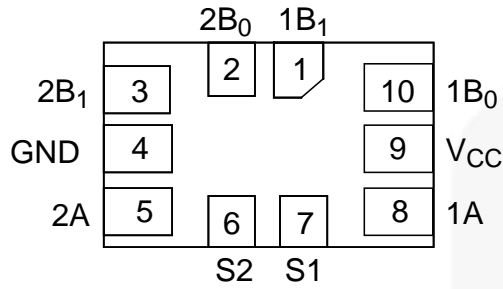


图 3. 10-管脚UMLP (俯视图)

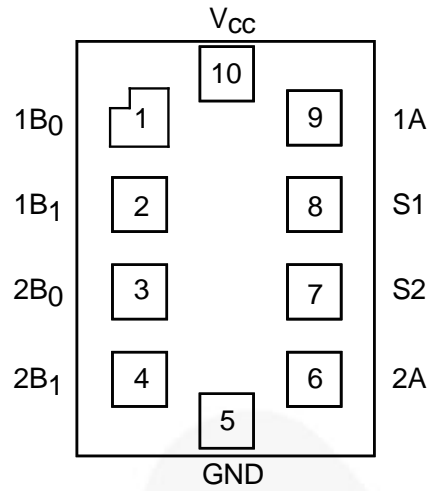


图 4. 10-管脚 MicroPak™

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	nB ₀ 连接nA (FSA2268/2268T); nB ₁ 接地 (FSA2268T)
逻辑高	nB ₁ 连接nA (FSA2268/2268T); nB ₀ 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)} FSA2268	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)} FSA2268T	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} FSA2268	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} FSA2268T	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, 2.3V, 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 10
			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 14
			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 12
OIRR	断开隔离	$f=100kHz$, $R_L=50\Omega$, $C_L=0pF$	1.65 to 4.3		-70				dB	图 13
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 11
BW	-3db 带宽	$R_L=50\Omega$, $C_L=0pF$	1.65 to 4.3		>50				MHz	图 17
THD	总谐波失 真	$f=20Hz$ to 20kHz, $R_L=32\Omega$, $V_{IN}=2V_{pp}$	1.65 to 4.3		.06				%	

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

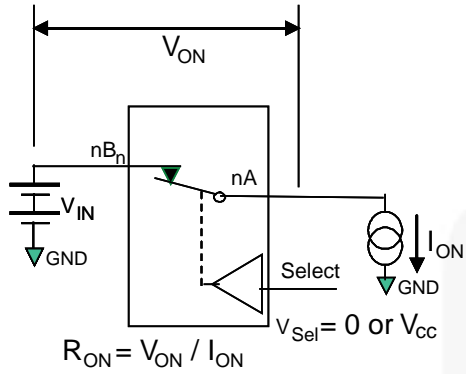


图 5. 导通电阻

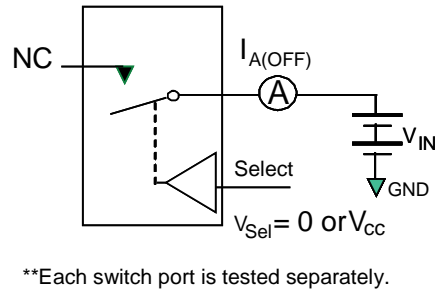


图 6. 断开漏电流(端口分开测试)

