

TOSHIBA Field Effect Transistor Silicon N Channel MOS Type

RFM01U7P

VHF- and UHF-band Amplifier Applications

(Note)The TOSHIBA products listed in this document are intended for high frequency Power Amplifier of telecommunications equipment. These TOSHIBA products are neither intended nor warranted for any other use. Do not use these TOSHIBA products listed in this document except for high frequency Power Amplifier of telecommunications equipment.

- Output power: $P_O = 1.2 \text{ W}$ (typ.)
- Gain: $G_P = 10.8 \text{ dB}$ (typ.)
- Drain efficiency: $\eta_D = 65\%$ (typ.)

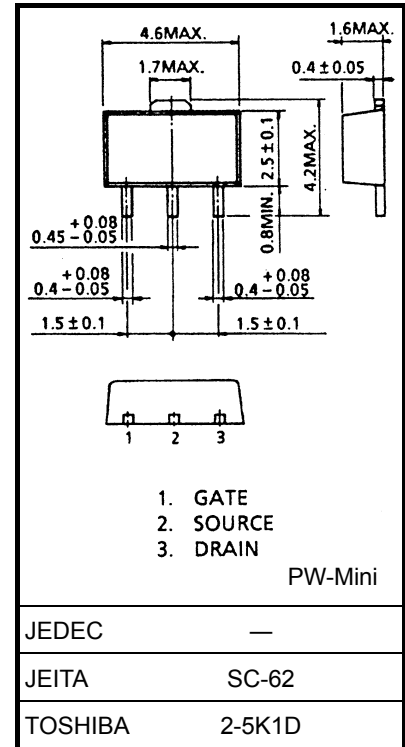
Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

| Characteristics | Symbol | Rating | Unit |
|---------------------------|----------------|------------|------------------|
| Drain-source voltage | V_{DSS} | 20 | V |
| Gate-source voltage | V_{GSS} | 10 | V |
| Drain current | I_D | 1 | A |
| Power dissipation | P_D (Note 1) | 3 | W |
| Channel temperature | T_{ch} | 150 | $^\circ\text{C}$ |
| Storage temperature range | T_{stg} | -45 to 150 | $^\circ\text{C}$ |

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings. Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

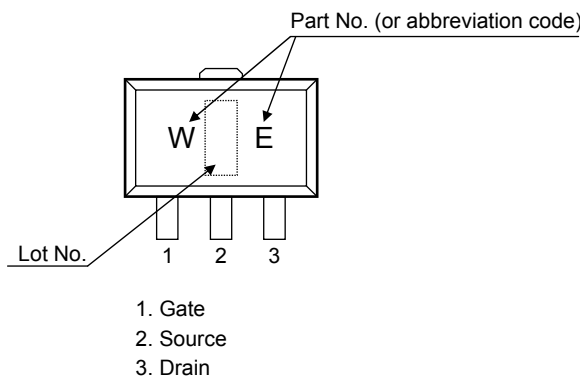
Note 1: $T_c = 25^\circ\text{C}$ (When mounted on a 1.6 mm glass epoxy PCB)

Unit: mm



Weight: 0.05 g (typ.)

Marking



Caution: This device is sensitive to electrostatic discharge. Please make enough tool and equipment earthed when you handle.

Start of commercial production
2008-11

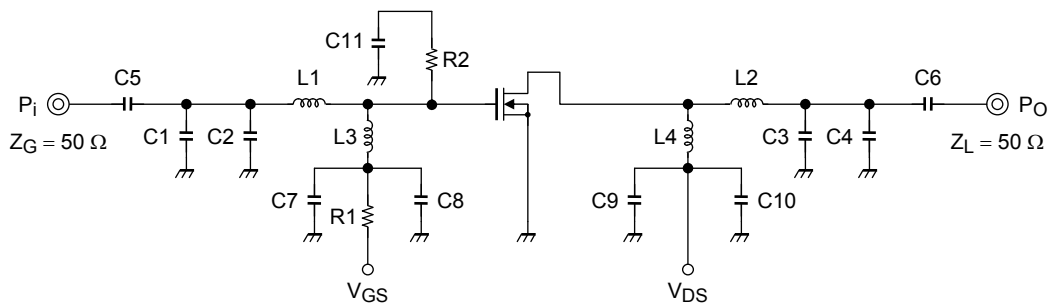
Electrical Characteristics (Ta = 25°C)

