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40406, 40408, 40410, 40407, 40409, 40411

Silicon N-P-N and P-N-P Power Transistors

For Audio-Amplifier Applications

RCA-40406-40411, inclusive, are diffused-junction silicon n-p-n and p-n-p transistors intended for use in audio amplifiers. Giving high-quality performance economically, these six devices have power dissipation ratings of 1 to 150 W. Types 40406, 40407, and 40408 are supplied in JEDEC TO-39 hermetic packages; types 40409 and 40410 are in TO-39 packages mounted on integral heat radiators. The 40411 unit, intended for use in audio output stages, is in a steel JEDEC TO-3 hermetic package.

	40406	40407	40408	40409	40410	40411	
$V_{CEO}(sus)$	-50	50	90	–	–	–	V
$V_{CER}(sus)$ R_{BE} = 100 Ω	–	–	–	90	-90	90	V
V_{EBO}	-4	4	4	4	-4	4	V
I_C	-0.7	0.7	0.7	0.7	-0.7	30	A
I_B	-0.2	0.2	0.2	0.2	-0.2	15	A
P_T:							
$T_A \leq 25°C$	1	1	1	–	–	–	W
$T_A \leq 50°C$	–	–	–	3	3	–	W
$T_C \leq 25°C$	–	–	–	–	–	150	W
T_J	-65 to +200						°C

Features:

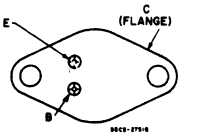
40406 & 40407
- $V_{CEO}(sus)$ = -50 V max. (40406)
- $V_{CEO}(sus)$ = 50 V max. (40407)
- 40406 is p-n-p complement of 40407
- 1 W dissipation rating

40408
- $V_{CEO}(sus)$ = 90 V max.
- 1 W dissipation rating

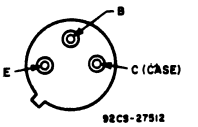
40409 & 40410
- $V_{CER}(sus)$ = 90 V max. (40409)
- $V_{CER}(sus)$ = -90 V max. (40410)
- 40410 is p-n-p complement of 40409
- 3 W free-air dissipation rating

40411
- $V_{CER}(sus)$ = 90 max.
- Hometaxial-base construction
- 150 W dissipation rating

TERMINAL DESIGNATIONS



JEDEC TO-3



JEDEC TO-39

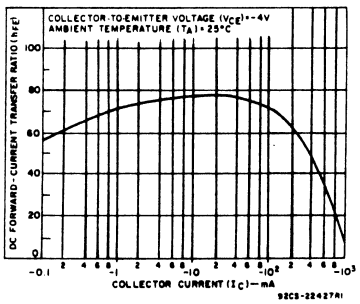


Fig. 1 – Typical dc beta characteristic for 40406 and 40410.

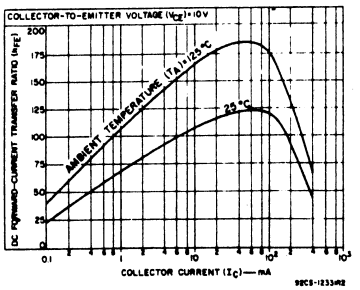


Fig. 2 – Typical dc beta characteristics for 40407, 40408, and 40409.

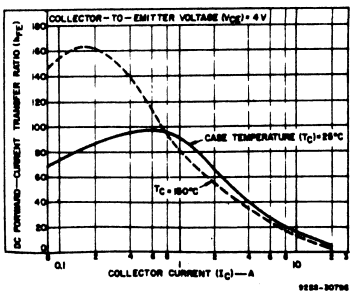


Fig. 3 – Typical dc beta characteristics for 40411.

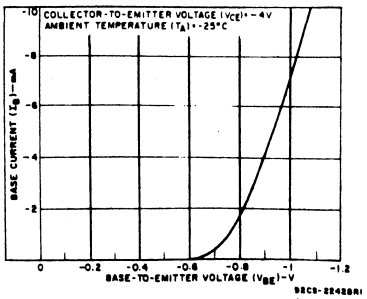


Fig. 4 – Typical input characteristic for 40406 and 40410.

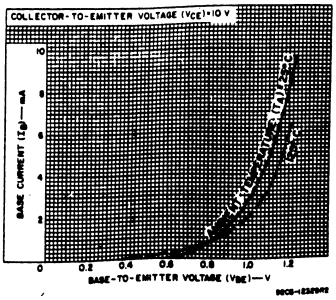


Fig. 5 – Typical input characteristics for 40407, 40408, and 40409.

