

GANE7R2-200QTM

200 V, 7.2 mOhm Gallium Nitride (GaN) FET in a QFN 3 mm x 5 mm TSC package

15 October 2026 **Product data sheet**

1. General description

The GANE7R2-200QTM is a general purpose 200 V, 7.2 mΩ gallium nitride (GaN) FET in a QFN 3 mm x 5 mm Top-Side Cooling (TSC) package. It is a normally-off e-mode device offering superior performance and very low on-state resistance housed in a TSC package to ensure better thermal performance.

2. Features and benefits

- Enhancement mode - normally-off power switch
- Ultra-high-frequency switching capability
- No body diode
- Ultra low gate charge and output charge
- RoHS, Pb-free, REACH-compliant
- High efficiency and high power density
- Excellent thermal performance
- QFN 3 mm x 5 mm TSC package

3. Applications

- High-power-density and high-switching-frequency DC-to-DC converters
- High power PSU AC-DC synchronous rectification
- AC/DC chargers, adapters
- Wireless power
- Motor drives
- Class-D audio amplifier

4. Quick reference data

Table 1. Quick reference data

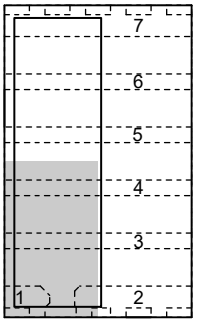
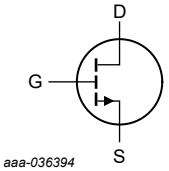
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{DS}	drain-source voltage	T_j = 25 °C		-	-	200	V
I_D	drain current	Continuous $T_j \leq 125$ °C	[1]	-	-	63	A
P_{tot}	total power dissipation	T_C = 25 °C; Fig. 1		-	-	250	W
T_j	junction temperature			-40	-	150	°C
Static characteristics							
R_{DSon}	drain-source on-state resistance	V_{GS} = 5 V; I_D = 15 A; T_j = 25 °C		-	7.2	10	mΩ
Dynamic characteristics							
Q_{GD}	gate-drain charge	I_D = 15 A; V_{DS} = 100 V; T_j = 25 °C		-	1.2	-	nC
$Q_{G(tot)}$	gate charge	I_D = 15 A; V_{DS} = 100 V; V_{GS} = 5 V; T_j = 25 °C; Fig. 9		-	10.1	12.6	nC

[1] Defined by design, not limited by thermal impedance. Not subject to production test.

nexperia

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	G	Gate	 Transparent top view **WQFN7 (SOT8159-2)**	
2,4,6	S	Source		
3,5,7	D	Drain		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
GANE7R2-200QTM	WQFN7	WQFN7: plastic very very thin Quad Flat package, no leads; exposed Die-Top; 7 terminals, 0.85 mm pitch; 3 mm × 5 mm × 0.65 mm body	SOT8159-2

6.1. Ordering options

Table 4. Ordering options

Type number	Orderable part number	Packing	Equivalent standard orderable part number
GANE7R2-200QTM	GANE7R2-200QTMZ	Reel 13" Q2/T3	-

7. Marking

Table 5. Marking codes

Type number	Marking code
GANE7R2-200QTM	7R2FM

8. Limiting values

Table 6. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

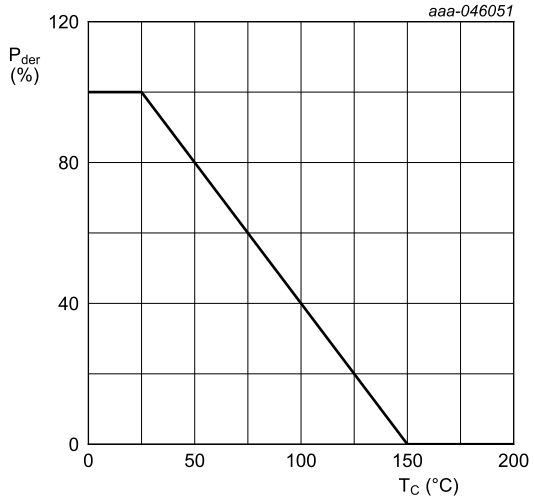
Symbol	Parameter	Conditions		Min	Max	Unit
V_{DS}	drain-source voltage	T_j = 25 °C		-	200	V
V_{TDS}	transient drain to source voltage		[1]	-	220	V
		up to 10,000 5 ms pulses at 150 °C		-	240	V

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

Symbol	Parameter	Conditions		Min	Max	Unit
V_{GS}	gate-source voltage			-4	6	V
P_{tot}	total power dissipation	T_C = 25 °C; Fig. 1		-	250	W
I_D	drain current	Continuous $T_j \leq 125$ °C	[2]	-	63	A
		Pulsed (25 °C, T_{pulse} = 300 µs)	[2]	-	130	A
T_{stg}	storage temperature			-55	150	°C
T_j	junction temperature			-40	150	°C

[1] pulsed, t_p = 1 µs, duty cycle = 1%
[2] Defined by design, not limited by thermal impedance. Not subject to production test.



$$P_{der} = \frac{P_{tot}}{P_{tot(25°C)}} \times 100\,\%$$

Fig. 1. Normalized total power dissipation as a function of case temperature

9. Thermal characteristics

Table 7. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-c)}$	thermal resistance from junction to case	Case Top		-	0.5	-	K/W
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	Case Bottom		-	3	-	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	using JEDEC 51-2 PCB		-	54	-	K/W

