

8-line ultralarge bandwidth ESD protection

Features

- 8-line 15 kV ESD protection
- ultralarge bandwidth:
 - no influence on signal rise and fall times
 - maximized number of signal harmonics
- low PCB space consumption: 1.2 x 1.2 mm² (1.44 mm²)
- very low leakage current: 0.1 µA max
- high reliability offered by monolithic integration
- high reduction of parasitic elements through integration and wafer level packaging

Complies with the following standards:

- IEC 61000-4-2 Level 4:
 - ± 15 kV (air discharge)
 - ± 8 kV (contact discharge)
- IEC 61000-4-2 Level 1:
 - ± 2 kV (air discharge)
 - ± 2 kV (contact discharge)

Applications

Where transient overvoltage protection in ESD sensitive equipment is required using high speed differential interfaces:

- mobile phones
- portable navigation devices
- portable multimedia players

Description

The ESDAULC6-8F3 is a monolithic application specific discrete device dedicated to ESD protection of high speed differential interfaces.

This device is ideal for applications where both reduced print circuit board space and power absorption capability are required.

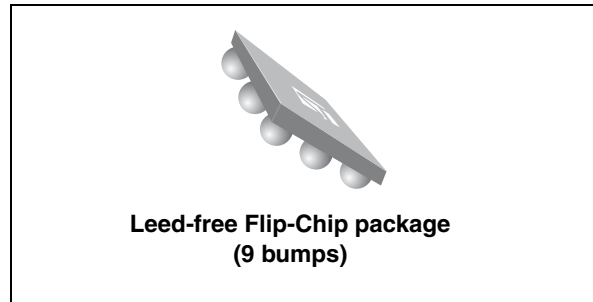


Figure 1. Pin configuration (bump side)

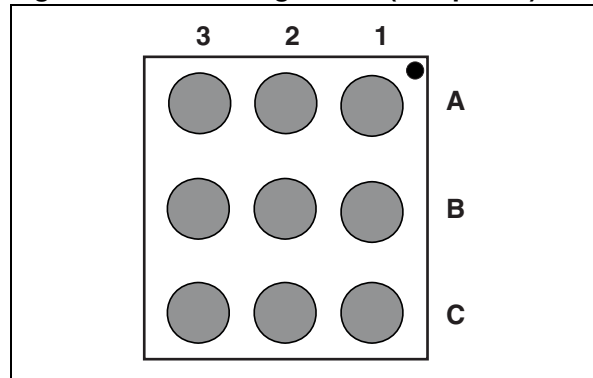
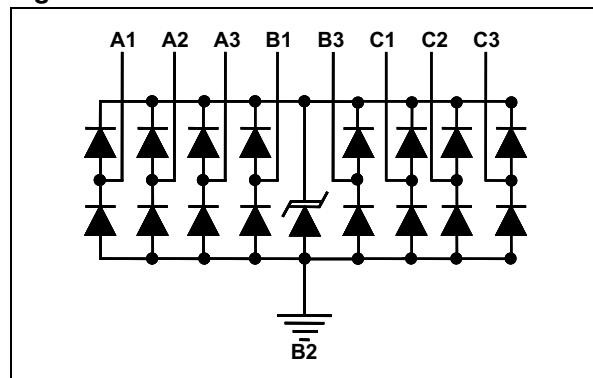


Figure 2. Schematic



TM: HDMI, the HDMI logo and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC.

1 Characteristics

Table 1. Absolute maximum ratings ($T_{amb} = 25\text{ °C}$)

Symbol	Parameter	Value	Unit
V_{PP}	ESD IEC 61000-4-2, level 4 - on all pins:		
	Air discharge	15	kV
	Contact discharge	15	
T_{op}	Operating temperature range	-30 to + 85	°C
T_{stg}	Storage temperature range	-55 to + 150	°C

