

Netherlands Electrotechnical Committee
Kalfjeslaan 2
NL-2623 AA DELFT

NL CECC 50 004-025
ISSUE3 JUNE 1978

Specification available from:-

Philips International B.V.
C.C. Elcoma
Postbox 218
NL-5600 MD EINDHOVEN



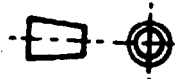
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ELECTRONIC COMPONENTS OF ASSESSED QUALITY
DETAIL SPECIFICATION IN ACCORDANCE WITH
BS CECC 50000 (1977)
Generic specification for discrete semiconductor devices

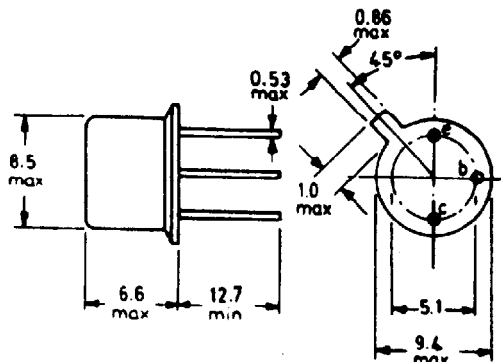
MANUFACTURER'S TYPE NUMBER
BFX34 BSV64
BSX62 BSX63 BSX64
(Gain groups 6, 10 and 16)
CECC 00200

Outline and dimensions Third angle projection
BS 3934 SO-134A

Collector is electrically connected to envelope



For ordering information
see Page 4



Marking information see page 4

All dimensions in mm

N-P-N AMBIENT RATED SILICON
PLANAR SWITCHING TRANSISTOR
IN HERMETICALLY SEALED
METAL CASE

LEVEL F

4. LIMITING VALUES (Absolute maximum system)
(Over the operating temperature range unless otherwise stated)

	Min.	Max.	Unit
T_{amb} Operating ambient temperature	-65	200	°C
T_{stg} Storage temperature	-65	200	°C
P_{tot} Power dissipation at $T_{amb} \leq 25^\circ\text{C}^*$		870	mW
P_{tot} Power dissipation at $T_{case} \leq 50^\circ\text{C}^*$ (*See derating curves Figs. 1 and 2)		5	W

	BFX34	BSV64	BSX62	BSX63	BSX64	Unit
V_{CBO} Collector-base continuous (direct) voltage	120	100	60	80	100	V
V_{CEO} Collector-emitter continuous (direct) voltage	60	60	40	60	80	V
V_{CES} Collector-emitter continuous (direct) voltage with base short circuit to emitter	120	100	60	80	100	V
V_{EBO} Emitter-base continuous (direct) voltage	6	5	5	5	5	V
I_C Continuous (direct) collector current	2	2	3	3	3	A
I_{CM} Peak repetitive collector current	5	5				A
I_B Continuous (direct) base current	1	1	0.5	0.5	0.5	A

Refer to Qualified Products List
specification.

CECC 00200 for details of manufacturers approved to this

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5. CHARACTERISTICS at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated

The parameters marked with sign + are tested for inspection, in the test groups A and C.

