

BRITISH STANDARDS INSTITUTION

2, PARK STREET, LONDON, W1A 2BS

Specification available from:— AS SHOWN IN PD 9002, and
CECC 00200SEMELAB MANUFACTURING LTD.,
COVENTRY ROAD,
LUTTERWORTH, LEICESTERSHIRE.

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BS CECC 50 004-121**ISSUE 1** September 1983.

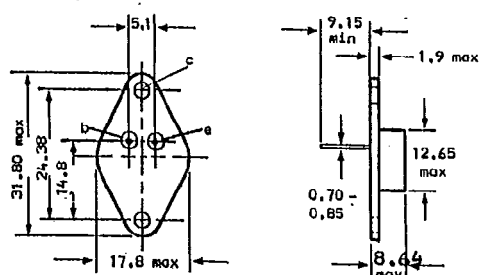
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ELECTRONIC COMPONENTS OF ASSESSED QUALITY
DETAIL SPECIFICATION IN ACCORDANCE WITH
BS CECC 50 000:1981**MANUFACTURER'S TYPE NUMBER**

See PD 9002 & CECC 00200

2N6077 2N6078**2N6079****For ordering information**
see clause 5**2.**CASE RATED BIPOLAR
SWITCHING TRANSISTORSNPN SILICON PLANAR EPITAXIAL
POWER TRANSISTORS IN HERMETICALLY
SEALED METAL CASE**3.**ASSESSMENT LEVEL F
PLUS ADDITIONAL TESTS**1. Outline and dimensions**

Third angle projection



For detail dimensions see Figure 4

Equivalent To JEDEC TO-66

Marking information see clause 6**4.****LIMITING VALUES** (Absolute maximum system)

These apply over the full temperature range unless otherwise stated

		Symbol	Min.	Max.	Units
4.1	Ambient operating temperature range	T_{amb}	-65	200	$^{\circ}C$
4.2	Storage temperature range	T_{stg}	-65	200	$^{\circ}C$
4.3	Maximum collector to base continuous (direct) voltage	V_{CBO}	-	300	V
	2N6077			275	V
	2N6078			375	V
	2N6079				
4.4	Maximum collector to emitter continuous (direct) voltage with zero base current	V_{CEO}	-	275	V
	2N6077			250	V
	2N6078			350	V
	2N6079				
4.4	Maximum collector to emitter continuous (direct) voltage with base-emitter reverse biased, $V_{EB} = 1.5$ V	V_{CEX}	-	300	V
	2N6077			275	V
	2N6078			375	V
	2N6079				
4.4	Maximum collector to emitter continuous (direct) voltage with $R_{BE} < 500 \Omega$	V_{CER}	-	300	V
	2N6077			275	V
	2N6078			375	V
	2N6079				
4.5	Maximum emitter to base continuous (direct) reverse voltage	V_{EBO}	-	6	V
4.6	Maximum continuous (direct) collector current	I_C	-	7	A
4.6	Maximum peak collector current	I_{CM}	-	10	A
4.7	Maximum continuous (direct) base current	I_B	-	4	A
4.7.1	Maximum total power dissipation $T_{case} = 25^{\circ}C$	P_{tot}	-	45	W
	(For derating curve see figure 1)				
	(For safe operating area see figure 2)				

Refer to Qualified Products List PD 9002 or CECC 00200 for details of manufacturers approved to this specification

**Documents**

Document Sharing Hub

5. CHARACTERISTICS

$T_{case} = 25^{\circ}C$ unless otherwise stated.

