



Is Now Part of



**ON Semiconductor®**

To learn more about ON Semiconductor, please visit our website at  
[www.onsemi.com](http://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](http://www.onsemi.com). Please email any questions regarding the system integration to [Fairchild\\_questions@onsemi.com](mailto:Fairchild_questions@onsemi.com).

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

# FSA2267 / FSA2267A

## 0.35Ω Low-Voltage Dual-SPDT Analog Switch

### Features

- Typical 0.35Ω On Resistance ( $R_{ON}$ ) for +2.7V Supply
- FSA2267A Features  $<10\mu A$   $I_{CCT}$  Current when S Input is Lower than  $V_{CC}$
- $R_{ON}$  Fatness for +2.7V Supply: 0.25Ω Maximum
- 1.6mm x 2.1mm 10-Lead MicroPak™ Package
- Broad  $V_{CC}$  Operating Range
- Low THD (0.02% Typical for 32Ω Load)
- High Current Handling Capability (350mA Continuous Current  $<3.3V$  Supply)

### Applications

- Cell phone
- PDA
- Portable Media Player

### Description

The FSA2267 and FSA2267A are Dual Single Pole Double Throw (SPDT) analog switches. The FSA2267 operates from a single 1.65V to 3.6V supply, while the FSA2267A operates from a single 2.3V to 4.3V supply. Each features an ultra-low On Resistance of 0.35Ω at a +2.7V supply and 25°C. Both devices are fabricated with sub-micron CMOS technology to achieve fast switching speeds and designed for break-before-make operation.

FSA2267A features very low quiescent current, even when the control voltage is lower than the  $V_{CC}$  supply. This feature services the mobile handset applications very well, allowing for the direct interface with baseband processor general-purpose I/Os.

### Ordering Information

Order Number	Top Mark	Package Description	Packing Method
FSA2267L10X	FC	10-Lead MicroPak, 1.6 x 2.1mm, JEDEC MO-255	5000 Units on Tape and Reel
FSA2267AL10X	FD	10-Lead MicroPak, 1.6 x 2.1mm, JEDEC MO-255	5000 Units on Tape and Reel
FSA2267AMUX	FSA 2267A	10-Lead Molded Small Outline Package (MSOP), JEDEC MO-187, 3.0mm Wide	4000 Units on Tape and Reel

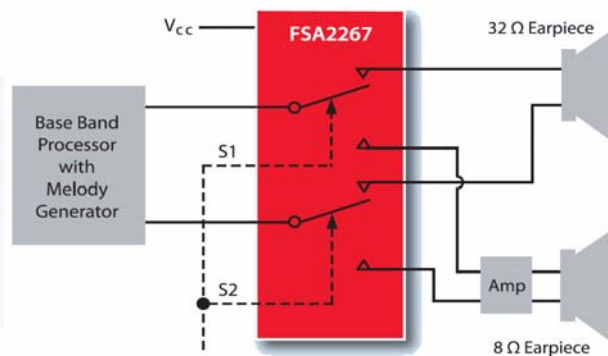


Figure 1. Application Diagram

## Analog Symbols

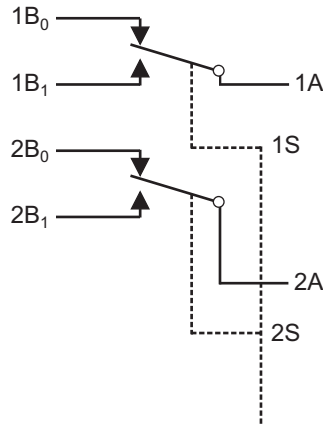


Figure 2. Analog Symbol

## Connections Diagram

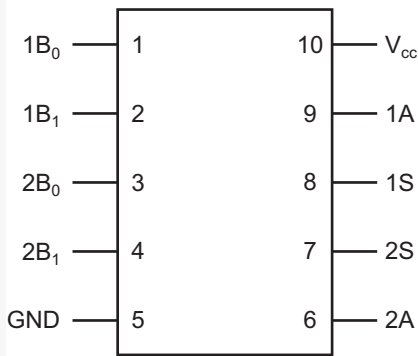


Figure 3. 10-Lead MSOP

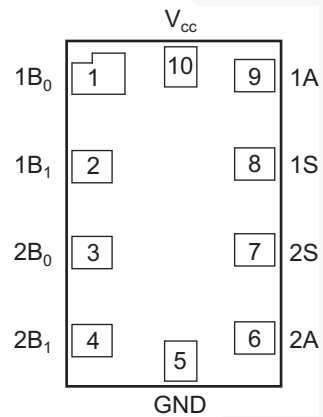


Figure 4. 10-Lead Micropak

## Truth Table

Control Input(s)	Function
LOW Logic Level	$B_0$ Connected to A
HIGH Logic Level	$B_1$ Connected to A

## Pin Descriptions

Pin	Name	Function
1, 2, 3, 4, 6, 9	$1B_0$ , $1B_1$ , $2B_0$ , $2B_1$ , 2A, 1A	Data Ports
8, 7	1S, 2S	Control Input
10	VCC	Supply Voltage
5	GND	Ground

## 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.	Unit
$V_{CC}$	Supply Voltage	-0.5	+5.5	V
$V_S$	Switch Voltage <sup>(1)</sup>	-0.5	$V_{CC} + 0.5$	V
$V_{IN}$	Control Input Voltage <sup>(1)</sup>	-0.5	5.5	V
$I_{IK}$	Input Diode Current <sup>(2)</sup>	-50		mA
$I_{SW}$	Switch Current		350	mA
$I_{SWPEAK}$	Peak Switch Current (Pulsed at 1ms Duration, <10% Duty Cycle)		500	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	Human Body Model: FSA2267		7500	V
	Human Body Model, JESD22-A114:FSA2267A		7000	V
	Charged Device Model, JESD22-C101: FSA2267/FSA2267A		1000	V

### Notes:

- The input and output negative voltage ratings may be exceeded if the input and output diode current ratings are observed.
- Minimums define the acceptable range of current. Negative current should not exceed minimum negative values.

