

DATA SHEET

BUJ303B

Silicon Diffused Power Transistor

Product specification

March 2018

Silicon Diffused Power Transistor

BUJ303B

GENERAL DESCRIPTION

High-voltage, high-speed planar-passivated npn power switching transistor in a TO220AB envelope intended for use in high frequency electronic lighting ballast applications, converters, inverters, switching regulators, motor control systems, etc.

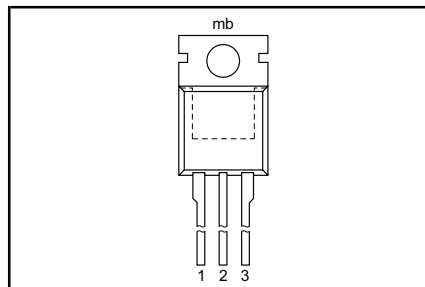
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0 \text{ V}$	-	1050	V
V_{CBO}	Collector-Base voltage (open emitter)		-	1050	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	V
I_C	Collector current (DC)		-	5	A
I_{CM}	Collector current peak value		-	10	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25 \text{ }^\circ\text{C}$	-	100	W
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 3 \text{ A}; I_B = 1 \text{ A}$	0.25	1.5	V
h_{FEsat}	DC current gain	$I_C = 3 \text{ A}; V_{CE} = 1.5 \text{ V}$	10.5	-	
t_f	Fall time	$I_C = 2.5 \text{ A}, I_{B1} = 0.5 \text{ A}$	300	-	ns

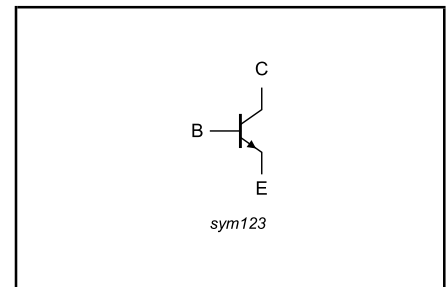
PINNING - TO220AB

PIN	DESCRIPTION
1	base
2	collector
3	emitter
mb	collector

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum Rating System (IEC 134)

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CESM}	Collector to emitter voltage	$V_{BE} = 0 \text{ V}$	-	1050	V
V_{CEO}	Collector to emitter voltage (open base)		-	400	V
V_{CBO}	Collector to base voltage (open emitter)		-	1050	V
I_C	Collector current (DC)		-	5	A
I_{CM}	Collector current peak value		-	10	A
I_B	Base current (DC)		-	2	A
I_{BM}	Base current peak value		-	4	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25 \text{ }^\circ\text{C}$	-	100	W
T_{stg}	Storage temperature		-65	150	$^\circ\text{C}$
T_j	Junction temperature		-	150	$^\circ\text{C}$

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Junction to mounting base		-	1.25	K/W
$R_{th\ j-a}$	Junction to ambient	in free air	60	-	K/W

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STATIC CHARACTERISTICS $T_{mb} = 25\text{ °C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}, I_{CBO} I_{CES}	Collector cut-off current ¹	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ °C}$	-	-	1.0 2.0	mA mA
I_{CEO}	Collector cut-off current ¹	$V_{CEO} = V_{CEOMmax}(400V)$	-	-	0.1	mA
I_{EBO} $V_{CEOsust}$ V_{CEsat}	Emitter cut-off current Collector-emitter sustaining voltage Collector-emitter saturation voltage	$V_{EB} = 9\text{ V}; I_C = 0\text{ A}$ $I_C = 300\text{ mA}; L = 25\text{ mH}$ $I_C = 3\text{ A}; I_B = 1\text{ A}$ $I_C = 1\text{ A}; I_B = 0.2\text{ A}$	- 400 -	- - 0.25	0.1 - 1.5	mA V V
V_{BEsat} h_{FE}	Base-emitter saturation voltage DC current gain	$I_C = 3\text{ A}; I_B = 1\text{ A}$ $I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$ $I_C = 800\text{ mA}; V_{CE} = 3\text{ V}$	- 10 23	1.0 - 31	1.5 - 40	V -
h_{FEsat}	DC current gain	$I_C = 3\text{ A}; V_{CE} = 1.5\text{ V}$	-	10.5	-	-