Clause CECC 50 0014	Meas.	PARAMETER AND TEST CONDITIONS	Symbol	Min.	Max.	Units
5.1	+	Static value of common-emitter forward current transfer ratio * $V_{CE} = 1 V \quad I_C = 1.2 A$ 2N6077 2N6078 2N6079	$h_{21E}(1)$	12 12	70 50	- -
5.1	+	Static value of common-emitter forward current transfer ratio * $V_{CE} = 5 V \quad I_C = 5 A$	$h_{21E}(2)$	10	-	-
5.2	+	Collector-emitter saturation voltage * $I_C = 5 A \quad I_B = 1 A$ 2N6078 $I_C = 3 A \quad I_B = 0.6 A$ 2N6077 $I_C = 4 A \quad I_B = 0.8 A$ 2N6079	$V_{CEsat}(1)$	- - -	3 1 3	V V V
5.2	+	Collector-emitter saturation voltage * $I_C = 1.2 A \quad I_B = 0.2 A$	$V_{CEsat}(2)$	-	0.5	V
5.4	+	Base-emitter saturation voltage * $I_C = 3 A \quad I_B = 0.6 A$ 2N6077 $I_C = 5 A \quad I_B = 1 A$ 2N6078 $I_C = 4 A \quad I_B = 0.8 A$ 2N6079	$V_{BEsat}(1)$	- - -	1.9 2 2	V V V
5.4	+	Base-emitter saturation voltage * $I_C = 1.2 A \quad I_B = 0.2 A$	$V_{BEsat}(2)$	-	1.6	V
5.5	+	Collector-emitter leakage current $V_{CE} = 250 V \quad V_{EB} = 1.5 V$ 2N6077 2N6078 $V_{CE} = 450 V \quad V_{EB} = 1.5 V$ 2N6079	$I_{CEX}(1)$	- - -	5 50 500	mA μA μA
5.5	+	Collector-emitter cut-off current $V_{CE} = 250 V \quad I_E = 0$	I_{CEO}	-	2	mA
5.6	+	Collector-emitter leakage current $V_{CE} = 250 V \quad T_{amb} = 125^{\circ}C$ 2N6077 2N6079 2N6078	$I_{CEX}(2)$	- -	8 200	mA μA

* Measured under pulse conditions: pulse length = 300 μs , duty cycle = 1.0%
+ Parameters which are verified in Groups A and C

5. CHARACTERISTICS

$T_{case} = 25^{\circ}C$ unless otherwise stated.

Clause CECC 50 004	Meas.	PARAMETER AND TEST CONDITIONS	Symbol	Min.	Max.	Units
	+	Emitter-base cut-off current $V_{EB} = .6 V$ $I_C = 0$	I_{EBO}	-	1	mA
	+	Second breakdown collector current $V_{CE} = 50 V$ Pulse duration = 1 second	I_{SB}	0.9	-	A
	+	Second breakdown energy $I_C = 3 A$ $L = 100 \mu H$ $R_{BE} = 500 \Omega$	E_{SB}	0.45	-	mJ
5.7.1	+	Rise time $I_C = 1.2 A$ $I_{B1} = 0.2 A$ Nominal values, see fig. 3	t_r	-	0.5	μs
5.7.1	+	Turn-on time $I_C = 1.2 A$ $I_{B1} = 0.2 A$ Nominal values, see fig. 3	t_{on}	-	0.8	μs
5.7.1	+	Turn-off time $I_C = 1.2 A$ $I_{B1} = -I_{B2} = 0.2 A$ Nominal values, see fig. 3	t_{off}	-	5.75	μs
5.7.2	+	Storage time $I_C = 1.2 A$ $I_{B1} = -I_{B2} = 0.2 A$ Nominal values, see fig. 3	t_s	-	5	μs
5.7.2	+	Transition frequency $V_{CE} = 10 V$ $I_C = 0.2 A$ $f = 1 MHz$	f_T	1	-	MHz
5.8	+	Common-base output capacitance $V_{CB} = 10 V$ $I_E = 0$ $f = 1.0 MHz$	C_{22b}	-	150	pF
5.9		Thermal resistance junction to case	$R_{th_{j-case}}$	-	3.9	$^{\circ}C/W$

* Measured under pulse conditions: pulse length = 300 μs , duty cycle = 1.0%
+ Parameters which are verified in Groups A and C

6. MARKING

6.1 Each device shall bear the following marking:

- (a) Terminal identification
- (b) Type number
- (c) Date code
- (d) Manufacturer's trade mark or factory identification code

6.2 Each package containing one or more of these transistors shall bear the above markings b, c and d and in addition, this detail specification number BS CECC 50 004 - 121 Issue 1 dated 15th September 1983.

