



# TF256 — N-channel Silicon Junction FET Electret Condenser Microphone Applications

## Features

- High gain :  $G_V=2.7\text{dB typ}$  ( $V_{CC}=2\text{V}$ ,  $R_L=2.2\text{k}\Omega$ ,  $C_{in}=5\text{pF}$ ,  $V_{IN}=10\text{mV}$ ,  $f=1\text{kHz}$ )
- Ultrasmall package facilitates miniaturization in end products [1.0mm×0.6mm×0.27mm (max 0.3mm)]
- Best suited for use in electret condenser microphone for audio equipments and telephones
- Excellent transient characteristics
- Adoption of FBET process
- Halogen free compliance

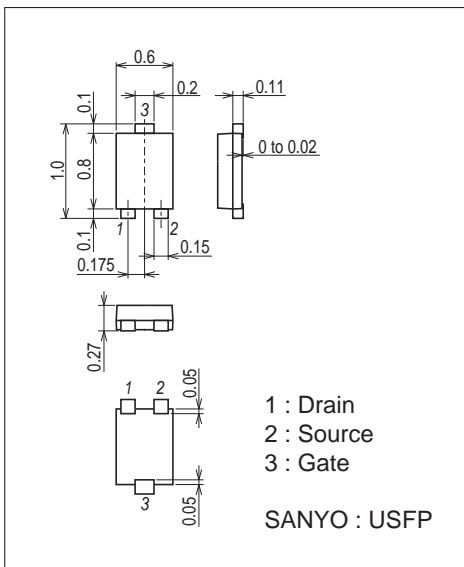
## Specifications

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

| Parameter                   | Symbol    | Conditions | Ratings     | Unit             |
|-----------------------------|-----------|------------|-------------|------------------|
| Gate-to-Drain Voltage       | $V_{GDO}$ |            | -20         | V                |
| Gate Current                | $I_G$     |            | 10          | mA               |
| Drain Current               | $I_D$     |            | 1           | mA               |
| Allowable Power Dissipation | $P_D$     |            | 30          | mW               |
| Junction Temperature        | $T_j$     |            | 150         | $^\circ\text{C}$ |
| Storage Temperature         | $T_{stg}$ |            | -55 to +150 | $^\circ\text{C}$ |

## Package Dimensions

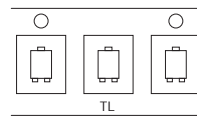
unit : mm (typ)  
7055-001



## Product & Package Information

- Package : USFP
- JEITA, JEDEC : -
- Minimum Packing Quantity : 10,000 pcs./real

