

N-CHANNEL SILICON FIELD-EFFECT TRANSISTORS

Asymmetrical N-channel planar epitaxial junction field-effect transistors in a plastic TO-92 variant; intended for applications up to the VHF range.

These FETs can be supplied in four I_{DSS} groups. Special features are the low feedback capacitance and the low noise figure. Thanks to these special features the BF410 is very suitable for applications such as the RF stages in FM portables (type A), car radios (type B) and mains radios (type C) or the mixer stage (type D).

QUICK REFERENCE DATA

Drain-source voltage	V_{DS}	max.	20	V			
Drain current (DC or average)	I_D	max.	30	mA			
Total power dissipation up to $T_{amb} = 75\text{ }^\circ\text{C}$	P_{tot}	max.	300	mW			
Drain current $V_{DS} = 10\text{ V}; V_{GS} = 0$	I_{DSS}		BF410A	B	C	D	
		min.	0.7	2.5	6	10	mA
		max.	3.0	7.0	12	18	mA
Transfer admittance $V_{DS} = 10\text{ V}; V_{GS} = 0; f = 1\text{ kHz}$	$ y_{fs} $	min.	2.5	4	6	7	mS
Feedback capacitance $V_{DS} = 10\text{ V}; V_{GS} = 0$ $V_{DS} = 10\text{ V}; I_D = 5\text{ mA}$	C_{rs}	typ.	0.5	0.5	—	—	pF
	C_{rs}	typ.	—	—	0.5	0.5	pF
Noise figure at optimum source admittance $G_S = 1\text{ mS}; -B_S = 3\text{ mS}; f = 100\text{ MHz}$ $V_{DS} = 10\text{ V}; V_{GS} = 0$ $V_{DS} = 10\text{ V}; I_D = 5\text{ mA}$	F	typ.	1.5	1.5	—	—	dB
	F	typ.	—	—	1.5	1.5	dB

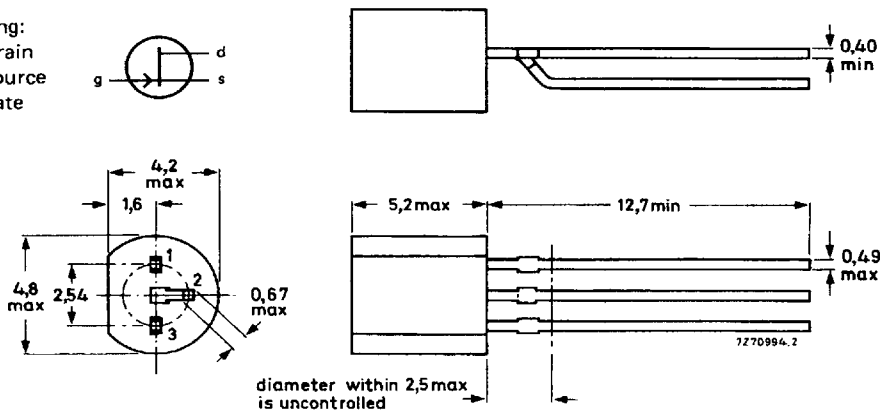
MECHANICAL DATA

Dimensions in mm

Fig. 1 TO-92 variant.

Pinning:

- 1 = drain
- 2 = source
- 3 = gate



RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

Drain-source voltage	V_{DS}	max.	20 V
Drain-gate voltage (open source)	V_{DGO}	max.	20 V
Drain current (DC or average)	I_D	max.	30 mA
Gate current	$\pm I_G$	max.	10 mA
Total power dissipation up to $T_{amb} = 75\text{ }^\circ\text{C}$	P_{tot}	max.	300 mW
Storage temperature range	T_{stg}		-65 to +150 $^\circ\text{C}$
Junction temperature	T_j	max.	150 $^\circ\text{C}$

THERMAL RESISTANCE

From junction to ambient in free air	$R_{th\ j-a}$	=	250 K/W
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STATIC CHARACTERISTICS

$T_{amb} = 25\text{ }^\circ\text{C}$

		BF410A	B	C	D	
Gate cut-off current						
$-V_{GS} = 0.2\text{ V}; V_{DS} = 0$	$-I_{GSS}$	max. 10	10	10	10	nA
Gate-drain breakdown voltage						
$I_S = 0; -I_D = 10\text{ }\mu\text{A}$	$-V_{(BR)GDO}$	min. 20	20	20	20	V
Drain current						
$V_{DS} = 10\text{ V}; V_{GS} = 0$	I_{DSS}	min. 0.7	2.5	6	10	mA
		max. 3.0	7.0	12	18	mA
Gate-source cut-off voltage						
$I_D = 10\text{ }\mu\text{A}; V_{DS} = 10\text{ V}$	$-V_{(P)GS}$	typ. 0.8	1.5	2.2	3	V

DYNAMIC CHARACTERISTICS

Measuring conditions (common source): $V_{DS} = 10\text{ V}$; $V_{GS} = 0$; $T_{amb} = 25\text{ }^{\circ}\text{C}$ for BF410A and B
 $V_{DS} = 10\text{ V}$; $I_D = 5\text{ mA}$; $T_{amb} = 25\text{ }^{\circ}\text{C}$ for BF410C and D

y-parameters (common source)

