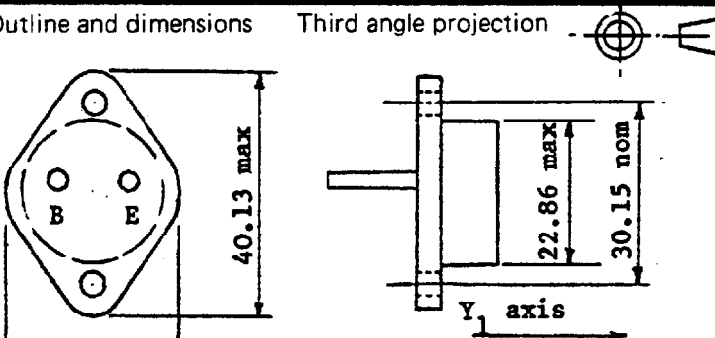


BRITISH STANDARDS INSTITUTION 2, PARK STREET, LONDON, W1A 2BS	BS CECC 50 004-128 ISSUE 1 MAY 1983  Page 1 of 24 Pages
Specification available from:— CECC 00200 AND TEXAS INSTRUMENTS LIMITED, MANTON LANE, BEDFORD, MK41 7PA TELEPHONE : BEDFORD 67466 TELEX : 82178	MANUFACTURER'S TYPE NUMBER 2N6544, 2N6545 SEE PD 9002 AND CECC 00200 For ordering information see Clause 7
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BS CECC 50 000 : 1981 1. Outline and dimensions Third angle projection  The collector is in electrical contact with the case. Outline BS 3934 SO-127A IEC 191-2 C14A B18. Dimensions in millimetres. Marking information - See Clause 6	2. CASE RATED BIPOLAR POWER TRANSISTORS FOR HIGH VOLTAGE SWITCHING APPLICATIONS. NPN TRIPLE DIFFUSED SILICON PLANAR TRANSISTORS IN HERMETICALLY SEALED METAL CASE. 3. ASSESSMENT LEVEL F PLUS ADDITIONAL TESTS

4. LIMITING VALUES (absolute maximum system)

These apply over the operating temperature range unless otherwise stated.

4.1	T_{case}	Case operating temperature range	-65 °C to +200 °C
4.2	T_{stg}	Storage temperature range	-65 °C to +200 °C

Voltage Ratings ($T_{case} = -65$ °C to +125 °C. See Fig. 10)

			2N6544	2N6545
4.3	V_{CBO}	Collector-base continuous (direct) voltage. $I_E = 0$	650V	850V
4.4	V_{CES}	Collector-emitter continuous (direct) voltage. $V_{BE} = 0$	650V	850V
4.4	V_{CEO}	Collector-emitter continuous (direct) voltage. $I_B = 0$	300V	400V
	V_{CEX}	Collector-emitter continuous (direct) voltage. $V_{FB} = 1.5V$	350V	450V
4.5	V_{EBO}	Emitter-base continuous (direct) voltage $I_C = 0$	9V	9V

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

BS CECC 50 004-128
ISSUE 1,
MAY 1983

4.6 Current Ratings

I_C	Continuous collector current	8	A
I_{CM}	Peak collector current (Note 1)	16	A

4.9 Power Ratings

4.9.1	P_{tot}	Total power dissipation (see Figs. 5 & 6) at $T_{case} = 25^\circ C$	125	W
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5. CHARACTERISTICS

$V_{CEO(sus)}$	Collector-emitter sustaining voltage Inductive loop switching measurement $I_C = 100mA, L = 25mH$		
	2N6544	300	V min.
	2N6545	400	V min.

$V_{CEX(sus)}$	Collector-emitter sustaining voltage $I_C = 4.5A, T_{case} = 100^\circ C$ $V_{clamp} = \text{rated } V_{CEX}$		
	2N6544	350	V min.
	2N6545	450	V min.

	$I_C = 8.0A, T_{case} = 100^\circ C$ $V_{clamp} = \text{rated } V_{CEO} - 100V$		
	2N6544	200	V min.
	2N6545	300	V min.

