File Number 1199

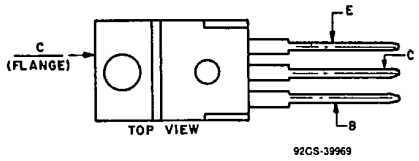
BUW64A, BUW64B, BUW64C

High-Current, Silicon N-P-N VERSAWATT Transistors

Switching Applications

Features:
- *Fast switching speed at temperatures up to 125° C*
- *Low $V_{CE}(sat)$*
- *VERSAWATT plastic package*

TERMINAL DESIGNATIONS



JEDEC TO-220AB

RCA-BUW64A, BUW64B, and BUW64C are epitaxial-base silicon n-p-n power transistors which feature fast switching speeds, low saturation voltages, and high safe-operating-area (SOA) ratings. They are specially designed for converters, inverters, pulse-width-modulated regulators and a variety of power switching circuits.

The BUW64A, BUW64B, and BUW64C transistors are supplied in the JEDEC TO-220AB (RCA VERSAWATT) plastic packages.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	BUW64A	BUW64B	BUW64C	
V_{CEV}				
V_{BE} = -1.5 V	140	160	180	V
V_{CEO}	90	110	130	V
V_{EBO}		7		V
$I_C(sat)$	5	5	4	A
I_C		7		A
I_{CM}		10		A
I_B		5		A
P_T				
T_C up to 25° C		50		W
T_C above 25° C ..... Derate Linearly		0.4		W/°C
T_{stg}, T_J		-65 to 150		°C
T_L				
At distance ≥ 1/8 in. (3.16 mm) from seating plane for 10 s max.		235		°C

BUW64A, 'BUW64B, BUW64C

ELECTRICAL CHARACTERISTICS, at Case Temperature T_C = 25°C Unless Otherwise Specified

CHARACTERISTIC	TEST CONDITIONS				LIMITS						UNITS
	VOLTAGE V dc		CURRENT A dc		BUW64A		BUW64B		BUW64C		
	V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	Min.	Max.	
I_{CEV}	140	−1.5			–	100	–	–	–	–	μA
	160	−1.5			–	–	–	100	–	–	
	180	−1.5			–	–	–	–	–	100	
T_C = 125°C	140	−1.5			–	1	–	–	–	–	mA
	160	−1.5			–	–	–	1	–	–	
	180	−1.5			–	–	–	–	–	1	
I_{EBO}		−7	0		–	100	–	100	–	100	μA
$V_{CEO(sus)}$[b]			0.01[a]	0	90	–	110	–	130	–	V
h_{FE}	2		0.2[a]		30	–	30	–	30	–	
	2		4[a]		–	–	–	–	20	–	
	2		5[a]		20	–	20	–	–	–	
$V_{BE(sat)}$			4[a]	0.4	–	–	–	–	–	1.4	V
			5[a]	0.5	–	1.5	–	1.5	–	–	
$V_{CE(sat)}$			4[a]	0.4	–	–	–	–	–	0.7	
			5[a]	0.5	–	0.8	–	0.8	–	–	
			7[a]	0.7	–	1.5	–	1.5	–	1.5	
$I_{S/b}$	20		2.5		1	–	1	–	1	–	s
$\lvert h_{fe} \rvert$ f = 5 MHz	10		0.5		10	40	10	40	10	40	
f_T	10		0.5		50	200	50	200	50	200	MHz
C_{obo} f = 0.1 MHz	10[c]				50	150	50	150	50	150	pF
t_d[d]		−4	4	0.4	–	–	–	–	–	0.1	μs
			5	0.5	–	0,1	–	0.1	–	–	
t_r[d]		−4	4	0.4	–	–	–	–	–	0.25	
			5	0.5	–	0.25	–	0.25	–	–	
t_s[d]		−4	4	0.4[e]	–	–	–	–	–	1	
			5	0.5[e]	–	1	–	1	–	–	
t_f[d]		−4	4	0.4[e]	–	–	–	–	–	0.5	
			5	0.5[e]	–	0.5	–	0.5	–	–	
$R_{\theta JC}$	4		5		–	2.5	–	2.5	–	2.5	°C/W

[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.

[c] V_{CB} value.

[d] V_{CC} = 70 V, t_p = 20 μs

[e] $I_{B_1} = -I_{B_2}$.

BUW64A, BUW64B, BUW64C

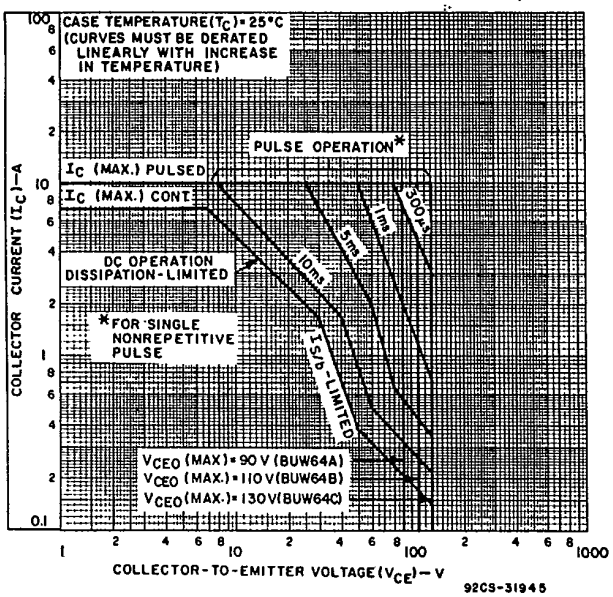


Fig. 1 – Maximum operating areas for all types (T_C = 25°C).

