



SANYO Semiconductors

# DATA SHEET

An ON Semiconductor Company

## TF252 — N-channel Silicon Junction FET Electret Condenser Microphone Applications

### Features

- High gain :  $G_V=1.0\text{dB typ}$  ( $V_{CC}=2\text{V}$ ,  $R_L=2.2\text{k}\Omega$ ,  $C_{in}=5\text{pF}$ ,  $V_{IN}=10\text{mV}$ ,  $f=1\text{kHz}$ ).
- 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 voltage characteristics.
- 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	$^\circ\text{C}$

Marking: D

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**SANYO Semiconductor Co., Ltd.**

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# TF252

## Electrical Characteristics at Ta=25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Gate-to-Drain Breakdown Voltage	$V_{(BR)GDO}$	$I_G = -100\mu A$	-20			V
Cutoff Voltage	$V_{GS(off)}$	$V_{DS} = 2V, I_D = 1\mu A$	-0.1	-0.4	-1.0	V
Zero-Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 2V, V_{GS} = 0V$	140*		350*	$\mu A$
Forward Transfer Admittance	$ y_{fs} $	$V_{DS} = 2V, V_{GS} = 0V, f = 1kHz$	0.8	1.4		mS
Input Capacitance	$C_{iss}$	$V_{DS} = 2V, V_{GS} = 0V, f = 1MHz$		3.1		pF
Reverse Transfer Capacitance	$C_{rss}$	$V_{DS} = 2V, V_{GS} = 0V, f = 1MHz$		0.95		pF
[Ta=25°C, V <sub>CC</sub> =2V, R <sub>L</sub> =2.2kΩ, C <sub>in</sub> =5pF, See specified Test Circuit.]						
Voltage Gain	$G_V$	$V_{IN} = 10mV, f = 1kHz$		1.0		dB
Reduced Voltage Characteristic	$\Delta G_{VV}$	$V_{IN} = 10mV, f = 1kHz, V_{CC} = 2.0 \rightarrow 1.5V$		-0.6	-2.0	dB
Frequency Characteristic	$\Delta G_{vf}$	$f = 1kHz \text{ to } 110Hz$			-1.0	dB
Total Harmonic Distortion	THD	$V_{IN} = 30mV, f = 1kHz$		0.65		%
Output Noise Voltage	$V_{NO}$	$V_{IN} = 0V, A \text{ curve}$		-106	-102	dB

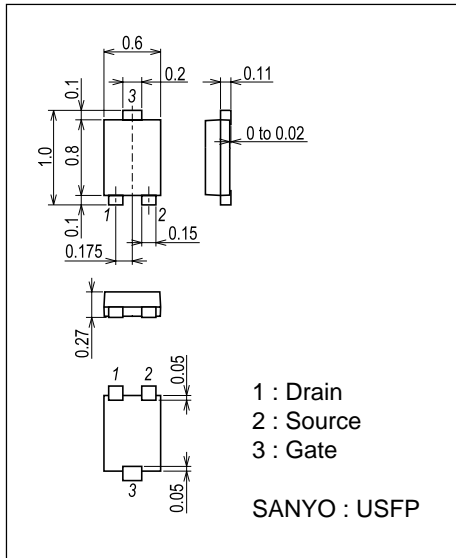
\* : The TF252 is classified by  $I_{DSS}$  as follows : (unit :  $\mu A$ )

Rank	4	5
$I_{DSS}$	140 to 240	210 to 350

## Package Dimensions

unit : mm (typ)

