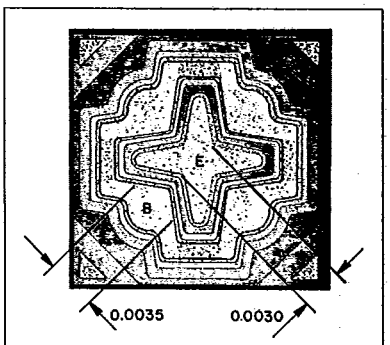
Process SPL
NPN Small-Signal Transistor

Process SPL is a double-diffused NPN silicon epitaxial transistor. It is designed to be used in general-purpose amplifier and medium-power switching applications.



SPL 0.022″ × 0.022″

ALTERNATE PROCESS: DCA

ABSOLUTE MAXIMUM RATINGS

Collector Current, I_C . . . . . 500 mA
Operating Junction Temperature, T_J . . . . . +150°C
Storage Temperature Range, T_S . . . . . −55°C to +150°C

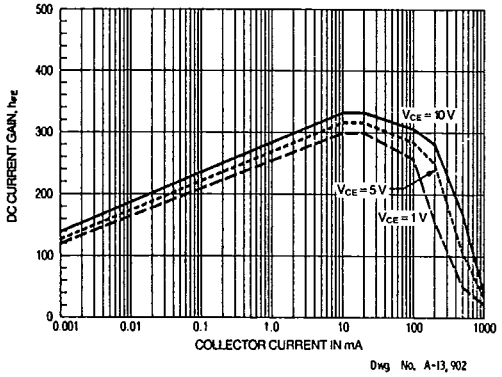
ELECTRICAL CHARACTERISTICS at T_A = +25°C

Characteristic	Symbol	Test Conditions	Limits			
			Min.	Typ.	Max.	Units
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 10 mA	30	50	—	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10 μA	6.0	7.5	—	V
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 100 μA	60	110	—	V
Collector Cutoff Current	I_{CBO}	V_{CB} = 50 V	—	—	100	nA
Emitter Cutoff Current	I_{EBO}	V_{EB} = 6.0 V	—	—	100	nA
Static Forward Current Transfer Ratio	h_{FE}	V_{CE} = 10 V, I_C = 0.1 mA	—	260	—	—
		V_{CE} = 10 V, I_C = 10 mA	75	330	—	—
		V_{CE} = 10 V, I_C = 100 mA	100	300	—	—
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 100 mA, I_B = 10 mA	—	0.1	0.25	V
		I_C = 500 mA, I_B = 50 mA	—	0.3	1.0	V
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 500 mA, I_B = 50 mA	—	1.1	2.0	V
Gain-Bandwidth Product	f_T	V_{CE} = 10 V, I_C = 20 mA	250	400	—	MHz
Output Capacitance	C_{cb}	V_{CB} = 10 V, f = 1.0 MHz	—	4.0	8.0	pF
Input Capacitance	C_{eb}	V_{EB} = 0.5 V, f = 1.0 MHz	—	17	25	pF
Delay Time*	t_d	V_{CC} = 30 V, I_C = 150 mA, I_B = 15 mA	—	8.0	10	ns
Rise Time*	t_r		—	15	25	ns
Storage Time*	t_s	V_{CC} = 30 V, I_C = 150 mA, I_{B1} = I_{B2} = 15 mA	—	160	225	ns
Fall Time*	t_f		—	40	60	ns

*Switching speeds measured at 2N2222A test conditions.

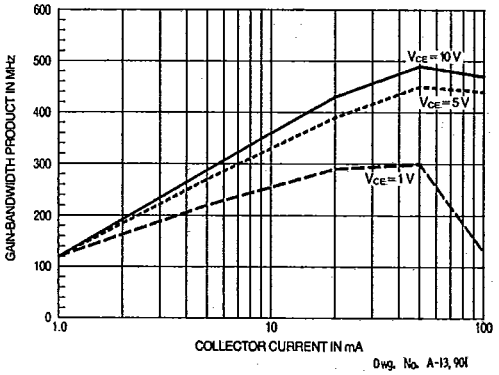
Typical Characteristics
at T_A = +25°C

h_{FE} AS A FUNCTION OF COLLECTOR CURRENT



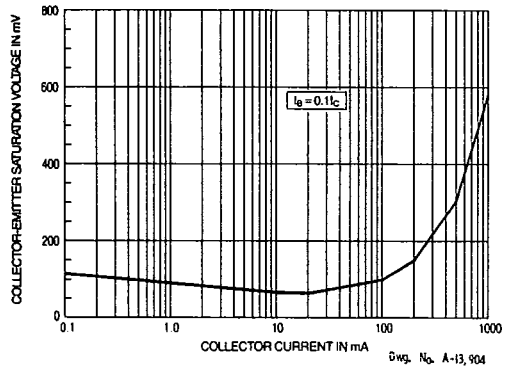
Dwg. No. A-13, 902

f_T AS A FUNCTION OF COLLECTOR CURRENT



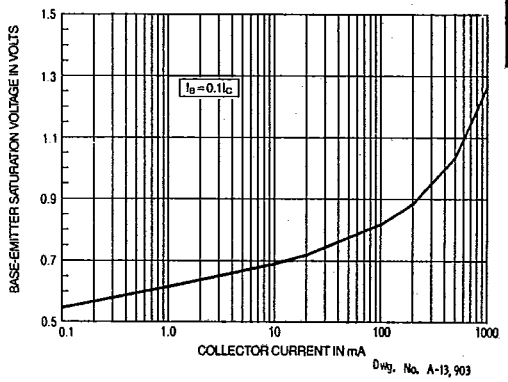
Dwg. No. A-13, 901

$V_{CE(sat)}$ AS A FUNCTION OF COLLECTOR CURRENT



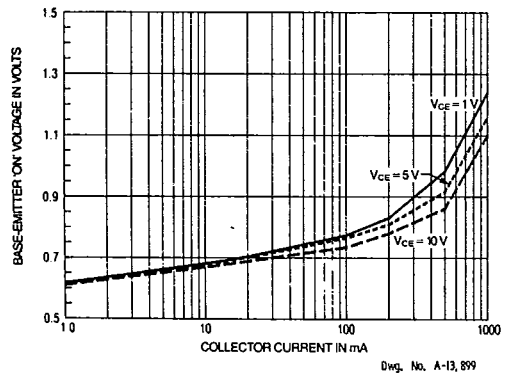
Dwg. No. A-13, 904

$V_{BE(sat)}$ AS A FUNCTION OF COLLECTOR CURRENT



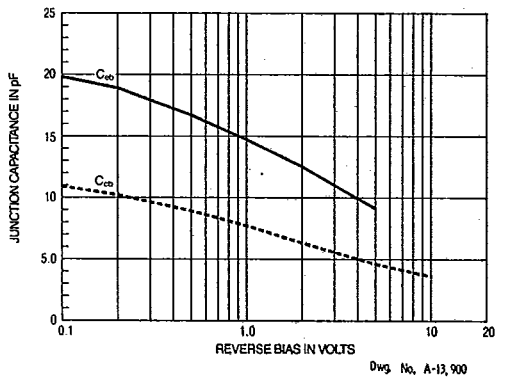
Dwg. No. A-13, 903

$V_{BE(ON)}$ AS A FUNCTION OF COLLECTOR CURRENT



Dwg. No. A-13, 899

JUNCTION CAPACITANCE AS A FUNCTION OF REVERSE BIAS



Dwg. No. A-13, 900