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FSA550

4PST 耗尽型隔离开关

特性

- 4PST (NC)
- 耗尽型 MOSFET
- 音频频率范围
- $V_{CC(OFF)}$: 1.6 V 至 3.0 V
- R_{ON} : 0.8 Ω 典型值
- R_{ON} 平坦度: 0.01 Ω 典型值
- THD+N: 0.002% 典型值
- 生态状态: 飞兆绿色、符合 RoHS 标准、无卤素

应用

- 便携媒体播放器 MP3
- 手机, 智能电话

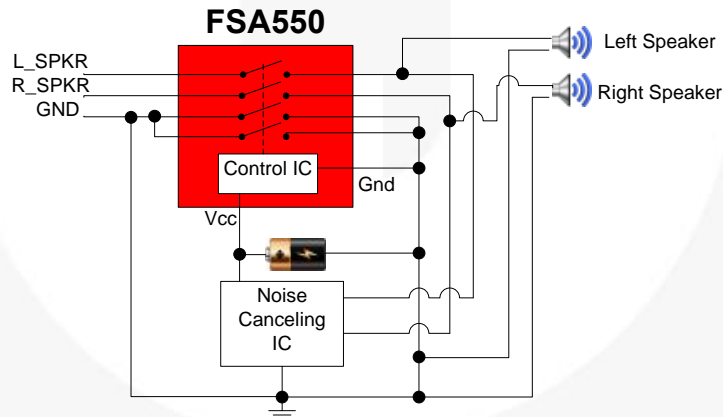
说明

FSA550 是一个高性能、四刀单掷 (4PST), 通常关闭的耗尽型隔离开关。耗尽型技术允许器件在不存在 V_{CC} 时导通信号, 在存在 V_{CC} 时隔离信号。

FSA550 在较宽的 V_{CC} 范围内运行, 具有设计灵活性。另外, 当存在 V_{CC} 时, 选择引脚允许内部振荡器频率在 500 kHz 和 750 kHz 之间以 75 kHz 的阶跃进行调整。该特性用于转移分散电磁干扰 (EMI), 从而满足客户规格要求。

相关资源

- FSA550 评估板



典型应用

订购信息

器件编号	顶标	工作温度范围	封装	包装方法
FSA550UCX	M4	-40 至 +85°C	12 引脚 WLCSP, 3 x 4 阵列, 0.4 mm 间距, 250 μ m 引脚	卷带和卷盘 (每卷 3000 装)
FSA550BUCX	M4	-40 至 +85°C	12 引脚 WLCSP (带背部层压), 3 x 4 阵列, 0.4 mm 间距, 250 μ m 引脚	卷带和卷盘 (每卷 3000 装)

引脚配置

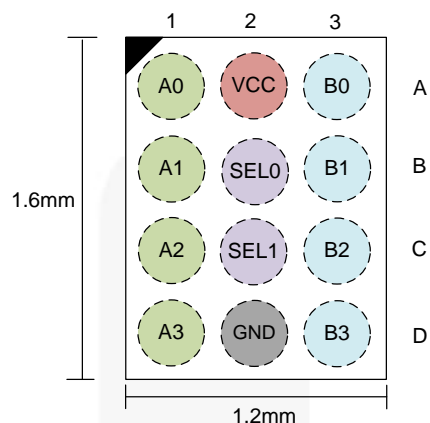


图 1. 引脚分配 (俯视图)

引脚描述

引脚号	名称	类型	说明
A1	A0	I/O	A - 端口
B1	A1	I/O	A - 端口
C1	A2	I/O	A - 端口
D1	A3	输入/输出	A - 端口
A2	V _{CC}	电源/控制	隔离电路电源电压 (参见表 1)
B2	SEL0	输入	振荡器频率控制 (参见表 2)。用于转移分散电磁干扰 (EMI), 从而满足客户规格要求。
C2	SEL1	输入	
D2	GND	接地	系统接地
A3	B0	输入/输出	B - 端口
B3	B1	输入/输出	B - 端口
C3	B2	输入/输出	B - 端口
D3	B3	输入/输出	B - 端口

表 1. 真值表

V _{CC}	功能
0 V - 0.2 V	B0-B3 = A0-A3
1.6 V - 3.0 V	断开; B0-B3 ≠ A0-A3

表 2. 振荡器频率步进逻辑

SEL1	SEL0	频率 (典型值)
低	低	500 kHz
低	高	575 kHz
高	低	650 kHz
高	高	725 kHz

绝对最大额定值

应力超过绝对最大额定值，可能会损坏器件。在超出推荐的工作条件的情况下，该器件可能无法正常工作，所以不建议让器件在这些条件下长期工作。此外，长期在高于推荐的工作条件下工作，会影响器件的可靠性。绝对最大额定值仅是应力规格值。

