2SK2685

GaAs HEMT

HITACHI

ADE-208-400
1st. Edition

Application

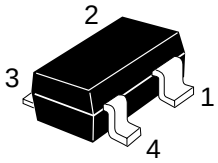
UHF low noise amplifier

Features

- Excellent low noise characteristics.
  Fmin = 0.83 dB Typ. (3 V, 10 mA, 2 GHz)
- High associated gain.
  Ga = 17 dB Typ. (3 V, 10 mA, 2 GHz)
- High voltage.
  V_{DS} = 6 or more voltage.
- Small package. (CMPAK-4)

Outline

CMPAK–4



1. Source
2. Gate
3. Source
4. Drain

Hitachi semiconductor

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Drain to source voltage	V_{DSS}	6	V
Gate to source voltage	V_{GSO}	–6	V
Gate to drain voltage	V_{GDO}	–7	V
Drain current	I_D	20	mA
Channel power dissipation	Pch	100	mW
Channel temperature	Tch	125	°C
Storage temperature	Tstg	–55 to +125	°C

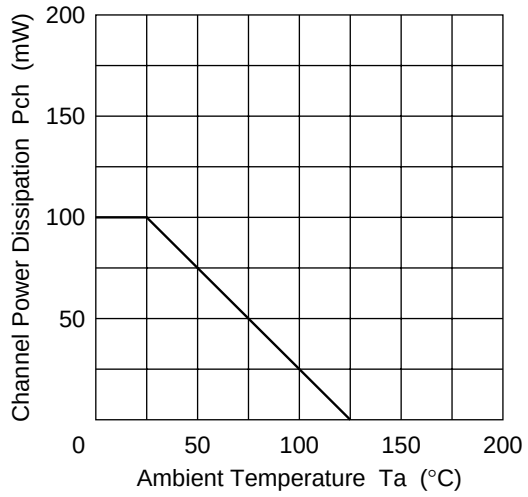
Attention: This device is very sensitive to electro static discharge.
It is recommended to adopt appropriate cautions when handling this transistor.

Electrical Characteristics (Ta = 25°C)

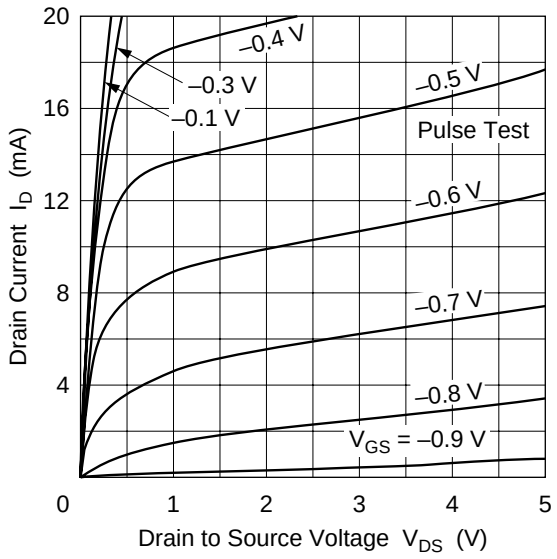
Item	Symbol	Min	Typ	Max	Unit	Test conditions
Gate to source leak current	I_{GSS}	—	—	–20	µA	V_{GS} = –6 V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	–0.3	—	–2.0	V	V_{DS} = 3 V, I_D = 100 µA
Drain current	I_{DSS}	35	50	70	mA	V_{DS} = 3 V, V_{GS} = 0 (Pulse Test)
Forward transfer admittance	$\|y_{fs}\|$	40	60	—	mS	V_{DS} = 3 V, I_D = 10 mA, f = 1 kHz
Associated gain	Ga	—	17.0	—	dB	V_{DS} = 3 V, I_D = 10 mA, f = 2 GHz
Associated gain	Ga	—	15.2	—	dB	V_{DS} = 3 V, I_D = 3 mA, f = 2 GHz
Associated gain	Ga	16	21.4	—	dB	V_{DS} = 3 V, I_D = 10 mA, f = 900 MHz
Associated gain	Ga	—	19.7	—	dB	V_{DS} = 3 V, I_D = 3 mA, f = 900 MHz
Minimum noise figure	Fmin	—	0.83	—	dB	V_{DS} = 3 V, I_D = 10 mA, f = 2 GHz
Minimum noise figure	Fmin	—	1.08	—	dB	V_{DS} = 3 V, I_D = 3 mA, f = 2 GHz
Minimum noise figure	Fmin	—	0.52	1.0	dB	V_{DS} = 3 V, I_D = 10 mA, f = 900 MHz
Minimum noise figure	Fmin	—	0.74	—	dB	V_{DS} = 3 V, I_D = 3 mA, f = 900 MHz

