

3SK139

Silicon N Channel 4-pole MOS Type

For UHF/VHF high-gain low-noise amplification

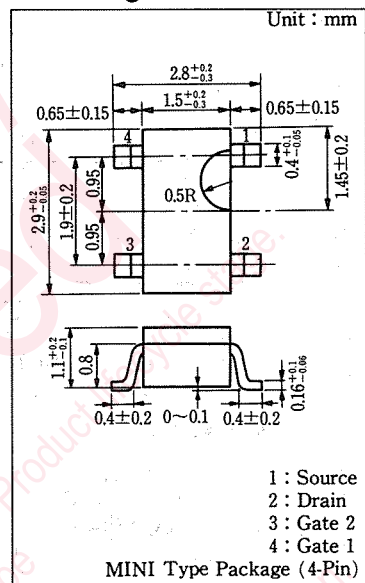
■ Features

- Low noise figure NF
- Large power gain PG
- A MINI type package that allows downsizing of equipment and automatic insertion by taping and magazine packaging

■ Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	15	V
Gate 1-Source Voltage	V_{G1S}	± 8	V
Gate 2-Source Voltage	V_{G2S}	± 8	V
Drain Current	I_D	30	mA
Power Dissipation	P_D	150	mW
Channel Temperature	T_{ch}	150	°C
Storage Temperature	T_{stg}	-55 ~ +150	°C

■ Package Dimensions



■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Condition	min.	typ.	max.	Unit
Drain Current	I_{DSS}^{*1}	$V_{DS}=10\text{ V}, V_{G1S}=0\text{ V}, V_{G2S}=4\text{ V}$	1.0		11.0	mA
Gate 1 Cutoff Current	I_{G1SS}	$V_{DS}=0, V_{G2S}=0, V_{G1S}=\pm 8\text{ V}$			± 20	nA
Gate 2 Cutoff Current	I_{G2SS}	$V_{DS}=0, V_{G1S}=0, V_{G2S}=\pm 8\text{ V}$			± 20	nA
Drain-Source Voltage	V_{DSX}	$I_D=50\text{ }\mu\text{A}, V_{G1S}=-5\text{ V}, V_{G2S}=0$	15			V
Gate 1 Source Cutoff Current	V_{G1SC}	$V_{DS}=10\text{ V}, V_{G2S}=4\text{ V}, I_D=100\text{ }\mu\text{A}$	-3.0		+0.5	V
Gate 2 Source Cutoff Current	V_{G2SC}	$V_{DS}=10\text{ V}, V_{G1S}=0, I_D=100\text{ }\mu\text{A}$	-1.5		+1.5	V
Forward Transfer Admittance (Common Source)	$ Y_{fs} $	$V_{DS}=10\text{ V}, I_D=10\text{ mA}, V_{G2S}=4\text{ V}, f=1\text{ kHz}$	12	20	28	mS
Input Capacitance	C_{iss}	$V_{DS}=10\text{ V}, V_{G1S}=V_{G2S}=-5\text{ V}, f=1\text{ MHz}$	1.8	2.3	2.8	pF
Δ Input Capacitance	ΔC_{iss}	$V_{DS}=8\text{ V}, V_{G1S}=-5\text{ V}, V_{G2S}=-1\text{ V},$ $V_{DS}=8\text{ V}, V_{G1S}=-1.4\text{ V}, V_{G2S}=-1.6\text{ V}$			+0.2 -0.05	pF
Output Capacitance	C_{oss}	$V_{DS}=10\text{ V}, V_{G1S}=V_{G2S}=-5\text{ V}, f=1\text{ MHz}$	0.6	1.0	1.4	pF
Small-Signal Reverse Transfer Capacitance	C_{rss}	$V_{DS}=10\text{ V}, V_{G1S}=V_{G2S}=-5\text{ V}, f=1\text{ MHz}$		0.02		pF
Power Gain	PG_1^{*2}	$V_{DS}=8\text{ V}, I_D=8\text{ mA}, V_{G2S}=3\text{ V}$	20	22	24	dB
Noise Figure	NF_1^{*2}	$f=50\sim 60\text{ MHz (Sweep)}$		2.0	3.2	dB
Power Gain	PG_2^{*2}	$V_{DS}=8\text{ V}, I_D=8\text{ mA}, V_{G2S}=3\text{ V}$	22	24	26	dB
Noise Figure	NF_2^{*2}	$f=190\sim 210\text{ MHz (Sweep)}$		1.2	2.0	dB
Power Gain	PG_3^{*2}	$V_{DS}=8\text{ V}, I_D=8\text{ mA}, V_{G2S}=3\text{ V}$	13	15	17	dB
Noise Figure	NF_3^{*2}	$f=490\sim 510\text{ MHz (Sweep)}$		2.8	4.5	dB
Gain Reduction	G_R^{*2}	$V_{DS}=8\text{ V}, V_{G2S}=-1.4\text{ V}, f=500\text{ MHz},$ $V_{G1S}=-1.6\text{ V}, \text{Gain max.}$	45			dB