Figure 3. Electrical characteristics - definitions

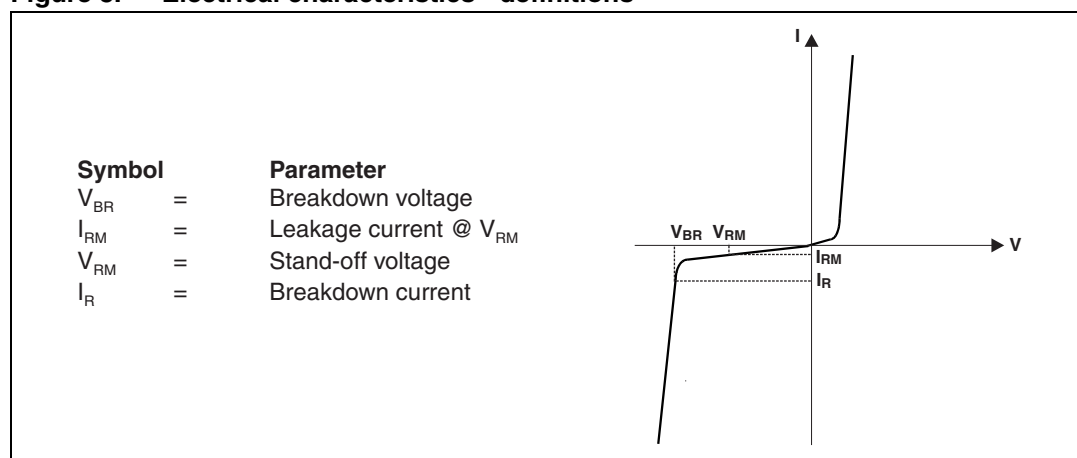


Table 2. Electrical characteristics ($T_{amb} = 25\text{ °C}$)

Symbol	Test condition	Min.	Typ.	Max.	Unit
V_{BR}	$I_R = 1\text{ mA}$	6		10	V
I_{RM}	$V_{RM} = 3\text{ V per line}$		3	100	nA
$C_{I/O-GND}$	$V_{line} = 0\text{ V}$, $V_{osc} = 30\text{ mV}$, $F = 1\text{ MHz}$			1.2	pF

Figure 4. S21(dB) attenuation measurement

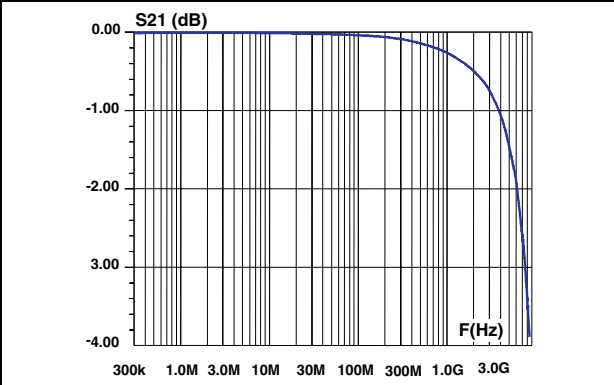


Figure 5. Analog crosstalk measurements

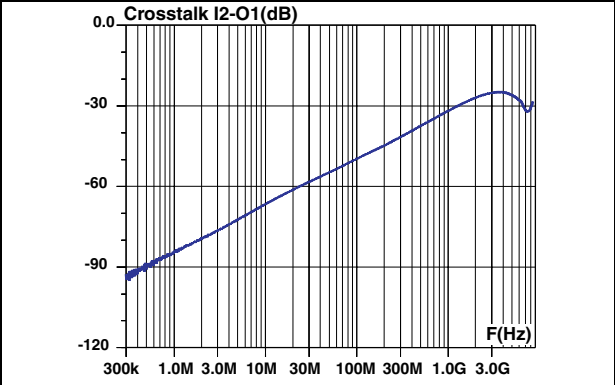


Figure 6. Digital crosstalk measurement

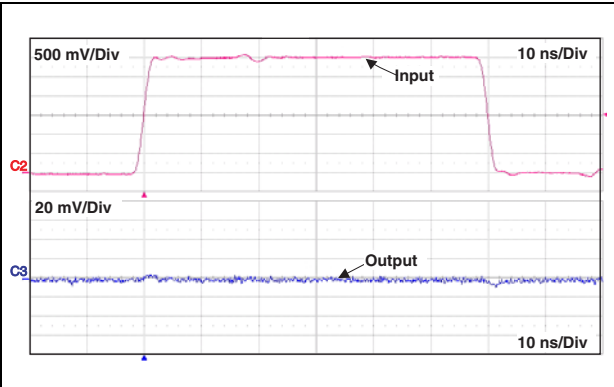


Figure 7. ESD response to IEC 61000-4-2 (+8 kV contact discharge)

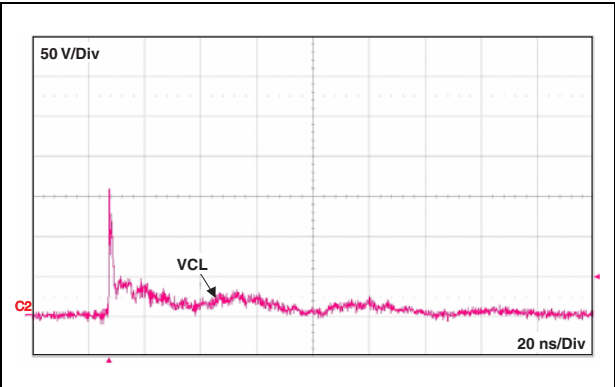


Figure 8. ESD response to IEC 61000-4-2 (-8 kV contact discharge)

