

FSA8029

Audio Jack Send / End Detection with MIC / Video Switch

Features

Detection	Accessory Plug-In 3- or 4-Pole Audio Jack Send / End Key Pressed
Switch Type	Microphone & Video
V _{DD}	2.5 to 4.3V
THD (MIC)	0.01% Typical
ESD (Air Gap)	16kV
Operating Temperature	-40°C to 85°C
Package	10-Lead UMLP 1.4x1.8x0.5mm, 0.4mm Pitch
Top Mark	KS
Ordering Information	FSA8029UMX

Applications

- 3.5mm and 2.5mm Audio Jacks
- Cellular Phones, Smartphones
- MP3 and PMP

Typical Application

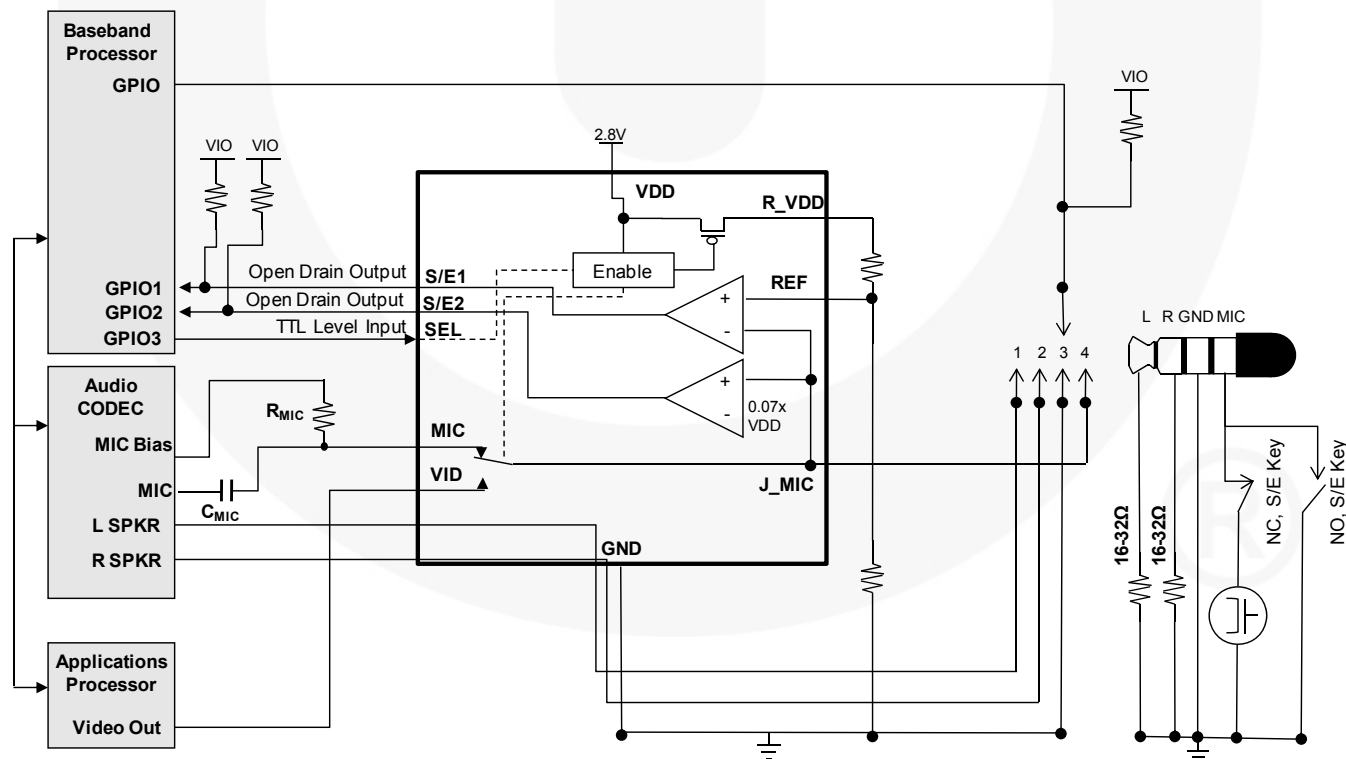


Figure 1. Mobile Phone Example

Description

The FSA8029 is an audio jack microphone / video switch for 3- or 4-pole accessories with send / end (S/E) detection. In addition to detection, the FSA8029 features an integrated microphone / video switch that allows the processor to configure the audio jack. The architecture is designed to allow common third-party headphones to be used for listening to music from mobile handsets, personal media players, and portable peripheral devices.