*1 I_{DSS} Ranking

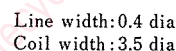
Rank	P	Q
$I_{DSS}(\text{mA})$	1~10	5~11
Marking	3 BP	3 BQ

■ Type Name Marking (Example)

Type No. I_{DSS} Ranking

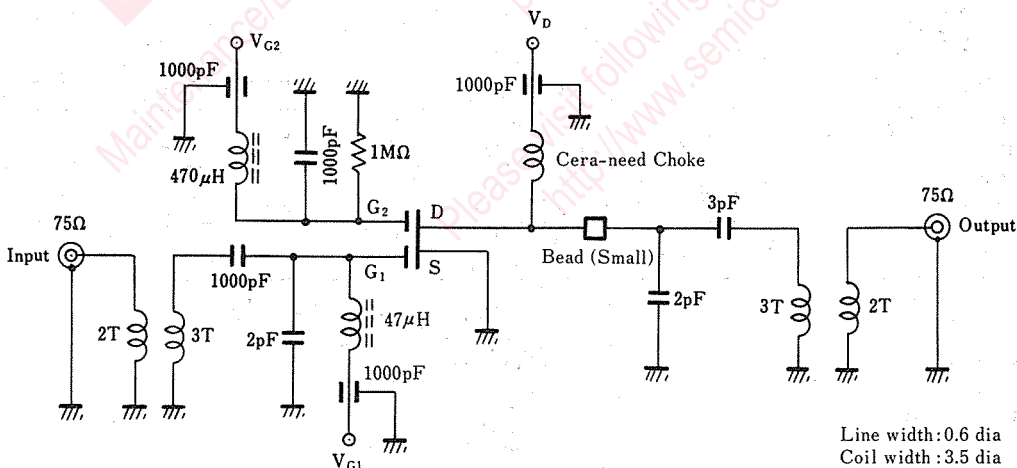


1) $f = 55 \text{ MHz}$ (PG_1, NF_1)