Note: Marking is “ZT–”.

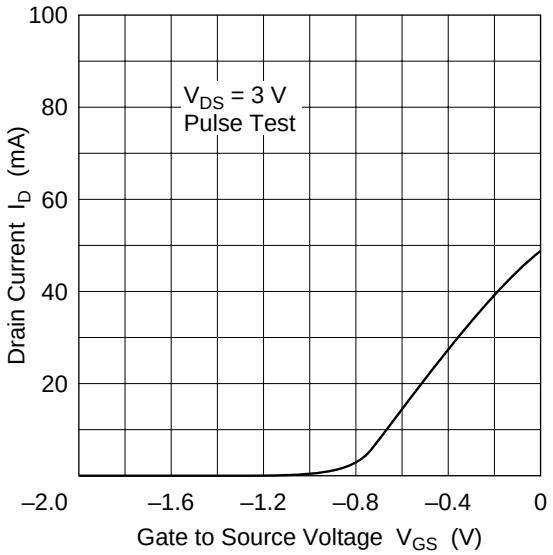
Maximum Channel Power Dissipation Curve



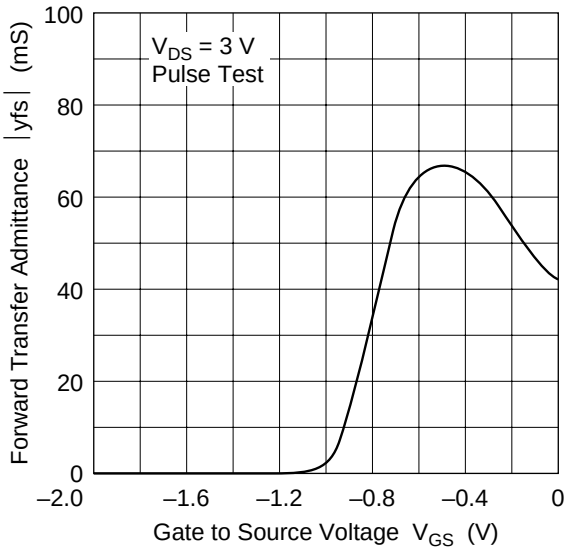
Typical Output Characteristics



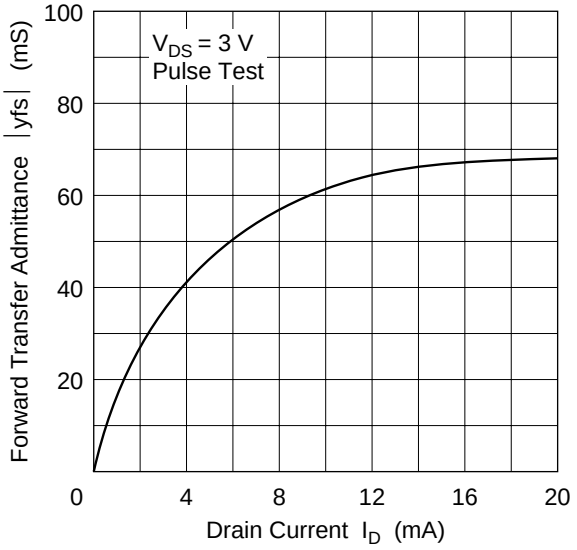