10. Characteristics

Table 8. Characteristics

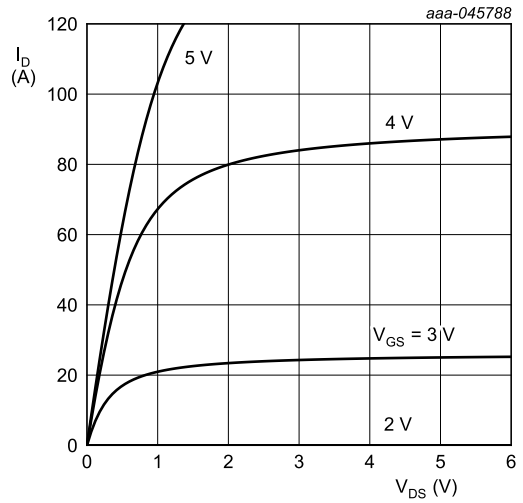
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
$V_{GS(th)}$	gate-source threshold voltage	I_D = 4 mA; $V_{DS} = V_{GS}$; T_j = 25 °C		0.8	1.5	2.5	V
I_{DSS}	drain leakage current	V_{DS} = 160 V; V_{GS} = 0 V; T_j = 25 °C		-	3	250	µA

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

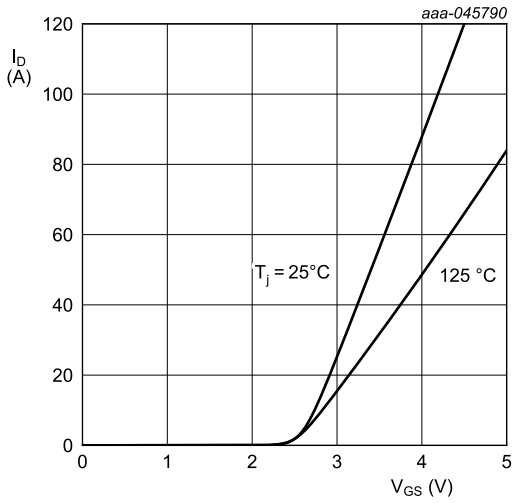
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{GSS}	gate leakage current	V_{GS} = 5 V; T_j = 25 °C		-	1.5	600	µA
		V_{GS} = 5 V; T_j = 125 °C	[1]	-	150	1300	µA
		V_{GS} = -4 V; T_j = 25 °C		-	20	800	µA
R_{DSon}	drain-source on-state resistance	V_{GS} = 5 V; I_D = 15 A; T_j = 25 °C		-	7.2	10	mΩ
R_G	gate resistance			-	0.4	-	Ω
Dynamic characteristics							
$Q_{G(tot)}$	gate charge	I_D = 15 A; V_{DS} = 100 V; V_{GS} = 5 V; T_j = 25 °C; Fig. 9		-	10.1	12.6	nC
Q_{GS}	gate-source charge	I_D = 15 A; V_{DS} = 100 V; T_j = 25 °C		-	3.5	-	nC
Q_{GD}	gate-drain charge			-	1.2	-	nC
C_{iss}	input capacitance	V_{DS} = 100 V; V_{GS} = 0 V; f = 1 MHz; T_j = 25 °C; Fig. 6		-	1298	1682	pF
C_{oss}	output capacitance			-	343	505	pF
C_{rss}	reverse transfer capacitance			-	2.8	-	pF
$C_{o(er)}$	effective output capacitance, energy related	0 V ≤ V_{DS} ≤ 100 V; V_{GS} = 0 V; T_j = 25 °C	[2]	-	435	-	pF
$C_{o(tr)}$	effective output capacitance, time related		[3]	-	579	-	pF
Q_{oss}	output charge	V_{GS} = 0 V; V_{DS} = 100 V; T_j = 25 °C	[4]	-	58	72	nC
Source-drain characteristics							
V_{SD}	source-drain voltage	I_S = 0.5 A; V_{GS} = 0 V; T_j = 25 °C	[1]	-	1.6	-	V

[1] Defined by design. Not subject to production test.
[2] $C_{o(er)}$ is a fixed capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0 to 100 V.
[3] $C_{o(tr)}$ is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 100 V.
[4] Q_r is not specified separately from Q_{oss} for e-mode GaN FETs, since $Q_r = Q_{oss} + Q_D$, and $Q_D = 0$. (Q_D is charge associated with diffusion of minority carriers. Since there is no body diode, no minority carriers in excess of Q_{oss} have to be transferred for e-mode GaN FETs.)



T_j = 25 °C

Fig. 2. Output characteristics: drain current as a function of drain-source voltage; typical values



V_{DS} = 6 V

Fig. 3. Transfer characteristics; drain current as a function of gate-source voltage; typical values

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

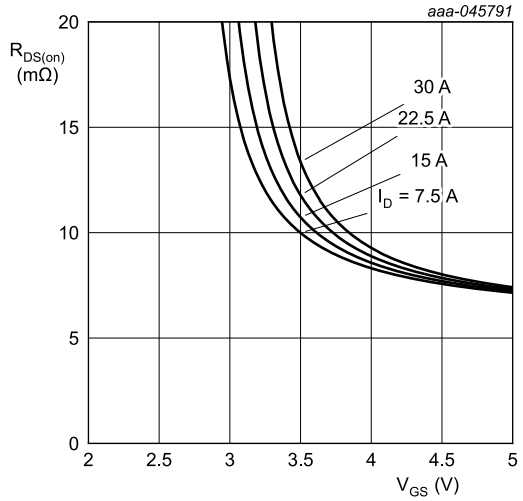
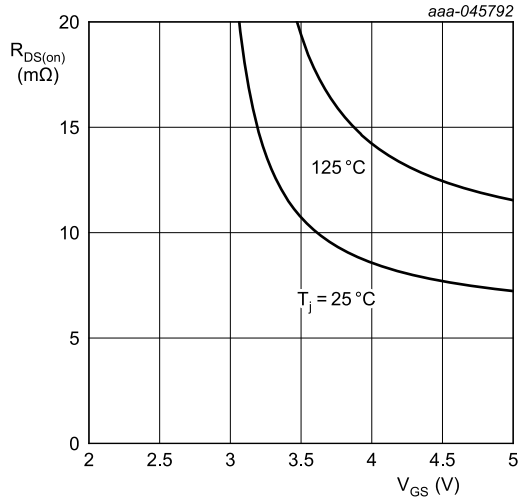


