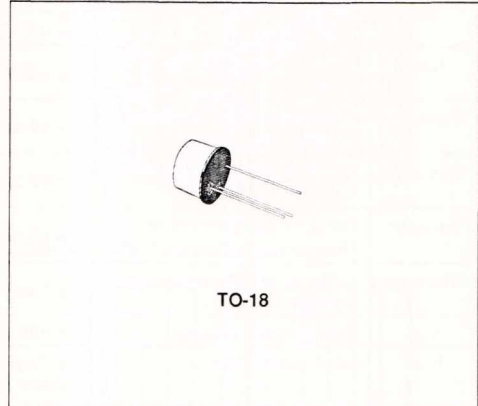


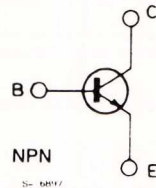
LOW-LEVEL, LOW-NOISE AMPLIFIER

DESCRIPTION

The BFY76 is a silicon planar epitaxial NPN transistor in Jedec TO-18 metal case. It is designed for use in high performance, low-level, low-noise amplifier circuits from audio to high frequencies.



INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CEs}	Collector-emitter Voltage ($V_{BE} = 0$)	60	V
V_{CE0}	Collector-emitter Voltage ($I_B = 0$)	60	V
V_{EB0}	Emitter-base Voltage ($I_C = 0$)	8	V
I_C	Collector Current	50	mA
P_{tot}	Total Power Dissipation at $T_{amb} \leq 25^\circ\text{C}$ at $T_{case} \leq 25^\circ\text{C}$	0.36	W
		1.2	W
T_{stg}, T_J	Storage and Junction Temperature	- 55 to 200	$^\circ\text{C}$

THERMAL DATA

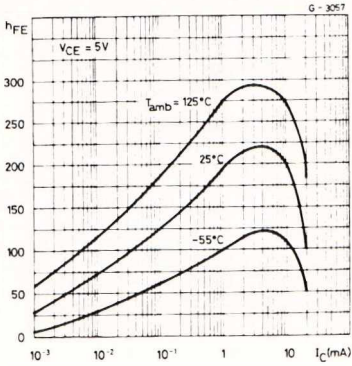
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max	146	$^{\circ}C/W$
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max	486	$^{\circ}C/W$

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

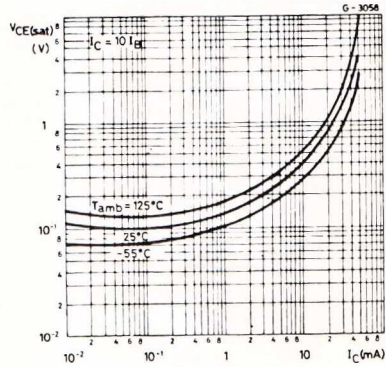
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{CES}	Collector Cutoff Current ($V_{BE} = 0$)	$V_{CE} = 50\ V$ $V_{CE} = 50\ V$ $T_{amb} = 150\ ^{\circ}C$			20 20	nA μA
I_{EBO}	Emitter Cutoff Current ($I_C = 0$)	$V_{EB} = 5\ V$			20	nA
$V_{(BR)CES}$	Collector-emitter Breakdown Voltage ($V_{BE} = 0$)	$I_C = 10\ \mu A$	60			V
$V_{(BR)CEO}^*$	Collector-emitter Breakdown Voltage ($I_B = 0$)	$I_C = 10\ mA$	60			V
$V_{(BR)EBO}$	Emitter-base Breakdown Voltage ($I_C = 0$)	$I_E = 10\ \mu A$	8			V
$V_{CE(sat)}^*$	Collector-emitter Saturation Voltage	$I_C = 1\ mA$ $I_B = 0.1\ mA$		0.15	0.35	V
V_{BE}	Base-emitter Voltage	$I_C = 100\ \mu A$ $V_{CE} = 5\ V$	0.5	0.58	0.7	V
h_{FE}^*	DC Current Gain	$I_C = 10\ \mu A$ $V_{CE} = 5\ V$ $I_C = 100\ \mu A$ $V_{CE} = 5\ V$ $I_C = 1\ mA$ $V_{CE} = 5\ V$ $I_C = 5\ mA$ $V_{CE} = 5\ V$	30 150	70 120 190 220	300	
h_{fe}	Small Signal Current Gain	$I_C = 1\ mA$ $V_{CE} = 5\ V$ $f = 1\ kHz$	80	220	350	
f_T	Transition Frequency	$I_C = 1\ mA$ $V_{CE} = 5\ V$ $f = 20\ MHz$	70	100		MHz
C_{EBO}	Emitter-base Capacitance	$I_C = 0$ $V_{EB} = 0.5\ V$ $f = 1\ MHz$		3.5	6	pF
C_{CBO}	Collector-base Capacitance	$I_E = 0$ $V_{CB} = 5\ V$ $f = 1\ MHz$		3.5	6	pF
NF	Noise Figure	$I_C = 10\ \mu A$ $V_{CE} = 5\ V$ $R_g = 10\ k\Omega$ $f = 100\ Hz$ $f = 1\ kHz$ $f = 10\ to\ 10\ 000\ Hz$		4 1.5 1.9	15 4 4	dB dB dB
h_{ie}	Input Impedance	$I_C = 1\ mA$ $V_{CE} = 5\ V$ $f = 1\ kHz$		8		$k\Omega$
h_{re}	Reverse Voltage Ratio	$I_C = 1\ mA$ $V_{CE} = 5\ V$ $f = 1\ kHz$		3×10^{-4}		
h_{oe}	Output Admittance	$I_C = 1\ mA$ $V_{CE} = 5\ V$ $f = 1\ kHz$		11		μS