5.1	$h_{21E(1)}$	Forward current transfer ratio* $V_{CE} = 3V, I_C = 2.5A$	12 min. 60 max.
	$h_{21E(2)}$	$V_{CE} = 3V, I_C = 5.0A$	7 min. 35 max.

5.2	$V_{CE(sat)(1)}$	Collector-emitter saturation voltage* $I_C = 5.0A, I_B = 1.0A$	1.5 V max.
	$V_{CE(sat)(3)}$	$I_C = 8.0A, I_B = 2.0A$	5.0 V max.
	$V_{CE(sat)(4)}$	$I_C = 5.0A, I_B = 1.0$ $T_{case} = 100^\circ C$	2.5 V max.

* = These parameters are measured under pulsed conditions. Pulse width = 300 μ s

† = These parameters measured in Groups A or C

NOTE 1: Pulse test: Pulse width 2 μ s, Duty Cycle <2%

5. CHARACTERISTICS (Cont'd)

5.4 Base-emitter saturation voltage*

$+V_{BE(sat)}(1)$	$I_C = 5.0A, I_B = 1.0A$	1.6	V max.
$V_{BE(sat)}(2)$	$I_C = 5.0A, I_B = 1.0A$	1.6	V max.
$T_{case} = 100^\circ C$			

5.5 $+I_{CEX(1)}$ Collector cut-off current

$V_{CEX} = \text{rated value}, V_{EB} = 1.5V$	0.5	mA max.
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5.6 $+I_{CEX(2)}$ Collector cut-off current

$V_{CEX} = \text{rated value}, V_{EB} = 1.5V$	2.5	mA max.
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$$T_{case} = 100^\circ C$$

I_{CER} Collector cut-off current

$V_{CE} = \text{rated value}, R_{BE} = 50\Omega$	3.0	mA max.
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$$T_{case} = 100^\circ C$$

I_{EBO} Emitter cut-off current

1.0	mA max.
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$$V_{EB} = 9V, I_C = 0$$

5.7 SWITCHING CHARACTERISTICS

5.7.1 $+Resistive Load$ (see Figs. 3 and 4)

t_d	Delay Time	$I_C = 5.0A, V_{CC} = 250V$ $I_{BON} = I_{BOFF} = 1.0A$	0.05	μs max.
t_r	Rise Time		1.00	μs max.
t_s	Storage Time		4.00	μs max.
t_f	Fall Time		1.00	μs max.

$+Inductive Load$ (see Figs. 1 and 2)

t_s	Storage Time	$I_C = 5.0A, V_{clamp}$ $V_{clamp} = \text{rated } V_{CEX}$	4.0	μs max.
t_f	Fall Time	$I_B = 1.0A,$ $V_{BE(OFF)} = 5.0V$ $T_{case} = 100^\circ C$	0.9	μs max.

* = These parameters are measured under pulsed conditions. Pulse width = 300 μs

† = These parameters measured in Groups A or C

BS CECC 50 004-128
ISSUE 1,
MAY 1983

5.7.1. Inductive Load (Continued)

f_t $I_C = 300\text{mA}$, $f = 1\text{MHz}$ 6.0 min. 28 max MHz
 $V_{CE} = 10\text{V (dc)}$ gain = unity

5.8 C_{ob} Output capacitance
 $V_{CE} = 10\text{V}$, $f = 1\text{MHz}$, $I_E = 0$ 75pF min. 300pF max.

5.9 R_{ojc} = Thermal resistance junction to case. 1.4 °C/W max.

6.0 MARKING

6.1. Each device shall bear the following markings:-

- (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 50 004-128.

7.0 ORDERING INFORMATION

The following minimum information is necessary to order a specific device, unless otherwise specified.

- precise type number
- CECC reference of detail specification with issue number and/or date when relevant.
- level of quality assessment as defined in Appendix IIA of CECC 50 000, and, if required, screening sequence as defined in Appendix VI of CECC 50 000.
- any other particulars

Example:- Type number-Detail specification number-Issue number-Level

RELATED DOCUMENTS

BS 2011/IEC 68	Methods for the environmental testing of electronic components and electronic equipment.
BS 3934/IEC 191	Dimensions of semiconductor devices.
BS E9000/ CECC 00 100 to 00 113	General requirements for electronic components of assessed quality.
BS E9007/CECC 00 007	Sampling plans and procedures for inspection by attributes.
BS/CECC 50 000	Harmonised generic specification for discrete semiconductor devices.
IEC 147-2	General principles of measuring methods.
PD 9002/CECC 00 200	Component selection guide.