| Characteristics | Symbol | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------|-----------|---|----------------|------|-----|---------------|
| Drain cut-off current | I_{DSS} | $V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$ | — | — | 10 | μA |
| Gate-source leakage current | I_{GSS} | $V_{GS} = 10\text{ V}$ | — | — | 5 | μA |
| Threshold voltage | V_{th} | $V_{DS} = 7.2\text{ V}, I_D = 0.5\text{ mA}$ | 0.6 | 1.1 | 1.6 | V |
| Output power | P_O | $V_{DS} = 7.2\text{ V},$ $I_{idle} = 100\text{ mA} (V_{GS} = \text{adjust}),$ $f = 520\text{ MHz}, P_i = 100\text{ mW},$ $Z_G = Z_L = 50\ \Omega$ | 1.0 | 1.2 | — | W |
| Drain efficiency | η_D | | 55 | 65 | — | % |
| Power gain | G_P | | 10.0 | 10.8 | — | dB |
| Load mismatch | — | $V_{DS} = 12.5\text{ V},$ $P_O = 1.2\text{ W} (P_i = \text{adjust}),$ $I_{idle} = 100\text{ mA} (V_{GS} = \text{adjust}),$ $f = 520\text{ MHz},$ VSWR LOAD 20:1 all phase | No degradation | | | — |

