

SILICON POWER MOS FIELD EFFECT TRANSISTOR

2SK2597

N-CHANNEL SILICON POWER MOSFET FOR BASE STATION OF 900 MHz BAND CELLULAR PHONE POWER AMPLIFICATION

FEATURES

- High output, high gain
 $P_o = 100 \text{ W}$, $G_L = 13 \text{ dB}$ (TYP.) ($f = 900 \text{ MHz}$)
 $P_o = 90 \text{ W}$, $G_L = 12 \text{ dB}$ (TYP.) ($f = 960 \text{ MHz}$)
- Low intermodulation distortion
- Covers all base station frequencies such as 800-MHz PDC and GSM
- High-reliability gold electrodes
- Hermetic sealed package
- Internal matching circuit
- Push-pull structure

ABSOLUTE MAXIMUM RATINGS ($T_A = 25 \text{ }^\circ\text{C}$)

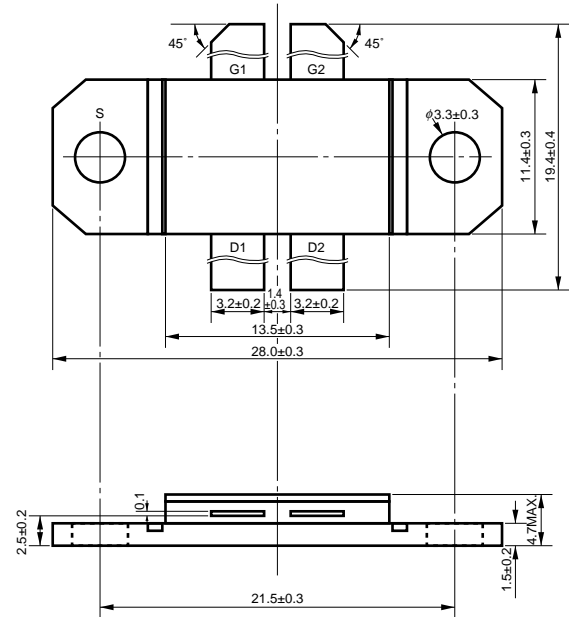
Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	7	V
Drain current (D.C.)	I_D	15 ^{Note}	A
Total power dissipation	P_T	290	W
Thermal resistance	R_{th}	0.6	$^\circ\text{C/W}$
Channel temperature	T_{ch}	200	$^\circ\text{C}$
Storage temperature	T_{stg}	-65 to +150	$^\circ\text{C}$

Note Per side

ELECTRICAL CHARACTERISTICS ($T_A = 25 \text{ }^\circ\text{C}$)

Parameter	Symbol	Condition	MIN.	TYP.	MAX.	Unit
Gate leakage current	I_{GSS}	$V_{GS} = 7 \text{ V}$			1	μA
Cut-off voltage	$V_{GS(off)}$	$V_{DS} = 5 \text{ V}$, $I_D = 50 \text{ mA}$	1.5		4	V
Drain current	I_{DSS}	$V_{DS} = 60 \text{ V}$			2	mA
Mutual conductance	g_m	$V_{DS} = 5 \text{ V}$, $I_D = 3 \text{ A}$, $\Delta I_D = 100 \text{ mA}$	2.0			S
Output power	P_o	$f = 960 \text{ MHz}$, $V_{DD} = 30 \text{ V}$	80	90		W
Drain efficiency	η_D	$I_{DQ} = 200 \text{ mA} \times 2$, $P_{in} = 40 \text{ dBm}$	35	40		%
Linear gain	G_L	$f = 960 \text{ MHz}$, $V_{DD} = 30 \text{ V}$ $I_{DQ} = 200 \text{ mA} \times 2$, $P_{in} = 30 \text{ dBm}$	11	12		dB
Third intermodulation distortion	IM_3	$f = 900 \text{ MHz}$, $\Delta f = 0.1 \text{ MHz}$, $V_{DD} = 30 \text{ V}$ $I_{DQ} = 200 \text{ mA} \times 2$, $P_o = 42 \text{ dBm}$		-38		dBc