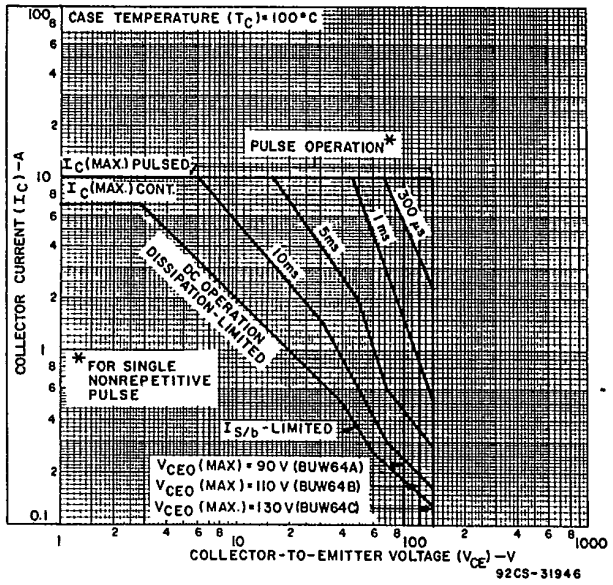


Fig. 2 – Maximum operating areas for all types (T_C = 100°C).

BUW64A, BUW64B, BUW64C

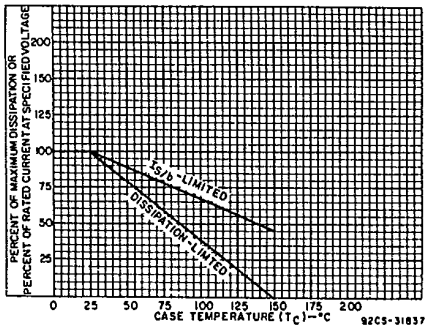


Fig. 3 – Dissipation and $I_{S/b}$ derating curves for all types.

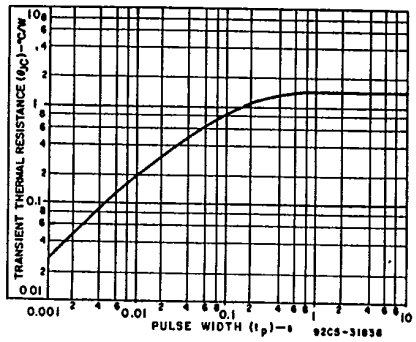


Fig. 4 – Typical thermal-response characteristic for all types.

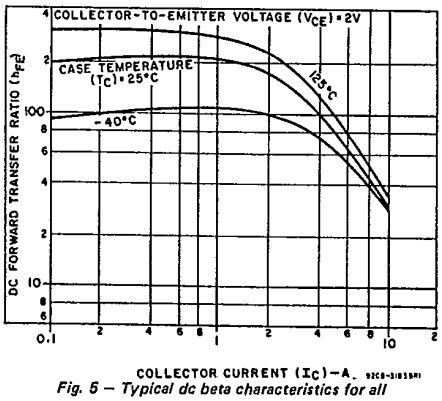


Fig. 5 – Typical dc beta characteristics for all types.

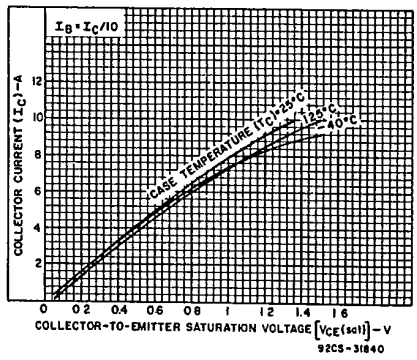


Fig. 6 – Typical collector-to-emitter saturation voltage characteristics for all types.

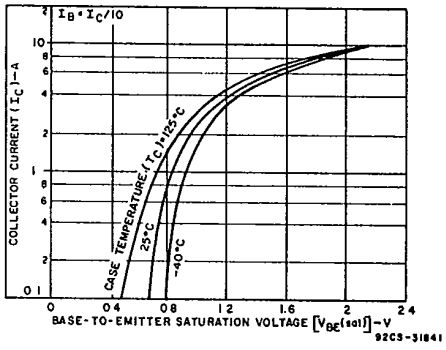


Fig. 7 – Typical base-to-emitter saturation voltage characteristic for all types.