## 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.	Unit
$V_{CC}$	Supply Voltage			V
	FSA2267	1.65	3.6	V
	FSA2267A	2.3	4.3	
$V_{IN}$	Control Input Voltage <sup>(3)</sup>	0	$V_{CC}$	V
$V_{SW}$	Switch Input Voltage	0	$V_{CC}$	V
$T_A$	Operating Temperature	-40	+85	°C

### Note:

- Unused inputs must be held HIGH or LOW. They may not float.

## ESD Protection

### ESD Performance of the FSA2267/FSA2267A

#### FSA2267

- ? HBM all pins 7.0kV
- ? CDM all pins 1.0kV

#### FSA2267A

- ? HBM all pins 7.5kV
- ? CDM all pins 1.0kV

### Human Body Model

Figure 5 shows the schematic representation of the Human Body Model ESD event. Figure 6 is the ideal waveform representation of the Human Body Model. The device is tested to JEDEC: JESD22-A114 Human Body Model.

### Charged Device Model

In manufacturing test and handling environments, a more useful model is the Charged Device Model and the FSA2267/FSA2267A has a very good ESD immunity to this model. The device is tested to JEDEC: JESD22-C101 Charged Device Model.

### IEC 61000-4-2

The IEC 61000-4-2 standard covers ESD testing and performance of finished equipment and evaluates the equipment in its entirety for ESD immunity. Fairchild Semiconductor has evaluated this device using the IEC 6100-4-2 representative system model depicted in Figure 7.

ESD values measured via the IEC 61000-4-2 evaluation method are influenced by the specific board layout, board size, and many other factors of the manufacturer's product application. Measured system ESD values cannot be guaranteed by Fairchild Semiconductor to exactly correlate to a manufacturer's in-house testing due to these application environment variables. Fairchild Semiconductor has been able to determine that, for ultra-portable applications, an enhanced ESD immunity, relative to the IEC 61000-4-2 specification, can be achieved with the inclusion of a 100Ω-series resistor in the V<sub>CC</sub> supply path to the analog switch (see Figure 8). Typical improvements of between 3-6kV of ESD immunity (I/O to GND) have been measured with the inclusion of the resistor with the IEC 61000-4-2 representative model. For more information on ESD testing methodologies, please refer to:

*AN-6019 Fairchild Analog Switch Products ESD Test Methodology Overview*  
<http://www.fairchildsemi.com/an/AN/AN-6019.pdf>

### Additional ESD Test Conditions

For information regarding test methodologies and performance levels, please contact Fairchild Semiconductor.

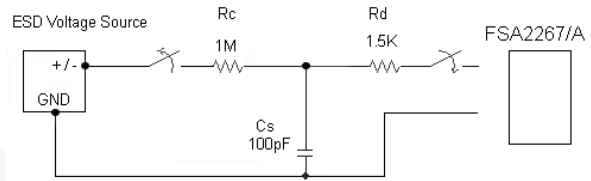


Figure 5. Human Body ESD Test Model

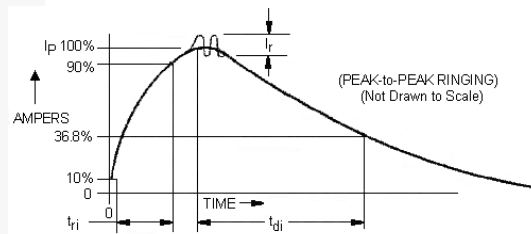


Figure 6. HBM Current Waveform

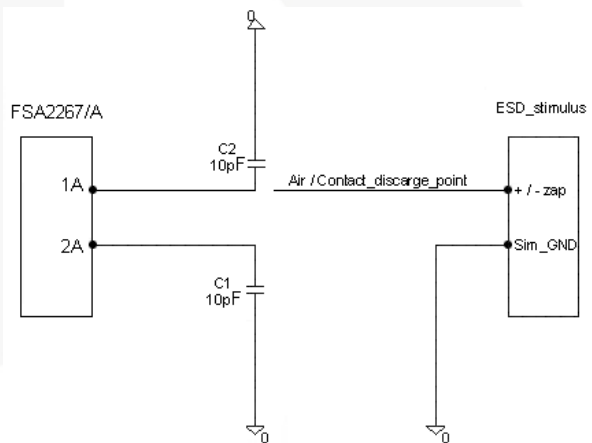


Figure 7. IEC 61000-4-2 ESD Test Model

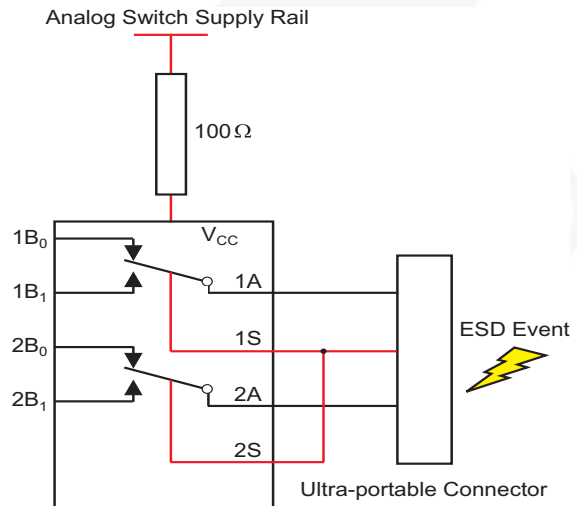


Figure 8. ESD Immunity with 100Ω Resistor

## FSA2267 DC Electrical Characteristics

All typical values are at 25°C unless otherwise specified.

