

DATA SHEET

BUJ105AB

Silicon Diffused Power Transistor

Product specification

January 2026

Silicon Diffused Power Transistor

BUJ105AB

GENERAL DESCRIPTION

High-voltage, high-speed planar-passivated npn power switching transistor in SOT404 (D²-PAK) surface-mount package intended for use in high frequency electronic lighting ballast applications, converters, inverters, switching regulators, motor control systems, etc.

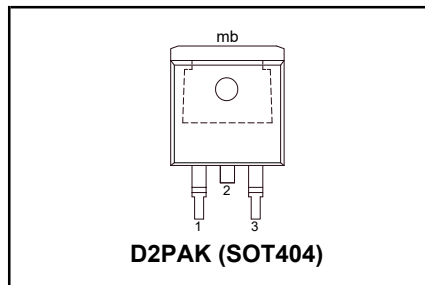
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	700	V
V_{CBO}	Collector-Base voltage (open emitter)		-	700	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	V
I_C	Collector current (DC)		-	8	A
I_{CM}	Collector current peak value		-	16	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ °C}$	-	125	W
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 4.0\text{ A}; I_B = 0.8\text{ A}$	0.3	1.0	V
h_{FEsat}		$I_C = 4.0\text{ A}; V_{CE} = 5\text{ V}$	11	15	
t_f	Fall time	$I_C = 5\text{ A}; I_{B1} = 1\text{ A}$	20	50	ns

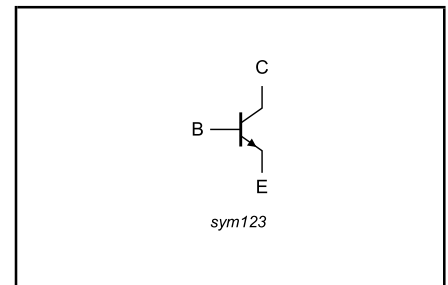
PINNING - SOT404

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	$V_{BE} = 0\text{ V}$	-	700	V
V_{CEO}	Collector to emitter voltage (open base)		-	400	V
V_{CBO}	Collector to base voltage (open emitter)		-	700	V
I_C	Collector current (DC)		-	8	A
I_{CM}	Collector current peak value		-	16	A
I_B	Base current (DC)		-	4	A
I_{BM}	Base current peak value		-	8	A
P_{tot}	Total power dissipation	$T_{mb} \leq 25\text{ °C}$	-	125	W
T_{stg}	Storage temperature		-65	150	°C
T_j	Junction temperature		-	150	°C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base		-	1.0	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	minimum footprint, FR4 board	55	-	K/W

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STATIC CHARACTERISTICS

 $T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}, I_{CBO} I_{CES}	Collector cut-off current ¹	$V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ }^{\circ}\text{C}$	- -	- -	0.2 0.5	mA mA
I_{CEO}	Collector cut-off current	$V_{CEO} = V_{CEOMmax} (400\text{V})$	-	-	0.1	mA
I_{EBO}	Emitter cut-off current	$V_{EB} = 9\text{ V}; I_C = 0\text{ A}$	-	-	1	mA
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}; I_C = 10\text{ mA};$ $L = 25\text{ mH}$	400	-	-	V
V_{CEsat}	Collector-emitter saturation voltage	$I_C = 4.0\text{ A}; I_B = 0.8\text{ A}$	-	0.3	1.0	V
V_{BEsat}	Base-emitter saturation voltage	$I_C = 4.0\text{ A}; I_B = 0.8\text{ A}$	-	1.0	1.5	V
h_{FE}	DC current gain	$I_C = 1\text{ mA}; V_{CE} = 5\text{ V}$	10	14	34	
h_{FE}		$I_C = 500\text{ mA}; V_{CE} = 5\text{ V}$	13	23	36	
h_{FEsat}		$I_C = 4.0\text{ A}; V_{CE} = 5\text{ V}$	8	11	15	