7055-001



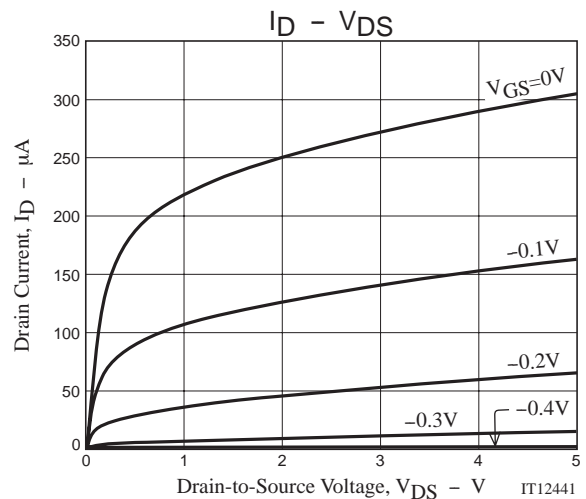
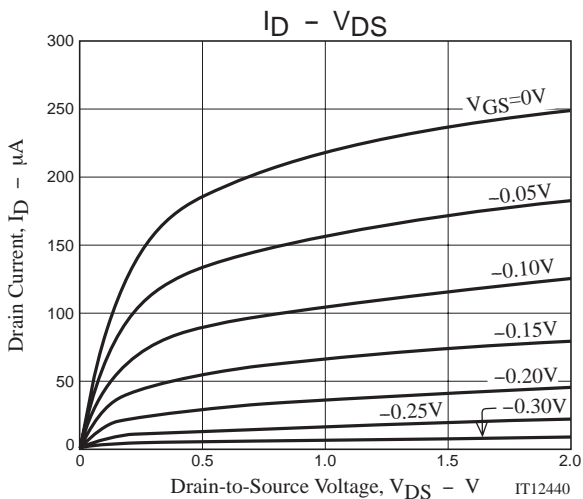
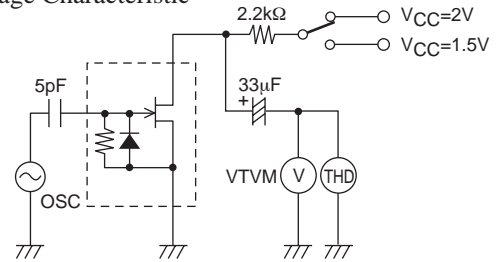
## Test Circuit

