Ordering number : ENA0890

SANYO Semiconductors

DATA SHEET

TF218THC — N-channel Silicon Junction FET 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_{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

Marking: A

SANYO Semiconductor Co., Ltd.
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

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}=5V, I_D=1μA	–0.2	–0.6	–1.0	V
Drain Current	I_{DSS}	V_{DS}=5V, V_{GS}=0V	140*		350*	μA
Forward Transfer Admittance	$\|yfs\|$	V_{DS}=5V, V_{GS}=0V, f=1kHz	0.5	1.0		mS
Input Capacitance	Ciss	V_{DS}=5V, V_{GS}=0V, f=1MHz		3.5		pF
Reverse Transfer Capacitance	Crss	V_{DS}=5V, V_{GS}=0V, f=1MHz		0.65		pF
[Ta=25°C, V_{CC}=4.5V, R_L=1kΩ, Cin=15pF, See specified Test Circuit.]						
Voltage Gain	G_V	V_{IN}=10mV, f=1kHz		–3.0		dB
Reduced Voltage Characteristic	ΔG_{VV}	V_{IN}=10mV, f=1kHz, V_{CC}=4.5→1.5V		–1.2	–3.5	dB
Frequency Characteristic	ΔGvf	f=1kHz to 110Hz			–1.0	dB
Input Impedance	Z_{IN}	f=1kHz	25			MΩ
Output Impedance	Z_O	f=1kHz		1000		Ω
Total Harmonic Distortion	THD	V_{IN}=30mV, f=1kHz		1.2		%
Output Noise Voltage	V_{NO}	V_{IN}=0V, A curve			–110	dB

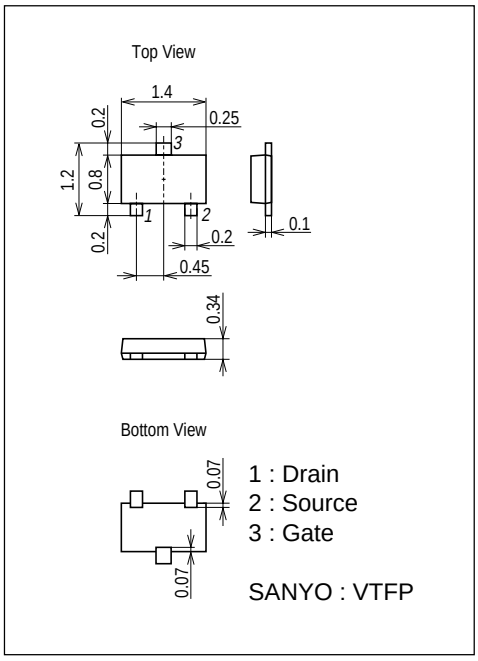
* : The TF218THC is classified by I_{DSS} as follows : (unit : μA)

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

Package Dimensions

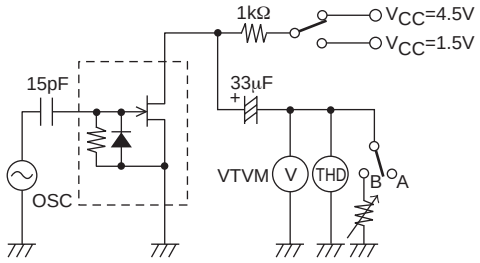
unit : mm (typ)