DYNAMIC CHARACTERISTICS

 $T_{mb} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (resistive load)	$I_{Con} = 5\text{ A}; I_{Bon} = -I_{Boff} = 1\text{ A};$ $R_L = 75\text{ ohms}; V_{BB2} = 4\text{ V};$			
t_{on}	Turn-on time		0.65	1	μs
t_s	Turn-off storage time		1.8	2.5	μs
t_f	Turn-off fall time		0.3	0.5	μs
	Switching times (inductive load)	$I_{Con} = 5\text{ A}; I_{Bon} = 1\text{ A}; L_B = 1\text{ }\mu\text{H};$ $-V_{BB} = 5\text{ V}$			
t_s	Turn-off storage time		1.2	1.7	μs
t_f	Turn-off fall time		20	50	ns
	Switching times (inductive load)	$I_{Con} = 5\text{ A}; I_{Bon} = 1\text{ A}; L_B = 1\text{ }\mu\text{H};$ $-V_{BB} = 5\text{ V}; T_j = 100\text{ }^{\circ}\text{C}$			
t_s	Turn-off storage time		1.4	1.9	μs
t_f	Turn-off fall time		25	100	ns

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

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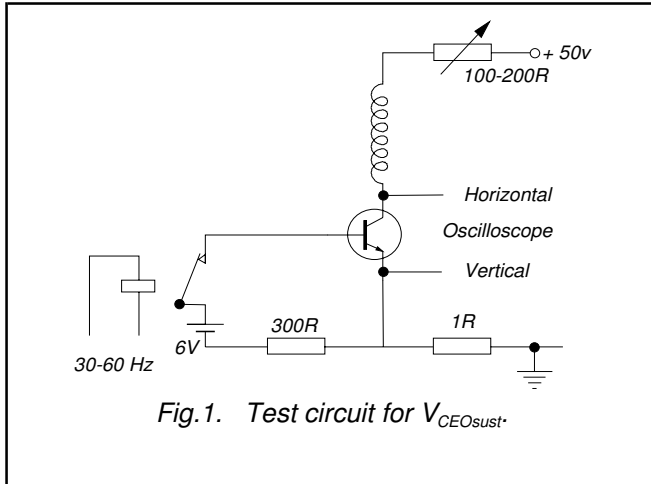
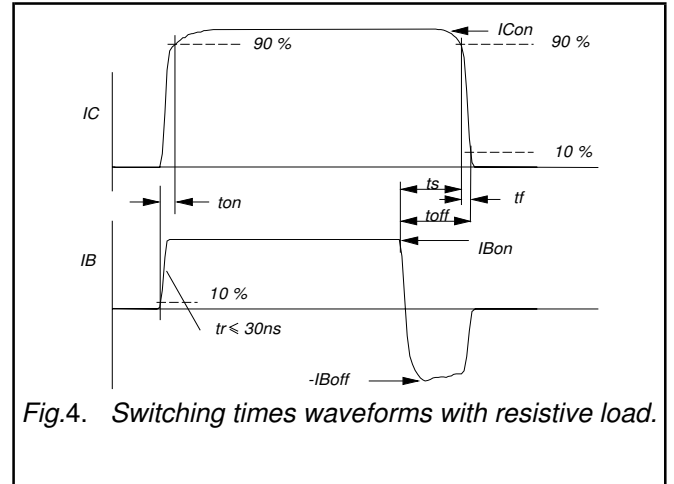
Fig.1. Test circuit for $V_{CEOsust}$.

Fig.4. Switching times waveforms with resistive load.

