



SANYO Semiconductors

## DATA SHEET

N-channel Silicon Junction FET

# TF202THC — Electret Condenser Microphone Applications

## Features

- Ultrasmall package facilitates miniaturization in end products.
- Especially suited for use in electret condenser microphone for audio equipments and telephones.
- Excellent voltage characteristics.
- Excellent transient characteristics.
- Adoption of FBET process.
- Halogen free compliance.

## 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> =5V, I <sub>D</sub> =1μA | -0.2    | -0.6 | -1.0 | V    |

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# TF202THC

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| Parameter   | Symbol       | Conditions  | Ratings |      |      | Unit      |
|---|--------------|---|---------|------|------|-----------|
|   |              |   | min     | typ  | max  |           |
| Drain Current   | $I_{DSS}$    | $V_{DS}=5V, V_{GS}=0V$                              | 140*    |      | 350* | $\mu A$   |
| Forward Transfer Admittance   | $ y_{fs} $   | $V_{DS}=5V, V_{GS}=0V, f=1kHz$                      | 0.5     | 1.0  |      | mS        |
| Input Capacitance   | $C_{iss}$    | $V_{DS}=5V, V_{GS}=0V, f=1MHz$                      |         | 3.5  |      | pF        |
| Reverse Transfer Capacitance  | $C_{rss}$    | $V_{DS}=5V, V_{GS}=0V, f=1MHz$                      |         | 0.65 |      | pF        |
| [ $T_a=25^\circ C, V_{CC}=4.5V, R_L=1k\Omega, C_{in}=15pF$ , See specified Test Circuit.] |              |   |         |      |      |           |
| Voltage Gain  | GV           | $V_{IN}=10mV, f=1kHz$                               |         | -3.0 |      | dB        |
| Reduced Voltage Characteristic  | $\Delta GW$  | $V_{IN}=10mV, f=1kHz, V_{CC}=4.5V \rightarrow 1.5V$ |         | -1.2 | -3.5 | dB        |
| Frequency Characteristic  | $\Delta Gvf$ | $f=1kHz$ to 110Hz                                   |         |      | -1.0 | dB        |
| Input Impedance   | $Z_{IN}$     | $f=1kHz$  | 25      |      |      | $M\Omega$ |
| Output Impedance  | $Z_O$        | $f=1kHz$  |         | 1000 |      | $\Omega$  |
| Total Harmonic Distortion   | THD          | $V_{IN}=30mV, f=1kHz$                               |         | 1.2  |      | %         |
| Output Noise Voltage  | $V_{NO}$     | $V_{IN}=0V, A$ Curve                                |         |      | -110 | dB        |

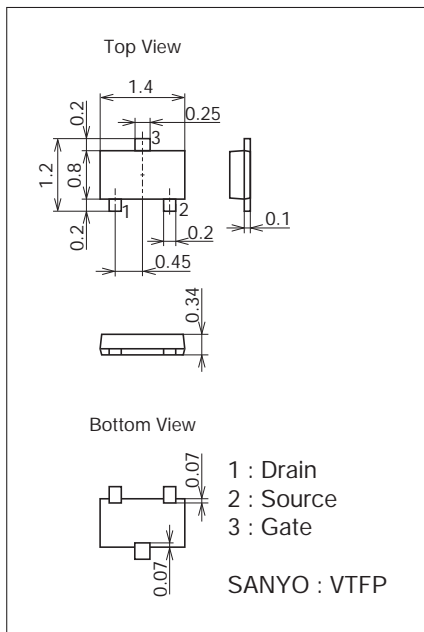
\* : The TF202THC is classified by  $I_{DSS}$  as follows : (unit :  $\mu A$ )

| Marking   | E4         | E5         |
|-----------|------------|------------|
| Rank      | 4          | 5          |
| $I_{DSS}$ | 140 to 240 | 210 to 350 |