7031-001

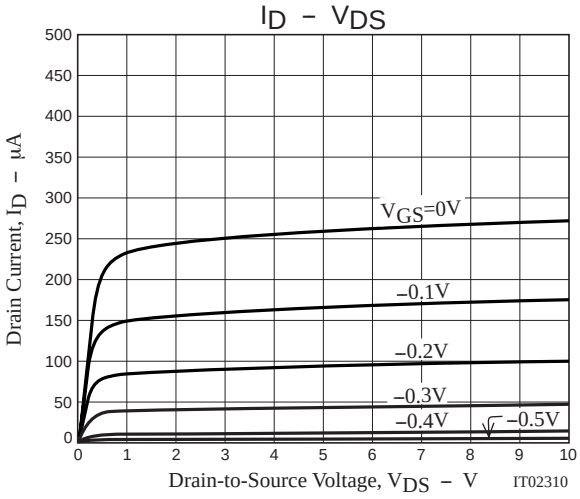


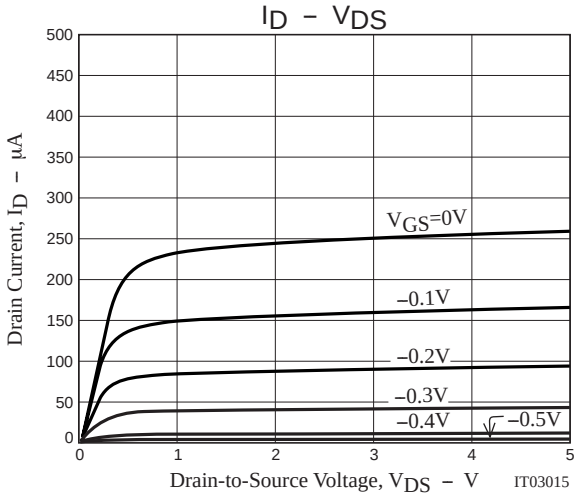
Test Circuit

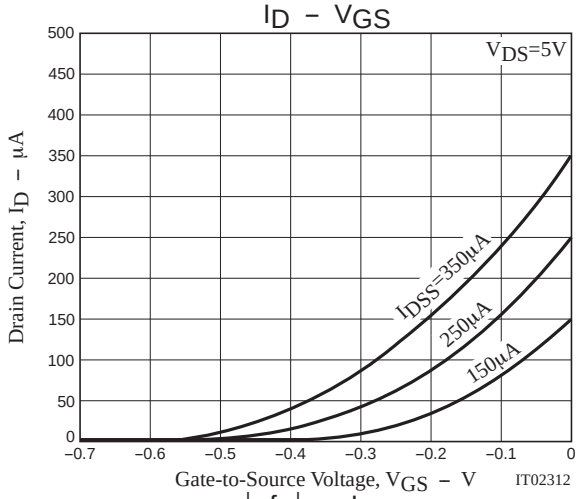
Voltage gain
Frequency Characteristic
Distortion
Reduced Voltage Characteristic

