

Advance GTVA311801FA

Thermally-Enhanced High Power RF GaN on SiC HEMT 180 W, 50 V, 2700 – 3100 MHz

Description

The GTVA311801FA is a 180-watt GaN on SiC high electron mobility transistor (HEMT) for use in the 2700 to 3100 MHz frequency band. It features input matching, high efficiency, and a thermally-enhanced package with earless flange.

Advance Specification Data Sheets describe products that are being considered by Wolfspeed for development and market introduction. The target performance shown in Advance Specifications is not final and should not be used for any design activity. Please contact Wolfspeed about the future availability of these products.

Features

- GaN on SiC HEMT technology
- Broadband internal input matching
- Typical pulsed CW performance (class AB), 2700 – 3100 MHz, 50 V, 300 μ s pulse width, 10% duty cycle
 - Output power at P_{3dB} = 180 W
 - Drain efficiency = 70%
 - Gain (P_{3dB}) = 15 dB
- Pb-free and RoHS compliant



GTVA311801FA
Package H-37265J-2

Target RF Characteristics

Pulsed CW Specifications (tested in Wolfspeed class AB test fixture)

V_{DD} = 50 V, I_{DQ} = 20 mA, P_{OUT} = 180 W, f = 3100 MHz, pulse width = 300 μ s, duty cycle = 10%

| Characteristic | Symbol | Min | Typ | Max | Unit |
|------------------|----------|-----|-----|-----|------|
| Gain | G_{ps} | — | 15 | — | dB |
| Drain Efficiency | η_D | — | 70 | — | % |

All published data at $T_{CASE} = 25^\circ\text{C}$ unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics

| Characteristic | Conditions | Symbol | Min | Typ | Max | Unit |
|--------------------------------|---|---------------|------|------|------|------|
| Drain-source Breakdown Voltage | $V_{GS} = -8\text{ V}$, $I_D = 21\text{ mA}$ | $V_{(BR)DSS}$ | 150 | — | — | V |
| Drain-source Leakage Current | $V_{GS} = -8\text{ V}$, $V_{DS} = 50\text{ V}$ | I_{DSS} | — | — | 5 | mA |
| Gate Threshold Voltage | $V_{DS} = 10\text{ V}$, $I_D = 21\text{ mA}$ | $V_{GS(th)}$ | -3.8 | -3.0 | -2.3 | V |

Recommended Operating Conditions

| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|-------------------------|---|-------------|-----|-------|-----|------|
| Drain Operating Voltage | | V_{DD} | 0 | — | 55 | V |
| Gate Quiescent Voltage | $V_{DS} = 50\text{ V}$, $I_D = 20\text{ mA}$ | $V_{GS(Q)}$ | — | -3.17 | — | V |

Absolute Maximum Ratings

| Parameter | Symbol | Value | Unit |
|---------------------------|-----------|-------------|------|
| Drain-source Voltage | V_{DSS} | 125 | V |
| Gate-source Voltage | V_{GS} | -10 to +2 | V |
| Gate Current | I_G | 20 | mA |
| Drain Current | I_D | 7.5 | A |
| Junction Temperature | T_J | 225 | °C |
| Storage Temperature Range | T_{STG} | -65 to +150 | °C |

Operation above the maximum values listed here may cause permanent damage. Maximum ratings are absolute ratings; exceeding only one of these values may cause irreversible damage to the component. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. For reliable continuous operation, the device should be operated within the operating voltage range (V_{DD}) specified above.

Thermal Characteristics

| Parameter | Symbol | Value | Unit |
|--------------------------------------|-----------------|-------|------|
| Thermal Resistance, Junction to Case | $R_{\theta JC}$ | TBD | °C/W |

Ordering Information

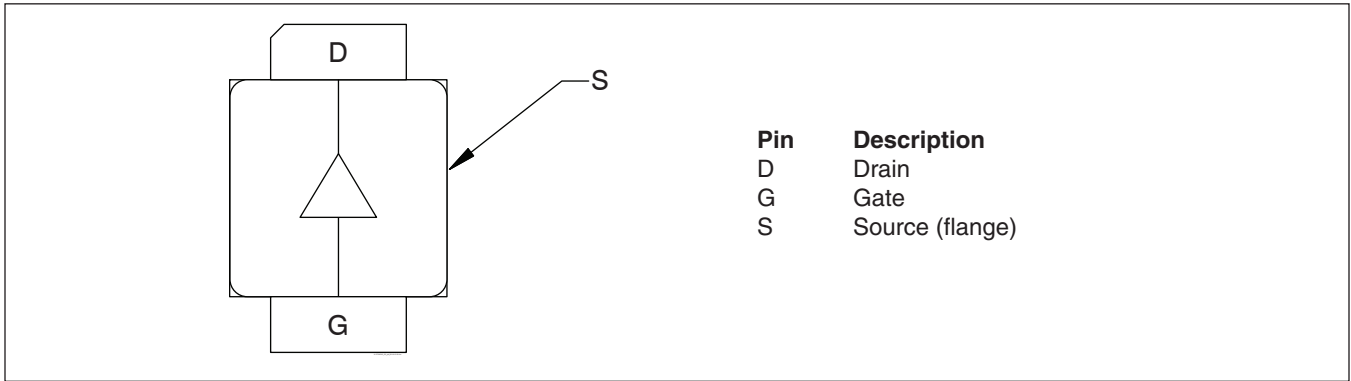
| Type and Version | Order Code | Package and ECCN | Shipping |
|--------------------|------------|------------------------|----------------------|
| GTVA311801FA V1 R0 | TBD | H-37265J-2, 3A001.b.3a | Tape & Reel, 50 pcs |
| GTVA311801FA V1 R2 | TBD | H-37265J-2, 3A001.b.3a | Tape & Reel, 250 pcs |