## Package Dimensions

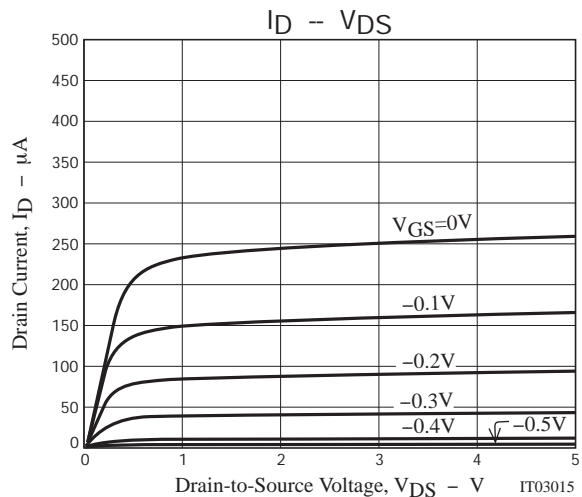
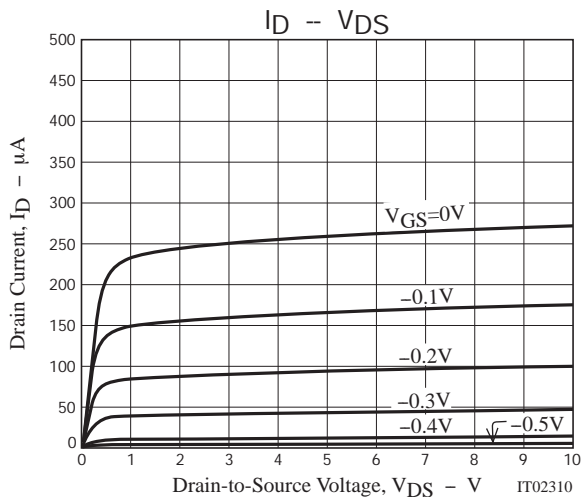
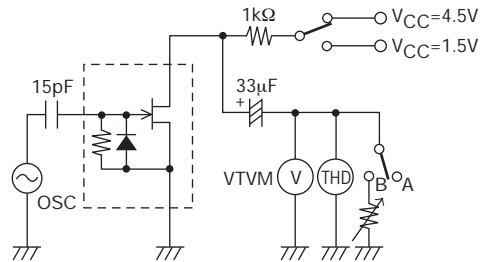
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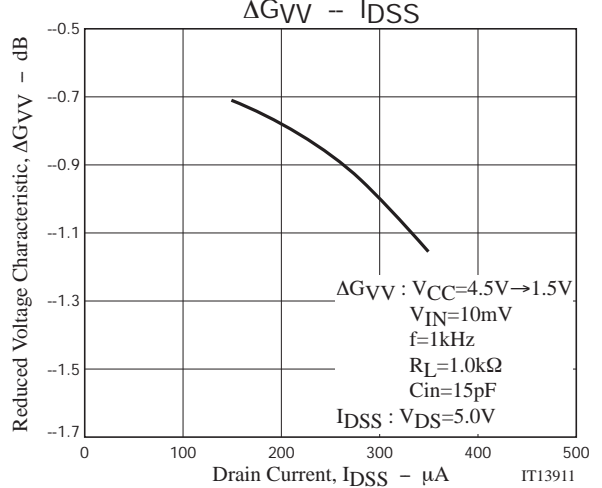