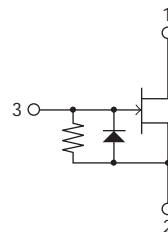
## Packing Type: TL



## Marking



## Electrical Connection

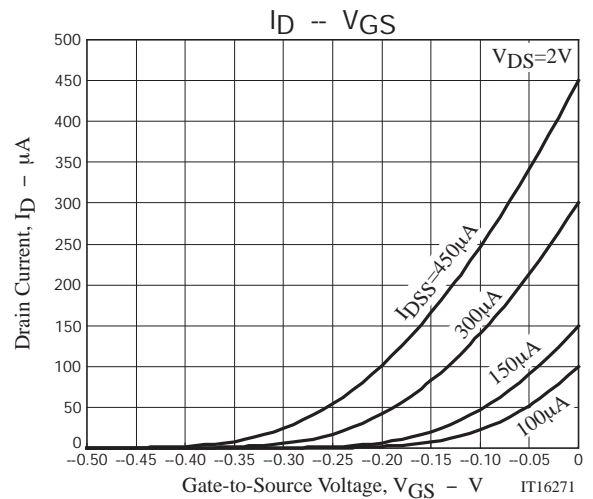
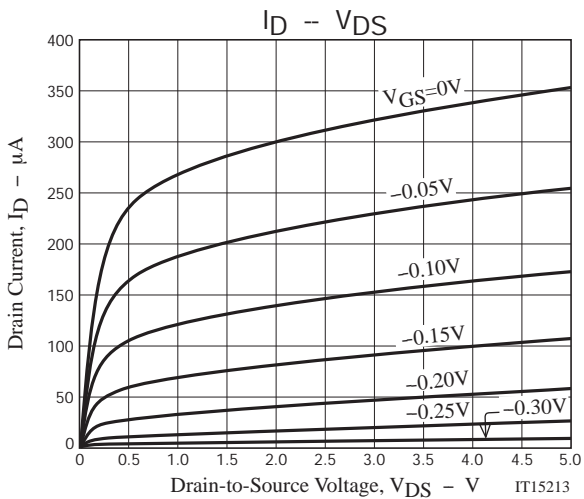
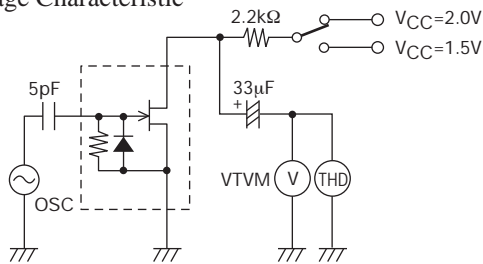