Typical Transfer Characteristics



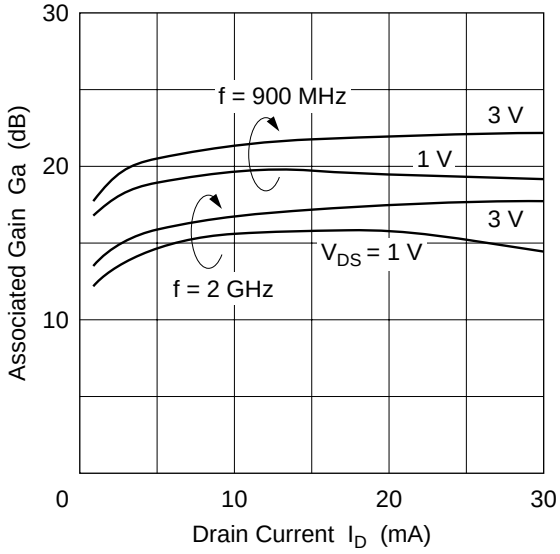
Forward Transfer Admittance vs. Gate to Source Voltage



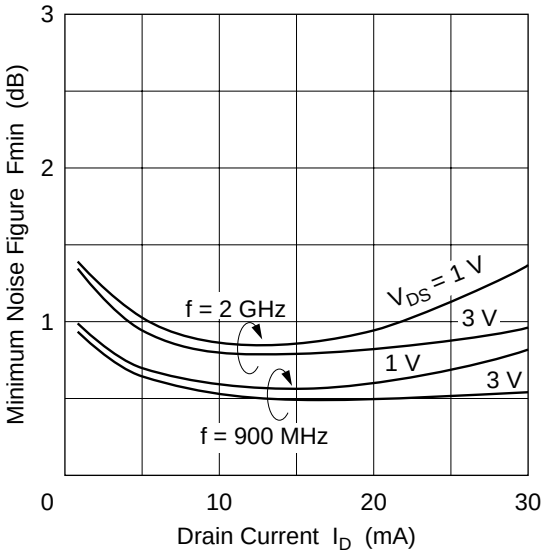
Forward Transfer Admittance vs. Drain Current



