



Is Now Part of

**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.

FMS6410B Dual-Channel Video Drivers with Integrated Filters and Composite Video Summer

Features

- 7.1MHz fifth-order Y,C filters with composite summer
- 50dB stopband attenuation at 27MHz on Y, C, and CV outputs
- Better than 0.1dB flatness to 4.5MHz on Y, C, and CV outputs
- No external frequency selection components or clocks
- < 5ns group delay on Y, C, and CV outputs
- AC-coupled inputs
-

Ordering Information

Part Number	Package	Operating Temperature Range	Pb-Free	Container	Pack Qty.
FMS6410BCS	SOIC-8	0°C to 70°C	Yes	Rail	95
FMS6410BCSX	SOIC-8	0°C to 70°C	Yes	Reel	2500

Pin Configuration

Figure 2. Pin Configuration

Pin Assignments

Pin#	Pin	Type	Description
1	Y _{IN}	Input	Luminance (luma) input: This pin is typically connected to the luma or composite video output pin from the external video encoder.
2	NC		No connect.
3	GND	Input	Must be tied to ground.
4	C		

Typical Application Diagram

Figure 3. AC- or DC-Coupled Application Diagram

Absolute Maximum Ratings

The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table defines the conditions for actual device operation.

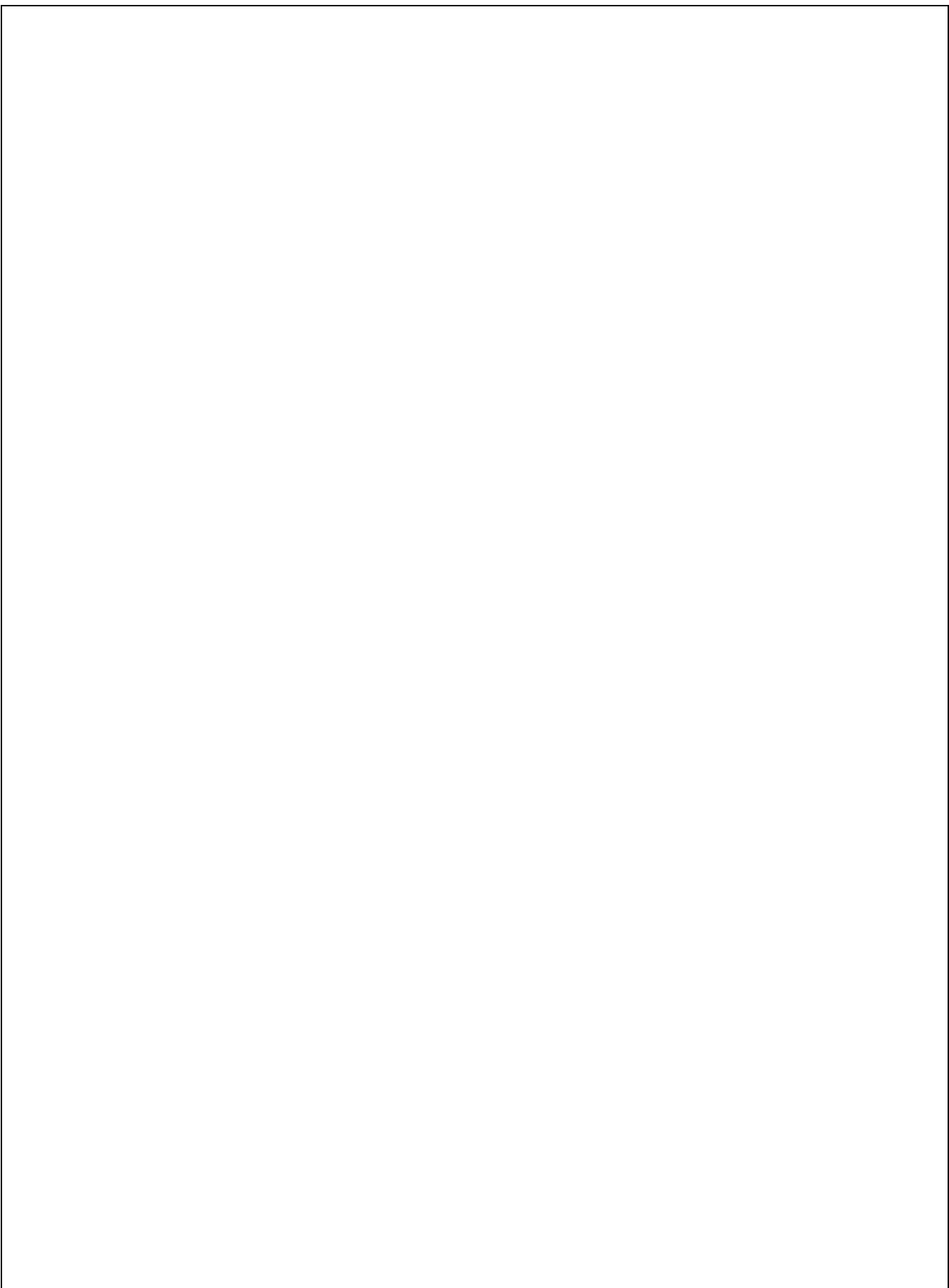
Parameter	Min.	Max.	Unit
DC Supply Voltage	-0.3	6.0	V
Analog and Digital I/O	-0.3	$V_{CC} + 0.3$	V
Output Current Any One Channel, Do Not Exceed		40	mA

