FAIRCHILD™

Is Now Part of

ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

2014 December

FSA642
低功率，3端口，高速 MIPI 开关

特性

- 低导通电容： 7.0pF（典型值）
- 低导通电阻： 7.0Ω（典型值）
- –3db带宽： 1GHz（典型值）
- 24-引脚 UMLP（2.5 x 3.4mm）封装
- 额定值 8kV ESD ；>16kV Power/GND ESD

应用

- 手机上的双镜头应用
- 手机上的双 LCD 应用，数码相机显示和取景器

说明

FSA642是双向低功率高速模拟开关。
引脚排列专为简化差分信号布局而设计，配置为三刀双掷开关（TPDT）。
FSA642专为两个MIPI器件之间切换进行优化，如相机或液晶显示器以及板上多媒体应用处理器（MAP）。

FSA642符合移动行业处理器接口（MIPI）的要求。
低电容设计使得FSA642可切换频率超过500MHz的信号。
出色的通道间抗串扰能力可以最大程度地减小干扰，实现MIPI规范所描述的高速差分信号和单端信号传输。

订购信息

器件编号	顶标	工作温度范围	封装
FSA642UMX	JG	–40 至 +85°C	24引脚，方形，超薄膜塑无铅封装（UMLP），2.5 x 3.4mm
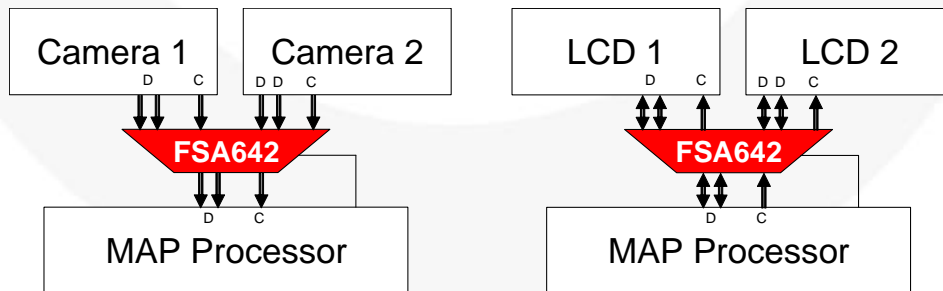
图 1.　　　应用模块图

引脚布局
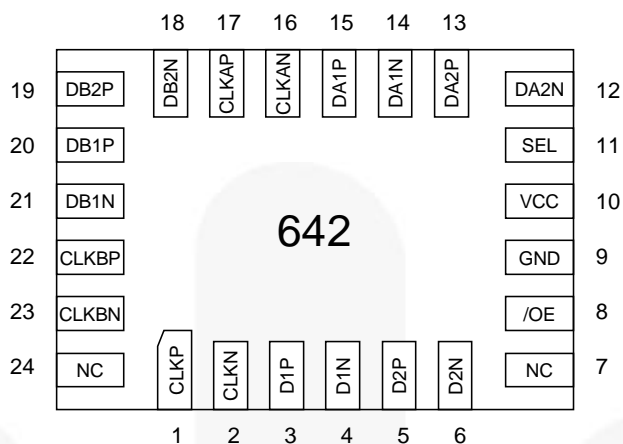
图 2. 引脚配置（俯视图）

引脚说明

引脚号	名称	说明
1，2	CLKP，CLKN	时钟路径（公共）
3，4	D1P，D1N	数据路径1（公共）
5，6	D2P，D2N	数据路径2（公共）
7，24	NC	未连接（浮空）
8	/OE	输出使能（低电平有效）
9	GND	接地
10	VCC	功率
11	SEL	选择（0=A，1=B）
12，13	DA2N，DA2P	数据路径（A2）
14，15	DA1N，DA1P	数据路径（A1）
16，17	CLKAN，CLKAP	时钟路径(A)
18，19	DB2N，DB2P	数据路径（2B）
20，21	DB1P，DB1N	数据路径（1B）
22，23	CLKBP，CLKBN，	时钟路径(B)

