

N-channel silicon field-effect transistors

PMBFJ308/309/310

FEATURES

- Low noise
- Interchangeability of drain and source connections
- High gain.

DESCRIPTION

Silicon symmetrical n-channel junction FETs in a SOT23 envelope. They are intended for use in VHF amplifiers, the AM input stage of car radios, oscillators and mixers.

PINNING - SOT23

PIN	DESCRIPTION
1	source
2	drain
3	gate

PIN CONFIGURATION

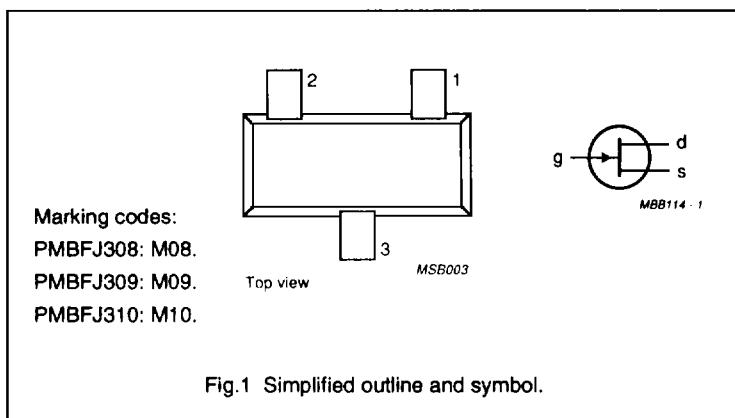


Fig.1 Simplified outline and symbol.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$\pm V_{DS}$	drain-source voltage		-	25	V
I_{DSS}	drain current	$V_{DS} = 10 \text{ V};$ $V_{GS} = 0$	12	60	mA
	PMBFJ308		12	30	mA
	PMBFJ309		24	60	mA
	PMBFJ310				
P_{tot}	total power dissipation	up to $T_{amb} = 25^\circ\text{C}$	-	250	mW
$-V_{GS(off)}$	gate-source cut-off voltage	$V_{DS} = 10 \text{ V};$ $I_D = 1 \mu\text{A}$	1	6.5	V
	PMBFJ308		1	4	V
	PMBFJ309		2	6.5	V
	PMBFJ310				
$ Y_{Is} $	common-source transfer admittance	$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA}$	10	-	mS

N-channel silicon field-effect transistors

PMBFJ308/309/310

LIMITING VALUES

In accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$\pm V_{DS}$	drain-source voltage		-	25	V
$-V_{GSO}$	gate-source voltage		-	25	V
$-V_{GDO}$	gate-drain voltage		-	25	V
I_G	forward gate current	DC value	-	50	mA
P_{tot}	total power dissipation	up to $T_{amb} = 25^\circ\text{C}$	-	250	mW
T_{stg}	storage temperature range		-65	150	$^\circ\text{C}$
T_j	junction temperature		-	150	$^\circ\text{C}$

THERMAL RESISTANCE

SYMBOL	PARAMETER	VALUE	UNIT
$R_{th\ j-a}$	from junction to ambient (note 1)	500	K/W

