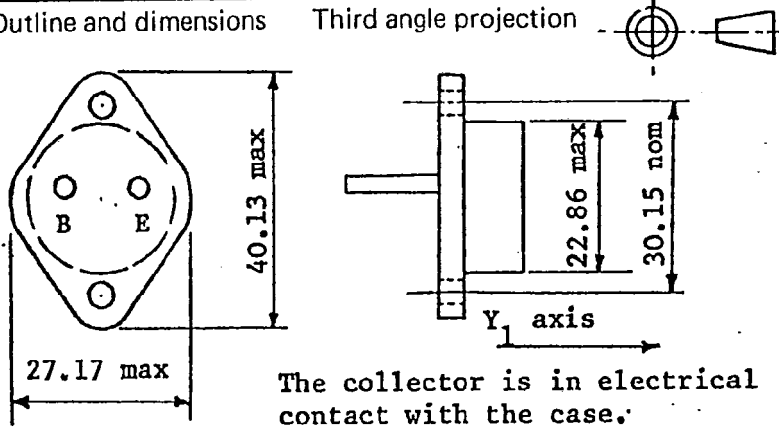


BRITISH STANDARDS INSTITUTION 2, PARK STREET, LONDON, W1A 2BS	BS CECC 50 004-120 ISSUE 1, JUNE 1983
Specification available from:— CECC 00200 AND TEXAS INSTRUMENTS LIMITED, MANTON LANE, BEDFORD, MK41 7PA TELEPHONE : BEDFORD 67466 TELEX : 82178	 Page 1 of 24 Pages
ELECTRONIC COMPONENTS OF ASSESSED QUALITY DETAIL SPECIFICATION IN ACCORDANCE WITH BS CECC 50 000 : 1981	MANUFACTURER'S TYPE NUMBER TIPL775, TIPL775A
1. Outline and dimensions Third angle projection  Outline BS 3934 SO-127A IEC 191-2 C14A B18. Dimensions in millimetres. Marking information - See Clause 6	SEE PD 9002 AND CECC 00200 For ordering information see Clause 7 2. CASE RATED DARLINGTON POWER TRANSISTORS FOR SWITCHING APPLICATIONS. NPN DARLINGTON, SILICON PLANAR TRANSISTORS IN HERMETICALLY SEALED METAL CASE. 3. ASSESSMENT LEVEL F + 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 ($T_{case} = -65\text{ °C to }+125\text{ °C}$. See Fig.11)

		TIPL 775	TIPL 775A
4.3.	V_{CBO} Collector-base continuous (direct) voltage. $I_E = 0$	150V	200V
4.4.	V_{CES} Collector-emitter continuous (direct) voltage. $V_{BE} = 0$	150V	200V
4.4.	V_{CEO} Collector-emitter continuous (direct) voltage. $I_B = 0$	120V	150V
4.5.	V_{EBO} Emitter-base continuous (direct) voltage. $I_C = 0$	5V	5V

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

4.6. Current Ratings

I_C	Continuous collector current	10	A
I_{CM}	Peak collector current (Note 1)	15	A

4.8. Power Ratings

4.8.1	P_{tot}	Total power dissipation (see Figs 2 & 3)	100	W
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5. CHARACTERISTICS (not for inspection purposes) at 25°C unless otherwise stated)

