

2SK3948

Silicon N-channel junction FET

For impedance conversion in low frequency

For electret capacitor microphone

■ Features

- Low noise voltage NV
- High voltage gain GV
- Thin package: TSSSMini3-F1 (1.2 mm × 1.2 mm × 0.33 mm)

■ Package

- Code
TSSSMini3-F1
- Pin Name
1: Drain
2: Source
3: Gate

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain-source voltage (Gate open)	V_{DSO}	20	V
Drain-gate voltage (Source open)	V_{DGO}	20	V
Drain-source current (Gate open)	I_{DSO}	2	mA
Drain-gate current (Source open)	I_{DGO}	2	mA
Power dissipation	P_{D}	100	mW
Operating ambient temperature	T_{opr}	-20 to +80	°C
Storage temperature	T_{stg}	-55 to +125	°C

■ Marking Symbol: 4X

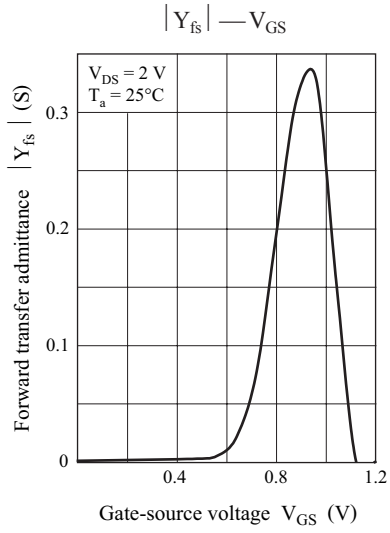
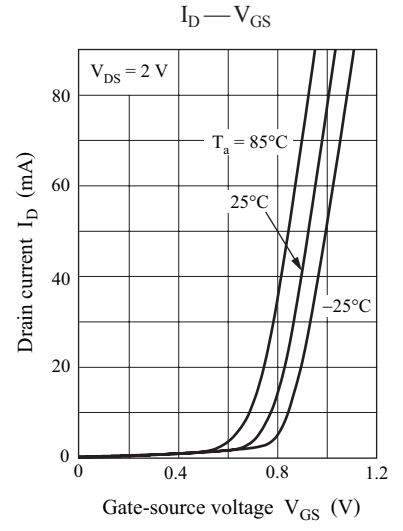
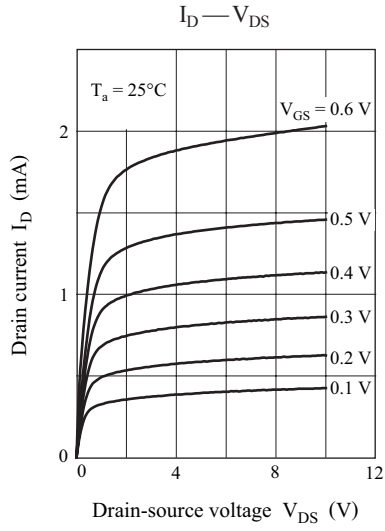
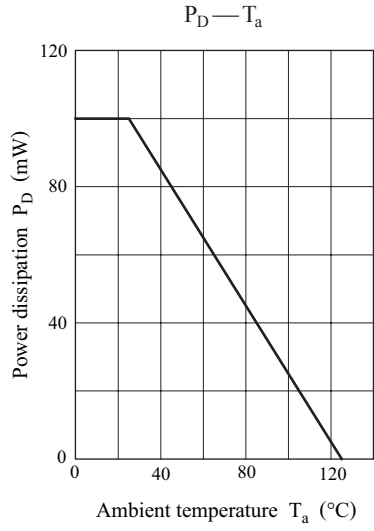
■ Electrical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain current *1	I_{D}	$V_{\text{DD}} = 2.0 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%$	170		470	μA
Drain-source current *2	I_{DSS}	$V_{\text{DD}} = 2.0 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%, V_{\text{GS}} = 0$	180		450	μA
Mutual conductance	g_{m}	$V_{\text{DS}} = 2.0 \text{ V}, V_{\text{GS}} = 0, f = 1 \text{ kHz}$	660	1500		μS
Noise voltage *3	NV	$V_{\text{DD}} = 2.0 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%$ $C_{\text{O}} = 5 \text{ pF}, \text{A-curve}$			8	μV
Voltage gain	G_{V1}	$V_{\text{DD}} = 2.0 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%$ $C_{\text{O}} = 5 \text{ pF}, e_{\text{G}} = 10 \text{ mV}, f = 1 \text{ kHz}$	-5.0	-1.0		dB
	G_{V2}	$V_{\text{DD}} = 12 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%$ $C_{\text{O}} = 5 \text{ pF}, e_{\text{G}} = 10 \text{ mV}, f = 1 \text{ kHz}$	-3.0	3.0		
	G_{V3}	$V_{\text{DD}} = 1.5 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%$ $C_{\text{O}} = 5 \text{ pF}, e_{\text{G}} = 10 \text{ mV}, f = 1 \text{ kHz}$	-7.0	-1.5		
Voltage gain difference	$\Delta G_{\text{V}} \cdot f $ *4	$V_{\text{DD}} = 2.0 \text{ V}, R_{\text{d}} = 2.2 \text{ k}\Omega \pm 1\%$ $C_{\text{O}} = 5 \text{ pF}, e_{\text{G}} = 10 \text{ mV}$ $f = 1 \text{ kHz to } 70 \text{ Hz}$		0.0	1.7	
	$ G_{\text{V1}} - G_{\text{V3}} $			0.5	1.0	dB