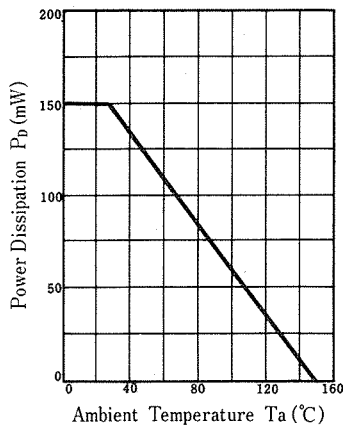
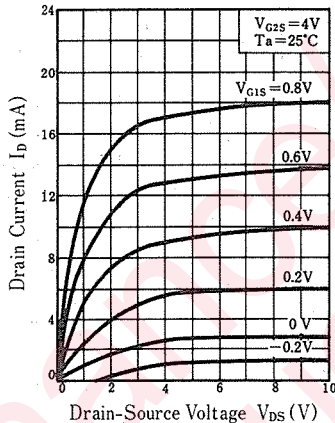
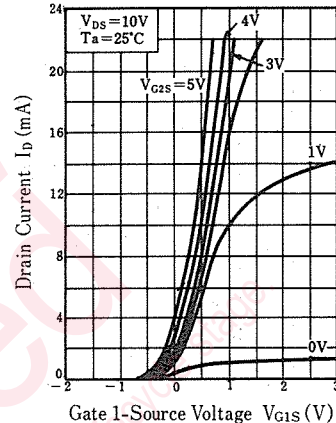
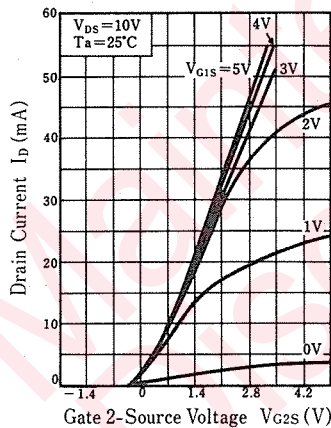
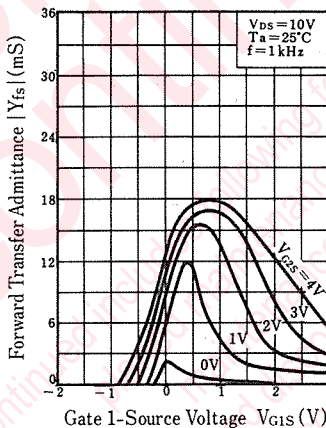
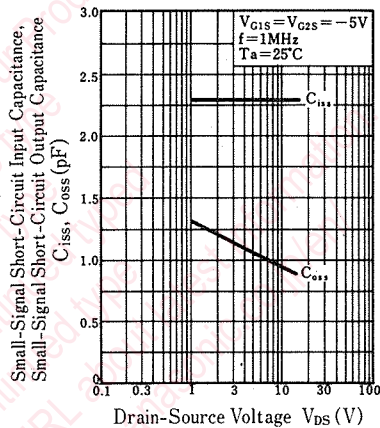
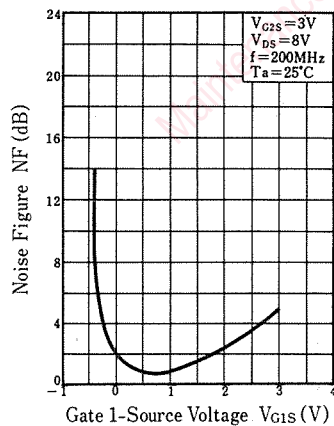
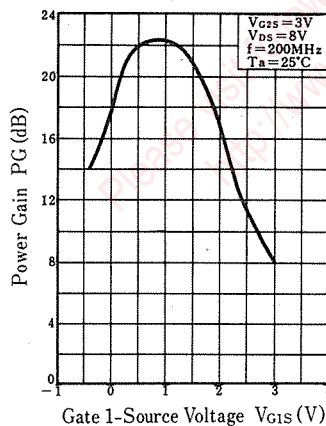
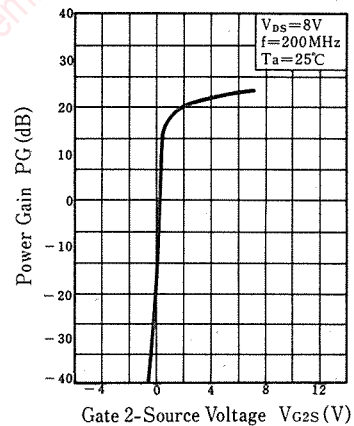


