



# SANYO Semiconductors

## DATA SHEET

# TF222B — N-channel Silicon Junction FET

## Condenser Microphone Applications

### Features

- Especially suited for use in condenser microphone for audio equipments and telephones.
- TF222B is possible to make applied sets smaller and thinner.
- Excellent voltage characteristic.
- Excellent transient characteristic.
- Adoption of FBET process.

### Specifications

**Absolute Maximum Ratings** at Ta=25°C

| Parameter                   | Symbol           | Conditions | Ratings     | Unit |
|-----------------------------|------------------|------------|-------------|------|
| Gate-to-Drain Voltage       | V <sub>GDO</sub> |            | -20         | V    |
| Gate Current                | I <sub>G</sub>   |            | 10          | mA   |
| Drain Current               | I <sub>D</sub>   |            | 1           | mA   |
| Allowable Power Dissipation | P <sub>D</sub>   |            | 100         | mW   |
| Junction Temperature        | T <sub>J</sub>   |            | 150         | °C   |
| Storage Temperature         | T <sub>stg</sub> |            | -55 to +150 | °C   |

**Electrical Characteristics** at Ta=25°C

| Parameter                                                                                                  | Symbol               | Conditions                                               | Ratings |      |      | Unit |
|------------------------------------------------------------------------------------------------------------|----------------------|----------------------------------------------------------|---------|------|------|------|
|                                                                                                            |                      |                                                          | min     | typ  | max  |      |
| Gate-to-Drain Breakdown Voltage                                                                            | V <sub>(BR)GDO</sub> | I <sub>G</sub> =-100μA                                   | -20     |      |      | V    |
| Cutoff Voltage                                                                                             | V <sub>GS(off)</sub> | V <sub>DS</sub> =2V, I <sub>D</sub> =1μA                 | -0.1    |      | -1.0 | V    |
| Zero-Gate Voltage Drain Current                                                                            | I <sub>DSS</sub>     | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V                 | 140*    |      | 350* | μA   |
| Forward Transfer Admittance                                                                                | y <sub>fs</sub>      | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V, f=1kHz         | 0.5     | 1.4  |      | mS   |
| Input Capacitance                                                                                          | C <sub>iss</sub>     | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V, f=1MHz         |         | 5.0  |      | pF   |
| Reverse Transfer Capacitance                                                                               | C <sub>rss</sub>     | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V, f=1MHz         |         | 1.1  |      | pF   |
| [Ta=25°C, V <sub>CC</sub> =2.0V, R <sub>L</sub> =2.2kΩ, C <sub>in</sub> =5pF, See specified Test Circuit.] |                      |                                                          |         |      |      |      |
| Voltage Gain                                                                                               | G <sub>V</sub>       | V <sub>IN</sub> =10mV, f=1kHz                            |         | -2.0 |      | dB   |
| Reduced Voltage Characteristics                                                                            | ΔG <sub>VV</sub>     | V <sub>IN</sub> =10mV, f=1kHz, V <sub>CC</sub> =2.0→1.5V |         | -0.6 | -2.0 | dB   |

Continued on next page.

\* : The TF222B is classified by I<sub>DSS</sub> as follows : (unit : μA)

| Rank             | B4         | B5         |
|------------------|------------|------------|
| I <sub>DSS</sub> | 140 to 240 | 210 to 350 |

