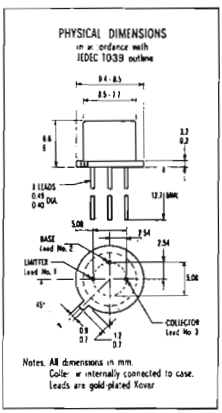
BFY64

HIGH CURRENT GENERAL PURPOSE TYPE

PNP DIFFUSED SILICON PLANAR EPITAXIAL TRANSISTOR

GENERAL DESCRIPTION - The BFY64 is a PNP silicon PLANAR epitaxial transistor designed for digital and analog applications at current levels up to 500 milliamperes. Its high beta, high f_T at high current, high LV_{CEO}, and low noise figure make it ideal for use in line driver, memory applications, and in low-noise amplifiers.



ABSOLUTE MAXIMUM RATINGS (Note 1)

Maximum Temperatures

Storage Temperature	-65°C to + 200°C
Operating Junction Temperature	200°C Maximum

Maximum Power Dissipations

Total Dissipation at 25°C Case Temperature (Notes 2 and 3)	3.0 Watts
at 25°C Ambient Temperature (Notes 2 and 3)	0.7 Watt

Maximum Voltages

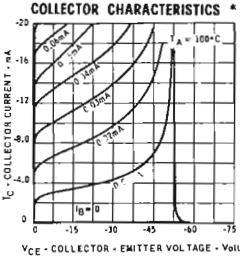
V_{CBO}	Collector to Base Voltage	-40 Volts
V_{CEO}	Collector to Emitter Voltage (Note 4)	-40 Volts
V_{EBO}	Emitter to Base Voltage	-5.0 Volts

ELECTRICAL CHARACTERISTICS (25°C free air temperature unless otherwise noted)

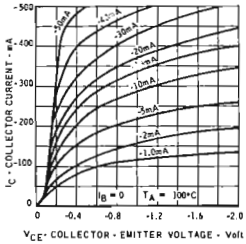
SYMBOL	CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS	
h_{FE}	DC Current Gain		130			I_C = 10 μA	V_{CE} = - 10 V
h_{FE}	DC Current Gain		200			I_C = 1.0 mA	V_{CE} = - 10 V
h_{FE}	DC Pulse Current Gain (Note 5)	80	200			I_C = 10 mA	V_{CE} = - 10 V
h_{FE}	DC Pulse Current Gain (Note 5)		150			I_C = 50 mA	V_{CE} = - 1.0 V
h_{FE}	DC Pulse Current Gain (Note 5)		130			I_C = 150 mA	V_{CE} = - 10 V
V_{BE} (sat)	Base Saturation Voltage (Note 5)		-0.92	-1.1	V	I_C = 50 mA (pulsed)	I_B = 2.5 mA
V_{BE} (sat)	Base Saturation Voltage (Note 5)		-1.0	-1.4	V	I_C = 150 mA (pulsed)	I_B = 15 mA
V_{BE} (sat)	Base-Emitter Saturation Voltage (Note 5)			-2.2	V	I_C = 500 mA (pulsed)	I_B = 50 mA
V_{CE} (sat)	Collector Saturation Voltage (Note 5)		-0.08	-0.3	V	I_C = 50 mA (pulsed)	I_B = 2.5 mA
V_{CE} (sat)	Collector Saturation Voltage (Note 5)		-0.18	-0.5	V	I_C = 150 mA (pulsed)	I_B = 15 mA
V_{CE} (sat)	Collector Saturation Voltage (Note 5)		-0.6	-1.8	V	I_C = 500 mA (pulsed)	I_B = 50 mA
I_{CES}	Collector Cutoff Current		0.2	30	nA	V_{CE} = 25 V	V_{BE} = 0
BV_{CBO}	Collector to Base Breakdown Voltage	-40			V	I_C = 10 μA	I_E = 0
BV_{EBO}	Emitter to Base Breakdown Voltage	-5.0			V	I_E = 10 μA	I_C = 0
V_{CEO} (sust)	Collector to Emitter Sustaining Voltage (Notes 4 and 5)	-40			V	I_C = 10 mA (pulsed)	I_B = 0
h_{fe}	High Frequency Current Gain (f = 100 Mc/s)	2.0	2.5			I_C = 50 mA	V_{CE} = - 20 V
C_{ob}	Output Capacitance		6.0	10	pF	I_E = 0	V_{CB} = - 10 V
C_{TE}	Emitter Transition Capacitance		15	25	pF	I_C = 0	V_{EB} = - 0.5 V
NF	Noise Figure (Note 6)		1.0		db	I_C = 30 μA	V_{CE} = - 5.0 V
t_{on}	Turn On Time (Note 7)		35	50	nsec	I_C = 300 mA	I_{B1} = 30 mA
t_{off}	Turn Off Time (Note 7)		70	120	nsec	I_C = 300 mA, I_{B1} = 30 mA, I_{B2} = - 30 mA	
h_{ie}	Input Resistance (f = 1 Kc/s)		1050		Ω	I_C = 10 mA	V_{CE} = - 10 V
h_{oe}	Output Conductance (f = 1 Kc/s)		110		μmho	I_C = 10 mA	V_{CE} = - 10 V
h_{re}	Voltage Feedback Ratio (f = 1 Kc/s)		240		$\times 10^{-6}$	I_C = 10 mA	V_{CE} = - 10 V
h_{fe}	Small Signal Current Gain (f = 1 Kc/s)		200			I_C = 10 mA	V_{CE} = - 10 V