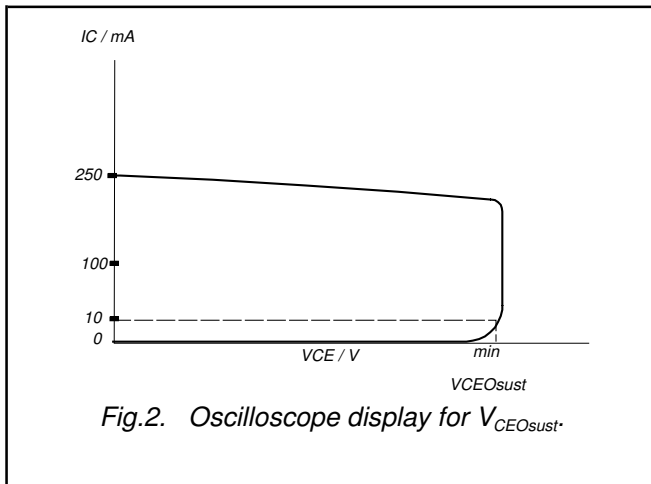
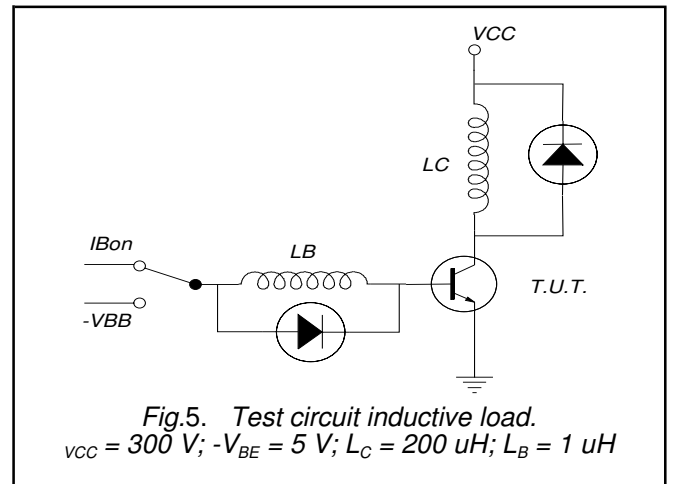
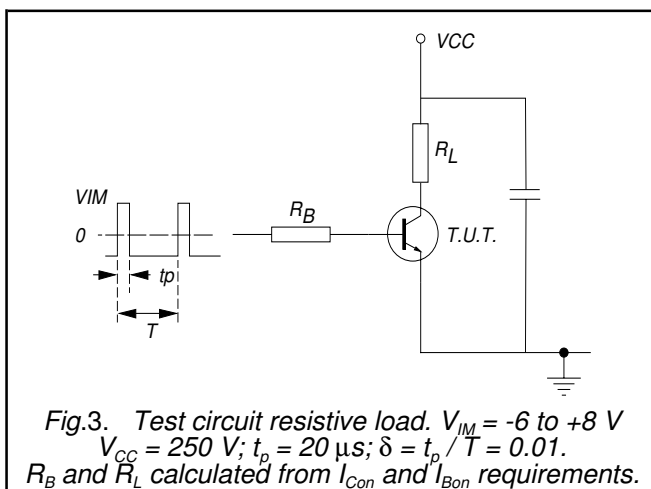
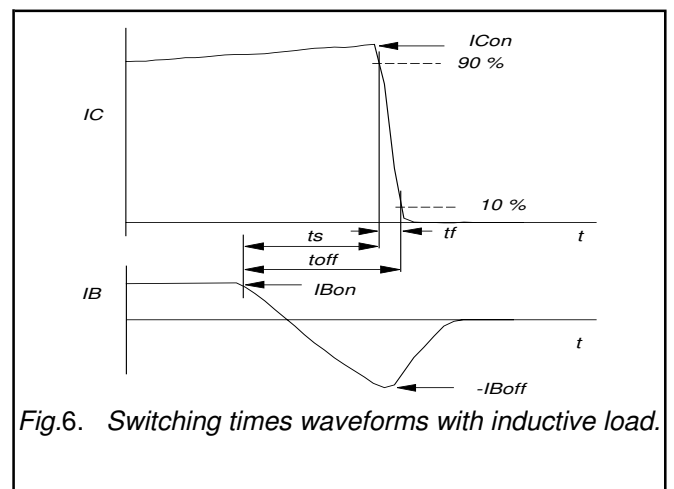
Fig.2. Oscilloscope display for $V_{CEOsust}$.Fig.5. Test circuit inductive load.
 $V_{CC} = 300 \text{ V}$; $-V_{BE} = 5 \text{ V}$; $L_C = 200 \text{ uH}$; $L_B = 1 \text{ uH}$ Fig.3. Test circuit resistive load. $V_{IM} = -6 \text{ to } +8 \text{ V}$
 $V_{CC} = 250 \text{ V}$; $t_p = 20 \text{ μs}$; $\delta = t_p / T = 0.01$.
 R_B and R_L calculated from I_{Con} and I_{Bon} requirements.

Fig.6. Switching times waveforms with inductive load.