8. INSPECTION REQUIREMENTS

ALL TESTS ARE NON-DESTRUCTIVE							
GROUP A							
LOT BY LOT							
EXAMINATION OR TEST	BS CECC 50000 REF	CONDITIONS at $T_{amb} = 25^{\circ}C$ unless otherwise stated	INSPECTION REQUIREMENTS				
			LIMITS			LEVEL OF ASSMT F	
			MIN	MAX	UNIT	IL	AQL
<u>SUBGROUP A1</u> Visual Inspection	4.2.1.					I	0.65%
<u>SUBGROUP A2a</u> Non-operatives	4.3.4.	Device is considered to be open circuit if $h_{21E} < 4$ Device is considered to be short circuit if $I_{CEX} > 50mA$				II	0.15%
<u>SUBGROUP A2b</u> Collector- emitter cut-off current $I_{CEX(1)}$ Collector- emitter saturation voltage $V_{CE(sat)(1)}$	4.3.4. T.009 4.3.4. T.003	$V_{CEX} = \text{rated value}$ $V_X = -1.5V$ $I_C = 8.0A$ $I_B = 2.0 A$	- -	0.5 5.0	mA V	II	0.65%

8. INSPECTION REQUIREMENTS

ALL TESTS ARE NON-DESTRUCTIVE

GROUP A
LOT BY LOT

EXAMINATION OR TEST	BS CECC 50000 REF	CONDITIONS at $T_{amb} = 25^{\circ}C$ unless otherwise stated	INSPECTION REQUIREMENTS				
			LIMITS			LEVEL OF ASSMT F	
			MIN	MAX	UNIT	IL	AQL
<u>SUBGROUP A3</u>						I	4.0%
Forward current transfer ratio	4.3.4. T.006	$V_{CE} = 3V$ $I_C = 2.5A$	12.0	60.0			
$h_{21E(1)}$							
$h_{21E(2)}$		$V_{CE} = 3V$ $I_C = 5.0A$	7.0	35.0			
Collector- emitter saturation voltage	4.3.4. T.003						
$V_{CE(sat)}(1)$		$I_C = 5.0A, I_B = 1.0A$		1.5	V		
Base-emitter saturation voltage	4.3.4. T.004						
$V_{BE(sat)}(1)$		$I_C = 5.0A, I_B = 1.0A$		1.6	V		
<u>SUBGROUP A4</u>						S-4	4.0%
<u>Resistive Load</u>							
t_d Delay Time		$I_C = 5.0A$		0.05	μs		
t_r Rise Time		$V_{CC} = 250V$		1.00	μs		
t_s Storage Time		$I_{BON} = I_{BOFF} = 1.0A$		4.00	μs		
t_f Fall time				1.00	μs		

8. INSPECTION REQUIREMENTS

ALL TESTS ARE NON-DESTRUCTIVE

GROUP A
LOT BY LOT

EXAMINATION OR TEST	BS CECC 50000 REF	CONDITIONS at $T_{amb} = 25^{\circ}C$ unless otherwise stated	INSPECTION REQUIREMENTS				
			LIMITS			LEVEL OF ASSMT F	
			MIN	MAX	UNIT	IL	AQL
SUBGROUP A4 (Continued)		The input waveforms are supplied by a generator with the following characteristics. $t_r < 20\mu s$ $t_f < 20\mu s$ $Z_{out} = 10\mu s$ to $100\mu s$ Duty Cycle $< 2\%$ See Figs. 3 and 4					
<u>Inductive Load</u>							
Storage Time t_s		$I_C = 5.0A$, $V_{clamp} =$ rated value. $I_B = 10A$, $V_{BE(OFF)} = 5.0V$		4.0	μs		
Fall Time t_f		$T_{case} = 100^{\circ}C$		0.9	μs		