Ordering number : ENA1617A

SANYO Semiconductors
DATA SHEET

An ON Semiconductor Company

N-channel Silicon Juncton FET

# TF256TH — Electret Condenser Microphone Applications

## Features

- High gain : $G_V$=2.7dB typ ($V_{CC}$=2V, $R_L$=2.2kΩ, Cin=5pF, $V_{IN}$=10mV, f=1kHz)
- Ultrasmall package facilitates miniaturization in end products
- Best suited for use in electret condenser microphone for audio equipments and telephones
- Excellent transient characteristics
- Adoption of FBET process
- Halogen free compliance

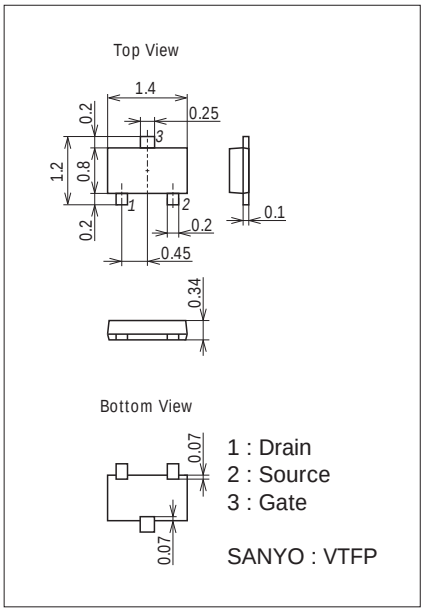
## Specifications

### Absolute Maximum Ratings at Ta=25°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 | $P_D$ | | 100 | mW |
| Junction Temperature | Tj | | 150 | °C |
| Storage Temperature | Tstg | | −55 to +150 | °C |

### Package Dimensions

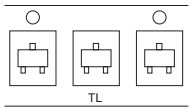
unit : mm (typ)
7031-001



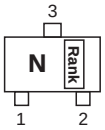

### Product & Package Information

- Package : VTFP
- JEITA, JEDEC : SC-106A
- Minimum Packing Quantity : 8,000 pcs./real

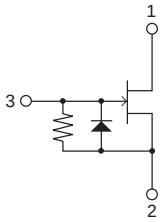
### Packing Type: TL




### Marking




### Electrical Connection



## Electrical Characteristics at Ta=25°C

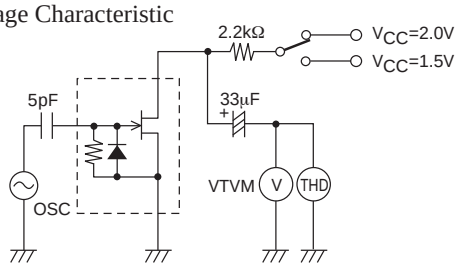
| Parameter | Symbol | Conditions | Ratings | | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | Rank | min | typ | max | |
| Gate-to-Drain Breakdown Voltage | $V_{(BR)GDO}$ | $I_G$=−100μA | | −20 | | | V |
| Cutoff Voltage | $V_{GS}$(off) | $V_{DS}$=2V, $I_D$=1μA | | −0.1 | −0.35 | −1.0 | V |
| Drain Current | $I_{DSS}$* | $V_{DS}$=2V, $V_{GS}$=0V | 3 | 100 | | 180 | μA |
| | | | 4 | 140 | | 280 | |
| | | | 5 | 240 | | 450 | |
| Forward Transfer Admittance | \| yfs \| | $V_{DS}$=2V, $V_{GS}$=0V, f=1kHz | | 0.75 | 1.7 | | mS |
| Input Capacitance | Ciss | $V_{DS}$=2V, $V_{GS}$=0V, f=1MHz | | | 3.1 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=2V, $V_{GS}$=0V, f=1MHz | | | 1.0 | | pF |
| [Ta=25°C, $V_{CC}$=2.0V, $R_L$=2.2kΩ, Cin=5pF, See specified Test Circuit.] | | | | | | | |
| Voltage Gain | $G_V$ | $V_{IN}$=10mV, f=1kHz | 3 | | 1.0 | | dB |
| | | | 4 | | 2.0 | | |
| | | | 5 | | 3.0 | | |
| Reduced Voltage Characteristic | $\Delta G_{VV}$ | $V_{IN}$=10mV, f=1kHz, $V_{CC}$=2.0V → 1.5V | 3 | | −0.5 | −1.0 | dB |
| | | | 4 | | −0.6 | −1.3 | |
| | | | 5 | | −0.9 | −2.0 | |
| Frequency Characteristic | ΔGvf | f=1kHz to 110Hz | | | | −1.0 | dB |
| Total Harmonic Distortion | THD | $V_{IN}$=30mV, f=1kHz | 3 | | 1.4 | | % |
| | | | 4 | | 0.9 | | |
| | | | 5 | | 0.35 | | |
| Output Noise Voltage | $V_{NO}$ | $V_{IN}$=0V, A curve | | | −105 | −100 | dB |

