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

■ Marking Symbol: 4X

■ Absolute Maximum Ratings $T_a = 25°C$

Parameter	Symbol	Rating	Unit
Drain-source voltage (Gate open)	V_{DSO}	20	V
Drain-gate voltage (Souece open)	V_{DGO}	20	V
Drain-source current (Gate open)	I_{DSO}	2	mA
Drain-gate current (Souece 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

■ Electrical Characteristics $T_a = 25°C±3°C$

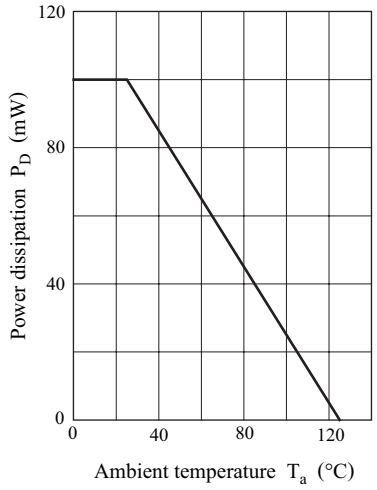
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain current *1	I_D	$V_{DD} = 2.0$ V, $R_d = 2.2$ kΩ ± 1%	170		470	μA
Drain-source current *2	I_{DSS}	$V_{DD} = 2.0$ V, $R_d = 2.2$ kΩ ± 1%, $V_{GS} = 0$	180		450	μA
Mutual conductance	g_m	$V_{DS} = 2.0$ V, $V_{GS} = 0$, f = 1 kHz	660	1 500		μS
Noise voltage *3	NV	$V_{DD} = 2.0$ V, $R_d = 2.2$ kΩ ± 1% $C_O = 5$ pF, A-curve			8	μV
Voltage gain	G_{V1}	$V_{DD} = 2.0$ V, $R_d = 2.2$ kΩ ± 1% $C_O = 5$ pF, $e_G = 10$ mV, f = 1 kHz	–5.0	–1.0		dB
	G_{V2}	$V_{DD} = 12$ V, $R_d = 2.2$ kΩ ± 1% $C_O = 5$ pF, $e_G = 10$ mV, f = 1 kHz	–3.0	3.0		dB
	G_{V3}	$V_{DD} = 1.5$ V, $R_d = 2.2$ kΩ ± 1% $C_O = 5$ pF, $e_G = 10$ mV, f = 1 kHz	–7.0	–1.5		dB
Voltage gain difference	$\Delta\|G_V . f\|$ *4	$V_{DD} = 2.0$ V, $R_d = 2.2$ kΩ ± 1% $C_O = 5$ pF, $e_G = 10$ mV f = 1 kHz to 70 Hz		0.0	1.7	dB
	$\|G_{V1} - G_{V3}\|$			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

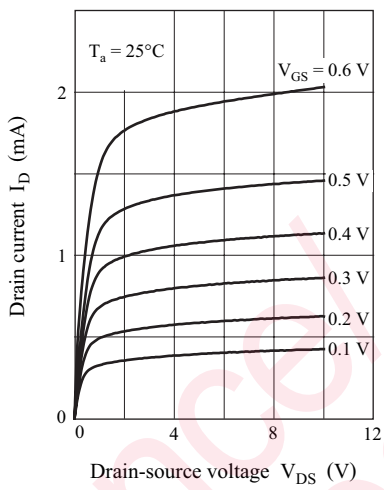
Rank	T	U
I_D (μA)	170 to 330	270 to 470
I_{DSS} (μA)	180 to 320	280 to 450

