

FSA1211 — 低功率、12端口、高速绝缘开关

产品特性

- C_{OFF} 电容值低：典型值为 2.0 pF
- 导通电阻低：典型值为 7.5 Ω
- 低功耗：最大值为 1 μ A
- 10 μ A I_{CCT} 最大值在扩展电压范围 ($V_{IN}=2.6$ V, $V_{CC}=4.3$ V)内, I_{CCT} 最大值 10 μ A
- -3db 带宽较宽：> 720 MHz
- 采用节省空间的 28-Lead UMLP封装
- 额定值 5.5 kV ESD ; >9 kV Power/GND ESD
- 导通电容低：典型值为 6 pF

适用范围

- 手机, PDA, 数码相机和笔记本
- 液晶显示器、电视和机顶盒

重要说明:

关于其他性能信息, 请联系
analogswitch@fairchildsemi.com.

说明

FSA1211是一款低功率, 12端口的高速开关。本器件为单刀单掷开关 (SPST), 并可隔离高速光源, 如手机摄像机接口。FSA1211 的导通电容极低, 仅为 (C_{ON}) 6 pF。较宽的带宽 (>720 MHz) 超过了通过3次谐波的要求, 这样可使信号边缘和相位失真最小。先进的通道间防串扰设计也可以大大削弱干扰。

FSA1211的引脚A和B包含专用电路, 从而允许器件耐受过压状况。本器件的设计可将电流损耗尽量降低, 即使当施加在/OE引脚上的控制电压低于电源电压 (V_{CC}) 时也可保证。对于手机等移动应用设备, 这项功能非常有价值, 可用于直接与基带处理器上的通用I/O连接。其他应用还包括便携式电话、PDA、数码相机、打印机和笔记本电脑的端口隔离和开关应用。

订购信息

器件型号	顶标	工作温度范围	封装
FSA1211UMX	F1211	-40 至 +85°C	28-管脚, 方形, 超薄膜塑无铅封装 (UMLP), 3.5x4 mm
FSA1211UDMX	F1211	-40 至 +85°C	28-管脚, 方形, 双列超薄膜塑无铅封装 (UMLP), 3.6x2.9 mm

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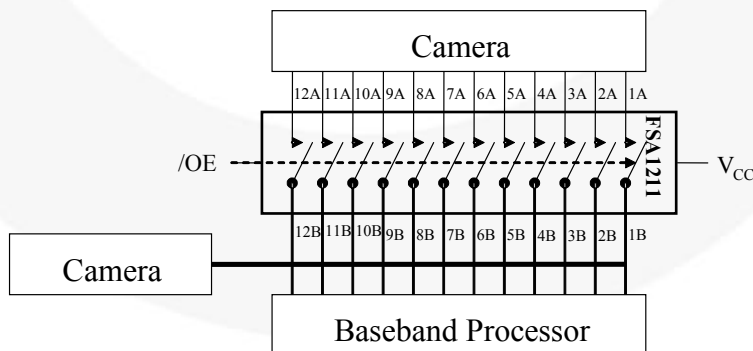


