File Number **870**

BUX66, BUX66A, BUX66B, BUX66C

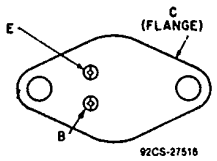
High Voltage Silicon P-N-P Transistors

For High-Speed Switching and Linear-Amplifier Applications

Features:

- *High voltage ratings:*
  $V_{CEO}(sus)$ = -150 V max. (BUX66)
  = -250 V max. (BUX66A)
  = -300 V max. (BUX66B)
  = -350 V max. (BUX66C)
- *Large safe-operating area.*

TERMINAL DESIGNATIONS



JEDEC TO-213AA

The RCA-BUX66, BUX66A, BUX66B, and BUX66C are silicon p-n-p transistors with high breakdown voltages and fast switching speeds. These transistors are intended for a wide variety of applications in ac/dc commercial equipment.

Typical applications include high-voltage operational and linear amplifiers, high-voltage switches, switching regulators, converters, and inverters.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

	BUX66	BUX66A	BUX66B	BUX66C	
V_{CBO}	—200	—300	—350	—400	V
$V_{CEV}(sus)$ V_{BE} = -1.5 V	—200	—300	—350	—400	V
$V_{CER}(sus)$ R_{BE} = 100Ω	—175	—275	—325	—375	V
$V_{CEO}(sus)$	—150	—250	—300	—350	V
V_{EBO}	—6	—6	—6	—6	V
I_C	—2	—2	—2	—2	A
I_{CM}	—5	—5	—5	—5	A
I_B	—1	—1	—1	—1	A
P_T Up to 25°C	35	35	35	35	W
Above 25°C, Derate linearly.	0.2	0.2	0.2	0.2	W/°C
T_J, T_{stg}			—65 to 200		°C
T_L At distance 1/16 in. (1.58 mm) from seating plane for 10 s max.	235	235	235	235	°C

BUX66, BUX66A, BUX66B, BUX66C

ELECTRICAL CHARACTERISTICS, *At Case Temperature (T_C) = 25°C Unless Otherwise Specified*

CHARACTERISTIC SYMBOL	TEST CONDITIONS				LIMITS				UNITS
	VOLTAGE V dc		CURRENT A dc		BUX66		BUX66A		
	V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	
I_{CEO}	−150			0	–	−10	–	−10	mA
I_{CEX}	−200	1.5			–	−8	–	–	mA
	−300	1.5			–	–	–	−8	mA
T_C = 100°C	−200	1.5			–	−10	–	–	mA
	−300	1.5			–	–	–	−10	mA
I_{EBO}		6	0		–	−1	–	−1	mA
h_{FE}	−5		−1[a]		10	150	10	150	
$V_{CEO(sus)}$			−0.2[a]	0	−150[c]	–	−250[c]	–	V
$V_{CER(sus)}$ R_{BE} = 50 Ω			−0.2		−175[c]	–	−275[c]	–	V
$V_{BE(sat)}$			−1[a]	−0.15	–	−1.5	–	−1.5	V
$V_{CE(sat)}$			−1[a]	−0.15	–	−2.5	–	−2.5	V
C_{obo} V_{CB} = 10 V f = 1 MHz					–	220	–	220	pF
$I_{S/b}$ t = 1 s, nonrep.	−40				−875	–	−875	–	mA
$\|h_{fe}\|$ f = 5 MHz	−10		−0.2		4	–	4	–	
t_r V_{CC} = −200 V			−1	−0.10[b]	–	0.6	–	0.6	μs
t_s V_{CC} = −200 V			−1	−0.10[b]	–	2.5	–	2.5	μs
t_f V_{CC} = −200 V			−1	−0.10[b]	–	0.6	–	0.6	μs
$R_{\theta JC}$					–	5	–	5	°C/W

[a] Pulsed: Pulse duration = 300 μs; duty factor ≤ 2%. [b] $I_{B1} = I_{B2}$

[c] Sustaining voltages, $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.

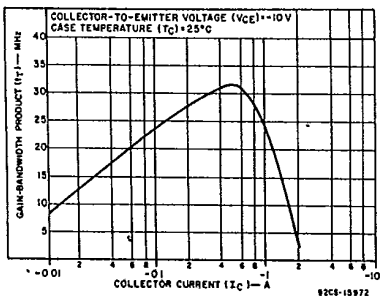


Fig. 1 – Typical gain-bandwidth product for all types.

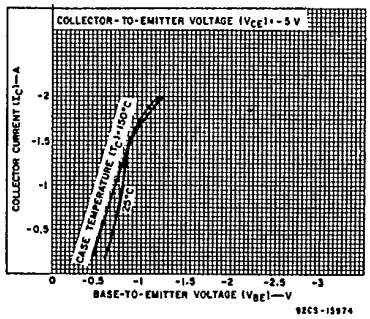


Fig. 2 – Typical transfer characteristics for all types.