- Determines when Send / End Button Key is Pressed
- Integrates a MIC / Video Switch for 4-Pole Configuration
- Reduces Pop / Click Caused by Microphone Bias

Related Resources

- For samples and questions, please contact:
Analog.Switch@fairchildsemi.com.
- FSA8029 Demonstration Board

Pin Configuration

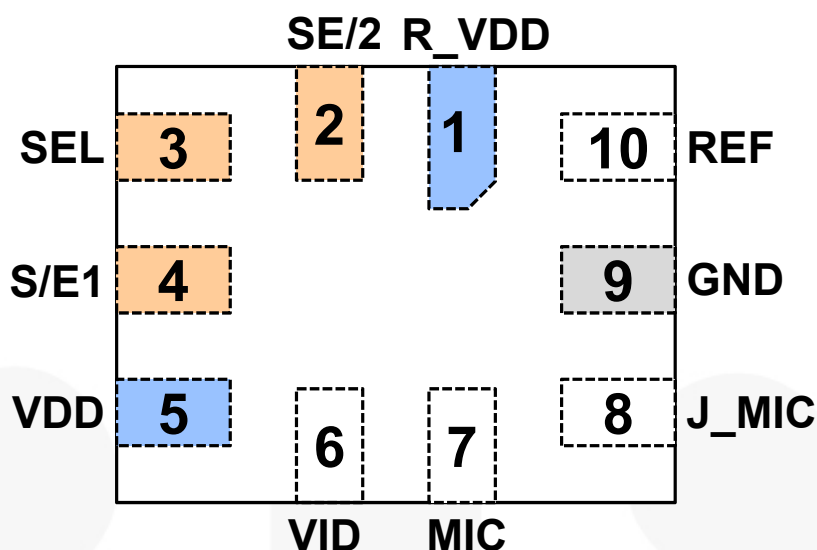


Figure 2. Pin Assignments (Through View)

Pin Descriptions

Name	Pin #	Type	Description
R_VDD	1	Output	Optional pull-up voltage, with a resistor divider, sets the reference voltage on the REF pin
S/E2	2	Output	Indicates state of normally open (N/O) send / end key press; open-drain output requires pull-up resistor
SEL	3	Input	MIC / VID switch select pin
S/E1	4	Output	Indicates state of normally closed (N/C) send / end key press; open-drain output requires pull-up resistor
VID	6	Switch	Video switch path; connects between video source and audio jack microphone pin
MIC	7	Switch	Microphone switch path to the CODEC microphone amplifier input
J_MIC	8	Switch	Microphone switch path connects to the microphone, send / end key, and video of the jack pole
REF	10	Input	Reference voltage used to detect a send / end key press through a resistor divider off R_VDD or external voltage reference
VDD	5	Power	Supply voltage
GND	9	Ground	Ground for both the audio jack and PCB

Note:

1. 0 = V_{OL} or V_{IL} ; 1 = V_{OH} or V_{IH} .

Table 1. Device Configuration in Reset and Active States

SEL	MIC	VID	R_VDD	S/E1 + S/E2
1	J_MIC	Open	VDD	Active
0	Open	J_MIC	GND	HIGH

Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter		Min.	Max.	Units
V _{DD}	Supply Voltage from Battery		-0.5	5.5	V
V _{SW}	Switch I/O Voltage		-0.5	V _{DD} +0.5	V
I _{IK}	Input Clamp Diode Current ⁽²⁾		-50		mA
I _{SW}	Switch I/O Current (Continuous) ⁽²⁾			50	mA
T _{STG}	Storage Temperature Range		-65	+150	°C
T _J	Maximum Junction Temperature			+150	°C
T _L	Lead Temperature (Soldering, 10 Seconds)			+260	°C
ESD	IEC 61000-4-2 System ESD	Air Gap	16		kV
		Contact	10		
	Human Body Model, JEDEC JESD22-A114	All other Pins	5		
		J_DET, J_MIC, V _{DD} , V _{IO} , GND	8		
	Charged Device Model, JEDEC JESD22-C101	All Pins	2		

Note:

2. The input and output negative ratings may be exceeded if the input and output diode current ratings are observed.

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter	Min.	Max.	Units
V _{DD}	Battery Supply Voltage	2.5	4.3	V
T _A	Operating Temperature	-40	+85	°C

DC Electrical Characteristics

All typical values are at $T_A = 25^\circ\text{C}$ unless otherwise specified.