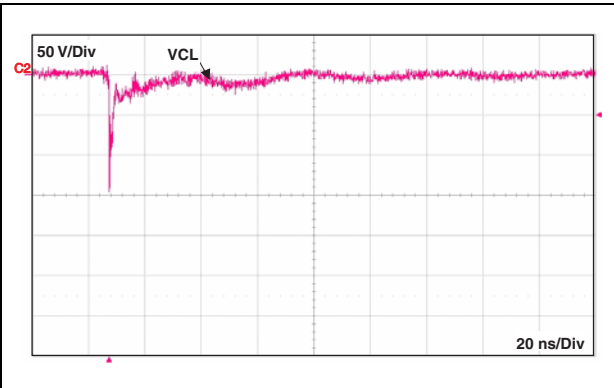


Figure 9. Line to ground capacitance versus applied voltage (typical values)

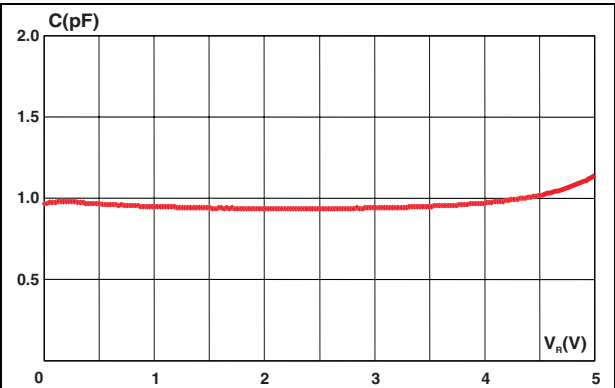
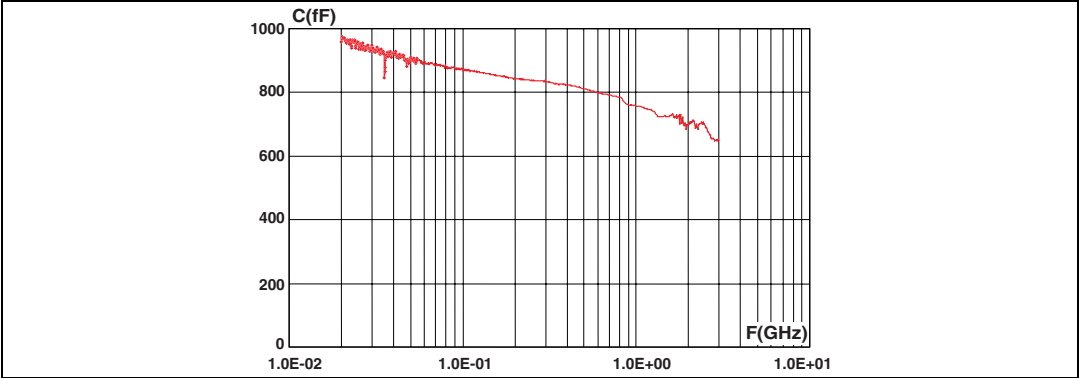
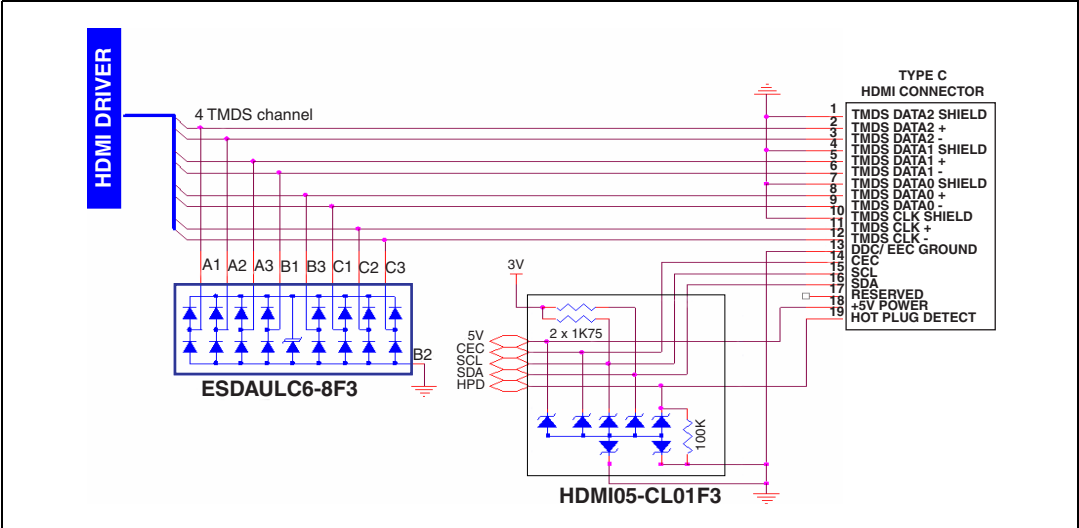