功能框图
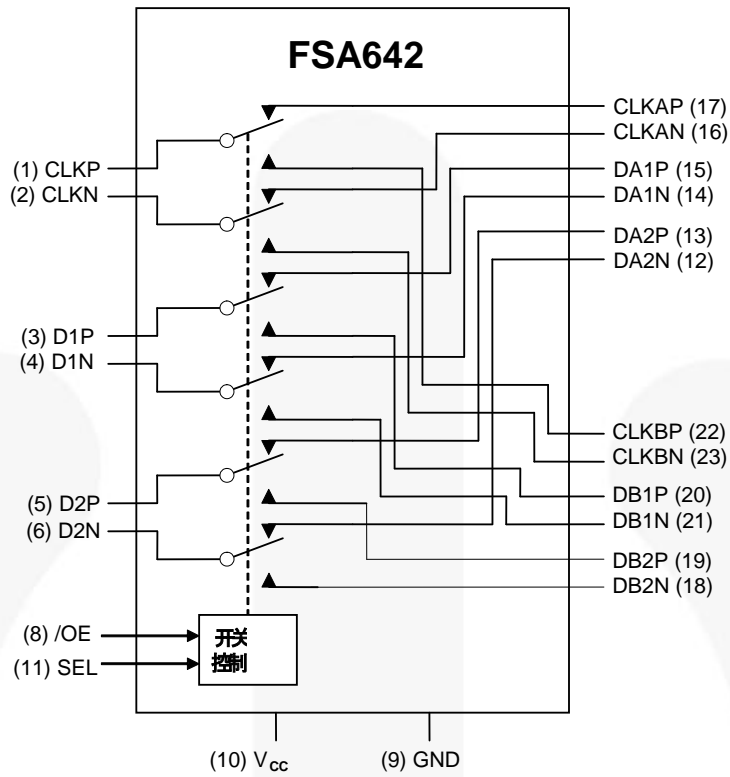
图 3. 功能框图

真值表

SEL	/OE	功能
无关	高	未连接
低	低	D1，D2，CLK=DA1，DA2，CLKA
高	低	D1，D2，CLK=DB1，DB2，CLKB

绝对最大额定值

应力超过绝对最大额定值，可能会损坏设备。

在超出推荐的工作条件的情况下，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		最小值	最大值	单位
V_{CC}	电源电压		−0.50	+5.25	V
V_{CNTRL}	DC 输入电压（SEL，/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	全部引脚		6.5	kV
		输入/输出至地		8.0	
		电源至地		16.0	
	充电器件模型，JEDEC：JESD22-C101			2.5	

注意：

1. 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器件的真实工作条件。 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}	电源电压	2.65	4.30	V
V_{CNTRL}	控制输入电压（SEL，/OE）[2]	0	V_{CC}	V
V_{SW}	开关 I/O 电压	−0.5	V_{CC}−1	V
T_A	工作温度	−40	+85	°C

注意：

2. 控制输入必须保持高电平或低电平，不允许浮空。

直流电气特性

若无其他说明，所有典型值都在T$_A$=25°C **下测得。**

符号	参数	工作条件	V$_{cc}$（V）	T$_A$=-40 至 +85°C			单位
				最小值	典型值	最大值	
V$_{IK}$	箝位二极管电压	I$_{IN}$=-18mA	2.775			-1.2	V
I$_{IN}$	控制脚输入漏电流	V$_{SW}$=0 to 4.3V	4.3	-1		1	μA
V$_{IH}$	输入电压高电平	V$_{IN}$=0 至 V$_{cc}$	2.650 至 2.775	1.3			V
			4.3	1.7			
V$_{IL}$	输入电压低电平	V$_{IN}$=0 至 V$_{cc}$	2.650 至 2.775			0.5	V
I$_{OZ}$	关断漏电流	A, B=0+0.3V to V$_{cc}$-0.3	4.3	-2		2	μA
I$_{CC}$	静态电源电流	V$_{CNTRL}$=0 or V$_{cc}$, I$_{OUT}$=0	4.3			1.0	μA
I$_{CCT}$	每个控制电压和V$_{cc}$的I$_{CC}$电流增量	V$_{CNTRL}$=1.8V	2.775			1.5	μA

直流电气特性，低速模式

若无其他说明，所有典型值都在T$_A$=25°C 下测得。

符号	参数	工作条件	V$_{cc}$（V）	T$_A$=-40 至 +85°C			单位
				最小值	典型值	最大值	
R$_{ON}$	LS 开关导通电阻[3]	V$_{SW}$=1.2V, I$_{ON}$=-10mA, 图 4	2.65		10	14	Ω
ΔR$_{ON}$	LS Delta R$_{ON}$[4]	V$_{SW}$=1.2V, I$_{ON}$=-10mA（内部成对）	2.65		0.65		Ω