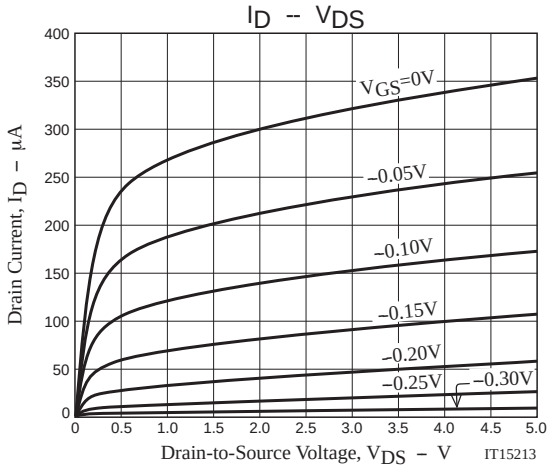
* : The TF256TH is classified by $I_{DSS}$ as follows : (unit : μA)

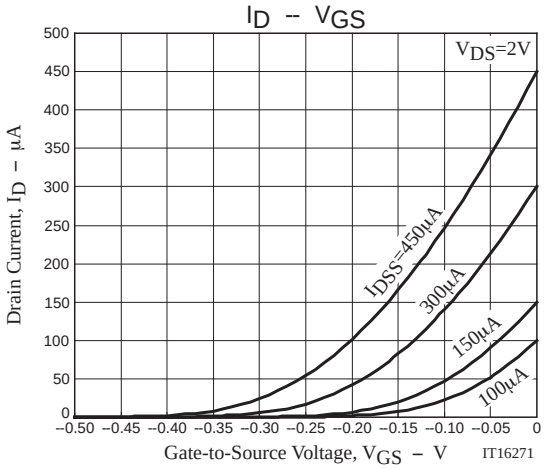
| Marking | N3 | N4 | N5 |
|---|---|---|---|
| Rank | 3 | 4 | 5 |
| $I_{DSS}$ | 100 to 180 | 140 to 280 | 240 to 450 |

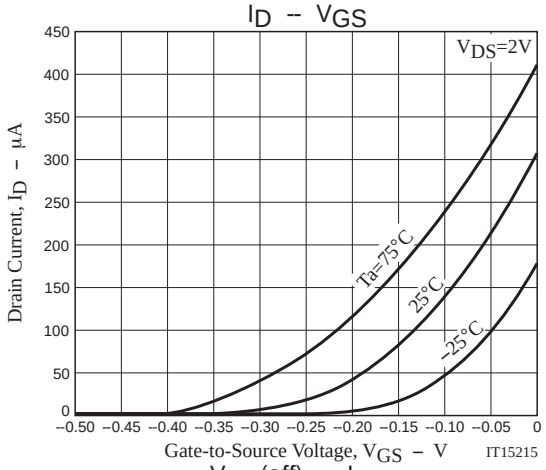
## Test Circuit

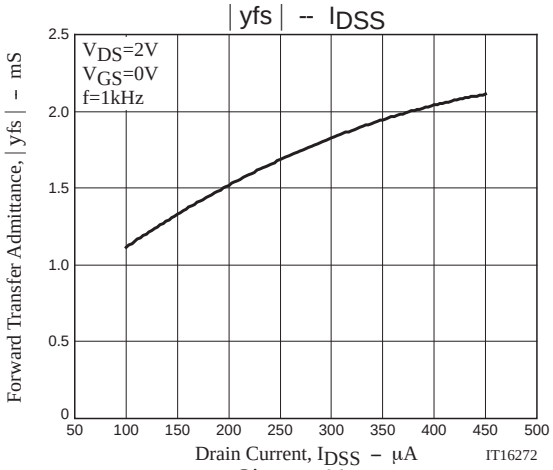
Voltage gain
Frequency Characteristic
Distortion
Reduced Voltage Characteristic