Figure 10. Line to ground capacitance versus applied frequency (typical values)



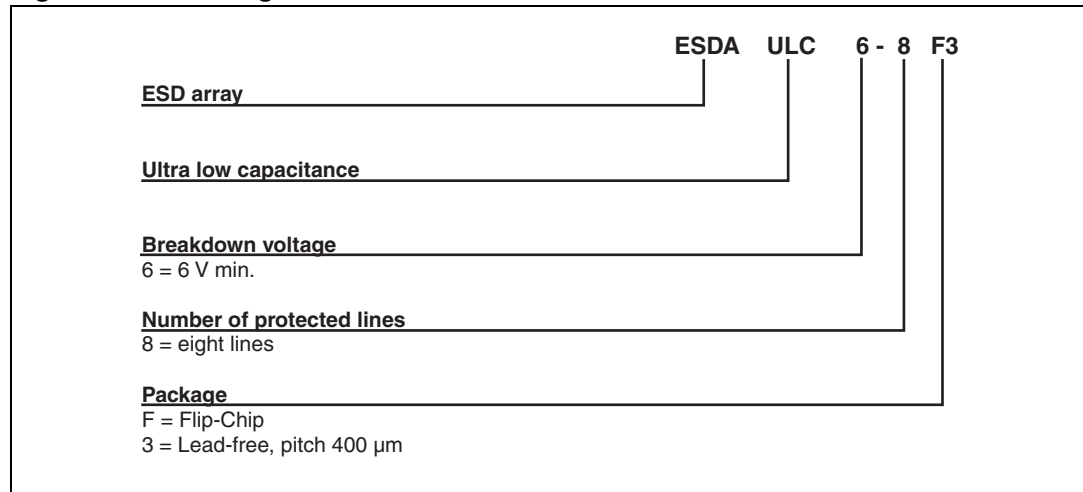
2 Typical application schematic

Figure 11. Implementation with HDMI type C connector



3 Ordering information scheme

Figure 12. Ordering information scheme



4 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Figure 13. Flip Chip dimensions

