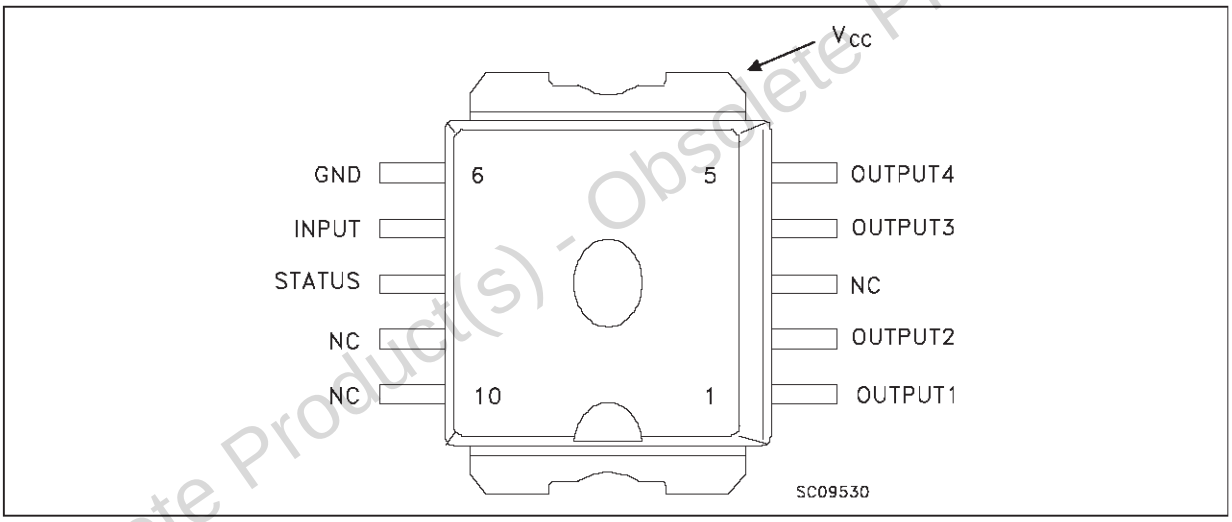
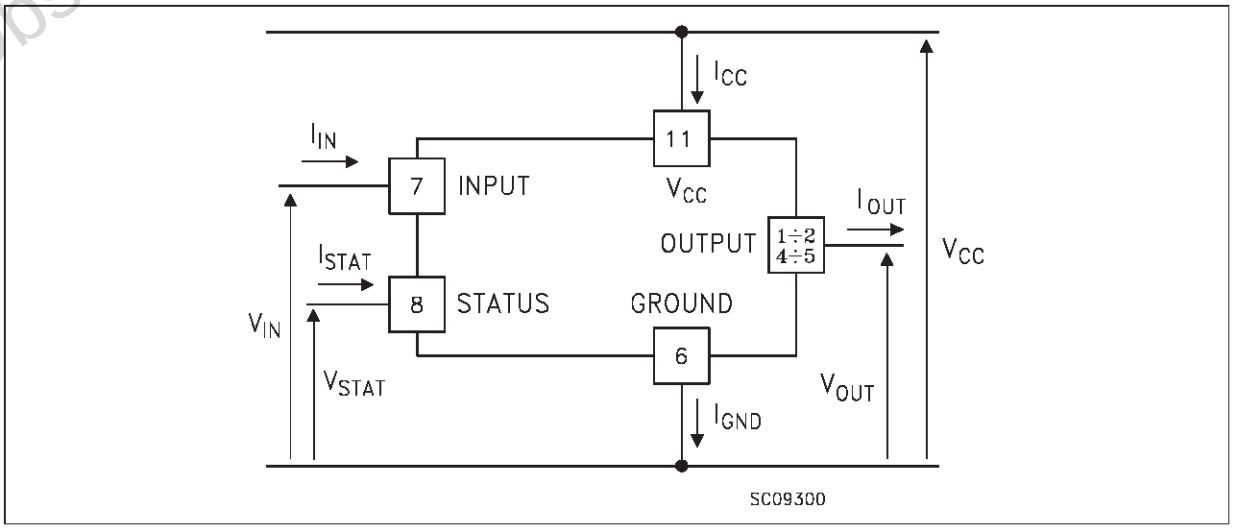
ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V_{CC}	Power Supply Voltage (continuous)	45	V
$-V_{CC}$	Reverse Supply Voltage (continuous)	-0.3	V
I_{OUT}	Output Current (continuous)	Internally Limited	A
I_R	Reverse Output Current	-25	A
I_{IN}	Input Current	±10	mA
I_{STAT}	Status Pin Current	±10	mA
$-I_{GND}$	Reverse Ground Current	-200	mA
V_{ESD}	Electrostatic Discharge (1.5 kΩ, 100 pF)	2000	V
P_{tot}	Power Dissipation at $T_c \leq 25\ ^oC$	112	W
T_j	Junction Operating Temperature	-40 to 150	^oC
T_{stg}	Storage Temperature	-55 to 150	^oC

