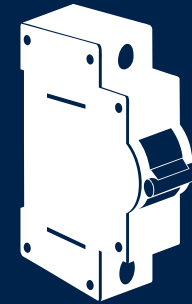


life.augmented

# Sensitive SCR Thyristors



# Low-power TRIAC (loads < 200 W)

	I <sub>T</sub>	V		Sensitivity				Packages							
	Amp	600 V	800 V	3 mA	5 mA	10 mA	25 mA 35 mA	TO-92	SO-8	SMBflat-3L	SOT-223	IPAK	DDAK	TO-220	TO-220FP
Standard Triacs (4 quadrants)															
Z006	0.8	•			•			•			•				
Z01	1	•	•	•	•	•	•	•	•	•	•				
Z04	4	•	•	•	•	•	•					•	•		
T4_Q	4	•			•							•	•		
Snubberless Triacs (3 quadrants)															
T4	4	•	•		•	•	•					•	•	•	•
ACS* and ACST															
ACS102	0.2	•			•				•						
ACS108	0.8	•	•		•	•		•		•	•				
ACST2	2		•			•							•		•
ACST3	3		•			•							•		
ACST4	4		•			•	•						•		

Washing machines



Irrigation



Inrush limiter for LEDs



Coffee machines



SMBflat-3L



SO-8



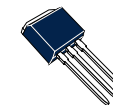
SOT-223



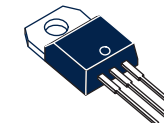
DDAK



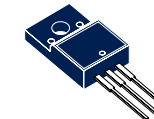
IPAK



TO-220AB



TO-220FPAB



# Sensitive-gate SCRs

	$I_T$	V			Sensitivity					Packages							
	Amp	600 V	800 V	1250 V	5 $\mu$ A	50 $\mu$ A	100 $\mu$ A	150 $\mu$ A	200 $\mu$ A	TO-92	SMBflat-3L	SOT-223	SOT23	IPAK	DPAK	TO-220	TO-220FP
X and P01 Families																	
X006 / P01	0.8	•			•	•			•	•		•					
X01	1	•						•			•		•				
X02	1.25	•	•			•			•	•	•	•					
X04	4	•	•			•			•					•	•		
TS Family																	
TS420	4	•							•					•	•	•	
TS820	8	•							•					•	•		•
TS1220	12	•							•					•	•		•
TS Family Overvoltage Protected																	
TS110	1.25			•			•			•	•						

