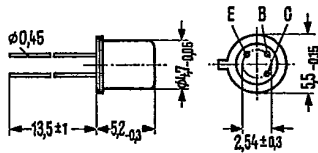


BCY 58, BCY 59, and BCY 65 E are epitaxial NPN silicon planar transistors in TO 18 cases (18 A 3 DIN 41876). The collector is electrically connected to the case. The transistors are particularly suitable for AF input and driver stages as well as for switching applications.

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Type	Ordering code
BCY 58	Q60203-Y58
BCY 58 VII	Q60203-Y58-G
BCY 58 VIII	Q60203-Y58-H
BCY 58 IX	Q60203-Y58-J
BCY 58 X	Q60203-Y58-K
BCY 59	Q60203-Y59
BCY 59 VII	Q60203-Y59-G
BCY 59 VIII	Q60203-Y59-H
BCY 59 IX	Q60203-Y59-J
BCY 59 X	Q60203-Y59-K
BCY 65 E	Q60203-Y65-S2
BCY 65 E VII	Q60203-Y65-E7
BCY 65 E VIII	Q60203-Y65-E8
BCY 65 E IX	Q60203-Y65-E9



Approx. weight 0.3 g

Dimensions in mm

Maximum ratings

	BCY 58	BCY 59	BCY 65 E	
Collector-emitter voltage	V_{CES} 32	45	60	V
Collector-emitter voltage	V_{CEO} 32	45	60	V
Emitter-base voltage	V_{EBO} 7	7	7	V
Collector current	I_C 200	200	100	mA
Base current	I_B 50	50	50	mA
Junction temperature	T_j 200	200	200	$^{\circ}C$
Storage temperature range	T_{stg} -65 to +200			$^{\circ}C$
Total power dissipation ($T_{case} \leq 45^{\circ}C$)	P_{tot} 1	1	1	W

Thermal resistance

Junction to ambient air	R_{thJA}	≤ 450	≤ 450	≤ 450	K/W
Junction to case	R_{thJC}	≤ 150	≤ 150	≤ 150	K/W

Static characteristics ($T_{amb} = 25^{\circ}C$)

The transistors are grouped according to the DC current gain h_{FE} and marked by Roman numerals.

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Static characteristics ($T_{amb} = 25^{\circ}\text{C}$)

Type		BCY 65 E	BCY 65 E	BCY 65 E	-	BCY 58
		BCY 58/59	BCY 58/59	BCY 58/59	BCY 58/59	BCY 59
h_{FE} group		VII	VIII	IX	X	BCY 65E
V_{CE} V	I_C mA	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B	h_{FE} I_C/I_B	V_{BE} V
5	0.01	78	145 (>20)	220 (>40)	300 (>100)	0.5
5	2	170 (120 to 220)	250 (180 to 310)	350 (250 to 460)	500 (380 to 630)	0.62 (0.55 to 0.7)*
1	10	190 (>80)	260 (120 to 400)	380 (160 to 630)	550 (240 to 1000)	0.7
1	50 ¹⁾	>40	>45	>60	-	0.76
1	100 ²⁾	>40	>45	>60	>60	0.76

Saturation voltages:

	V_{CEsat}	V_{BEsat}	
($I_C = 10\text{ mA}; I_B = 0.25\text{ mA}$)	0.12 (<0.35)	0.7 (<0.85)	V
($I_C = 10\text{ mA}; I_B = 2.5\text{ mA}$) ²⁾	0.3 (<0.7)	0.9 (<1.2)	V
($I_C = 50\text{ mA}; I_B = 1.25\text{ mA}$) ¹⁾	0.1 (<0.7)	0.9 (<1.2)	V