图 1. 模拟符号

引脚布局

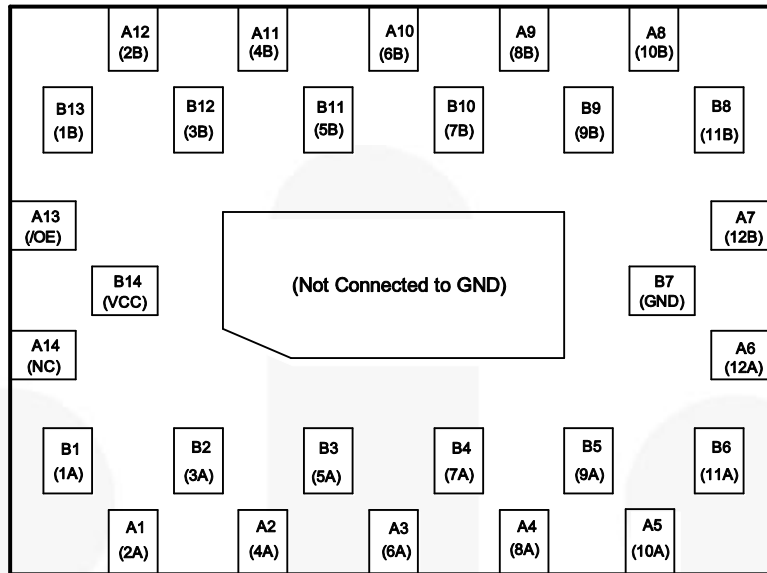


图 2. 双列UMLP (括号中的功能) (俯视图)

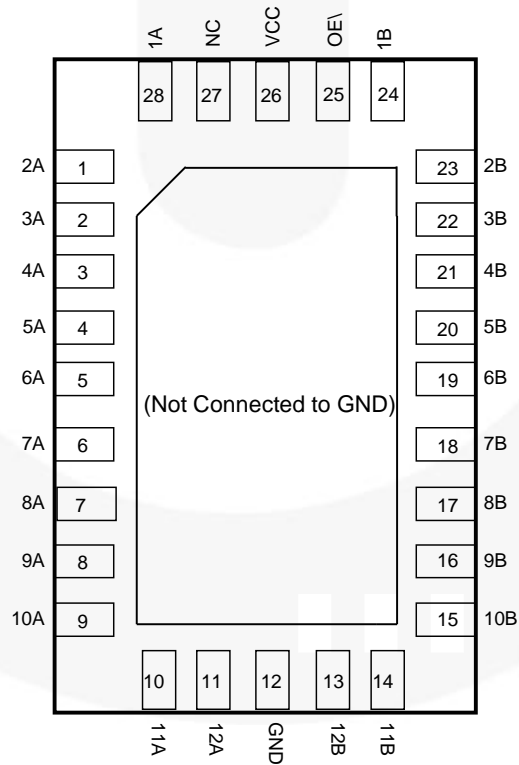


图 3. UMLP (俯视图)

引脚说明

UMLP 双引脚 #	UMLP 单引脚 #	名称	说明
A1-A6, B1-B6	1-11, 28	1A-12A	总线A侧
B7	12	GND	接地
A7-A12, B8-B13	13-24	12B-1B	总线B侧
A14	27	NC	未定义
A13	25	/OE	启用开关
B14	26	VCC	电源

真值表

/OE	功能
HIGH	未连接
LOW	1A-12A=1B-12B

绝对最大额定值

如果应力超过绝对最大额定值，器件就会毁损。在推荐的工作条件之上，该器件可能无法正常运行或操作，且不建议让器件在这些条件下长期工作。此外，过度暴露在高于推荐的工作条件下，会影响器件的可靠性。绝对最大额定值仅是额定应力值。

符号	参数	Min.	Max.	Unit
V _{CC}	电源电压	-0.50	+5.25	V
V _{CNTRL}	直流输入电压 (/OE) ⁽¹⁾	-0.5	V _{CC}	V
V _{SW}	直流开关I/O电压 ⁽¹⁾	-0.5	V _{CC} + 0.3	V
I _{IK}	直流输入二极管电流	-50		mA
I _{OUT}	直流输出电流		50	mA
T _{STG}	存储温度	-65	+150	°C
ESD	人体模型, JEDEC: JESD22-A114	全部管脚	5.5	kV
		I/O 至 GND	9	
		电源至 GND	9	
	充电器件模型, JEDEC: JESD22-C101		2	

说明：

- 当测量输入与输出二极管电流额定值时，该输入与输出可能超出负额定值。

推荐工作条件

推荐的操作条件表定义了真实器件的工作条件。指定推荐的工作条件，以确保设备的最佳性能达到数据表中的规格。飞兆半导体建议不超过推荐的工作条件，或将绝对最大额定值设计为工作条件。