说明：
3. 在指定通过电流下，由A/B 和 CLK/Dn引脚之间的电压降测得。
4. 由产品特性保证。

直流电气特性，高速模式

若无其他说明，所有典型值都T$_A$=25°C 下测得。

符号	参数	工作条件	V$_{cc}$（V）	T$_A$=-40 至 +85°C			单位
				最小值	典型值	最大值	
R$_{ON}$	HS 开关导通电阻[5]	V$_{SW}$=0.4V, I$_{ON}$=-10mA, 图 4	2.65		7.0	9.5	Ω
ΔR$_{ON}$	HS Delta R$_{ON}$[6]	V$_{SW}$=0.4V, I$_{ON}$=-10mA（内部成对）	2.65		0.65		Ω

说明：
5. 在指定通过电流下，由A/B 和 Dn引脚之间的电压降测得。
6. 由产品特性保证。

FSA642 —低功率，3端口，高速 MIPI 开关

交流电气特性

所有值的测量条件为 R$_L$=50Ω 和 R$_S$=50Ω，典型值为 V$_{cc}$=2.775V，T$_A$=25°C ，除非另有说明。

符号	参数	工作条件	V$_{cc}$（V）	T$_A$=-40°C 至 +85°C			单位
				最小值	典型值	最大值	
O$_{IRR}$	关断隔离[7]	f=100MHz，R$_T$=50Ω 图 14	2.775		−35		dB
Xtalk	非相邻通道串扰[7]	f=100MHz，R$_T$=50Ω 图 15	2.775		−55		dB
BW	−3db 带宽[7]	C$_L$=0pF，R$_T$=50Ω 图 13	2.775		1.0		GHz
t$_{ON}$	开机时间SEL，/OE 至输出	C$_L$=5pF，V$_{SW}$=1.2V 图 6，图 7	2.650 至 2.775		20	37	ns
t$_{OFF}$	关断时间SEL，/OE 至输出	C$_L$=5pF，V$_{SW}$=1.2V 图 6，图 7	2.650 至 2.775		15	27	ns
t$_{PD}$	传输延迟[7]	C$_L$=5pF 图 6，图 8	2.775		0.25		ns
t$_{BBM}$	"先开后合"时间	C$_L$=5pF，V$_{SW1}$=V$_{SW2}$=1.2V 图 12	2.650 至 2.775	3	5	8	ns

注意：
7. 由产品特性保证。

交流电气特性，高速模式

若无其他说明，所有典型值都在 V$_{cc}$=2.775V ，T$_A$=25°C 下测得。

符号	参数	工作条件	T$_A$=-40°C 至 +85°C			单位
			最小值	典型值	最大值	
t$_{SK(Part\_Part)}$	多器件通道间相位差[8, 9]	V$_{SW}$=0.2Vdiff$_{PP}$，C$_L$=5pF		40	80	ps
t$_{SK(Chl\_Chl)}$	单器件通道间相位差[8]	V$_{SW}$=0.2Vdiff$_{PP}$，C$_L$=5pF，图 9		15	30	ps
t$_{SK(脉冲)}$	同一差分通道内的反向转换相位差[8]	V$_{SW}$=0.2Vdiff$_{PP}$，C$_L$=5pF		10	20	ps

说明：
8. 由产品特性保证。
9. 假设所有器件应用相同的 V$_{cc}$ 和温度。

电容值

符号	参数	工作条件	T$_A$=-40°C 至 +85°C			单位
			最小值	典型值	最大值	
C$_{IN}$	控制引脚输入电容[10]	V$_{cc}$=0V		1.5		
C$_{ON}$	Dn/CLK− 导通电容[10]	V$_{cc}$=2.775V，/OE=0V，f=1MHz，at 25°C 图 11	6.0	7.0	9.0	pF
C$_{OFF}$	Dn/CLK− 关断电容[10]	V$_{cc}$=2.775V，/OE=2.775V，f=1MHz 图 10		2.5		