Note

1. Device mounted on an FR4 printed-circuit board.

N-channel silicon field-effect transistors

PMBFJ308/309/310

STATIC CHARACTERISTICS $T_j = 25^\circ\text{C}$.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$-V_{(\text{BR})\text{GSS}}$	gate-source breakdown voltage	$-I_G = 1 \mu\text{A}$ $V_{DS} = 0$	25	-		V
I_{DSS}	drain current PMBFJ308 PMBFJ309 PMBFJ310	$V_{DS} = 10 \text{ V}$; $V_{GS} = 0$	12	-	60	mA
			12	-	30	mA
			24	-	60	mA
$-I_{GSS}$	reverse gate leakage current	$-V_{GS} = 15 \text{ V}$; $V_{DS} = 0$	-	-	1	nA
V_{GSS}	gate-source forward voltage	$V_{DS} = 0$; $I_G = 1 \text{ mA}$	-	-	1	V
$-V_{GS(\text{off})}$	gate-source cut-off voltage PMBFJ308 PMBFJ309 PMBFJ310	$V_{DS} = 10 \text{ V}$; $I_D = 1 \mu\text{A}$	1	-	6.5	V
			1	-	4	V
			2	-	6.5	V
$R_{DS(on)}$	drain-source on-resistance	$V_{DS} = 100 \text{ mV}$; $V_{GS} = 0$	-	50	-	Ω
$ Y_{fs} $	common-source transfer admittance	$V_{DS} = 10 \text{ V}$; $I_D = 10 \text{ mA}$	10	-	-	mS
$ Y_{os} $	common-source output admittance	$V_{DS} = 10 \text{ V}$; $I_D = 10 \text{ mA}$	-	-	250	μS

N-channel silicon field-effect transistors

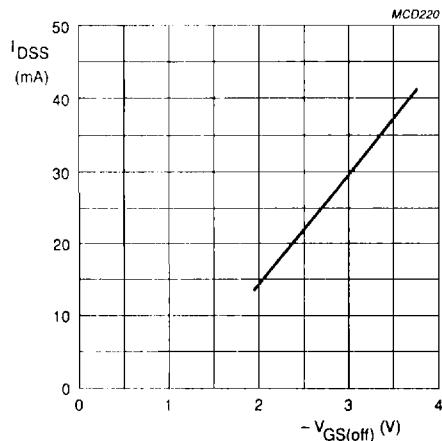
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DYNAMIC CHARACTERISTICS $T_j = 25^\circ\text{C}$.

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
C_{is}	input capacitance	$V_{DS} = 10 \text{ V};$ $-V_{GS} = 10 \text{ V};$ $f = 1 \text{ MHz}$	3	5	pF
		$V_{DS} = 10 \text{ V};$ $-V_{GS} = 0;$ $T_{amb} = 25^\circ\text{C}$	6	—	pF
C_{rs}	feedback capacitance	$V_{DS} = 0;$ $-V_{GS} = 10 \text{ V};$ $f = 1 \text{ MHz}$	1.3	2.5	pF
g_{is}	common-source input conductance	$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 100 \text{ MHz}$	200	—	μS
		$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 450 \text{ MHz}$	3	—	mS
g_{ts}	common-source transfer conductance	$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 100 \text{ MHz}$	13	—	mS
		$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 450 \text{ MHz}$	12	—	mS
$-g_{rf}$	common-source feedback conductance	$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 100 \text{ MHz}$	30	—	μS
		$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 450 \text{ MHz}$	450	—	μS
g_{os}	common-source output conductance	$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 100 \text{ MHz}$	150	—	μS
		$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 450 \text{ MHz}$	400	—	μS
e_n	equivalent input noise voltage	$V_{DS} = 10 \text{ V};$ $I_D = 10 \text{ mA};$ $f = 100 \text{ Hz}$	6	—	$\frac{nV}{\sqrt{\text{Hz}}}$

N-channel silicon field-effect transistors

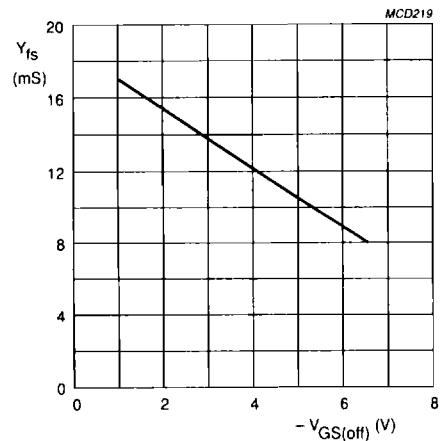
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$V_{DS} = 10$ V; $T_j = 25$ °C.