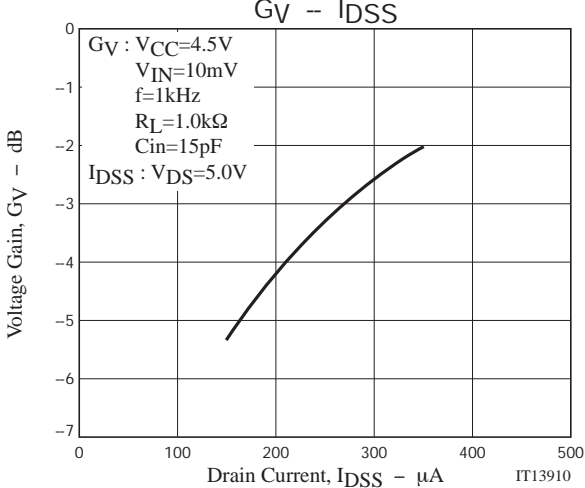
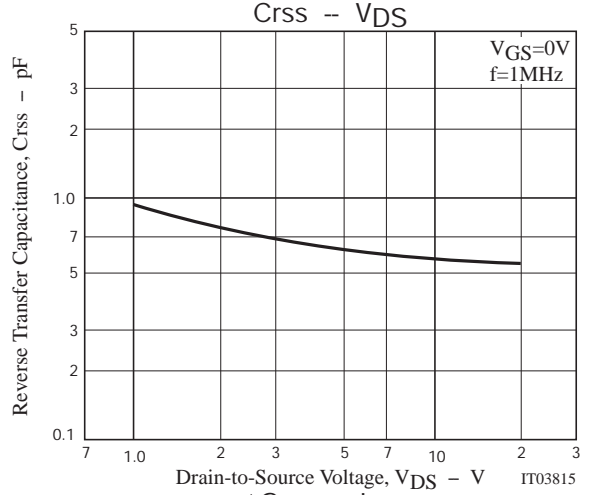
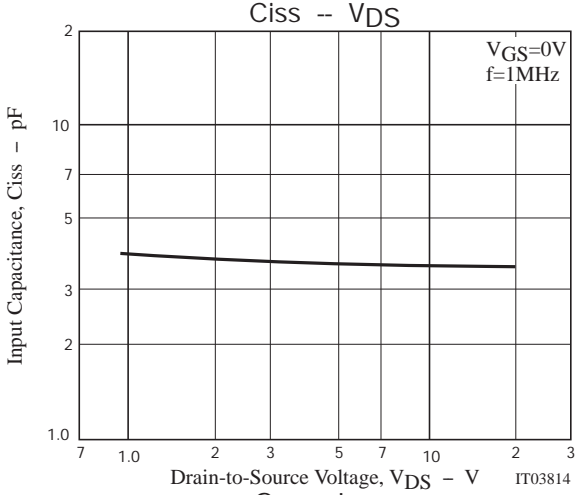
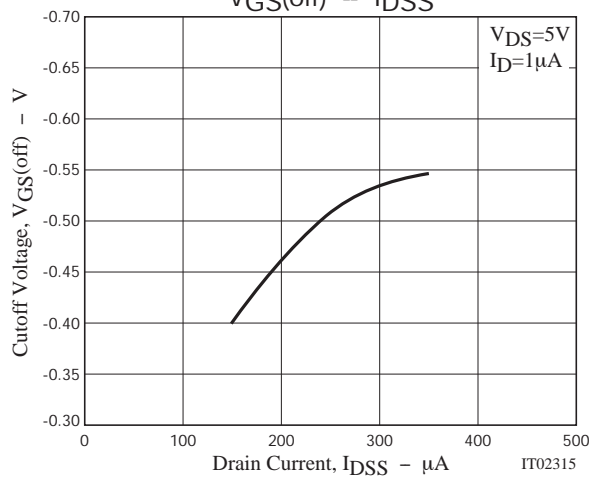
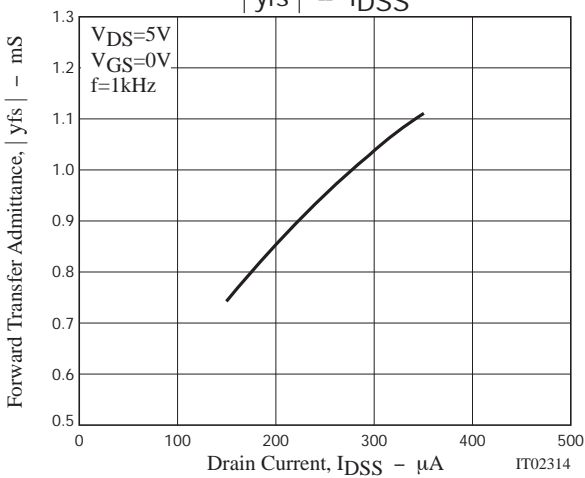
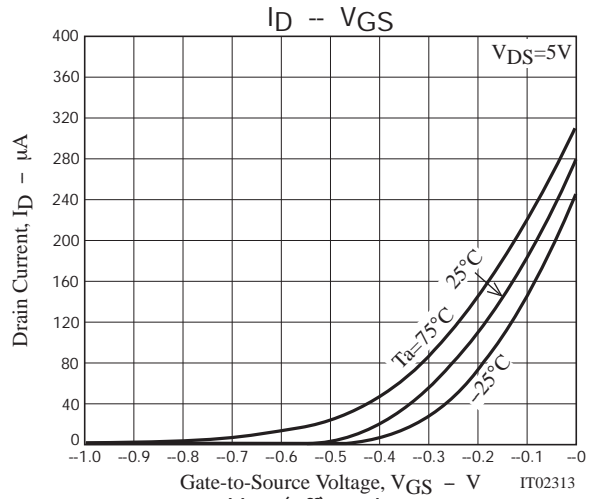