符号	参数	Min.	Max.	Unit
V _{CC}	电源电压	1.8	4.3	V
V _{CNTRL}	控制输入电压 (S, /OE) ⁽²⁾	0	V _{CC}	V
V _{SW}	开关I/O电压	-0.5	V _{CC}	V
T _A	工作温度	-40	+85	°C

说明：

- 控制输入必须保持高电平或低电平，不允许浮动。

直流电气特性

若无其他说明，所有典型值都在25°C下测得。

符号	参数	工作条件	V _{CC} (V)	T _A =- 40°C 至 +85°C			Units
				Min.	Typ.	Max.	
V _{IK}	钳位二极管电压	I _{IN} =-18 mA	2.8			-1.2	V
V _{IH}	输入电压高电平		1.8	1.0			
			2.8	1.3			V
			3.6	1.5			
			4.3	1.7			V
V _{IL}	输入电压低电平		1.8			0.4	
			2.8			0.5	
			3.6			0.6	V
			4.3			0.7	V
I _{IN}	控制脚输入漏电流	V _{SW} =0 to V _{CC}	1.8 to 4.3	-1		1	μA
I _{OZ}	关断漏电流	0 ≤ A, B ≤ 3.6 V	1.8 to 4.3	-2		2	μA
R _{ON}	开关导通电阻 ⁽³⁾	I _{ON} =-8 mA, V _{SW} =0 V, 图 4	2.8		5.7	10.0	Ω
		I _{ON} =-8 mA, V _{SW} =3.0 V, 图 4	2.8		9.0	14.0	
		I _{ON} =-8 mA, V _{SW} =0 V, 图 4	1.8		8.5	15.0	
		I _{ON} =-8 mA, V _{SW} =1.8 V, 图 4	1.8		15.0	30.0	
I _{CC}	静态电源电流	V _{IN} =0 or V _{CC} , I _{OUT} =0	4.3			1	μA
I _{CC} T	每个控制端和V _{CC} 端的I _{CC} 电流增加量	V _{IN} =2.6 V, V _{CC} =4.3 V	4.3			10	μA

注意:

3. 在指定通过电流下，由 A和B引脚之间的电压降测得。
导通电阻决定于这两个端口(A或B端口)上的电压降。

交流电气特性

若无其他说明，所有典型值都在25°C， $V_{CC}=3.3V$ 时测得。

符号	参数	工作条件	V_{CC} (V)	$T_A=-40^{\circ}C$ 至 $+85^{\circ}C$			Unit
				Min.	Typ.	Max.	
t_{ON}	开机时间/OE至输出	$R_L=50\ \Omega$, $C_L=5\ pF$, $V_{SW}=0.8\ V$ 图5, 图6	2.8 至 3.6		23	30	ns
			1.8			45	
t_{OFF}	关机时间/OE至输出	$R_L=50\ \Omega$, $C_L=5\ pF$, $V_{SW}=0.8\ V$ 图5, 图6	2.8 至 3.6		19	25	ns
			1.8			35	
t_{PD}	传输延迟 ⁽⁴⁾	$C_L=5\ pF$, $R_L=50\ \Omega$ 图5, 图7	3.3		0.25		ns
O_{IRR}	关断隔离	$R_L=50\ \Omega$, $f=100\ MHz$ 图12	1.8 至 3.6		-45		dB
Xtalk	非相邻通道串扰	$R_L=50\ \Omega$, $f=100\ MHz$ 图13	1.8 至 3.6		-40		dB
BW	-3db 带宽	$R_L=50\ \Omega$, $C_L=0\ pF$ 图11	1.8 至 3.6		720		MHz
		$R_L=50\ \Omega$, $C_L=5\ pF$ 图11			325		MHz