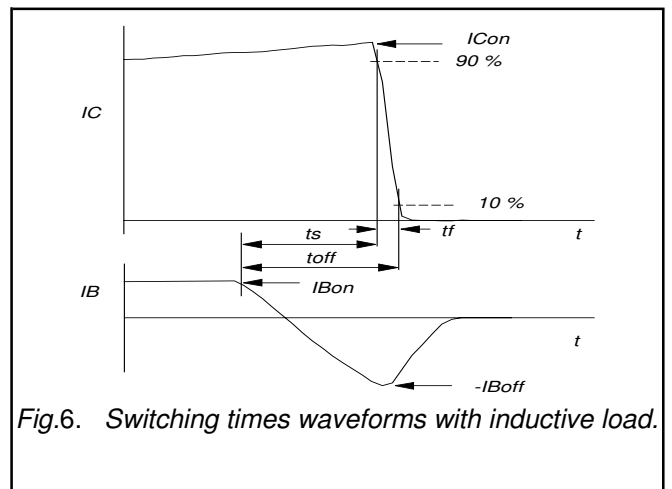
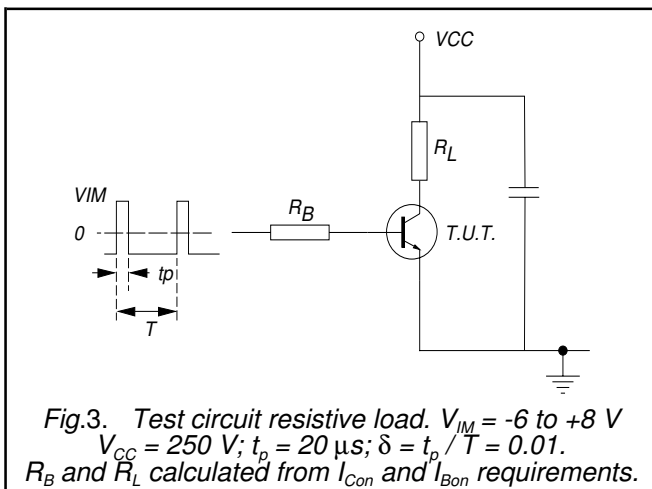
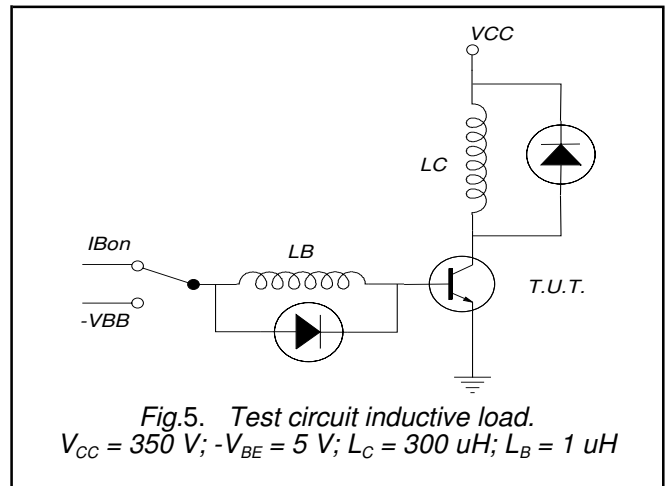
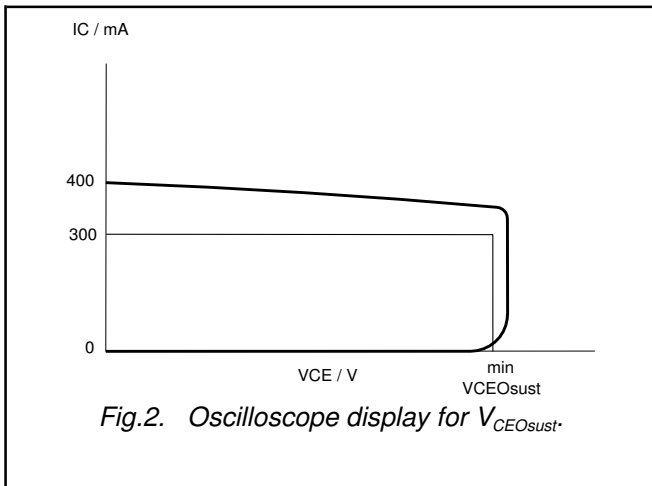
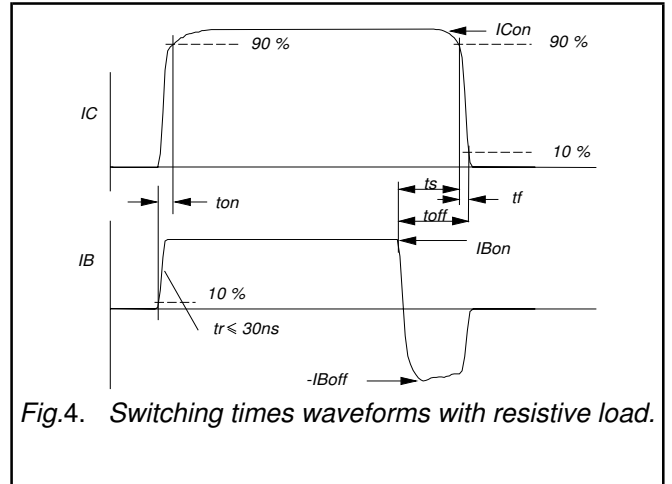
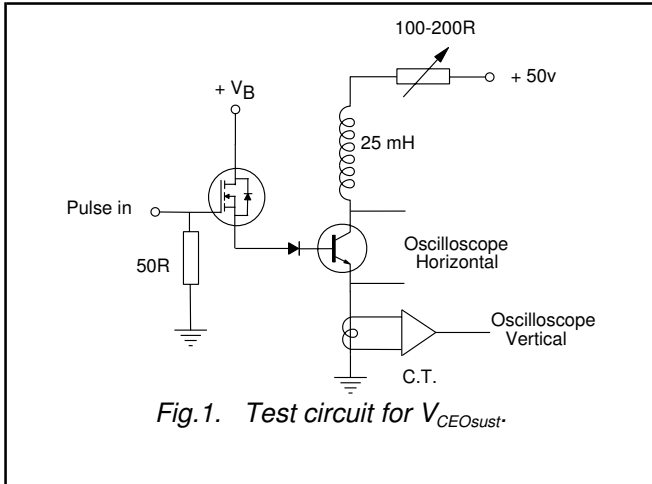
DYNAMIC CHARACTERISTICS $T_{mb} = 25\text{ °C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
t_{on} t_s t_f	Switching times (resistive load) Turn-on time Turn-off storage time Turn-off fall time	$I_{Con} = 2.5\text{ A}; I_{Bon} = 0.5\text{ A}; I_{Boff} = -1\text{ A};$ $V_{CC} = 250\text{ V};$	1 2.5 0.3	- - -	μs μs μs
t_s t_f	Switching times (inductive load) Turn-off storage time Turn-off fall time	$I_{Con} = 2.5\text{ A}; I_{Bon} = 0.5\text{ A}; -V_{BB} = 5\text{ V};$ $L_C = 300\text{ }\mu\text{H}; L_B = 1\text{ }\mu\text{H}; V_{CC} = 350\text{ V}$	2 200	- -	μs ns
t_s t_f	Switching times (inductive load) Turn-off storage time Turn-off fall time	$I_{Con} = 2.5\text{ A}; I_{Bon} = 0.5\text{ A}; -V_{BB} = 5\text{ V};$ $L_C = 300\text{ }\mu\text{H}; L_B = 1\text{ }\mu\text{H}; V_{CC} = 350\text{ V};$ $T_j = 100\text{ °C}$	3 300	- -	μs ns