CONNECTION DIAGRAM



CURRENT AND VOLTAGE CONVENTIONS



ELECTRICAL TRANSIENTS REQUIREMENTS

ISO T/R 7637/1 Test Pulse	TEST LEVELS				
	I	II	III	IV	Delays and Impedance
1	-25 V	-50 V	-75 V	-100 V	2 ms, 10 Ω
2	+25 V	+50 V	+75 V	+100 V	0.2 ms, 10 Ω
3a	-25 V	-50 V	-100 V	-150 V	0.1 µs, 50 Ω
3b	+25 V	+50 V	+75 V	+100 V	0.1 µs, 50 Ω
4	-4 V	-5 V	-6 V	-7 V	100 ms, 0.01 Ω
5	+26.5	+46.5	+66.5	+86.5	400 ms, 2 Ω

ISO T/R 7637/1 Test Pulse	TEST LEVELS RESULTS				
	I	II	III	IV	
1	C	C	C	C	
2	C	C	C	C	
3a	C	C	C	C	
3b	C	C	C	C	
4	C	C	C	C	
5	C	E	E	E	

(With a series resistor ≥ 1 KΩ in input and status pins).

CLASS	CONTENTS
C	All function of the device are performed as designed after exposure to disturbance.
E	One or more functions of the device is not performed as designed after exposure and cannot be returned to proper operation without replacing the device.

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	1.1	°C/W
$R_{thj\text{-}a(*)}$	Thermal Resistance Junction-ambient	Max	50	°C/W

(*) When mounted using minimum recommended pad size on FR-4 board.

ELECTRICAL CHARACTERISTICS (V_{CC} = 13 V; -40 °C < T_J < 125 °C unless otherwise specified)

POWER

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{CC}	Operating Supply Voltage		5.5	13	36	V
V_{usd}	Under Voltage Shut Down		3	4	5.5	V
V_{ov}	Overvoltage Shut Down		36	39	45	V
R_{on}	On State Resistance	I_{OUT} = 5 A T_J = 25 °C I_{OUT} = 5 A			20 36	mΩ mΩ
I_S	Supply Current	Off state T_{Case} = 25 °C On State		15 1.4	30 3.3	µA mA

LOGIC INPUT

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{IL}	Input Low Level Voltage	(*)			1.5	V
V_{IH}	Input High Level Voltage (see note 1)	(*)	3.5			V
$V_{I(hyst.)}$	Input Hysteresis Voltage		0.2	0.85	1.5	V
I_{IN}	Input Current	V_{IN} = 5 V T_{case} = 25 °C			100	µA
V_{ICL}	Input Clamp Voltage	I_{IN} = 10 mA I_{IN} = -10 mA	5	6 -0.7	7	V V

(*) : The input voltage is internally clamped at 6 V about. It is possible to connect this pin to an higher voltage via an external resistor provided the input current does not exceed 10 mA.

SWITCHING (V_{CC} = 13 V)

