

SONY **2SK613**

Silicon N-Channel Junction FET T-29-25

Description

Making the best of Epitaxy and Pattern latest technology, 2SK613 accomplishes so far unattainable levels of performance.

Usage with head amplifiers for video cameras and the like, ensures the highest efficiency.

Features

- High figure of merit
 $\left(\begin{matrix} V_{DS} = 5V \\ I_D = 10mA \end{matrix} \right) | Y_{fs} | / C_{iss} 4.5$
- High forward transfer admittance
 $\left(\begin{matrix} V_{DS} = 5V \\ V_{GS} = 0V \end{matrix} \right) | Y_{fs} | 30 \text{ mS(Typ.)}$
- Low input capacitance
 C_{iss} 6.6 pF(Typ.)

Structure

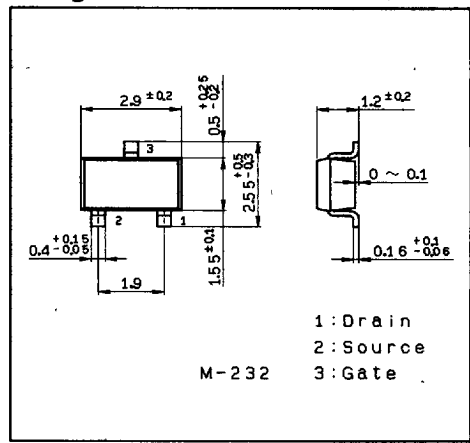
- Silicon N-Channel junction FET

Absolute Maximum Ratings (Ta=25°C)

● Drain to gate voltage	V _{DGG}	15	V
● Source to gate voltage	V _{SGG}	15	V
● Drain current	I _D	50	mA
● Gate current	I _G	5	mA
● Allowable power dissipation	P _D	150	mW
● Junction temperature	T _j	150	°C
● Storage temperature	T _{stg}	-55 to +150	°C

Package Outline

Unit: mm



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Electrical Characteristics

Unless otherwise specified (Ta = 25°C)

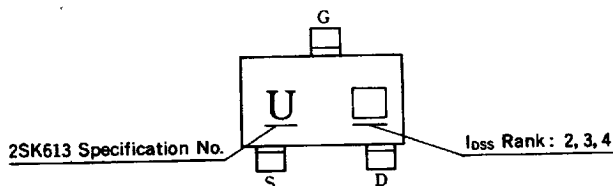
Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Drain to Gate Voltage	V_{DGO}	$I_G = 10 \mu A$	15			V
Source to Gate Voltage	V_{SGO}	$I_G = 10 \mu A$	15			V
Drain to Source Voltage	V_{DSX}	$I_D = 10 \mu A, V_{GS} = -3 V$	15			V
Gate Cutoff Current	I_{GSS}	$V_{GS} = -7 V, V_{DS} = 0 V$			-2	nA
Drain Current	$I_{DSS} *$	$V_{GS} = 5 V, V_{DS} = 0 V$	13.4		42.0	mA
Gate to Source Cutoff Voltage	$V_{GS(OFF)} *$	$V_{DS} = 5 V, I_D = 100 \mu A,$	-0.65		-2.0	V
Forward Transfer Admittance	$ Y_{fs} *$	$V_{DS} = 5 V, V_{GS} = 0 V, f = 1 kHz$	23	30		mS
Input Capacitance	C_{iss}	$V_{DS} = 5 V, V_{GS} = 0 V, f = 1 MHz$		6.6	7.5	pF
Equivalent Input Noise Voltage	e_n	$V_{DS} = 5 V, I_D = 10 mA, R_g = 0 \Omega, f = 1 kHz$		4.0	7.0	nV/ \sqrt{Hz}

(* Drain current detail specification as follows.)

Classification

	I_{DSS} (mA) $\left(\begin{matrix} V_{DS} = 5 V \\ V_{GS} = 0 V \end{matrix} \right)$	$V_{GS(OFF)}$ (V) $\left(\begin{matrix} V_{DS} = 5 V \\ I_D = 100 \mu A \end{matrix} \right)$	$ Y_{fs} $ (mS) $\left(\begin{matrix} V_{DS} = 5 V \\ V_{GS} = 0 V \\ f = 1 kHz \end{matrix} \right)$	Mark
2SK613-2	13.4 to 21.0	-0.65 to -1.26	23	2
2SK613-3	19.0 to 30.2	-0.85 to -1.6	25	3
2SK613-4	27.4 to 42.0	-1.05 to -2.0	29	4