TYPICAL ELECTRICAL CHARACTERISTICS

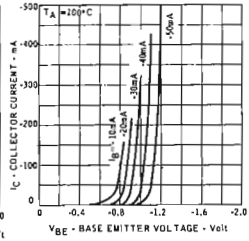
COLLECTOR CHARACTERISTICS *



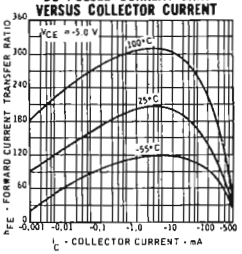
COLLECTOR CHARACTERISTICS *



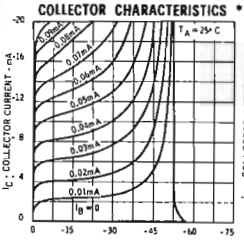
BASE CHARACTERISTICS *



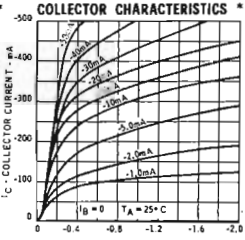
DC PULSED CURRENT GAIN VERSUS COLLECTOR CURRENT



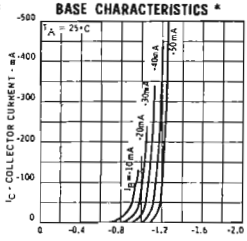
COLLECTOR CHARACTERISTICS *



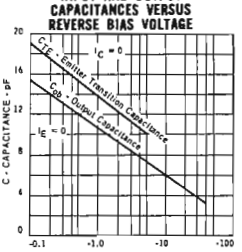
COLLECTOR CHARACTERISTICS *



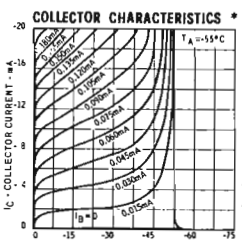
BASE CHARACTERISTICS *



INPUT AND OUTPUT CAPACITANCES VERSUS REVERSE BIAS VOLTAGE



COLLECTOR CHARACTERISTICS *



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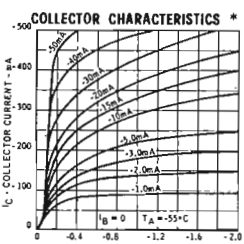
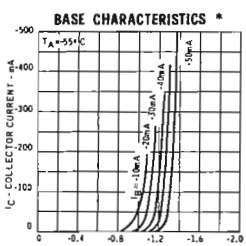
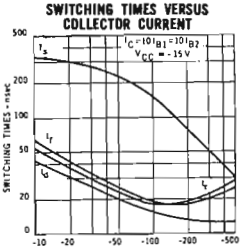