Fig. 4. Drain-source on-state resistance as a function of gate-source voltage; various drain currents



I_D = 15 A

Fig. 5. Drain-source on-state resistance as a function of gate-source voltage; various junction temperatures

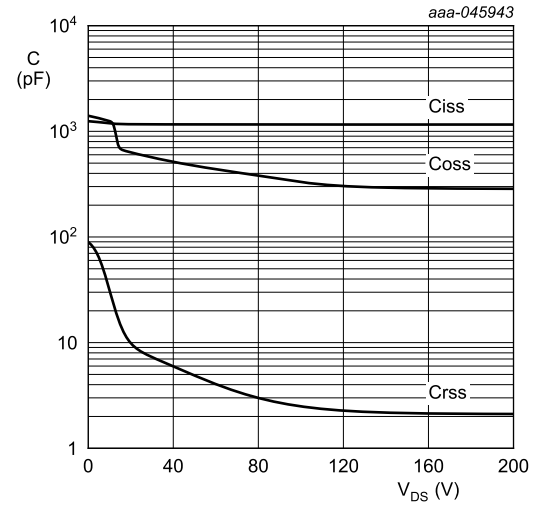


Fig. 6. Input, output and reverse transfer capacitances as a function of drain-source voltage; typical values

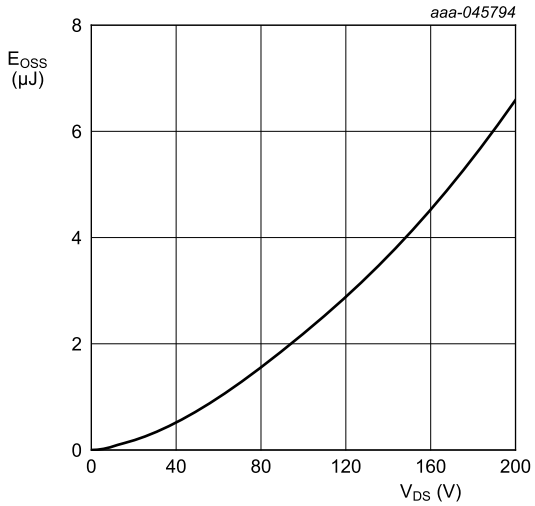


Fig. 7. Typical C_{oss} stored energy

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

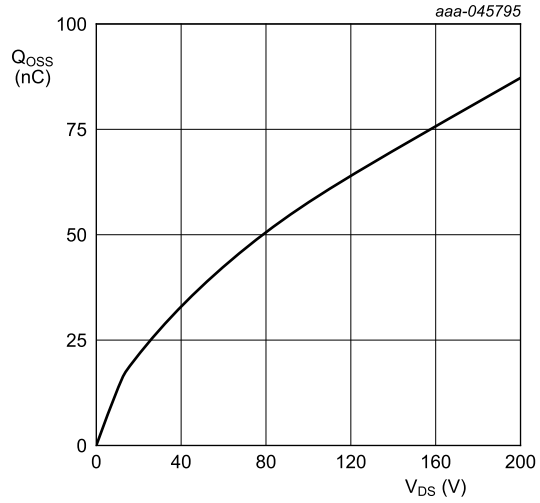
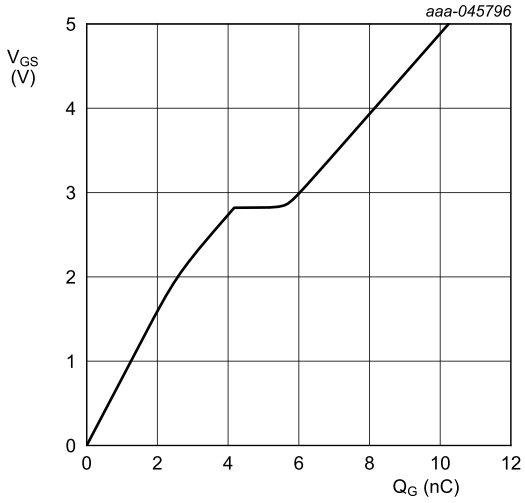