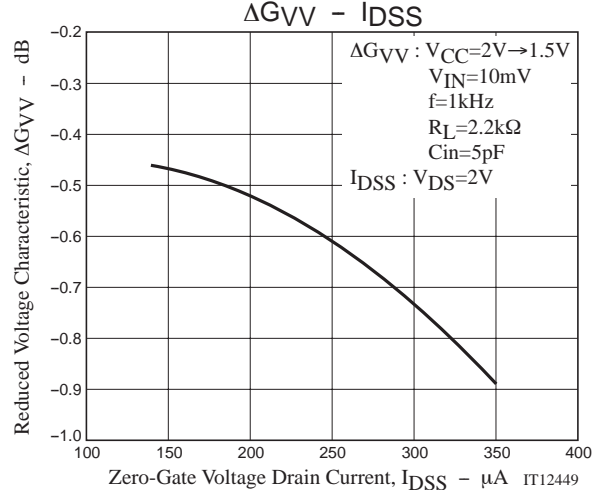
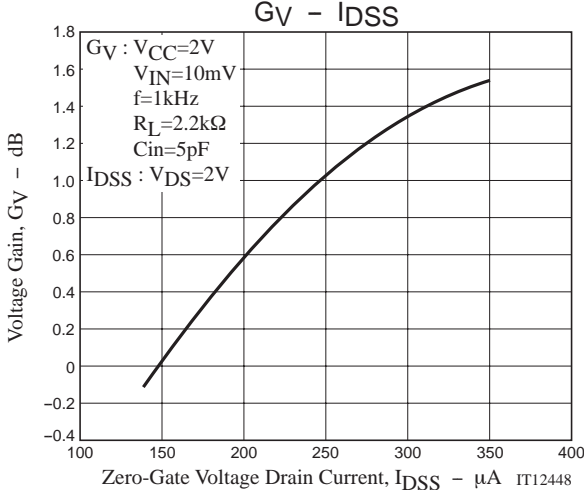
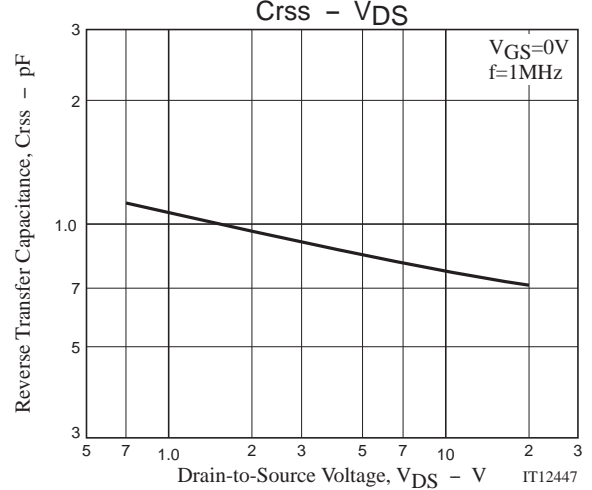
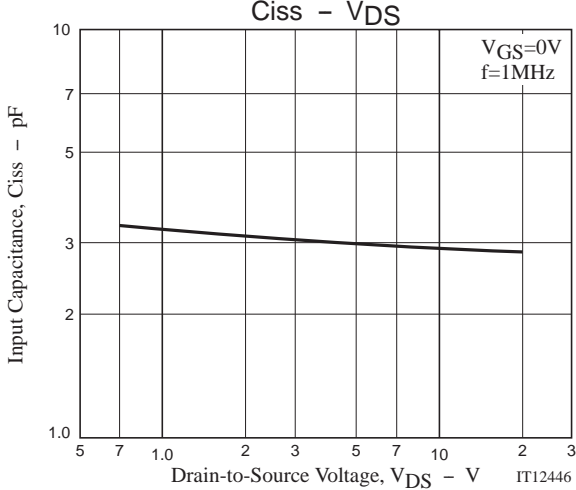
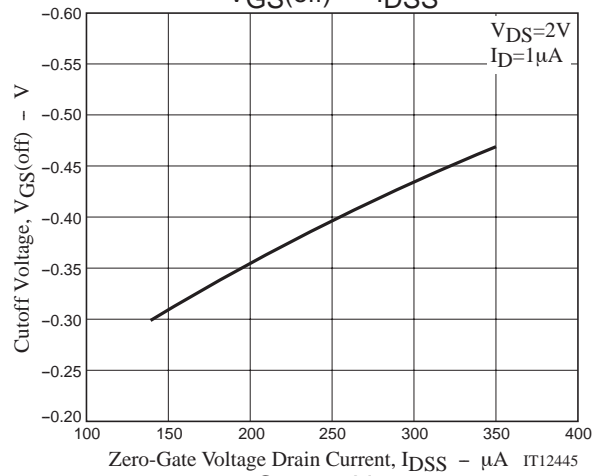
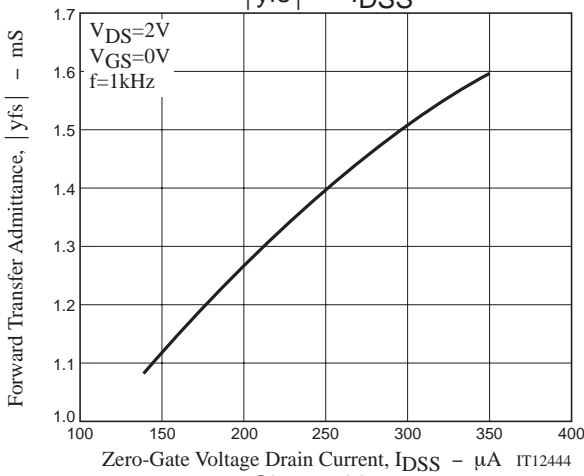
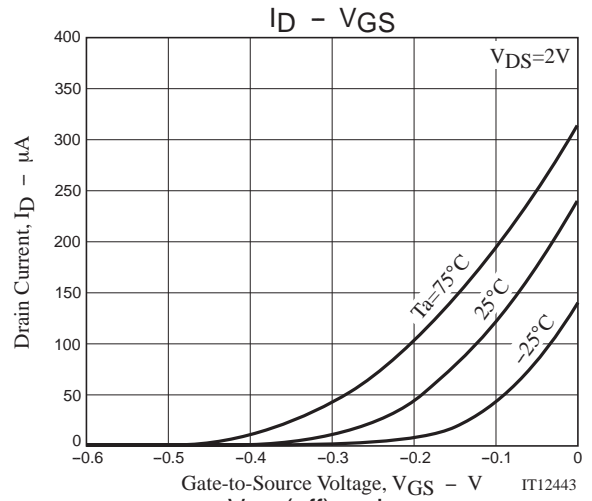
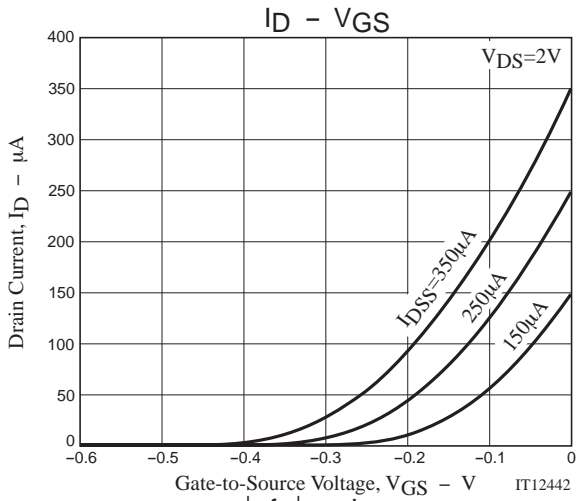
Voltage gain

