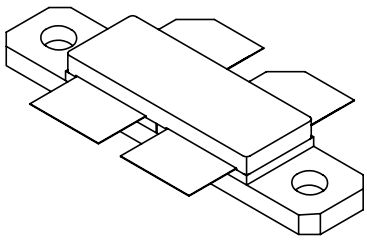
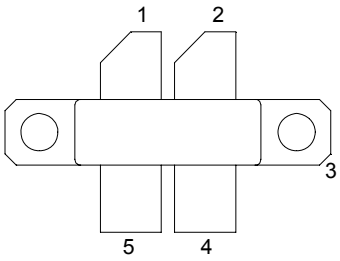
# ST50V10200

Datasheet

## RF power LDMOS transistor for frequencies up to 1.5 GHz



**M246**




1-2 Drain

3 Source

4-5 Gate

## Features

| Order code | $F_{REQ}$ | $V_{DD}$ | $P_{OUT}$ (typ.) | Gain | $N_D$ |
|---|---|---|---|---|---|
| ST50V10200 | 1000 MHz | 50 V | 200 W | 18 dB | 60% |

- High efficiency and linear gain operations
- Integrated ESD protection
- Large positive and negative gate/source voltage range
- In compliance with the European Directive 2002/95/EC

## Applications

- Broadband communications
- Industrial, scientific and medical (ISM)
- Avionics

## Description

The ST50V10200 is a common-source N-channel enhancement-mode lateral field-effect RF power transistor designed for broadband commercial, avionics and industrial applications at frequencies up to 1.5 GHz. It can be used in A/AB and C classes for all typical modulation formats.

STPOWER

| Product status link |
|---|
| ST50V10200 |

| Product summary | |
|---|---|
| **Order code** | ST50V10200 |
| **Marking** | ST50V10200 ES |
| **Package** | M246 |
| **Packing** | TBD |

# 1 Electrical ratings

**Table 1. Absolute maximum ratings (+25 °C)**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $B_{VDSS}$ | Drain-source voltage | 110 | V |
| $V_{GS}$ | Gate-source voltage | -8/+10 | V |
| $V_{DD}$ | Drain supply voltage | 18 | V |
| $T_{STG}$ | Storage temperature range | -65 to +150 | °C |
| $T_J$ | Junction temperature | +200 | °C |

**Table 2. Thermal data**

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| $R_{thj\text{-}case}$ | Junction-case thermal resistance<br>$T_{CASE}$ = +85 °C , $T_J$ = +200 °C, DC test | 0.40 | °C/W |

**Table 3. ESD protection**

| Symbol | Parameter | Class |
|---|---|---|
| HBM | Human body model (according to JESD22-A114) | 2 |

# 2 Electrical characteristics

($T_C$ = 25 °C unless otherwise specified)

**Table 4. Static (per side)**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $V_{(BR)DSS}$ | Drain-source breakdown voltage | $V_{GS}$ = 0 V, $I_D$ = 100 µA | 110 | | | V |
| $I_{DSS}$ | Zero-gate voltage drain current | $V_{GS}$ = 0 V, $V_{DS}$ = 50 V | | | 1 | µA |
| $I_{GSS}$ | Gate-body leakage current | $V_{DS}$ = 0 V, $V_{GS}$ = 6 V | | | 1 | µA |
| $V_{GS(th)}$ | Gate threshold voltage | $V_{DS}$ = 28 V, $I_D$ = 600 µA | 1 | TBD | 3 | V |
| $V_{DS(on)}$ | Static drain-source on-resistance | $V_{GS}$ = 10 V, $I_D$ = 5 A | | | 1.4 | V |
| $C_{ISS}$ | Common source input capacitance | $V_{GS}$ = 0 V, $V_{DD}$ = 50 V, $F_{REQ}$ = 1 MHz | | 118 | | pF |
| $C_{RSS}$ | Common source feedback capacitance | | | 2 | | pF |
| $C_{OSS}$ | Common source output capacitance | | | 44 | | pF |

**Table 5. Dynamic**

| Symbol | Parameter | Test conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $P_{OUT}$ | Output power | $V_{DD}$ = 50 V, $I_{DQ}$ = 0.2 A, $F_{REQ}$ = 1000 MHz, | - | 225 | - | W |
| Gain | Power gain | | - | 17.5 | - | dB |
| Efficiency | Drain efficiency | | - | 60 | - | % |
| IMD3 | 3rd order intermodulation | | - | TBD | - | dBc |
| VSWR | Load mismatch | $P_{OUT}$ = 200 W, all phases | - | 10:1 | - | |