ELECTRICAL CHARACTERISTICS, $T_C = 25°$ *Unless Otherwise Specified*

CHARACTERISTIC	TEST CONDITIONS			LIMITS								UNITS
	VOLTAGE V dc	CURRENT A dc		40406# 40407		40408		40409 40410#		40411		
	V_{CE}	I_C	I_B	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
I_{CBO} $I_E = 0$	10•			–	0.25♦	–	–	–	–	–	–	μA
I_{CEO}	40			–	1	–	–	–	–	–	–	μA
	80			–	–	–	1	–	–	–	–	
$T_C = 150°$ C												
40406	40			–	0.01	–	–	–	–	–	–	mA
40407	40			–	0.1	–	–	–	–	–	–	
40408	80			–	–	–	0.25	–	–	–	–	
I_{CER} $R_{BE} = 100\ \Omega$	80			–	–	–	–	–	1	–	500	μA
$T_C = 150°$ C	80			–	–	–	–	–	0.1	–	2	mA
I_{EBO} $V_{BE} = -4$ V		0		–	100	–	100	–	100	–	500	μA
V_{CEO}(sus)		0.1[a]	0	50[b]	–	90[b]	–	–	–	–	–	V
V_{CER}(sus) $R_{BE} = 100\ \Omega$		0.1			–	–	–		–	–	–	V
		0.2			–	–	–	–	–	90	–	
V_{BE}	10	0.001[a]		–	0.8[c]	–	–	–	–	–	–	V
	4	0.01[a]		–	–	–	1	–	–	–	–	
	4	0.15[a]		–	–	–	–	–	1	–	–	
	4	4[a]		–	–	–	–	–	–	–	1.2	
V_{CE}(sat)		0.15[a]	0.015	–	–	–	1.4	–	1.4	–	–	V
		4[a]	0.4	–	–	–	–	–	–	–	0.8	
40406	10	0.1 mA[a]		30	200	–	–	–	–	–	–	
40407	10	0.001[a]		40	200	–	–	–	–	–	–	
h_{FE} 40408	4	0.01[a]		–	–	40	200	–	–	–	–	
40409-10	4	0.15[a]		–	–	–	–	50	250	–	–	
40411	4	4[a]		–	–	–	–	–	–	35	100	
h_{fe} $f = 20$ MHz	10	0.05		6♦	–	–	–	–	–	–	–	
f_T	4	0.05		100 (typ.)		100 (typ.)		100 (typ.)		–	–	MHz
	4	4		–	–	–	–	–	–	800 (typ.)		kHz
C_{obo} $I_E = 0$ $f = 1$ MHz	10•			15♦	–	–	–	–	–	–	–	pF
$I_{S/b}$ $t = 1$s nonrep	40			–	–	–	–	5*	–	–	–	A
$R_{\theta JC}$				–	35	–	35	–	–	–	1.17	°C/W
$R_{\theta JA}$				–	175	–	175	–	50	–	–	

* For p-n-p devices, voltage and current values are negative

• V_{CB} ♦ 40407 only * 40410 only

[a] Pulsed; pulse duration = 300 μs, duty factor ≤ 2%

[b] CAUTION: The sustaining voltage V_{CEO}(sus) MUST NOT be measured on a curve tracer. V_{CEO}(sus) should be measured by the pulse method (Note 'a').

[c] 40406 tested at $I_C = -0.1$ mA

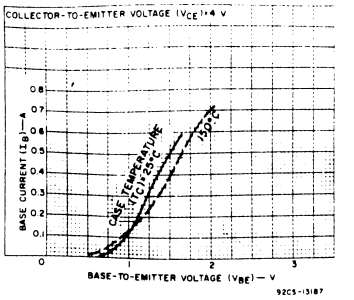


Fig. 6 – Typical input characteristics for 40411.

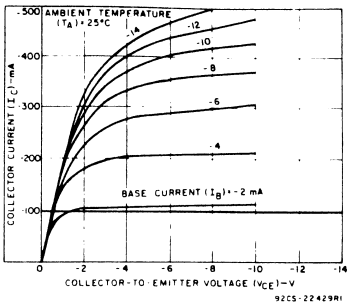


Fig. 7 – Typical output characteristics for 40406 and 40410.

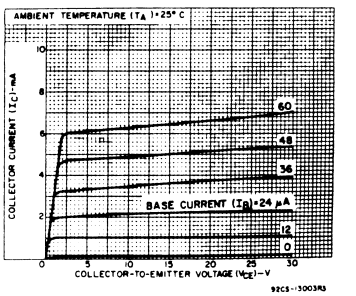


Fig. 8 – Typical output characteristics for 40407, 40408, and 40409.

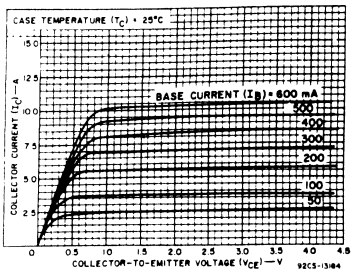


Fig. 9 – Typical output characteristics for 404II.