$V_{CE(SUS)}$	Collector-emitter sustaining voltage inductive loop switching measurement $I_C = 100mA, L = 25mH$ TIPL 775 TIPL 775A	150	V min
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5.1	h_{21E}	Static forward current transfer ratio $V_{CE} = 5V, I_C = 500mA^*$	60 min. 500 max
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5.2.	$V_{CE(SAT)} (1)$	Collector-emitter saturation voltage $I_C = 10A, I_B = 500mA^*$	2.0 V max
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$V_{CE(SAT)} (2)$	Collector-emitter saturation voltage $I_C = 500mA, I_B = 50mA^*$	1.5	V max
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$V_{CE(SAT)} (3)$	Collector-emitter saturation voltage $I_C = 7A, I_B = 300mA^*$	1.5	V max
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$V_{CE(SAT)} (4)$	Collector-emitter saturation voltage $I_C = 4A, I_B = 200mA^*$	1.2	V max
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$V_{CE(SAT)} (5)$	Collector-emitter saturation voltage $I_C = 10A, I_B = 500mA^* T_{amb} = 100^\circ C$	2.0	V max
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5.4.	$V_{BE(SAT)} (1)$	Base-emitter saturation voltage $I_C = 10A, I_B = 500mA^*$	2.2 V max
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$V_{BE(SAT)} (3)$	Base-emitter saturation voltage $I_C = 7A, I_B = 300mA^*$	1.9	V max
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$V_{BE(SAT)} (4)$	Base-emitter saturation voltage $I_C = 4A, I_B = 200mA^*$	1.8	V max
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$V_{BE(SAT)} (5)$	Base-emitter saturation voltage $I_C = 10A, I_B = 500mA^* T_{amb} = 100^\circ C$	2.1	V max
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* These parameters are measured under pulsed conditions. Pulse width = 300µs, Duty Cycle = 2%

NOTE 1 Pulse test, pulse duration = 2ms

5. CHARACTERISTICS (Cont'd)

5.5.	$I_{CES(1)}$	Collector-emitter cut-off current				
		$V_{CE} = 150V$	TIPL 775	50	μA	max.
		$V_{CE} = 200V$	TIPL 775A	50	μA	max.
5.6.	$I_{CES(2)}$	Collector-emitter cut-off current @ $T_{amb} = 100^{\circ}C$				
		$V_{CE} = 150V$	TIPL 775	1.0	mA	max.
		$V_{CE} = 200V$	TIPL 775A	1.0	mA	max.
5.5.	$I_{CEO(1)}$	Collector-emitter leakage current				
		$V_{CE} = 120V$	TIPL 775	50	μA	max.
		$V_{CE} = 150V$	TIPL 775A	50	μA	max.
	I_{EBO}	Emitter base cut-off current				
		$V_{EB} = 5V, I_C = 0$		4	mA	max.
5.7.	f_T	Transition Frequency		<u>Min.</u>	<u>Max.</u>	<u>Unit</u>
		$V_{CE} = 10V, I_C = 500mA$		4.0	-	MHz

5.7. Switching Characteristics
Resistive Switching
TIPL775

t_s	Storage time	-	1.0	μs
	$I_C = 10A, I_{BON} = 0.05A$			
	$I_{BOFF} = 2.5A, V_{CE} = 100V$			

TIPL775A

t_s	Storage time	-	1.0	μs
	$I_C = 10A, I_{BON} = 0.05A$			
	$I_{BOFF} = 2.5A, V_{CE} = 100V$			
	$T_{case} = 25^{\circ}C$			

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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 50 004-120.

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 GROUP A 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	1.5%
<u>SUBGROUP A2a</u> Non-operatives	4.3.4	Device considered to be open circuit if $h_{21E(1)}$ Device considered to be short circuit if $I_{CES(1)}$	- 500	20.0 -	 μA	II	.15%
<u>SUBGROUP A2b</u> Collector-emitter cut-off current $I_{CES(1)}$ Collector-cut-off current $I_{CEO(1)}$ Collector-emitter saturation voltage $V_{CE(SAT)}(1)$	4.3.4 T.009 4.3.4 T.009	$V_{CE} = 150V$ TIPL775 $V_{CE} = 200V$ TIPL775A $V_{CE} = 120V$ TIPL775 $V_{CE} = 150V$ TIPL775A $I_C = 10A$ $I_B = 500mA$	- - - -	50.0 50.0 50.0 50.0	μA μA μA μA	II	0.65%
<u>SUBGROUP A3</u> Forward current transfer ratio h_{21E} Collector-emitter saturation voltage $V_{CE(SAT)}(2)$	4.3.4 T.006 4.3.4. T.003	$V_{CE} = 5V$ $I_C = 500mA$ $I_C = 500mA$ $I_B = 50mA$	60.0 -	500.0 1.5	 V	I	4.0%