**Table 6. Impedance data**

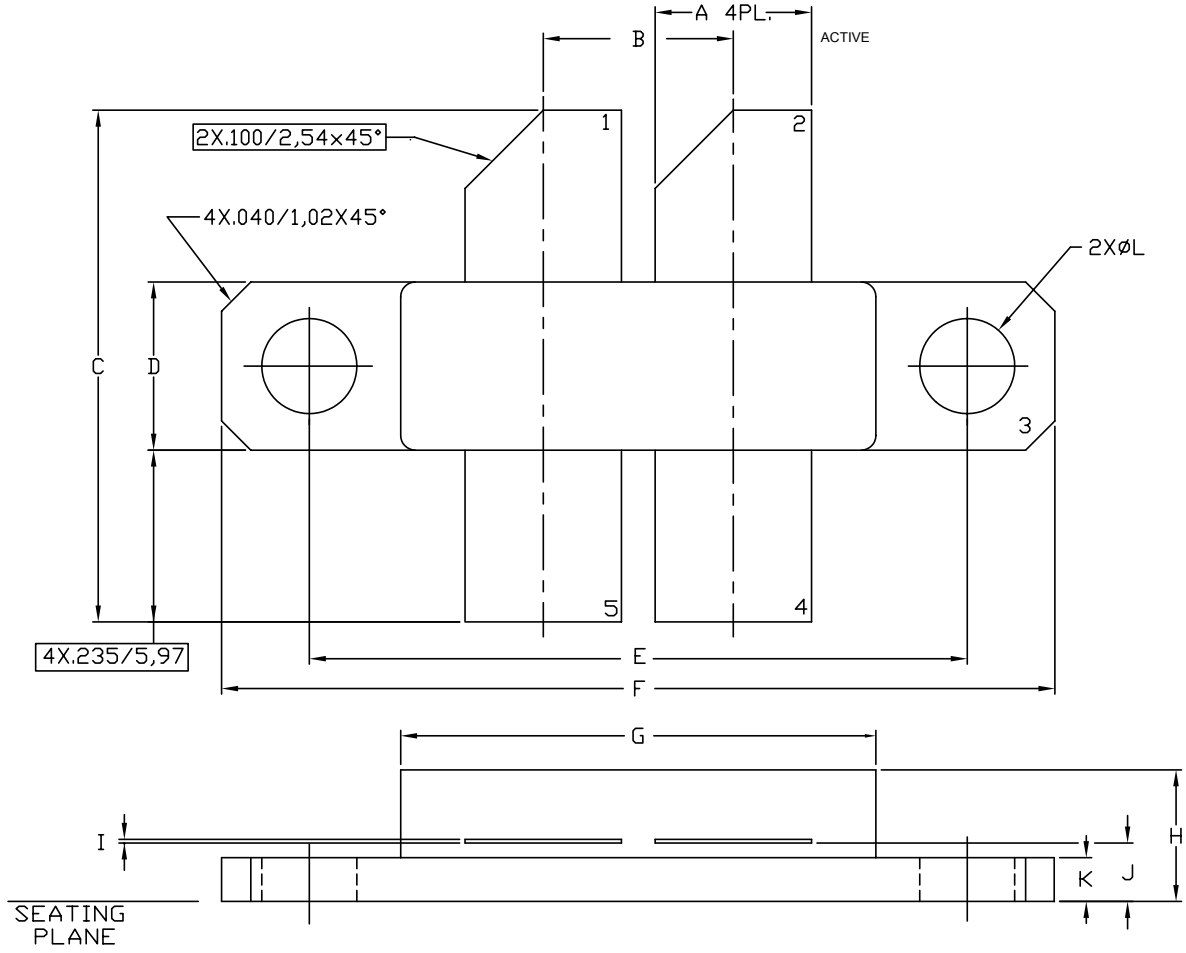
| Frequency (in MHz) | Input impedance ($Z_{IN}$) | Drain load impedance ($Z_{DL}$) |
|---|---|---|
| 2 | TBD | TBD |
| 5 | TBD | TBD |
| 10 | TBD | TBD |
| 30 | TBD | TBD |
| 60 | TBD | TBD |
| 100 | TBD | TBD |
| 200 | TBD | TBD |

# 3 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.

## 3.1 0.230 x 0.650 WIDE 4/L BAL N/HERM W/FLG M246 package information

**Figure 1. 0.230 x 0.650 WIDE 4/L BAL N/HERM W/FLG M246 package outline**




7145054_5

**Table 7. 0.230 x 0.650 WIDE 4/L BAL N/HERM W/FLG M246 mechanical data**

| Symbol | Milimeters | | |
|---|---|---|---|
| | Min. | Typ. | Max. |
| A | 5.33 | | 5.59 |
| B | 6.48 | | 6.73 |
| C | 17.27 | | 18.29 |
| D | 5.72 | | 5.97 |
| E | | 22.86 | |
| F | 28.83 | | 29.08 |
| G | 16.26 | | 16.76 |
| H | 4.19 | | 5.08 |
| I | 0.08 | | 0.15 |
| J | 1.83 | | 2.24 |
| K | 1.40 | | 1.65 |
| L | 3.18 | | 3.43 |

## Revision history

Table 8. **Document revision history**

| Date | Version | Changes |
|---|---|---|
| 12-Sep-2018 | 1 | Initial release |
| 22-Mar-2019 | 2 | Updated Table 1 and Table 4. |

# Contents

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2019 STMicroelectronics – All rights reserved

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

STMicroelectronics:

ST50V10200