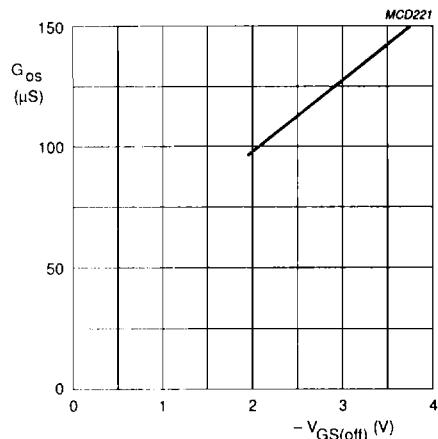
Fig.2 Drain current as a function of gate-source cut-off voltage.



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$V_{DS} = 10$ V; $I_D = 10$ mA; $T_j = 25$ °C.

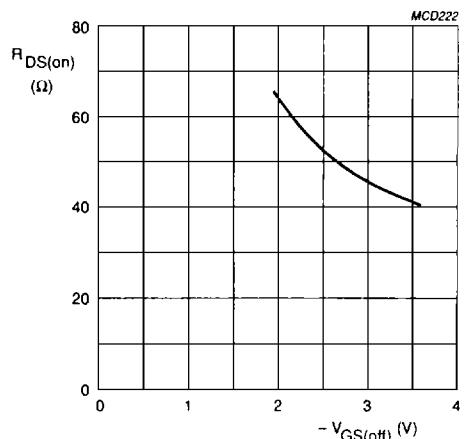
Fig.3 Common-source transfer admittance as a function of gate-source cut-off voltage.



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$V_{DS} = 10$ V; $I_D = 10$ mA; $T_j = 25$ °C.

Fig.4 Common-source output conductance as a function of gate-source cut-off voltage.



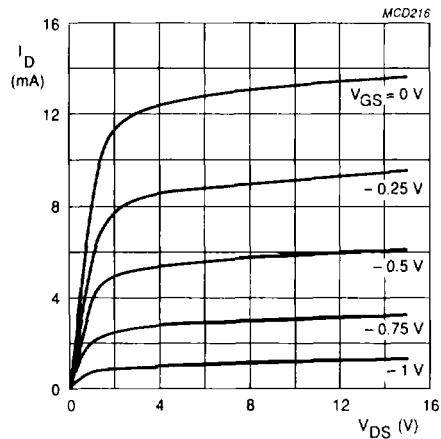
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$V_{DS} = 0.1$ V; $V_{GS} = 0$; $T_j = 25$ °C.

Fig.5 Drain-source on resistance as a function of gate-source cut-off voltage.

N-channel silicon field-effect transistors

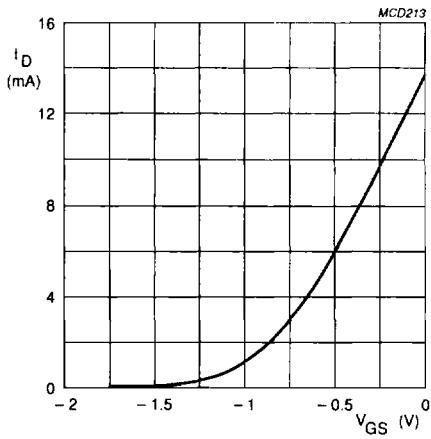
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PMBFJ308.

$T_j = 25^\circ\text{C}$.

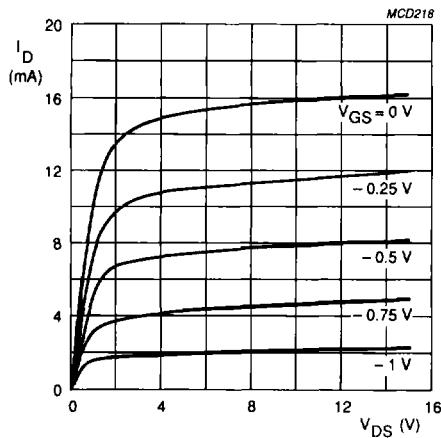
Fig.6 Output characteristics, typical values.



PMBFJ308.

$V_{DS} = 10\text{ V}; T_j = 25^\circ\text{C}$.

