RFsemi

RJN1164

Electret Capacitor Microphone Applications

Features

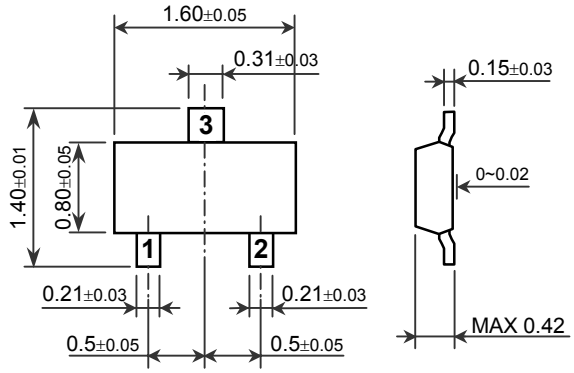
- Specially suited for use in audio and telephone electret capacitor microphones
- Excellent voltage gain
- Very low noise
- High ESD voltage
- Ultra-small size package

Applications

- Cellular phones
- Portable audio
- PDAs
- MP3 players

Package Type : SOT-400

[unit:mm]



[TOP VIEW] [SIDE VIEW]

1. Drain 2. Source 3. Gate

Absolute Maximum Ratings at Ta = 25 °C

Parameter	Symbol	Ratings	Unit
Gate-to-Drain Voltage	V_{GDO}	-20	V
Gate Current	I_G	10	mA
Drain Current	I_D	10	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} = 5V, I_D = 1μA	-0.2	-0.6	-1.5	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = 5V, V_{GS} = 0	70*		430*	μA
Forward Transfer Admittance	| yfs |	V_{DS} = 5V, V_{GS} = 0, f = 1kHz	0.4	1.2		mS
Input Capacitance	Ciss	V_{DS} = 5V, V_{GS} = 0, f = 1MHz		3.5		pF
Reverse Transfer Capacitance	Crss	V_{DS} = 5V, V_{GS} = 0, f = 1MHz		0.8		pF

* The RJN1164 is classified by I_{DSS} as follows

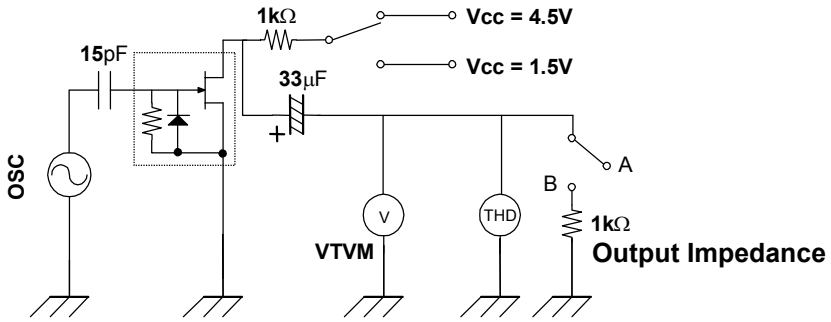
Classification	A1	A2	B	C	D
I_{DSS}(μA)	70~120	100~170	150~270	210~350	320~430