IGNITOR



AFCI GFCI



LED BALLAST



DIMMER



SOT-23



SMBflat-3L



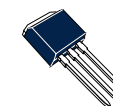
SOT-223



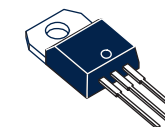
DPAK



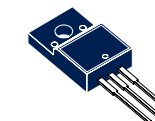
IPAK



TO-220AB



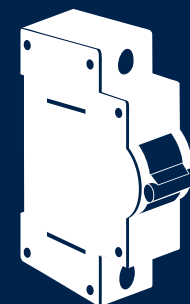
TO-220FP





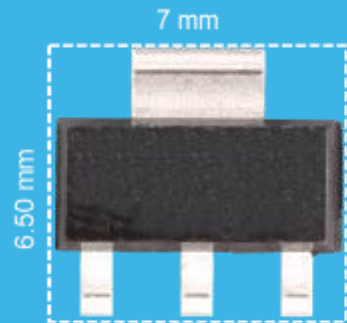
life.augmented

# Sensitive SCR for Circuit Breakers

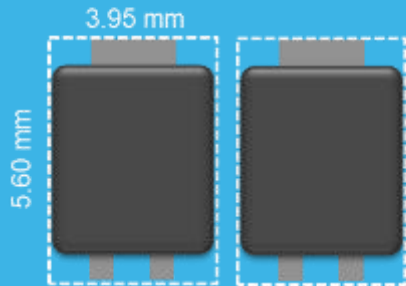


# Sensitive SCR for e-Breaker

Large Product range, Tailored by Market, Smallest Package



x1  
SOT223

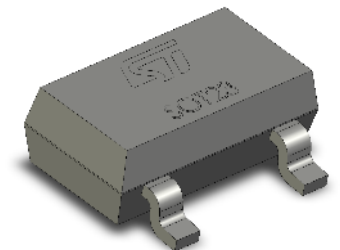
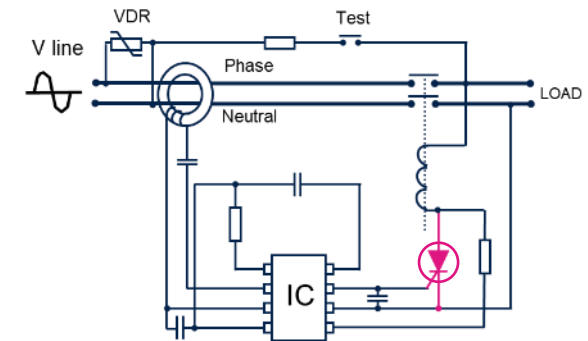
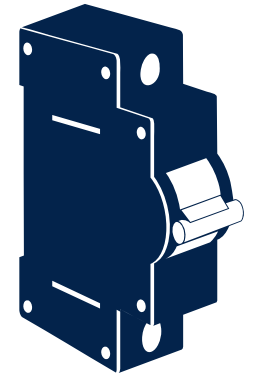


x2  
SMBFlat-3L



x3  
SOT23

	LEGACY	220V MARKET	110V MARKET	LEGACY
PARAMETER	X0202	TS110	X0115	P0102
$I_{GT}$	N/A	N/A	30 $\mu$ A	N/A
	200 $\mu$ A	100 $\mu$ A	150 $\mu$ A	200 $\mu$ A
$T_q$ (typ)		30 $\mu$ s	20 $\mu$ s	20 $\mu$ s
$I_{T(RMS)}$	1.25 A	1.25 A	0.8 A	0.25 A
$I_{TSM}$	25 A	20 A	7.6 A	7 A
$V_{DRM}$	800V	800 V	600 V	200V
$V_{DSM}$	N/A	1250 V	750 V	N/A
$di/dt$	50 A/ $\mu$ s	100 A/ $\mu$ s	50 A/ $\mu$ s	50 A/ $\mu$ s
$dV/dt$	10 V/ $\mu$ s	100 V/ $\mu$ s	80 V/ $\mu$ s	200 V/ $\mu$ s
Packages	TO-92	X0202NA	TS110-8A1	
	SOT-223	X0202NN		P0102DN
	SMBF-3L	X0202NUF	TS110-8UF	X0115MUF
	SOT23		X0115ML	P0102BL





