

Signal Transistors

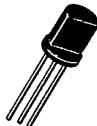
2N3414-17, GES3414-17

T-29-19

Silicon Transistors



TO-92



TO-98

The GE/RCA Types 2N3414-17 and GES3414-17 are planar epitaxial passivated NPN silicon transistors intended for general purpose industrial circuits. These transistors are especially suited for high level linear amplifiers or medium

speed switching circuits in industrial control applications. These types are supplied in JEDEC TO-92 package (GES3414-17) and in JEDEC TO-98 package (2N3414-17).

Devices in TO-98 package are supplied with and without seating flange (see Dimensional Outline).



MAXIMUM RATINGS, Absolute-Maximum Values:

	2N3414,15 GES3414,15	2N3416,17 GES3416,17
COLLECTOR TO EMITTER VOLTAGE (V_{CE0})	25	50 V
EMITTER TO BASE VOLTAGE (V_{EB0})	5	5 V
COLLECTOR TO BASE VOLTAGE (V_{CB0})	25	50 V
CONTINUOUS COLLECTOR CURRENT (I_C) (Note 1)	500	500 mA
TOTAL POWER DISSIPATION ($T_A \leq 25^\circ\text{C}$) (P_T) (Note 2)		360 mW
TOTAL POWER DISSIPATION ($T_A \leq 65^\circ\text{C}$) (P_T) (Note 2)		260 mW
OPERATING TEMPERATURE (T_J)		-55 to +150 °C
STORAGE TEMPERATURE (T_{STG})		-55° to +150°C
LEAD TEMPERATURE, $1/16" \pm 1/32"$ (1.58mm $\pm$ 0.8mm) from case for 10s max (T_L)		+260 °C

NOTES:

1. Determined from power limitations due to saturation voltage at this current.
2. Derate 7.2mW/°C increase in case temperature about 25°C.

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ELECTRICAL CHARACTERISTICS, At Ambient Temperature (T_A) = 25°C Unless Otherwise Specified

CHARACTERISTICS	SYMBOL	LIMITS				UNITS
		3414,5		3416,7		
		MIN.	MAX.	MIN.	MAX	
Collector Cutoff Current ($V_{CB} = 25V$)	I_{CBO}	—	0.1	—	—	μA
($V_{CB} = 25V, T_A = 100^{\circ}C$)		—	15	—	—	
Collector Cutoff Current ($V_{CB} = 50V$)	I_{CBO}	—	—	—	0.1	
($V_{CB} = 50V, T_A = 100^{\circ}C$)		—	—	—	15	
Emitter Cutoff Current ($V_{EB} = 5V$)	I_{EBO}	—	0.1	—	0.1	V
Collector Saturation voltage ($I_B = 3mA, I_C = 50mA$)	$V_{CE(SAT)}$	—	0.3	—	0.3	
Base Saturation Voltage ($I_B = 3mA, I_C = 50mA$)	$V_{BE(SAT)}$	—	0.85	—	0.85	
—		3414,6		3415,7		—
DC Forward Current Transfer Ratio ($V_{CE} = 4.5V, I_C = 2mA$)	h_{FE}	75	225	180	540	—
Small-Signal Forward Current Transfer Ratio ($V_{CE} = 4.5V, f = 1kHz$)	h_{f_e}	75		180	—	
—		3414,15		3416,17		—
Small-Signal Forward Current Transfer Ratio ($V_{CE} = 10V; I_C = 1mA; f = 1Hz$)	h_{f_e}	180	330	150	300	—
Input Impedance	h_{i_e}	5100	9000	4200	8300	Ω
Output Admittance	h_{o_e}	14	21	10	20	$\mu mhos$
Voltage Feedback Ratio	h_{r_e}	0.27	0.45	0.2	0.4	X 10-3

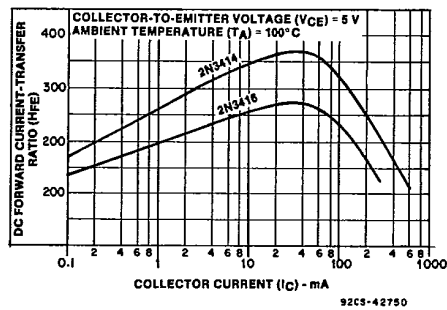


Fig. 1—Typical dc forward-current transfer ratio characteristics.

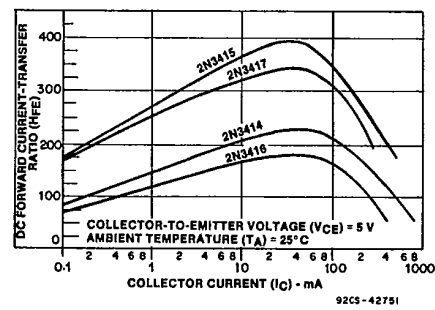


Fig. 2—Typical dc forward-current transfer ratio characteristics.

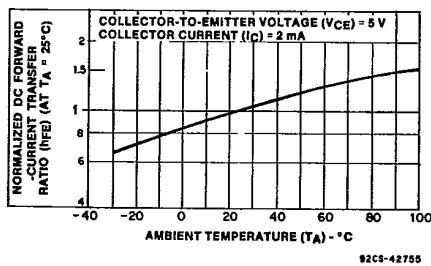


Fig. 3—Normalized dc forward current transfer ratio characteristic.

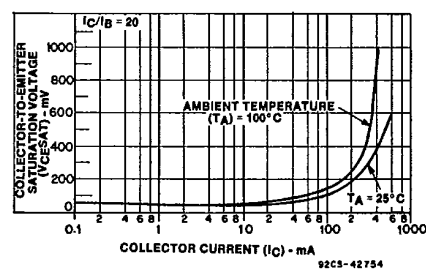


Fig. 4—Typical collector-to-emitter saturation voltage characteristics.