Mark



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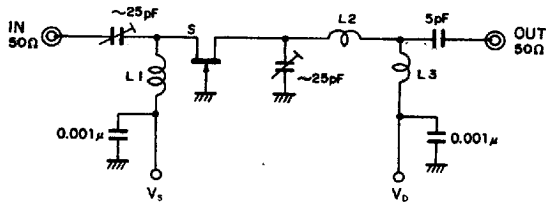
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Standard Circuit Design Data

Item	Symbol	Condition	Typ.	Unit
Forward Transfer Admittance	$ Y_{fs} $	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, f = 1\text{ kHz}$.25	mS
Input Capacitance	C_{iss}	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, f = 1\text{ MHz}$	5.5	pF
Gate Cutoff Current	I_G	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}$	10	pA
Input Resistance	r_{is}	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, f = 100\text{ MHz}$	3.5	k Ω
Input Capacitance	C_{is}		5.5	pF
Output Resistance	r_{os}		2.0	k Ω
Output Capacitance	C_{os}		1.5	pF
Power Gain	PG	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, f = 100\text{ MHz}$	14	dB
Noise Figure	NF		1.8	dB
Equivalent Input Noise Voltage	\bar{e}_n	$V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, f = 1\text{ kHz}, R_g = 0\ \Omega$	4.0	nV/ $\sqrt{\text{Hz}}$
Reverse Transfer	C_{rss}	$V_{DS} = 5\text{ V}, V_S = 0\text{ V}, f = 1\text{ MHz}$	1.6	pF

100 MHz PG, NF Test Circuit



- L1: ϕ 0.45 mm Polyurethan wire ϕ 3 mm 10.5 t
 L2: ϕ 0.45 mm Polyurethan wire ϕ 3 mm 5.5 t
 L3: ϕ 0.45 mm Polyurethan wire ϕ 3 mm 5.5 t

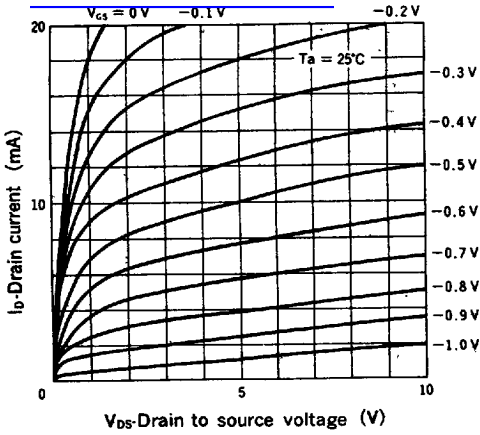
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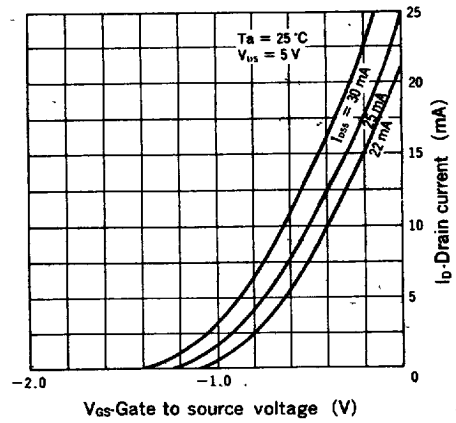
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Drain current vs. Gate to source voltage

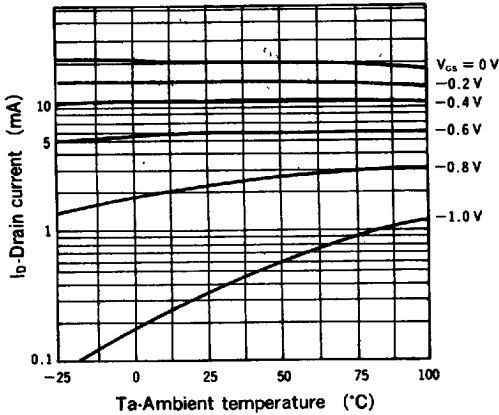
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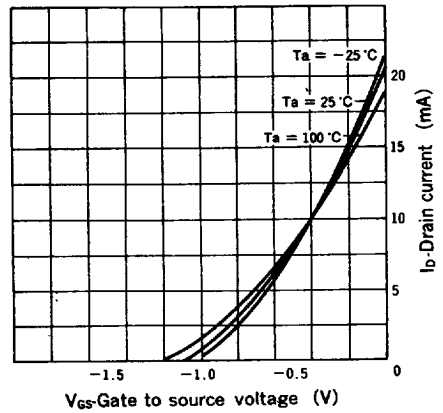
Drain current vs. Gate to source voltage