- Note) 1. Measuring methods are based on JAPANESE INDUSTRIAL STANDARD JIS C 7030 measuring methods for transistors.
 2. A protection diode is built-in between gate and source of transistor. However if forward current flows between gate and source transistor might be damaged. So please be careful not insert reverse.
 3. *1: I_{D} is assured for I_{DSS} .
 *2: Rank classification

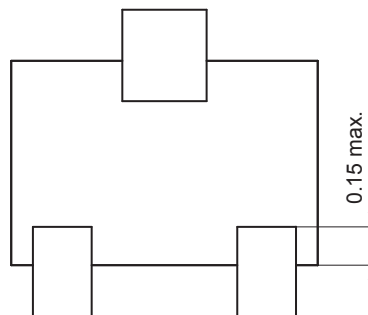
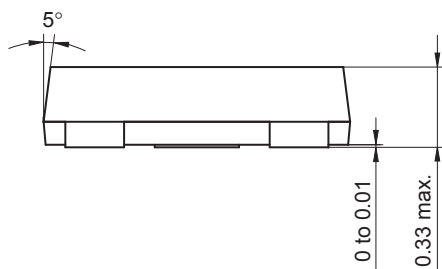
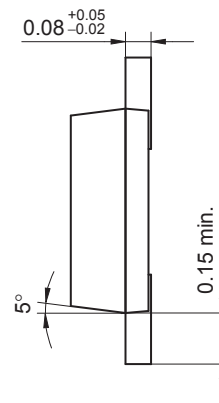
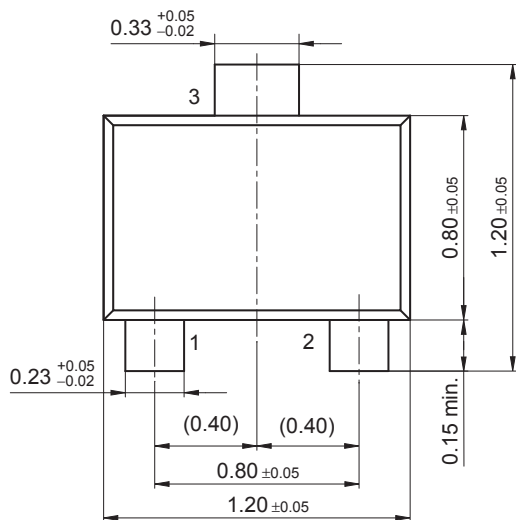
Rank	T	U
$I_{\text{D}} (\mu\text{A})$	170 to 330	270 to 470
$I_{\text{DSS}} (\mu\text{A})$	180 to 320	280 to 450

- *3: NV is assured for design.
 *4: $\Delta |G_{\text{V}} \cdot f|$ is assured for AQL 0.065. (The measurement method is used by source-grounded circuit.)



TSSSMini3-F1

Unit: mm



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