Reliability Information

Symbol	Parameter	Min.	Typ.	Max.	Unit
T_J	Junction Temperature			150	°C
T_{STG}	Storage Temperature Range	-65		150	°C
T_L	Lead Temperature (Soldering, 10s)			300	°C
Θ_{JA}	Thermal Resistance, JEDEC Standard Multi-Layer Test Boards, Still Air		115		°C/W

Recommended Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Unit
T_A	Operating Temperature Range	0		70	°C
V_{CC}	Supply Voltage Range	4.75	5.00	5.25	V



Applications Information

Functional Description

This product is a two-channel, monolithic, continuous-time, video filter designed for reconstructing the luminance and chrominance signals from an S-Video D/A source. Composite video output is generated by summing the Y and C outputs. The chip is designed to have AC-coupled inputs and work with either AC- or DC-coupled outputs.

The reconstruction filters provide a fifth-order Butterworth response with group delay equalization. This provides a maximally flat response in terms of delay and amplitude. Each of the three outputs is capable of driving $2V_{pp}$ into a 75Ω load.

All channels are clamped during the sync interval to set the appropriate minimum output DC level. With this operation, the effective input time constant is greatly reduced, which allows use of small, low-cost coupling capacitors. The net effect is that the input settles to 10mV in 10ms for any DC shifts present in the input video signal.

In most applications, the input coupling capacitors are $0.1\mu\text{F}$. The Y and C inputs typically sink $1\mu\text{A}$ of current during active video, which normally tilts a horizontal line by 2mV at the Y output. During sync, the clamp restores this leakage current by sourcing an average of $20\mu\text{A}$ over the clamp interval. Any change in the coupling capacitor values affect the amount of tilt per line. Any reduction in tilt comes with an increase in settling time.

Luminance (Y) I/O

The typical luma input is driven by either a low-impedance source of $1V_{pp}$ or the output of a 75Ω terminated line driven by the output of a current DAC. In either case, the input must be capacitively coupled to allow the sync-detect and DC-restore circuitry to operate properly.

All outputs are capable of driving $2V_{pp}$, AC or DC coupled, into either a single or dual video load. A single video load consists of a series 75Ω impedance matching resistor connected to a terminated 75Ω line, presenting a total of 150Ω of loading to the part. A dual load is two of these in parallel, which presents a total of 75Ω to the part. The gain of the Y, C, and CV signals is 6dB with $1V_{pp}$ input levels.