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8. INSPECTION REQUIREMENTS

ALL GROUP A TESTS ARE NON-DESTRUCTIVE

GROUP A
Lot by Lot

EXAMINATION OR TEST	BS CECC 50000 REF	CONDITIONS at T _{amb} = 25 °C unless otherwise stated	INSPECTION REQUIREMENTS				
			LIMITS			LEVEL OF ASSMT F	
			MIN	MAX	UNIT	IL	AQL
<u>SUBGROUP A3</u> (Cont'd)							
Collector-emitter saturation voltage	4.3.4 T.003						
V _{CE(SAT)} (3)		I _C = 7A, I _B = 300mA	-	1.5	V		
V _{CE(SAT)} (4)		I _C = 4A, I _B = 200mA	-	1.2	V		
Base-emitter saturation voltage	4.3.4						
V _{BE(SAT)} (1)		I _C = 10A I _B = 500mA	-	2.2	V		
V _{BE(SAT)} (3)		I _C = 7A I _B = 300mA	-	1.9	V		
V _{BE(SAT)} (4)		I _C = 4A I _B = 200mA	-	1.8	V		
<u>SUBGROUP A4</u>							
Switching times						S-4	4.0%
Resistive Switching							
Storage Time							
t _s		<u>TIPL775/775A</u> I _C = 10A, I _{BON} = 0.05A I _{BOFF} = 2.5A, V _{CE} = 100V T _{case} = 25°C	-	1.0	µS		
Transition Frequency							
f _T		V _{CE} = 10V, I _C = 500mA F = 1 MHz T _{case} = 25°C	4.0	-	MHz		

**Document**
Document Sharing

D = DESTRUCTIVE
ND = NON-DESTRUCTIVE

GROUP B
Lot by Lot

EXAMINATION OR TEST	D ND	BS CECC 50000 REF	CONDITIONS at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated	Inspection Requirements				
				LIMITS			LEVEL OF ASSMT F	
				Min	Max	Units	IL	AQL
<u>SUBGROUP B1</u> Dimensions	ND	4.2.2	Ref. IEC 191-2 C14A B18 U_1 U_2 q A		40.13 27.17 30.40 12.19	mm mm mm mm	S-2	2.5%
<u>SUBGROUP B3</u> Lead Bending	D	4.4.9	Force = 10N		No Damage		S-3	2.5%
<u>SUBGROUP B4</u> Solderability	D	4.4.7	Solder Bath method		Good Wetting		S-4	2.5%
<u>SUBGROUP B5</u> Rapid change of temp- erature followed by:	ND	4.4.4	Test Na. $T_A = -65^{\circ}\text{C}$ $T_B = 200^{\circ}\text{C}$ 5 cycles 6 cycles Method 1				S-4	2.5%

D = DESTRUCTIVE
ND = NON-DESTRUCTIVE

GROUP B
Lot by Lot

EXAMINATION OR TEST	D ND	BS CECC 50000 REF	CONDITIONS at T _{amb} = 25 °C unless otherwise stated	Inspection Requirements				
				LIMITS			LEVEL OF ASSMT F	
				Min	Max	Units	IL	AQL
SUBGROUP B5 (Cont'd)								
<u>Post-test end-points</u>								
I _{CES} (1)		4.3.4 T.009	Conditions as Subgroup A2		50.0	μA		
h _{21E}		4.3.4 T.006	Conditions as Subgroup A3	60.0	500.0			
V _{CE(SAT)} (1)		4.3.4 T.003	Conditions as Subgroup A2		2.0	V		
SUBGROUP B8							S-4	1.5%
Electrical Endurance	ND	4.5.2.3.	High temp. reverse bias Duration = 168 hrs. +72 h -10 h V _{CB} = 120V TIPL775 = 160V TIPL775A T _{case} = 125°C					
<u>Post-test end-points</u>								
I _{CES} (1)		4.3.4 T.009	Conditions as Subgroup A2		100.0	μA		
h _{21E}		4.3.4 T.003	Conditions as Subgroup A3	48.0	600.0			
V _{CE(SAT)} (1)		4.3.4 T.003	Conditions as Subgroup A2		2.4	V		
SUBGROUP CTR			Attributes information for B3, B4, B5 and B8.					