说明：

4. 由产品特性保证。

高速相关的交流电气特性

符号	参数	工作条件	V _{CC} (V)	T _A =- 40°C 至 +85°C			Unit
				Min.	Typ.	Max.	
t _{SK(O)}	通道间时滞 ⁽⁵⁾	C _L =5 pF	3.0至3.6		60		ps
t _{SK(P)}	在相同输出下, 反向转换的时滞 ⁽⁵⁾	C _L =5 pF	3.0至3.6		20		ps

说明：

5. 由产品特性保证。

电容值

符号	参数	工作条件	T _A =- 40°C至+85°C			Unit
			Min.	Typ.	Max.	
C _{IN}	控制引脚输入电容	V _{CC} =0 V, f=1 MHz		1.0		pF
C _{ON}	D+/D-导通电容	V _{CC} =3.3 V, /OE=0 V, f=1 MHz 图10		6.0		
C _{OFF}	D1n, D2n 关断电容	V _{CC} 和 /OE=3.3 V, f=1 MHz 图9		2.0		

测试框图

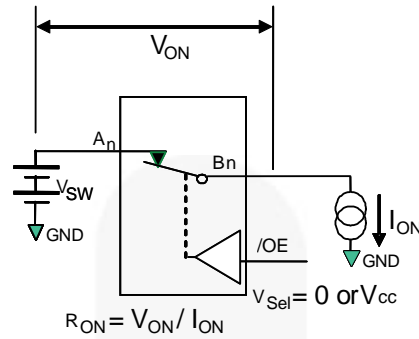
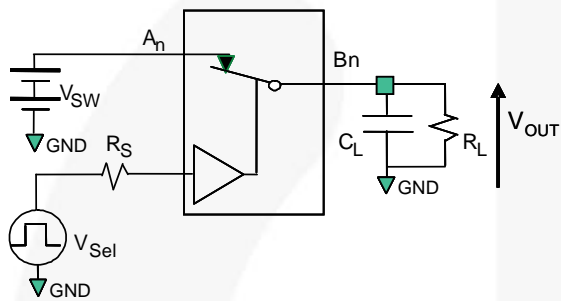


图 4. 导通电阻



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

图 5. 交流测试电路负载

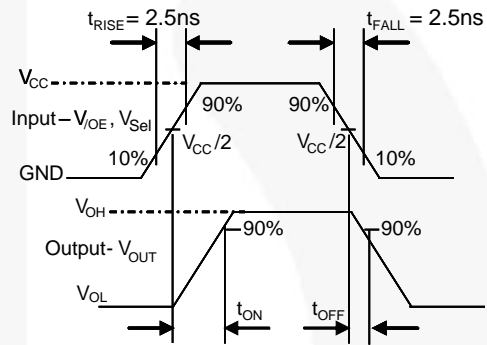


图 6. 开通/关断波形

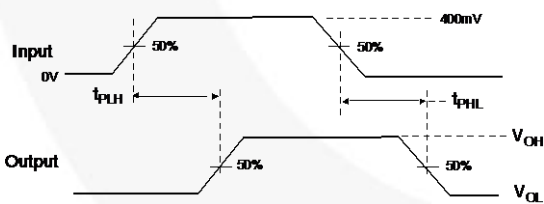


图 7. 传输延迟($t_{trf} = 500ps$)

