Ordering number : ENN7621

N-Channel Silicon Junction FET

# EC3A02T

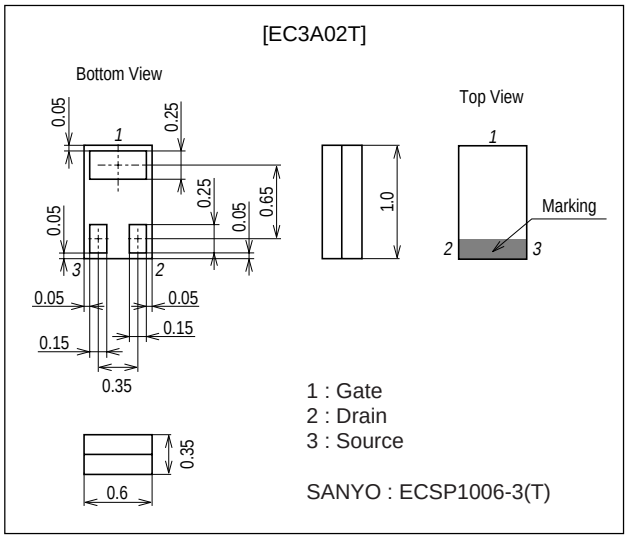
## Electret Condenser Microphone Applications

### Features

- Ultrasmall (1006 size) and thin (0.35mm) leadless package.
- Especially suited for use in electret condenser microphone for audio equipments and telephones.
- Excellent voltage characteristics.
- Excellent transient characteristics.
- Adoption of FBET process.

### Package Dimensions

unit : mm
2223




### 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 |

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

| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | 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 | | -1.0 | V |
| Drain Current | $I_{DSS}$ | $V_{DS}$=2V, $V_{GS}$=0 | 140* | | 350* | μA |

Continued on next page.

*The EC3A02T is classified by $I_{DSS}$ as follows.(unit : μA)

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



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Continued from preceding page.

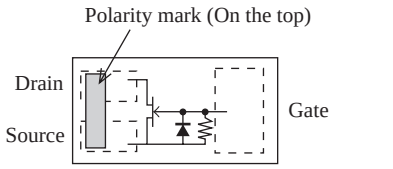
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Forward Transfer Admittance | \|yfs\| | $V_{DS}$=2V, $V_{GS}$=0, f=1kHz | 0.5 | | | mS |
| Input Capacitance | Ciss | $V_{DS}$=2V, $V_{GS}$=0, f=1MHz | | 5.0 | | pF |
| Reverse Transfer Capacitance | Crss | $V_{DS}$=2V, $V_{GS}$=0, f=1MHz | | 1.1 | | pF |

[Ta=25°C, $V_{CC}$=2.0V, $R_L$=2.2kΩ, Cin=5pF, See Specified Test Circuit]

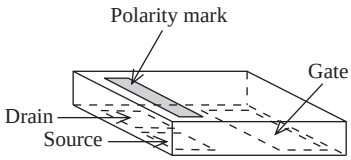
| Parameter | Symbol | Conditions | Ratings | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ | max | |
| Voltage Gain | $G_V$ | f=1kHz, $V_{IN}$=10mV | | −2.0 | | dB |
| Reduced Voltage Characteristic | $\Delta G_{VV}$ | f=1kHz, $V_{IN}$=10mV, $V_{CC}$=2→1.5V | | −0.6 | −2.0 | dB |
| Frequency Characteristic | ΔGvf | f=1kHz to 110Hz | | | −1.0 | dB |
| Total Harmonic Distortion | THD | f=1kHz, $V_{IN}$=30mV | | 0.7 | | % |
| Output Noise Voltage | $V_{NO}$ | $V_{IN}$=0, A Curve | | | −102 | dB |