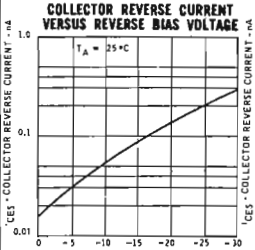
BASE CHARACTERISTICS *



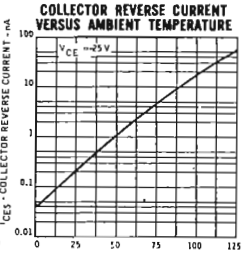
SWITCHING TIMES VERSUS COLLECTOR CURRENT



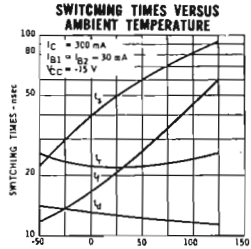
COLLECTOR REVERSE CURRENT VERSUS REVERSE BIAS VOLTAGE



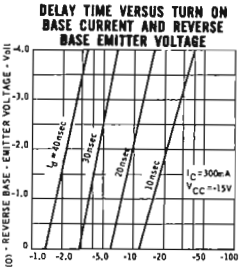
COLLECTOR REVERSE CURRENT VERSUS AMBIENT TEMPERATURE



SWITCHING TIMES VERSUS AMBIENT TEMPERATURE



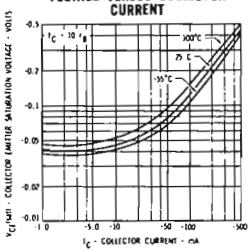
DELAY TIME VERSUS TURN ON BASE CURRENT AND REVERSE BASE EMITTER VOLTAGE



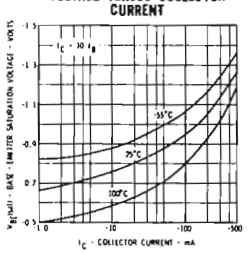
* Single family characteristics on Transistor Curve Tracer.

TYPICAL ELECTRICAL CHARACTERISTICS

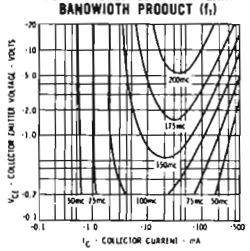
PULSED COLLECTOR SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



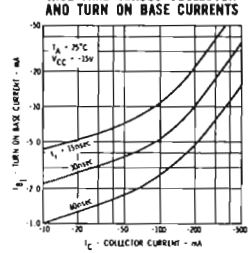
PULSED BASE SATURATION VOLTAGE VERSUS COLLECTOR CURRENT



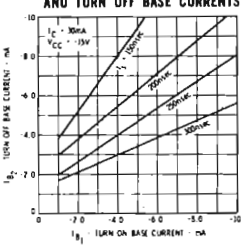
CONTOURS OF CONSTANT GAIN BANDWIDTH PRODUCT (f_T)



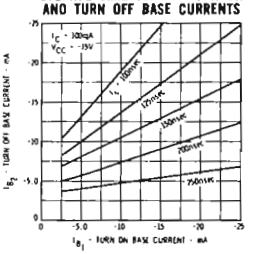
RISE TIME VERSUS COLLECTOR AND TURN ON BASE CURRENTS



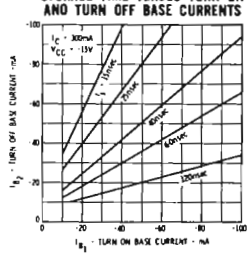
STORAGE TIME VERSUS TURN ON AND TURN OFF BASE CURRENTS