MIC Switch

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40$ to $+85^\circ\text{C}$			Units
				Min.	Typ.	Max.	
R_{ON}	MIC Switch On Resistance	$I_{OUT} = 24\text{mA}$, $V_{IN} = 2.2\text{V}$	2.8		2.0	4.0	Ω
			3.0		1.5	3.5	
			3.3		1.2	3.0	
			3.8		1.0	2.5	
$R_{FLAT(ON)}$	On Resistance Flatness	$I_{OUT} = 24\text{mA}$, $V_{IN} = V$ to V_{DD}	2.8		0.7	1.5	Ω
			3.0		0.6	1.4	
			3.3		0.5	1.3	
			3.8		0.5	1.2	
V_{IN}	Switch Input Voltage Range		2.5 to 4.3	0		V_{DD}	V
C_{ON}	MIC and J_MIC Switch ON Capacitance	$f = 1\text{MHz}$	2.8		15		pF
C_{OFF}	MIC and J_MIC Switch OFF Capacitance	$f = 1\text{MHz}$	2.8		8		pF

Video Switch Characteristics

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40$ to $+85^\circ\text{C}$			Unit
				Min.	Typ.	Max.	
R_{ON}	MIC Switch On Resistance	$I_{OUT} = 24\text{mA}$, $V_{IN} = 0.5\text{V}$	2.8		1.0	1.5	Ω
			3.0		0.9	1.4	
			3.3		0.8	1.3	
			3.8		0.7	1.2	
$R_{FLAT(ON)}$	On Resistance Flatness	$I_{OUT} = 24\text{mA}$, $V_{IN} = 0\text{V}$ to 1.2V	2.8		0.4	0.60	Ω
			3.0		0.3	0.55	
			3.3		0.2	0.50	
			3.8		0.15	0.45	
V_{IN}	Switch Input Voltage Range		2.5 to 4.3	0		1.5	V
C_{ON}	VID Switch On Capacitance	$f = 1\text{MHz}$	2.8		40		pF
C_{OFF}	VID Switch Off Capacitance	$f = 1\text{MHz}$	2.8		10		pF

Parallel I/O

Symbol	Parameter	$T_A = -40$ to $+85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	
V_{IH}	Input High Voltage (EN, SEL)	$0.44 \times V_{DD}$		V_{DD}	V
V_{IL}	Input Low Voltage (EN, SEL)	GND		$0.15 \times V_{DD}$	V
$PUR_{S/E}$	Pull-Up Resistor on S/E	2		110	K Ω
V_{OL}	Output Low Voltage (S/E) (V_{PUR} = Voltage of Pull-Up Resistor)			$0.2 \times V_{PUR}$	V

Continued on the following page...

DC Electrical Characteristics (Continued)

All typical values are at $T_A = 25^\circ\text{C}$ unless otherwise specified.

Comparator NC Switch

Symbol	Parameter	$T_A = -40 \text{ to } +85^\circ\text{C}$			Unit
		Min.	Typ.	Max.	
V_{REF}	Input Voltage on REF Pin	1		$V_{\text{DD}} - 0.075$	V
COM_{HYS}	Hysteresis of Comparator “-” Terminal		50		mV

Comparator NO Switch

Symbol	Parameter	V_{DD} (V)	$T_A = -40 \text{ to } +85^\circ\text{C}$			Unit
			Min.	Typ.	Max.	
V_{COMP}	Comparator Threshold for Send / End Sensing	2.5 to 4.3		$0.07 \times V_{\text{DD}}$		V
COM_{HYS}	Hysteresis of Comparator “+” Terminal			50		mV

Current

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40 \text{ to } +85^\circ\text{C}$			Unit
				Min.	Typ.	Max.	
I_{OFF}	Off-State Leakage Current	$J_{\text{MIC}} = 1\text{V}, 4.3\text{V}$, $\text{MIC or VID} = 4.3\text{V}, 1\text{V}$	4.3	-15		15	nA
I_{IN}	Input Leakage Current	Inputs 0 to 4.3V	0 to 4.3			1	μA
$I_{\text{CC-EN}}$	Low-Power Mode	EN = LOW	2.5 to 4.3		10		nA
$I_{\text{CC-VID}}$	Current During Video Mode	Active Current, SEL = LOW	2.5 to 4.3		10		nA
$I_{\text{CC-MIC}}$	Current During Microphone Mode	Active Current, SEL = HIGH	2.5 to 4.3		20		μA

AC Electrical Characteristics

All typical values are for $V_{CC} = 3.3V$ at $T_A = 25^\circ C$ unless otherwise specified.