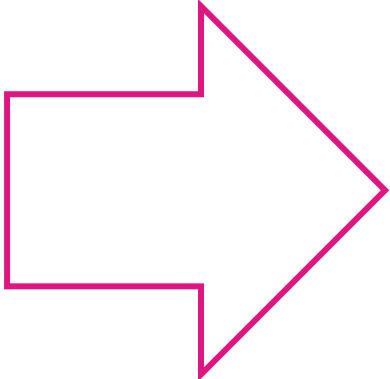
# Benefits of SMBflat-3L

Faster  
automatic  
assembly

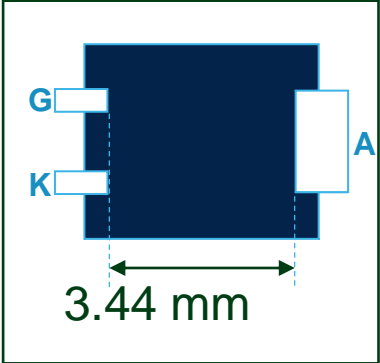
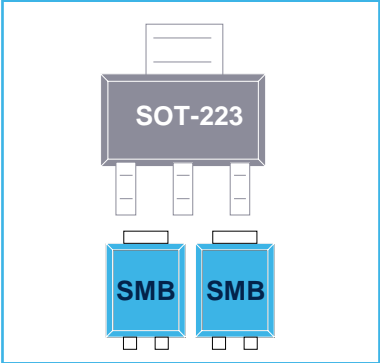
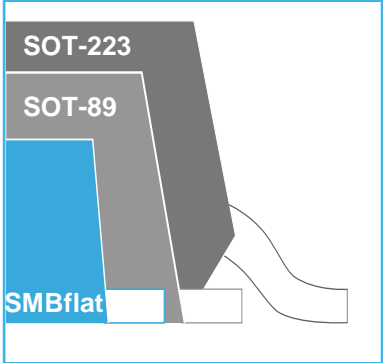
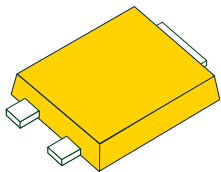
Ultra Compact

No coating on  
PCB

PCB Material  
IIIa



**COST  
SAVING**



Surface Mount  
Package

1mm Ultra Flat  
Thyristor Package

Ultra Small footprint  
for loads  $\geq 0.8A$

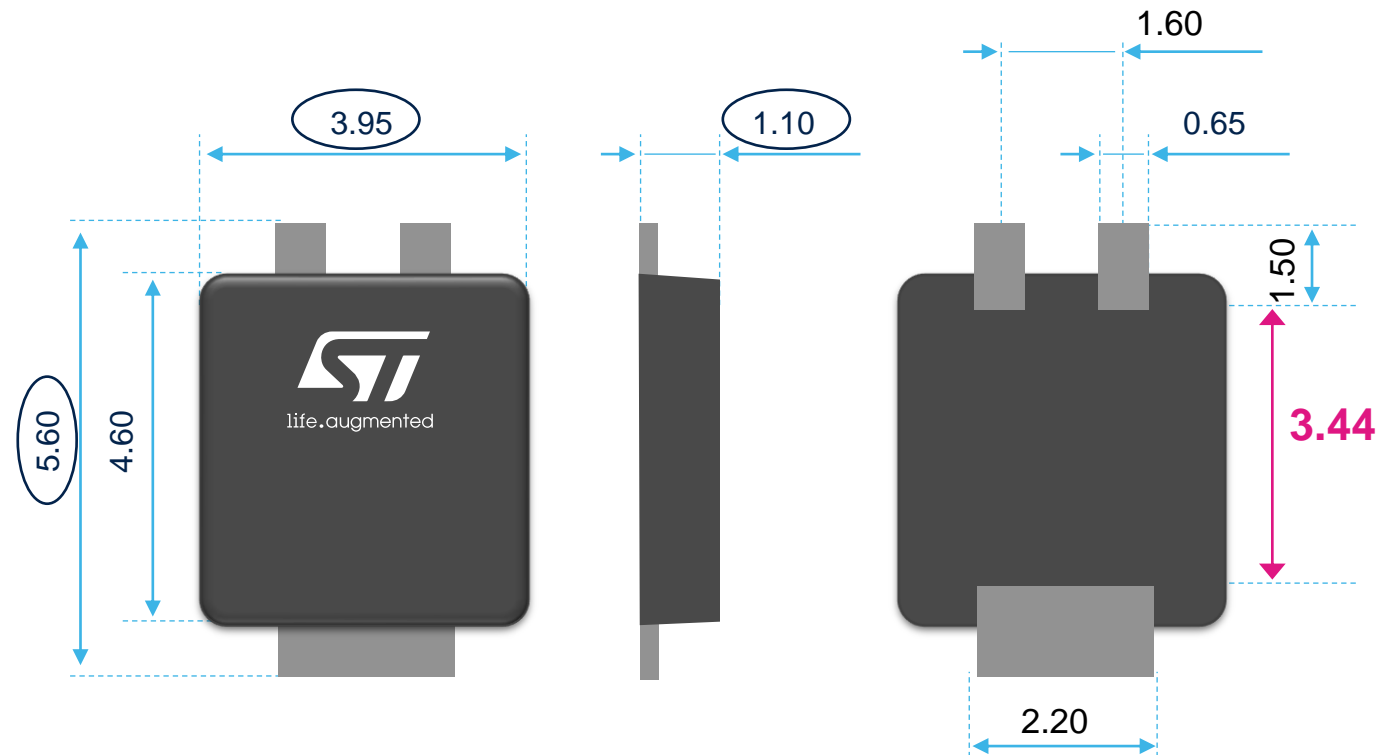
Creepage OK for  
250V Applications  
(Pollution level 2)