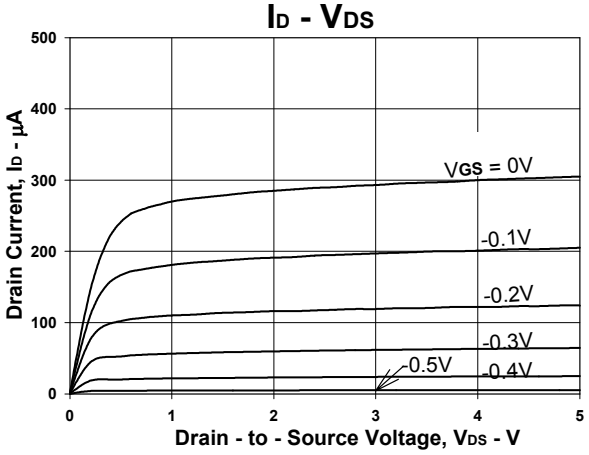
Electrical Characteristics

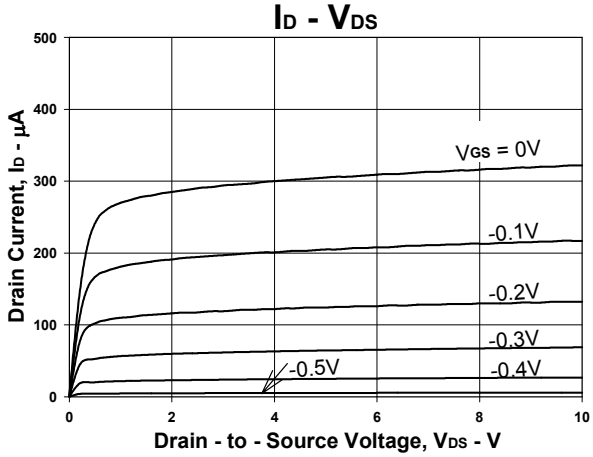
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
[Ta = 25°C, V_{CC} = 4.5V, R_L = 1kΩ, C_{IN} = 15pF, See Specified Test Circuit.]						
Voltage Gain	G_V	V_{IN} = 10 mV, f = 1kHz		-3.0		dB
Reduced Voltage Characteristics	ΔG_{VV}	V_{IN} = 10 mV, V_{CC} = 4.5 → 1.5V		-1.2	-3.5	dB
Frequency Characteristics	ΔG_{Vf}	f = 1kHz to 110Hz			-1.0	dB
Input Impedance	Z_{IN}	f = 1kHz	30			MΩ
Output Impedance	Z_O	f = 1kHz			700	Ω
Total Harmonic Distortion	THD	V_{IN} = 10mV, f = 1kHz		1.0		%
Output Noise Voltage	V_{NO}	V_{IN} = 0, A curve			-110	dB

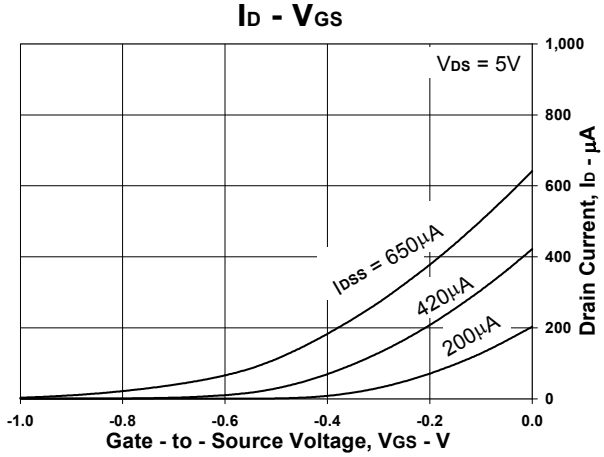
Test Circuit

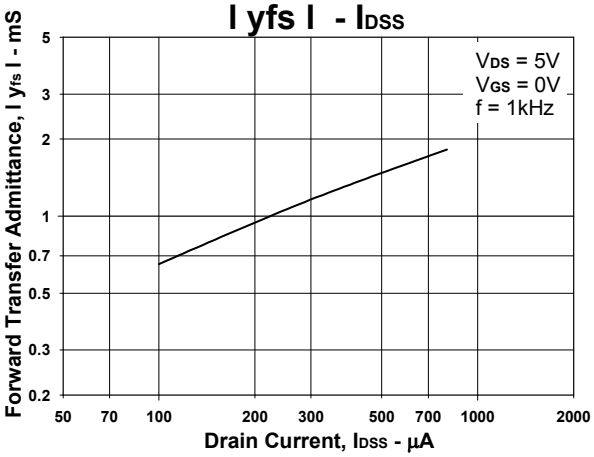
Voltage Gain
Frequency Characteristics
Distortion
Reduced Voltage Characteristics