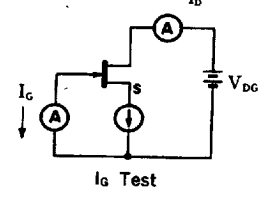
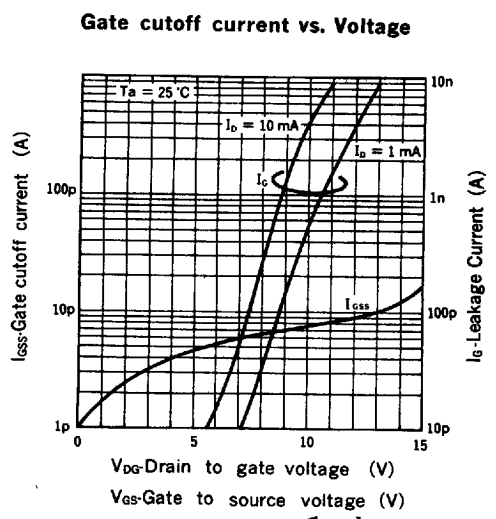
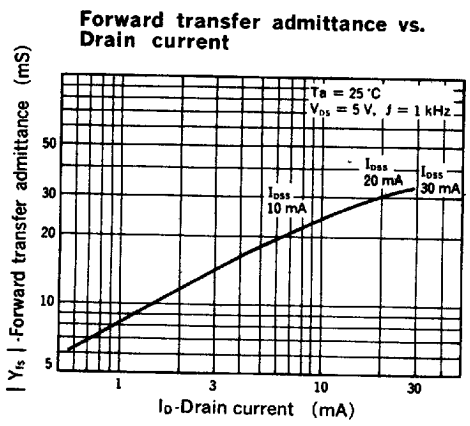
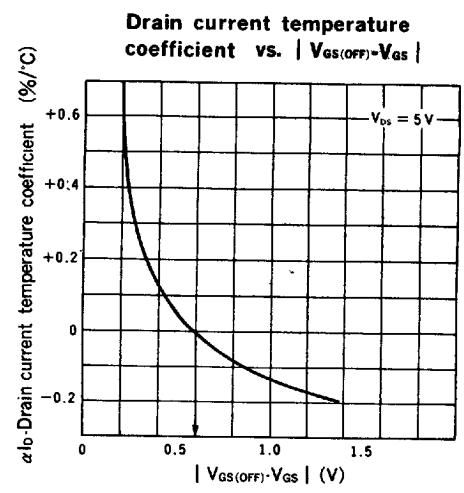
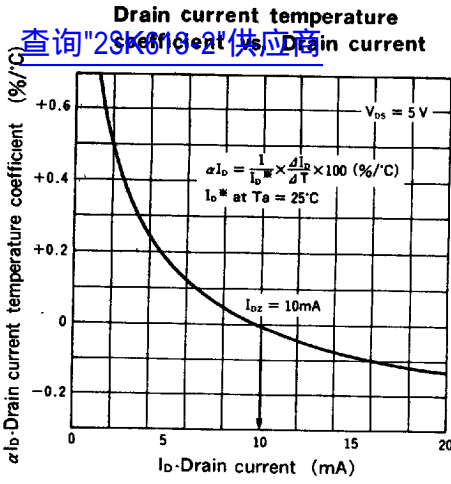


Drain current vs. Ambient temperature

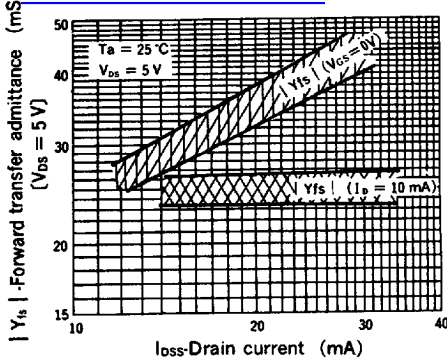


Drain current vs. Gate to source voltage

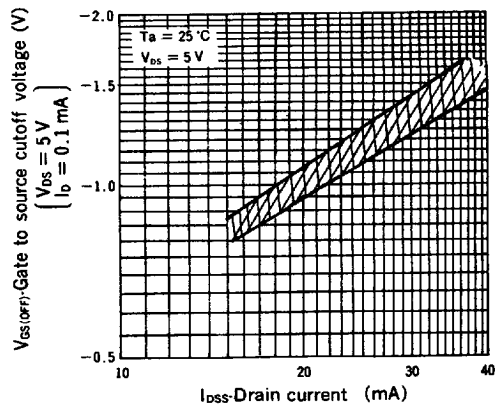




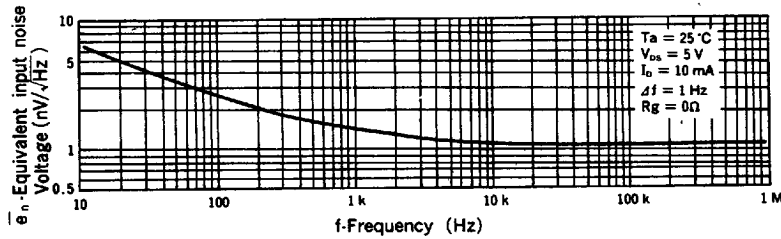
Forward transfer admittance vs. Drain current