PACKAGE DRAWING (Unit: mm)

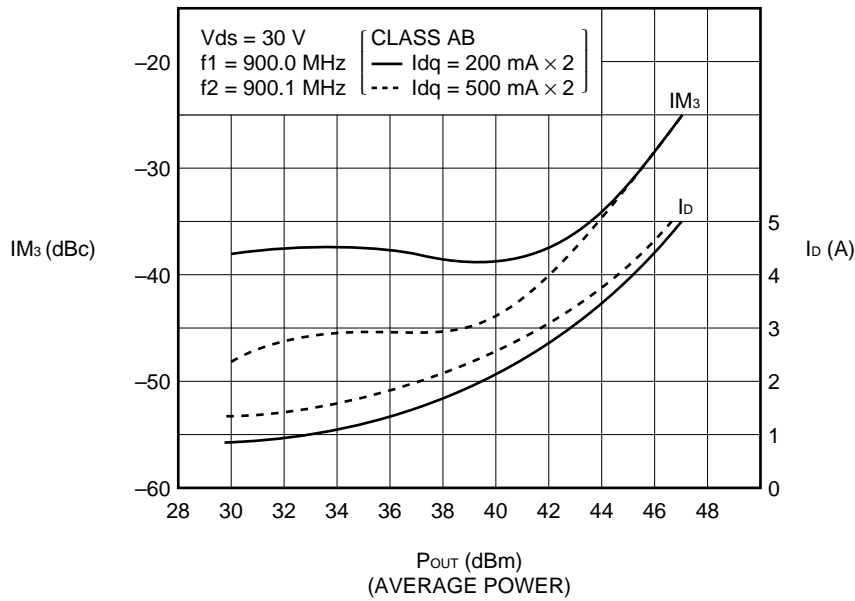


G1, G2: gate
D1, D2: drain
S : source
Flange is connected to the source.

The information in this document is subject to change without notice.