注意：
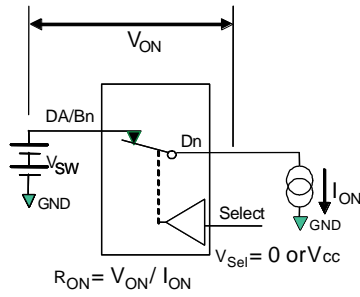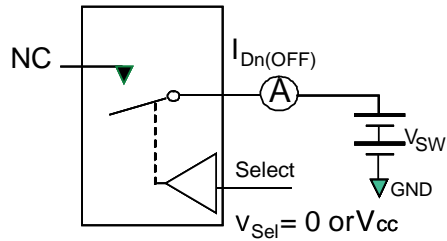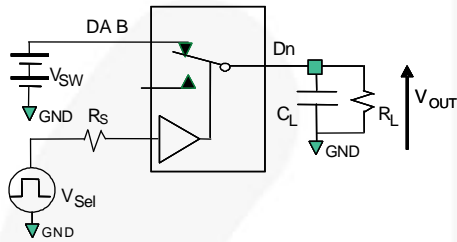10. 由产品特性保证。

测试框图

图 4. 导通电阻

$R_{ON} = V_{ON} / I_{ON}$

**Each switch port is tested separately

图 5. 关断漏电流

R_L, R_S, an C_L ar fu ctions of FOD2073 location
environment (se AC Tables for spe ific v lues)
C_L inclu es test fixture an stra capacitance

图 6. 交流测试电路负载

图 7. 开通/关断波形

图 8. 传输延迟（$t_R t_F$ - 500ps）

图 9. 通道间相位差

图 10. 通道关断电容

图 11. 通道导通电容

测试框图 （续）

t_{RISE} = 2.5ns

V_{CC}

Input - V_{Sel}

9 %

$V_{CC}/2$

0V

1 %

V_{OUT}

0.9*$V_{o\ t}$ 0.9*$V_{o\ t}$

t_{BBM}

R_L, R_S, and C_L ar functions of FO   tation environment (see AC Tables for specific v lues). C_L includes test fixture and stra   capacitance.
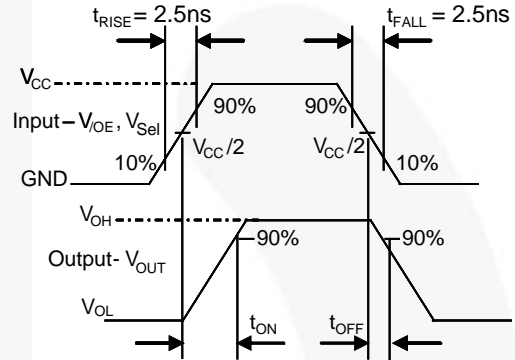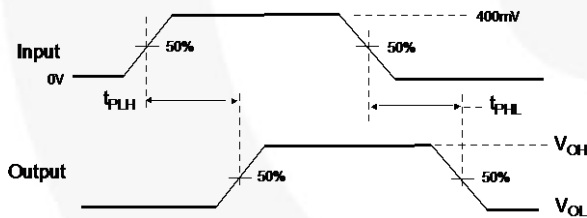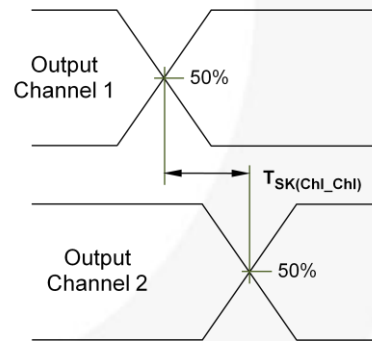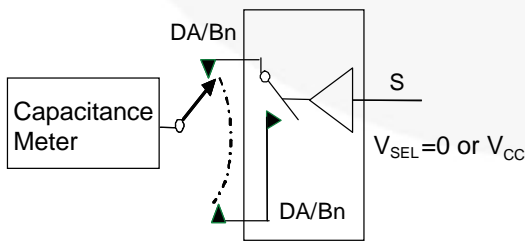
图 12.   先开后合间隔时序

Network Analyzer

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

图 13.   带宽

Network Analyzer

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

Off isolation = 20 Log (V_{OUT} / V_{IN})

图 14.   通道的关断隔离

Network Analyzer

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

Crosstalk = 20 Log (V_{OUT} / V_{IN})

图 15.   非相邻通道间串扰

物理尺寸测试

2X △ 0.05 C
2.50 A B
PIN#1 IDENT
3.40
TOP VIEW
2X △ 0.05 C

SIDE VIEW
∥ 0.10 C
△ 0.08 C
0.50±0.05
0.15±0.05
0.025±0.025
SEATING PLANE C

BOTTOM VIEW
2.50±0.05
(0.15)4X
0.40±0.05(23X)
0.40
3.40±0.05
DETAIL A
PIN#1 IDENT
0.85
0.20±0.05(24X)
⊕ 0.10 C A B
0.05 C