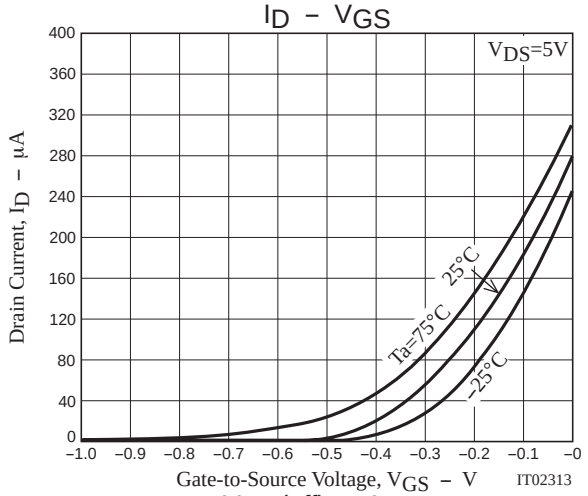


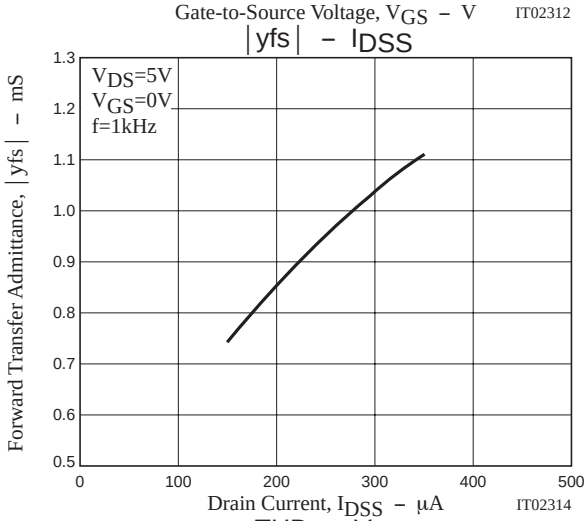
Output Impedance

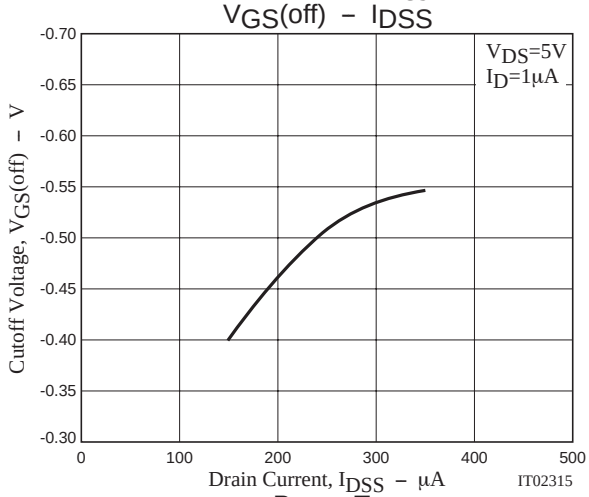


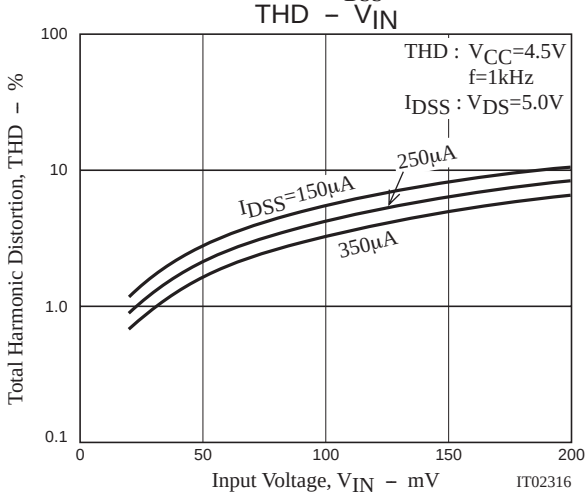


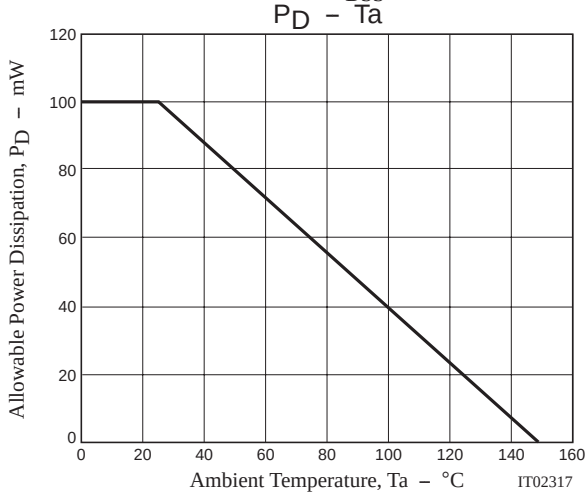

ID – VGS
VDS=5V
IDSS=350μA
250μA
150μA
Drain Current, ID – μA
Gate-to-Source Voltage, VGS – V
IT02312

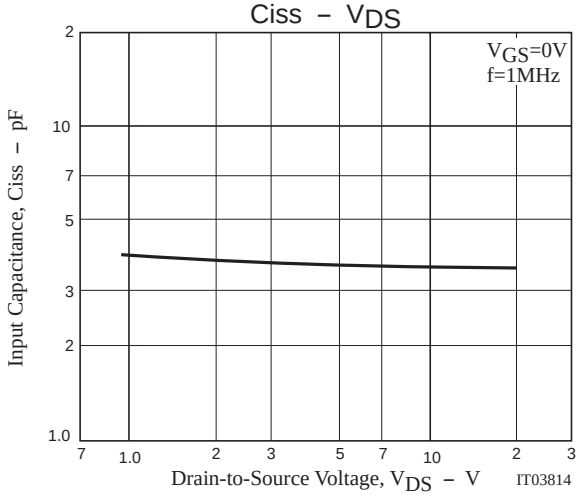

ID – VGS
VDS=5V
25°C
Ta=75°C
–25°C
Drain Current, ID – μA
Gate-to-Source Voltage, VGS – V
IT02313