Fig. 8. Output charge as a function of drain-source voltage; typical values



V_{DS} = 100 V; I_D = 15 A

Fig. 9. Gate-source voltage as a function of gate charge; typical values

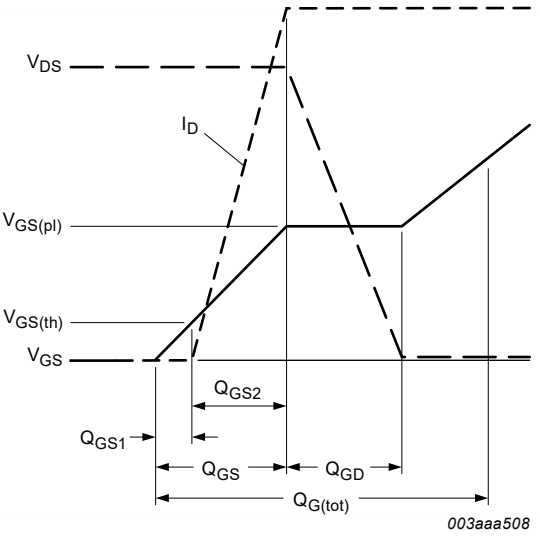
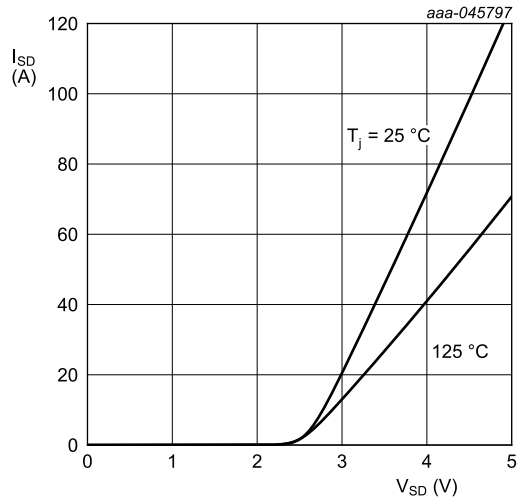
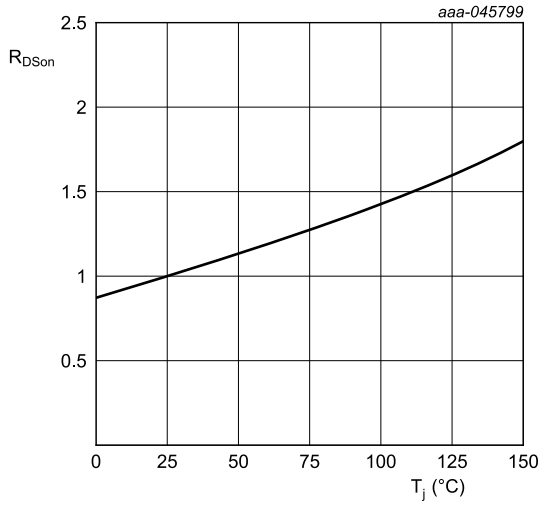


Fig. 10. Gate charge waveform definitions



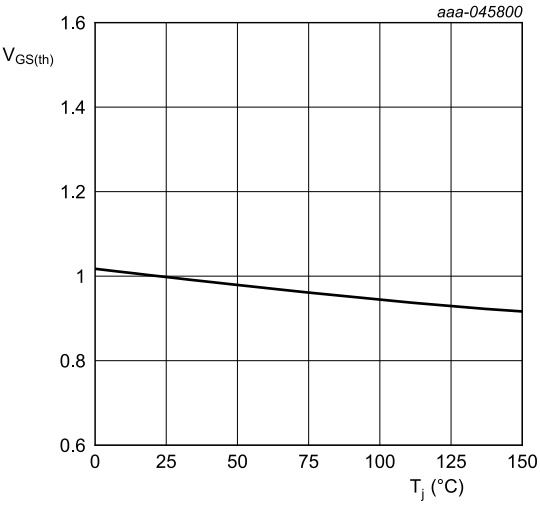
V_{GS} = 0 V

Fig. 11. Reverse drain-source characteristics



V_{GS} = 5 V; I_D = 15 A

Fig. 12. Normalized on-state resistance as a function of temperature



I_D = 4 mA

Fig. 13. Normalized threshold voltage as a function of temperature

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

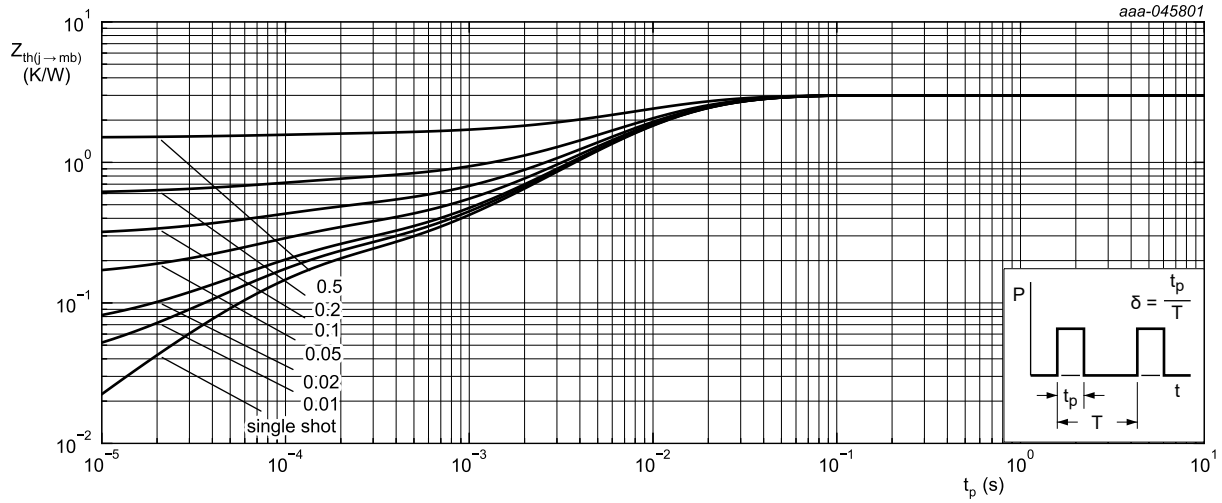


Fig. 14. Transient thermal impedance from junction to mounting base as a function of pulse duration