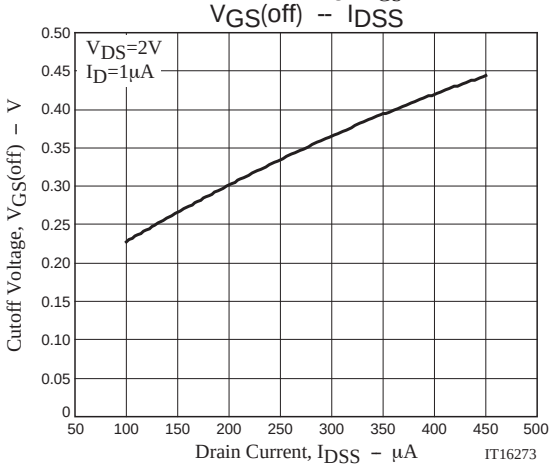


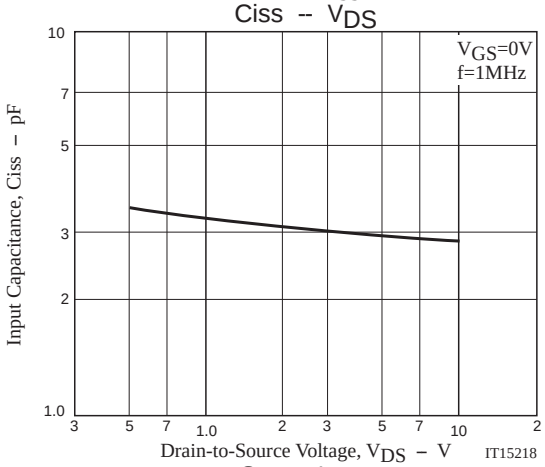



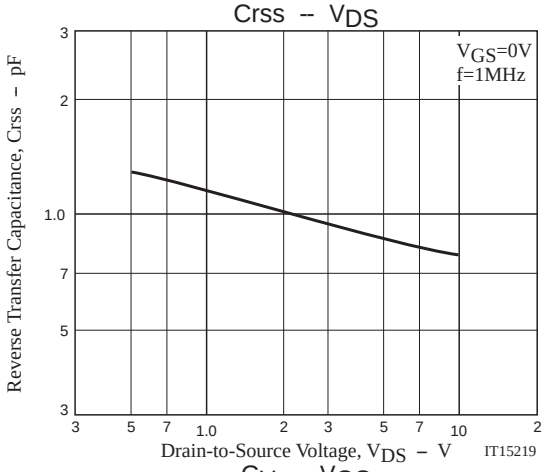



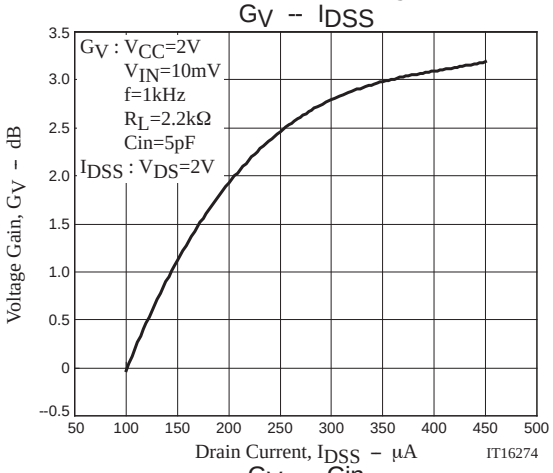


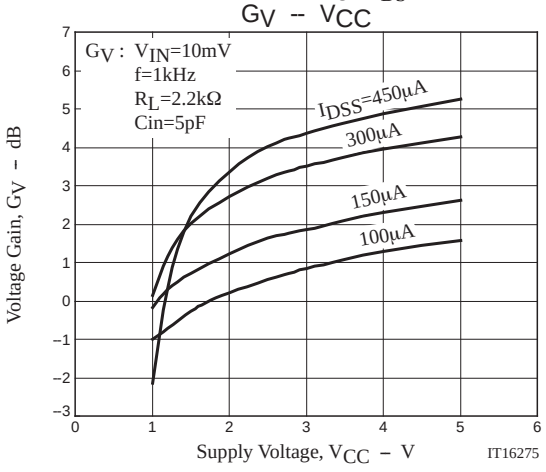



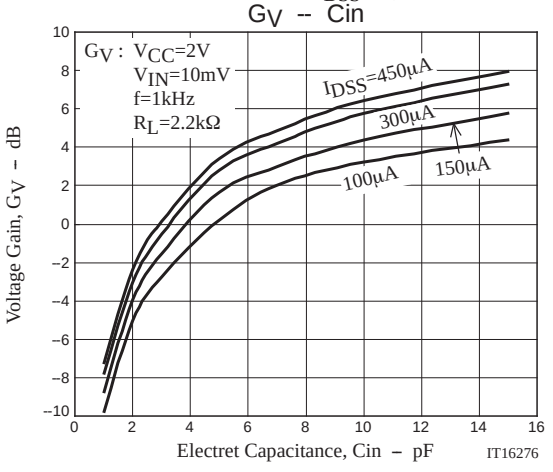



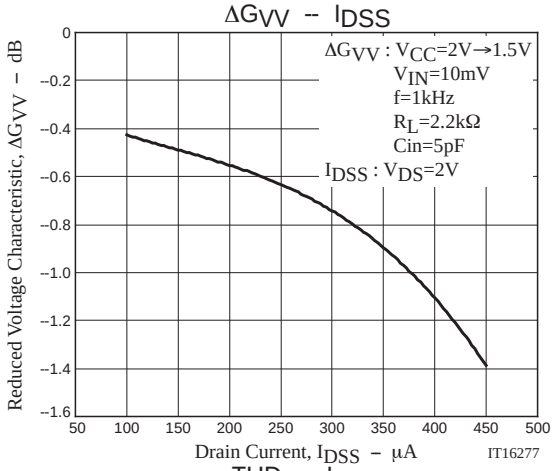