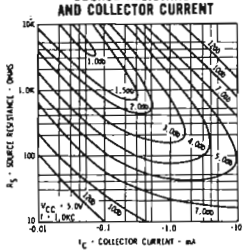
STORAGE TIME VERSUS TURN ON AND TURN OFF BASE CURRENTS



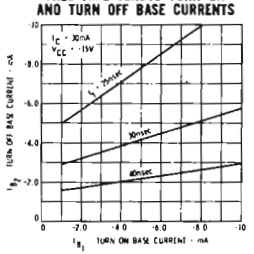
STORAGE TIME VERSUS TURN ON AND TURN OFF BASE CURRENTS



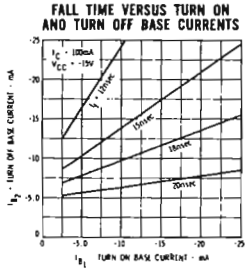
NOISE FIGURE VERSUS SOURCE RESISTANCE AND COLLECTOR CURRENT



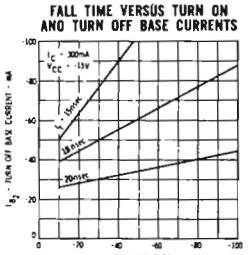
FALL TIME VERSUS TURN ON AND TURN OFF BASE CURRENTS



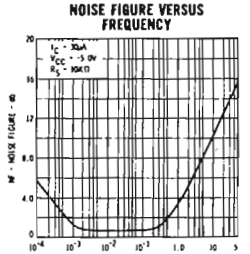
FALL TIME VERSUS TURN ON AND TURN OFF BASE CURRENTS



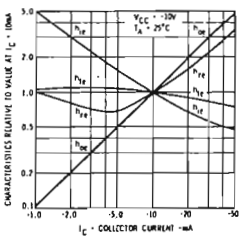
FALL TIME VERSUS TURN ON AND TURN OFF BASE CURRENTS

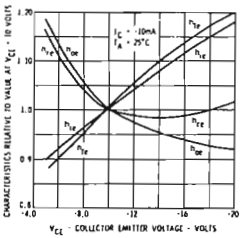


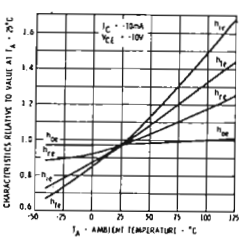
NOISE FIGURE VERSUS FREQUENCY



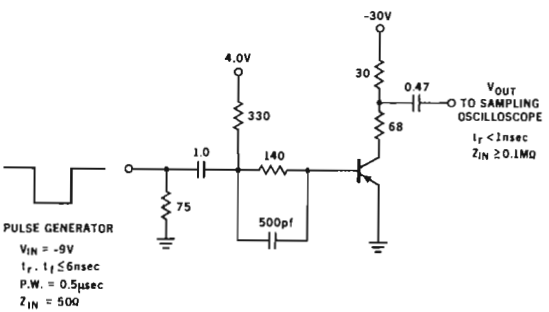
TYPICAL COMMON EMITTER CHARACTERISTICS







T_{ON} and T_{OFF} TEST CIRCUIT



NOTES:

(1) These ratings are limiting values above which the serviceability of any individual semiconductor device may be impaired.

(2) These are steady state limits. The factory should be consulted on applications involving pulsed or low duty cycle operations.

(3) These ratings give a maximum junction temperature of 200°C and junction-to-case thermal resistance of 58.3°C/Watt (derating factor of 17.2 mW/°C); junction-to-ambient thermal resistance of 250°C/Watt (derating factor of 4.0 mW/°C).

(4) This rating refers to a high-current point where collector-to-emitter voltage is lowest. For more information send for SGS Publication AR 5.

(5) Pulse Conditions: length = 300 μsec; duty cycle = 1%.

(6) f = 1.0 Kc/s; R_S = 10 KΩ.

(7) See switching circuit for exact values of I_C, I_{B1}, and I_{B2}.