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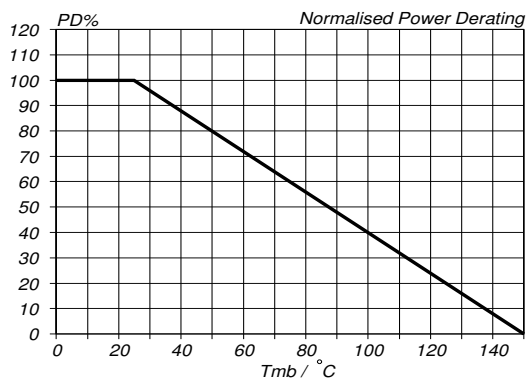


Fig. 7. Normalised power dissipation.
 $PD\% = 100 \cdot PD / PD_{25^\circ C} = f(T_{mb})$

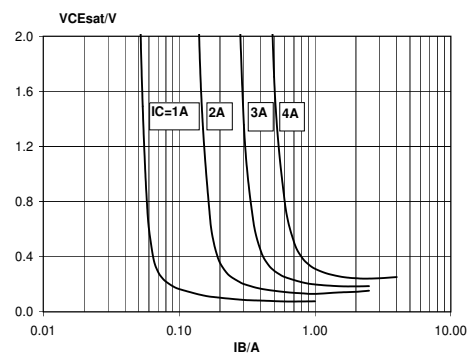


Fig. 10. Collector-Emitter saturation voltage.
 Solid lines = typ values, $V_{CEsat} = f(I_B)$; $T_j = 25^\circ C$.

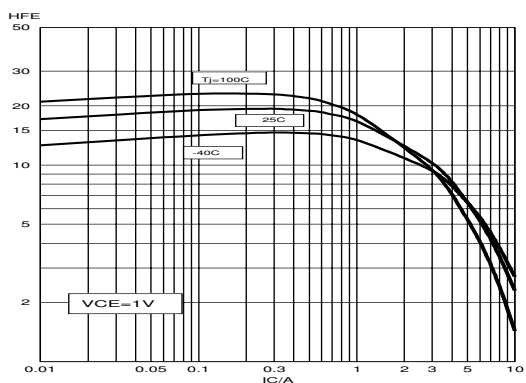


Fig. 8. Typical DC current gain. $h_{FE} = f(I_C)$
 parameter V_{CE}

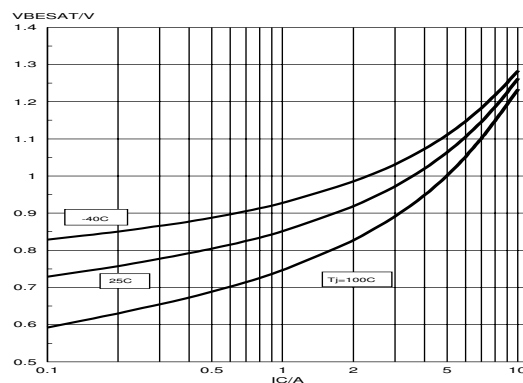


Fig. 11. Base-Emitter saturation voltage.
 Solid lines = typ values, $V_{BEsat} = f(I_C)$; at $I_C/I_B = 4$.

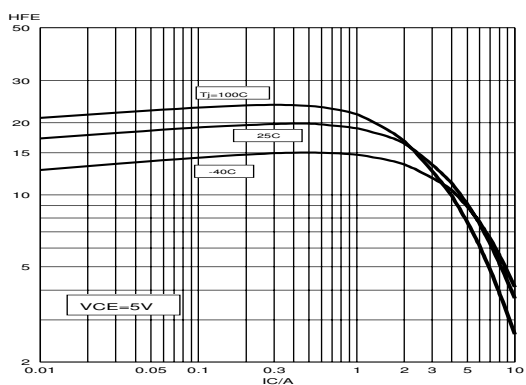


Fig. 9. Typical DC current gain. $h_{FE} = f(I_C)$
 parameter V_{CE}

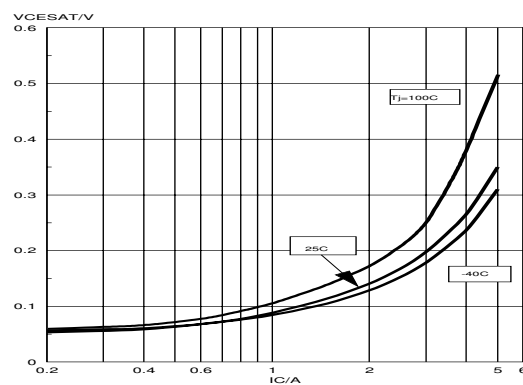


Fig. 12. Collector-Emitter saturation voltage.
 Solid lines = typ values, $V_{CEsat} = f(I_C)$; at $I_C/I_B = 4$.