符号	参数		最小值	最大值	单位
V_{CC}	电源/控制电压		0	4.6	V
V_{IN}	输入电压（选择引脚）		0	V_{CC}	V
$V_{SW(ON)}$	DC 开关 I/O 电压（开关导通）	$V_{CC}=0\text{ V}$	-4	+4	V
$V_{SW(OFF)}^{(1)}$	DC 开关 I/O 电压（开关隔离）	$V_{CC}=\text{供电}$	-0.5	3.0	V
I_{IK}	直流输入二极管电流		-50		mA
I_{SW}	开关 I/O 电流	$V_{CC}=0\text{V}$ （开关导通）		350	mA
I_{SWPEAK}	峰值开关电流	持续 1 ms 脉冲，<10% 的占空比		500	mA
ESD	人体模型，ANSI/ESDA/JEDEC JS-001-2012	全部引脚		5.0	kV
	元件充电模型，JEDEC: JESD22-C101			1.5	
	IEC 61000-4-2 系统	接触式		8.0	
		空气式		15.0	
T_A	绝对最大工作温度		-40	+85	°C
T_{STG}	存储温度		-65	+150	°C

注：

1. 开关隔离（关断）时， V_{SW} 值必须 $<V_{CC}$ 。

推荐工作条件

推荐的操作条件表明了器件的真实工作条件。指定推荐的工作条件，以确保器件的最佳性能达到数据表中的规格。飞兆半导体建议不要超过推荐工作条件，也不能按照绝对最大额定值进行设计。

符号	参数		最小值	最大值	单位
$V_{CC(ON)}$	开关导通的电源电压		0	0.2	V
$V_{CC(OFF)}$	开关隔离的电源电压		1.6	3.0	V
$V_{SW(ON)}$	DC 开关 I/O 电压（开关导通）	$V_{CC} = 0\text{ V}$	-2	2	V
$V_{SW(OFF)}$	DC 开关 I/O 电压（开关隔离）	$V_{CC} = 1.6\text{ V 至 }3.0\text{ V}$	0	1.4	V

直流电气特性

除非另有说明，否则 T_A 的典型值为 25°C。

符号	参数	条件	V_{CC} (V)	$T_A = -40^\circ\text{C}$ 至 $+85^\circ\text{C}$			单位
				最小值	典型值	最大值	
I_{ON}	接地开关漏电流 (开关导通)	$A_n = -1.4\text{ V}$ 至 1.4 V , $B_n =$ 悬空	0	0	0.3	1.0	μA
I_{OFF}	接地开关漏电流 (开关隔离)	$A_n = 0.4\text{ V}$ 至 1.4 V , $B_n =$ 悬空	3	0	0.5	3.5	μA
R_{ON}	开关导通电阻 ⁽²⁾	$I_{SW} = \pm 24\text{ mA}$, $V_{SW} = -1.4\text{ V}$ 至 $+1.4\text{ V}$	0		0.8		Ω
$R_{FLAT(ON)}$	导通电阻平坦度 ⁽²⁾	$I_{SW} = \pm 24\text{ mA}$, $V_{SW} = -1.4\text{ V}$ 至 $+1.4\text{ V}$	0		0.01		Ω
I_{CC}	静态电源电流	$SEL0 = SEL1 = V_{CC}$	3	0	50	70	μA
V_{IH}	输入高电平 (选择引脚) ⁽³⁾		3	$0.8 \cdot V_{CC}$			V
V_{IL}	输入低电平 (选择引脚) ⁽³⁾		3			$0.2 \cdot V_{CC}$	V
I_{IN}	输入漏电流 (选择引脚)		3	0		± 1	μA

注意:

- 通过测试和特性保证。
- 选择控制引脚上的电压必须 $\leq V_{CC}$ 。

交流电气特性

除非另有说明，否则 T_A 的典型值为 25°C。

符号	参数	条件	V_{CC} (V)	典型值	单位
t_{ON}	导通时间 V_{CC} 至输出 ^(4,5)	$R_L = 32\ \Omega$, $C_L = 10\text{ pF}$, $V_{SW} = 1.4\text{ V}$	1.6	120	ns
t_{OFF}	关断时间 V_{CC} 至输出 ^(4,5)	$R_L = 32\ \Omega$, $C_L = 10\text{ pF}$, $V_{SW} = 1.4\text{ V}$	1.6	160	μs
O_{IRR}	关断隔离 ^(4,5)	$R_L = 32\ \Omega$, $f = 20\text{ kHz}$, $V_{SW} = 0.35\text{ V}_{RMS}$	1.6	-90	dB
X_{TALK}	串扰 ^(4,5)	$R_L = 32\ \Omega$, $f = 20\text{ kHz}$, $V_{SW} = 1\text{ V}_{RMS}$	0	-90	dB
BW	-3dB 带宽 ⁽⁵⁾	$R_L = 50\ \Omega$, $C_L = 0\text{ pF}$	0	<50	MHz
THD+N	总谐波失真 + 噪声 ^(4,5)	$R_L = 32\ \Omega$, $f = 20\text{ Hz}$ to 20 kHz , $V_{SW} = 1\text{ V}_{RMS}$	0	0.002	%

