SGS-THOMSON MICROELECTRONICS

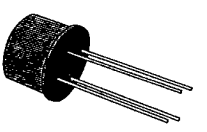
S G S-THOMSON

BFX73-2N918 2N3600

HIGH-FREQUENCY OSCILLATORS AND AMPLIFIERS

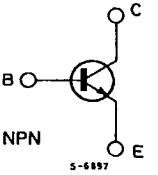
The BFX73, 2N918 and 2N3600 are silicon planar epitaxial NPN transistors in Jedec TO-72 metal case.

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_{EBO}	Emitter-base Voltage (I_C = 0)	3	V
I_C	Collector Current	50	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25$ °C at $T_{amb} \leq 25$ °C	200 300	mW mW
T_{stg}, T_j	Storage and Junction Temperature	– 65 to 200	°C

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THERMAL DATA

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

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector Cutoff Current (I_E = 0)	V_{CB} = 15 V V_{CB} = 15 V T_{amb} = 150 °C			10 1	nA µA
$V_{(BR)CBO}$	Collector-base Breakdown Voltage (I_E = 0)	I_C = 1 µA	30			V
$V_{CEO\ (sus)}$	Collector-emitter Sustaining Voltage (I_B = 0)	I_C = 3 mA	15			V
$V_{(BR)\ EBO}$	Emitter-base Breakdown Voltage (I_C = 0)	I_E = 10 µA	3			V
$V_{CE\ (sat)}$	Collector-emitter Saturation Voltage	I_C = 10 mA I_B = 1 mA			0.4	V
$V_{BE\ (sat)}$	Base-emitter Saturation Voltage	I_C = 10 mA I_B = 1 mA			1	V
h_{FE}	DC Current Gain	I_C = 3 mA V_{CE} = 1 V for **2N918/BFX73** for **2N3600**	 20 20	 50	 150	
f_T	Transition Frequency	for **2N918/BFX73** I_C = 4 mA V_{CE} = 10 V f = 100 MHz for **2N3600** I_C = 5 mA V_{CE} = 6 V f = 100 MHz	 600 850	 900	 1500	 MHz MHz
C_{EBO}	Emitter-base Capacitance	I_C = 0 V_{EB} = 0.5 V f = 1 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 MHz V_{CE} = 0 V V_{CE} = 10 V		1.8 1	3 1.7	pF pF
C_{re}	Reverse Capacitance (for **2N3600** only)	I_C = 0 V_{CB} = 10 V f = 1 MHz			1	pF
NF	Noise Figure	I_C = 1.5 mA V_{CE} = 6 V R_g = 50 Ω f = 200 MHz for **2N3600** I_C = 1 mA V_{CE} = 6 V R_g = 400 Ω f = 60 MHz for **2N918/BFX73** for **2N3600**			 4.5 6 3	 dB dB dB
G_{pe}	Power Gain	R_g = 50 Ω f = 200 MHz for **2N918/BFX73** I_C = 6 mA V_{CE} = 12 V for **2N3600** I_C = 5 mA V_{CE} = 6 V	 15 17	 21	 24	 dB dB

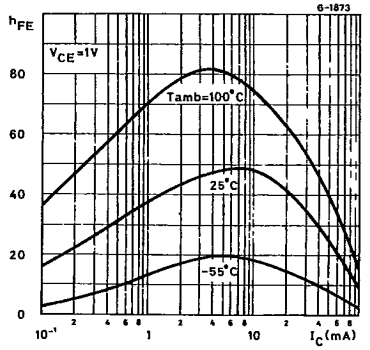
* See test circuits.

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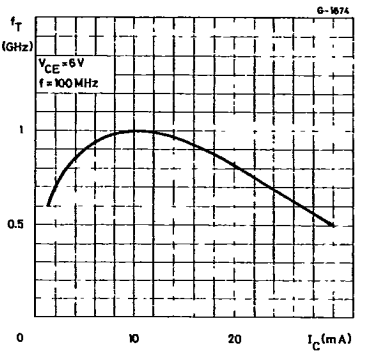
ELECTRICAL CHARACTERISTICS (continued)

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

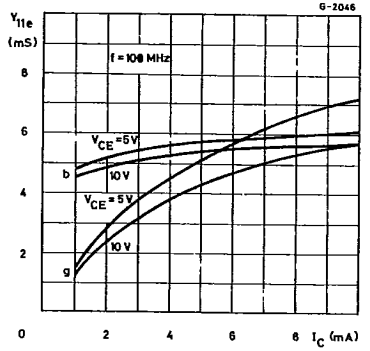
DC Current Gain.