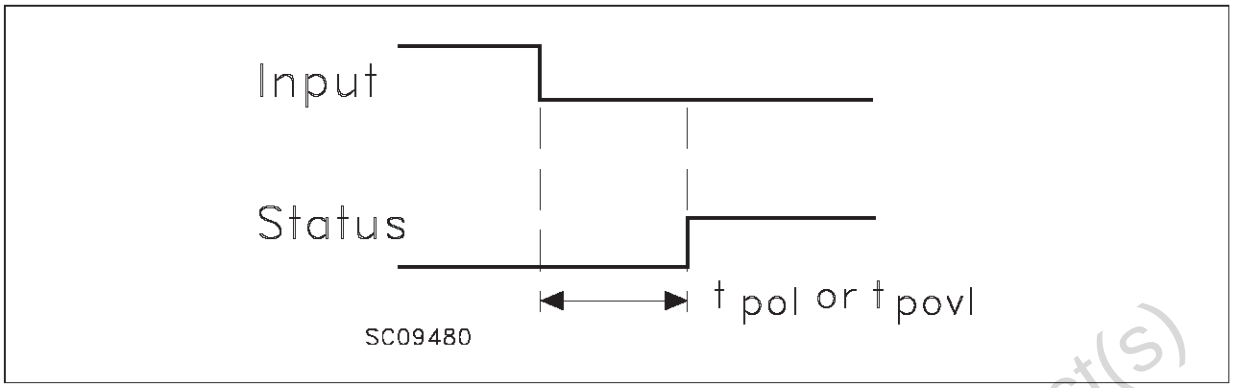
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time Of Output Current	I_{OUT} = 5 A Resistive Load Input Rise Time < 0.1 µs T_j = 25 °C	25	90	250	µs
t_r	Rise Time Of Output Current	I_{OUT} = 5 A Resistive Load Input Rise Time < 0.1 µs T_j = 25 °C	80	300	650	µs
$t_{d(off)}$	Turn-off Delay Time Of Output Current	I_{OUT} = 5 A Resistive Load Input Rise Time < 0.1 µs T_j = 25 °C	300	750	1500	µs
t_f	Fall Time Of Output Current	I_{OUT} = 5 A Resistive Load Input Rise Time < 0.1 µs T_j = 25 °C	80	200	400	µs
$(di/dt)_{on}$	Turn-on Current Slope	I_{OUT} = 5 A		0.02	0.05	A/µs
$(di/dt)_{off}$	Turn-off Current Slope	I_{OUT} = 5 A		0.02	0.05	A/µs

ELECTRICAL CHARACTERISTICS (continued)
PROTECTIONS AND DIAGNOSTICS

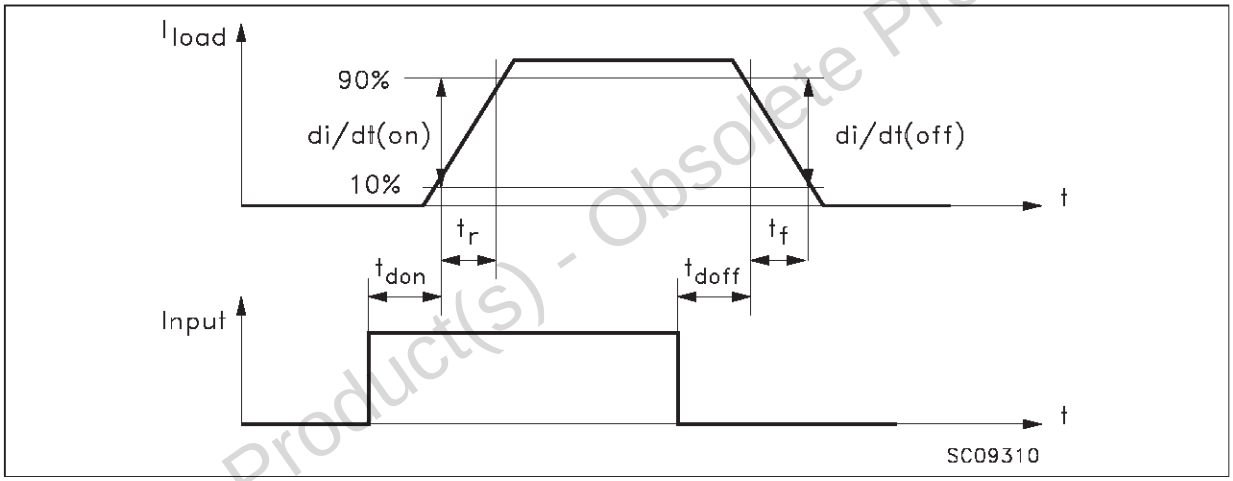
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
T_{TSD}	Thermal Shut-down Temperature		150	170	190	°C
T_{TR}	Thermal Reset Temperature		135			°C
T_{RSD} (HYST)	Thermal Hysteresis		5	15	50	°C
V_{ENOL}	Output Voltage Authorizing Openload Detection	$8V \le V_{CC} \le 30V$	5.2	6.6	8	V
I_{OL}	Open Load Current Level	$8V \le V_{CC} \le 30V$	100	800	1500	mA
I_{OV}	Over Current	R_{LOAD} ≤10 mΩ - 40°C<T_{Case}<125°C	25	50		A
I_{AV}	Average Current in Short Circuit	R_{LOAD} ≤10 mΩ T_C = 85°C		5.4		A
V_{STAT}	Status Output Voltage	I_{STAT} = 1.6 mA (Fault Condition)			0.4	V
V_{SCL}	Status Clamp Voltage	I_{STAT} = 10 mA I_{STAT} = -10 mA	5.5	6 -0.7	7	V V
t_{POL}	Status Delay	(*)	50	300	950	µs
t_{POVL}	Status Delay	(*)			10	µs
V_{DEMAG}	Turn-off Output Clamp Voltage	I_{OUT} = 5 A, L = 1 mH, V_{IN} = 0	V_{CC}-45	V_{CC}-50	V_{CC}-55	V