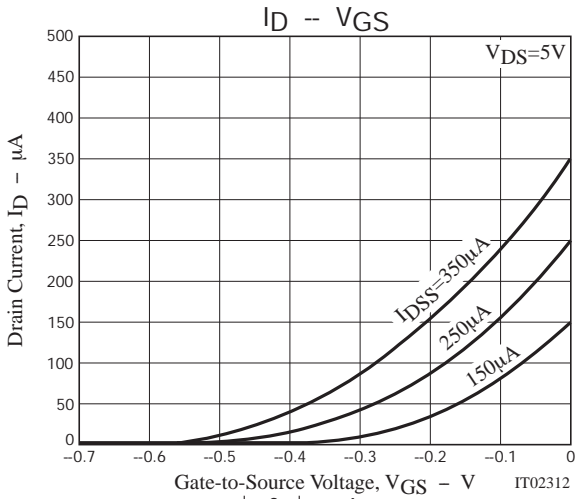
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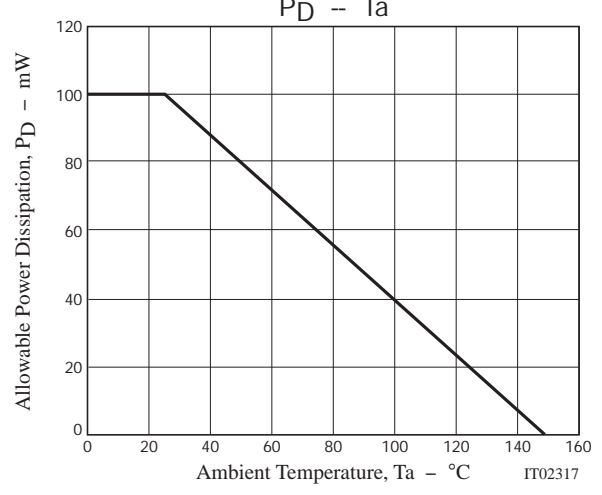
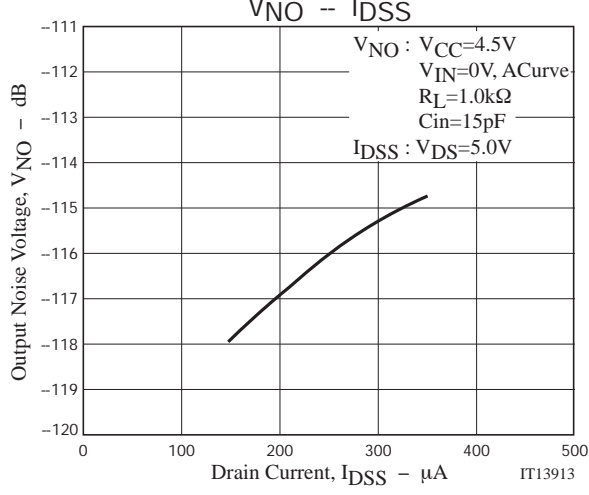
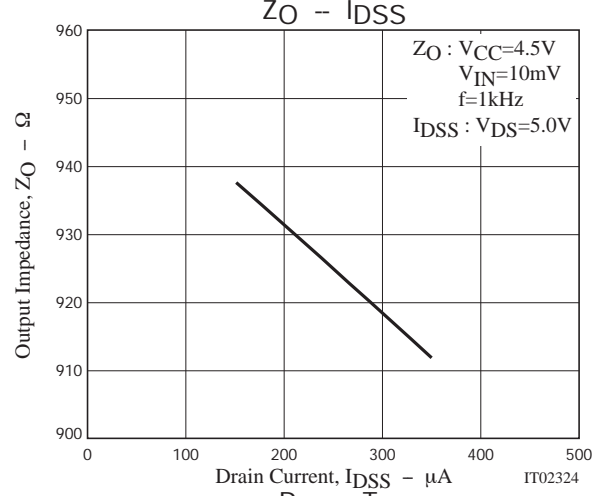
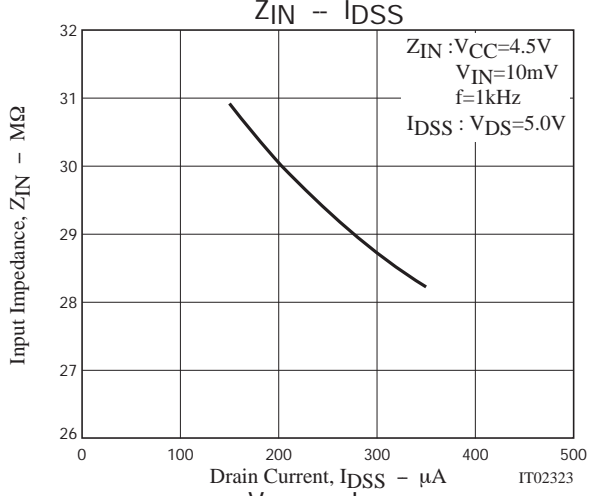
