

3SK183

GaAs N Channel MES FET

For UHF band low-noise amplification

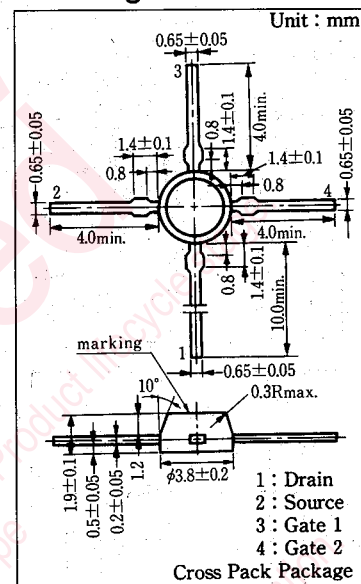
■ Features

- Low noise figure NF
- Low small-signal short-circuit input capacitance C_{iss}
- Low-voltage operation possible

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

Item	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	13	V
Gate 1-Source Voltage	V_{G1S}	-6	V
Gate 2-Source Voltage	V_{G2S}	-6	V
Drain Current	I_D	50	mA
Gate 1 Current	I_{G1}	1	mA
Gate 2 Current	I_{G2}	1	mA
Power Dissipation	P_D	350	mW
Channel Temperature	T_{ch}	135	$^\circ\text{C}$
Storage Temperature	T_{stg}	-55 ~ +135	$^\circ\text{C}$

■ Package Dimensions



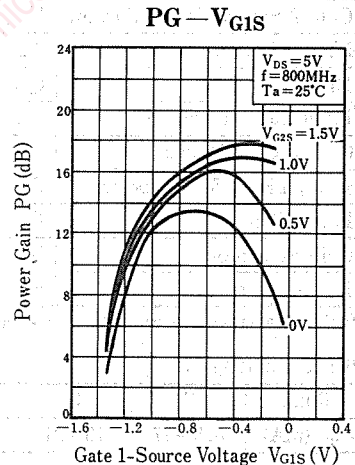
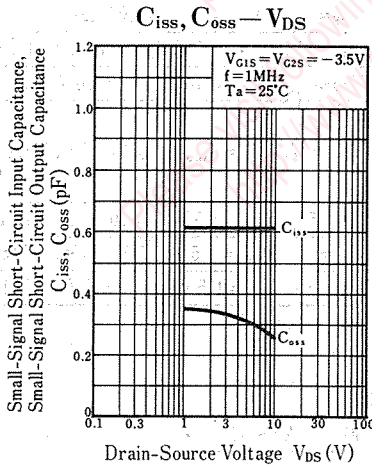
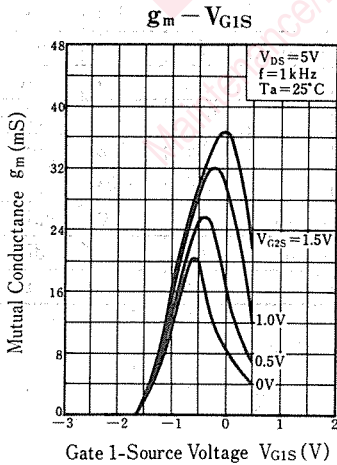
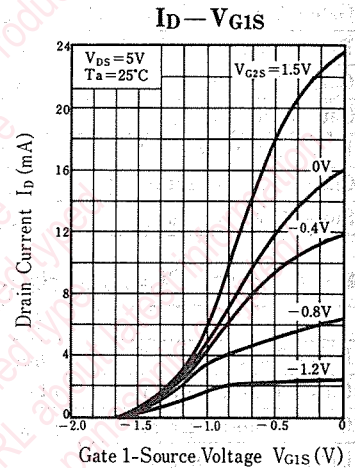
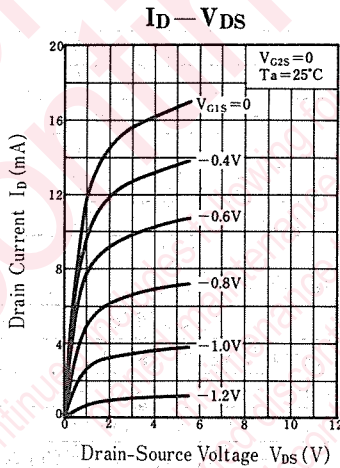
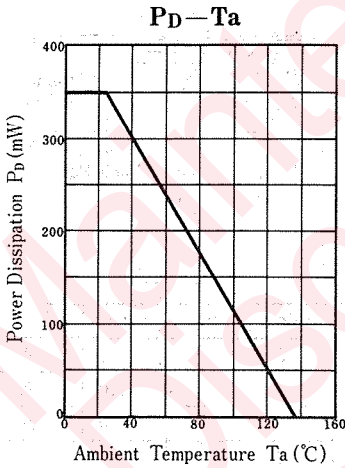
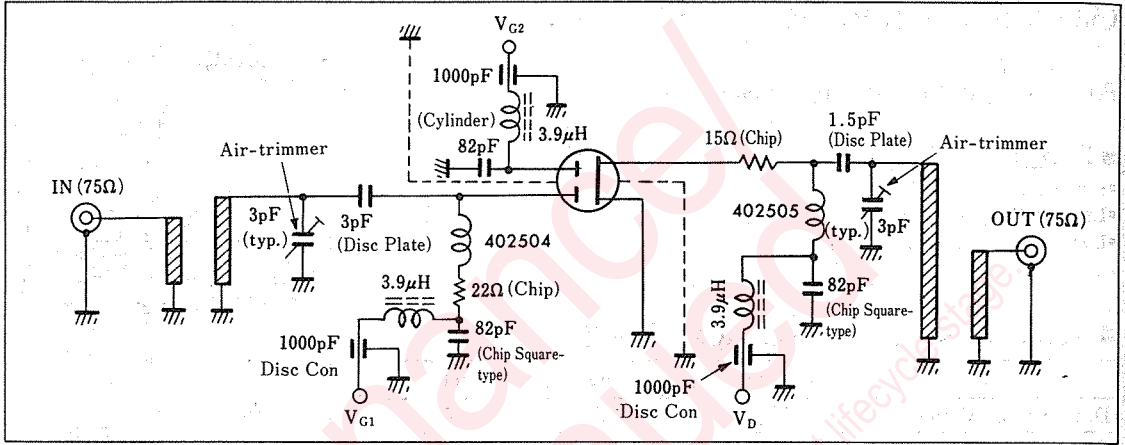
■ Electrical Characteristics ($T_a=25^\circ\text{C}$)