			Min.	Max.	Unit
$^{+}I_{CES(1)}$	Collector cut-off current with base short circuit to emitter $V_{EB} = 0, V_{CE} = 60\text{ V}$	BFX34	—	10	μA
		BSV64	—	10	μA
		40 V	—	100	nA
		60 V	—	100	nA
		80 V	—	100	nA
		BSX64	—	100	nA
$^{+}I_{CES(2)}$	$V_{EB} = 0, T_{amb} = 100^{\circ}\text{C}, V_{CE} = 60\text{ V}$	BFX34	—	1	mA
		BSV64	—	1	mA
		40 V	—	100	μA
		60 V	—	100	μA
		80 V	—	100	μA
		BSX64	—	100	μA
$^{+}V_{(BR)CBO}$	Collector-base breakdown voltage $I_C = 100\text{ }\mu\text{A}$	BFX34	120	—	V
		BSV64	100	—	V
		BSX62	60	—	V
		BSX63	80	—	V
		BSX64	100	—	V
$^{+}V_{CE(sust)}$	Collector-emitter sustaining voltage $I_C = 100\text{ mA}^*$	BFX34	60	—	V
		BSV64	60	—	V
		BSX62	40	—	V
		BSX63	60	—	V
		BSX64	80	—	V
$^{+}I_{EBO}$	Emitter-base leakage current $I_C = 0, V_{EB} = 4\text{ V}$ 5 V	BFX34	—	10	μA
		BSV64	—	10	μA
		BSX62	—	10	μA
		BSX63	—	10	μA
		BSX64	—	10	μA
$^{+}h_{21E(1)}$	Static forward current transfer ratio $V_{CE} = 2\text{ V}, I_C = 2\text{ A}^*$ $V_{CE} = 1\text{ V}, I_C = 1\text{ A}^*$	BFX34	40	150	
		BSV64	40	—	
		BSX62, 63, 64			
		Group 6	40	100	
		Group 10	63	160	
		Group 16	100	250	
$^{+}h_{21E(3)}$	Static forward current transfer ratio $V_{CE} = 2\text{ V}, I_C = 5\text{ A}^*$ $V_{CE} = 5\text{ V}, I_C = 2\text{ A}^*$	BFX34	25	—	
		BSV64	25	—	
		BSX62	25	—	
		BSX63	25	—	
		BSX64	25	—	
$^{+}V_{CE(sat)1}$	Collector-emitter saturation voltage $I_C = 2\text{ A}, I_B = 200\text{ mA}^*$ $I_C = 5\text{ A}, I_B = 500\text{ mA}^*$	BSX62	—	0.8	V
		BSX63	—	0.8	V
		BSX64	—	0.8	V
		BFX34	—	1.0	V
		BSV64	—	1.0	V

*Pulsed $t_p = 300\text{ }\mu\text{s}$ $\delta \leq 2\%$

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			NL CECC 50		Unit
			Min.	Max.	
$+V_{CE(sat)2}$	Collector-emitter saturation voltage $I_C = 1\text{ A}, I_B = 100\text{ mA}^*$	BSX62	—	0.7	V
		BSX63	—	0.7	V
		BSX64	—	0.7	V
$+V_{BE(sat)1}$	Base-emitter saturation voltage $I_C = 2\text{ A}, I_B = 200\text{ mA}^*$	BSX62	—	1.3	V
		BSX63	—	1.3	V
		BSX64	—	1.3	V
	$I_C = 5\text{ A}, I_B = 500\text{ mA}^*$	BFX34	—	1.6	V
		BSV64	—	1.8	V
$+V_{BE(sat)2}$	Base-emitter saturation voltage $I_C = 1\text{ A}, I_B = 100\text{ mA}^*$	BSX62	—	1.2	V
		BSX63	—	1.2	V
		BSX64	—	1.2	V
$+C_{22b}$	Common-base output capacitance $I_E = 0, V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	BFX34	—	100	pF
		BSV64	—	80	pF
		BSX62	—	70	pF
		BSX63	—	70	pF
		BSX64	—	70	pF
$+C_{11e}$	Common-emitter input capacitance $I_C = 0, V_{EB} = 0.5\text{ V}, f = 1\text{ MHz}$	All	—	400	pF
$+f_T$	Transition frequency $I_C = 500\text{ mA}, V_{CE} = 5\text{ V}, f = 20\text{ MHz}^*$	BFX34	70	—	MHz
		BSV64	70	—	MHz
	$I_C = 200\text{ mA}, V_{CE} = 10\text{ V}, f = 20\text{ MHz}^*$	BSX62	30	—	MHz
		BSX63	30	—	MHz
		BSX64	30	—	MHz
$+t_{on}$	Turn-on time** $I_C = 1\text{ A}, I_B = 50\text{ mA}$	BSX62, 63, 64	—	0.3	μs
		BFX34)	—	0.6	μs
	$I_C = 5\text{ A}, I_B = 500\text{ mA}$	BSV64)	—	0.6	μs
$+t_{off}$	Turn-off time** $I_C = 1\text{ A}, I_{B1} = I_{B2} = 50\text{ mA}$	BSX62, 63, 64	—	1.5	μs
		BFX34)	—	1.2	μs
		BSV64)	—	1.2	μs

*Pulsed $t_p = 300\text{ }\mu\text{s}$ $\delta \leq 2\%$

(**For switching circuits see Figs.3 and 4)

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MARKING

Each device shall bear the following markings:

- (a) Type number, e.g., BFX34, BSX62-10.
- (b) Date code, e.g., 7801
- (c) Manufacturer's trade mark or factory identification code, QDG.