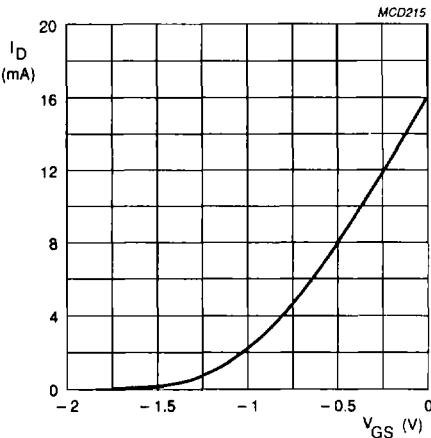
Fig.7 Input characteristics, typical values.



PMBFJ309.

$T_j = 25^\circ\text{C}$.

Fig.8 Output characteristics, typical values.



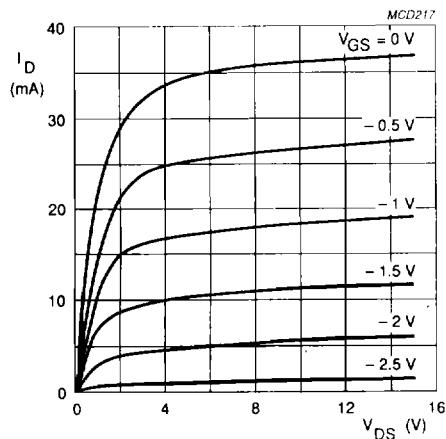
PMBFJ309.

$V_{DS} = 10\text{ V}; T_j = 25^\circ\text{C}$.

Fig.9 Input characteristics, typical values.

N-channel silicon field-effect transistors

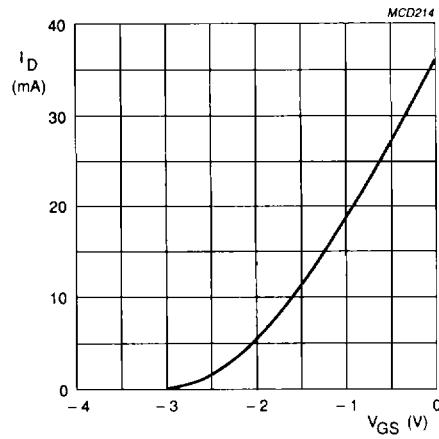
PMBFJ308/309/310



PMBFJ310.

$T_j = 25^\circ\text{C}$.

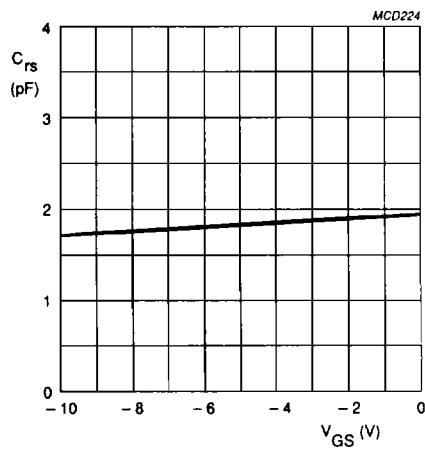
Fig.10 Output characteristics, typical values.



PMBFJ310.

$V_{DS} = 10 \text{ V}; T_j = 25^\circ\text{C}$.

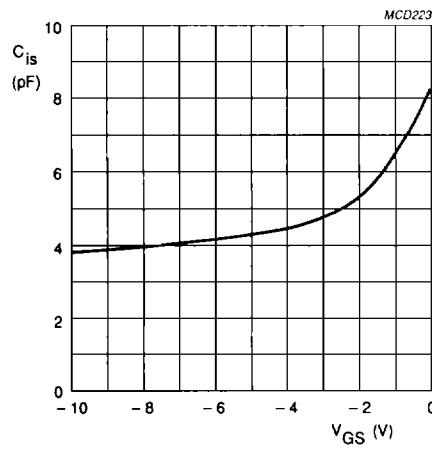
Fig.11 Input characteristics, typical values.



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$V_{DS} = 10 \text{ V}; T_j = 25^\circ\text{C}$.