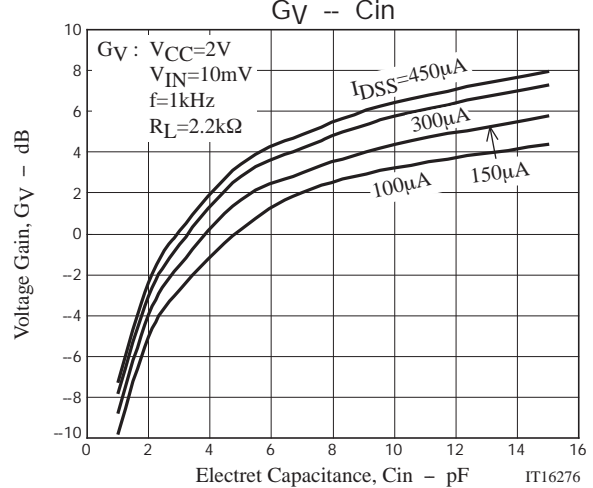
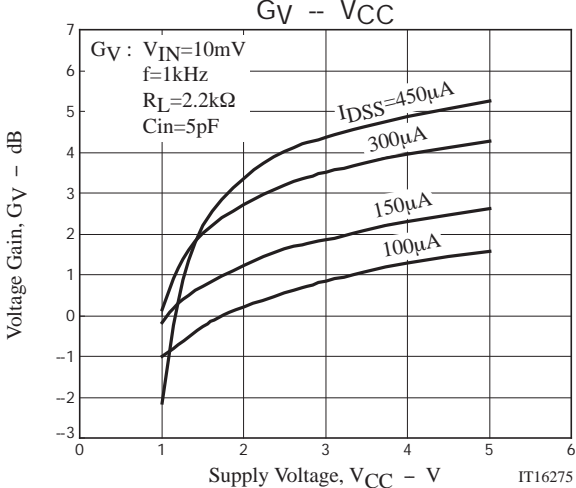
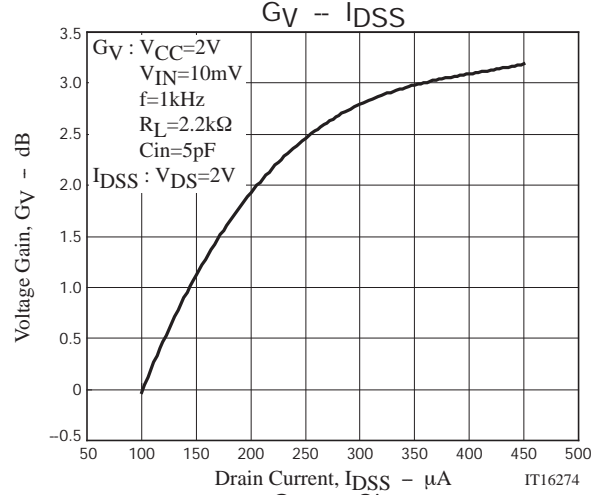
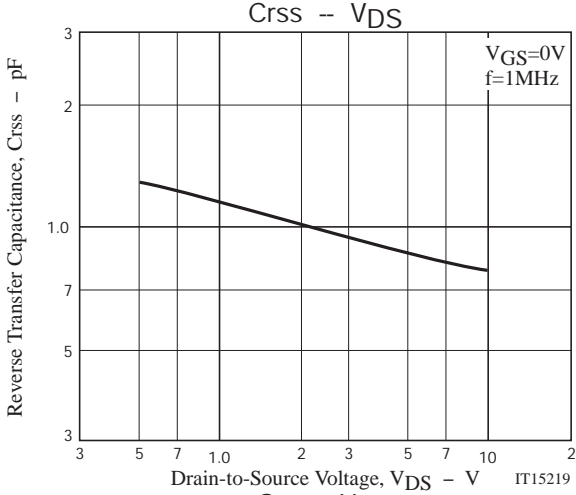