* Pulsed : pulse duration = 300 μs , duty cycle = 1 %.

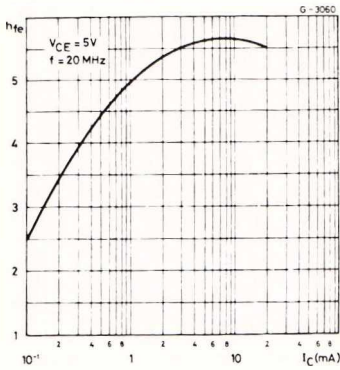
DC Current Gain.



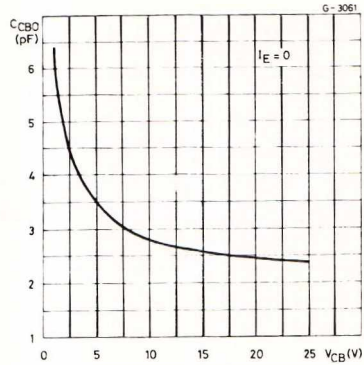
Collector-emitter Saturation Voltage.



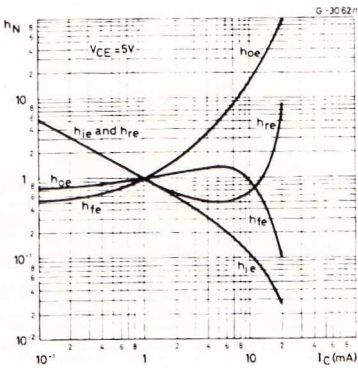
High Frequency Current Gain.



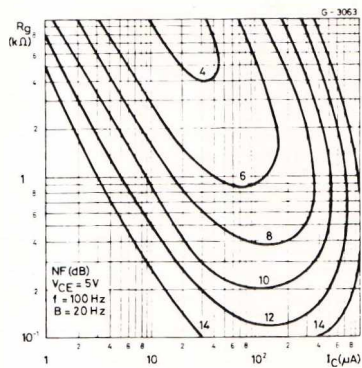
Collector-base capacitance.



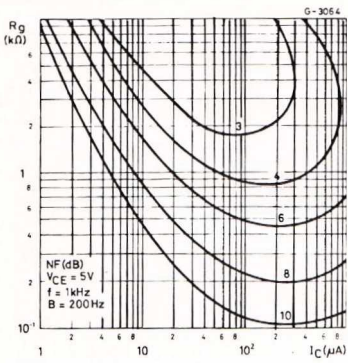
Normalized h Parameters.



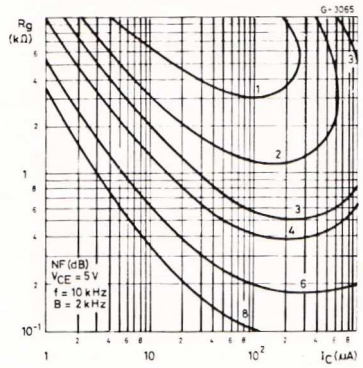
Contours of Constant Noise Figure (f = 100 kHz).



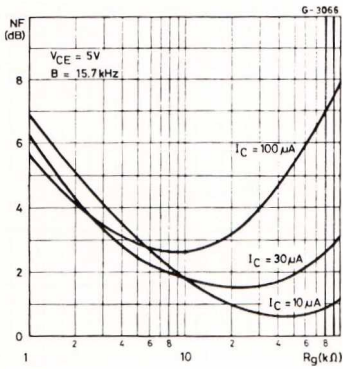
Contours of Constant Noise Figure ($f = 1$ kHz).



Contours of Constant Noise Figure ($f = 10$ kHz).



Noise Figure vs. Source Resistance.



Noise Figure vs. Frequency.