¹ Measured with half sine-wave voltage (curve tracer).

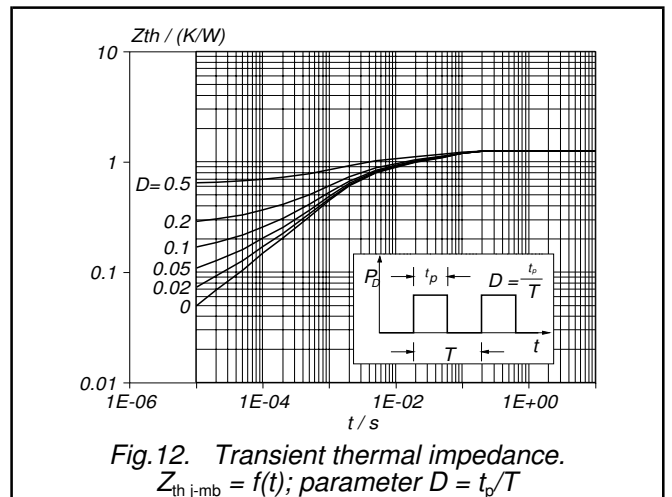
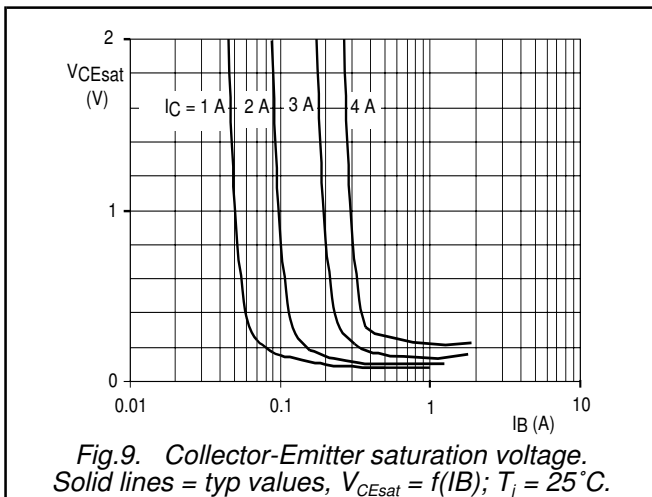
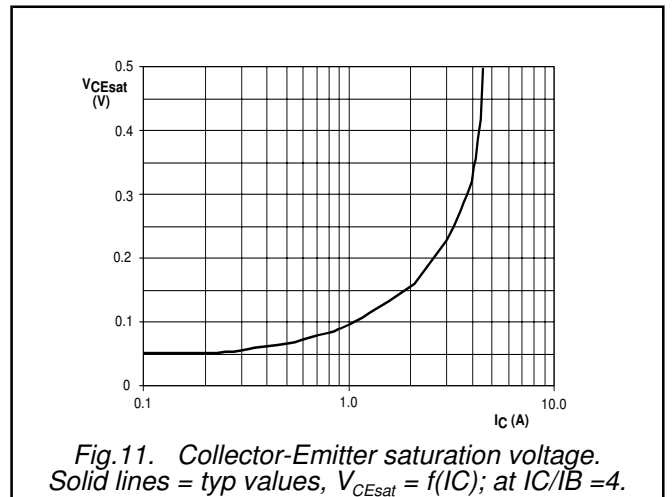
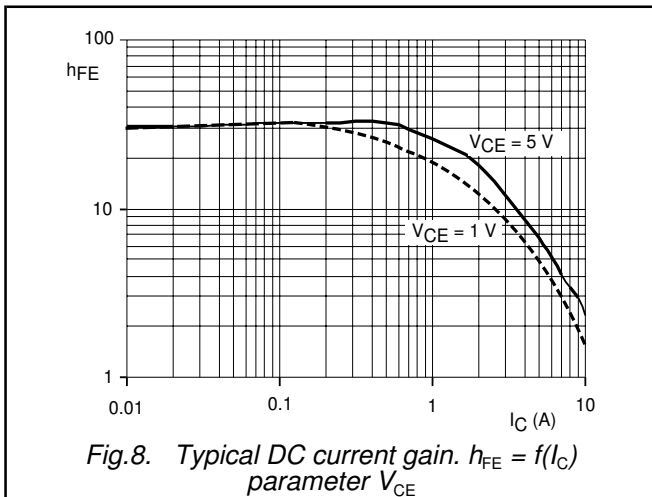
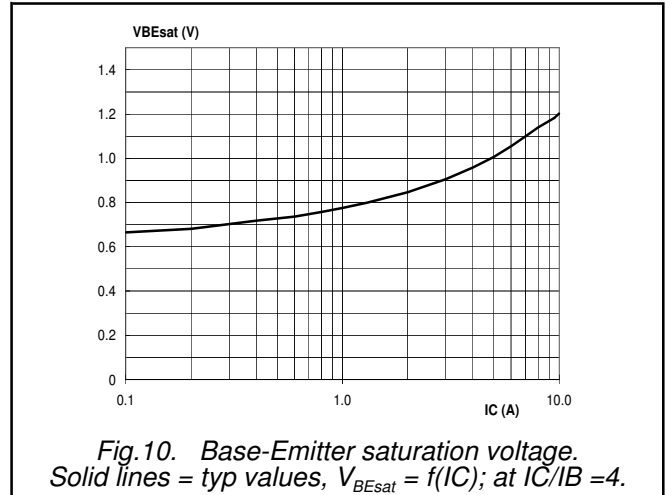
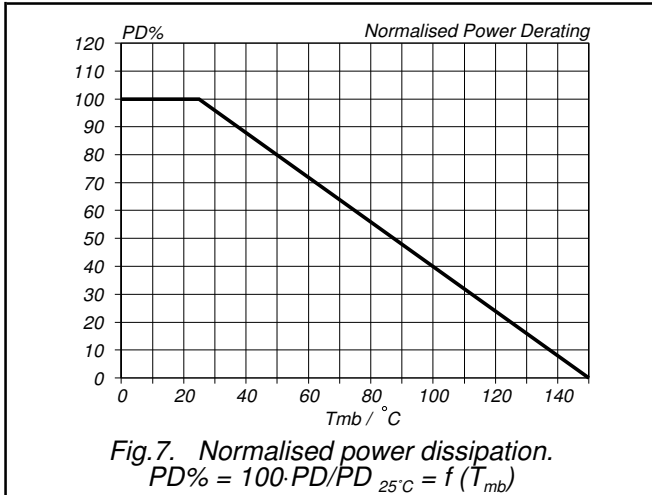
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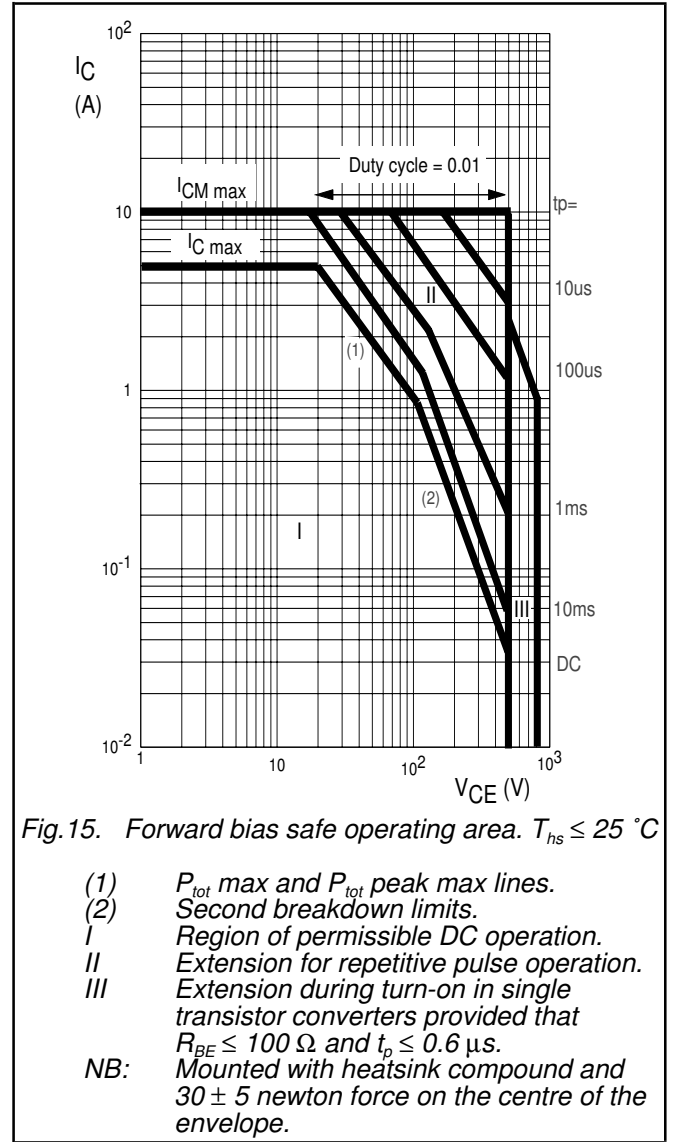
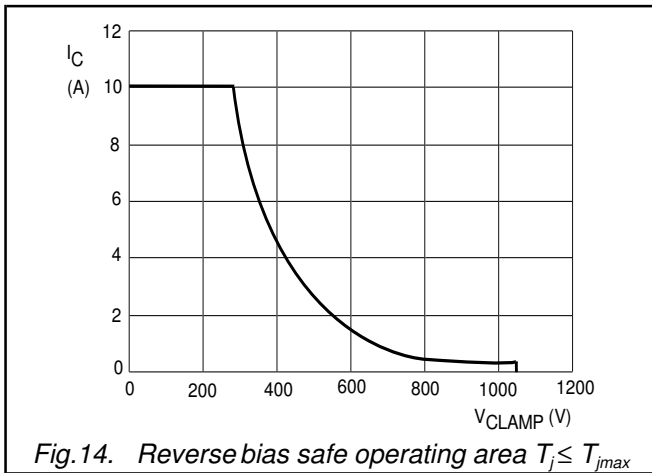
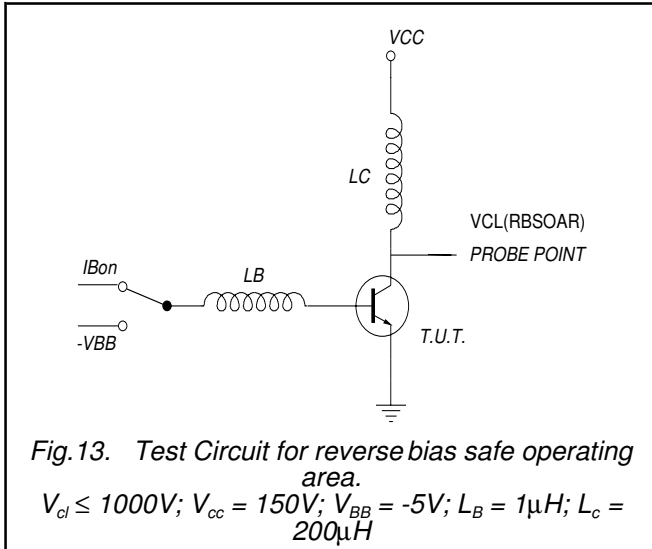
