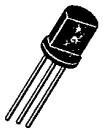
2N3858-60, 2N3858A, 2N3859A

Silicon Transistors



TO-98

The GE/RCA 2N3858, 2N3859 and 2N3860 are planar epitaxial passivated NPN silicon transistors designed primarily for AM radio I.F. and converter applications. These types are supplied in JEDEC TO-98 package.

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

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	2N3858 2N3859 2N3860	2N3858A 2N3859A	
COLLECTOR TO EMITTER VOLTAGE (V_{CEO})	30	60	V
EMITTER TO BASE VOLTAGE (V_{EBO})	4	6	V
COLLECTOR TO BASE VOLTAGE (V_{CBO})	30	60	V
CONTINUOUS COLLECTOR CURRENT (I_C)(Note 1)	100	100	mA
TOTAL POWER DISSIPATION ($T_A \leq 25°C$) (P_T) (Note 2)	360	360	mW
OPERATING TEMPERATURE (T_J)	−55 to +125		°C
STORAGE TEMPERATURE (T_{stg})	−55 to +150		°C
LEAD TEMPERATURE, 1/16" ± 1/32" (1.58mm ± 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 3.6 mW/°C increase in ambient temperature above 25°C.

File Number **2060**

2N3858-60, 2N3858A, 2N3859A

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

CHARACTERISTICS	SYMBOL	LIMITS			UNITS
		MIN.	TYP.	MAX.	
Collector Cutoff Current (V_{CB} = 40V)	I_{CBO}	–	–	50	nA
(V_{CB} = 40V, T_A = 100°C)		–	–	10	μA
Emitter Cutoff Current (V_{EBO} = 5V)	I_{EBO}	–	–	100	nA
DC Forward Current Transfer Ratio 2N3858A (V_{CE} = 1V, I_C = 10mA)	h_{FE}	60	–	–	–
2N3859A (V_{CE} = 1V, I_C = 10mA)		100	–	–	–
2N3858, 58A (V_{CE} = 4.5V, I_C = 2 mA)		60	–	120	–
2N3859, 59A (V_{CE} = 4.5V, I_C = 2 mA)		100	–	200	–
2N3860 (V_{CE} = 4.5V, I_C = 2 mA)		150	–	300	–
Collector–Base Breakdown Voltage (I_C = 0.1mA)	BV_{CBO}	40	–	–	V
Emitter–Base Breakdown Voltage (I_E = 0.1mA)	BV_{EBO}	5	–	–	
Collector–Emitter Breakdown Voltage (I_C = 1ma)	BV_{CEO}	40	–	–	
Collector Saturation Voltage (I_C = 10mA, I_B = 1mA)	$V_{CE(SAT)}$	–	–	0.125	
Gain Bandwidth Product (V_{CE} = 10V, I_C = 2mA) 2N3858, A	f_T	90	125	250	MHz
2N3859, A		90	140	250	
2N3860		90	170	250	
Collector–Base Time constant (V_{CE} = 10V, I_C = 2mA)	$r_b'C_c$	–	65	150	ps
Output Capacitance, Common Base (V_{CB} = 10V, I_E = 0, f = 1Mc)	C_{cbo}	2	2.7	4	pF
Input Capacitance, Common Base (V_{EB} = 0.5V, I_E = 0, f = 1Mc)	C_{ibo}	–	10	–	
Case Capacitance	–	–	0.66	–	

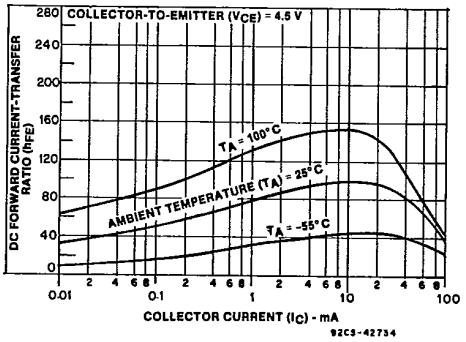


Fig. 1 – Typical dc forward current transfer ratio characteristics for 2N3858 and 2N3858A.

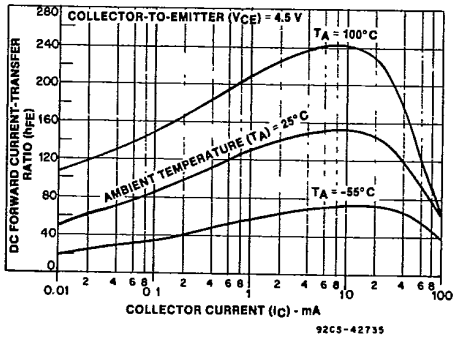


Fig. 2 – Typical dc forward-current transfer ratio characteristics for 2N3859 and 2N3859A.

