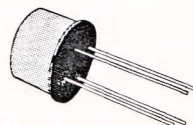




HIGH-FREQUENCY OSCILLATORS AND AMPLIFIERS

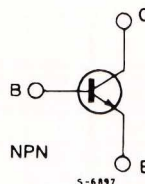
The BFX73, 2N918 and 2N3600 are silicon planar epitaxial NPN transistors in Jedec TO-72 metal case.

They are designed for low-noise VHF amplifiers, oscillators up to 1 GHz, non-neutralized IF amplifiers and non-saturating circuits with rise and fall times of less than 2.5 ns.



TO-72

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CBO}	Collector-base Voltage ($I_E = 0$)	30	V
V_{CEO}	Collector-emitter Voltage ($I_B = 0$)	15	V
V_{EB0}	Emitter-base Voltage ($I_C = 0$)	3	V
I_C	Collector Current	50	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25^\circ\text{C}$ at $T_{amb} \leq 25^\circ\text{C}$	200 300	mW mW
T_{stg}, T_J	Storage and Junction Temperature	- 65 to 200	$^\circ\text{C}$

THERMAL DATA

$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	584	°C/W
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	875	°C/W

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\ ^\circ\text{C}$ unless otherwise specified)

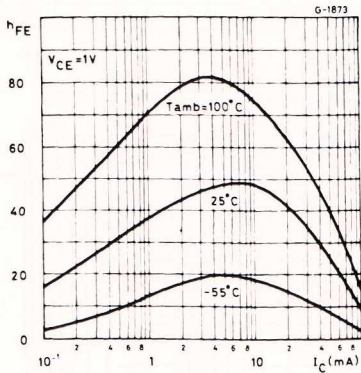
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current ($I_E = 0$)	$V_{CB} = 15\text{ V}$ $V_{CB} = 15\text{ V } T_{amb} = 150\ ^\circ\text{C}$			10 1	nA μA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage ($I_E = 0$)	$I_C = 1\ \mu\text{A}$	30			V
$V_{CEO(sus)}$	Collector-emitter Sustaining Voltage ($I_B = 0$)	$I_C = 3\text{ mA}$	15			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = 10\ \mu\text{A}$	3			V
$V_{CE(sat)}$	Collector-emitter Saturation Voltage	$I_C = 10\text{ mA } I_B = 1\text{ mA}$			0.4	V
$V_{BE(sat)}$	Base-emitter Saturation Voltage	$I_C = 10\text{ mA } I_B = 1\text{ mA}$			1	V
h_{FE}	DC Current Gain	$I_C = 3\text{ mA } V_{CE} = 1\text{ V}$ for 2N918/BFX73 for 2N3600	20 20	50	150	
f_T	Transition Frequency	for 2N918/BFX73 $I_C = 4\text{ mA } V_{CE} = 10\text{ V}$ $f = 100\text{ MHz}$ for 2N3600 $I_C = 5\text{ mA } V_{CE} = 6\text{ V}$ $f = 100\text{ MHz}$	600 850	900	1500	MHz MHz
C_{EBO}	Emitter-base Capacitance	$I_C = 0$ $f = 1\text{ MHz}$ for 2N918/BFX73 for 2N3600		1.4	2	pF pF
C_{CBO}	Collector-base Capacitance (for 2N918/BFX73 only)	$I_E = 0$ $f = 1\text{ MHz}$ $V_{CE} = 0\text{ V}$ $V_{CE} = 10\text{ V}$		1.8 1	3 1.7	pF pF
C_{re}	Reverse Capacitance (for 2N3600 only)	$I_C = 0$ $f = 1\text{ MHz}$ $V_{CB} = 10\text{ V}$			1	pF
NF	Noise Figure	$I_C = 1.5\text{ mA } V_{CE} = 6\text{ V}$ $R_g = 50\ \Omega$ $f = 200\text{ MHz}$ for 2N3600 $I_C = 1\text{ mA } V_{CE} = 6\text{ V}$ $R_g = 400\ \Omega$ $f = 60\text{ MHz}$ for 2N918/BFX73 for 2N3600			4.5 6 3	dB dB dB
G_{pe}	Power Gain	$R_g = 50\ \Omega$ $f = 200\text{ MHz}$ for 2N918/BFX73 $I_C = 6\text{ mA } V_{CE} = 12\text{ V}$ for 2N3600 $I_C = 5\text{ mA } V_{CE} = 6\text{ V}$	15 17	21	24	dB dB

* See test circuits.