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

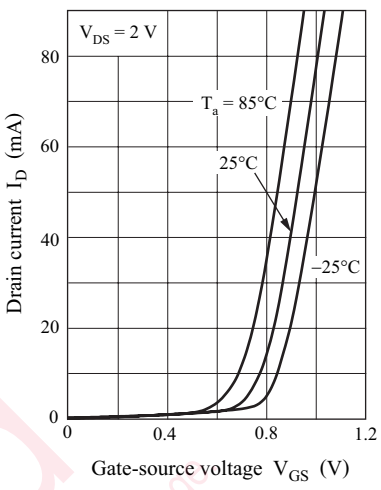
P_D — T_a



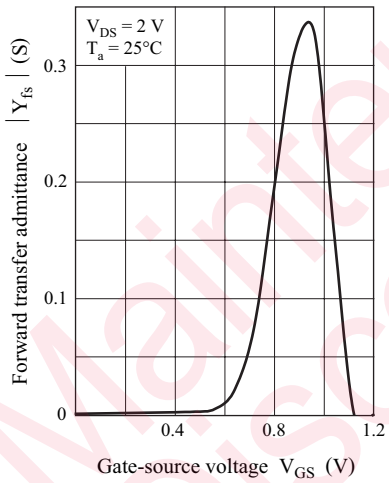
I_D — V_{DS}



I_D — V_{GS}

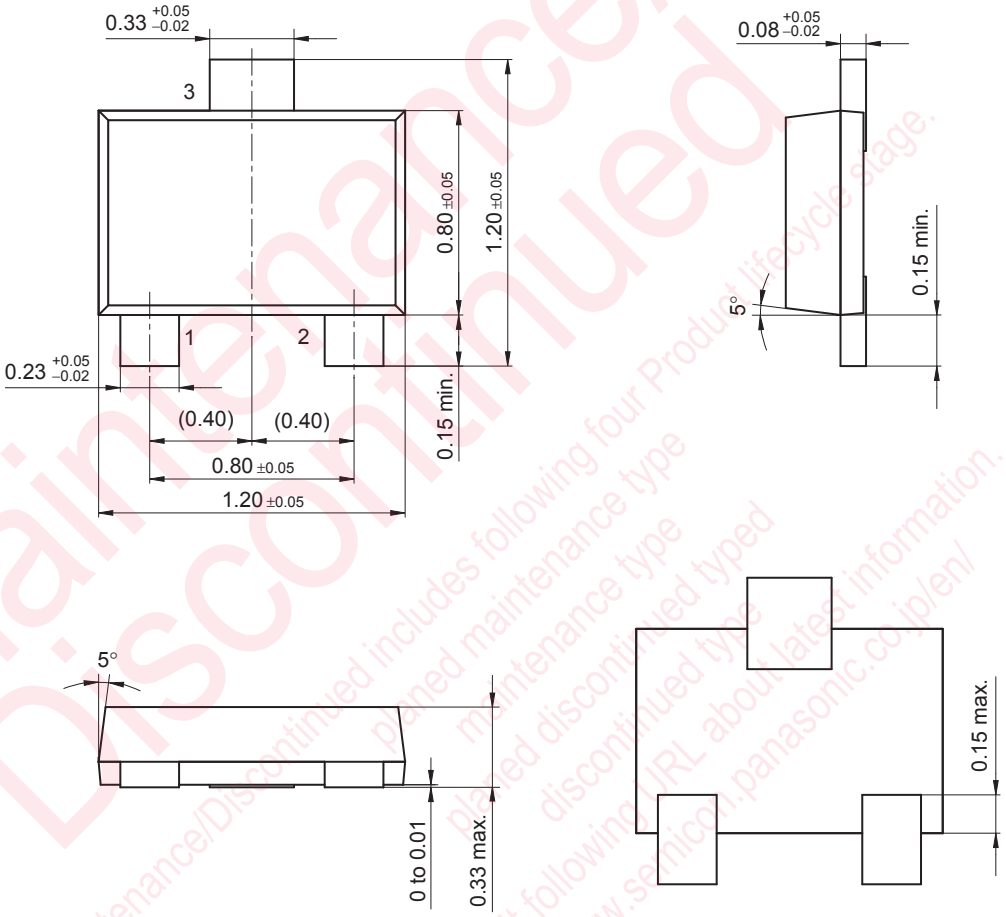


$|Y_{fs}|$ — V_{GS}



TSSSMini3-F1

Unit: mm



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