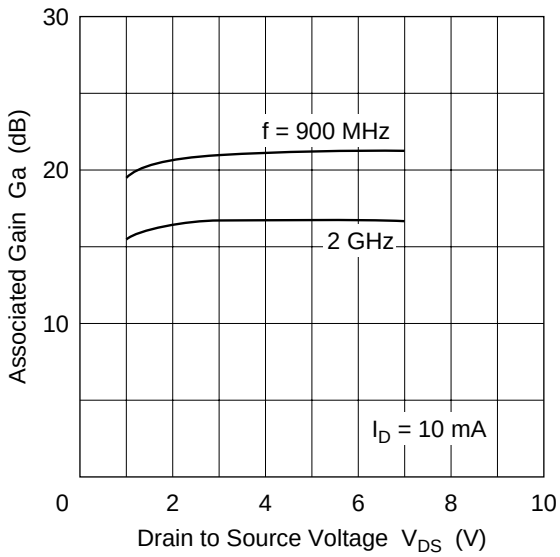
Associated Gain vs. Drain Current



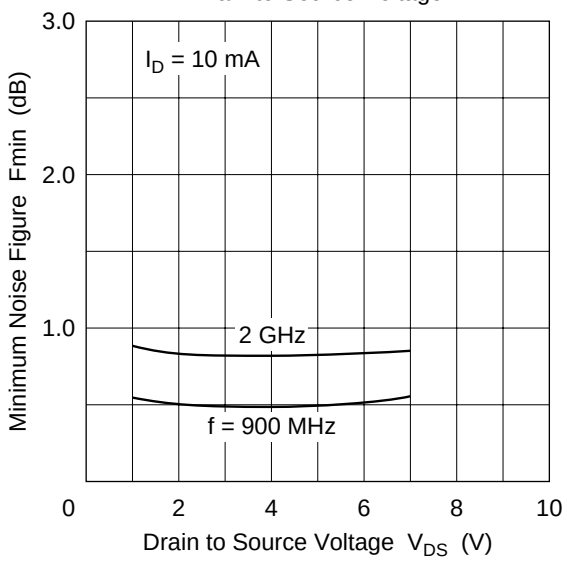
Minimum Noise Figure vs. Drain Current



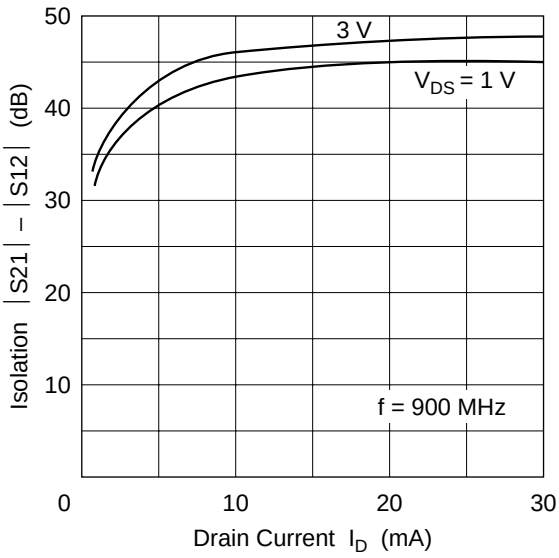
Associated Gain vs. Drain to Source Voltage



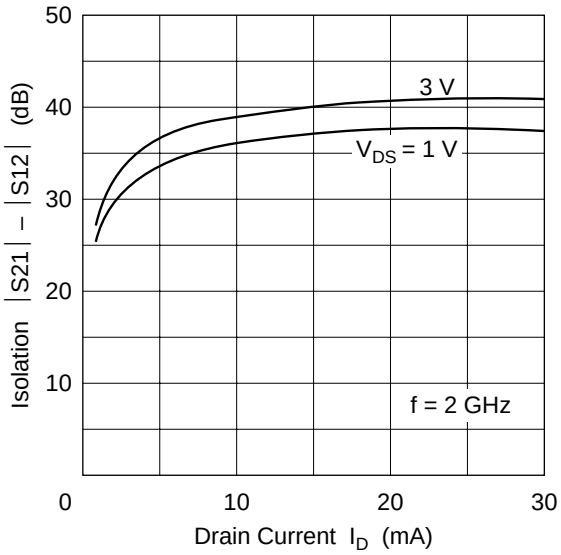
Minimum Noise Figure vs.
Drain to Source Voltage