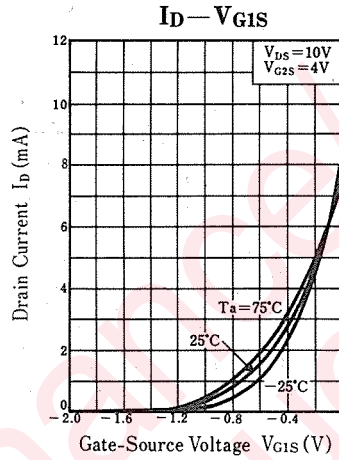
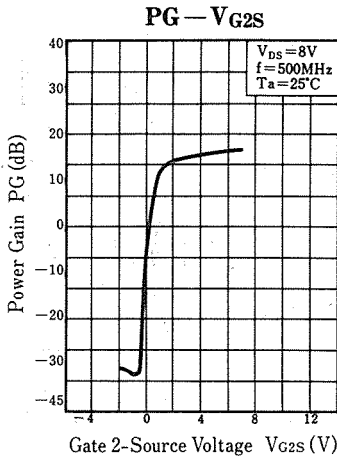
Line width: 0.6 dia
Coil width: 3.5 dia

Line width: 0.6 dia
Coil width: 3.5 dia



Line width: 0.6 dia
Coil width : 3.5 dia

$P_D - T_a$  $I_D - V_{DS}$  $I_D - V_{G1S}$  $I_D - V_{G2S}$  $|Y_{fs}| - V_{G1S}$  $C_{iss}, C_{oss} - V_{DS}$ NF - V_{G1S} PG - V_{G1S} PG - V_{G2S} 



Request for your special attention and precautions in using the technical information and semiconductors described in this book

- (1) If any of the products or technical information described in this book is to be exported or provided to non-residents, the laws and regulations of the exporting country, especially, those with regard to security export control, must be observed.
- (2) The technical information described in this book is intended only to show the main characteristics and application circuit examples of the products. No license is granted in and to any intellectual property right or other right owned by Panasonic Corporation or any other company. Therefore, no responsibility is assumed by our company as to the infringement upon any such right owned by any other company which may arise as a result of the use of technical information described in this book.
- (3) The products described in this book are intended to be used for standard applications or general electronic equipment (such as office equipment, communications equipment, measuring instruments and household appliances).
Consult our sales staff in advance for information on the following applications:
 - Special applications (such as for airplanes, aerospace, automobiles, traffic control equipment, combustion equipment, life support systems and safety devices) in which exceptional quality and reliability are required, or if the failure or malfunction of the products may directly jeopardize life or harm the human body.
 - Any applications other than the standard applications intended.
- (4) The products and product specifications described in this book are subject to change without notice for modification and/or improvement. At the final stage of your design, purchasing, or use of the products, therefore, ask for the most up-to-date Product Standards in advance to make sure that the latest specifications satisfy your requirements.
- (5) When designing your equipment, comply with the range of absolute maximum rating and the guaranteed operating conditions (operating power supply voltage and operating environment etc.). Especially, please be careful not to exceed the range of absolute maximum rating on the transient state, such as power-on, power-off and mode-switching. Otherwise, we will not be liable for any defect which may arise later in your equipment.
 - ☐ Even when the products are used within the guaranteed values, take into the consideration of incidence of break down and failure mode, possible to occur to semiconductor products. Measures on the systems such as redundant design, arresting the spread of fire or preventing glitch are recommended in order to prevent physical injury, fire, social damages, for example, by using the products.
- (6) Comply with the instructions for use in order to prevent breakdown and characteristics change due to external factors (ESD, EOS, thermal stress and mechanical stress) at the time of handling, mounting or at customer's process. When using products for which damp-proof packing is required, satisfy the conditions, such as shelf life and the elapsed time since first opening the packages.
- (7) This book may be not reprinted or reproduced whether wholly or partially, without the prior written permission of our company.