注意:

- $SEL0=SEL1=$ 低电平。
- 由产品特性保证。

电容值

若无其他说明， $T_A = 25^\circ\text{C}$ 。

符号	参数	条件	典型值	单位
C_{ON}	导通电容 (开关导通)	$V_{CC} = 0\text{ V}$, $f = 1\text{ MHz}$, 400 mV_{PP}	10	pF
C_{OFF}	关断电容 (开关隔离)	$V_{CC} = 1.6\text{ V}$, $f = 1\text{ MHz}$, 400 mV_{PP}	10	

物理尺寸

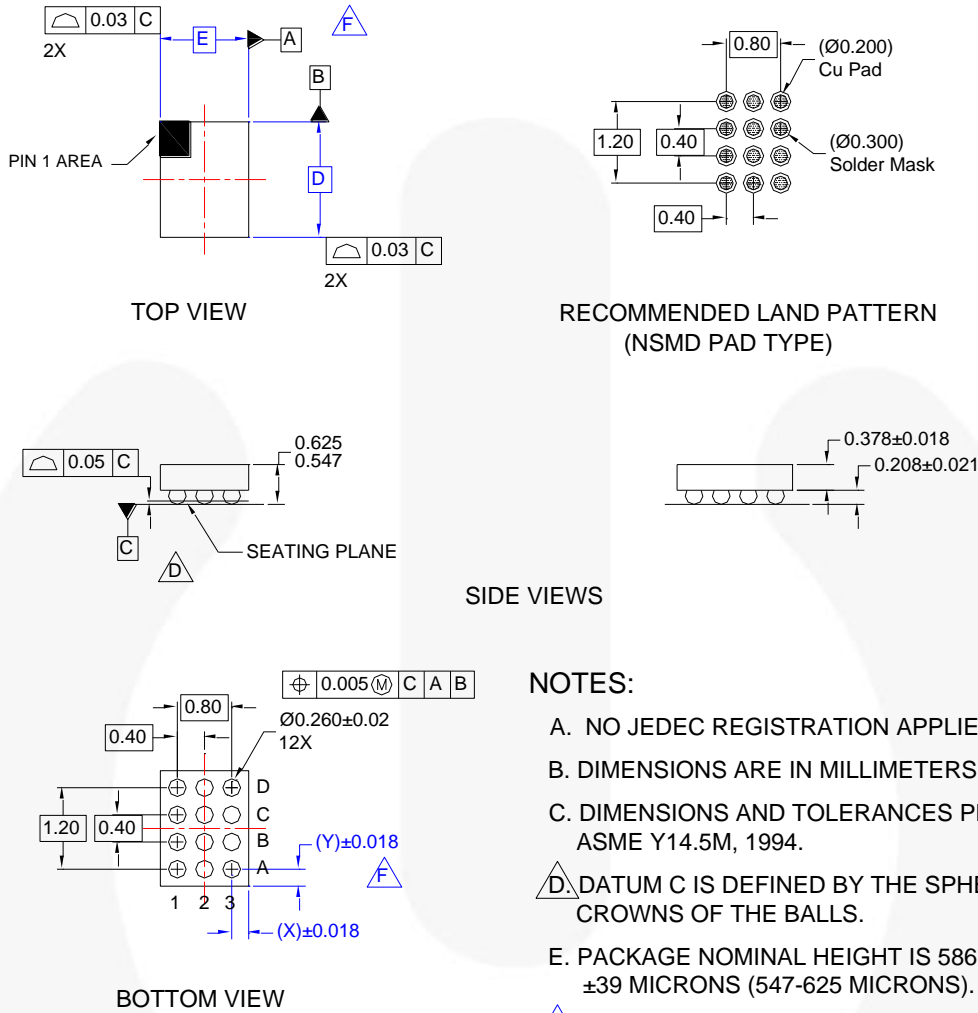


图 2. 12 引脚晶圆级芯片尺寸封装 (WLCSP), 3x4 阵列, 0.4 mm 间距






产品规格尺寸

E	D	X	Y
1.16 mm	1.56 mm	0.18 mm	0.18 mm



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