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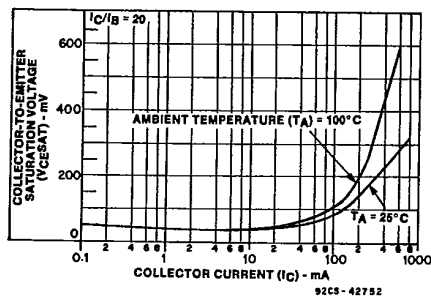


Fig. 5—Typical collector-to-emitter saturation voltage characteristics.

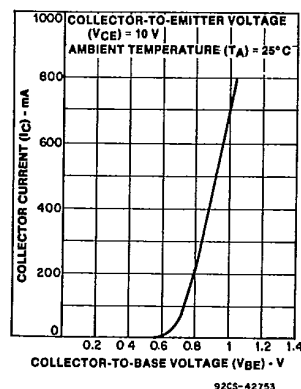


Fig. 6—Typical collector current characteristics.

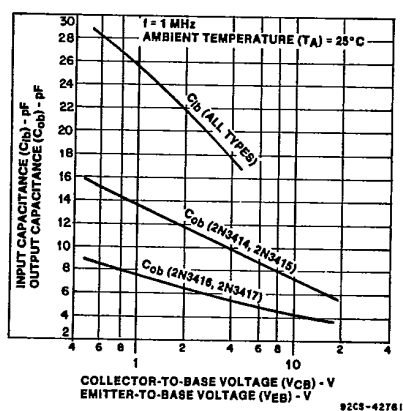


Fig. 7—Typical input and output capacitance characteristics.

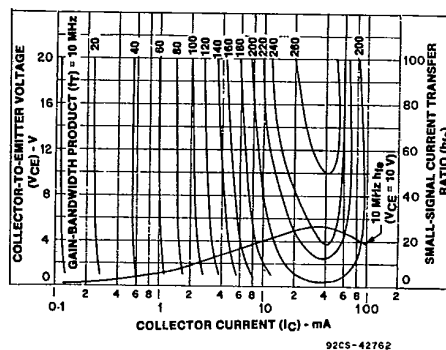


Fig. 8—Typical gain-bandwidth product characteristics; and small-signal current transfer ratio characteristic for 2N3414, 2N3415, GES3414 and GES3415.

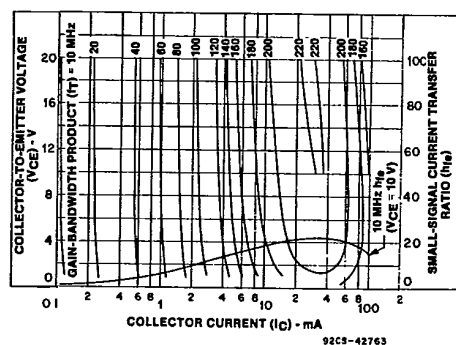


Fig. 9—Typical gain-bandwidth product characteristics; and small-signal current transfer ratio characteristic for 2N3416, 2N3417, GES3416 and GES3417.

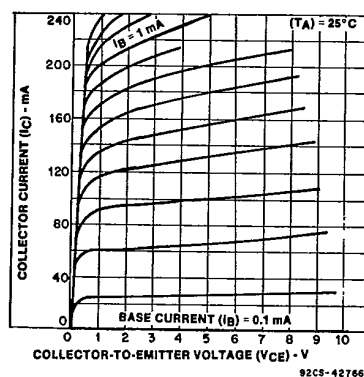


Fig. 10—Typical collector characteristics for 2N3414, 2N3415, GES3414 and GES3415.

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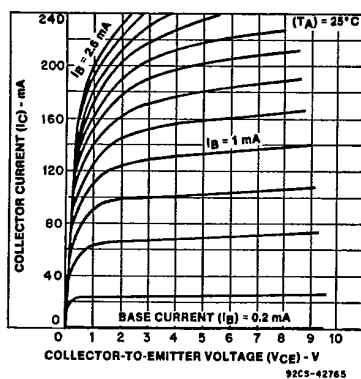
2N3414-17, GES3414-17

Fig. 11—Typical collector characteristics for 2N3416, 2N3417, GES3416 and GES3417.

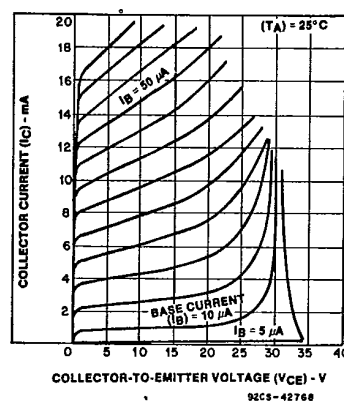


Fig. 12—Typical collector characteristics for 2N3414, 2N3415, GES3414, and GES3416.

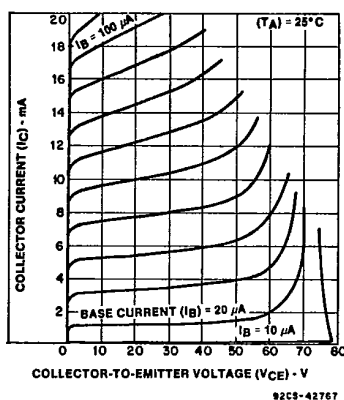


Fig. 13—Typical collector characteristics for 2N3416, 2N3417, GES3416, and GES3417.

TERMINAL CONNECTIONS

TO-92 Package
Lead 1 - Emitter
Lead 2 - Base
Lead 3 - Collector

TERMINAL CONNECTIONS

TO-98 Package
Lead 1 - Emitter
Lead 2 - Collector
Lead 3 - Base