## Type No. Indication (Top view)


## Electrical Connection (Top view)

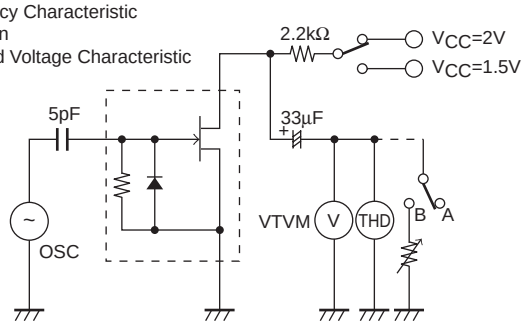



*Electrodes : On the bottom

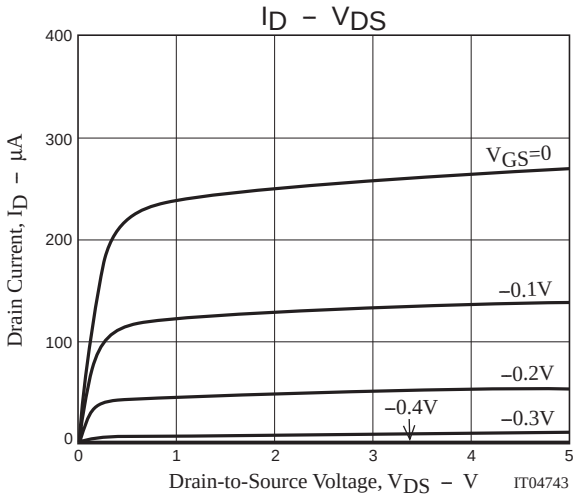


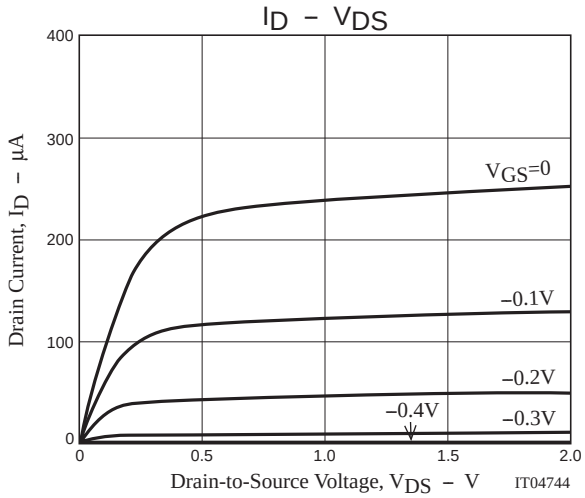

## Test Circuit

Voltage Gain
Frequency Characteristic
Distortion
Reduced Voltage Characteristic

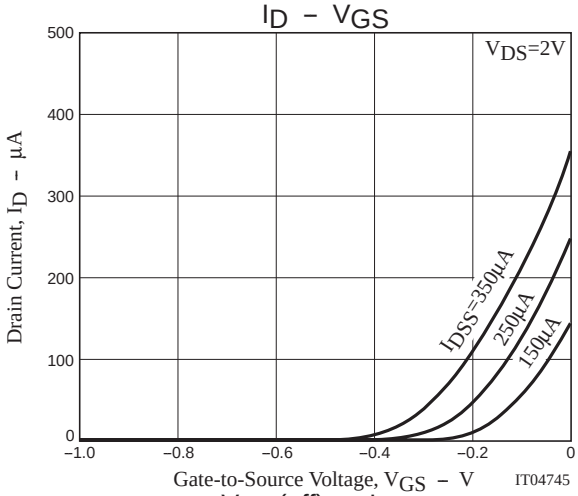



Output Impedance

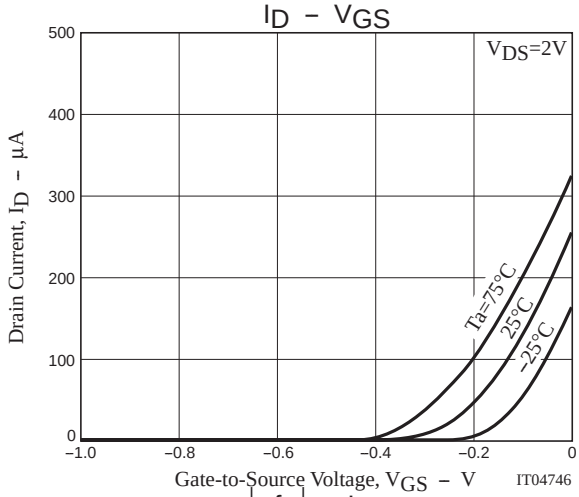