Fig.12 Feedback capacitance, typical values.



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$V_{DS} = 10 \text{ V}; T_j = 25^\circ\text{C}$.

Fig.13 Input capacitance, typical values.

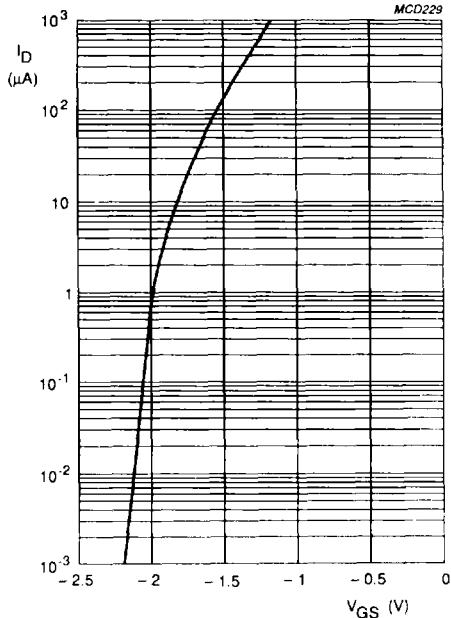
**N-channel silicon field-effect
transistors****PMBFJ308/309/310****PMBFJ308, 309 & 310.** $V_{DS} = 10$ V; $T_J = 25$ °C.

Fig.14 Drain current as a function of
gate-source voltage, typical values.

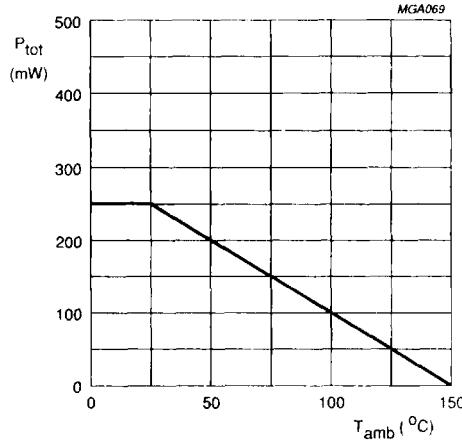
**PMBFJ308, 309 & 310.**

Fig.15 Power derating curve.

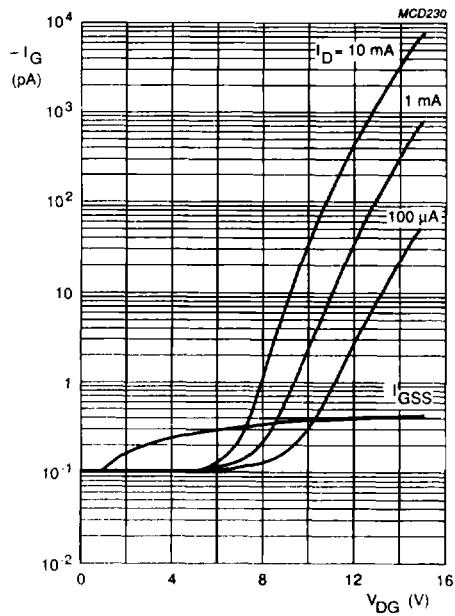
**N-channel silicon field-effect
transistors****PMBFJ308/309/310****PMBFJ308, 309 & 310.** $T_j = 25^\circ\text{C}$.

Fig.16 Gate current as a function of drain-gate voltage, typical values.