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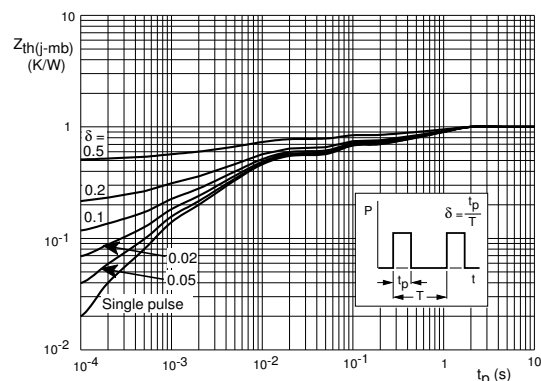


Fig.13. Transient thermal impedance.
 $Z_{th(j-mb)} = f(t)$; parameter $\delta = t_p/T$

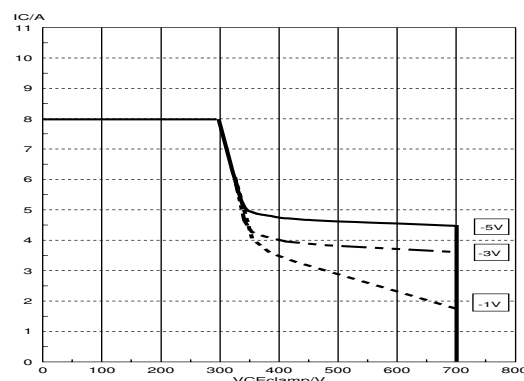


Fig.15. Reverse bias safe operating area ($T_j < T_{jmax}$)
 for $-V_{BE} = 5V, 3V \text{ \& } 1V$.

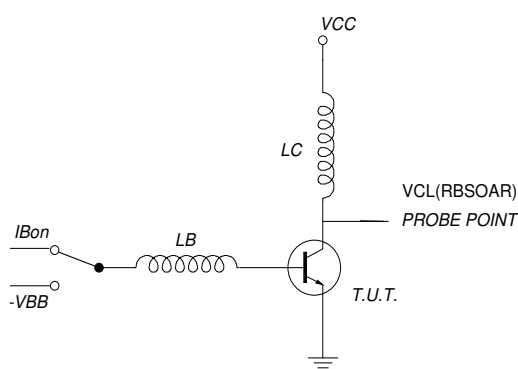


Fig.14. Test circuit for reverse bias safe operating area.

$V_{clamp} < 700V$; $V_{CC} = 150V$; $-V_{BE} = 5V, 3V \text{ \& } 1V$;
 $L_B = 1\mu H$; $L_C = 200\mu H$.