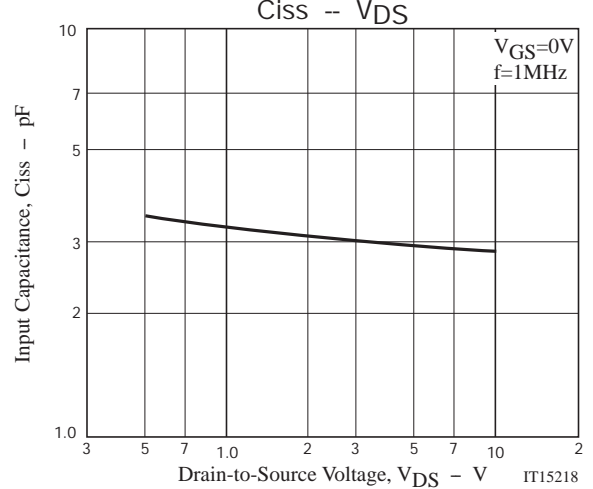
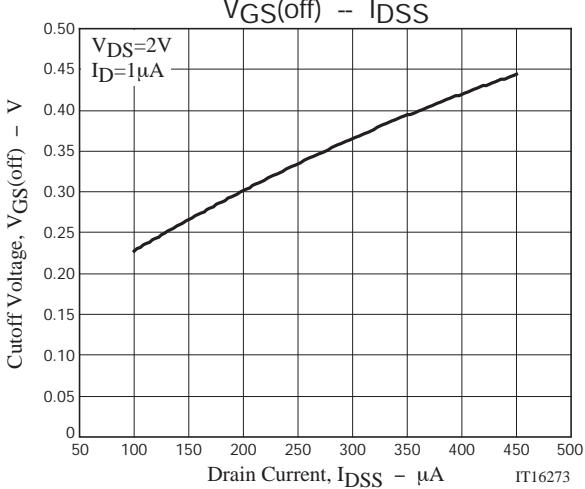
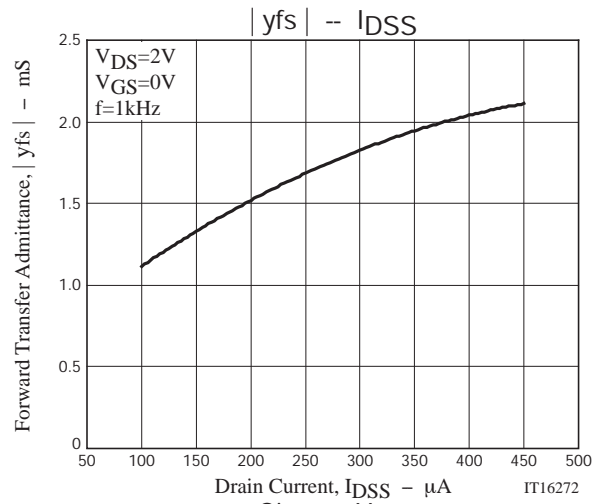
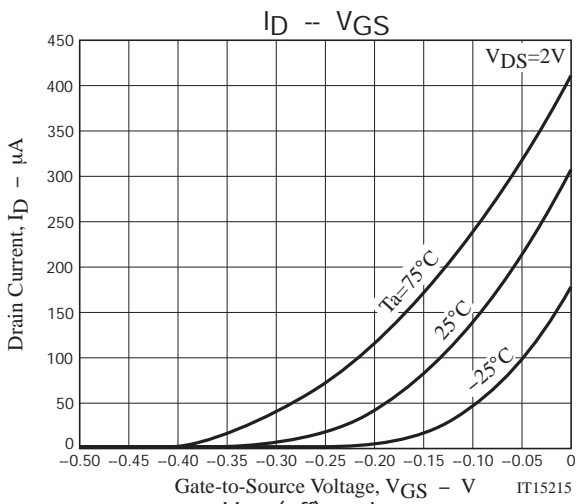
Electrical Characteristics at Ta=25°C