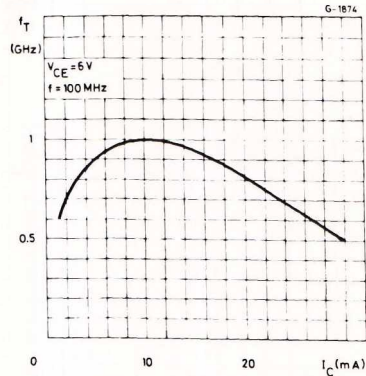
ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
P_o^*	Output Power	$I_C = 12 \text{ mA}$ $V_{CB} = 10 \text{ V}$ $f = 500 \text{ MHz}$ for 2N918/BFX73 for 2N3600	30 20	40		mW mW
π	Collector Efficiency (for 2N918/BFX73 only)	$I_C = 12 \text{ mA}$ $V_{CB} = 10 \text{ V}$ $f = 500 \text{ MHz}$	25			%
$r_{b'b}, C_{b'b'c}$	Feedback Time Constant (for 2N3600 only)	$I_C = 5 \text{ mA}$ $V_{CB} = 6 \text{ V}$ $f = 31.9 \text{ MHz}$	4		15	ps

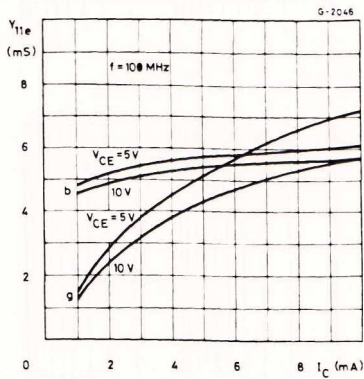
DC Current Gain.



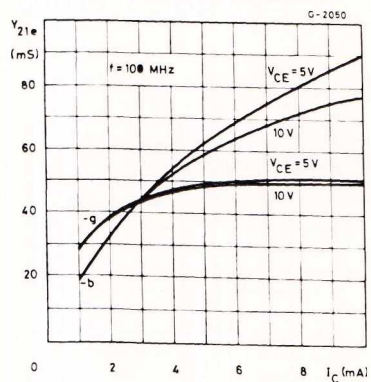
Transition Frequency.



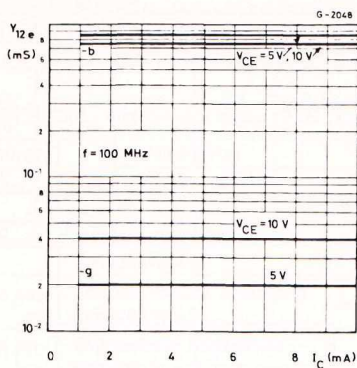
Input Admittance vs. Collector Current.



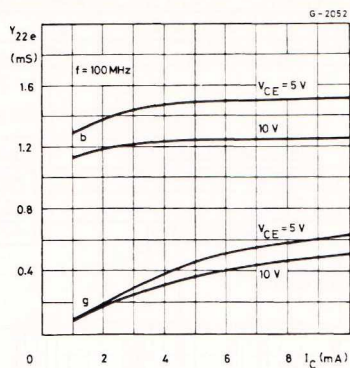
Forward Transadmittance vs. Collector Current.



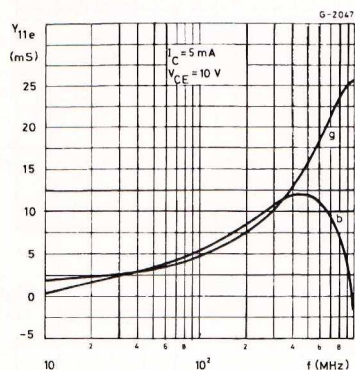
Reverse Transadmittance vs. Collector Current.



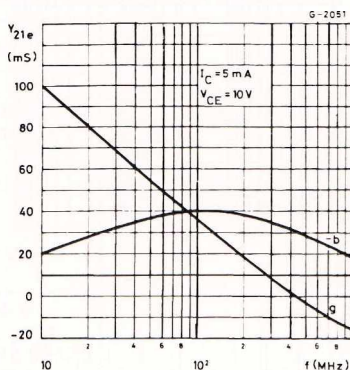
Output Admittance vs. Collector Current.



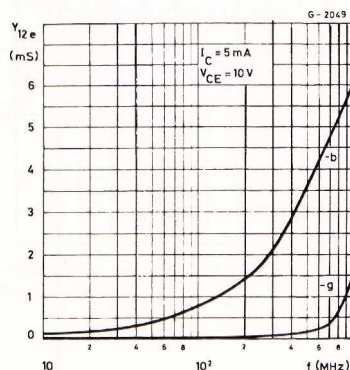
Input Admittance vs. Frequency.



Forward Transadmittance vs. Frequency.



Reverse Transadmittance vs. Frequency.



Output Admittance vs. Frequency.

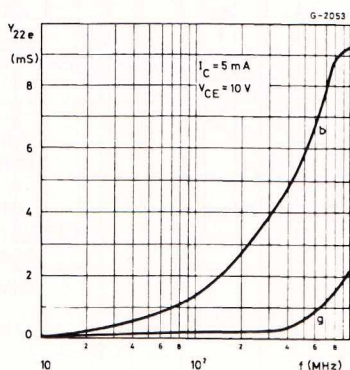


Figure 1 : 500 MHz Oscillator Test Circuit.

