

TOSHIBA FIELD EFFECT TRANSISTOR GaAs N CHANNEL SINGLE GATE MODULATION DOPE TYPE

2SK2856

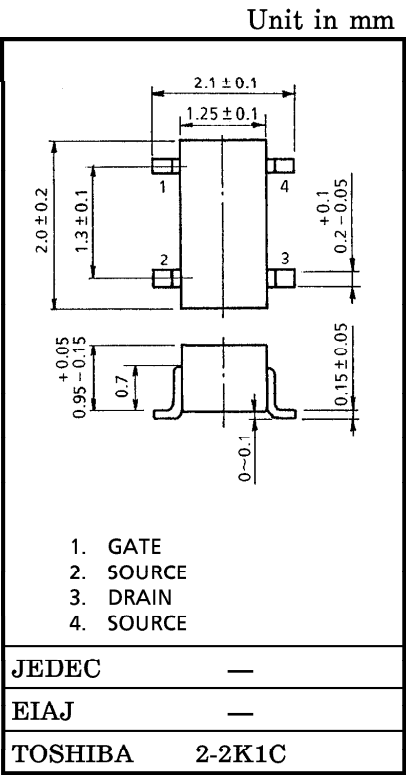
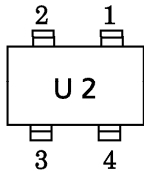
UHF BAND LOW NOISE AMPLIFIER APPLICATIONS

- Low Noise Figure : NF=0.7dB (f=1.5GHz)
- High Gain : Ga=21.5dB (f=1.5GHz)

MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTIC            | SYMBOL           | RATING  | UNIT |
|---------------------------|------------------|---------|------|
| Gate-Drain Voltage        | V <sub>GDO</sub> | −3      | V    |
| Gate-Source Voltage       | V <sub>GSO</sub> | −3      | V    |
| Drain Current             | I <sub>D</sub>   | 80      | mA   |
| Power Dissipation         | P <sub>D</sub>   | 100     | mW   |
| Channel Temperature       | T <sub>ch</sub>  | 125     | °C   |
| Storage Temperature Range | T <sub>stg</sub> | −55~125 | °C   |