OUTPUT v.s. IM₃, I_D CHARACTERISTICS

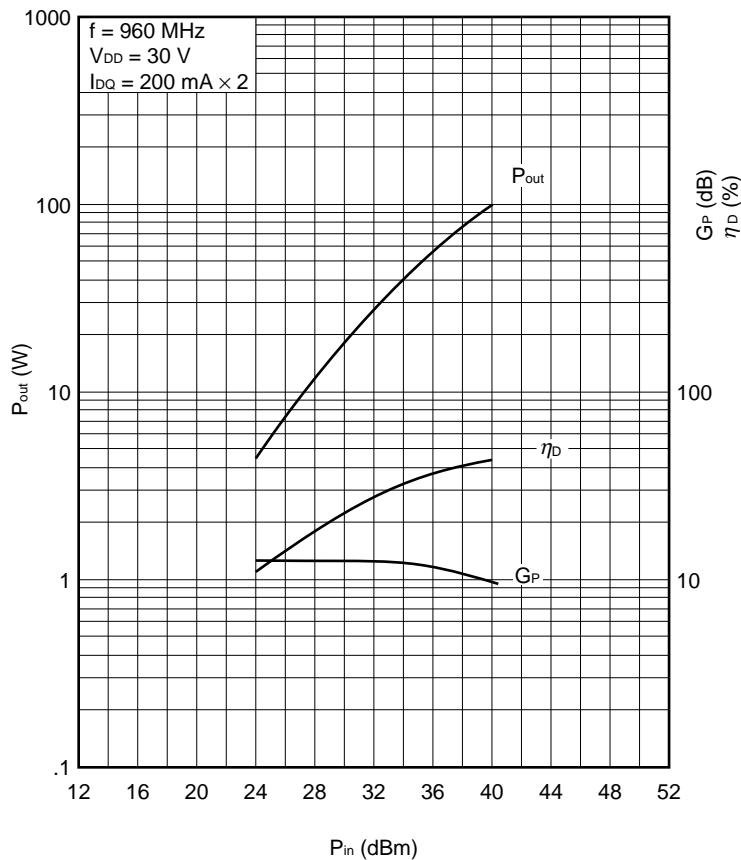
THIRD ORDER INTERMODULATION DISTORTION / DRAIN CURRENT v.s. OUTPUT POWER



INPUT v.s. OUTPUT, POWER GAIN, EFFICIENCY

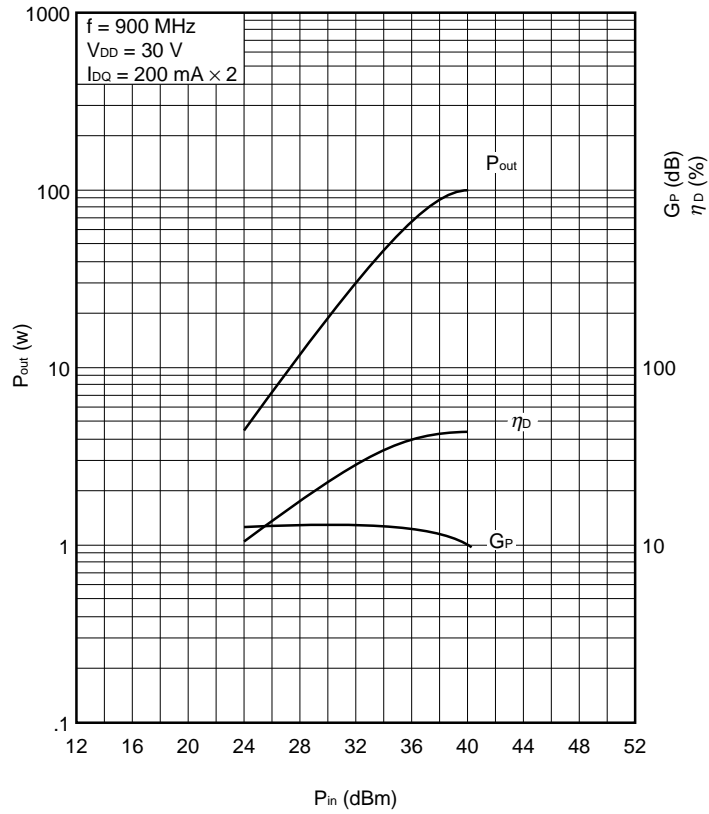
(1) f = 960 MHz

OUTPUT POWER / DRAIN EFFICIENCY / POWER GAIN vs. INPUT POWER



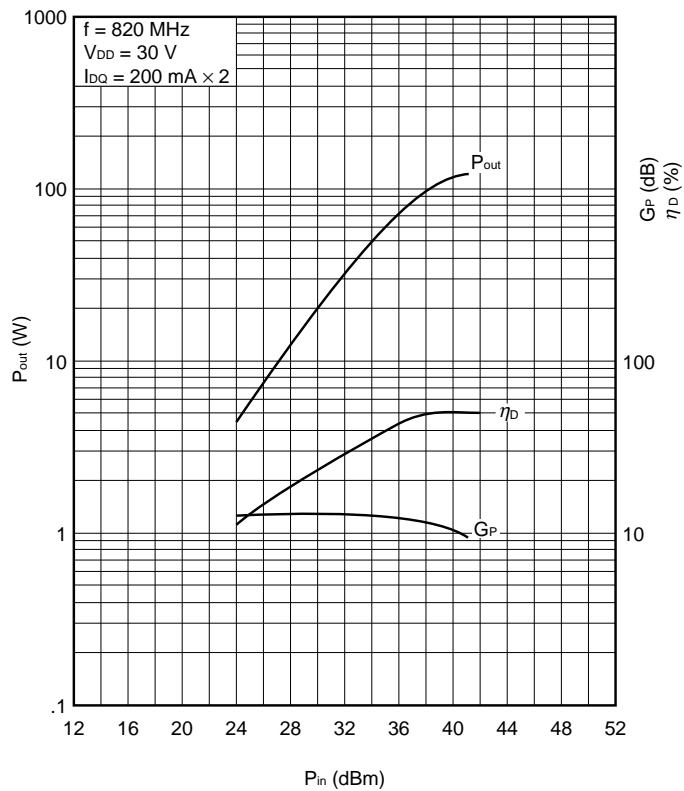
(2) $f = 900 \text{ MHz}$

OUTPUT POWER / DRAIN EFFICIENCY /