MIC Switch

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40$ to $+85^\circ C$			Unit
				Min.	Typ.	Max.	
THD	Total Harmonic Distortion	$R_T = 600\Omega$, $V_{SW} = 0.5V_{PP}$, $f = 20Hz$ to $20kHz$, $V_{IN} = 2.2V$	2.8		.003		%
O_{IRR}	Off Isolation	$f = 20kHz$, $R_S = 32\Omega$, $C_L = 0pF$, $R_T = 32\Omega$	2.8		-100		dB
X_{TALK}	Crosstalk from MIC to VID	$f = 1MHz$, $R_L = 100\Omega$	2.8		-67		dB

Video Switch Characteristics

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40$ to $+85^\circ C$			Unit
				Min.	Typ.	Max.	
D_G	Differential Gain	$R_L = 150\Omega$, $f = 3.58MHz$	2.8		.09		%
D_P	Differential Phase	$R_L = 150\Omega$, $f = 3.58MHz$	2.8		.13		°
O_{IRR}	Off Isolation	$f = 10MHz$, $R_L = 150\Omega$,	2.8		-45		dB
X_{TALK}	Crosstalk from VID to MIC	$f = 10MHz$, $R_{IN} = 10\Omega$, $C_L = 0pF$, $R_L = 150\Omega$	2.8		-65		dB