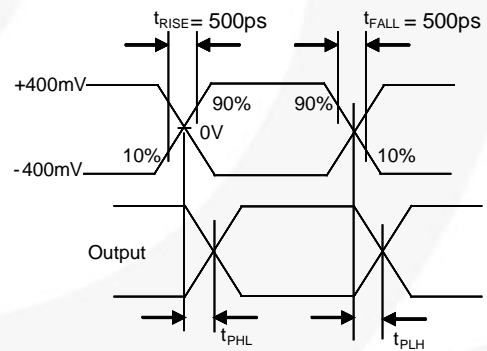


图 8. 内部成对时滞测试 $t_{sk(P)}$

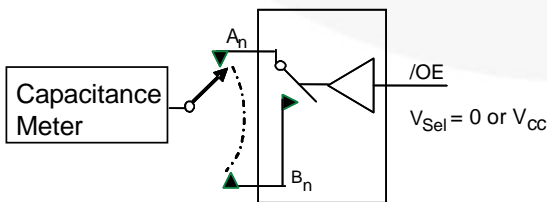


图 9. 通道关断电容

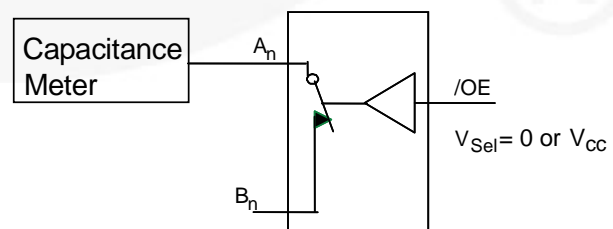


图 10. 通道导通电容

测试框图 (续)