Symbol	Parameter	Conditions	V <sub>CC</sub>	T <sub>A</sub> = +25°C			T <sub>A</sub> = -40 to +85°C		Units
			(V)	Min.	Typ.	Max.	Min.	Max.	
V <sub>IH</sub>	Input Voltage High		2.7 to 3.6				2.0		V
			2.3 to 2.7				1.7		
			1.65 to 1.95				0.65 V <sub>CC</sub>		
V <sub>IL</sub>	Input Voltage Low		2.7 to 3.6					0.8	V
			2.3 to 2.7					0.7	
			1.65 to 1.95					0.35 V <sub>CC</sub>	
I <sub>IN</sub>	Control Input Leakage	V <sub>IN</sub> = 0V to V <sub>CC</sub>	1.65 to 3.6				-0.5	0.5	μA
I <sub>NO(OFF)</sub> , I <sub>NC(OFF)</sub>	Off-Leakage Current of Port nB <sub>0</sub> and nB <sub>1</sub>	nA = 0.3V, 3.3V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 3.3V or floating	3.6	-5.0		5.0	-50	50	nA
		nA = 0.3V, 2.4V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 2.4V or floating	2.7	-5.0		5.0	-50	50	
		nA = 0.3V, 1.65V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 1.65V or floating	1.95	-5.0		5.0	-50	50	
I <sub>A(ON)</sub>	On Leakage Current of Port 1A and 2A	nA = 0.3V, 3.3V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 3.3V or floating	3.6	-5.0		5.0	-50	50	nA
		nA = 0.3V, 2.4V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 2.4V or floating	2.7	-5.0		5.0	-50	50	
		nA = 0.3V, 1.65V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 1.65V or floating	1.95	-5.0		5.0	-50	50	
R <sub>ON</sub>	Switch On Resistance <sup>(4)</sup> See Figure 9	I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V, 0.7V, 2.0V, 2.7V	2.7		0.35			0.60	Ω
		I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V, 0.7V, 1.6V, 2.3V	2.3		0.45			0.75	
		I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0.8V	1.65		1.0			3.9	
ΔR <sub>ON</sub>	On Resistance Matching Between Channels <sup>(5)</sup>	I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0.7V	2.7		0.040			0.075	Ω
			2.3		0.040			0.080	
			1.65		0.1				
R <sub>FLAT(ON)</sub>	On Resistance Flatness <sup>(6)</sup>	I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V to V <sub>CC</sub>	2.7					0.25	Ω
			2.3					0.3	
			1.65		0.3				
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = 0V or V <sub>CC</sub> , I <sub>OUT</sub> = 0A	3.6	-100		100	-500	500	nA

### Notes:

- On resistance is determined by the voltage drop between A and B pins at the indicated current through the switch.
- ΔR<sub>ON</sub> = R<sub>ONmax</sub> - R<sub>ONmin</sub> measured at identical V<sub>CC</sub>, temperature, and voltage.
- Flatness is defined as the difference between the maximum and minimum value of R<sub>ON</sub> over the specified range of conditions.

## FSA2267A DC Electrical Characteristics

All typical values are at 25°C unless otherwise specified.

