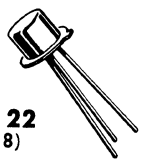
2N707, A (SILICON)

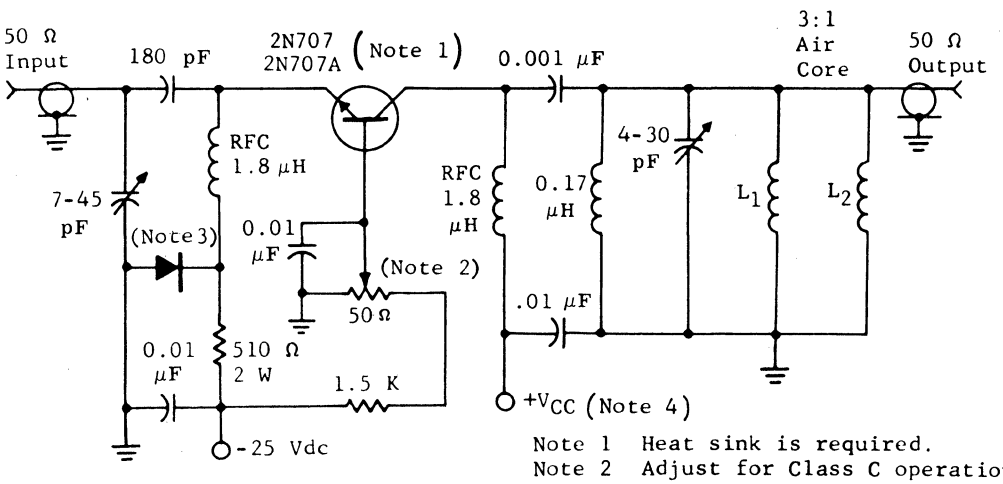


CASE 22
(TO-18)
Collector connected to case

NPN silicon epitaxial mesa transistors for VHF oscillator and class C amplifier applications.

MAXIMUM RATINGS

Rating	Symbol	2N707	2N707A	Unit
Collector-Emitter Voltage	V_{CEO}	-	40	Vdc
Collector-Emitter Voltage ($R_{BE} \leq 10$ ohms)	V_{CER}	28	-	Vdc
Collector-Base Voltage	V_{CB}	56	70	Vdc
Emitter-Base Voltage	V_{EB}	4.0	5.0	Vdc
Total Device Dissipation @ $T_A = 25^oC$	P_D	0.3	0.5	Watt
Derate above 25^oC		2.0	3.33	$mW/^oC$
Total Device Dissipation @ $T_C = 25^oC$	P_D	1.0	1.2	Watts
Derate above 25^oC		6.67	8.0	$mW/^oC$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +175		^oC



L_1 5 turns #14 wire wound on 1/2" diameter.

L_2 2 turns #14 wire wound on L_1.

Note 1 Heat sink is required.
Note 2 Adjust for Class C operation.
Note 3 Very High conductance silicon diode.
Note 4 Adjust V_{CC} for proper V_{CE}

FIGURE 1 – 100 MHz, CLASS C, COMMON BASE AMPLIFIER

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector-Emitter Breakdown Voltage [1] (I_C = 20 mAdc, I_B = 0)	2N707A	BV_{CEO}	40	-	-	Vdc
Collector-Emitter Breakdown Voltage (I_C = 10 mAdc, R_{BE} = 10 ohms)	2N707	BV_{CER}	28	-	-	Vdc
Collector-Base Breakdown Voltage (I_C = 10 μAdc, I_E = 0)	2N707 2N707A	BV_{CBO}	56 70	- -	- -	Vdc
Emitter-Base Breakdown Voltage (I_E = 100 μAdc, I_C = 0)	2N707A	BV_{EBO}	5.0	-	-	Vdc
Collector Cutoff Current		I_{CBO}				μAdc
(V_{CB} = 15 Vdc, I_E = 0)	2N707		-	0.005	5.0	
(V_{CB} = 15 Vdc, I_E = 0, T_A = 150°C)	2N707		-	3.0	-	
(V_{CB} = 30 Vdc, I_E = 0)	2N707A		-	0.01	1.0	
(V_{CB} = 30 Vdc, I_E = 0, T_A = 150°C)	2N707A		-	5.0	100	
Emitter Cutoff Current		I_{EBO}				μAdc
(V_{BE} = 4 Vdc, I_C = 0)	2N707		-	-	10	
(V_{BE} = 5 Vdc, I_C = 0)	2N707A		-	-	100	
ON CHARACTERISTICS						
DC Current Gain (I_C = 10 mAdc, V_{CE} = 1 Vdc)	2N707 2N707A	h_{FE}	9.0 9.0	12 -	- 50	-
Collector Saturation Voltage (I_C = 10 mAdc, I_B = 1 mAdc)		$V_{CE(sat)}$	-	0.18	0.6	Vdc
Base-Emitter Saturation Voltage (I_C = 10 mAdc, I_B = 1 mAdc)		$V_{BE(sat)}$	-	0.75	0.9	Vdc
DYNAMIC CHARACTERISTICS						
Current-Gain — Bandwidth Product (I_E = 15 mAdc, V_{CE} = 10 Vdc)		f_T	70	350	-	MHz
Maximum Frequency of Oscillation		f_{max}	-	600	-	MHz
Output Capacitance		C_{ob}				pF
(V_{CB} = 10 Vdc, I_E = 0)	2N707		-	4.0	10.0	
(V_{CB} = 5 Vdc, I_E = 0)	2N707A		-	4.0	6.0	
Collector-Base Time Constant (I_C = 10 mAdc, V_{CB} = 10 Vdc, f = 4 MHz)		$r'_b C_c$	-	80	-	ps
FUNCTIONAL TEST						
Power Output (Figure 1)		P_{out}				mW
(V_{CE} = 20 Vdc, P_{in} = 50 mW)	All Types		200	300	-	
(V_{CE} = 40 Vdc, P_{in} = 175 mW)	2N707A		400	-	-	
100-MHz Oscillator Efficiency (V_{CE} = 28 Vdc, I_C = 40 mAdc)		η	-	38	-	%

[1] **Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.**