

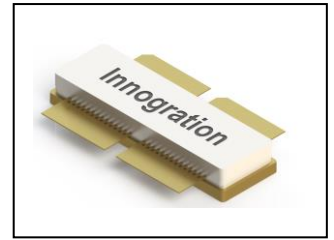
M2Q1031VPS LDMOS TRANSISTOR

Document Number: M2Q1031VPS
Preliminary Datasheet V1.0

300W, UHF band 50V High Power RF LDMOS FETs

Description

The M2Q1031VPS is a 300W capable, Input/Output matched LDMOS FET, designed for commercial and industrial applications within UHF band up to 1GHz, supporting both pulse and CW applications upon bandwidth trade off. **In typical 400-1000M full band tuning, it can reach >300W pulsed CW and >250W CW power**



There isn't guarantee when this device is used outside of the band stated above.

- Typical RF performance within 400-1000MHz with device soldered

| M2Q1031VPS ^{V0} VGS=3.21V VDS=50V IDQ=200mA CW | | | | | | | | |
|---|------------|----------|---------|-----------|-----------|--------|-----------------------|-----------------------|
| Freq (MHz) | Psat (dBm) | Psat (W) | IDS (A) | Pin (dBm) | Gain (dB) | Eff(%) | 2 nd (dBc) | 3 rd (dBc) |
| 400 | 54.90 | 309.0 | 8.80 | 40.00 | 14.90 | 70.23 | -13.70 | -18.10 |
| 500 | 54.55 | 285.1 | 10.20 | 40.35 | 14.20 | 55.90 | -17.50 | -25.30 |
| 600 | 55.21 | 331.9 | 11.95 | 40.45 | 14.76 | 55.55 | -24.50 | -17.00 |
| 700 | 55.61 | 363.9 | 11.90 | 40.61 | 15.00 | 61.16 | -33.10 | -41.30 |
| 800 | 55.23 | 333.4 | 11.60 | 41.59 | 13.64 | 57.49 | -38.60 | -43.30 |
| 900 | 55.18 | 329.6 | 11.96 | 41.87 | 13.31 | 55.12 | -32.40 | -43.30 |
| 1000 | 54.90 | 309.0 | 10.07 | 41.61 | 13.29 | 61.38 | -32.40 | -30.90 |

Features

- High breakdown voltage enable high ruggedness
- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Excellent thermal stability, low HCI drift
- Compliant to Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

Table 1. Maximum Ratings

| Rating | Symbol | Value | Unit |
|--------------------------------|------------------|-------------|------|
| Drain--Source Voltage | V _{DSS} | 110 | Vdc |
| Gate--Source Voltage | V _{GS} | -10 to +10 | Vdc |
| Operating Voltage | V _{DD} | +55 | Vdc |
| Storage Temperature Range | T _{stg} | -65 to +150 | °C |
| Case Operating Temperature | T _c | +150 | °C |
| Operating Junction Temperature | T _j | +225 | °C |

Table 2. Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|------------------|-------|------|
| Thermal Resistance, Junction to Case ,Case Temperature 25°C, 50Vdc, DC test | R _{θJC} | 0.45 | °C/W |

Table 3. ESD Protection Characteristics

| Test Methodology | Class |
|-------------------------------------|---------|
| Human Body Model (per JESD22--A114) | Class 2 |

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Table 4. Electrical Characteristics (TA = 25 °C unless otherwise noted)