LEAD SHAPE AT PACKAGE EDGE
R0.20 PACKAGE EDGE
LEAD OPTION 1 SCALE : 2X
LEAD OPTION 2 SCALE : 2X

RECOMMENDED LAND PATTERN
2.800
2.225
0.663
0.563
0.400
2.225 3.700
0.225
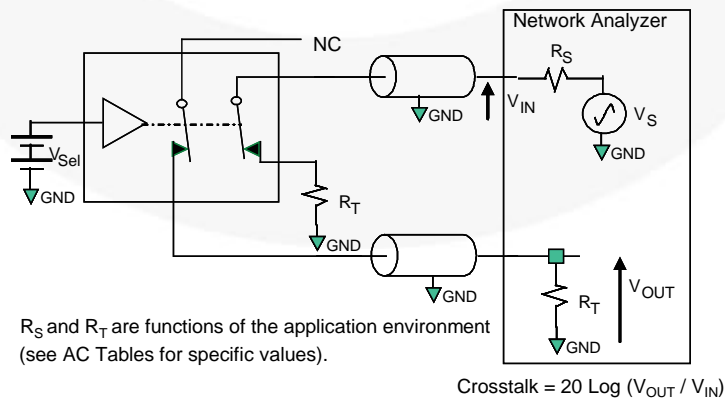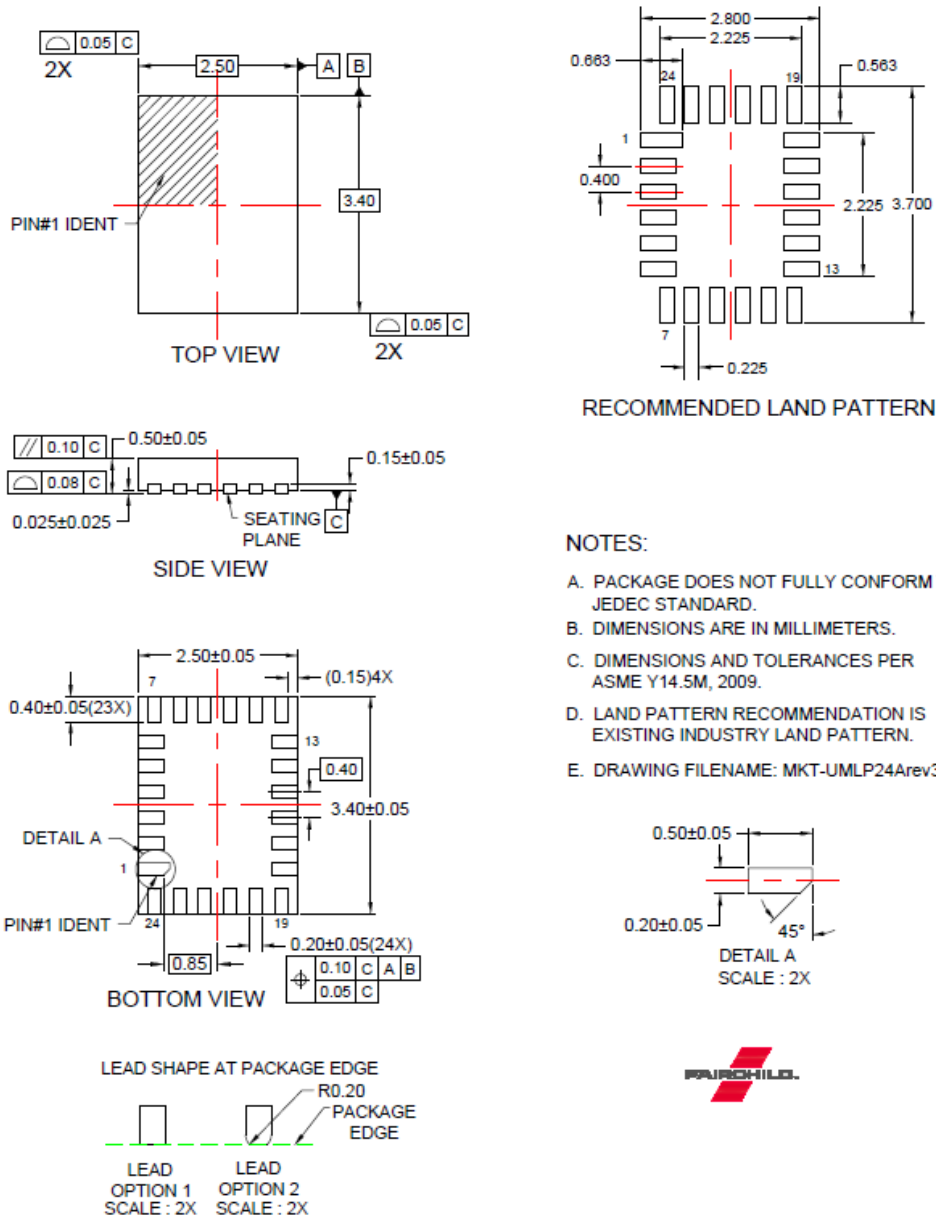
NOTES:

A. PACKAGE DOES NOT FULLY CONFORM TO JEDEC STANDARD.
B. DIMENSIONS ARE IN MILLIMETERS.
C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 2009.
D. LAND PATTERN RECOMMENDATION IS EXISTING INDUSTRY LAND PATTERN.
E. DRAWING FILENAME: MKT-UMLP24Arev3.

0.50±0.05
0.20±0.05
45°
DETAIL A SCALE : 2X

图 16. 24-引脚，UMLP

Product-Specific Dimensions

Description	Nominal Values (mm)	Description	Nominal Values (mm)
Overall Height	0.500	Lead Length (23x)	0.4
Pkg Standoff	0.026	Lead Length, Pin 1 (1x)	0.5
Lead Thickness	0.152	Lead Pitch	0.4
Lead Width (24x)	0.200	Body Length (X)	3.4
		Body Width (Y)	2.5

2.5x3.4 UMLP24L Packing
- Embossed Tape FSA642UMX
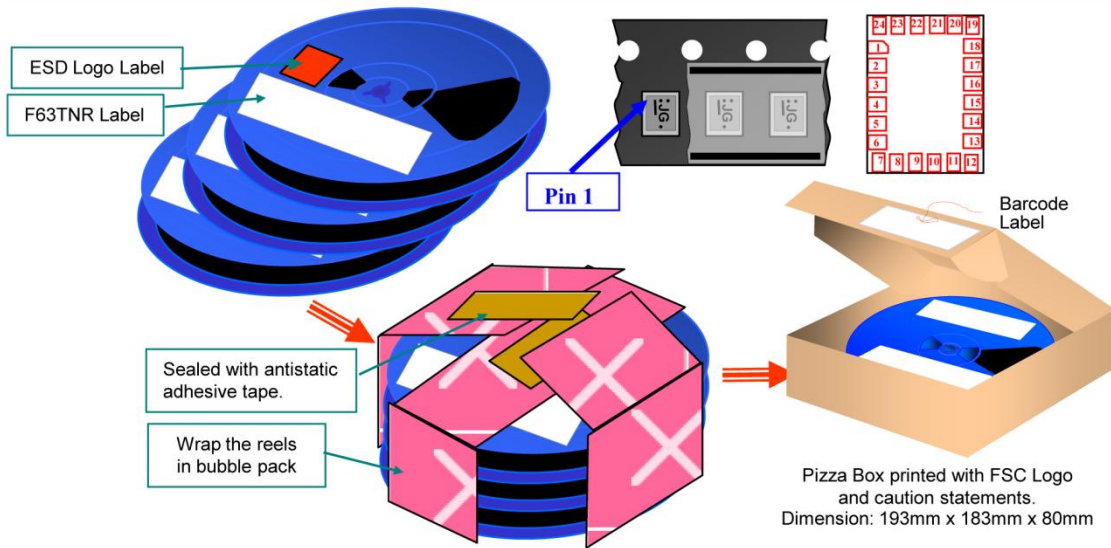
FAIRCHILD
SEMICONDUCTOR®

Packing Description:

UMLP 24 pins products are classified under Moisture Sensitive Level 1.

The carrier tape is made from dissipative polystyrene or polycarbonate resin. The cover tape is a multilayer film primarily composed of polyester film, adhesive layer, heat activated sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 5000 units per 178 mm diameter reel. Up to three reels are packed in each intermediate box. The reels is made of polystyrene plastic (anti-static coated or intrinsic).