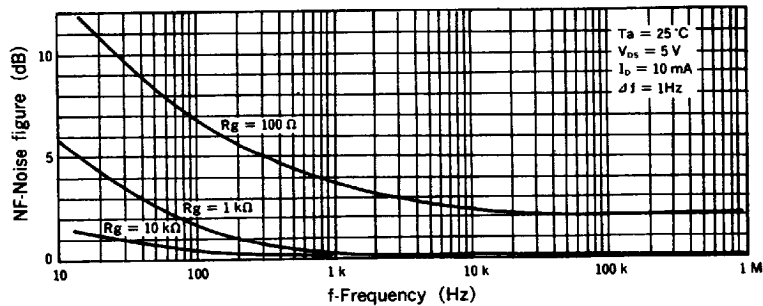
Gate to source cutoff voltage vs. Drain current



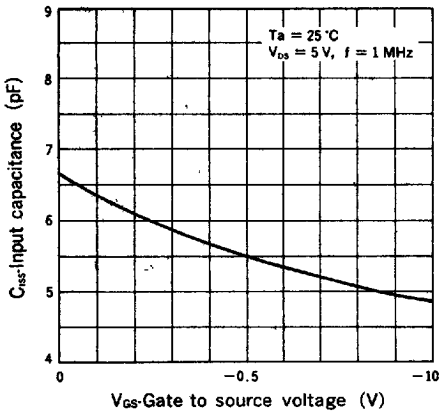
Equivalent input noise voltage vs. Frequency



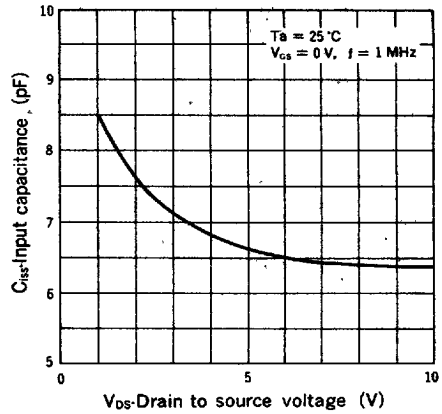
Noise figure vs. Frequency



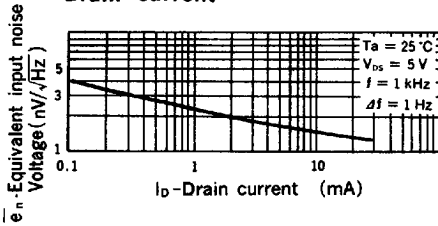
Input capacitance vs. Gate to source voltage
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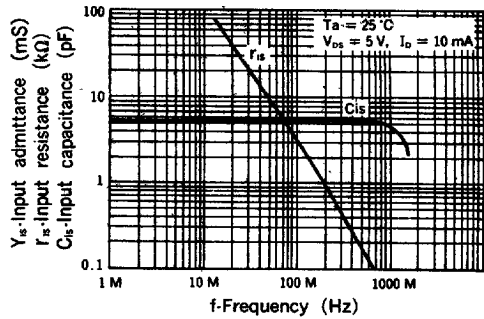
Input capacitance vs. Drain to source voltage



Equivalent input noise voltage vs. Drain current



Input admittance vs. Frequency



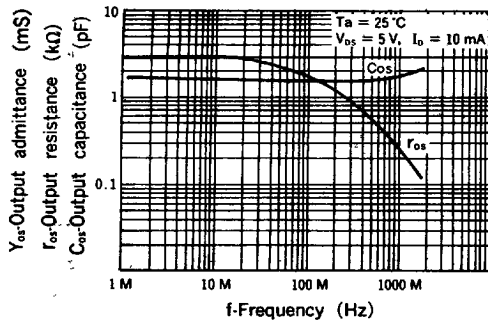
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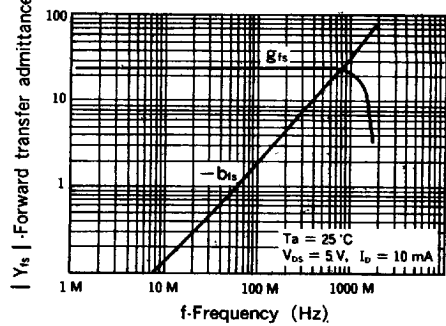
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Output admittance vs. Frequency

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Forward transfer admittance vs. Frequency



Reverse transfer admittance vs. Frequency