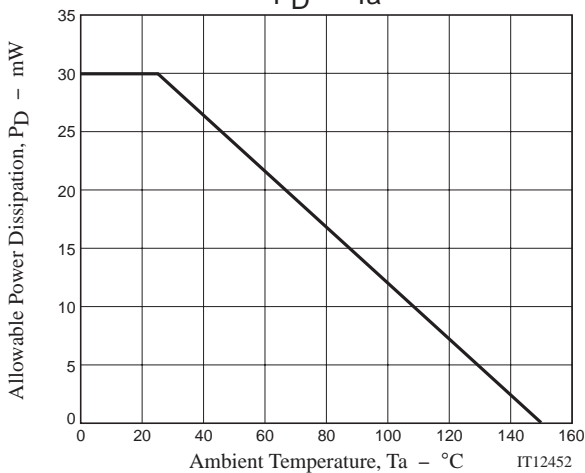
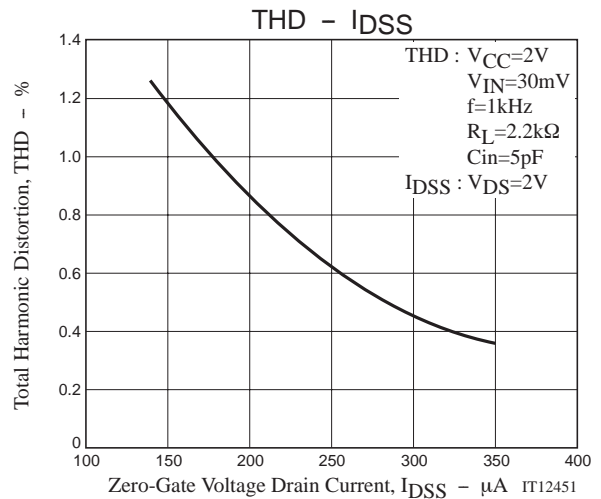
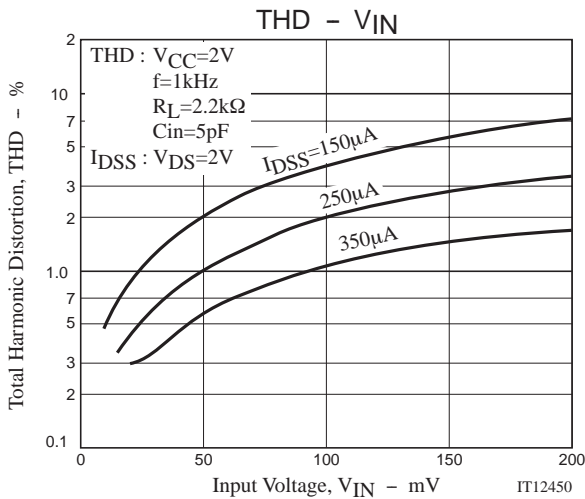
Frequency Characteristic

Distortion

Reduced Voltage Characteristic







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