		BCY 58	BCY 59	BCY 65E	
Collector cutoff current ($V_{CES} = 32\text{ V}$)	I_{CES}	0.2 (<10)	-	-	nA*
($V_{CES} = 45\text{ V}$)	I_{CES}	-	0.2 (<10)	-	nA*
($V_{CES} = 60\text{ V}$)	I_{CES}	-	-	0.2 (<10)	nA*
Collector cutoff current ($V_{CES} = 32\text{ V}; T_{amb} = 150^{\circ}\text{C}$)	I_{CES}	0.2 (<10)	-	-	μA
($V_{CES} = 45\text{ V}; T_{amb} = 150^{\circ}\text{C}$)	I_{CES}	-	0.2 (<10)	-	μA
($V_{CES} = 60\text{ V}; T_{amb} = 150^{\circ}\text{C}$)	I_{CES}	-	-	0.2 (<10)	μA
Collector cutoff current ($V_{CE} = 32\text{ V}; V_{BE} = 0.2\text{ V}; T_{amb} = 100^{\circ}\text{C}$)	I_{CEX}	<20	-	-	μA
($V_{CE} = 45\text{ V}; V_{BE} = 0.2\text{ V}; T_{amb} = 100^{\circ}\text{C}$)	I_{CEX}	-	<20	-	μA
($V_{CE} = 60\text{ V}; V_{BE} = 0.2\text{ V}; T_{amb} = 100^{\circ}\text{C}$)	I_{CEX}	-	-	<20	μA
Emitter cutoff current ($V_{EBO} = 5\text{ V}$)	I_{EBO}	<10	<10	<10	nA*
Collector-emitter breakdown voltage ($I_{CEO} = 2\text{ mA}$)	$V_{(BR)CEO}$	>32	>45	>60	V*
Emitter-base breakdown voltage ($I_{EBO} = 1\text{ }\mu\text{A}$)	$V_{(BR)EBO}$	>7	>7	>7	V*

1) applies only to BCY 65 E
2) applies only to BCY 58, BCY 59
*) AQL = 0.65%

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Dynamic characteristics ($T_{amb} = 25^{\circ}C$)		BCY 58	BCY 59	BCY 65 E	
Transition frequency ($I_C = 10\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 100\text{ MHz}$)	f_T	250 (> 125)	250 (> 125)	250 (> 125)	MHz
Collector-base capacitance ($V_{CBO} = 10\text{ V}$; $f = 1\text{ MHz}$)	C_{CBO}	3.5 (< 6)	3.5 (< 6)	3.5 (< 6)	pF
Emitter-base capacitance ($V_{EBO} = 0.5\text{ V}$; $f = 1\text{ MHz}$)	C_{EBO}	8 (< 15)	8 (< 15)	8 (< 15)	pF
Noise figure ($I_C = 0.2\text{ mA}$; $V_{CE} = 5\text{ V}$; $R_g = 2\text{ k}\Omega$; $f = 1\text{ kHz}$; $\Delta f = 200\text{ Hz}$)	NF	2 (< 6)	2 (< 6)	2 (< 6)	dB

Four-pole characteristics ($I_C = 2\text{ mA}$; $V_{CE} = 5\text{ V}$; $f = 1\text{ kHz}$)

h_{FE} group	VII	VIII	IX	X	
h_{11e}	2.7 (1.6 to 4.5)	3.6 (2.5 to 6)	4.5 (3.2 to 8.5)	7.5 (4.5 to 12)	k Ω
h_{12e}	1.5	2	2	3	10^{-4}
h_{21e}	200	260	330	520	-
h_{22e}	18 (< 30)	24 (< 50)	30 (< 60)	50 (< 100)	μS

Switching times:

Operating point: BCY 58; BCY 59; BCY 65 E

$I_C: I_{B1} : -I_{B2}$ approx. 10:1:1 mA; $R_1 = 5\text{ k}\Omega$; $R_2 = 5\text{ k}\Omega$; $V_{BB} = 3.6\text{ V}$; $R_L = 990\ \Omega$

t_d	35	ns	t_s	400	ns
t_r	50	ns	t_f	80	ns
t_{on}	85 (< 150)	ns	t_{off}	480 (< 800)	ns

Switching times:

Operating point: BCY 58; BCY 59

$I_C: I_{B1} : -I_{B2}$ approx. 100:10:10 mA; $R_1 = 500\ \Omega$; $R_2 = 700\ \Omega$; $V_{BB} = 5\text{ V}$; $R_L = 98\ \Omega$

t_d	5	ns	t_s	250	ns
t_r	50	ns	t_f	200	ns
t_{on}	55 (< 150)	ns	t_{off}	450 (< 800)	ns

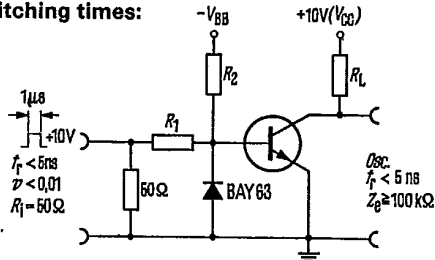
Switching times:

Operating point: BCY 65 E

$I_C: I_{B1} : -I_{B2}$ approx. 50:5:5 mA; $R_1 = 1\text{ k}\Omega$; $R_2 = 1.3\text{ k}\Omega$; $V_{BB} = 4.7\text{ V}$; $R_L = 195\ \Omega$

t_d	15	ns	t_s	300	ns
t_r	50	ns	t_f	150	ns
t_{on}	65 (< 150)	ns	t_{off}	450 (< 800)	ns

Test circuit for switching times:

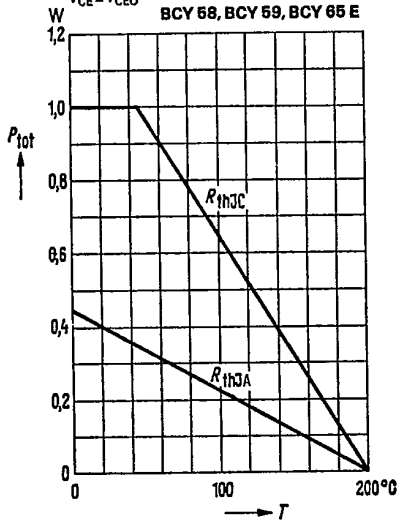


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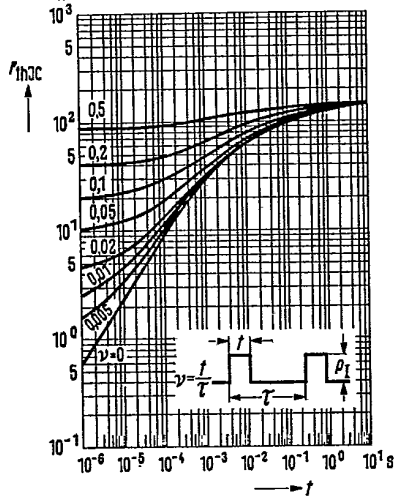
BCY 58
 BCY 59
 BCY 65 E

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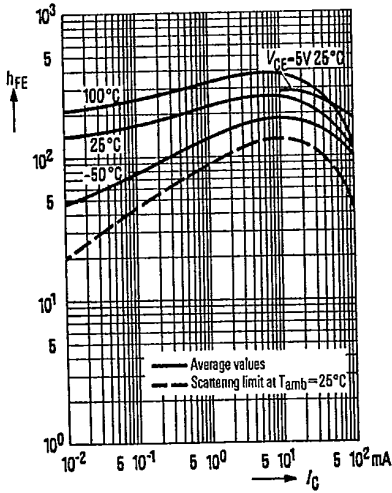
Total perm. power dissipation
 versus temperature
 $P_{tot} = f(T)$; R_{th} = parameter;
 $V_{CE} \leq V_{CE0}$



Permissible pulse load
 $r_{thJC} = f(t)$; v = parameter
 BCY 58, BCY 59, BCY 65 E



DC current gain $h_{FE} = f(I_C)$
 $V_{CE} = 1V$; T_{amb} = parameter
 (common emitter configuration)



Collector current $I_C = f(V_{BE})$
 $V_{CE} = 1V$
 (common emitter configuration)