7. ORDERING INFORMATION

Orders for these transistors should contain the following minimum information:

- (a) The device type and this detail specification number.
- (b) The quantity required.
- (c) If required, screening sequence from Appendix VI of CECC 50000.
- (d) Level of quality assessment as defined in Appendix IIA of CECC 50000.

B. TEST CONDITIONS AND INSPECTION REQUIREMENTS

GROUP A - LOT-BY-LOT

Note:- All devices, subjected to Tests marked 'D' which are destructive, shall not be accepted for release.
(See 3.5.6 of BS CECC 50 000).

EXAMINATION OR TEST	REF. BS CECC 50 000	CONDITIONS $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated	INSPECTION REQUIREMENTS			
			LIMITS		LEVEL	
			Min	Max	F	
					IL	AQL
<u>SUBGROUP A1</u> Visual inspection	4.2.1				I	0.65%
<u>SUBGROUP A2a</u> Non-operatives OPEN CIRCUIT SHORT CIRCUIT		Device considered to be open circuit if $h_{21E(1)} < 5$ Device considered to be short circuit if $I_{CEO} > 200 \text{ mA}$			II	0.15%
<u>SUBGROUP A2b</u> Collector-base cut-off current I_{CEO} Collector-emitter current $I_{CEX(1)}$ Common-emitter forward current transfer ratio $h_{21E(1)} *$ Collector-emitter saturation voltage $V_{CEsat(1)} *$	4.3.4 T.009 4.3.4 T.009 4.3.4 T.006 4.3.4 T.003	$V_{CE} = 250 \text{ V } I_E = 0$ $V_{CE} = 250 \text{ V } V_{EB} = 1.5 \text{ V } 2\text{N}6077$ $V_{CE} = 450 \text{ V } V_{EB} = 1.5 \text{ V } 2\text{N}6078$ $V_{CE} = 450 \text{ V } V_{EB} = 1.5 \text{ V } 2\text{N}6079$ $V_{CE} = 1 \text{ V } I_C = 1.2 \text{ A } 2\text{N}6077/2\text{N}6078$ $I_C = 1.2 \text{ A } 2\text{N}6079$ $I_C = 5 \text{ A } I_B = 1 \text{ A } 2\text{N}6078$ $I_C = 4 \text{ A } I_B = 0.8 \text{ A } 2\text{N}6079$ $I_C = 3 \text{ A } I_B = 0.6 \text{ A } 2\text{N}6077$	- - - - 12 12 - - -	2 mA 5 mA 50 μA 500 μA 70 50 3 V 3 V 1 V	II	0.65%
<u>SUBGROUP A3</u> Emitter-base cut-off current I_{EBO} Base-emitter saturation voltage $V_{BEsat(1)} *$ Base-emitter saturation voltage $V_{BEsat(2)} *$ Common-emitter forward current transfer ratio $h_{21E(2)} *$ Collector-emitter saturation voltage $V_{CEsat(2)} *$	4.3.4 T.002 4.3.4 T.004 4.3.4 T.004 4.3.4 T.006 4.3.4 T.003	$V_{EB} = 6 \text{ V } I_C = 0$ $I_C = 5 \text{ A } I_B = 1 \text{ A } 2\text{N}6078$ $I_C = 4 \text{ A } I_B = 0.8 \text{ A } 2\text{N}6079$ $I_C = 3 \text{ A } I_B = 0.6 \text{ A } 2\text{N}6077$ $I_C = 1.2 \text{ A } I_B = 0.2 \text{ A}$ $V_{CE} = 5 \text{ V } I_C = 5 \text{ A}$ $I_C = 1.2 \text{ A } I_B = 0.2 \text{ A}$	- - - - - 10 -	1 mA 2 V 2 V 1.9 V 1.6 V - 0.5 V	I	2.5%

* Measured under pulse conditions: pulse length = 300 μs , duty cycle = 1.0%