Symbol	Parameter	Conditions	V <sub>CC</sub>	T <sub>A</sub> = +25°C			T <sub>A</sub> = -40 to +85°C		Units
			(V)	Min.	Typ.	Max.	Min.	Max.	
V <sub>IH</sub>	Input Voltage High		3.6 to 4.3				1.7		V
			2.7 to 3.6				1.5		
			2.3 to 2.7				1.4		
V <sub>IL</sub>	Input Voltage Low		3.6 to 4.3					0.7	V
			2.7 to 3.6					0.5	
			2.3 to 2.7					0.4	
I <sub>IN</sub>	Control Input Leakage	V <sub>IN</sub> = 0V to V <sub>CC</sub>	2.3 to 4.3				-0.5	0.5	μA
I <sub>NO(OFF)</sub> , I <sub>NC(OFF)</sub>	Off-Leakage Current of Port nB <sub>0</sub> and nB <sub>1</sub>	nA = 0.3V, 4.0V, nB <sub>0</sub> or nB <sub>1</sub> = 4.0V, 0.3V or floating	4.3	-10.0		10.0	-100	100	nA
		nA = 0.3V, 3.3V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 3.3V or floating	3.6	-5.0		5.0	-50	50	
		nA = 0.3V, 2.4V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 2.4V or floating	2.7	-5.0		5.0	-50	50	
I <sub>A(ON)</sub>	On Leakage Current of Port 1A and 2A	nA = 0.3V, 4.0V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 4.0V or floating	4.3	-20.0		20.0	-200	200	nA
		nA = 0.3V, 3.3V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 3.3V or floating	3.6	-5.0		5.0	-50	50	
		nA = 0.3V, 3.3V, nB <sub>0</sub> or nB <sub>1</sub> = 0.3V, 3.3V or floating	2.7	-5.0		5.0	-50	50	
R <sub>ON</sub>	Switch On Resistance <sup>(7)</sup>	I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V, 0.7V, 3.6V, 4.3V	4.3		0.35			0.6	Ω
		I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V, 0.7V, 2.3V, 3.0V	3.0		0.35			0.6	
		I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V, 0.7V, 2.0V, 2.7V	2.7		0.35			0.6	
		I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0.8V	1.65		1.0				
ΔR <sub>ON</sub>	On Resistance Matching Between Channels <sup>(8)</sup> See Figure 10	I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0.7V	4.3		0.04			0.075	Ω
			3.0		0.04			0.075	
			2.7		0.04			0.075	
			1.65		0.1				
R <sub>FLAT(ON)</sub>	On Resistance Flatness <sup>(9)</sup>	I <sub>OUT</sub> = 100mA, nB <sub>0</sub> or nB <sub>1</sub> = 0V to V <sub>CC</sub>	4.3		0.15			0.25	Ω
			3.0		0.15			0.25	
			2.7		0.15			0.25	
			1.65		0.3				
I <sub>CC</sub>	Quiescent Supply Current	V <sub>IN</sub> = 0V or V <sub>CC</sub> , I <sub>OUT</sub> = 0A	4.3	-100	80	100	-500	500	nA
I <sub>CCT</sub>	Increase in I <sub>CC</sub> per Input	V <sub>IN</sub> = 1.8V	4.3		7.0	10.0		15.0	μA
		V <sub>IN</sub> = 2.6V			0.5	2.0		7.0	

### Notes:

- On resistance is determined by the voltage drop between A and B pins at the indicated current through the switch.
- ΔR<sub>ON</sub> = R<sub>ONmax</sub> - R<sub>ONmin</sub> measured at identical V<sub>CC</sub>, temperature, and voltage.
- Flatness is defined as the difference between the maximum and minimum value of R<sub>ON</sub> over the specified range of conditions.

## FSA2267 AC Electrical Characteristics

All typical values are at 25°C unless otherwise specified.

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = +25°C			T <sub>A</sub> = -40 to +85°C		Units	Figure Number
				Min.	Typ.	Max.	Min.	Max.		
t <sub>ON</sub>	Turn-On Time	nB <sub>0</sub> or nB <sub>1</sub> = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35 pF	2.7 to 3.6		30.0	38.0		42.0	ns	Figure 11
			2.3 to 2.7		29.0	37.0		40.0		
			1.65 to 1.95		27.0	35.0		38.0		
t <sub>OFF</sub>	Turn-Off Time	nB <sub>0</sub> or nB <sub>1</sub> = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35 pF	2.7 to 3.6		13.0	16.0		18.0	ns	Figure 11
			2.3 to 2.7		14.0	18.0		20.0		
			1.65 to 1.95		15.0	21.0		25.0		
t <sub>BBM</sub>	Break-Before-Make Time	nB <sub>0</sub> or nB <sub>1</sub> = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35 pF	2.7 to 3.6		17.0		2.0		ns	Figure 12
			2.3 to 2.7		15.0		2.0			
			1.65 to 1.95		12.0		2.0			
Q	Charge Injection	C <sub>L</sub> = 100 pF, V <sub>GEN</sub> = 0V, R <sub>GEN</sub> = 0Ω	2.7 to 3.6		9.0				pC	Figure 14
		C <sub>L</sub> = 100 pF, V <sub>GEN</sub> = 0V, R <sub>GEN</sub> = 0Ω	2.3 to 2.7		9.0					
		C <sub>L</sub> = 100 pF, V <sub>GEN</sub> = 0V, R <sub>GEN</sub> = 0Ω	1.65 to 1.95		9.0					
OIRR	Off Isolation	f = 100kHz, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 5pF (Stray)	2.7 to 3.6		-80.0				dB	Figure 13
			2.3 to 2.7		-80.0					
			1.65 to 1.95		-80.0					
Xtalk	Crosstalk	f = 100kHz, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 5pF (Stray)	2.7 to 3.6		-80.0				dB	Figure 13
			2.3 to 2.7		-80.0					
			1.65 to 1.95		-80.0					
BW	-3db Bandwidth	R <sub>L</sub> = 50Ω	1.65 to 3.6		45.0				MHz	Figure 16
THD	Total Harmonic Distortion	R <sub>L</sub> = 32Ω, V <sub>IN</sub> = 2V <sub>pk-pk</sub> , f = 20Hz to 20kHz	2.7 to 3.6		0.024				%	Figure 17
		R <sub>L</sub> = 32Ω, V <sub>IN</sub> = 1.5V <sub>pk-pk</sub> , f = 20Hz to 20kHz	2.3 to 2.7		0.015					
		R <sub>L</sub> = 32Ω, V <sub>IN</sub> = 1.2V <sub>pk-pk</sub> , f = 20Hz to 20kHz	1.65 to 1.95		0.35					



## FSA2267A AC Electrical Characteristics

All typical value are at 25°C unless otherwise specified.