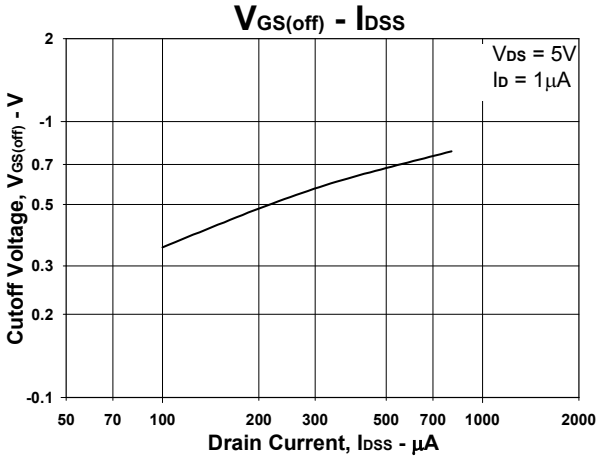


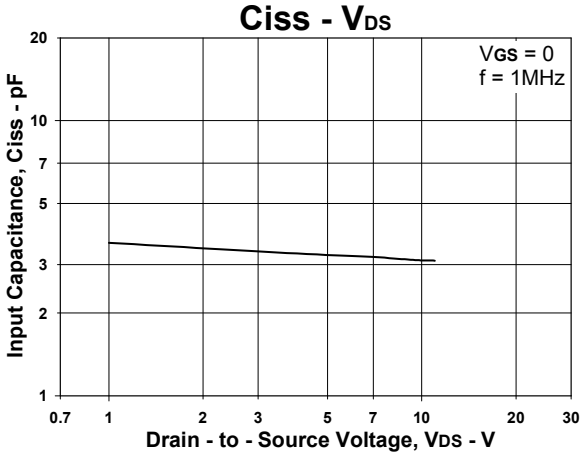


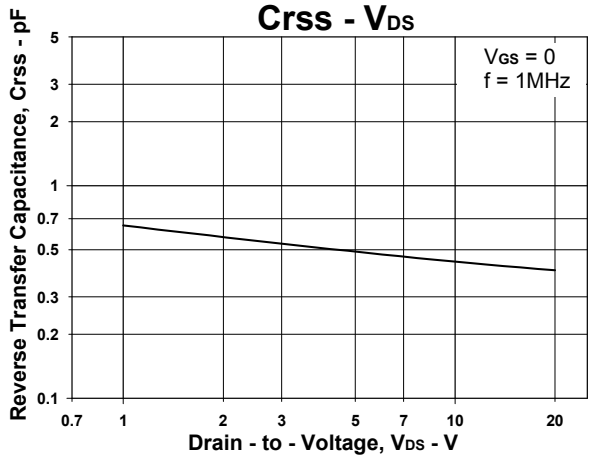


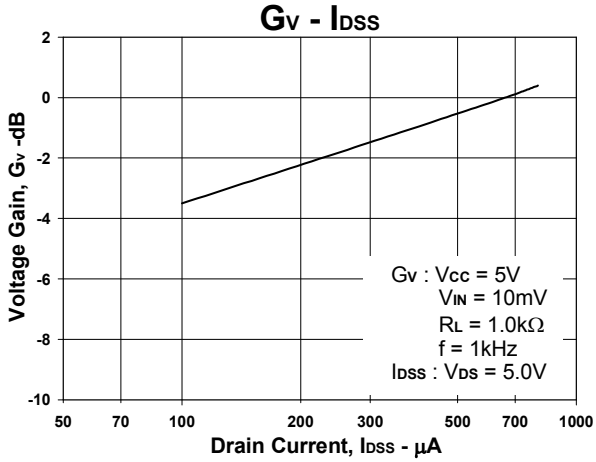

ID - VGS
VDS = 5V
IDSS = 650μA
420μA
200μA
Drain Current, ID - μA
Gate - to - Source Voltage, VGS - V
1,000
800
600
400
200
0
-1.0
-0.8
-0.6
-0.4
-0.2
0.0