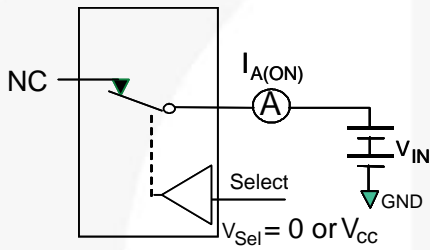


图 7. 导通漏电流

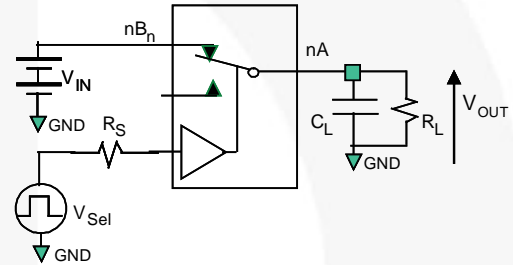


图 8. 测试电路负载

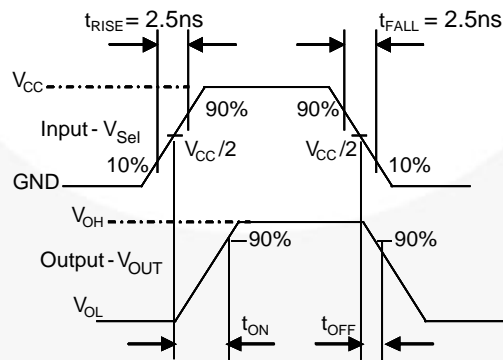


图 9. 开启/关闭波形

测试框图 (续)

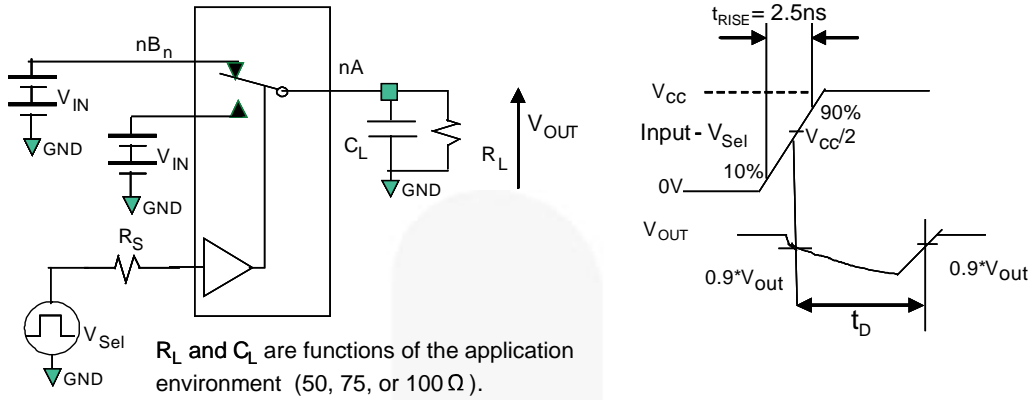


图 10. 先关后开间隔时间

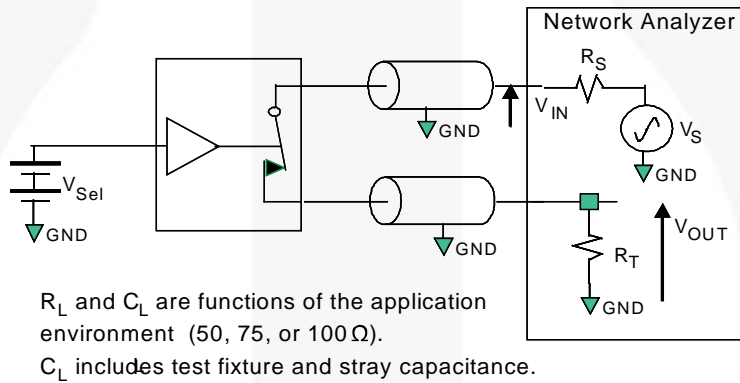


图 11. 带宽

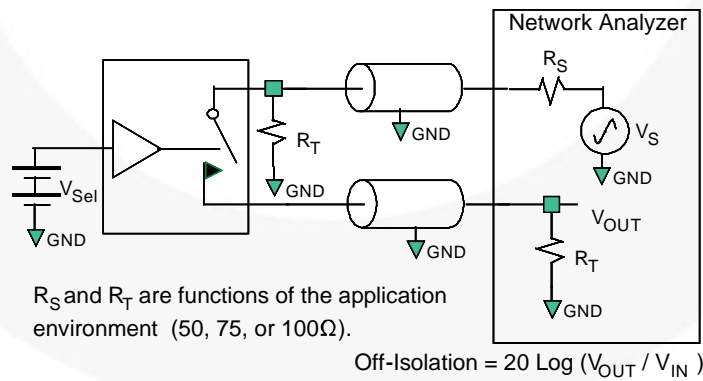


图 12. 线路断开Off 隔离

测试框图 (续)