Evaluation Board

| Order Code | Frequency | Description | ECCN |
|---------------------|-----------------|-----------------------------------|------------|
| LTN/GTVA311801FA V1 | 2700 – 3100 MHz | Class AB, RO4350B, 0.508 mm thick | 3A001.b.3a |

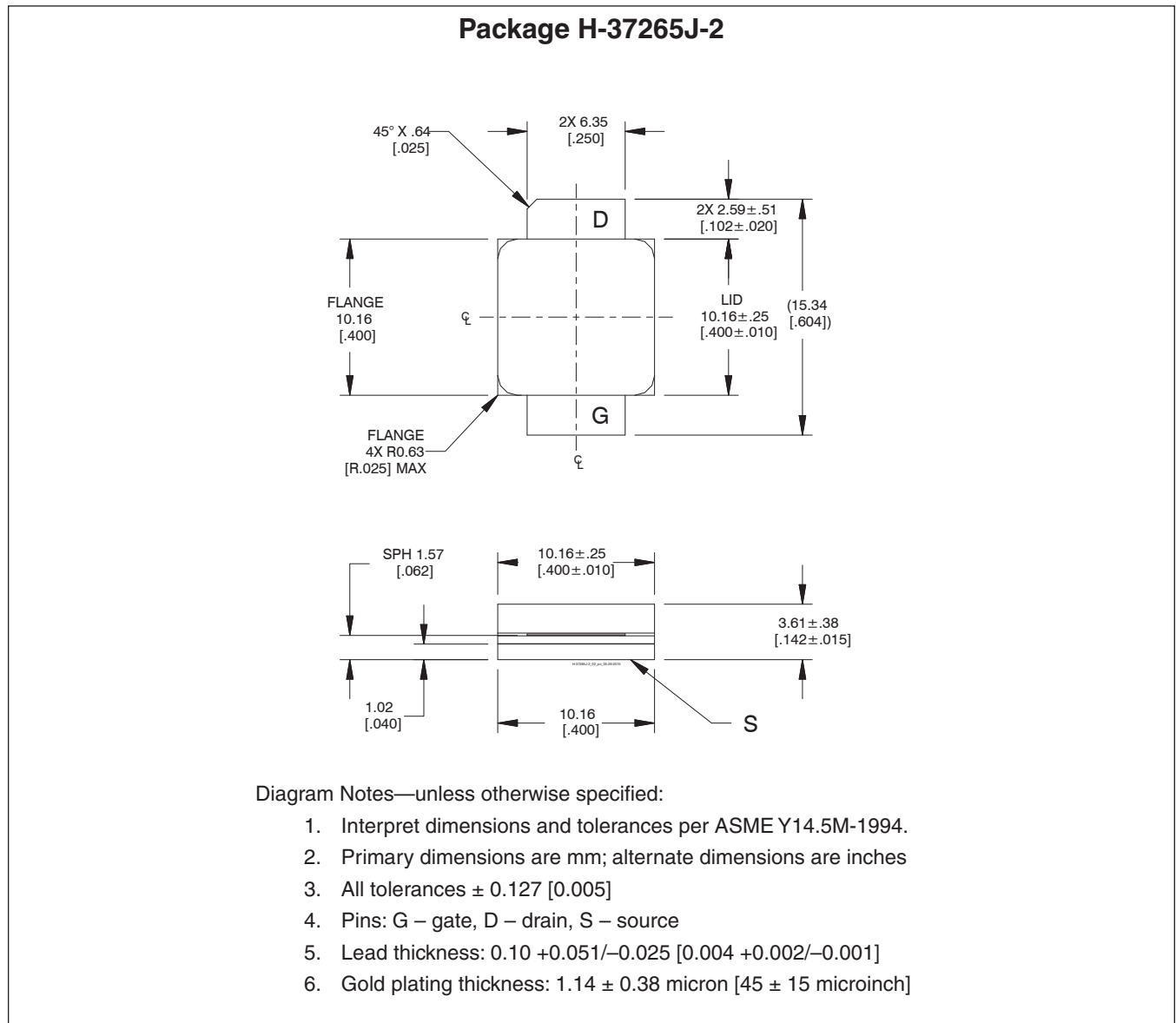


Pinout Diagram (top view)



See next page for package dimensions

Package Outline Specifications





Revision History

| Revision | Date | Data Sheet | Page | Subjects (major changes at each revision) |
|----------|------------|------------|----------|--|
| 01 | 2017-01-26 | Advance | all | Advance Specification provides target requirements for product development |
| 01.1 | 2018-02-01 | Advance | 1 | Updated pulsed CW performance and pulsed CW spec table |
| 02 | 2018-05-01 | Advance | All 2 | Converted to Wolfspeed Data Sheet Updated DC Characteristics and max ratings table format |
| | | | | |

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Notes

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