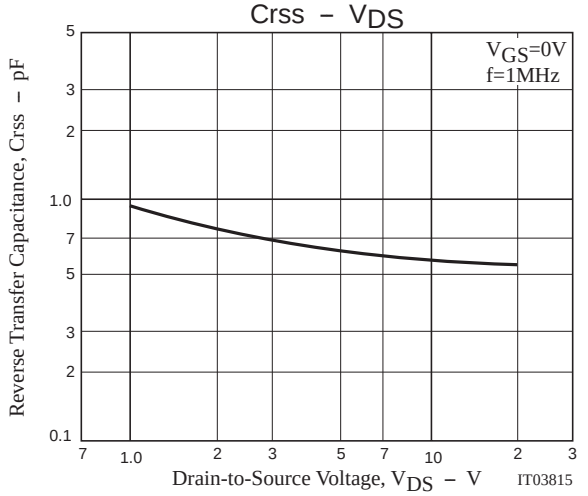

|yfs| – IDSS
VDS=5V
VGS=0V
f=1kHz
Forward Transfer Admittance, |yfs| – mS
Drain Current, IDSS – μA
IT02314

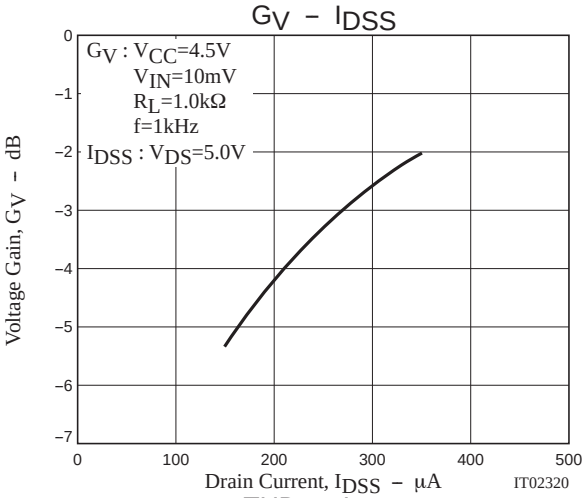

VGS(off) – IDSS
VDS=5V
ID=1μA
Cutoff Voltage, VGS(off) – V
Drain Current, IDSS – μA
IT02315

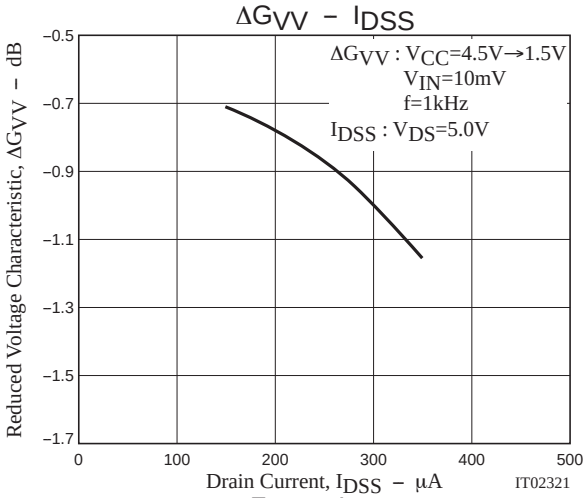

THD – VIN
THD : VCC=4.5V
f=1kHz
IDSS : VDS=5.0V
250μA
IDSS=150μA
350μA
Total Harmonic Distortion, THD – %
Input Voltage, VIN – mV
IT02316

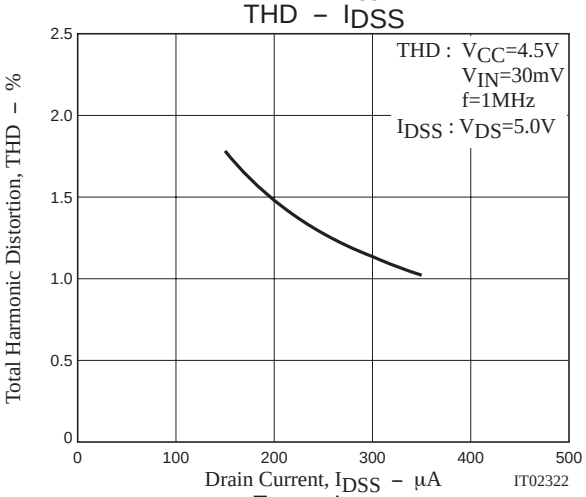

PD – Ta
Allowable Power Dissipation, PD – mW
Ambient Temperature, Ta – °C
IT02317