(*) ISO definitions T_{POL} = Status delay in case of open load conditions
T_{POVL} = Status delay in case of over load conditions

FIGURE 1



SWITCHING PARAMETERS TEST CONDITIONS

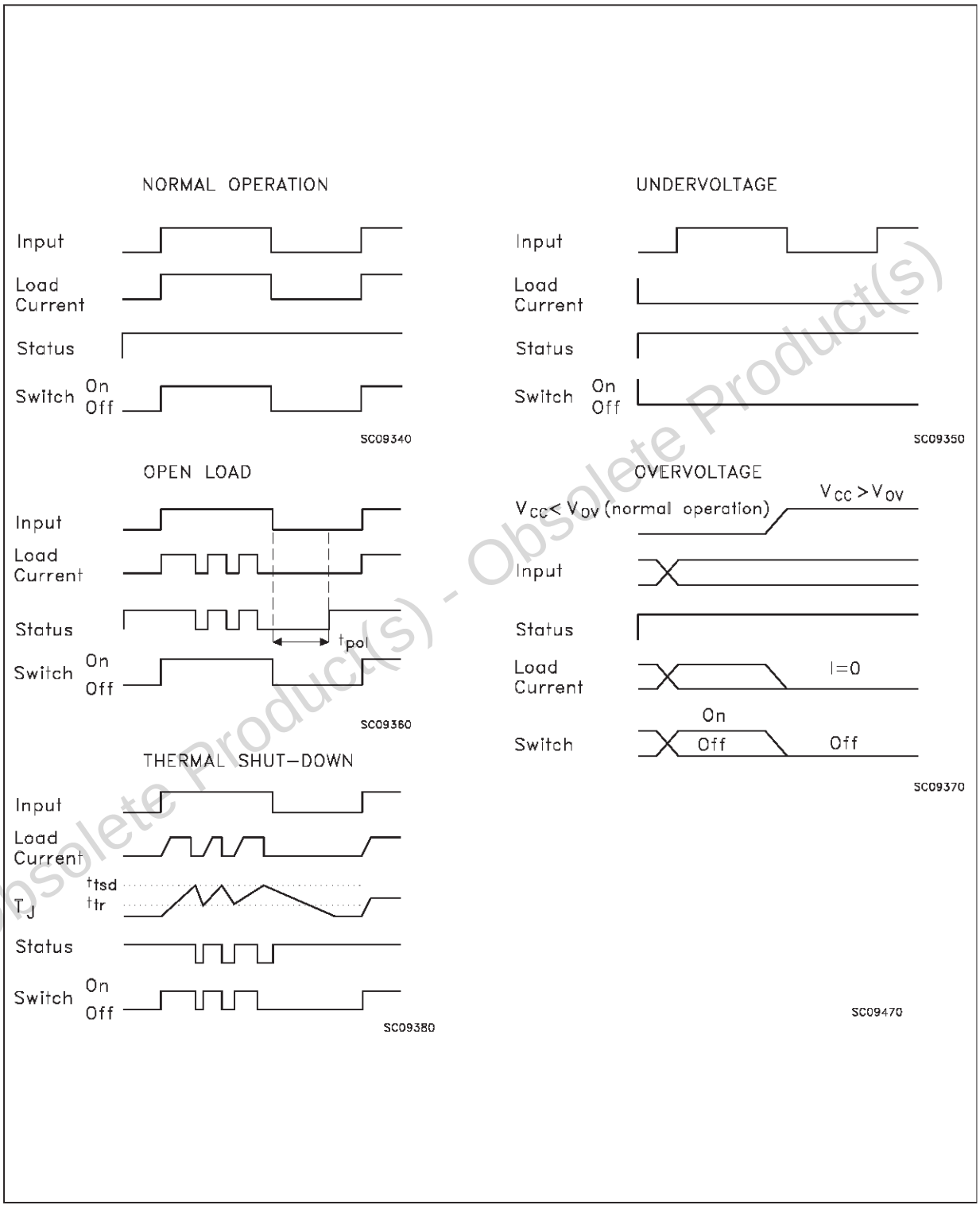


TRUTH TABLE

Conditions	INPUT	OUTPUT	STATUS
Normal Operation	L H	L H	H H
Over-voltage	X	L	H
Under-voltage	X	L	H
Thermal shut-down	H	L	L
Open load	H	H	L