Marking : B

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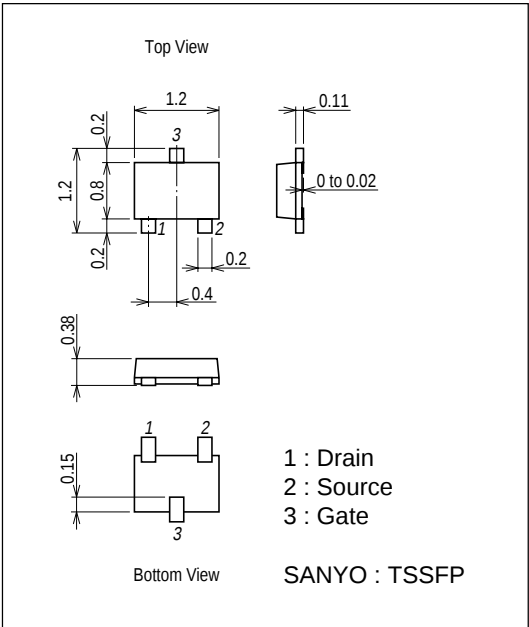
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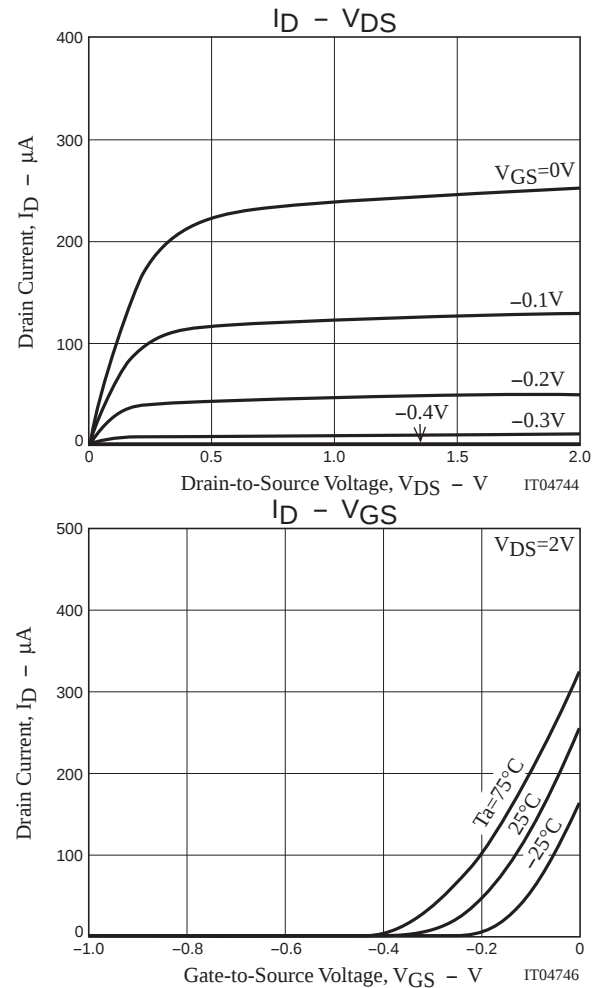
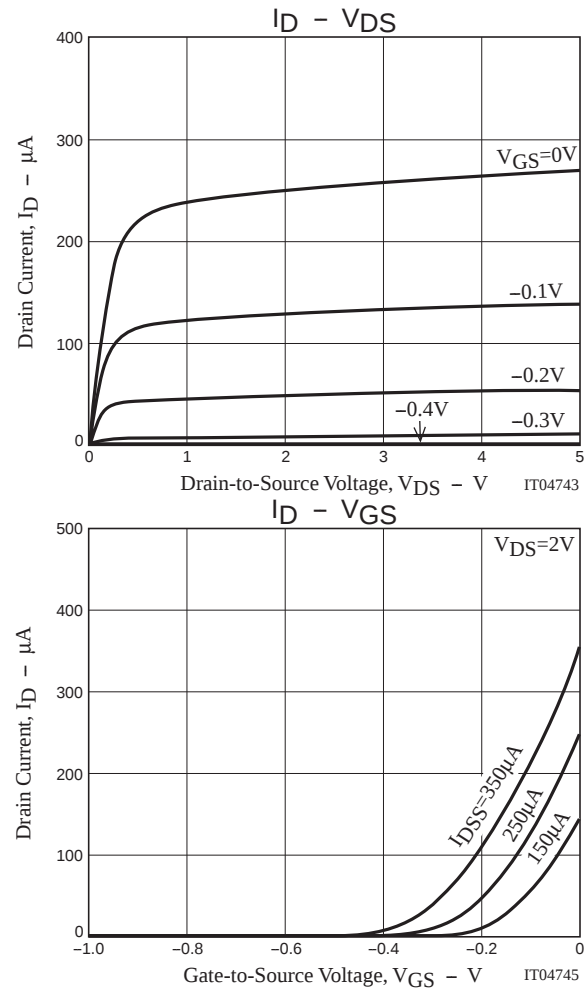
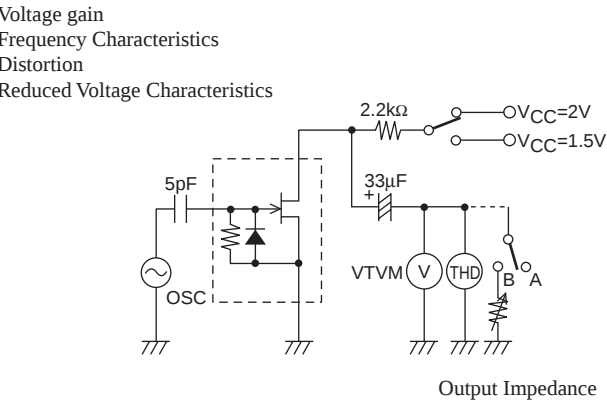
| Parameter                 | Symbol          | Conditions                          | Ratings |     |      | Unit |
|---------------------------|-----------------|-------------------------------------|---------|-----|------|------|
|                           |                 |                                     | min     | typ | max  |      |
| Frequency Characteristics | $\Delta G_{vf}$ | $f=1\text{kHz to }110\text{Hz}$     |         |     | -1.0 | dB   |
| Total Harmonic Distortion | THD             | $V_{IN}=30\text{mV}, f=1\text{kHz}$ |         | 0.7 |      | %    |
| Output Noise Voltage      | $V_{NO}$        | $V_{IN}=0\text{V}, A \text{ curve}$ |         |     | -102 | dB   |