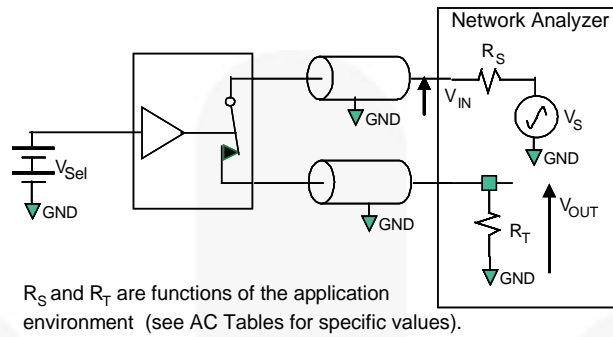


图 11. 带宽

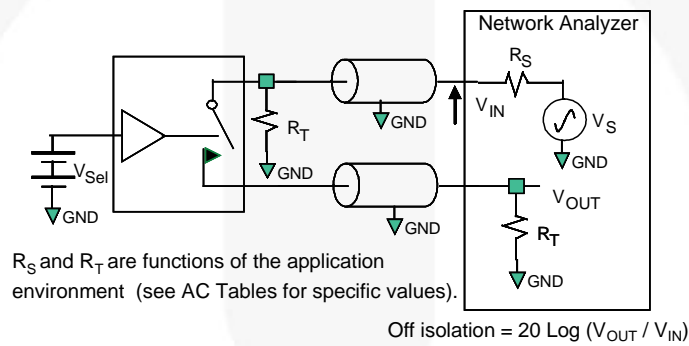


图 12. 通道的关断隔离

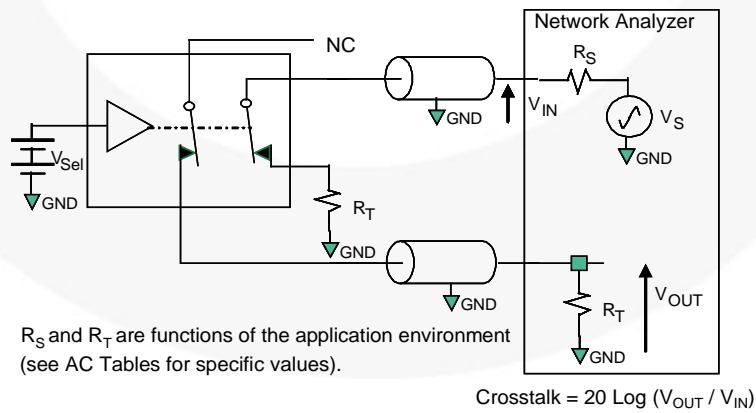


图 13. 非相邻通道间串扰

物理尺寸

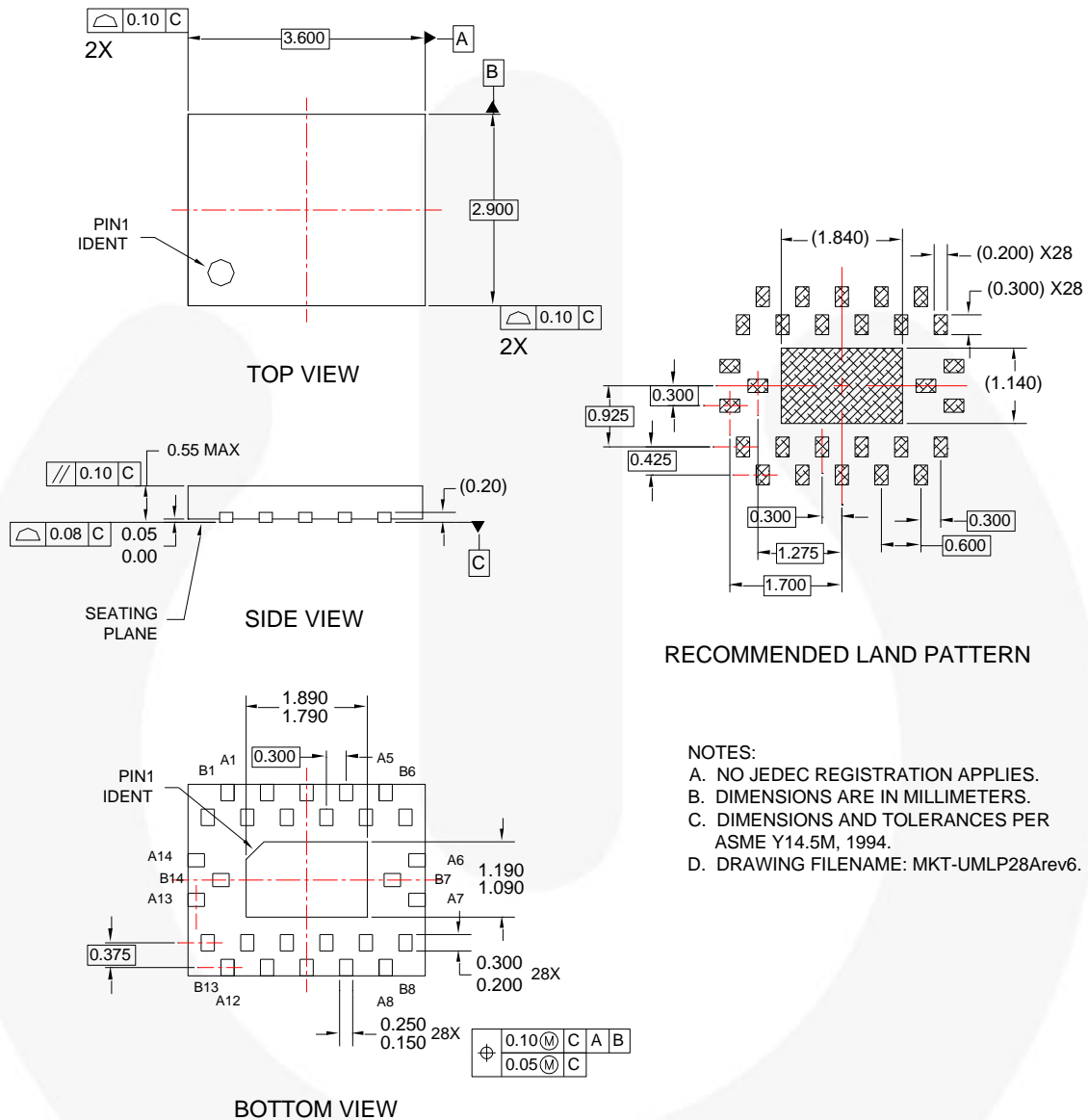


图 14. 28-管脚，方形，超薄膜塑无铅封装 (UMLP)