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = +25°C			T <sub>A</sub> = -40 to +85°C		Units	Figure Number
				Min.	Typ.	Max.	Min.	Max.		
t <sub>ON</sub>	Turn-On Time	nB <sub>0</sub> or nB <sub>1</sub> = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35pF	3.6 to 4.3		37.0	46.0		48.0	ns	Figure 11
			2.7 to 3.6		37.0	50.0		57.0		
			2.3 to 2.7		60					
			1.65		570					
t <sub>OFF</sub>	Turn-Off Time	nB <sub>0</sub> or nB <sub>1</sub> = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35pF	3.6 to 4.3		15.0	23.0		25.0	ns	Figure 11
			2.7 to 3.6		16.0	30.0		30.0		
			2.3 to 2.7		50.0					
			1.65		500					
t <sub>BBM</sub>	Break-Before-Make Time	nB <sub>0</sub> or nB <sub>1</sub> = 1.5V, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 35pF	3.6 to 4.3		8.0		2.0	ns	Figure 12	
			2.7 to 3.6		8.0		2.0			
			2.3 to 2.7		8.0		2.0			
Q	Charge Injection	C <sub>L</sub> = 100 pF, V <sub>GEN</sub> = 0V, R <sub>GEN</sub> = 0Ω	3.6 to 4.3		24.0			pC	Figure 14	
		C <sub>L</sub> = 100 pF, V <sub>GEN</sub> = 0V, R <sub>GEN</sub> = 0Ω	2.7 to 3.6		24.0					
		C <sub>L</sub> = 100 pF, V <sub>GEN</sub> = 0V, R <sub>GEN</sub> = 0Ω	2.3 to 2.7		24.0					
OIRR	Off Isolation	f = 100kHz, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 5pF (Stray)	3.6 to 4.3		-75.0			dB	Figure 13	
			2.7 to 3.6		-75.0					
			2.3 to 2.7		-75.0					
Xtalk	Crosstalk	f = 100kHz, R <sub>L</sub> = 50Ω, C <sub>L</sub> = 5pF (Stray)	3.6 to 4.3		-70.0			dB	Figure 13	
			2.7 to 3.6		-70.0					
			2.3 to 2.7		-70.0					
BW	-3db Bandwidth	R <sub>L</sub> = 50Ω	2.3 to 4.3		45.0			MHz	Figure 16	
THD	Total Harmonic Distortion	R <sub>L</sub> = 32Ω, V <sub>IN</sub> = 2V <sub>pk-pk</sub> , f = 20Hz to 20kHz	3.6 to 4.3		0.02			%	Figure 17	
		R <sub>L</sub> = 32Ω, V <sub>IN</sub> = 1.5V <sub>pk-pk</sub> , f = 20Hz to 20kHz	2.7 to 3.6		0.02					
		R <sub>L</sub> = 32Ω, V <sub>IN</sub> = 1.2V <sub>pk-pk</sub> , f = 20Hz to 20kHz	2.3 to 2.7		0.02					

## Capacitance

Symbol	Parameter	Conditions	V <sub>CC</sub> (V)	T <sub>A</sub> = +25°C			T <sub>A</sub> = -40 to +85°C		Units	Figure Number
				Min.	Typ.	Max.	Min.	Max.		
C <sub>IN</sub>	Control Pin Input Capacitance	f = 1Mhz	0.0		1.5				pF	Figure 15
C <sub>OFF</sub>	B Port Off Capacitance	f = 1Mhz	3.3		30.0				pF	Figure 15
C <sub>ON</sub>	A Port On Capacitance	f = 1Mhz	3.3		126				pF	Figure 15