POWER GAIN vs. INPUT POWER

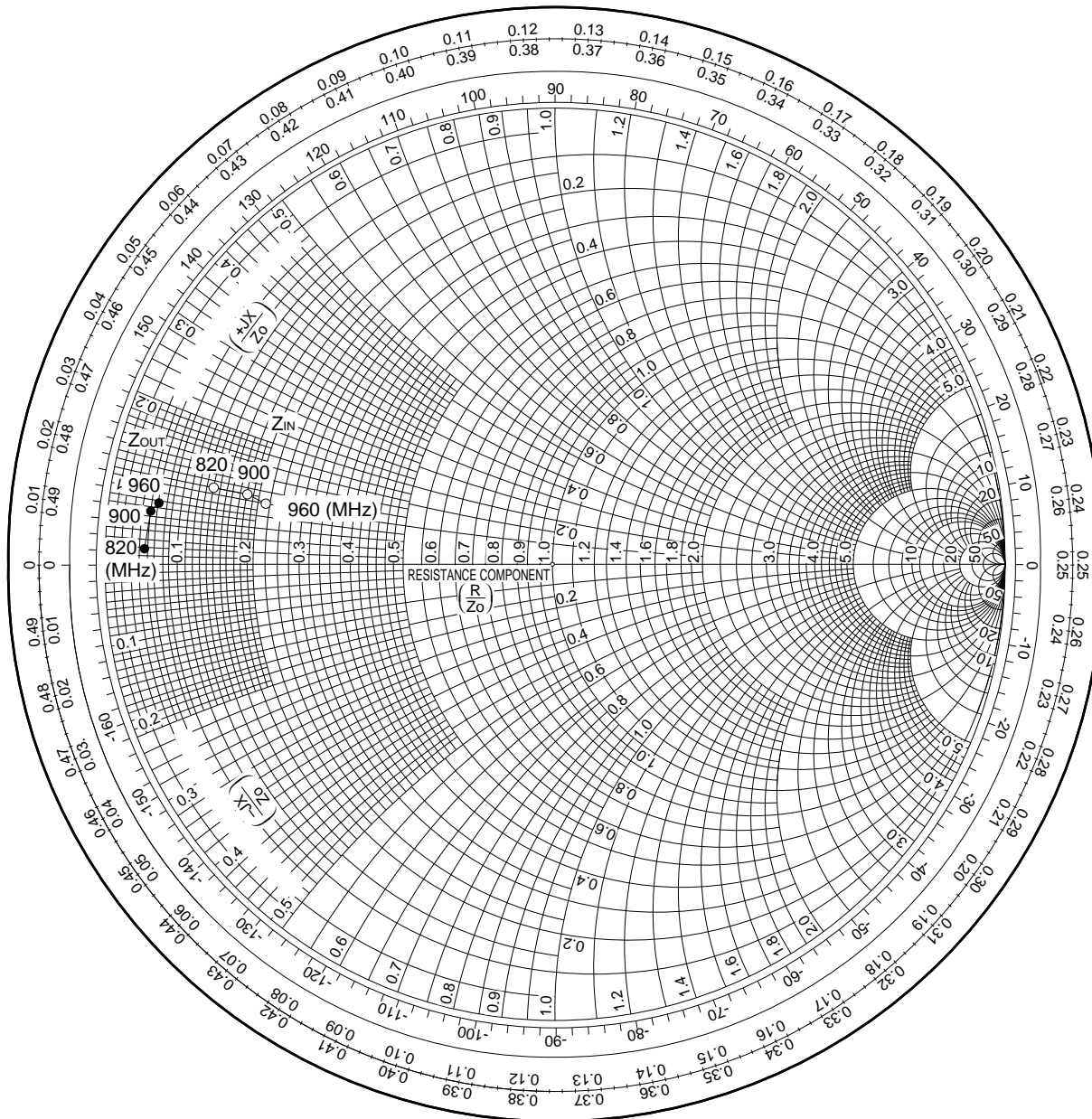


(3) $f = 820 \text{ MHz}$

OUTPUT POWER / DRAIN EFFICIENCY /
POWER GAIN vs. INPUT POWER



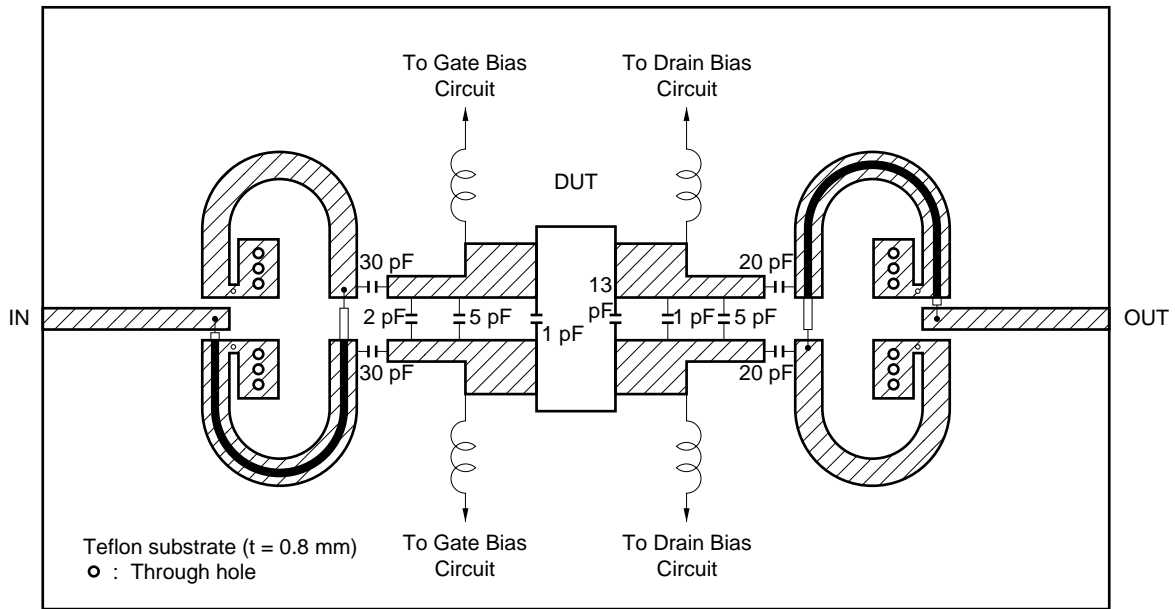
Z_{IN}, Z_{OUT}



V_{DD} = 30 V, I_{DQ} = 200 mA × 2, P_{in} = 40 dBm

f (MHz)	Z _{IN} (Ω)	Z _{OUT} (Ω)
820	6.52 + j5.52	2.34 + j0.91
900	8.86 + j5.49	2.78 + j3.23
960	10.36 + j4.79	2.95 + j3.37

APPLICATION CIRCUIT EXAMPLE (f = 960 MHz)



Notes on Handling

This product internally uses beryllie porcelain (beryllium oxide). If powder or vapor of beryllium oxide enters your respiratory organs, you will have a difficulty in breathing, which is dangerous. Therefore, do no disassemble or chemically process the product.

Be sure to abolish the product separately from general industrial wastes or garbage.

[MEMO]

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