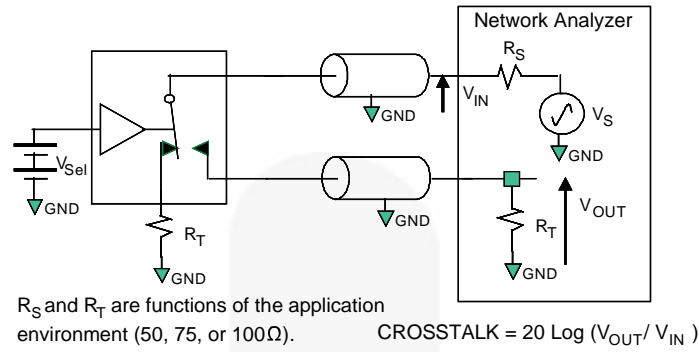


图 13. 相邻通道间的串扰

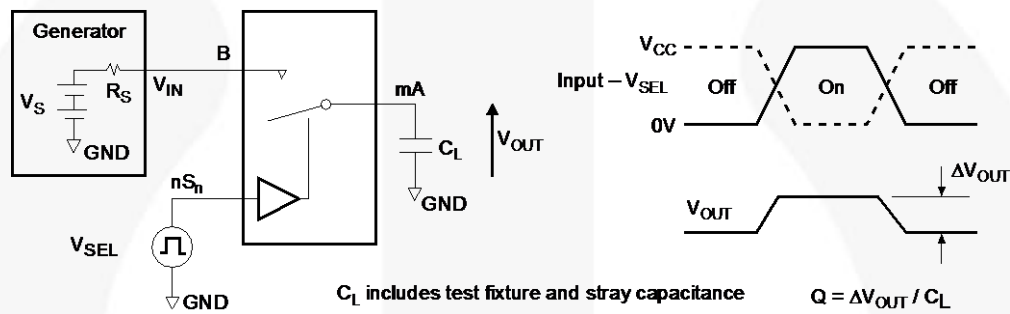


图 14. 电荷注入测试

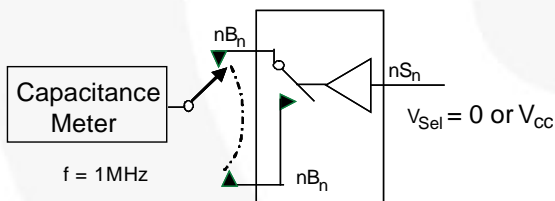


图 15. 通道断开电容

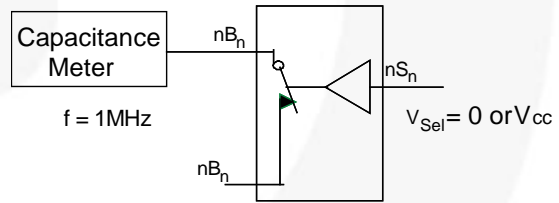


图 16. 通道导通电容