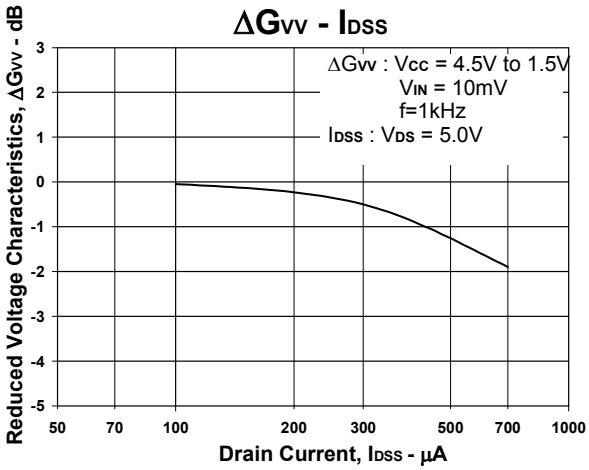

| yfs | - IDSS
VDS = 5V
VGS = 0V
f = 1kHz
Forward Transfer Admittance, | yfs | - mS
Drain Current, IDSS - μA
5
3
2
1
0.7
0.5
0.3
0.2
50
70
100
200
300
500
700
1000
2000

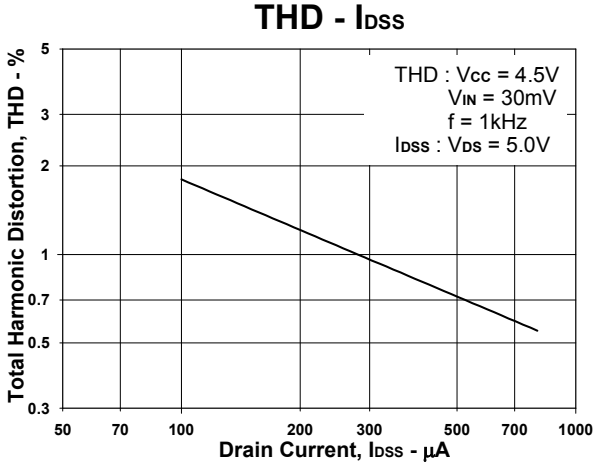

VGS(off) - IDSS
VDS = 5V
ID = 1μA
Cutoff Voltage, VGS(off) - V
Drain Current, IDSS - μA
2
-1
0.7
0.5
0.3
0.2
-0.1
50
70
100
200
300
500
700
1000
2000

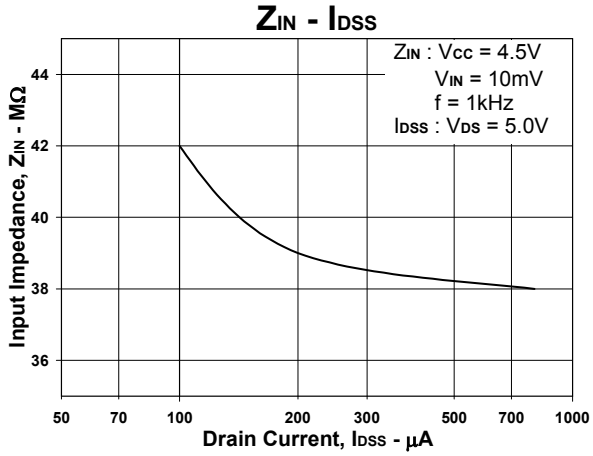

Ciss - VDS
VGS = 0
f = 1MHz
Input Capacitance, Ciss - pF
Drain - to - Source Voltage, VDS - V
20
10
7
5
3
2
1
0.7
1
2
3
5
7
10
20
30