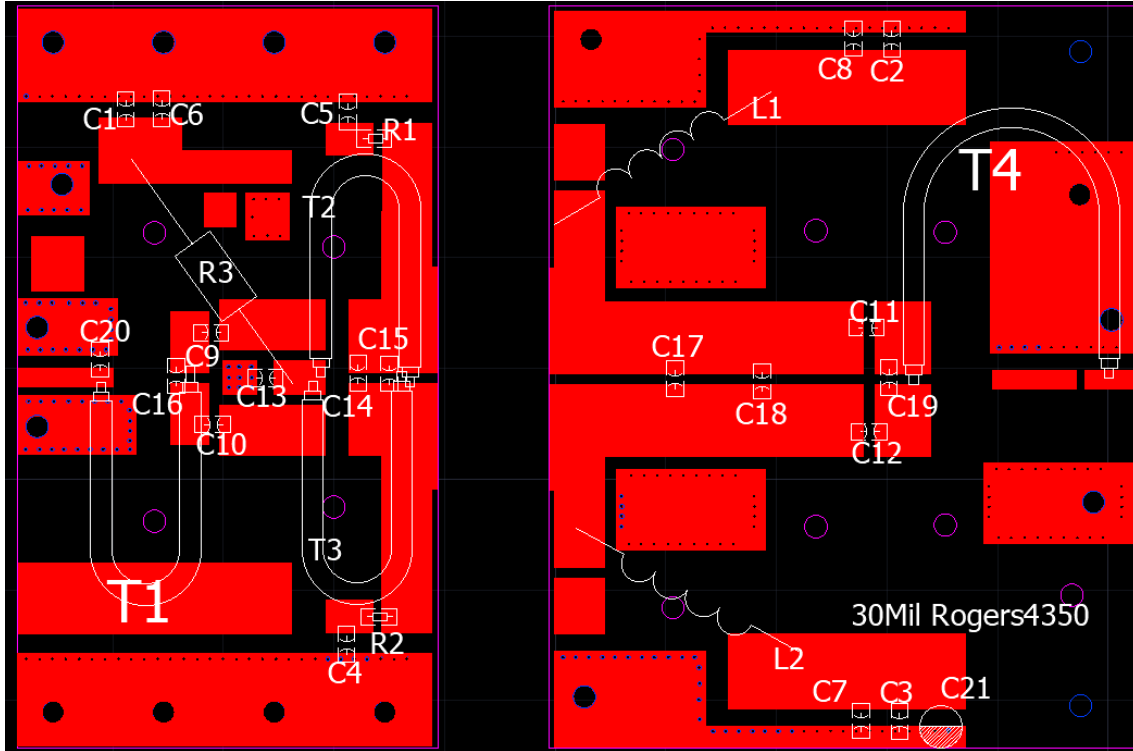
| Characteristic | Symbol | Min | Typ | Max | Unit |
|--|----------------------|-----|------|-----|------|
| DC Characteristics | | | | | |
| Drain-Source Voltage V _{GS} =0V, I _{DS} =1.0mA | V _{(BR)DSS} | | 110 | | V |
| Zero Gate Voltage Drain Leakage Current (V _{DS} = 50V, V _{GS} = 0 V) | I _{DSS} | — | — | 1 | μA |
| Gate—Source Leakage Current (V _{GS} = 10 V, V _{DS} = 0 V) | I _{GSS} | — | — | 1 | μA |
| Gate Threshold Voltage (V _{DS} = 50V, I _D = 600 μA) | V _{GS(th)} | — | 2.54 | — | V |
| Gate Quiescent Voltage (V _{DD} = 50 V, I _D = 500 mA, Measured in Functional Test) | V _{GS(Q)} | — | 3.4 | — | V |

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400-1000MHz

Reference Circuit of Test Fixture
(Layout file upon request) PCB: Roger 4350B, 30mils