# SMBflat-3L Dimensions

**Creepage > 3.4 mm (250V AC Switch; no certification required)**  
**MSL-1, Halogen Free**

Length : 5.6 mm  
Width : 3.95 mm  
Height < 1.10 mm





life.augmented

# Sensitive SCR for Ignitors

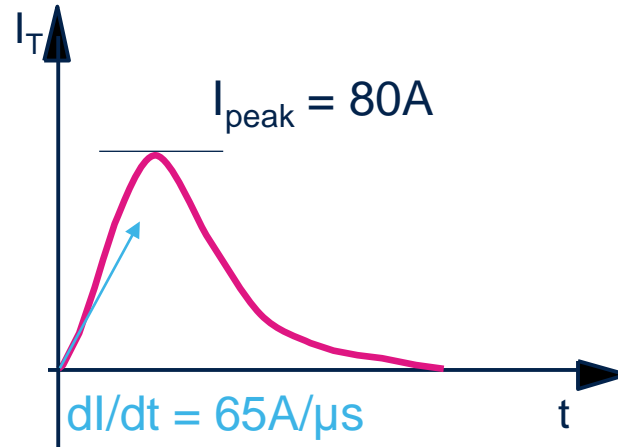
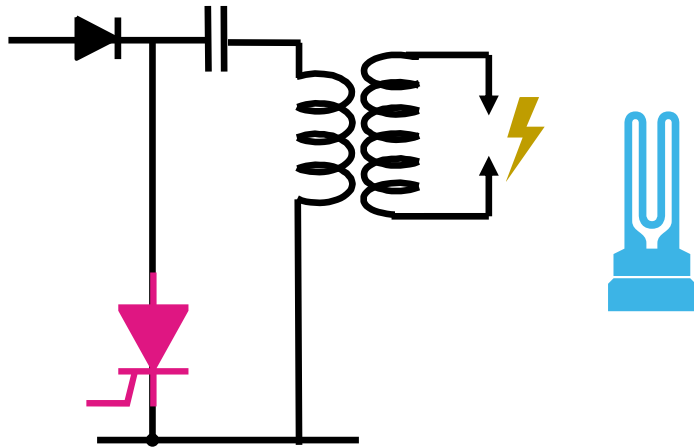






# Ignitor and Capacitive Discharge Circuits

X0115MUF enables ignitors robustness thanks to improved Voltage and Turn-On performances



$$I_{\text{TSM}} (10\mu\text{s}) \text{ max} = 100 \text{ A}$$

$$\frac{di}{dt} \text{ max} = 75 \text{ A}/\mu\text{s}$$

$$V_{\text{DSM}} \text{ max} = 750 \text{ V}$$



life.augmented

# Sensitive SCR for Light Dimmers





# Sensitive SCR for Light Dimmers

Experience LED deep dimming with Sensitive SCR

Reference design with STM8: [STEVAL\\_ILD004V2](#)