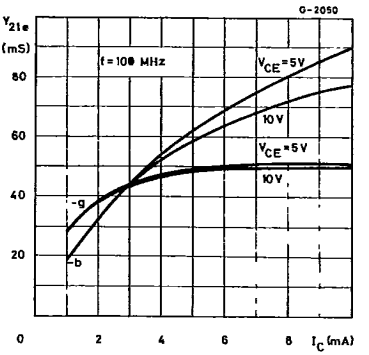
Transition Frequency.



Input Admittance vs. Collector Current.

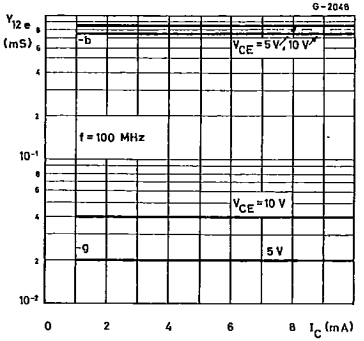


Forward Transadmittance vs. Collector Current.

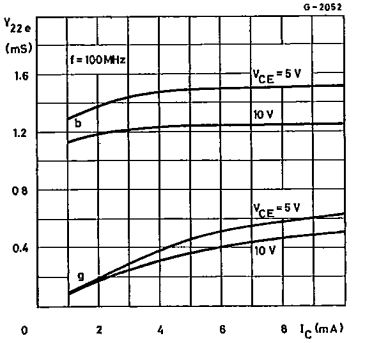


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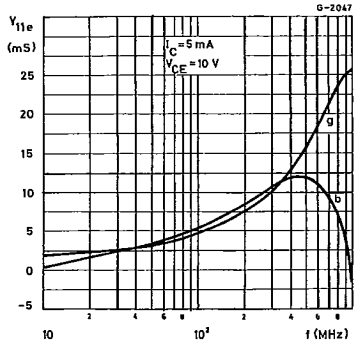
Reverse Transadmittance vs. Collector Current.



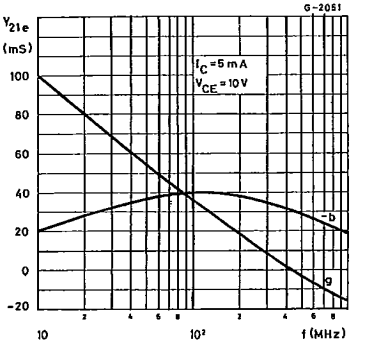
Output Admittance vs. Collector Current.



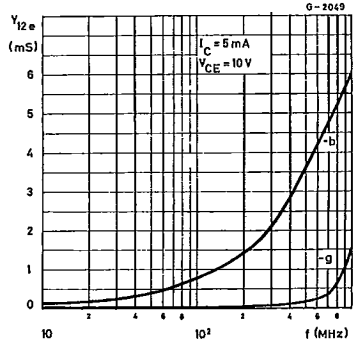
Input Admittance vs. Frequency.



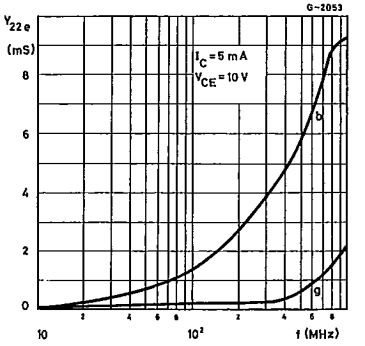
Forward Transadmittance vs. Frequency.



Reverse Transadmittance vs. Frequency.



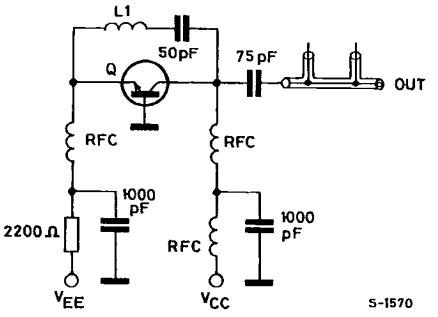
Output Admittance vs. Frequency.



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Figure 1 : 500 MHz Oscillator Test Circuit.

T-31-15



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