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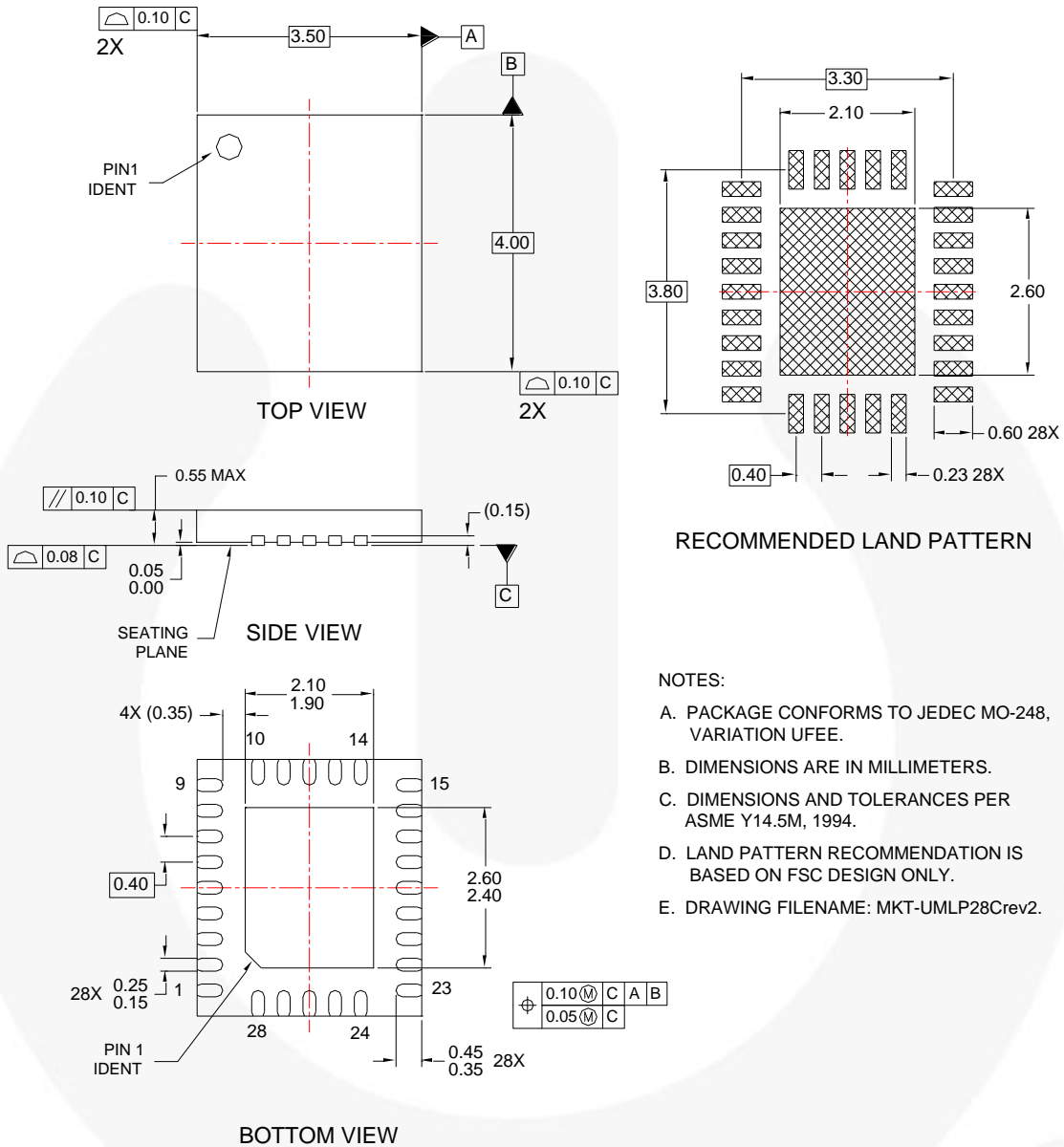


图 15. 28-管脚超薄模塑无铅封装(UMLP)

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