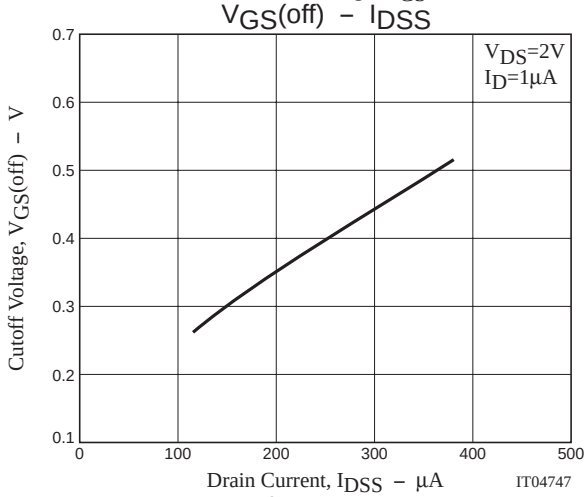
$I_D$ – $V_{GS}$



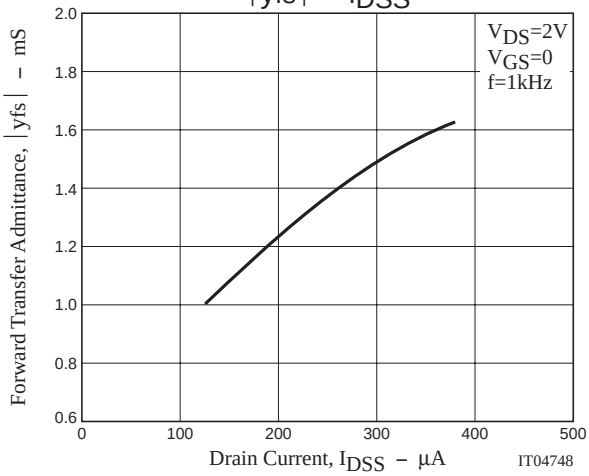

$I_D$ – $V_{GS}$



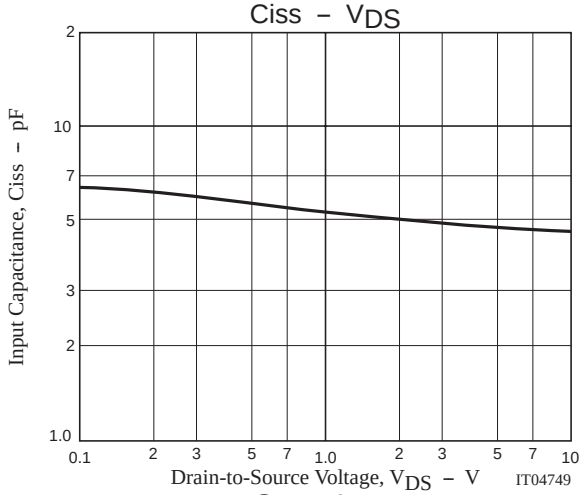

$V_{GS(off)}$ – $I_{DSS}$



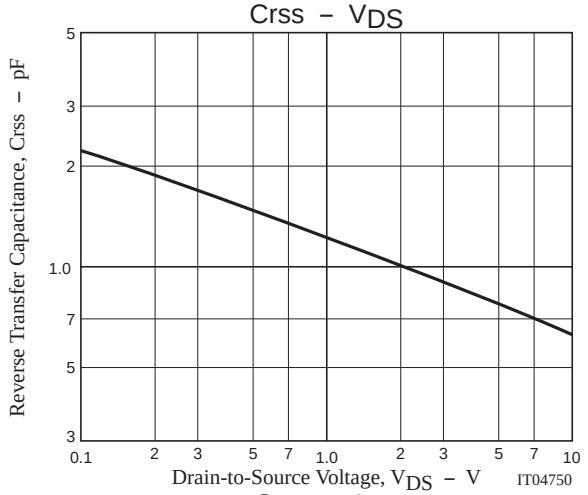

$|y_{fs}|$ – $I_{DSS}$



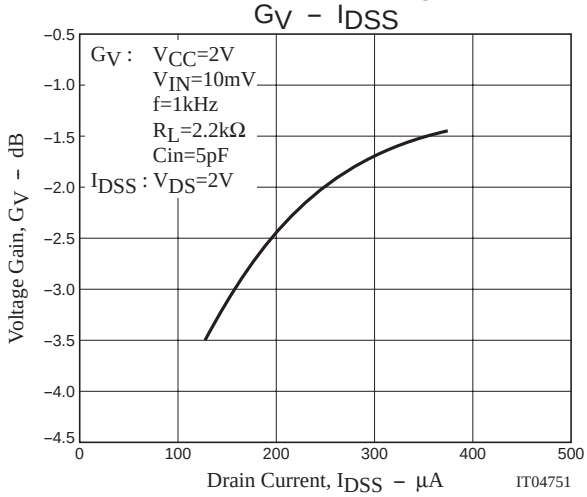

Ciss – $V_{DS}$




Crss – $V_{DS}$




$G_V$ – $I_{DSS}$




$\Delta G_{VV}$ – $I_{DSS}$