Item	Symbol	Condition	min.	typ.	max.	Unit
Drain Current	$I_{DSS}^{*1 *2}$	$V_{DS}=5\text{ V}, V_{G1S}=V_{G2S}=0$	8.5		35	mA
Gate 1 Cutoff Current	I_{G1SS}^{*1}	$V_{G1S}=-6\text{ V}, V_{DS}=V_{G2S}=0$			-20	μA
Gate 2 Cutoff Current	I_{G2SS}^{*1}	$V_{G2S}=-6\text{ V}, V_{DS}=V_{G1S}=0$			-20	μA
Drain-Source Voltage	V_{DSX}^{*1}	$V_{G1S}=-3.5\text{ V}, V_{G2S}=0, I_D=50\ \mu\text{A}$	13			V
Gate 1 Source Cutoff Current	V_{G1SC}^{*1}	$V_{DS}=5\text{ V}, V_{G2S}=0, I_D=200\ \mu\text{A}$			-6.0	V
Gate 2 Source Cutoff Current	V_{G2SC}^{*1}	$V_{DS}=5\text{ V}, V_{G1S}=0, I_D=200\ \mu\text{A}$			-6.0	V
Mutual Conductance	g_m	$V_{DS}=5\text{ V}, V_{G2S}=1.5\text{ V}, I_D=10\text{ mA}, f=1\text{ kHz}$	18	23		mS
Drain Current	I_{G2DO}^{*1}	$V_{G2D}=-13\text{ V}, (\text{Gate1 to source: Open})$			50	μA
Input Capacitance	C_{iss}^{*1}	$V_{DS}=5\text{ V}, V_{G1S}=V_{G2S}=-6.0\text{ V}, f=1\text{ MHz}$		0.6	2.0	pF
Output Capacitance	C_{oss}^{*1}			0.35	1.2	pF
Small-Signal Reverse Transfer Capacitance	C_{rss}^{*1}			0.02	0.04	pF
Power Gain	PG^{*3}	$V_{DS}=5\text{ V}, V_{G2S}=1.5\text{ V}, I_D=10\text{ mA}, f=800\text{ MHz}$	13	16	20	dB
Gain Reduction	G_R^{*3}	$V_{DS}=5\text{ V}, V_{AGC}=1.5/-3.5\text{ V}, f=800\text{ MHz}$	37	45		dB
Noise Figure	NF^{*3}	$V_{DS}=5\text{ V}, V_{G2S}=1.5\text{ V}, I_D=10\text{ mA}, f=800\text{ MHz}$		1.2	2.8	dB

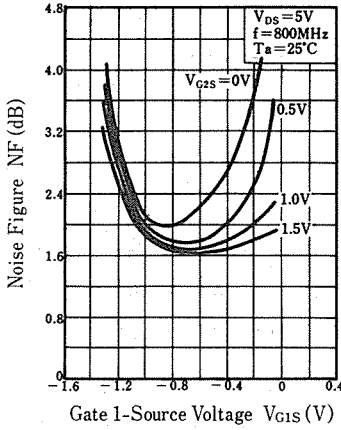
*1 Insert a serial resistor 33k Ω at Gate1 and Gate2, respectively.*2 I_{DSS} Ranking

Rank	P	Q	R	S
$I_{DSS}(\text{mA})$	8.5~17	15~21	19~30	25~35

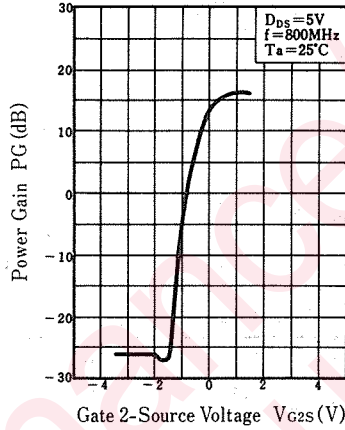
*3 PG, NF Measuring Circuit (f=800MHz)



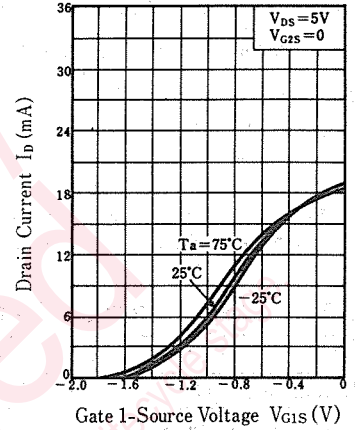
NF - V_{G1S}



PG - V_{G2S}



I_D - V_{G1S}



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