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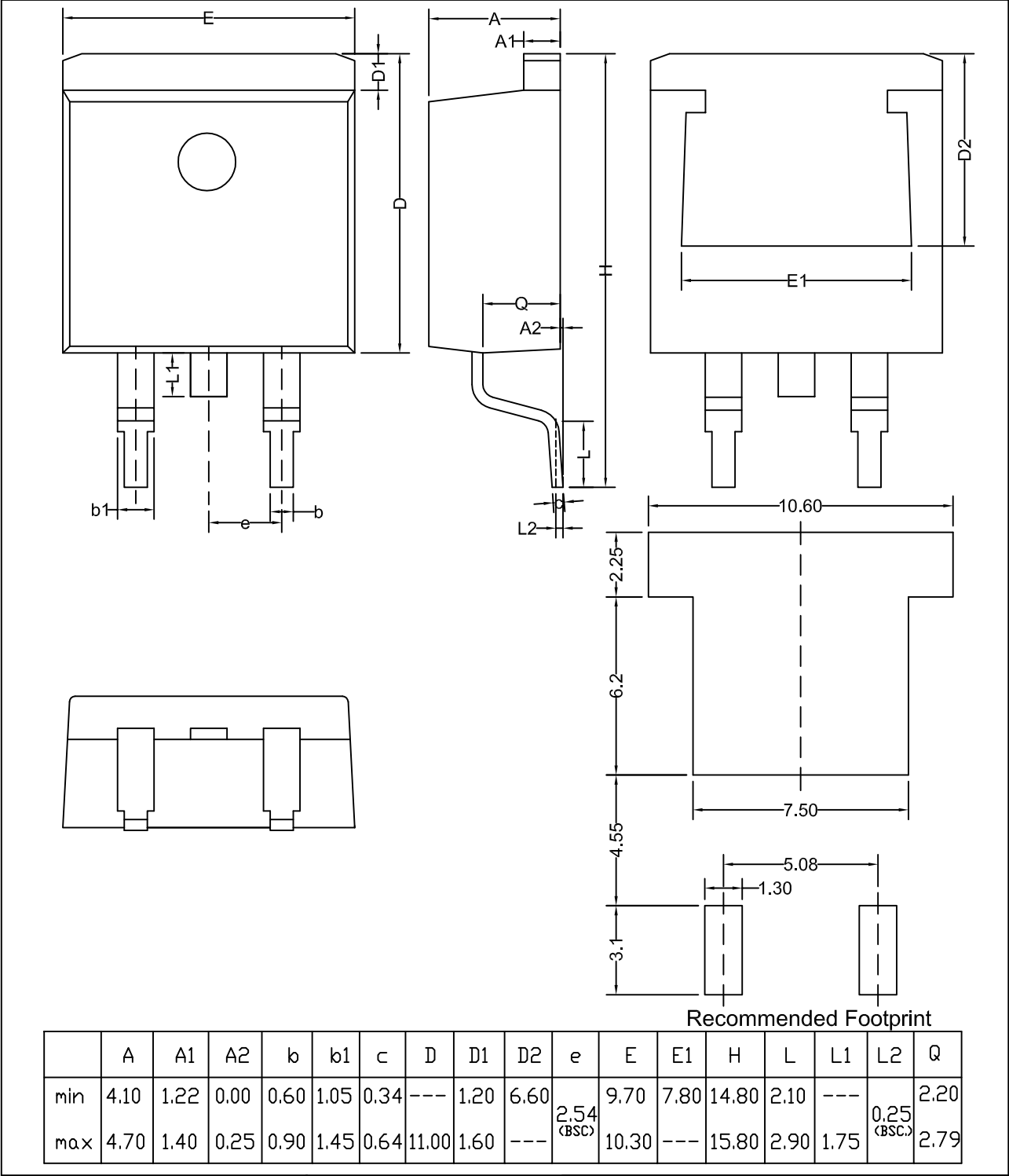
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MECHANICAL DATA

Assembly factory: N

Plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)

TO263



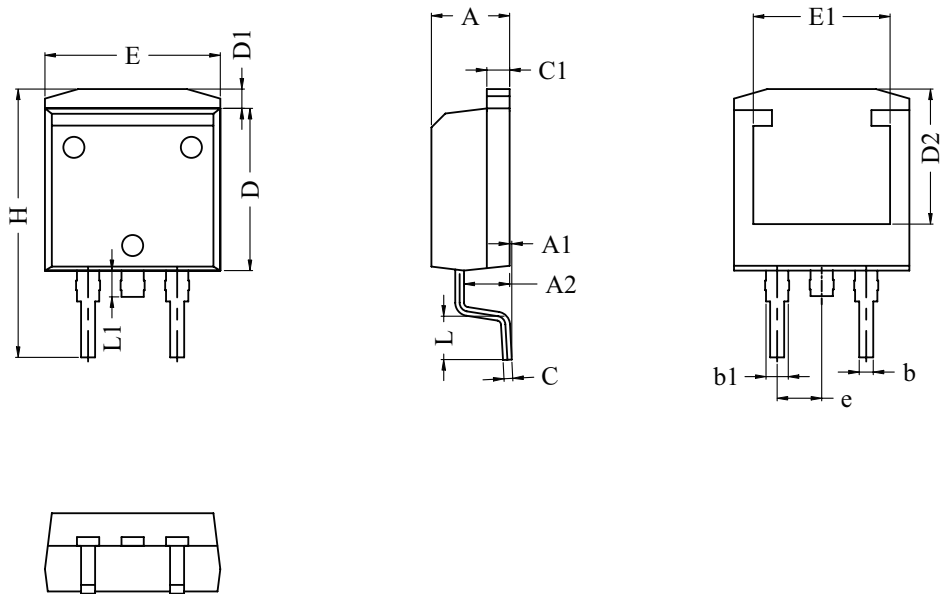
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Assembly factory: P

Plastic single-ended surface-mounted package (D2PAK); 3 leads (one lead cropped)