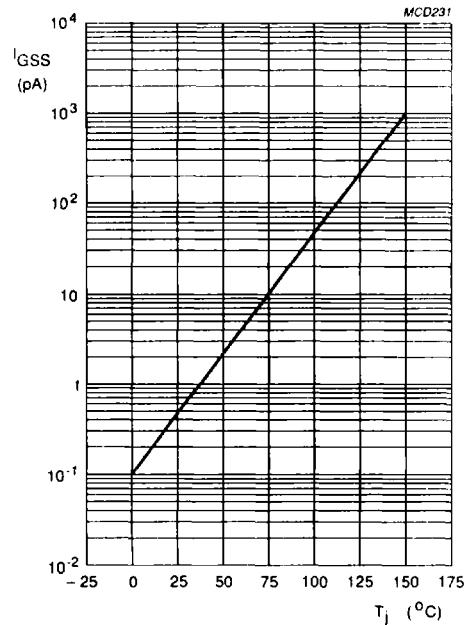
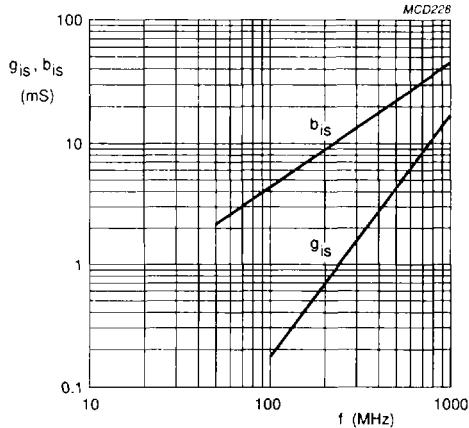
**PMBFJ308, 309 & 310.**

Fig.17 Gate current as a function of junction temperature, typical values.

N-channel silicon field-effect transistors

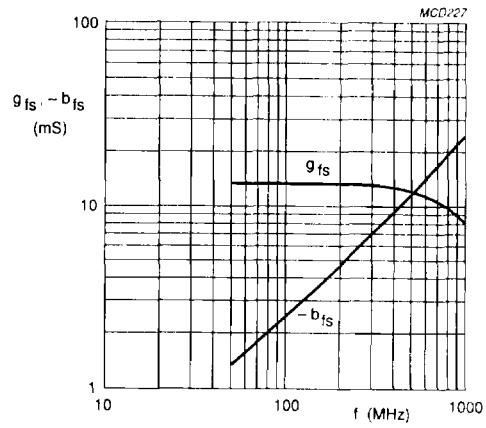
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$V_{DS} = 10$ V; $I_D = 10$ mA; $T_{amb} = 25$ °C.

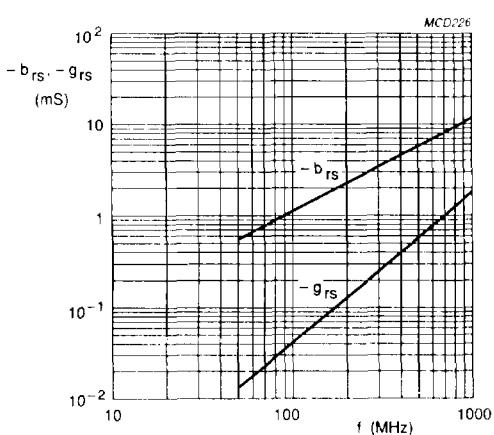
Fig.18 Input admittance, typical values.



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$V_{DS} = 10$ V; $I_D = 10$ mA; $T_{amb} = 25$ °C.

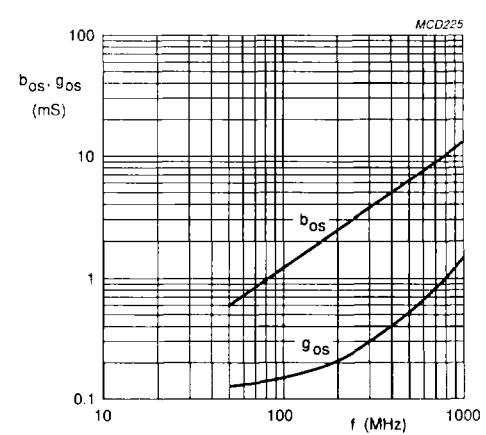
Fig.19 Forward admittance, typical values.



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$V_{DS} = 10$ V; $I_D = 10$ mA; $T_{amb} = 25$ °C.

Fig.20 Reverse admittance, typical values.



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$V_{DS} = 10$ V; $I_D = 10$ mA; $T_{amb} = 25$ °C.

Fig.21 Output admittance, typical values.