MARKING



Weight : 0.006g

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

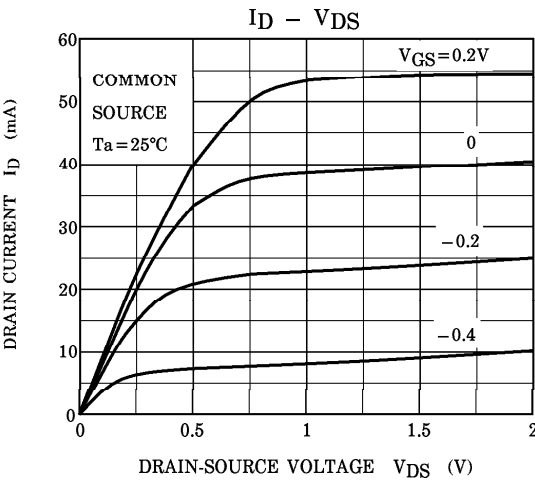
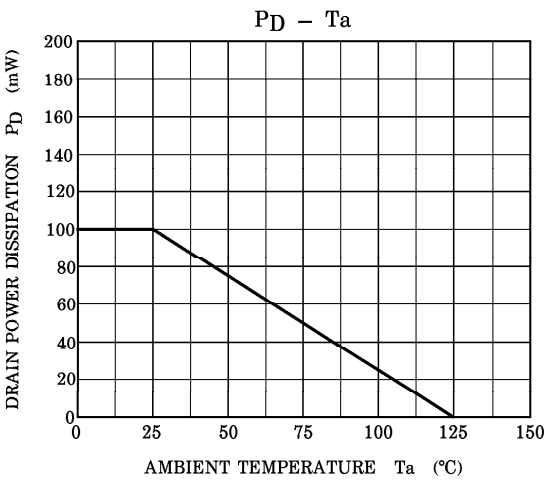
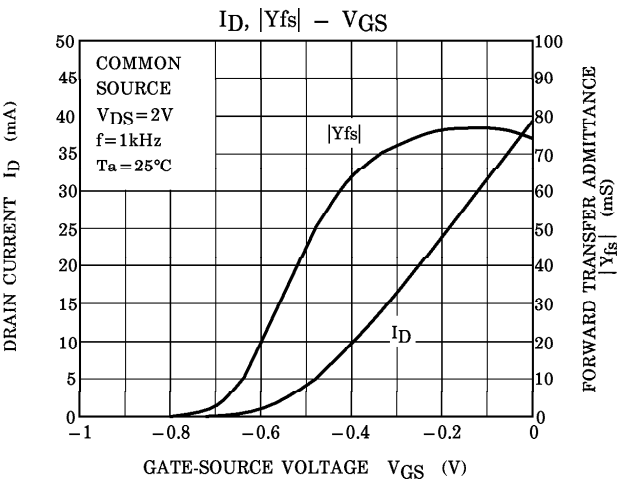
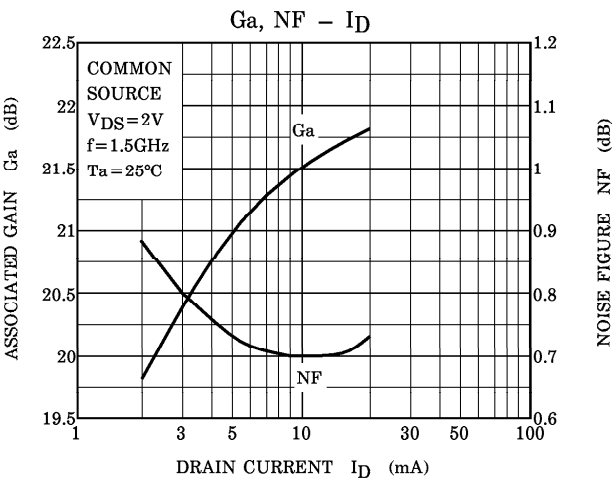
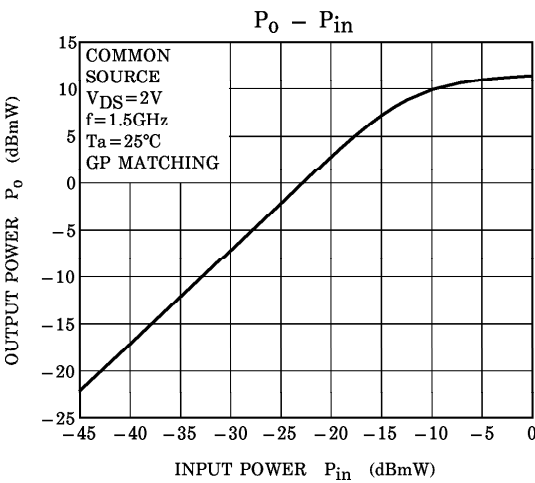
| CHARACTERISTIC              | SYMBOL                | TEST CONDITION                                      | MIN. | TYP. | MAX. | UNIT |
|-----------------------------|-----------------------|-----------------------------------------------------|------|------|------|------|
| Gate Leakage Current        | I <sub>GSS</sub>      | V <sub>DS</sub> =0, V <sub>GS</sub> =−2V            | —    | —    | −20  | μA   |
| Drain Current               | I <sub>DSS</sub>      | V <sub>DS</sub> =2V, V <sub>GS</sub> =0             | 15   | 40   | 80   | mA   |
| Gate-Source Cut-off Voltage | V <sub>GS</sub> (OFF) | V <sub>DS</sub> =2V, I <sub>D</sub> =100μA          | −0.2 | −0.8 | −2   | V    |
| Forward Transfer Admittance | Y <sub>fs</sub>       | V <sub>DS</sub> =2V, I <sub>D</sub> =10mA, f=1kHz   | —    | 55   | —    | mS   |
| Noise Figure                | NF                    | V <sub>DS</sub> =2V, I <sub>D</sub> =10mA, f=1.5GHz | —    | 0.7  | 1.5  | dB   |
| Associated Gain             | Ga                    | V <sub>DS</sub> =2V, I <sub>D</sub> =10mA, f=1.5GHz | 18   | 21.5 | —    | dB   |

CAUTION

This device electrostatic sensitivity. Please handle with caution.