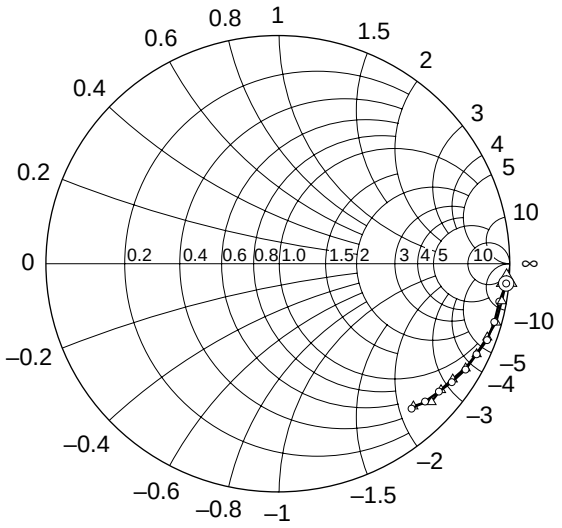
Isolation vs. Drain Current



Isolation vs. Drain Current

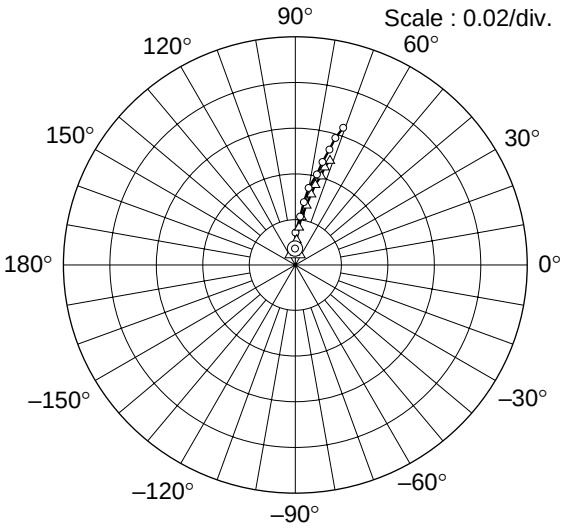


S11 Parameter vs. Frequency



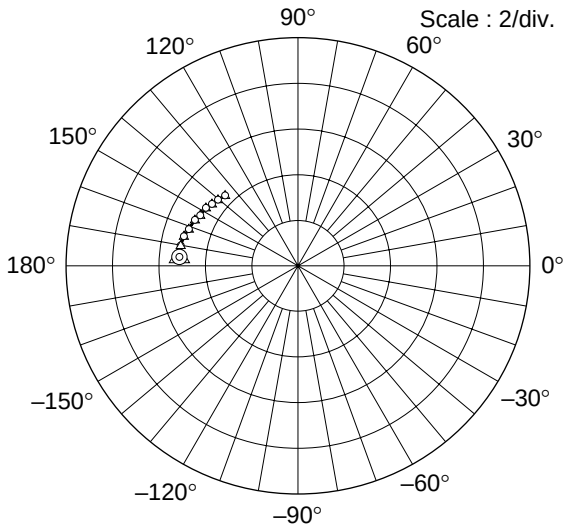
Condition : I_D = 10 mA, Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(V_{DS} = 1 V)
(V_{DS} = 3 V)

S12 Parameter vs. Frequency



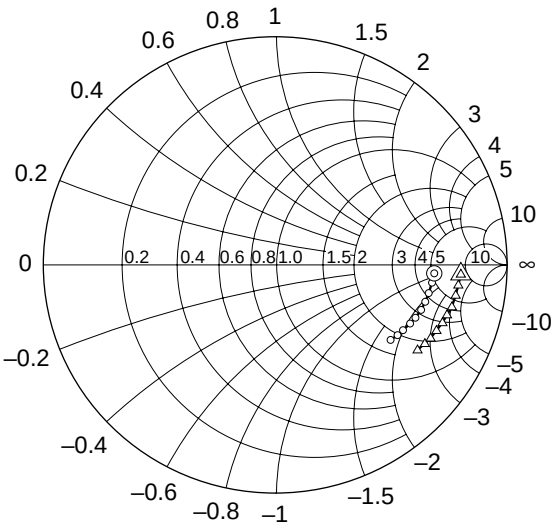
Condition : I_D = 10 mA, Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(V_{DS} = 1 V)
(V_{DS} = 3 V)

S21 Parameter vs. Frequency



Condition : I_D = 10 mA, Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(V_{DS} = 1 V)
(V_{DS} = 3 V)

S22 Parameter vs. Frequency



Condition : I_D = 10 mA, Zo = 50 Ω
200 to 2000 MHz (200 MHz step)
(V_{DS} = 1 V)
(V_{DS} = 3 V)