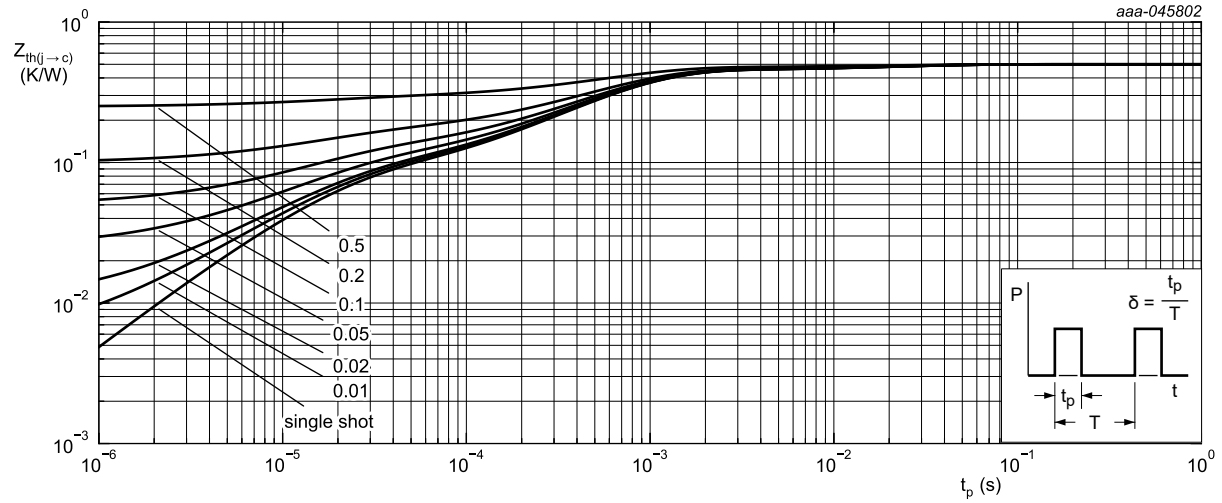


Fig. 15. Transient thermal impedance from junction to case as a function of pulse duration