These full reels are individually barcode labeled and placed inside a pizza box made of recyclable corrugated brown paper with a Fairchild logo printing. The reel is packed single reel in the pizza box. And these pizza boxes are placed inside a barcode labeled shipping box which comes in different sizes depending on the number of parts shipped.
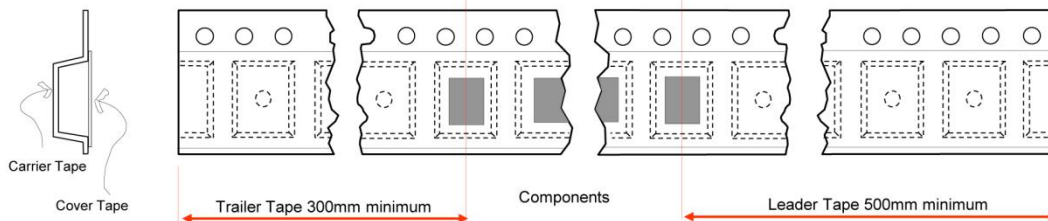
ESD Logo Label

F63TNR Label

Pin 1

Barcode Label

Sealed with antistatic adhesive tape.

Wrap the reels in bubble pack

Pizza Box printed with FSC Logo and caution statements.
Dimension: 193mm x 183mm x 80mm

ESD Logo Label sample

FAIRCHILD
SEMICONDUCTOR ™

Electrostatic
Sensitive Devices
Require Proper
Handling Procedures

TNR Date   Remark

Sample of F63TNR Label

LOT: PMH010088888   QTY: 5000

FSID: FSA642UMX   SPEC:

D/C1: P1215NA   QTY1:   SPEC REV: 2nd Level Interconnect
                                                          1. Category G3
                                 Green Component   2. Maximum safe temperature 260 deg C
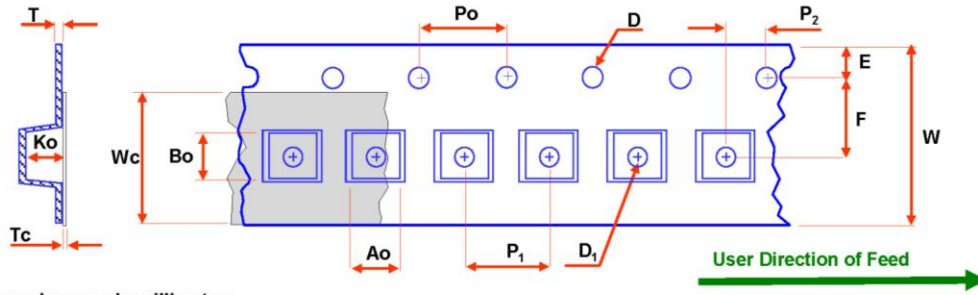D/C2:   QTY2:   RoHS   3. MSL 1
                                 COMPLIANT   FAIRCHILD SEMICONDUCTOR   (F63TNR)6.0

Tape Leader and Trailer Configuration

Carrier Tape

Cover Tape

Trailer Tape 300mm minimum   Components   Leader Tape 500mm minimum

Rev 1 170810

图 17.   Tape and Reel Packing Specification, page 1

UMLP Embossed Tape Dimension

User Direction of Feed

Dimensions are in millimeters

Package	Ao +/-0.05	Bo +/-0.05	D +/-0.10	D₁ +/-0.05	E +/-0.1	F +/-0.05	Ko +/-0.05	P₁ TYP	Po TYP	P₂ +/-0/05	T TYP	Tc +/-0.005	W +/-0.3	Wc TYP
UMLP24A	2.70	3.60	1.50	0.6	1.75	3.5	0.70	4	4	2.0	0.254	0.06	8	5.5

Notes: Ao, Bo, and Ko dimensions are determined with respect to the EIA /Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).