### Typical Characteristics

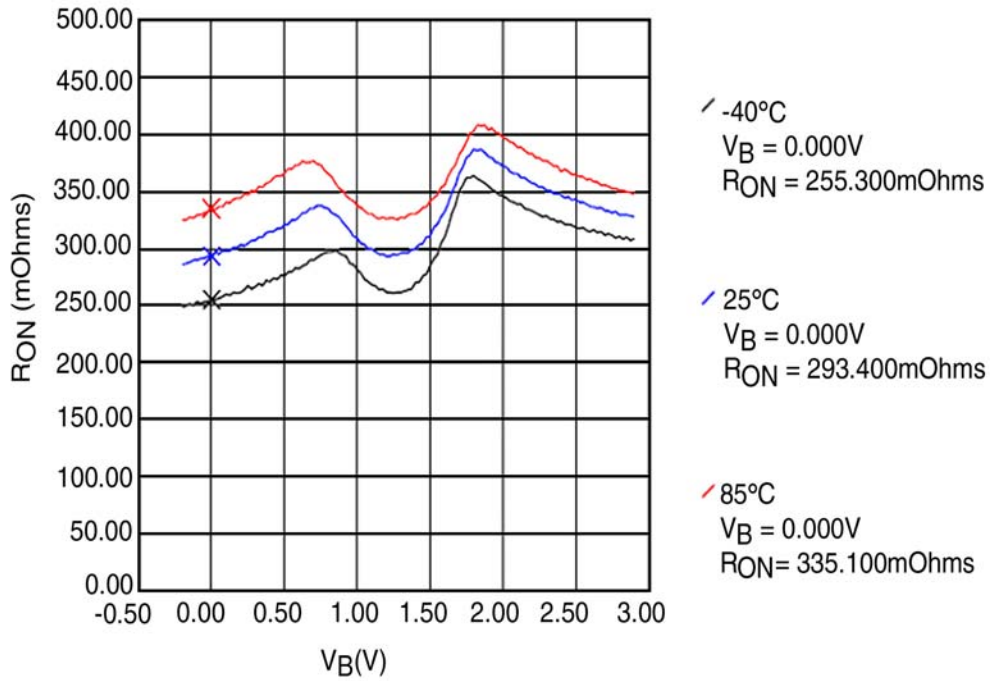


Figure 9.  $R_{ON}$  at 2.7V for FSA2267

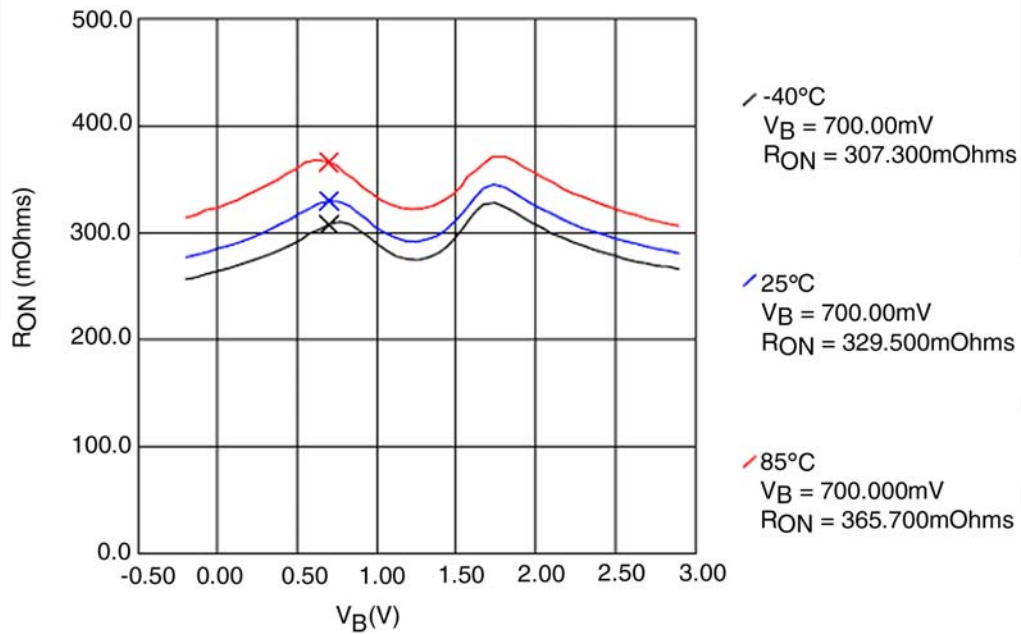
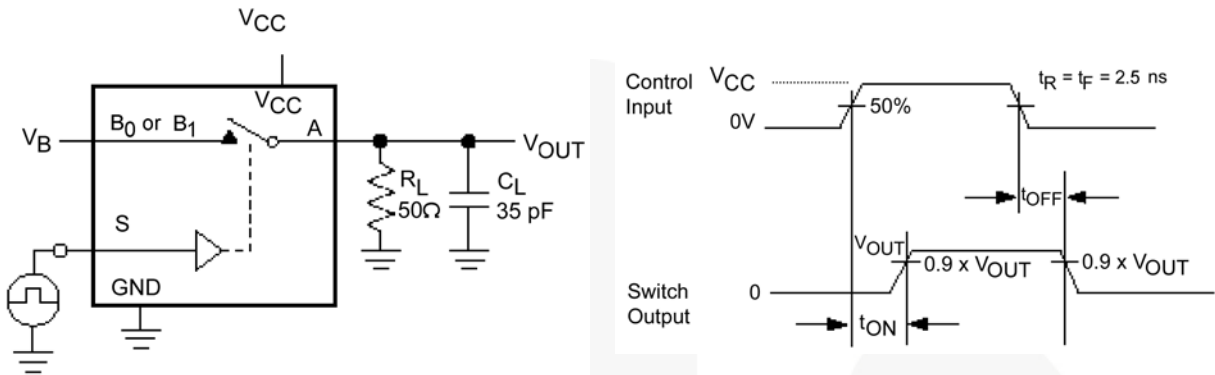


Figure 10.  $R_{ON}$  at 2.7V for FSA2267A

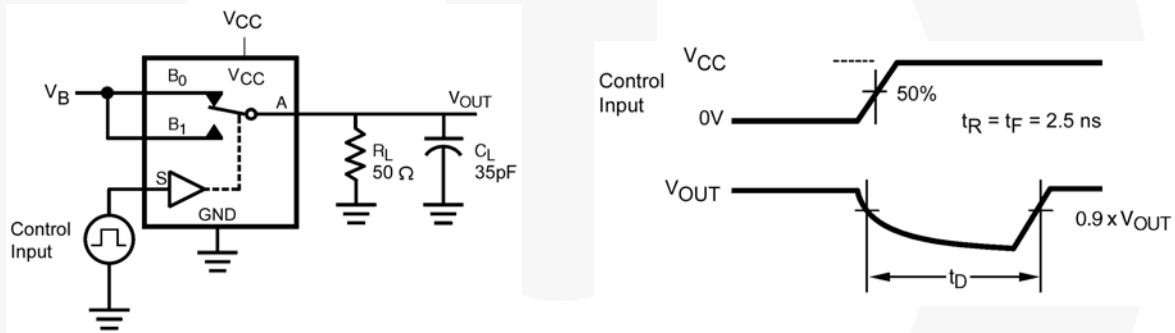
### AC Loading and Waveforms



$C_L$  includes Fixture and Stray Capacitance.