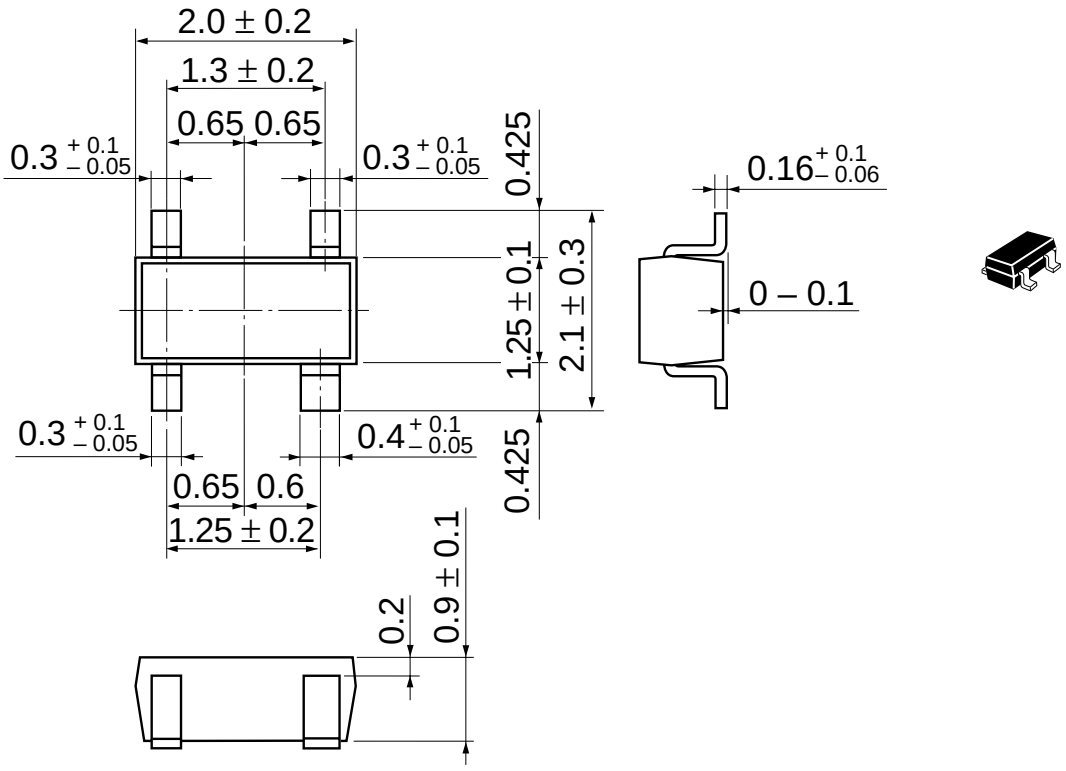
S Parameter (V_{DS} = 1 V, I_D = 10 mA, Z_O = 50)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.996	–4.8	5.12	175.8	0.00691	89.8	0.688	–3.2
400	0.980	–9.5	5.13	169.9	0.0143	88.2	0.682	–6.5
600	0.977	–15.0	5.07	165.4	0.0210	83.3	0.674	–10.6
800	0.970	–19.9	4.94	161.6	0.0276	81.5	0.668	–13.8
1000	0.952	–24.4	4.84	156.5	0.0399	79.3	0.658	–17.2
1200	0.938	–29.2	4.74	152.7	0.0404	76.0	0.648	–20.7
1400	0.916	–34.0	4.67	147.7	0.0462	74.8	0.636	–23.7
1600	0.896	–38.2	4.55	144.1	0.0523	73.1	0.622	–27.1
1800	0.882	–42.9	4.47	140.0	0.0578	72.0	0.611	–29.9
2000	0.859	–47.1	4.36	135.8	0.0630	70.3	0.597	–33.1

S Parameter (V_{DS} = 3 V, I_D = 10 mA, Z_O = 50 Ω)

Freq.	S11		S21		S12		S22	
(MHz)	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.	MAG.	ANG.
200	0.998	–4.0	5.13	175.8	0.00581	89.8	0.802	–3.2
400	0.988	–9.2	5.14	170.1	0.0110	85.5	0.796	–6.5
600	0.978	–14.5	5.08	165.2	0.0163	83.3	0.790	–9.8
800	0.968	–19.4	4.95	161.4	0.0216	82.0	0.783	–13.3
1000	0.953	–24.2	4.85	156.4	0.0363	79.2	0.774	–16.4
1200	0.937	–28.7	4.75	152.5	0.0312	76.5	0.764	–19.4
1400	0.917	–33.3	4.68	147.8	0.0358	75.3	0.753	–22.5
1600	0.900	–37.5	4.57	144.0	0.0401	73.2	0.742	–25.4
1800	0.883	–41.9	4.49	140.1	0.0442	72.8	0.731	–28.1
2000	0.858	–46.1	4.37	135.9	0.0477	71.4	0.718	–31.1

Unit: mm



Hitachi Code	CMPAK-4(T)
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.006 g

Datasheet Title

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