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## S-PARAMETER

## COMMON SOURCE

(V<sub>DS</sub> = 2V, I<sub>D</sub> = 10mA, T<sub>a</sub> = 25°C, Z<sub>0</sub> = 50Ω)

| FREQ.<br>(MHz) | S11   |     | S21   |     | S12   |     | S22   |     |
|----------------|-------|-----|-------|-----|-------|-----|-------|-----|
|                | MAG   | ANG | MAG   | ANG | MAG   | ANG | MAG   | ANG |
| 100            | 0.999 | -2  | 5.283 | 178 | 0.002 | 87  | 0.766 | -2  |
| 200            | 0.997 | -4  | 5.258 | 176 | 0.005 | 87  | 0.766 | -3  |
| 300            | 0.997 | -6  | 5.254 | 174 | 0.007 | 87  | 0.765 | -4  |
| 400            | 0.990 | -8  | 5.242 | 172 | 0.009 | 86  | 0.765 | -6  |
| 500            | 0.987 | -10 | 5.207 | 169 | 0.011 | 84  | 0.765 | -7  |
| 600            | 0.985 | -12 | 5.201 | 167 | 0.014 | 84  | 0.764 | -8  |
| 700            | 0.982 | -14 | 5.169 | 166 | 0.016 | 83  | 0.763 | -10 |
| 800            | 0.980 | -16 | 5.150 | 163 | 0.018 | 82  | 0.763 | -11 |
| 900            | 0.975 | -18 | 5.112 | 162 | 0.020 | 81  | 0.762 | -12 |
| 1000           | 0.967 | -20 | 5.089 | 159 | 0.022 | 81  | 0.760 | -14 |
| 1100           | 0.965 | -22 | 5.067 | 158 | 0.024 | 80  | 0.760 | -15 |
| 1200           | 0.955 | -24 | 5.047 | 156 | 0.026 | 79  | 0.757 | -16 |
| 1300           | 0.948 | -26 | 5.020 | 154 | 0.028 | 78  | 0.756 | -18 |
| 1400           | 0.941 | -27 | 4.991 | 151 | 0.030 | 77  | 0.754 | -19 |
| 1500           | 0.931 | -29 | 4.922 | 150 | 0.032 | 76  | 0.751 | -20 |
| 1600           | 0.924 | -31 | 4.917 | 147 | 0.034 | 75  | 0.751 | -21 |
| 1700           | 0.915 | -33 | 4.879 | 146 | 0.036 | 75  | 0.747 | -22 |
| 1800           | 0.906 | -34 | 4.809 | 144 | 0.038 | 75  | 0.747 | -23 |
| 1900           | 0.897 | -36 | 4.785 | 142 | 0.039 | 73  | 0.742 | -24 |
| 2000           | 0.885 | -38 | 4.697 | 139 | 0.041 | 72  | 0.740 | -25 |
| 2100           | 0.873 | -39 | 4.691 | 138 | 0.042 | 71  | 0.735 | -26 |
| 2200           | 0.861 | -41 | 4.575 | 136 | 0.044 | 71  | 0.730 | -27 |
| 2300           | 0.848 | -42 | 4.573 | 135 | 0.045 | 71  | 0.728 | -28 |
| 2400           | 0.838 | -44 | 4.434 | 131 | 0.047 | 70  | 0.723 | -29 |
| 2500           | 0.823 | -45 | 4.433 | 131 | 0.048 | 69  | 0.721 | -29 |
| 2600           | 0.816 | -46 | 4.325 | 128 | 0.049 | 69  | 0.718 | -30 |

## CONSTANT NOISE FIGURE

NF min=0.7dB,  $\Gamma_{\text{opt}}=0.53\angle 14^\circ$ ,  $R_n=25\Omega$

@ $V_{\text{DS}}=2\text{V}$ ,  $I_{\text{D}}=10\text{mA}$ ,  $f=1.5\text{GHz}$

$T_a=25^\circ\text{C}$ ,  $Z_0=50\Omega$