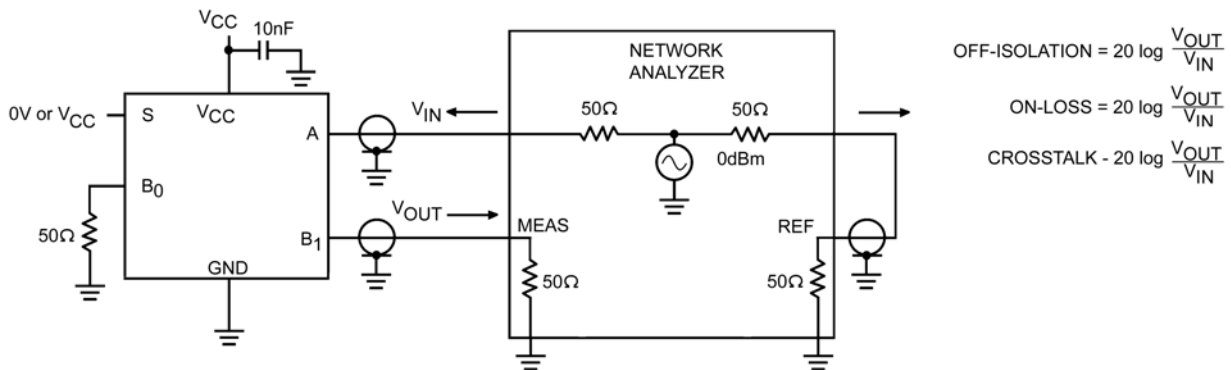
Logic input waveforms are inverted for switches with opposite logic sense.

**Figure 11. Turn-On/Turn-Off Timing**



$C_L$  Includes Fixture and Stray Capacitance

**Figure 12. Break-Before-Make Timing**



**Figure 13. Off Isolation and Crosstalk**

AC Loading and Waveforms (Continued)