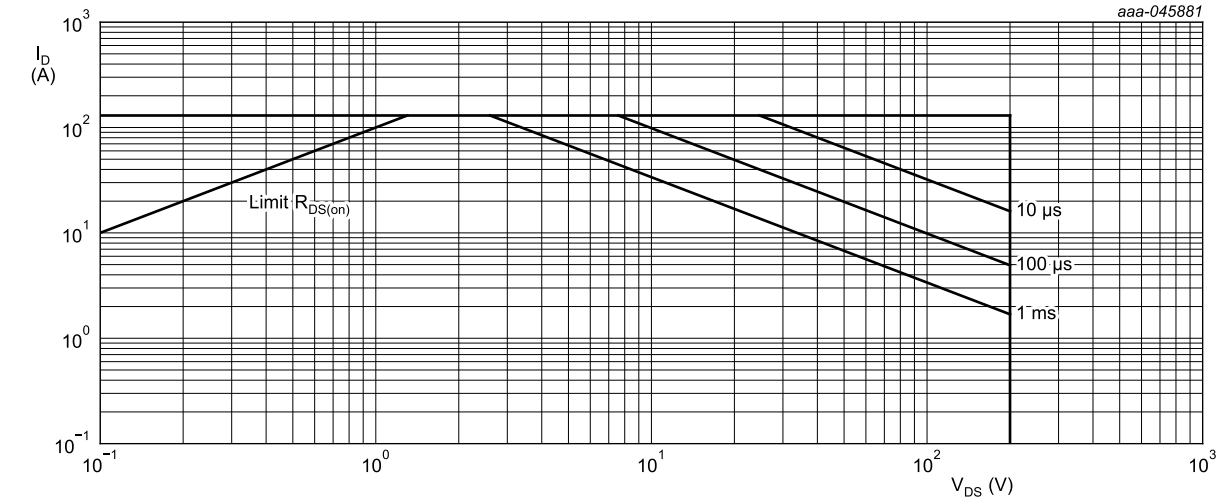


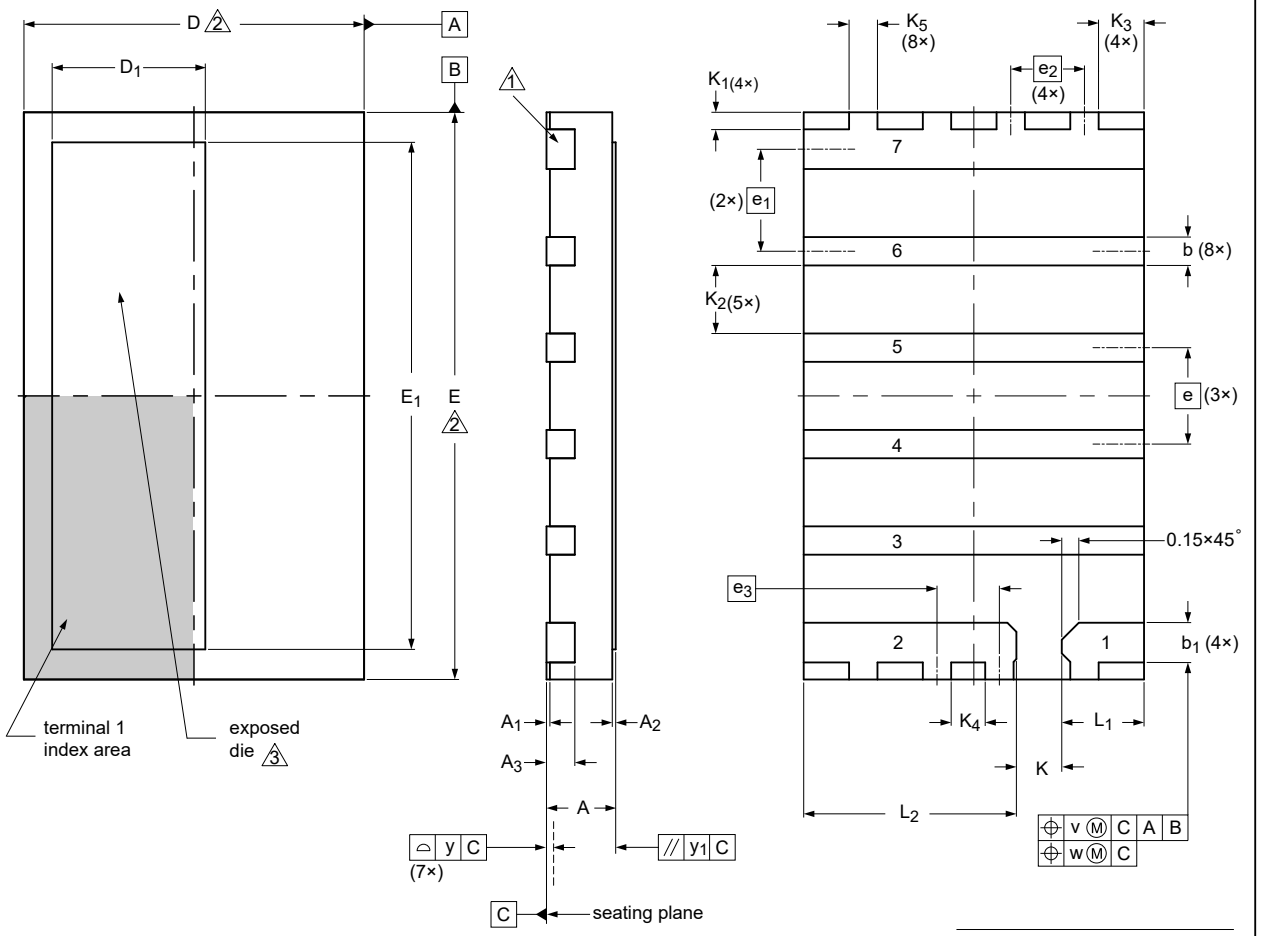
Fig. 16. Safe operating area T_C = 25 °C, single pulse

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

11. Package outline

WQFN7: plastic very very thin Quad Flat package, no leads; exposed Die-Top; 7 terminals, 0.85 mm pitch; 3 mm × 5 mm × 0.65 mm body **SOT8159-2**



K_5	v	w	y	y_1
0.25 REF	0.10	0.05	0.08	0.10

Dimensions (mm are the original dimensions)

Unit[1]		A	A_1	A_2	A_3	b	b_1	D	D_1	E	E_1	e	e_1	e_2	e_3	L_1	L_2	K	K_1	K_2	K_3	K_4
mm	max	0.70	0.05	0.10	0.25	0.30	0.40	3.10	1.35 REF	5.10	4.47 REF	0.85 BSC	0.90 BSC	0.65 BSC	0.55 BSC	0.825	1.975	0.40 REF	0.15 REF	0.60 REF	0.40 REF	0.30 REF
	nom	0.65	0.02			0.25	0.35	3.00		5.00						0.725	1.875					
	min	0.60	0.00			0.20	0.30	2.90		4.90						0.625	1.775					

Note
1. Exposed lead ends are permissible in various shapes.
2. Dimensions do not include mold flash, protrusion or gate burrs.
3. Exposed die is connected to the source, not recommended to use it as electrical connection.

sot8159-2_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOT8159-2						26-05-21

Fig. 17. Package outline WQFN7 (SOT8159-2)

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

12. Soldering

Footprint information for reflow soldering of WQFN7 package, part A **SOT8159-2**