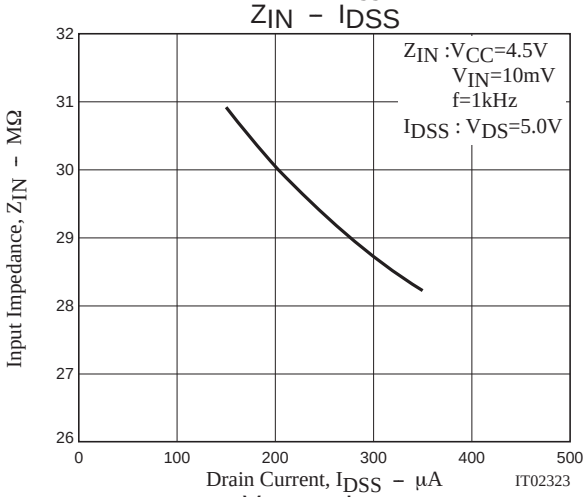

Ciss – VDS
VGS=0V
f=1MHz
Input Capacitance, Ciss – pF
Drain-to-Source Voltage, VDS – V
IT03814

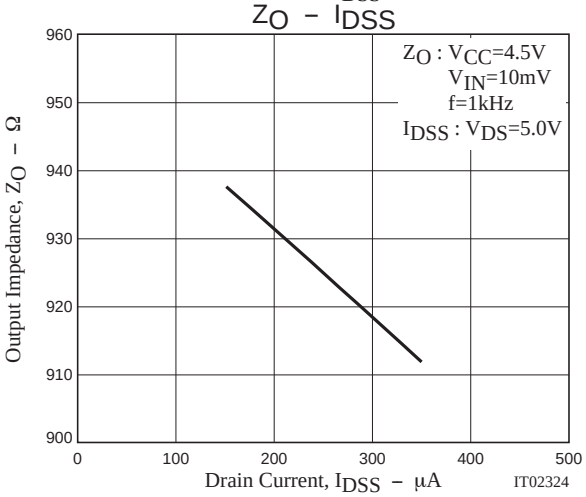

Crss – VDS
VGS=0V
f=1MHz
Reverse Transfer Capacitance, Crss – pF
Drain-to-Source Voltage, VDS – V
IT03815

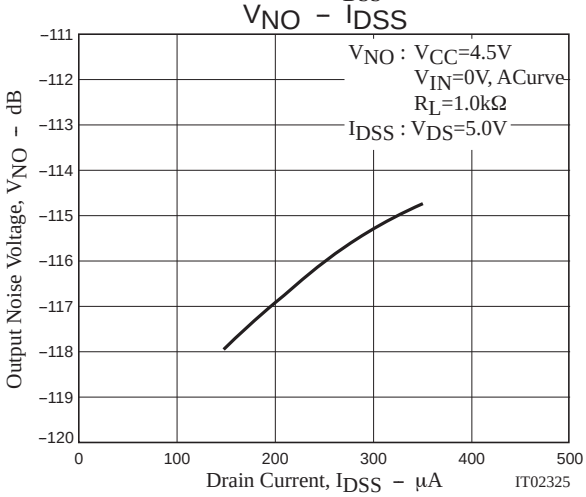

GV – IDSS
GV : VCC=4.5V
VIN=10mV
RL=1.0kΩ
f=1kHz
IDSS : VDS=5.0V
Voltage Gain, GV – dB
Drain Current, IDSS – µA
IT02320


ΔGVV – IDSS
ΔGVV : VCC=4.5V→1.5V
VIN=10mV
f=1kHz
IDSS : VDS=5.0V
Reduced Voltage Characteristic, ΔGVV – dB
Drain Current, IDSS – µA
IT02321


THD – IDSS
THD : VCC=4.5V
VIN=30mV
f=1MHz
IDSS : VDS=5.0V
Total Harmonic Distortion, THD – %
Drain Current, IDSS – µA
IT02322


ZIN – IDSS
ZIN :VCC=4.5V
VIN=10mV
f=1kHz
IDSS : VDS=5.0V
Input Impedance, ZIN – MΩ
Drain Current, IDSS – µA
IT02323


ZO – IDSS
ZO : VCC=4.5V
VIN=10mV
f=1kHz
IDSS : VDS=5.0V
Output Impedance, ZO – Ω
Drain Current, IDSS – µA
IT02324


VNO – IDSS
VNO : VCC=4.5V
VIN=0V, ACurve
RL=1.0kΩ
IDSS : VDS=5.0V
Output Noise Voltage, VNO – dB
Drain Current, IDSS – µA
IT02325