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Dim	All Dimensions in Millimeters		
	Min	Typ	Max
A	4.30	4.46	4.60
A1	0	0.13	0.25
A2	2.50	2.60	2.70
b	0.70	0.80	0.90
b1	1.10	1.27	1.45
C	0.40	0.52	0.60
C1	1.17	1.30	1.40
D	9.10	9.25	9.40
D1	1.00	1.10	1.30
D2	7.40	7.70	8.00
E	9.80	10.00	10.20
E1	7.60	7.80	8.00
e	2.54 BSC		
H	14.80	15.30	15.80
L	2.10	2.47	2.80
L1	1.30	1.50	1.70

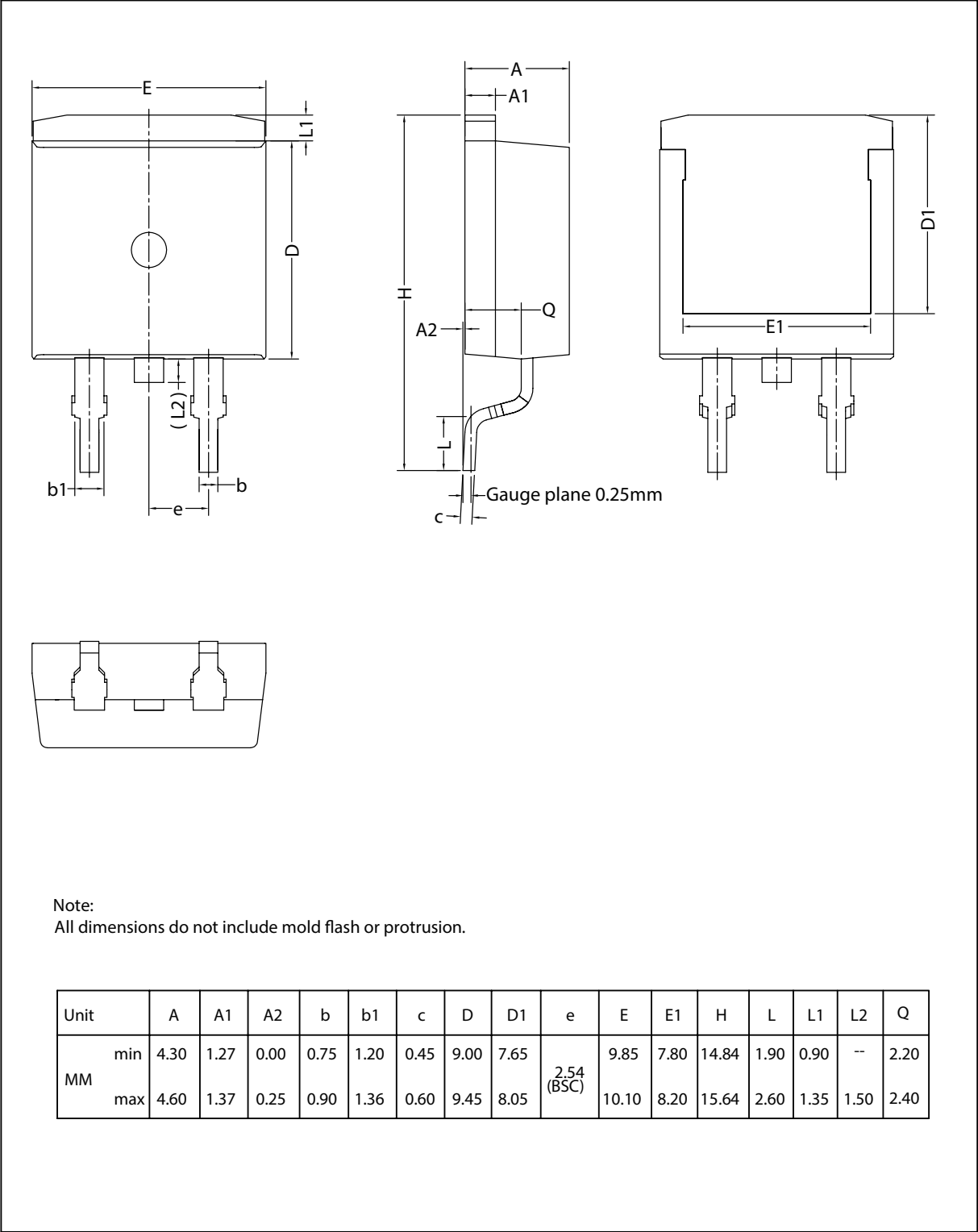
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Assembly factory: d

Plastic single-ended surface-mounted package (D2PAK);

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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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