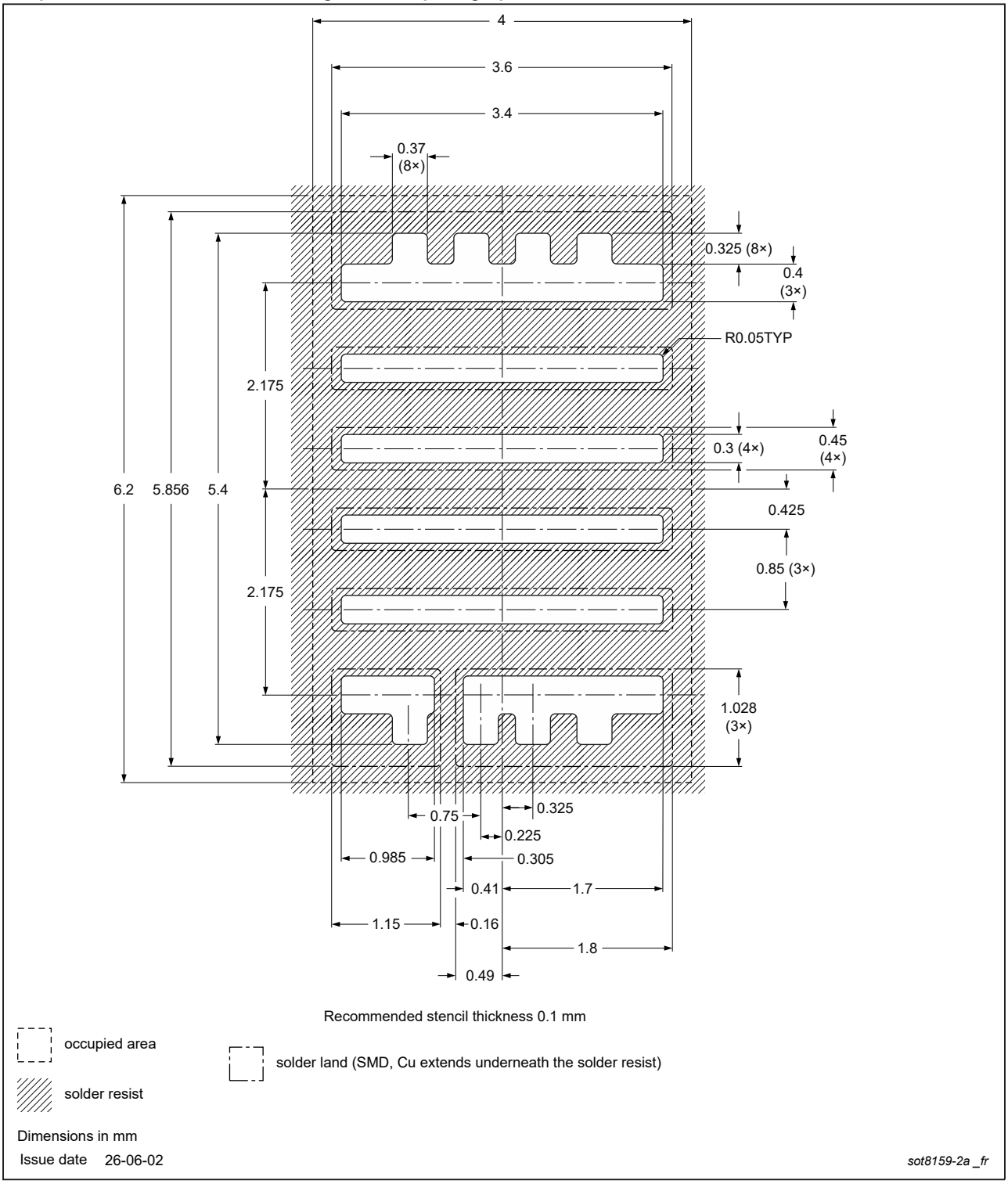


Fig. 18. Reflow soldering footprint for WQFN7 (SOT8159-2), solder land and resist

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

Footprint information for reflow soldering of WQFN7 package, part B **SOT8159-2**