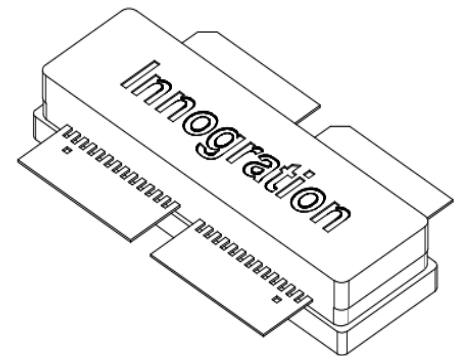
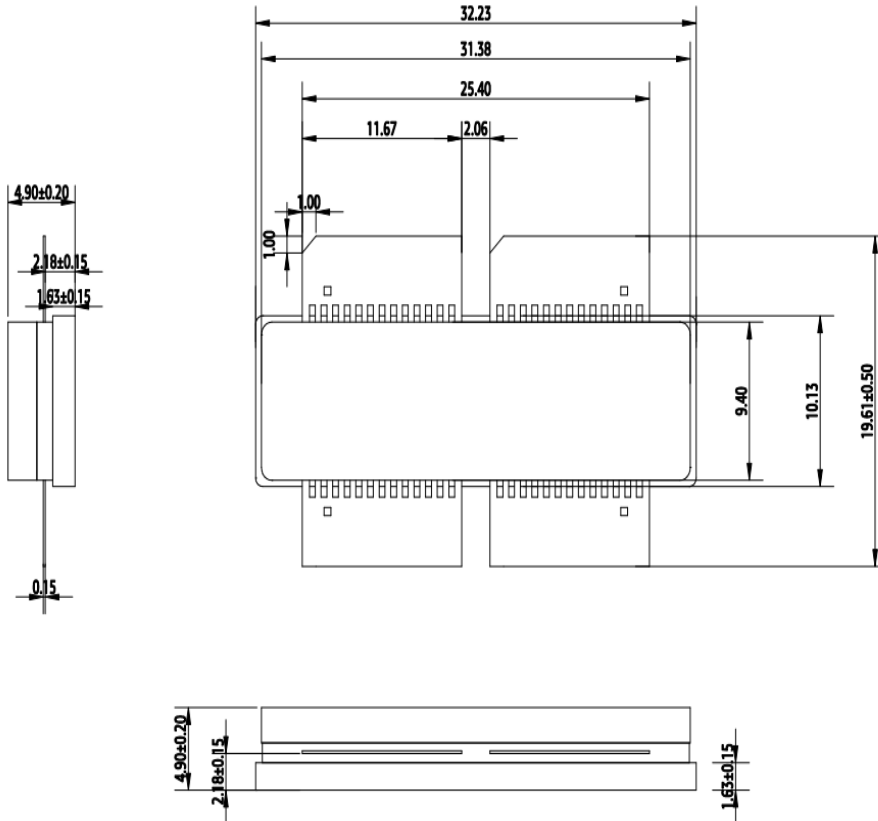
| Component | Description | Suggestion |
|-----------|----------------|------------------------------|
| C1~C5,C13 | 10uF/200V-1210 | Ceramic multilayer capacitor |
| C6~C8 | 470pF | |
| C9,C10 | 47pF | |
| C11,C12 | 75pF | |
| C19,C20 | 1pF | |
| C14 | 7.5pF | |
| C15 | 10pF | |
| C16 | 3.3pF | |
| C17 | 4.7pF | |
| C16 | 5.1pF | |
| C21 | 470uF-63V | electrolytic capacitor |
| R1,R2 | 10 Ω /1206 | Chip Resistor |
| R3 | 300 Ω | Color Ring Resistor |
| T1 | 50 ohm-40mm | RFSFBU-086-50 |
| T2,T3 | 16.7 ohm-40mm | SFF-16.7-1.5 |
| T4 | 35 ohm-55mm | SFF-35-3 |
| L1,L2 | 1.5mm wire | DIY |

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Package Outline

Earless Flanged Plastic Air Cavity Package; 4 leads



Unit:mm

Tolerance ±0.10mm, Except as Noted.

Revision history

Table 5. Document revision history

| Date | Revision | Datasheet Status |
|-----------|----------|---|
| 2026/5/15 | Rev 1.0 | Preliminary Datasheet and package finalized as D4C V3 |
| | | |
| | | |

Application data based on TC-26-17

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