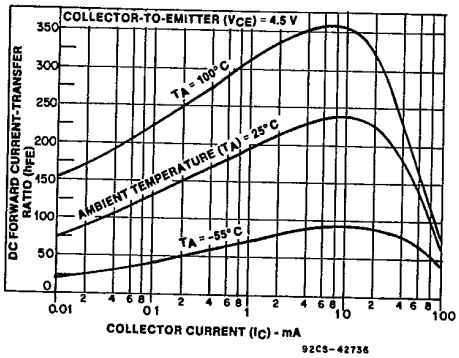


Fig. 3—Typical dc forward-current transfer ratio characteristics for 2N3860.

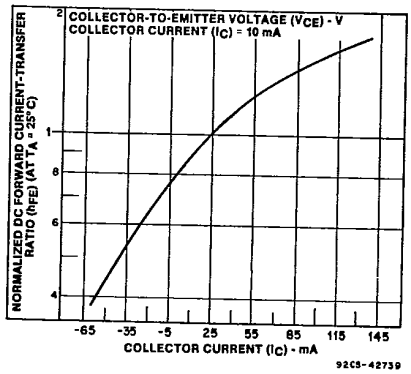


Fig. 4—Normalized dc forward current transfer ratio characteristic for all types.

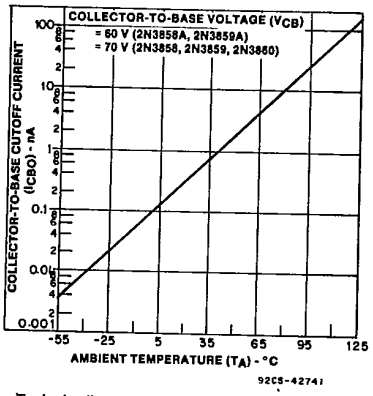


Fig. 5—Typical collector-to-base cutoff current characteristic for all types.

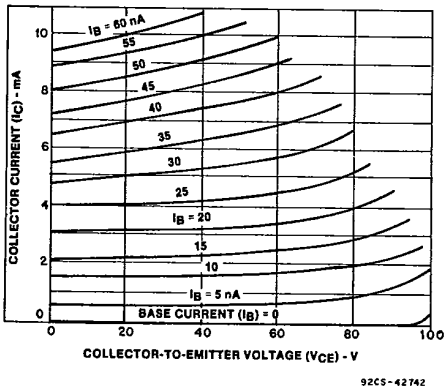


Fig. 6—Typical collector characteristics for 2N3858.

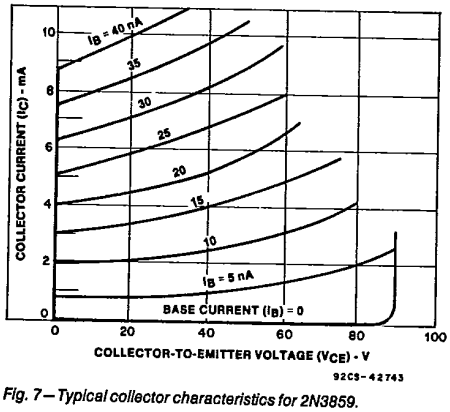


Fig. 7—Typical collector characteristics for 2N3859.

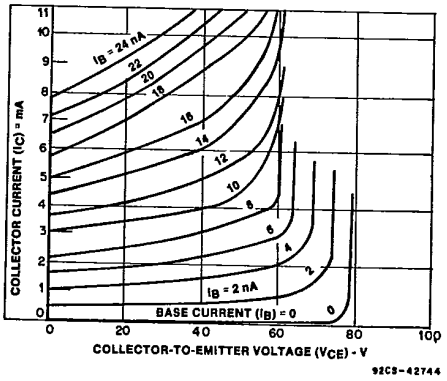


Fig. 8—Typical collector characteristics for 2N3860.