20 deg maximum component rotation

Sketch A (Side or Front Sectional View)
Component Rotation

Sketch B (Top View)
Component Rotation

Sketch C (Top View)
Component lateral movement
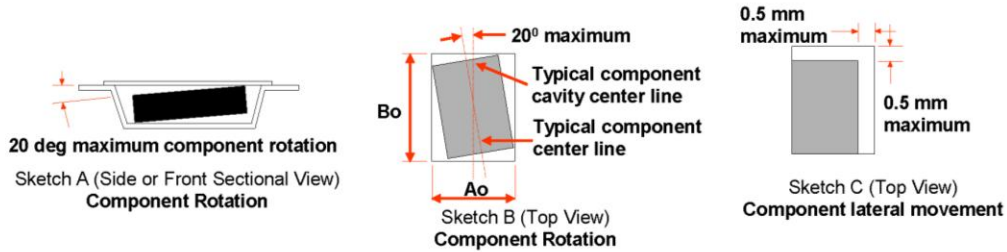
Shipping Reel Dimension
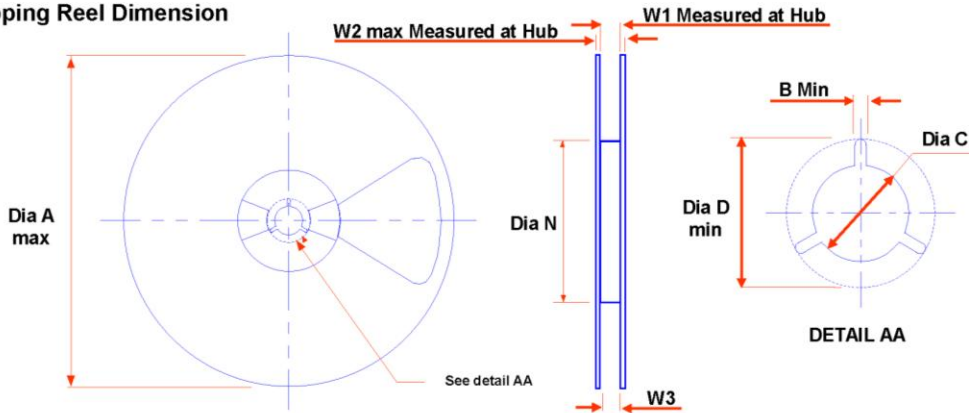
Dimensions are in millimeters

Tape Width	Dia A max	Dim B min	Dia C +.5/-.2	Dia D min	Dim N min	Dim W1 +2/-0	Dim W2 max	Dim W3 (LSL - USL)
8	178	1.5	13	20.2	55	8.4	14.4	7.9~10.9

图 18.   Tape and Reel Packing Specification, page 2

TRADEMARKS

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

AccuPower™	F-PFS™	OPTOPLANAR®	SYSTEM GENERAL®*
Awinda®	FRFET®	®	TinyBoost®
AX-CAP®*	Global Power Resource℠	PowerTrench®	TinyBuck®
BitSiC™	GreenBridge™	PowerXS™	TinyCalc™
Build it Now™	Green FPS™	Programmable Active Droop™	TinyLogic®
CorePLUS™	Green FPS™ e-Series™	QFET®	TINYOPTO™
CorePOWER™	Gmax™	QS™	TinyPower™
CROSSVOLT™	GTO™	Quiet Series™	TinyPWM™
CTL™	IntelliMAX™	RapidConfigure™	TinyWire™
Current Transfer Logic™	ISOPLANAR™	™	TranSiC™
DEUXPEED®	Making Small Speakers Sound Louder and Better™	Saving our world, 1mW/W/kW at a time™	TriFault Detect™
Dual Cool™	MegaBuck™	SignalWise™	TRUECURRENT®*
EcoSPARK®	MICROCOUPLER™	SmartMax™	µSerDes™
EfficientMax™	MicroFET™	SMART START™	
ESBC™	MicroPak™	Solutions for Your Success™	
F®	MicroPak2™	SPM®	UHC®
Fairchild®	MillerDrive™	STEALTH™	Ultra FRFET™
Fairchild Semiconductor®	MotionMax™	SuperFET®	UniFET™
FACT Quiet Series™	MotionGrid®	SuperSOT™-3	VCX™
FACT®	MTi®	SuperSOT™-6	VisualMax™
FAST®	MTx®	SuperSOT™-8	VoltagePlus™
FastvCore™	MVN®	SupreMOS®	XS™
FETBench™	mWSaver®	SyncFET™	Xsens™
FPS™	OptoHiT™	Sync-Lock™	仙童™
	OPTOLOGIC®		

* Trademarks of System General Corporation, used under license by Fairchild Semiconductor.

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. TO OBTAIN THE LATEST, MOST UP-TO-DATE DATASHEET AND PRODUCT INFORMATION, VISIT OUR WEBSITE AT HTTP://WWW.FAIRCHILDSEMI.COM. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.

2. A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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.

Rev. I72

PUBLICATION ORDERING INFORMATION

© Semiconductor Components Industries, LLC

www.onsemi.com