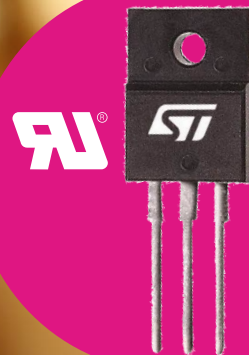
Low holding current to increase dimming range

**TS820-6FP**

600 V, 8 A

**TS1220-6FP**

600 V, 12 A

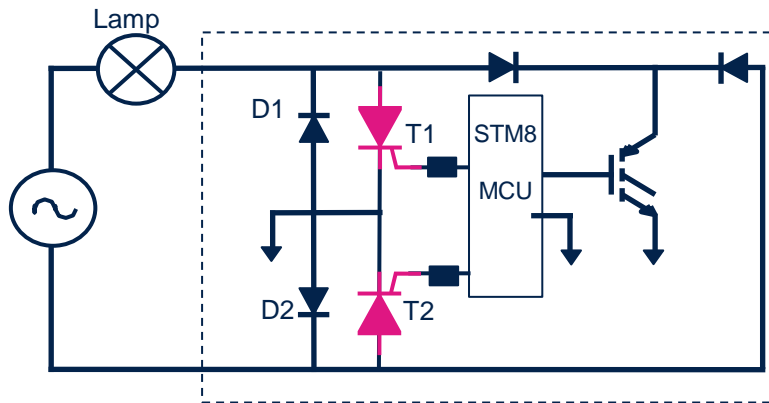
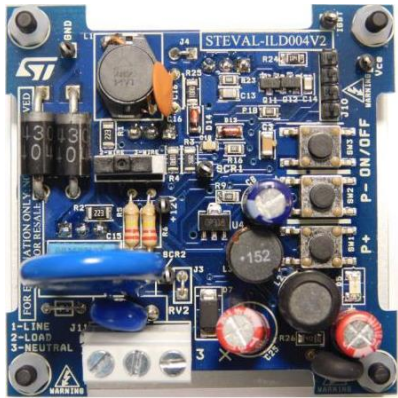


UL-1557 recognized component at 2 kV level



# SCR Based Light Dimmer Demo Board

STEVAL\_ILD004V2 offers a sensitive Thyristors based light dimmer reference design



## Main Characteristics

- 110V / 240V compatible
- 2-Wires and 3-Wires compatible
- Power: 300W
- Topology: SCR in Anti-series
- Deep dimming enabled (92% to 97% light dimming range on LED)

## 8bit STM8S MCU control

## Performances:

- Overcurrent protection at turn-on
- Soft-start & soft-stop
- Excellent compatibility with LED and CFL (97% with tested lamps; 100% with ILD004V2 in 3 wires option mode)
- No flickering in case multiple lamps in parallel

Buy on st.com:





# Leading-edge dimmer compatible lamps

Load	Type	2-wires		3-wires	
		# Lamp tested	Dimming success	# Lamp tested	Dimming success
R	Incandescent, Halogen, electronic transformer, CFL/LED high power with PFC	4/4	100 %	4/4	100 %
L	Transformer	5/5	100 %	5/5	100 %
C	CFL and LED dimmable lamps, LED in parallel	28/31	90 %	31/31	100 %

Validation with STEVAL-ILD004V2  
SCR dimmer in two configuration:

- 2-wires dimmer (Load and Line connection)
- 3-wires dimmer (Load, Neutral and Line connection)

ST Reference design evaluated:

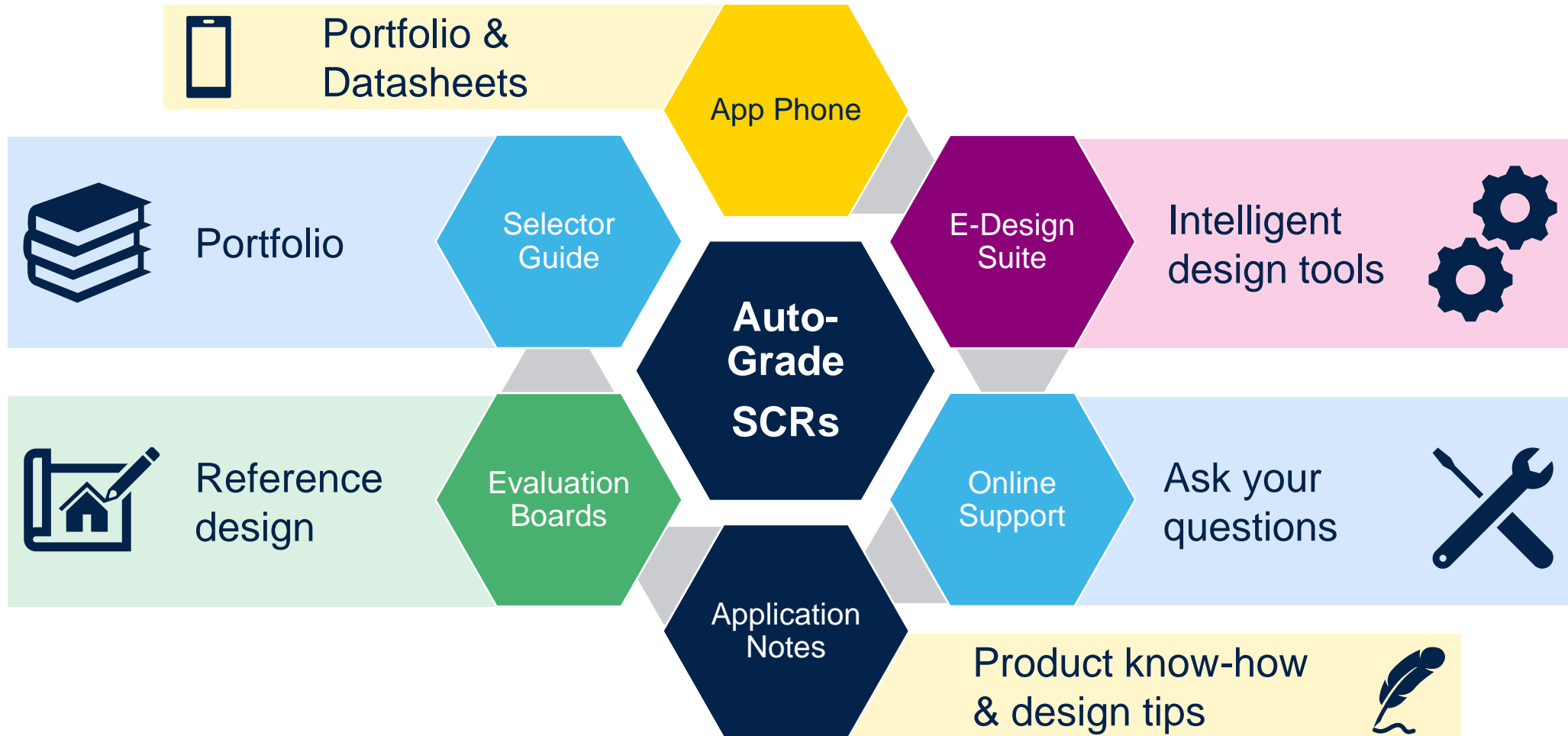
- ON-state : flickering phenomenon, jittering
- OFF-state : Ghosting effect, lamp light-up

Lamps are Thyristor leading-edge compatible for deep dimming

(90 % of tested lamps in 2-wires configuration)



# Want to know more ?



# Our technology starts with You

© STMicroelectronics - All rights reserved.

ST logo is a trademark or a registered trademark of STMicroelectronics International NV or its affiliates in the EU and/or other countries.

For additional information about ST trademarks, please refer to [www.st.com/trademarks](http://www.st.com/trademarks).

All other product or service names are the property of their respective owners.



life.augmented