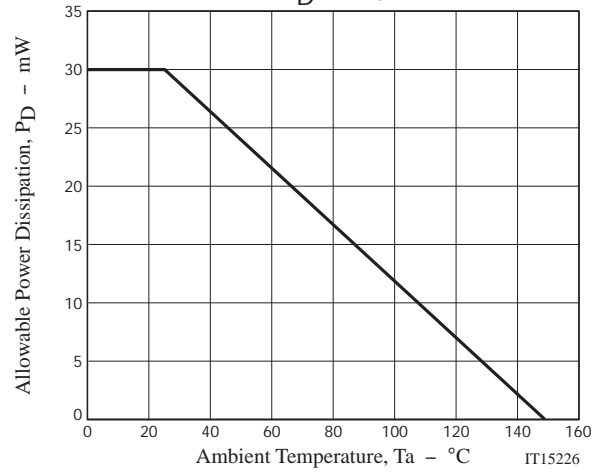
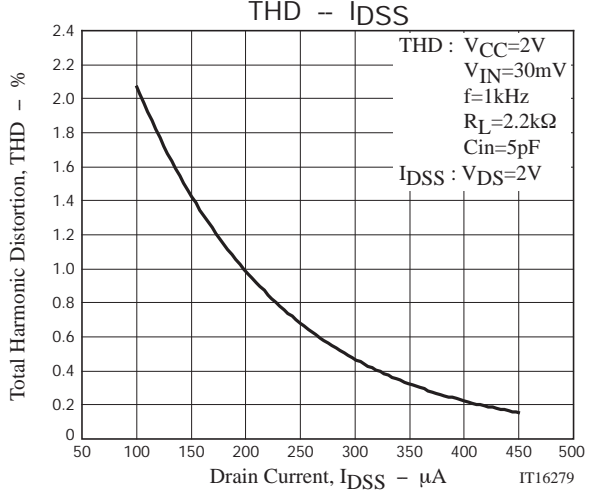
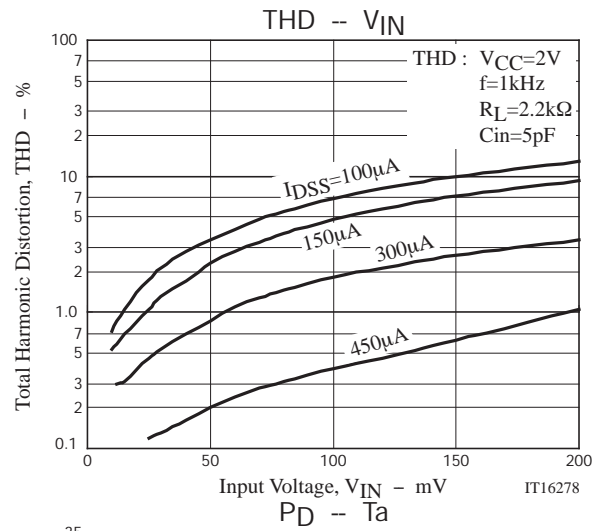
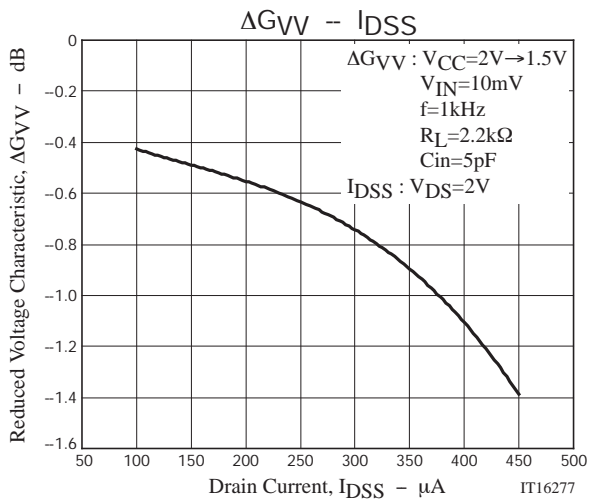
| Parameter  | Symbol               | Conditions  | Ratings |      |       | Unit |     |
|--|----------------------|---|---------|------|-------|------|-----|
|  |                      |   | Rank    | min  | typ   |      | max |
| Gate-to-Drain Breakdown Voltage  | V(BR)GDO             | I <sub>G</sub> =-100μA                                      |         | -20  |       | V    |     |
| Cutoff Voltage   | V <sub>GS(off)</sub> | V <sub>DS</sub> =2V, I <sub>D</sub> =1μA                    |         | -0.1 | -0.35 | -1.0 | V   |
| Drain Current  | I <sub>DSS</sub>     | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V                    | 3       | 100  |       | 180  | μA  |
|  |                      |   | 4       | 140  |       | 280  |     |
|  |                      |   | 5       | 240  |       | 450  |     |
| Forward Transfer Admittance  | y <sub>fs</sub>      | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V, f=1kHz            |         | 0.75 | 1.7   | mS   |     |
| Input Capacitance  | C <sub>iss</sub>     | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V, f=1MHz            |         |      | 3.1   | pF   |     |
| Reverse Transfer Capacitance   | C <sub>rss</sub>     | V <sub>DS</sub> =2V, V <sub>GS</sub> =0V, f=1MHz            |         |      | 1.0   | 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                               | 3       |      | 1.0   |      | dB  |
|  |                      |   | 4       |      | 2.0   |      |     |
|  |                      |   | 5       |      | 3.0   |      |     |
| Reduced Voltage Characteristic   | ΔG <sub>VV</sub>     | V <sub>IN</sub> =10mV, f=1kHz, V <sub>CC</sub> =2.0V → 1.5V | 3       |      | -0.5  | -1.0 | dB  |
|  |                      |   | 4       |      | -0.6  | -1.3 |     |
|  |                      |   | 5       |      | -0.9  | -2.0 |     |
| Frequency Characteristic   | ΔG <sub>Vf</sub>     | f=1kHz to 110Hz   |         |      |       | -1.0 | dB  |
| Total Harmonic Distortion  | THD                  | V <sub>IN</sub> =30mV, f=1kHz                               | 3       |      | 1.4   |      | %   |
|  |                      |   | 4       |      | 0.9   |      |     |
|  |                      |   | 5       |      | 0.35  |      |     |
| Output Noise Voltage   | V <sub>NO</sub>      | V <sub>IN</sub> =0V, A curve                                |         |      | -105  | -100 | dB  |

Test Circuit

- Voltage gain
- Frequency Characteristic
- Distortion
- Reduced Voltage Characteristic







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