Chrominance (C) I/O

The chrominance input can be driven in the same manner as the luminance input, but is typically only a $0.7V_{pp}$ signal.

Since the chrominance signal doesn't contain any DC content, the output signal can be AC coupled using a capacitor as small as $0.1\mu\text{F}$ if DC coupling is not desired.

Composite Video (CV) Output

The composite video output driver is same as the other outputs.

Layout Considerations

General layout and supply bypassing play major roles in high-frequency performance and thermal characteristics. Fairchild offers a demonstration board, FMS6410BDEMO, to guide layout and aid device testing

Applications Information (Continued)

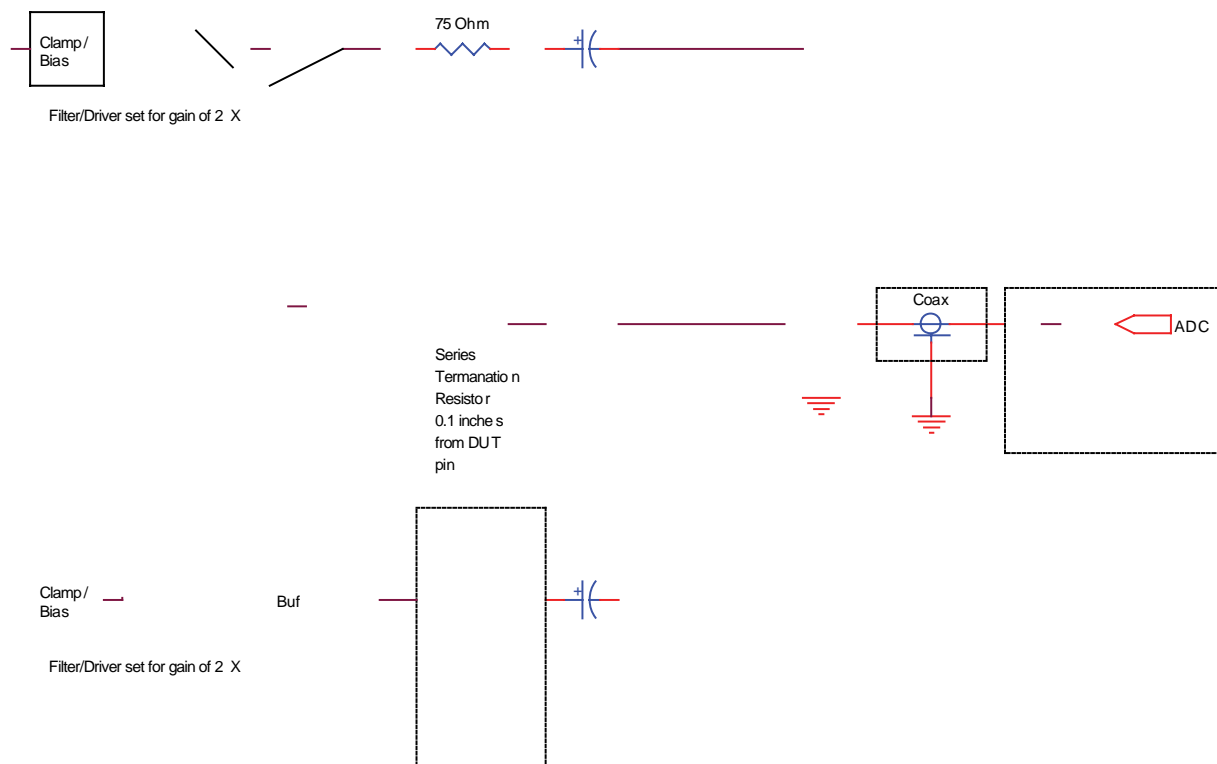
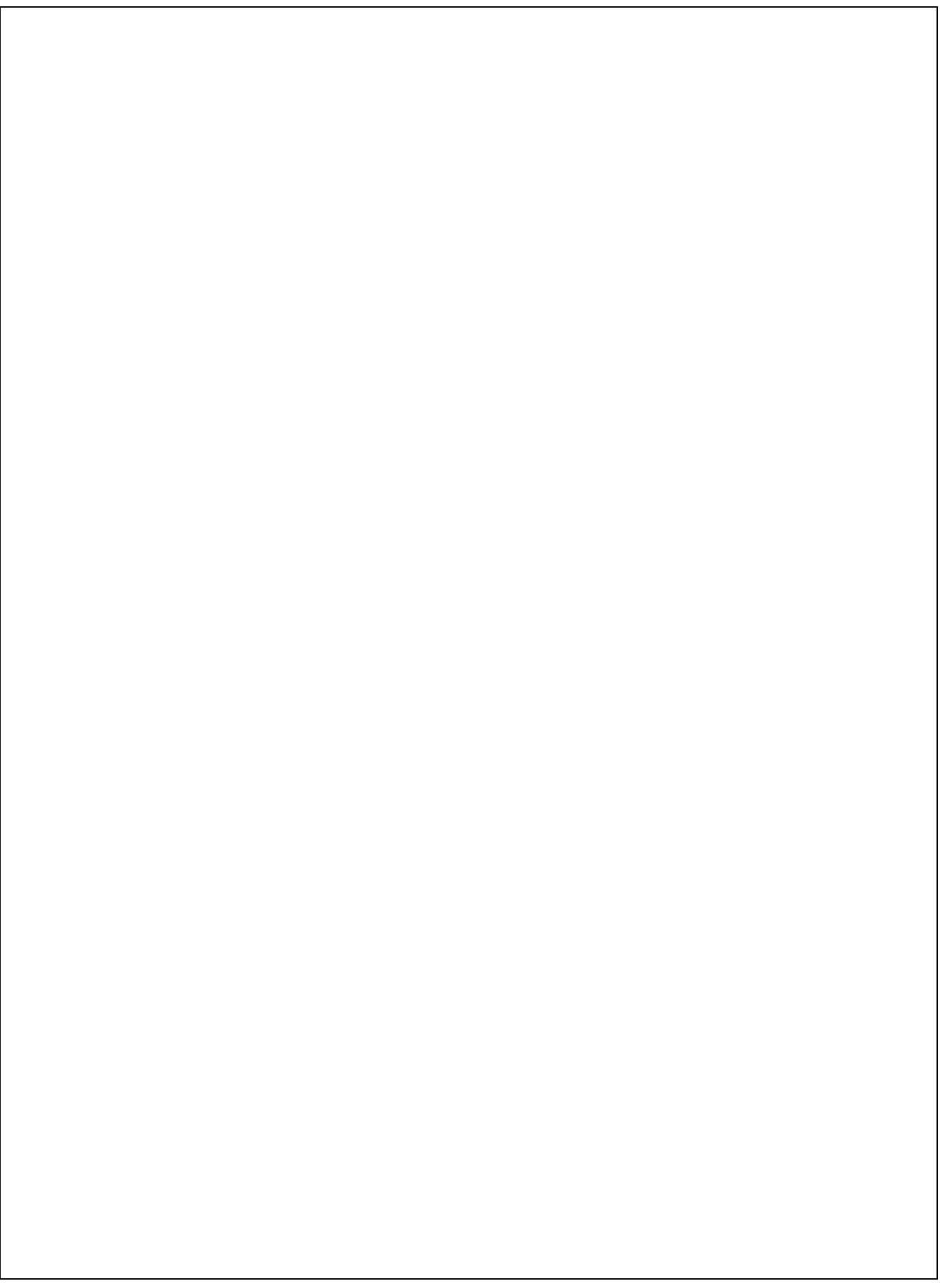


Figure 5. Schematic Representation of a Video Filter / Driver

FMS6410B Dual-Channel Video Drivers with Integrated Filters and Composite Video Summer



TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.


ACEx™

FACT Quiet Series™

OCX™

SILENT SWITCHER®

UniFET™

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. 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

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