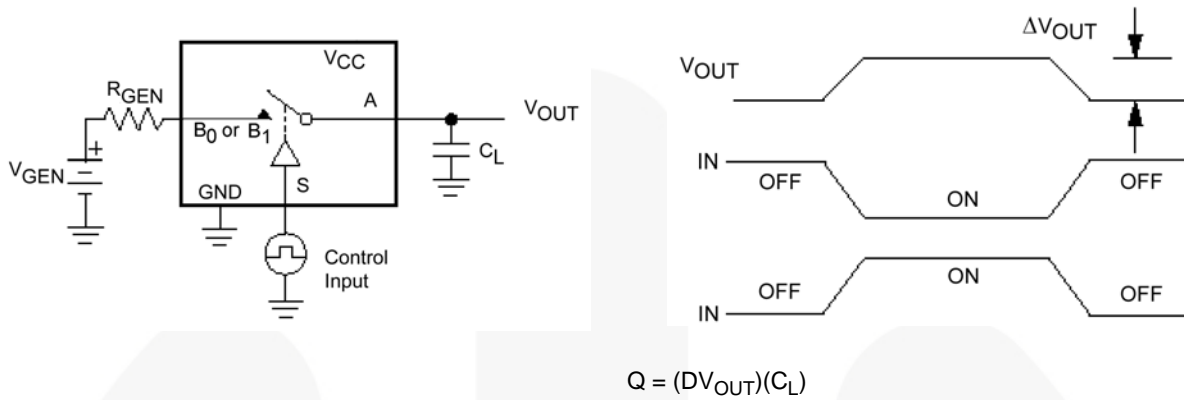


Figure 14. Charge Injection

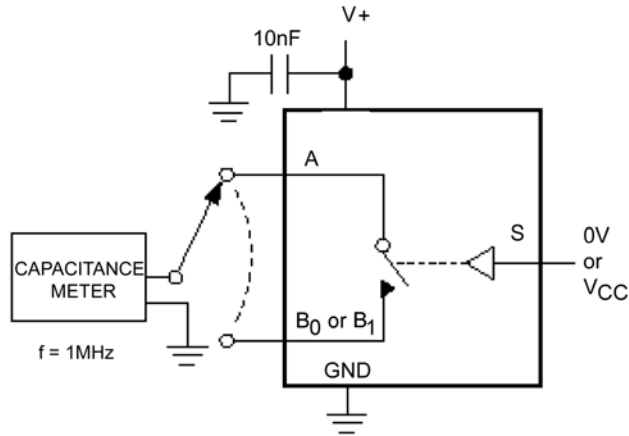


Figure 15. On/Off Capacitance Measurement Setup

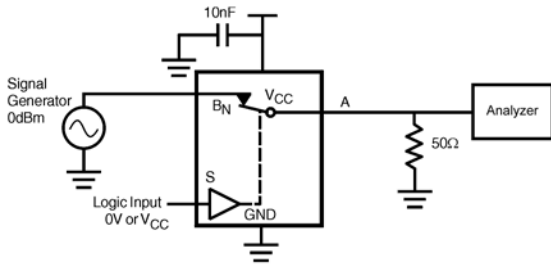


Figure 16. Bandwidth

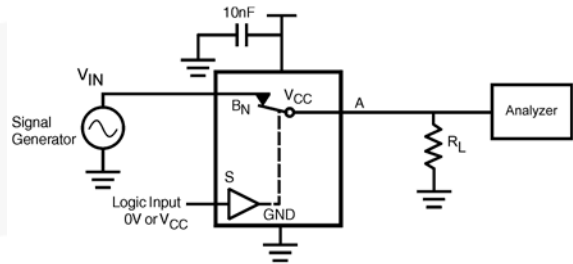
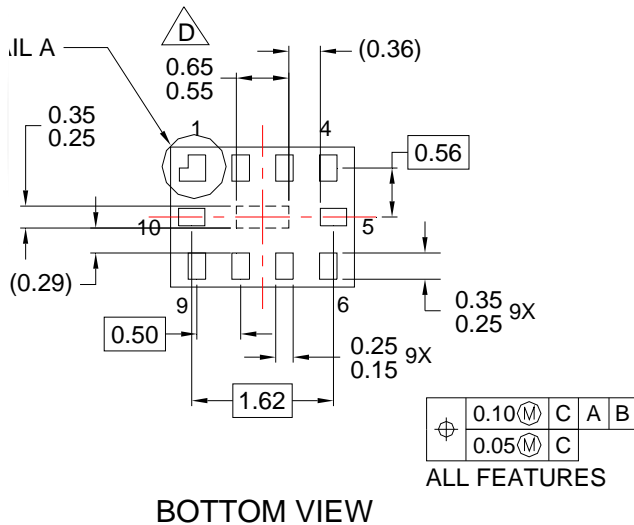
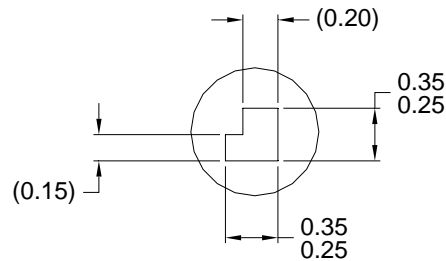
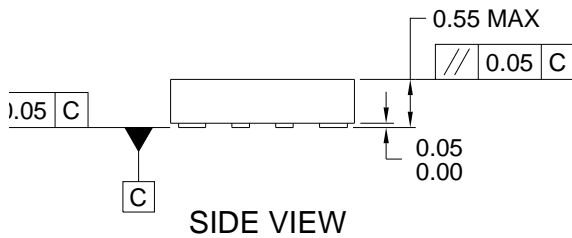
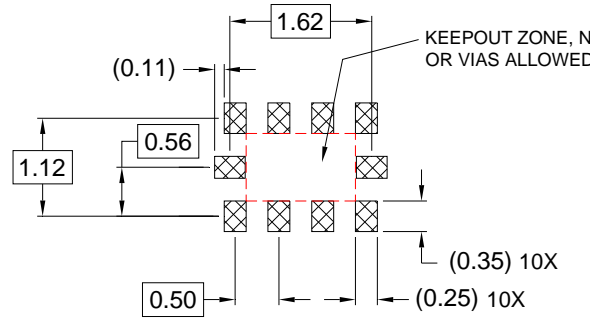
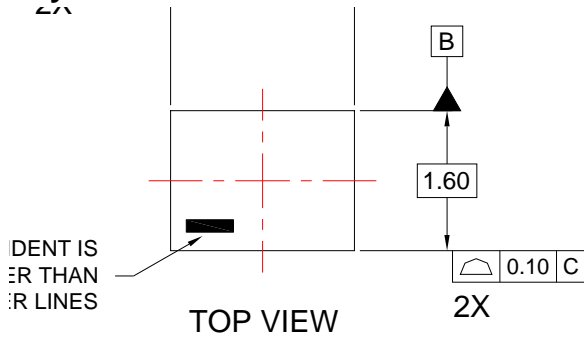


Figure 17. Harmonic Distortion

### Physical Dimensions



**NOTES:**

- A. PACKAGE CONFORMS TO JEDEC REGISTRATION MO-255, VARIATION UABI
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994.
- D. PRESENCE OF CENTER PAD IS PACKAGE SUPPLIER DEPENDENT. IF PRESENT IS NOT INTENDED TO BE SOLDERED AND HAS A BLACK OXIDE FINISH.
- E. DRAWING FILENAME: MKT-MAC10Arev5.

**Figure 18. 10-Lead, MicroPak™, 1.6 x 2.1mm**

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/)  
[http://www.fairchildsemi.com/packaging/.](http://www.fairchildsemi.com/packaging/)

[For current tape and reel specifications, visit Fairchild Semiconductor's online packaging area:](http://www.fairchildsemi.com/products/logic/pdf/micropak_tr.pdf)  
[http://www.fairchildsemi.com/products/logic/pdf/micropak\\_tr.pdf.](http://www.fairchildsemi.com/products/logic/pdf/micropak_tr.pdf)







**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™                                                                          | <b>the power franchise</b>                                                          |
| 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/WkW 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®                                                                         | SerDes™                                                                             |
| Fairchild®                                                                        | MillerDrive™                                   | SuperSOT™-3                                                                       | UHC®                                                                                |
| Fairchild Semiconductor®                                                          | MotionMax™                                     | SuperSOT™-6                                                                       | Ultra FRFET™                                                                        |
| FACT Quiet Series™                                                                | Motion-SPM™                                    | SuperSOT™-8                                                                       | UniFET™                                                                             |
| FACT®                                                                             | mWSaver™                                       | SupreMOS®                                                                         | VCX™                                                                                |
| FAST®                                                                             | OptoHiT™                                       | SyncFET™                                                                          | VisualMax™                                                                          |
| FastvCore™                                                                        | OPTOLOGIC®                                     | Sync-Lock™                                                                        | VoltagePlus™                                                                        |
| FETBench™                                                                         | OPTOPLANAR®                                    |  | XS™                                                                                 |
| 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](http://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

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local  
Sales Representative