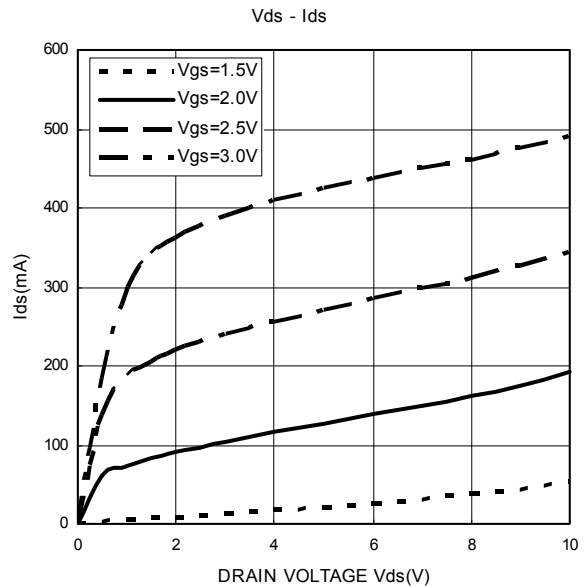
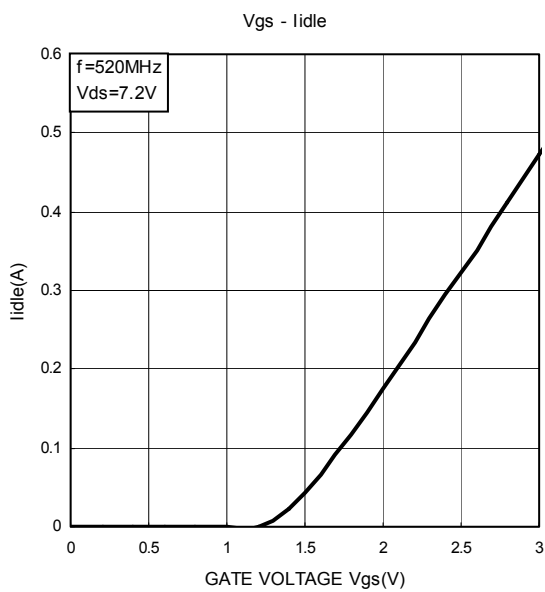
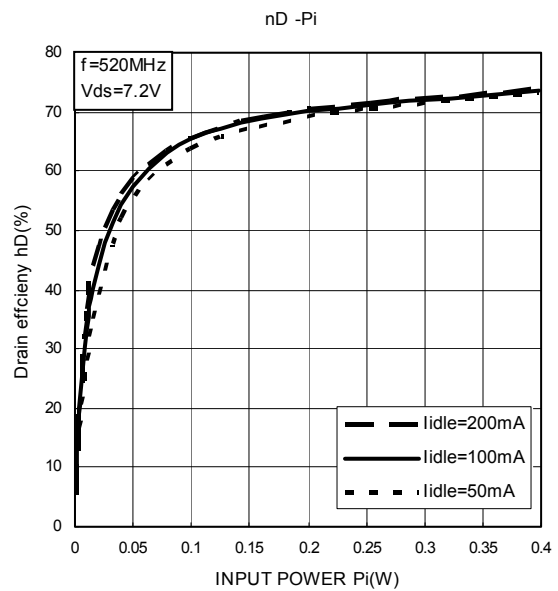
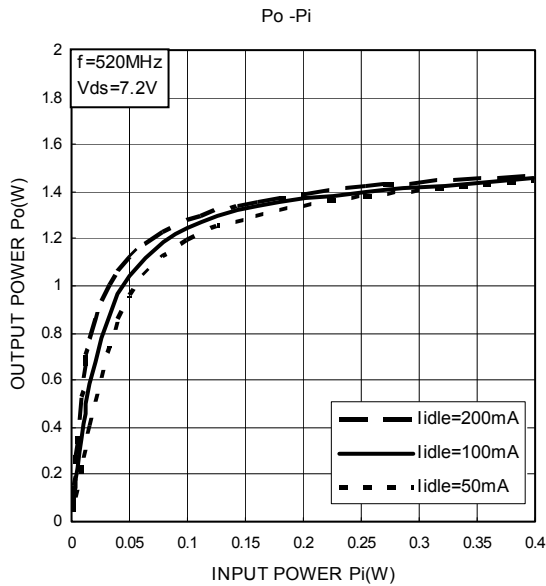
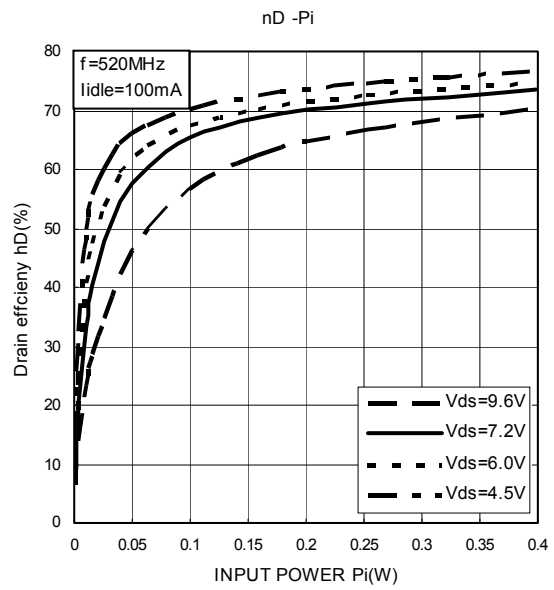
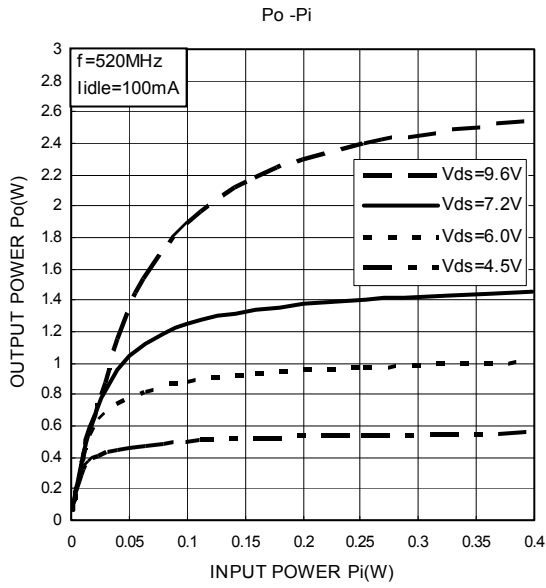
Note 2: These characteristic values are measured using measurement tools specified by Toshiba.