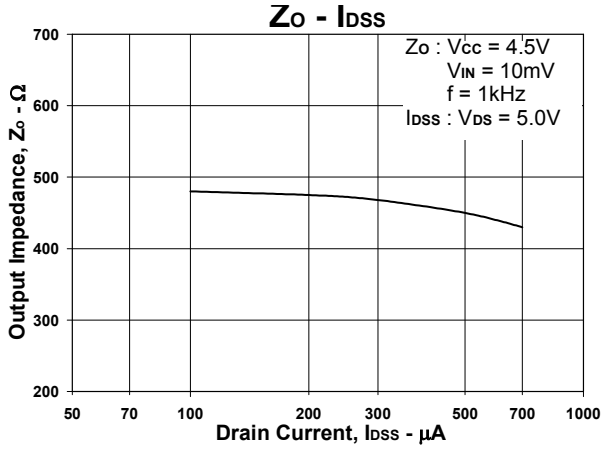

Crss - VDS
VGS = 0
f = 1MHz
Reverse Transfer Capacitance, Crss - pF
Drain - to - Voltage, VDS - V
5
3
2
1
0.7
0.5
0.3
0.2
0.1
0.7
1
2
3
5
7
10
20

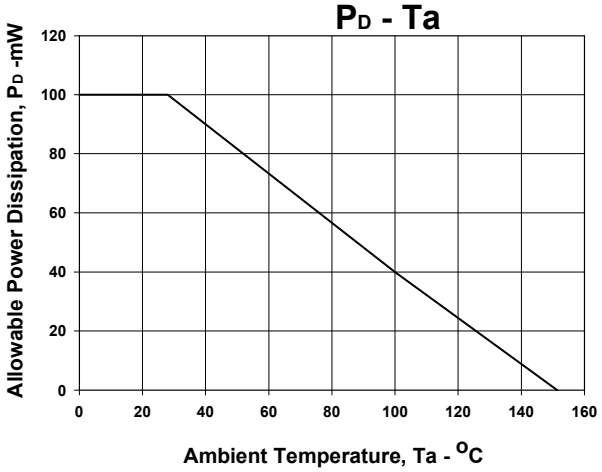

GV - IDSS
GV : VCC = 5V
VIN = 10mV
RL = 1.0kΩ
f = 1kHz
IDSS : VDS = 5.0V
Voltage Gain, GV -dB
Drain Current, IDSS - μA
2
0
-2
-4
-6
-8
-10
50
70
100
200
300
500
700
1000

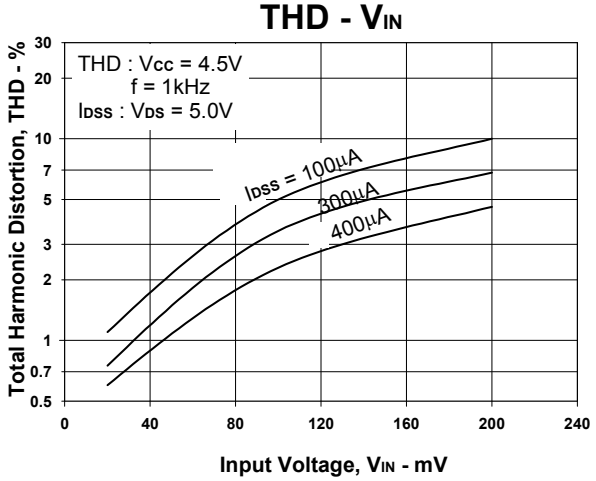

ΔGvv - IDSS
ΔGvv : Vcc = 4.5V to 1.5V
VIN = 10mV
f=1kHz
IDSS : VDS = 5.0V
Reduced Voltage Characteristics, ΔGvv - dB
Drain Current, IDSS - μA


THD - IDSS
THD : Vcc = 4.5V
VIN = 30mV
f = 1kHz
IDSS : VDS = 5.0V
Total Harmonic Distortion, THD - %
Drain Current, IDSS - μA


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


ZO - IDSS
Zo : Vcc = 4.5V
VIN = 10mV
f = 1kHz
IDSS : VDS = 5.0V
Output Impedance, Zo - Ω
Drain Current, IDSS - μA


PD - Ta
Allowable Power Dissipation, PD -mW
Ambient Temperature, Ta - °C


THD - VIN
THD : Vcc = 4.5V
f = 1kHz
IDSS : VDS = 5.0V
IDSS = 100μA
300μA
400μA
Total Harmonic Distortion, THD - %
Input Voltage, VIN - mV