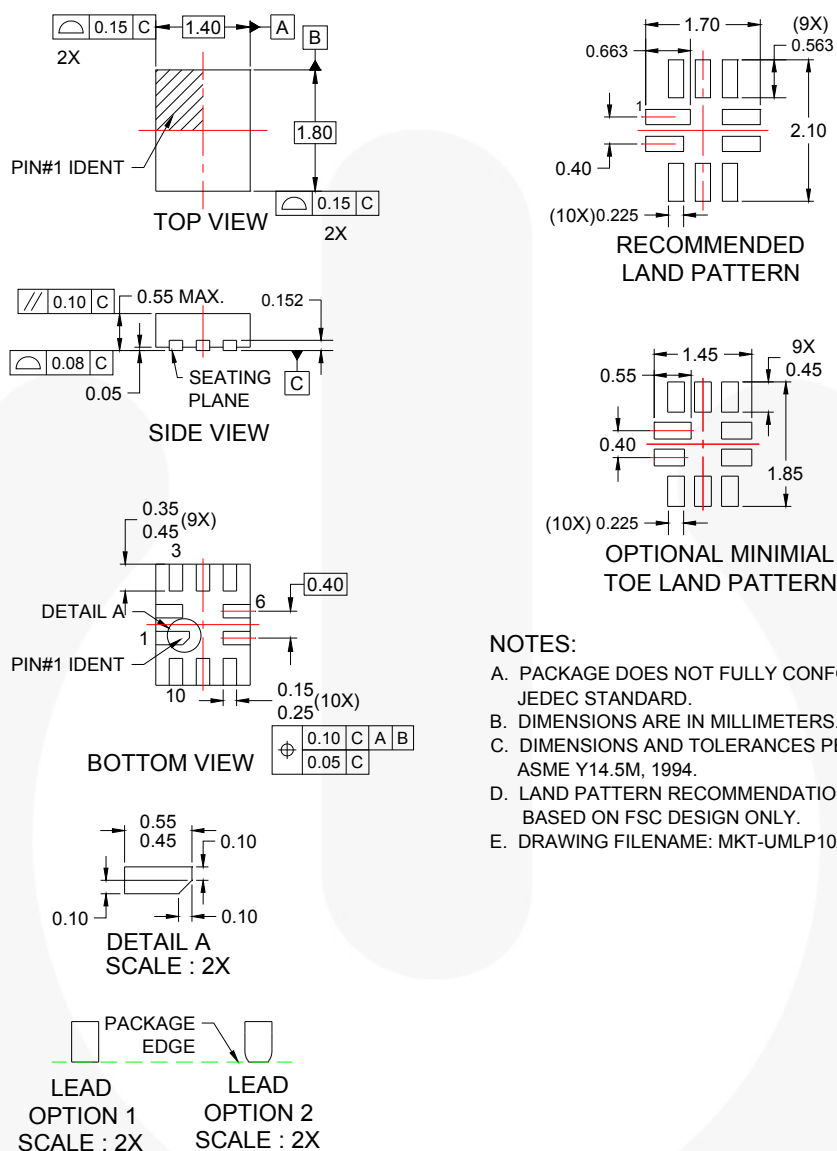
Parallel I/O

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40$ to $+85^\circ C$			Unit
				Min.	Typ.	Max.	
t_{BBM}	Break-Before-Make Time		2.5 to 4.3		120		ns
$t_{SEL-COM-ON}$	Select to Comparator On	SEL LOW \rightarrow HIGH to Comparator On	2.5 to 4.3		10		μs
$t_{SEL-COM-OFF}$	Select to Comparator Off	SEL HIGH \rightarrow LOW to Comparator Off	2.5 to 4.3		20		ns
t_{ON}	Switch Turn-On Time		2.5 to 4.3		40		ns
t_{OFF}	Switch Turn-Off Time		2.5 to 4.3		15		ns
$t_{J_MIC-S/E}$	Propagation Delay from Comparator Trigger to S/E Output	$J_MIC > REF$ from LOW \rightarrow HIGH $J_MIC < REF$ from HIGH \rightarrow LOW	2.5 to 4.3		10		μs

Power

Symbol	Parameter	Conditions	V_{DD} (V)	$T_A = -40$ to $+85^\circ C$			Unit
				Min.	Typ.	Max.	
PSRR	Power Supply Rejection Ratio	Power Supply Noise at $300mV_{PP}$, Measured 10/90%, $f = 217Hz$	2.8		-100		dB

Physical Dimensions



NOTES:

- A. PACKAGE DOES NOT FULLY CONFORM TO JEDEC STANDARD.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
- D. LAND PATTERN RECOMMENDATION IS BASED ON FSC DESIGN ONLY.
- E. DRAWING FILENAME: MKT-UMLP10Arev3.

Figure 3. 10-Lead, UMLP Package

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>




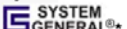
Ordering Information

Part Number	Operating Temperature Range	Top Mark	Package
FSA8029UMX	-40 to +85°C	KS	10-Lead 1.4 x 1.8 x 0.55mm, 0.4mm Pitch, Ultrathin Molded Leadless Package (UMLP)



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.

2Cool™	F-PFS™	PowerTrench®	The Power Franchise®
AccuPower™	FRFET®	PowerXS™	the power franchise
AX-CAP™*	Global Power Resource™	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 at a time™	TinyPWM™
Current Transfer Logic™	ISOPLANAR™	SignalWise™	TinyWire™
DEUXPEED®	Making Small Speakers Sound Louder and Better™	SmartMax™	TranSiC™
Dual Cool™	MegaBuck™	SMART START™	TriFault Detect™
EcoSPARK®	MICROCOUPLER™	Solutions for Your Success™	TRUECURRENT®*
EfficientMax™	MicroFET™	SPM®	µSerDes™
ESBC™	MicroPak™	STEALTH™	
	MicroPak2™	SuperFET®	UHC®
Fairchild®	MillerDrive™	SuperSOT™-3	Ultra FRFET™
Fairchild Semiconductor®	MotionMax™	SuperSOT™-6	UniFET™
FACT Quiet Series™	Motion-SPM™	SuperSOT™-8	VCX™
FACT®	mWSaver™	SupreMOS®	VisualMax™
FAST®	OptoHit™	SyncFET™	VoltagePlus™
FastvCore™	OPTOLOGIC®	Sync-Lock™	XS™
FETBench™	OPTOPLANAR®		
FlashWriter®*			
FPS™			

* 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. 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. I61

AMEYA360

Components Supply Platform

Authorized Distribution Brand :



Website :

Welcome to visit www.ameya360.com

Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
Minhang District, Shanghai , China

➤ Sales :

Direct +86 (21) 6401-6692
Email amall@ameya360.com
QQ 800077892
Skype ameyasales1 ameyasales2

➤ Customer Service :

Email service@ameya360.com

➤ Partnership :

Tel +86 (21) 64016692-8333
Email mkt@ameya360.com