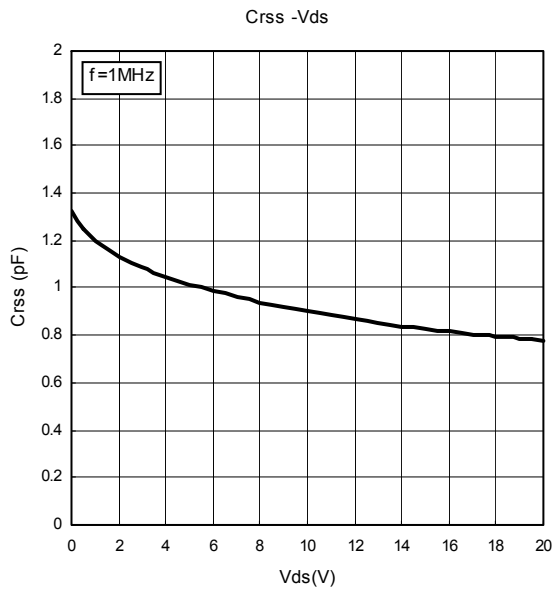
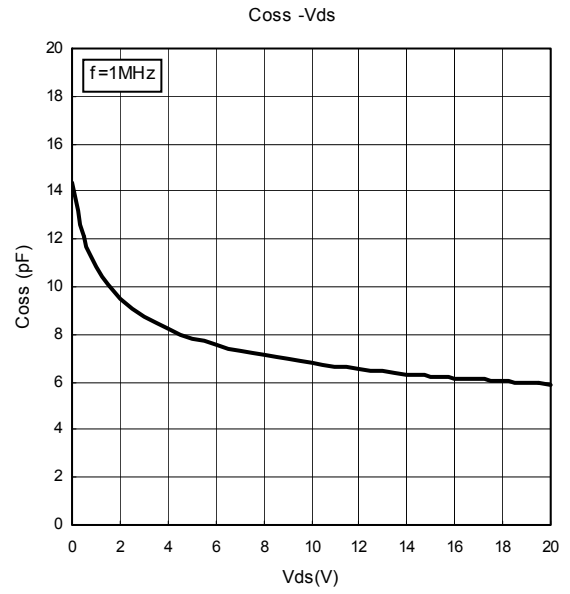
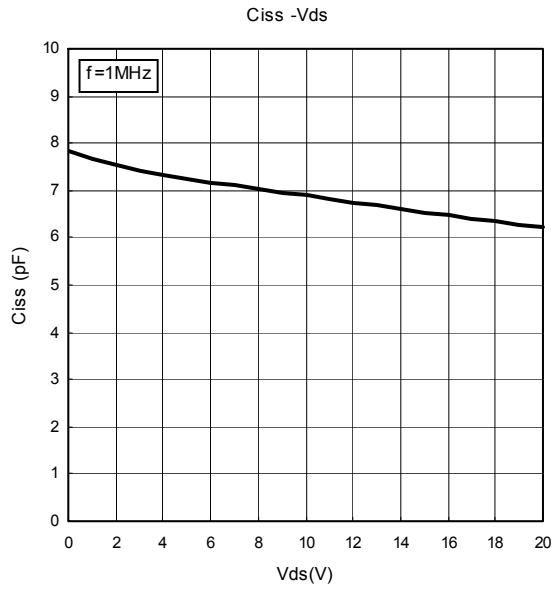
Output Power Test Fixture

(Test Condition: $f = 520\text{ MHz}, V_{DS} = 7.2\text{ V}, I_{idle} = 100\text{ mA}, P_i = 100\text{ mW}$)



| | | |
|----------------------|---|--------------------|
| C1: 15 pF | L1: $\phi 0.8\text{ mm}$ enamel wire, 2.2ID, 1T | R1: 1.5 k Ω |
| C2: 10 pF | L2: $\phi 0.8\text{ mm}$ enamel wire, 2.2ID, 1T | R2: 51 Ω |
| C3: 9 pF | L3: $\phi 0.8\text{ mm}$ enamel wire, 5.5ID, 4T | |
| C4: 6 pF | L4: $\phi 0.8\text{ mm}$ enamel wire, 5.5ID, 8T | |
| C5: 2200 pF | | |
| C6: 2200 pF | | |
| C7: 10 μF | | |
| C8: 10000 pF | | |
| C9: 10 μF | | |
| C10: 10000 pF | | |
| C11: 2200 pF | | |





Note 3: These are only typical curves and devices are not necessarily guaranteed at these curves.

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