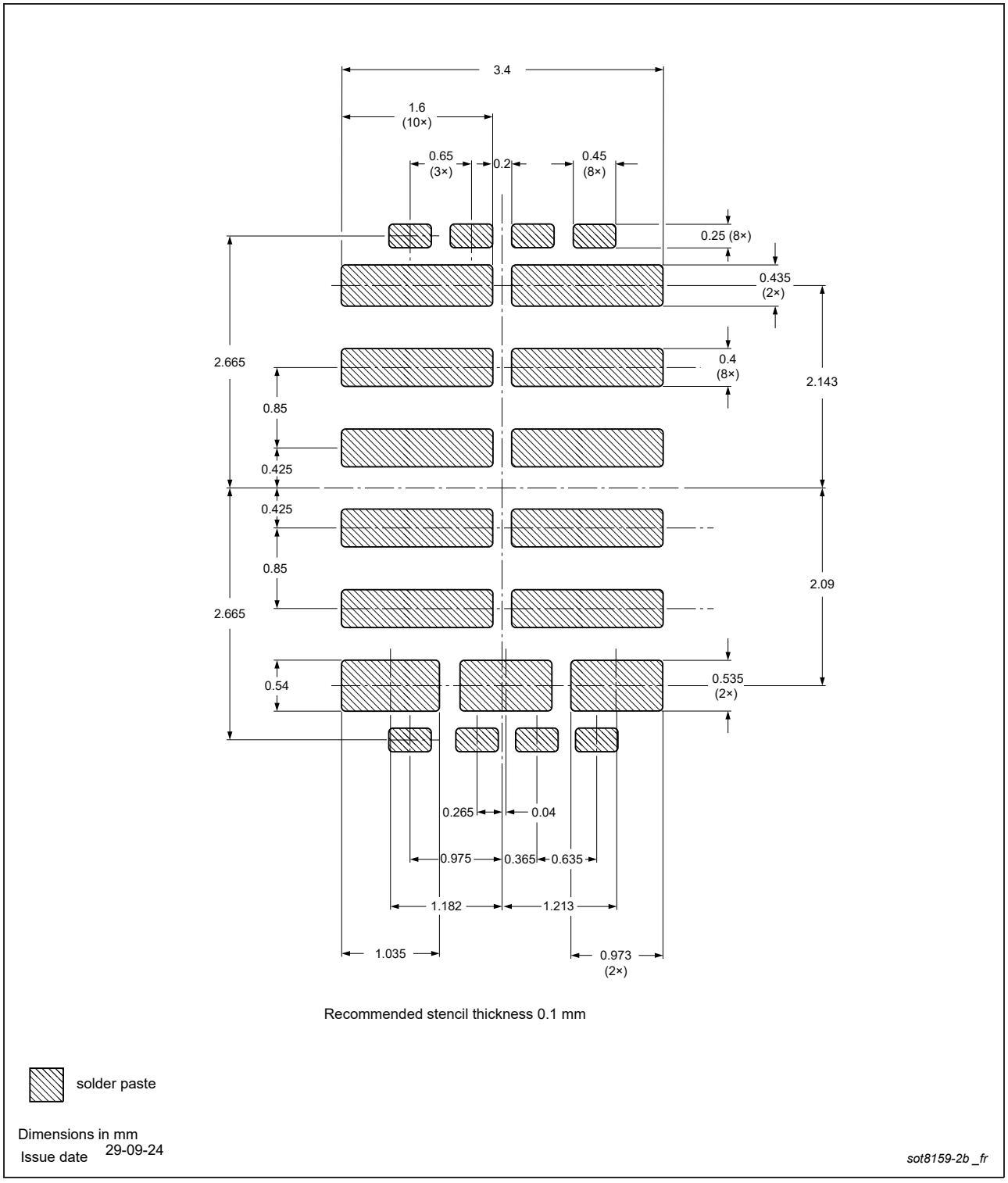


Fig. 19. Reflow soldering footprint for WQFN7 (SOT8159-2), solder paste

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

13. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. Nexperia does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local Nexperia sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

Product specification — The information and data provided in a Product data sheet shall define the specification of the product as agreed between Nexperia and its customer, unless Nexperia and customer have explicitly agreed otherwise in writing. In no event however, shall an agreement be valid in which the Nexperia product is deemed to offer functions and qualities beyond those described in the Product data sheet.

Disclaimers

Limited warranty and liability — Information in this document is believed to be accurate and reliable. However, Nexperia does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. Nexperia takes no responsibility for the content in this document if provided by an information source outside of Nexperia.

In no event shall Nexperia be liable for any indirect, incidental, punitive, special or consequential damages (including - without limitation - lost profits, lost savings, business interruption, costs related to the removal or replacement of any products or rework charges) whether or not such damages are based on tort (including negligence), warranty, breach of contract or any other legal theory.

Notwithstanding any damages that customer might incur for any reason whatsoever, Nexperia's aggregate and cumulative liability towards customer for the products described herein shall be limited in accordance with the Terms and conditions of commercial sale of Nexperia.

Right to make changes — Nexperia reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — Nexperia products are not designed, authorized or warranted to be suitable for use in life support, life-critical or safety-critical systems or equipment, nor in applications where failure or malfunction of an Nexperia product can reasonably be expected to result in personal injury, death or severe property or environmental damage. Nexperia and its suppliers accept no liability for inclusion and/or use of Nexperia products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Quick reference data — The Quick reference data is an extract of the product data given in the Limiting values and Characteristics sections of this document, and as such is not complete, exhaustive or legally binding.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. Nexperia makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Customers are responsible for the design and operation of their applications and products using Nexperia products, and Nexperia accepts no liability for any assistance with applications or customer product design. It is customer's sole responsibility to determine whether the Nexperia product is suitable and fit for the customer's applications and products planned, as well as for the planned application and use of customer's third party customer(s). Customers should provide appropriate design and operating safeguards to minimize the risks associated with their applications and products.

Nexperia does not accept any liability related to any default, damage, costs or problem which is based on any weakness or default in the customer's applications or products, or the application or use by customer's third party customer(s). Customer is responsible for doing all necessary testing for the customer's applications and products using Nexperia products in order to avoid a default of the applications and the products or of the application or use by customer's third party customer(s). Nexperia does not accept any liability in this respect.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) will cause permanent damage to the device. Limiting values are stress ratings only and (proper) operation of the device at these or any other conditions above those given in the Recommended operating conditions section (if present) or the Characteristics sections of this document is not warranted. Constant or repeated exposure to limiting values will permanently and irreversibly affect the quality and reliability of the device.

Terms and conditions of commercial sale — Nexperia products are sold subject to the general terms and conditions of commercial sale, as published at http://www.nexperia.com/profile/terms, unless otherwise agreed in a valid written individual agreement. In case an individual agreement is concluded only the terms and conditions of the respective agreement shall apply. Nexperia hereby expressly objects to applying the customer's general terms and conditions with regard to the purchase of Nexperia products by customer.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from competent authorities.

Non-automotive qualified products — Unless this data sheet expressly states that this specific Nexperia product is automotive qualified, the product is not suitable for automotive use. It is neither qualified nor tested in accordance with automotive testing or application requirements. Nexperia accepts no liability for inclusion and/or use of non-automotive qualified products in automotive equipment or applications.

In the event that customer uses the product for design-in and use in automotive applications to automotive specifications and standards, customer (a) shall use the product without Nexperia's warranty of the product for such automotive applications, use and specifications, and (b) whenever customer uses the product for automotive applications beyond Nexperia's specifications such use shall be solely at customer's own risk, and (c) customer fully indemnifies Nexperia for any liability, damages or failed product claims resulting from customer design and use of the product for automotive applications beyond Nexperia's standard warranty and Nexperia's product specifications.

Translations — A non-English (translated) version of a document is for reference only. The English version shall prevail in case of any discrepancy between the translated and English versions.

Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

All information provided in this document is subject to legal disclaimers.

© Nexperia B.V. 2026. All rights reserved

Contents

1. General description....1
2. Features and benefits....1
3. Applications....1
4. Quick reference data....1
5. Pinning information....2
6. Ordering information....2
6.1. Ordering options....2
7. Marking....2
8. Limiting values....2
9. Thermal characteristics....3
10. Characteristics....3
11. Package outline....8
12. Soldering....9
13. Legal information....11

© **Nexperia B.V. 2026. All rights reserved**

For more information, please visit: http://www.nexperia.com
For sales office addresses, please send an email to: salesaddresses@nexperia.com
Date of release: 15 October 2026