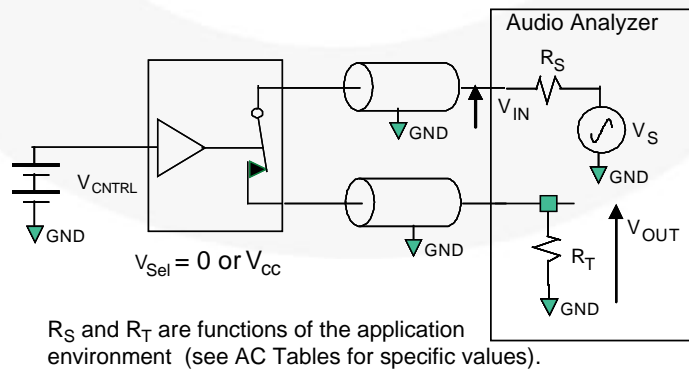
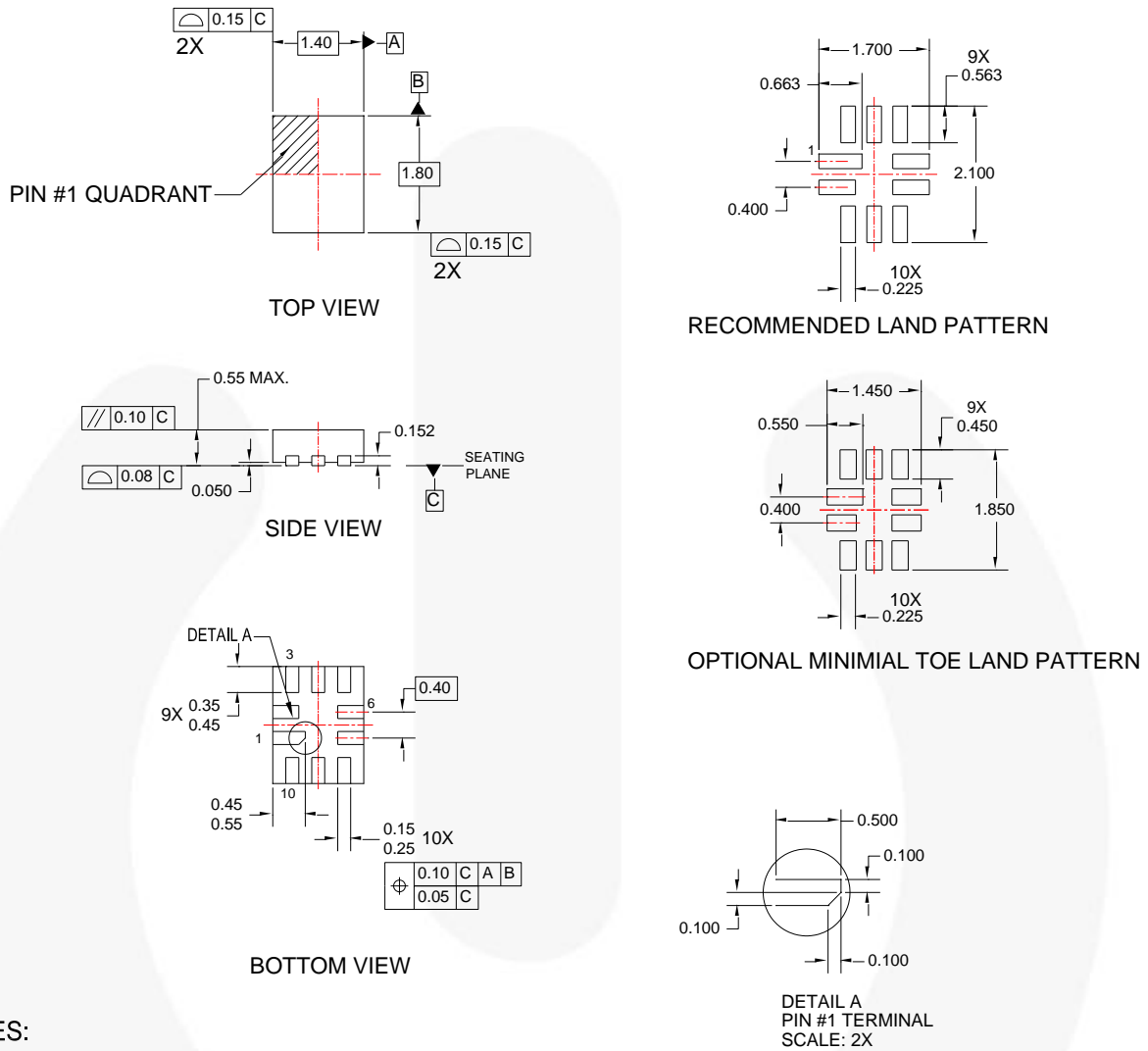


图 17. 总谐波失真

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

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Physical Dimensions (Continued)