Signal Transistors

T-31-19

2N3858-60, 2N3858A, 2N3859A

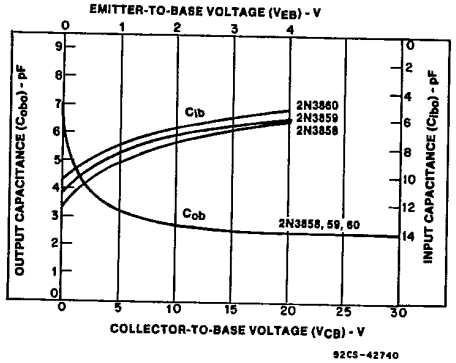


Fig. 9—Typical output and input characteristics for 2N3858, 2N3859 and 2N3860.

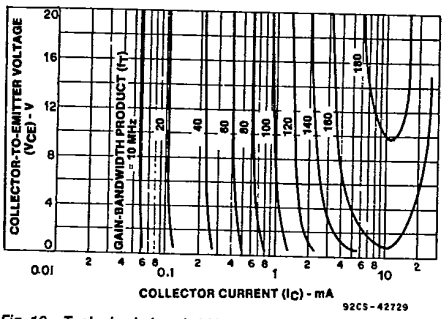


Fig. 10—Typical gain-bandwidth characteristics for 2N3858 and 2N3858A.

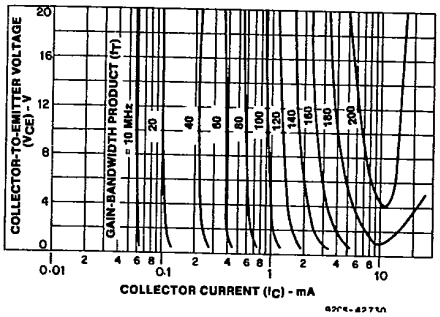


Fig. 11—Typical gain-bandwidth product characteristics for 2N3859 and 2N3859A.

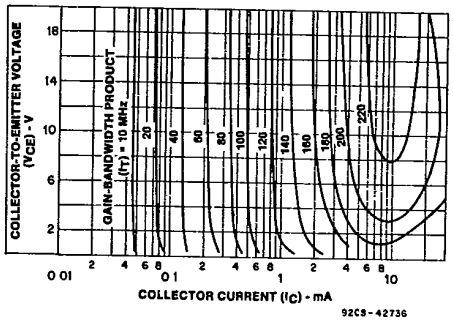


Fig. 12—Typical gain-bandwidth product characteristics for 2N3860.

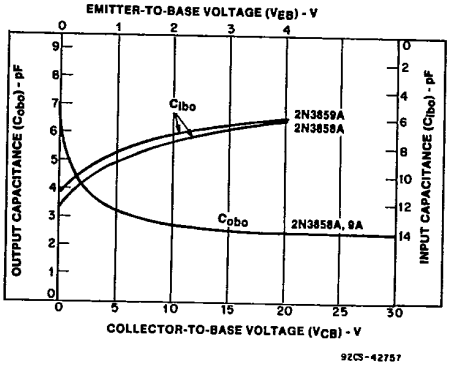


Fig. 13—Typical output and input capacitance characteristics for 2N3858A and 2N3859A.

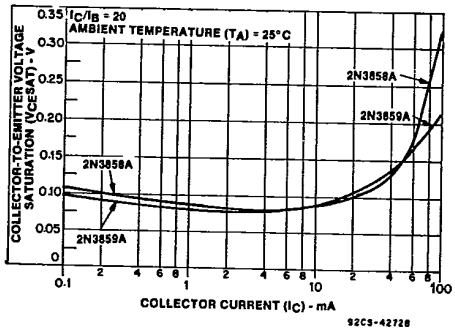


Fig. 14—Typical collector-to-emitter saturation voltage characteristics 2N3858A and 2N3859A.

2N3858-60, 2N3858A, 2N3859A

T-31-19

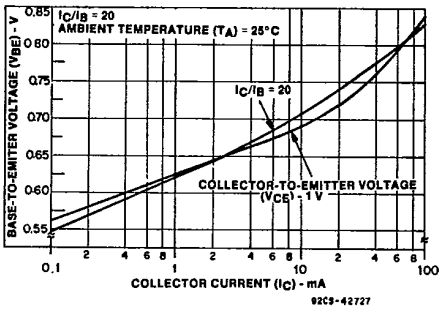


Fig. 15—Typical base-to-emitter voltage characteristics for 2N3858A and 2N3859A.

TERMINAL CONNECTIONS

Lead 1 - Emitter
Lead 2 - Collector
Lead 3 - Base