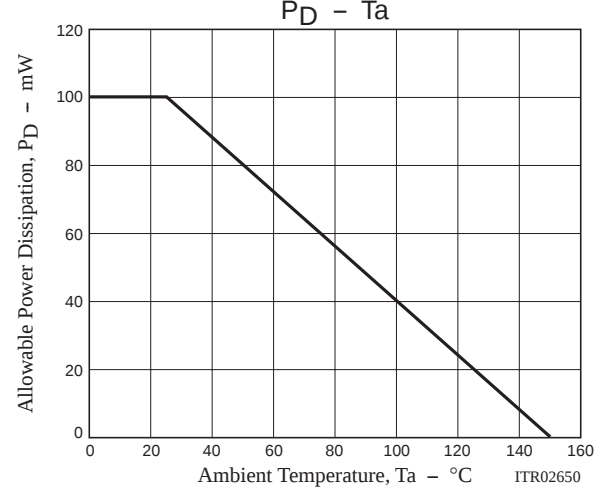
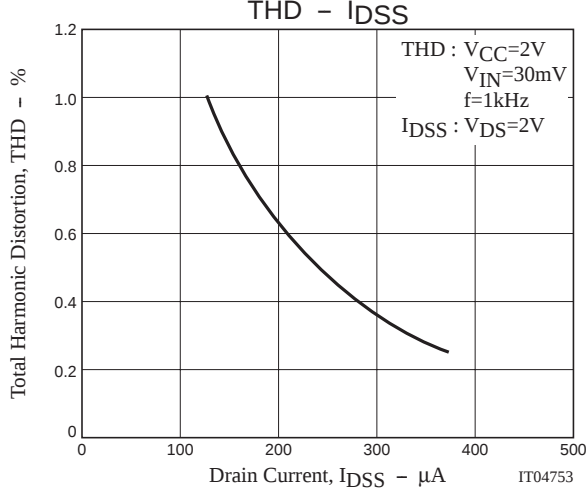
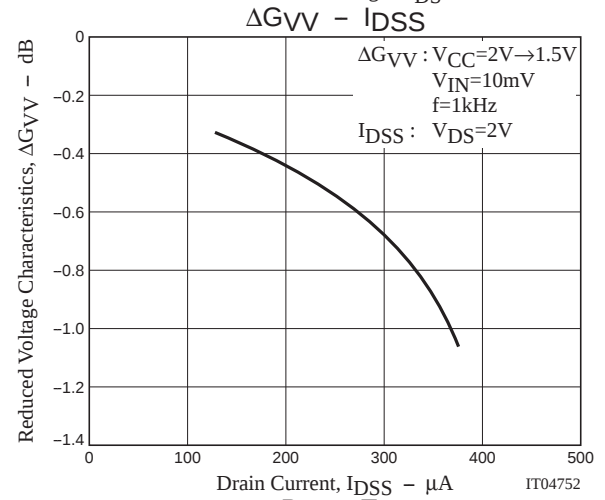
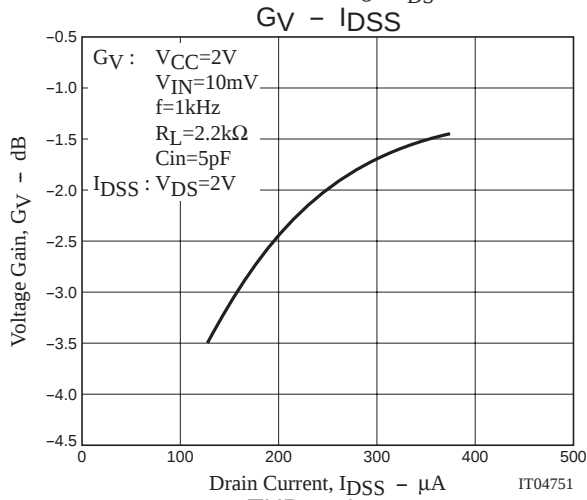
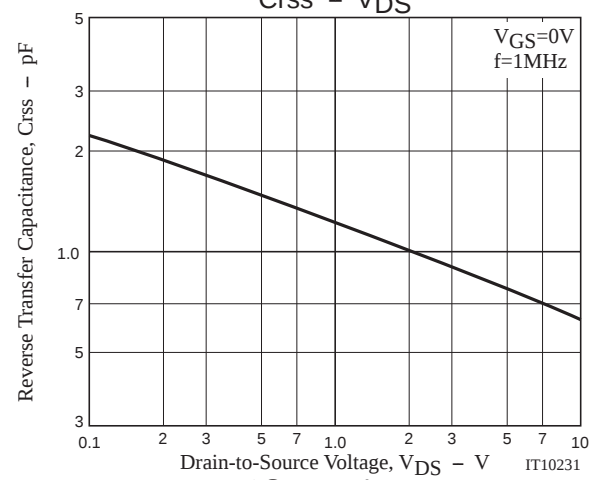