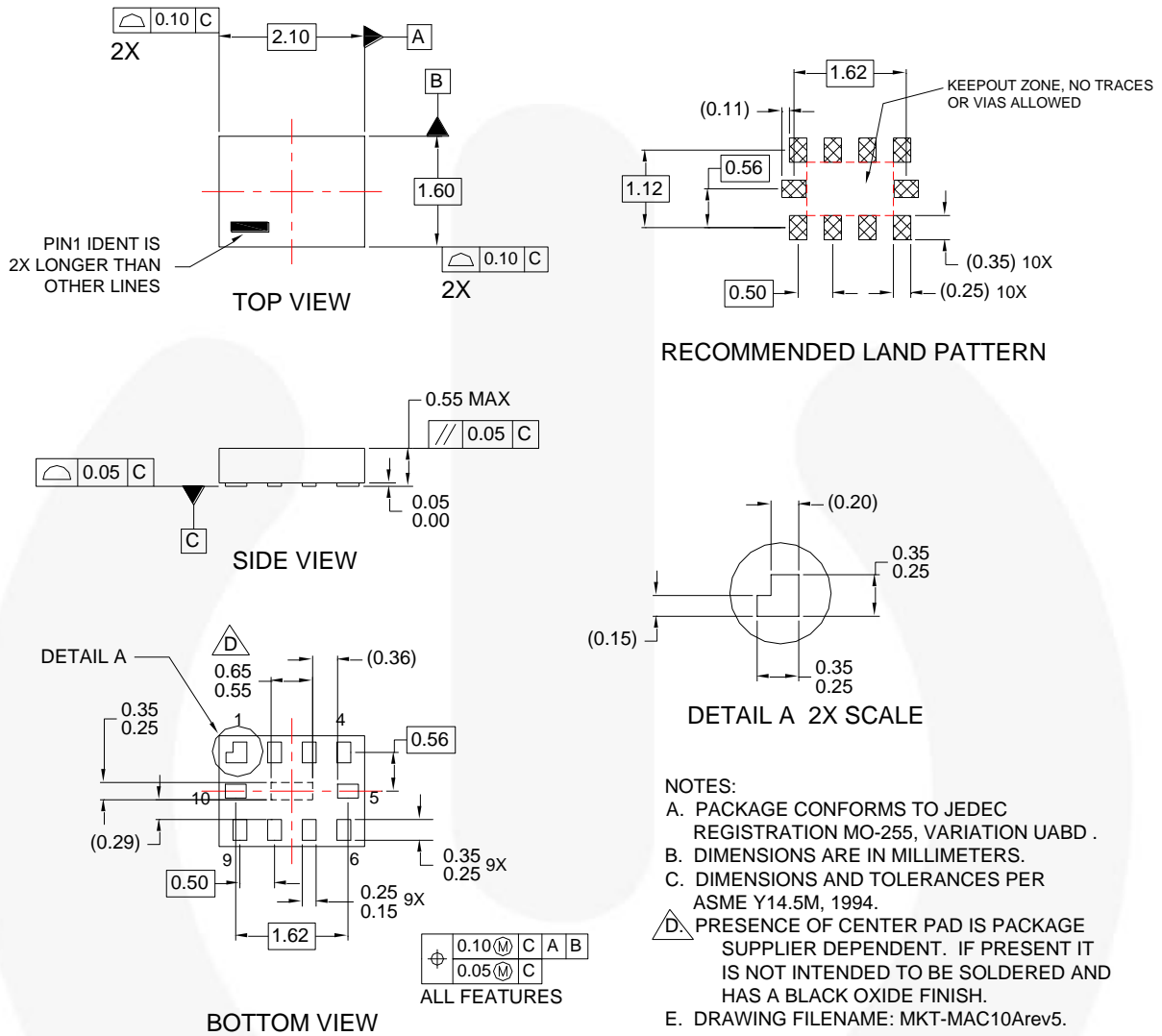


图 19. 10-引脚, MicroPak™, 1.6mm宽

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| AX-CAP™* | Global Power Resource SM | Programmable Active Droop™ | TinyBoost™ |
| BitSiC™ | GreenBridge™ | QFET® | TinyBuck™ |
| Build it Now™ | Green FPS™ | QS™ | TinyCalc™ |
| CorePLUS™ | Green FPS™ e-Series™ | Quiet Series™ | TinyLogic® |
| CorePOWER™ | Gmax™ | RapidConfigure™ | TINYOPTO™ |
| CROSSVOLT™ | GTO™ |  ™ | TinyPower™ |
| CTL™ | IntelliMAX™ | Saving our world, 1mW/W/kW at a time™ | TinyPWM™ |
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