2 Each package containing one or more of these transistors shall bear the above marking and in addition, this detail specification number CECC 50 004-025.

ORDERING INFORMATION

Orders for this transistor should include the following minimum information:

- 1 Transistor type, e.g., BFX34 to CECC 50,004-025, Issue 1.
For BSX62/63/64 add gain code 6, 10 or 16 as applicable, e.g. BSX62-6.

RELATED DOCUMENTS

- 1 CECC 50 000 Generic specification for discrete semiconductor devices.
CECC 00-007 Sampling plans and procedures for inspection by attributes.
1 CECC 00-200 Qualified products list.

6. TEST CONDITIONS AND INSPECTION REQUIREMENTS.

All reference to clause numbers are to CECC 50-000 unless otherwise stated.

GROUP A – Lot by lot

All tests are non-destructive (3.5.6).

Examination or test	Ref.	Conditions at T _{amb} = 25 °C unless otherwise stated	Inspection requirements					
			Limits		Units	Levels	IL	AQL %
			Min.	Max.				
Subgroup A1 Visual inspection	4.2.1.	All types	As 4.2.1.				I	1.5

Examination or Test	REF	Conditions at $T_{amb}=25^{\circ}C$ unless otherwise stated	Inspection requirements					
			Limits		Units	Levels	I.L	AQL %
			Min.	Max.				
Subgroup A2a Non-operatives							II	0.15
Short circuit								
ICES(1)	4.3.4 T.009	Conditions as in Subgroup A2b BFX34,BSV64, BSX62,63,64	-	1.0	mA			
			-	10	uA			
Open circuit								
ICE(1)	4.3.4 T.006	Conditions as in Subgroup A2b	5	-				

Subgroup A2b							II	1.0	
$I_{CES(1)}$	4.3.4. T-009	$V_{CE} = 60 \text{ V}, V_{EB} = 0$							
			BFX34	—	10	μA			
		$= 60 \text{ V}$	BSV64	—	10	μA			
		$= 40 \text{ V}$	BSX62	—	100	nA			
		$= 60 \text{ V}$	BSX63	—	100	nA			
$V_{(BR)CBO}$	App. A	$= 80 \text{ V}$	BSX64	—	100	nA			
		$I_C = 100 \mu\text{A}$	BFX34	120	—	V			
			BSV64	100	—	V			
			BSX62	60	—	V			
			BSX63	80	—	V			
BSX64	100		—	V					
$V_{CE(sust)}$	4.3.4 T-011	$I_C = 100 \text{ mA}^*$	BFX34	60	—	V			
			BSV64	60	—	V			
			BSX62	40	—	V			
			BSX63	60	—	V			
			BSX64	80	—	V			
$h_{21E(1)}$	4.3.4 T-006	$V_{CE} = 2 \text{ V}, I_C = 2 \text{ A}^*$	BFX34	40	150				
			BSV64	40	—				
			$V_{CE} = 1 \text{ V}, I_C = 1 \text{ A}^*$	BSX62)					
				BSX63)					
				BSX64)					
Group 6	40	100							
$h_{21E(3)}$	4.3.4. T-006	$V_{CE} = 2 \text{ V}, I_C = 5 \text{ A}^*$	Group 10	63	160				
			Group 16	100	250				
			BFX34	25					
			BSV64	25					
			$V_{CE} = 5 \text{ V}, I_C = 2 \text{ A}^*$	BSX62	25				
BSX63	25								
BSX64	25								
$V_{CE(sat)(1)}$	4.3.4. T-003	$I_C = 5 \text{ A}^*, I_B = 0.5 \text{ A}$		BFX34		1.0	V		
			BSV64		1.0	V			
			$I_C = 2 \text{ A}^*, I_B = 0.2 \text{ A}$	BSX62		0.8	V		
				BSX63		0.8	V		
				BSX64		0.8	V		

*Pulsed $t_p = 300 \mu\text{s}$ $\delta \leq 2\%$

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