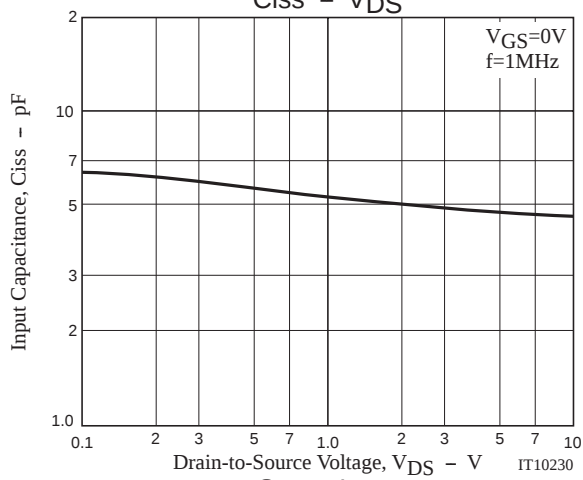
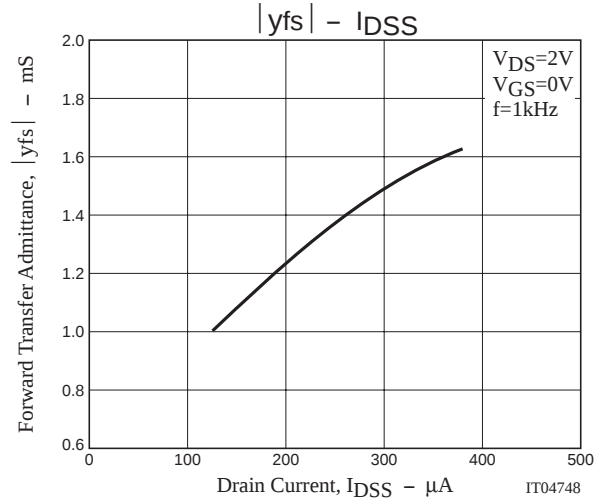
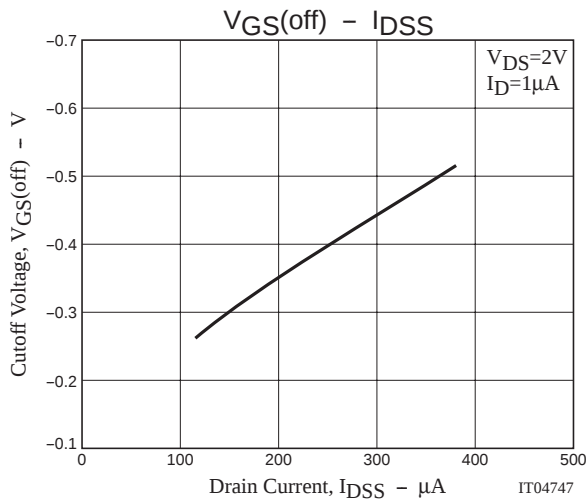
Package Dimensions

unit : mm  
7048-001



Test Circuit





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