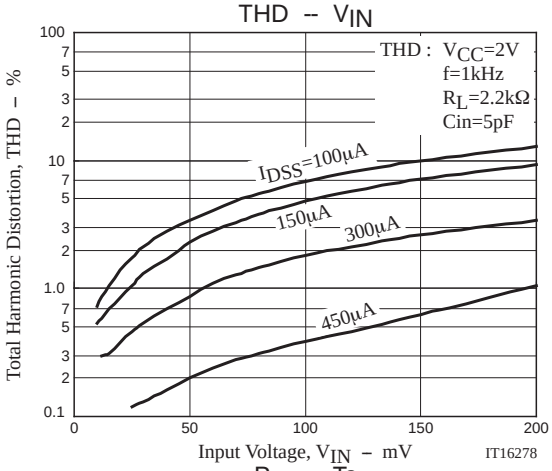



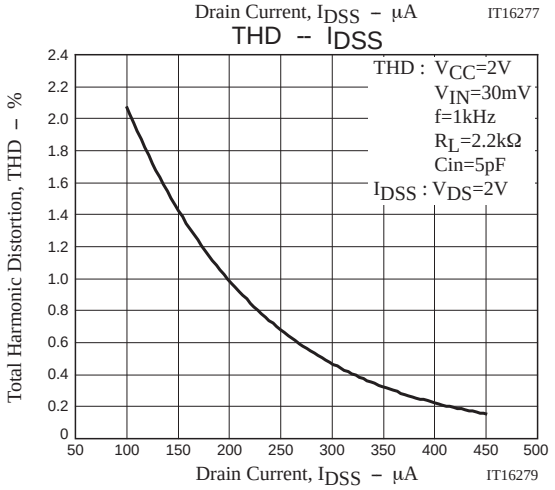



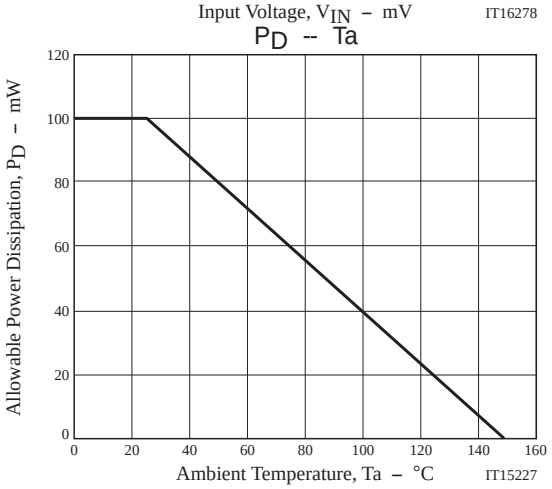





This catalog provides information as of January, 2011. Specifications and information herein are subject to change without notice.