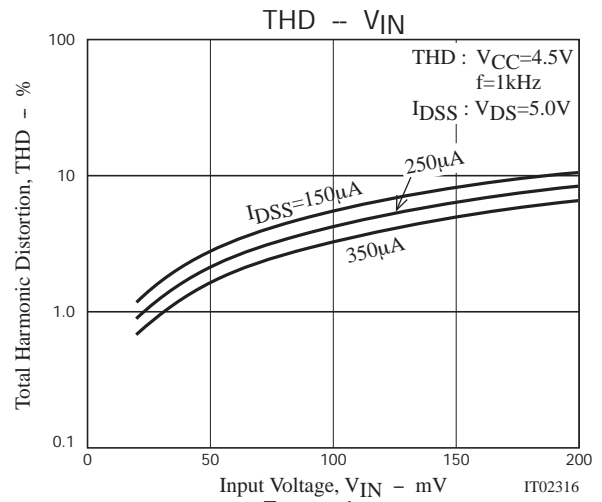
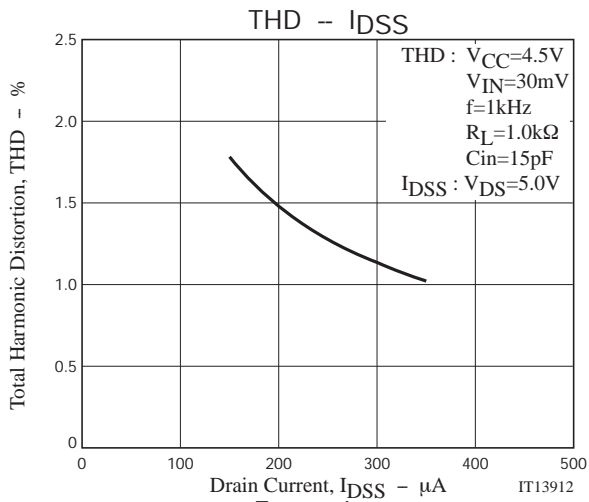
## Test Circuit

Voltage gain  
Frequency Characteristic  
Distortion  
Reduced Voltage Characteristic





# TF202THC



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