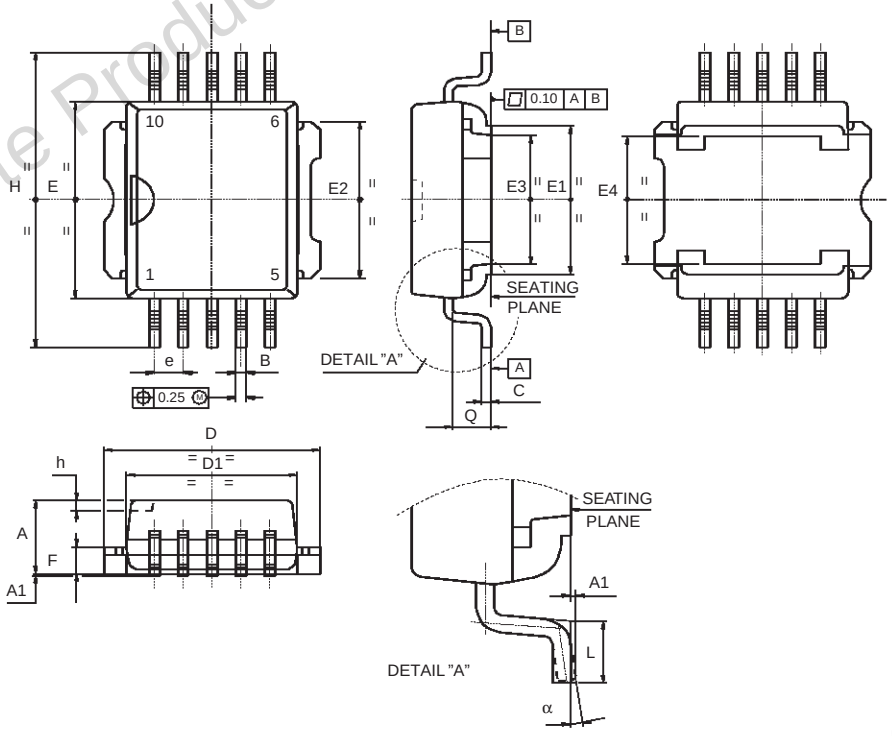
H = high level, L= low level, X= unspecified

FIGURE 2: Switching Waveforms



PowerSO-10 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	3.35		3.65	0.132		0.144
A1	0.00		0.10	0.000		0.004
B	0.40		0.60	0.016		0.024
c	0.35		0.55	0.013		0.022
D	9.40		9.60	0.370		0.378
D1	7.40		7.60	0.291		0.300
E	9.30		9.50	0.366		0.374
E1	7.20		7.40	0.283		0.291
E2	7.20		7.60	0.283		0.300
E3	6.10		6.35	0.240		0.250
E4	5.90		6.10	0.232		0.240
e		1.27			0.050	
F	1.25		1.35	0.049		0.053
H	13.80		14.40	0.543		0.567
h		0.50			0.002	
L	1.20		1.80	0.047		0.071
q		1.70			0.067	
α	0^o		8^o			



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.

ST PRODUCTS ARE NOT DESIGNED OR AUTHORIZED FOR USE IN: (A) SAFETY CRITICAL APPLICATIONS SUCH AS LIFE SUPPORTING, ACTIVE IMPLANTED DEVICES OR SYSTEMS WITH PRODUCT FUNCTIONAL SAFETY REQUIREMENTS; (B) AERONAUTIC APPLICATIONS; (C) AUTOMOTIVE APPLICATIONS OR ENVIRONMENTS, AND/OR (D) AEROSPACE APPLICATIONS OR ENVIRONMENTS. WHERE ST PRODUCTS ARE NOT DESIGNED FOR SUCH USE, THE PURCHASER SHALL USE PRODUCTS AT PURCHASER’S SOLE RISK, EVEN IF ST HAS BEEN INFORMED IN WRITING OF SUCH USAGE, UNLESS A PRODUCT IS EXPRESSLY DESIGNATED BY ST AS BEING INTENDED FOR “AUTOMOTIVE, AUTOMOTIVE SAFETY OR MEDICAL” INDUSTRY DOMAINS ACCORDING TO ST PRODUCT DESIGN SPECIFICATIONS. PRODUCTS FORMALLY ESCC, QML OR JAN QUALIFIED ARE DEEMED SUITABLE FOR USE IN AEROSPACE BY THE CORRESPONDING GOVERNMENTAL AGENCY.

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.

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