BUX66, BUX66A, BUX66B, BUX66C

ELECTRICAL CHARACTERISTICS, *At Case Temperature (T_C) = 25°C Unless Otherwise Specified*

CHARACTERISTIC SYMBOL	TEST CONDITIONS				LIMITS				UNITS
	VOLTAGE V dc		CURRENT A dc		BUX66B		BUX66C		
	V_{CE}	V_{BE}	I_C	I_B	Min.	Max.	Min.	Max.	
I_{CEO}	−150			0	–	−5	–	−5	mA
I_{CEX}	−350	1.5			–	−8	–	–	mA
	−400	1.5			–	–	–	−8	mA
T_C = 100°C	−350	1.5			–	−10	–	–	mA
	−400	1.5			–	–	–	−10	mA
I_{EBO}		6	0		–	−1	–	−1	mA
h_{FE}	−5		−1[a]		10	150	10	150	
$V_{CEO(sus)}$			−0.2[a]	0	−300[c]	–	−350[c]	–	V
$V_{CER(sus)}$ R_{BE} = 50 Ω			−0.2		−325[c]	–	−375[c]	–	V
$V_{BE(sat)}$			−1[a]	−0.15	–	−1.5	–	−1.5	V
$V_{CE(sat)}$			−1[a]	−0.15	–	−2.5	–	−2.5	V
C_{obo} V_{CB} = 10 V f = 1 MHz					–	220	–	220	pF
$I_{S/b}$ t = 1 s, nonrep.	−40				−875	–	−875	–	mA
$\|h_{fe}\|$ f = 5 MHz	−10		−0.2		4	–	4	–	
t_r V_{CC} = −200 V			−1	−0.10[b]	–	0.6	–	0.6	µs
t_s V_{CC} = −200 V			−1	−0.10[b]	–	2.5	–	2.5	µs
t_f V_{CC} = −200 V			−1	−0.10[b]	–	0.6	–	0.6	µs
$R_{\theta JC}$					–	5	–	5	°C/W

[a] Pulsed: Pulse duration = 300 µs; duty factor ≤ 2%. [b] $I_{B1} = I_{B2}$

[c] Sustaining voltages, $V_{CEO(sus)}$ and $V_{CER(sus)}$ MUST NOT be measured on a curve tracer.

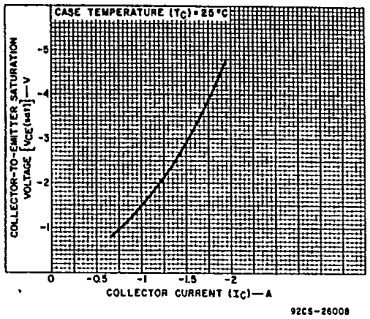


Fig.3 — Typical saturation-voltage characteristic for all types.

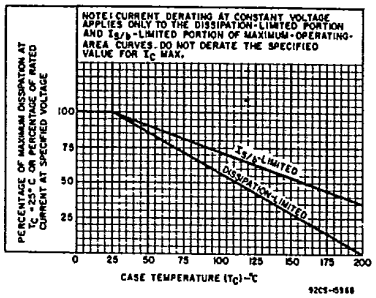


Fig. 4 — Derating curve for all types.

BUX66, BUX66A, BUX66B, BUX66C

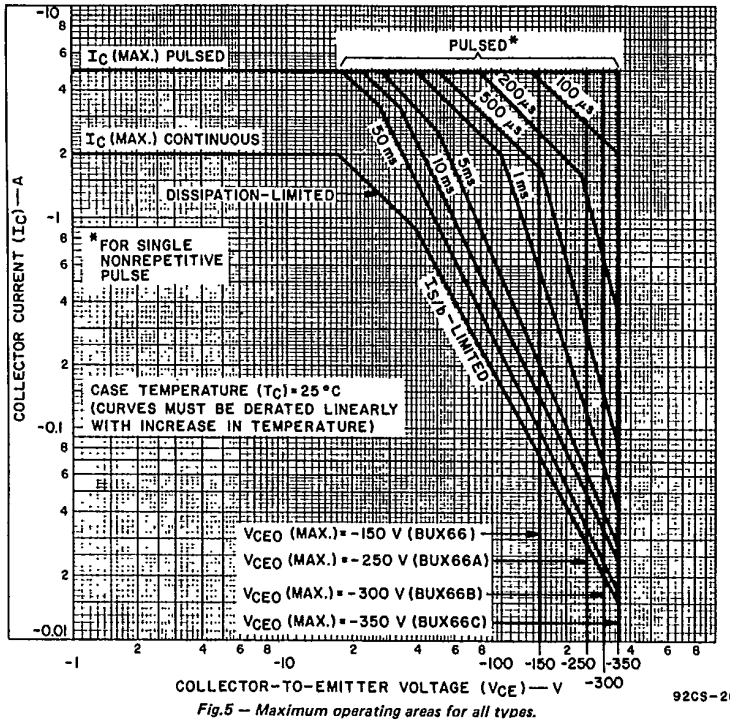


Fig.5 — Maximum operating areas for all types.