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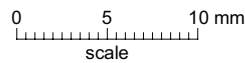
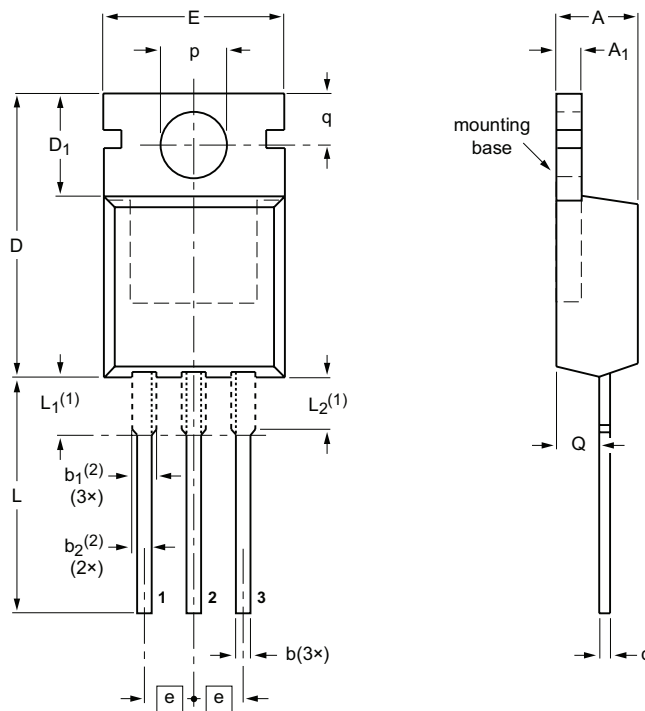
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MECHANICAL DATA

Plastic single-ended package; heatsink mounted; 1 mounting hole; 3-lead TO-220AB

SOT78



DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁	b	b ₁ (²)	b ₂ (²)	c	D	D ₁	E	e	L	L ₁ (¹)	L ₂ (¹) max.	p	q	Q
mm	4.7	1.40	0.9	1.6	1.3	0.7	16.0	6.6	10.3	2.54	15.0	3.30	3.0	3.8	3.0	2.6
	4.1	1.25	0.6	1.0	1.0	0.4	15.2	5.9	9.7		12.8	2.79		3.5	2.7	2.2

Notes

- 1. Lead shoulder designs may vary.
- 2. Dimension includes excess dambar.

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
SOT78		3-lead TO-220AB	SC-46		08-04-23 08-06-13

Legal information

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Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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