		BF410A	B	C	D	
Input capacitance at $f = 1\text{ MHz}$	C_{is} max.	5	5	5	5 pF	
Input conductance at $f = 100\text{ MHz}$	g_{is} typ.	100	90	60	50 μS	
Feedback capacitance at $f = 1\text{ MHz}$	typ.	0.5	0.5	0.5	0.5 pF	
	max.	0.7	0.7	0.7	0.7 pF	
Transfer admittance at $f = 1\text{ kHz}$ $V_{GS} = 0$ instead of $I_D = 5\text{ mA}$	$ Y_{fs} $ min.	2.5	4.0	4.0	3.5 mS	
	$ Y_{fs} $ min.	—	—	6.0	7.0 mS	
Transfer admittance at $f = 100\text{ MHz}$	$ Y_{fs} $ typ.	3.5	5.5	5.0	5.0 mS	
Output capacitance at $f = 1\text{ MHz}$	C_{os} max.	3	3	3	3 pF	
Output conductance at $f = 1\text{ MHz}$	g_{os} max.	60	80	100	120 μS	
Output conductance at $f = 100\text{ MHz}$	g_{os} typ.	35	55	70	90 μS	
Noise figure at optimum source admittance $G_S = 1\text{ mS}$; $-B_S = 3\text{ mS}$; $f = 100\text{ MHz}$	F	typ.	1.5	1.5	1.5	1.5 dB

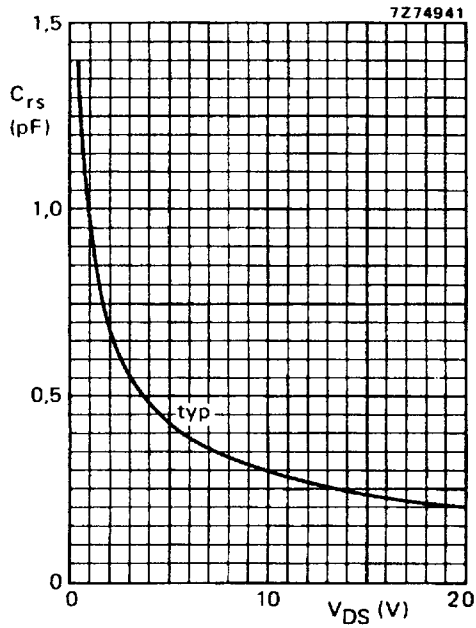


Fig. 2 $V_{GS} = 0$ for BF410A and BF410B;
 $I_D = 5$ mA for BF410C and BF410D;
 $f = 1$ MHz; $T_{amb} = 25$ °C.

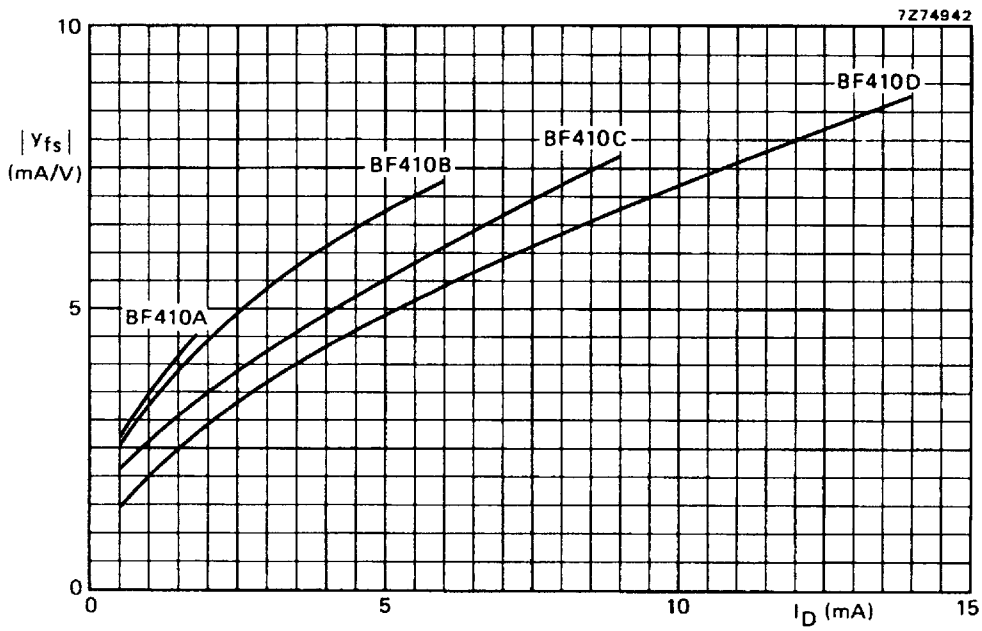


Fig. 3 $V_{DS} = 10$ V; $f = 1$ kHz; $T_{amb} = 25$ °C; typical values.