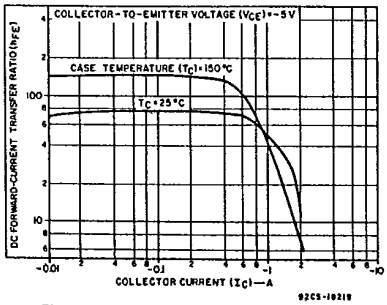


Fig. 6 — Typical dc beta characteristics for all types.

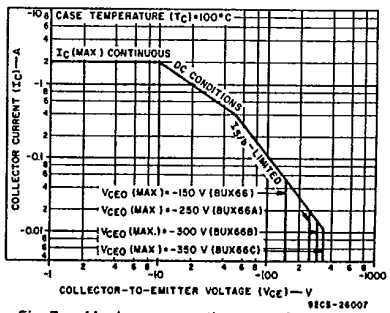


Fig. 7 — Maximum operating areas for all types at T_C = 100° C.

BUX66, BUX66A, BUX66B, BUX66C

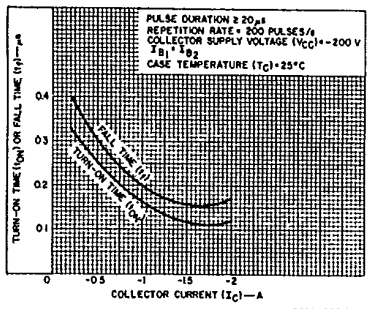


Fig. 8 — Typical turn-on time and fall-time characteristics for all types.

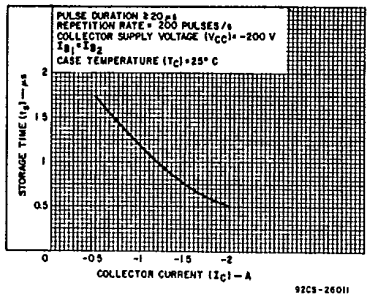


Fig. 9 — Typical storage-time characteristic for all types.

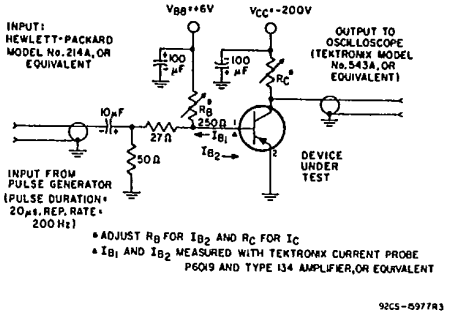


Fig. 10 — Circuit used to measure saturated switching times for all types.

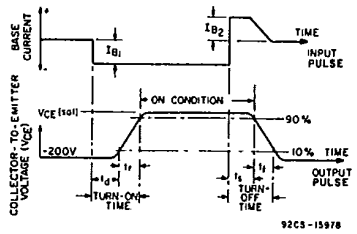


Fig. 11 — Phase relationship between input current and output voltage showing reference points for specification of switching times.

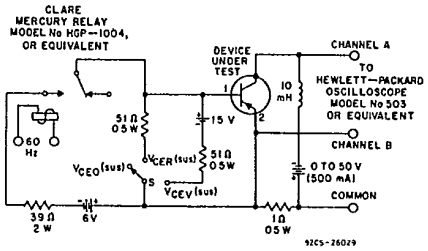
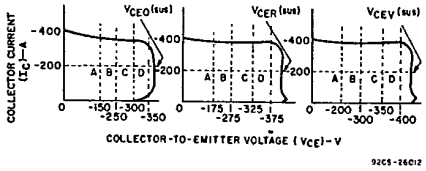


Fig. 12 — Circuit used to measure sustaining voltages $V_{CEO}(sus)$, $V_{CER}(sus)$, and $V_{CEV}(sus)$ for all types.



NOTE: Sustaining voltages are acceptable when traces fall to the right and above points "A" for BUX66, points "B" for BUX66A, points "C" for BUX66B, and points "D" for BUX66C.

Fig. 13 — Oscilloscope display for measurement of sustaining voltages.