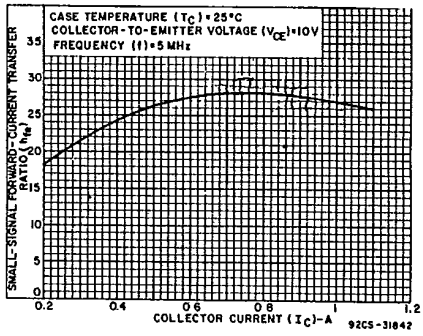


Fig. 8 – Typical small-signal forward-current transfer ratio characteristic for all types (f = 5 MHz).

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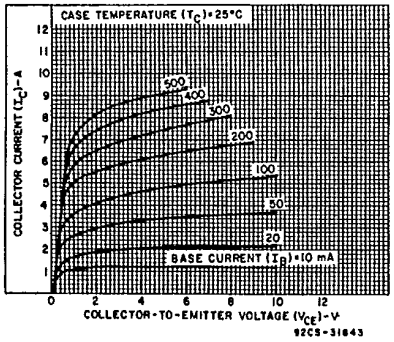

Fig. 9 – Typical output characteristics for all types.

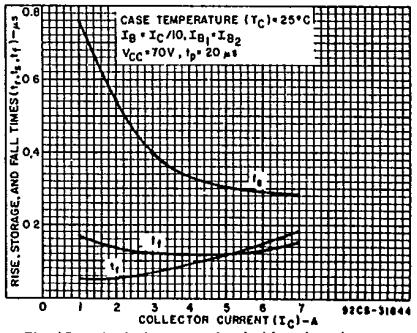

Fig. 10 – Typical saturated-switching-time characteristics as a function of collector current for all types (T_C = 25°C).

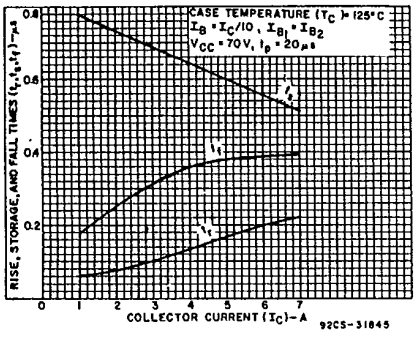

Fig. 11 – Typical saturated-switching-time characteristics as a function of collector current for all types (T_C = 125°C).

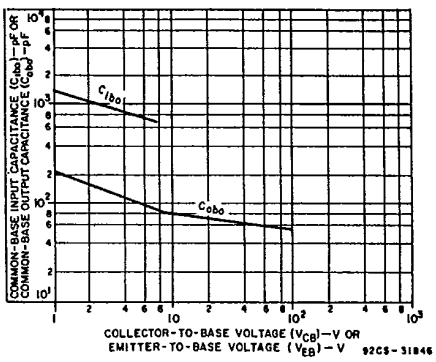

Fig. 12 – Typical common-base input (C_{ibo}) or output (C_{obo}) capacitance characteristic for all types.

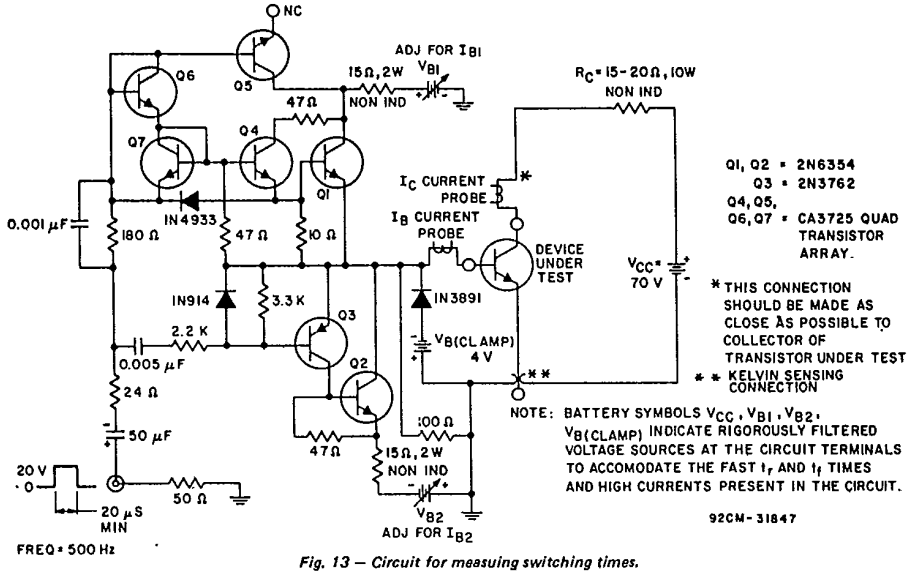

Fig. 13 – Circuit for measuring switching times.

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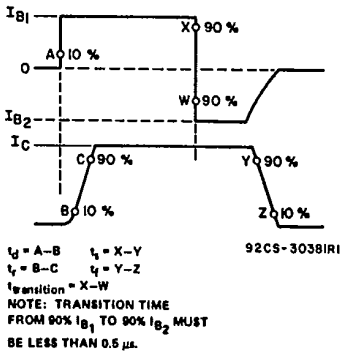

Fig. 14 — Phase relationship between input and output currents showing reference points for specification of switching times.