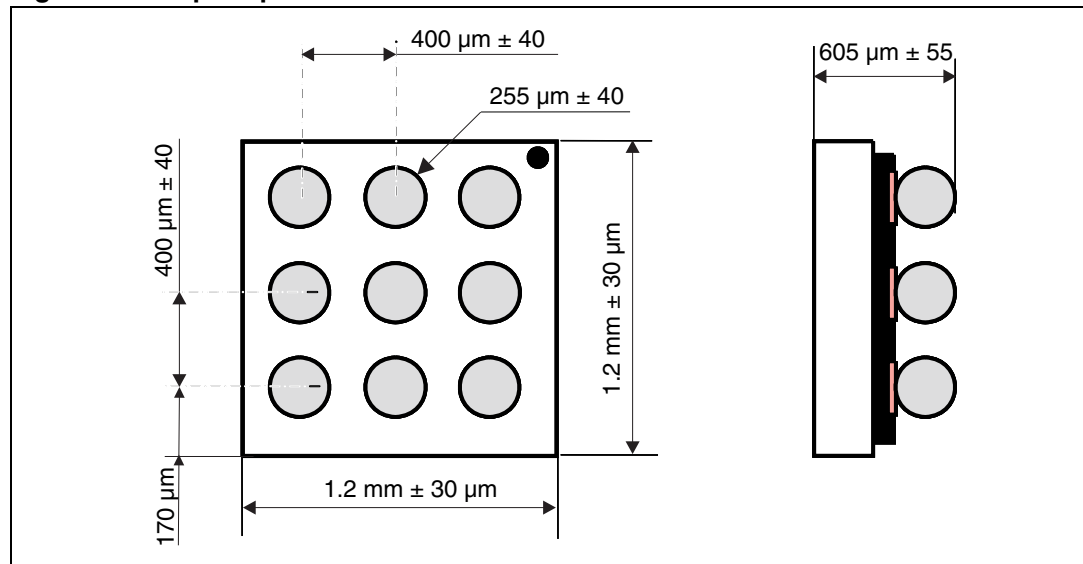


Figure 14. Footprint

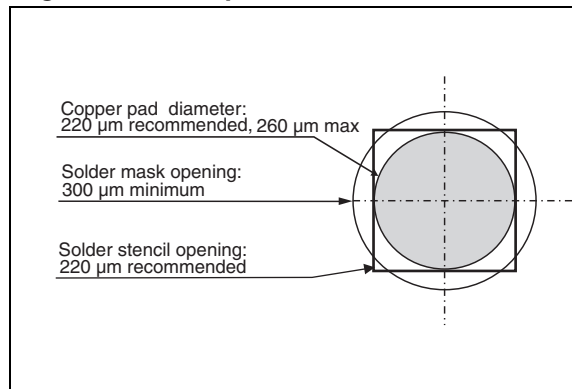


Figure 15. Marking

Dot, ST logo
 ■ ECOPACK® Grade
 xx = marking
 z = manufacturing location
 yww = datecode
 (y = year
 ww = week)

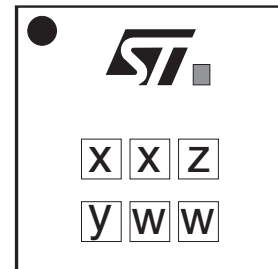
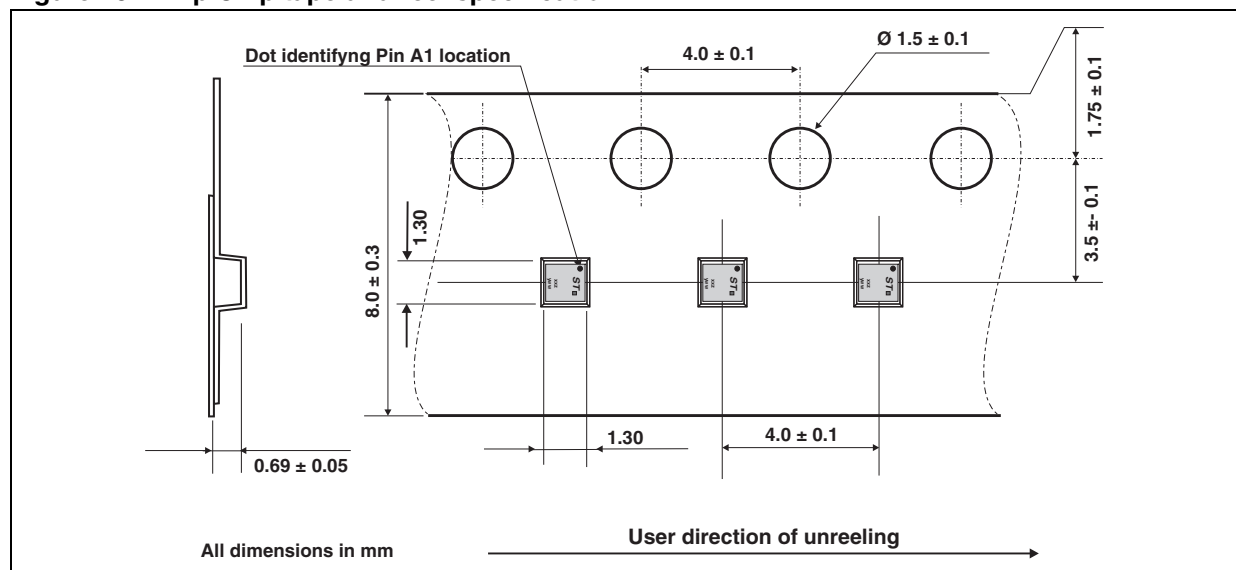


Figure 16. Flip Chip tape and reel specification



Note: More packing information is available in the application notes:
 AN2348: "Flip Chip: Package description and recommendations for use"
 AN1751: "EMI Filters: Recommendations and measurements"

5 Ordering information

Table 3. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
ESDAULC6-8F3	ER	Flip Chip	1.88 mg	5000	Tape and reel (7")

6 Revision history

Table 4. Document revision history

Date	Revision	Changes
06-Oct-2010	1	First issue.
15-Oct-2010	2	Corrected typographical error in document title.

Please Read Carefully:

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered as a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2010 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com