

DATA SHEET

BUJ105AB

Silicon Diffused Power Transistor

Product specification

October 2018

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.

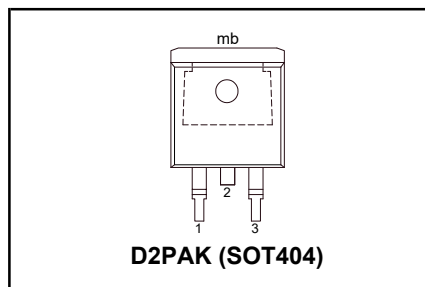
QUICK REFERENCE DATA

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

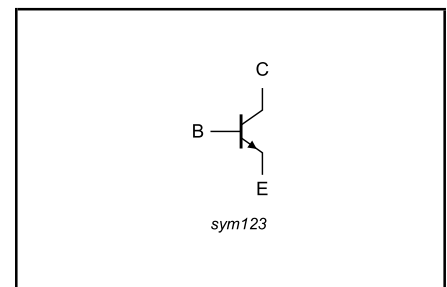
PINNING - SOT404

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

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

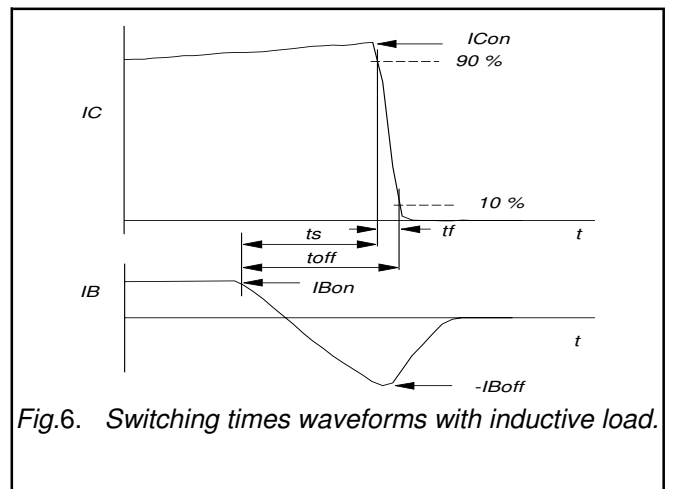
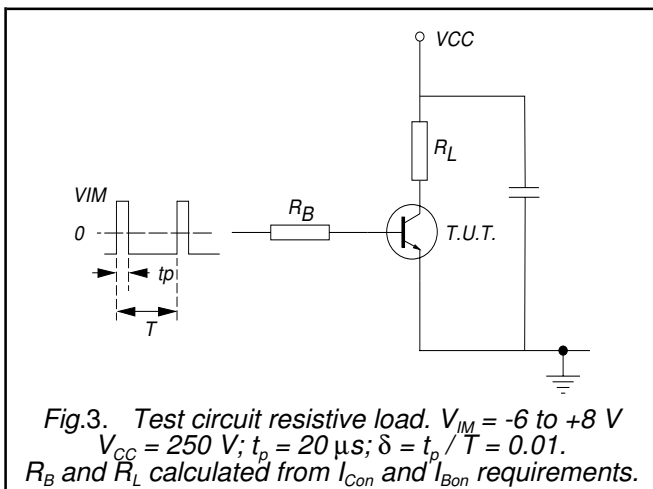
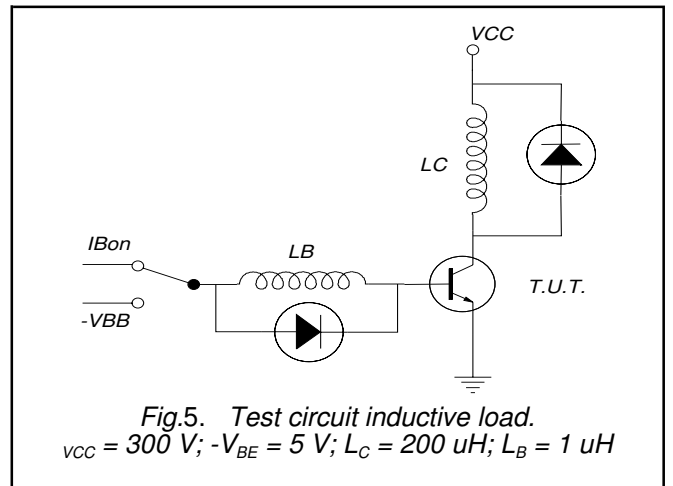
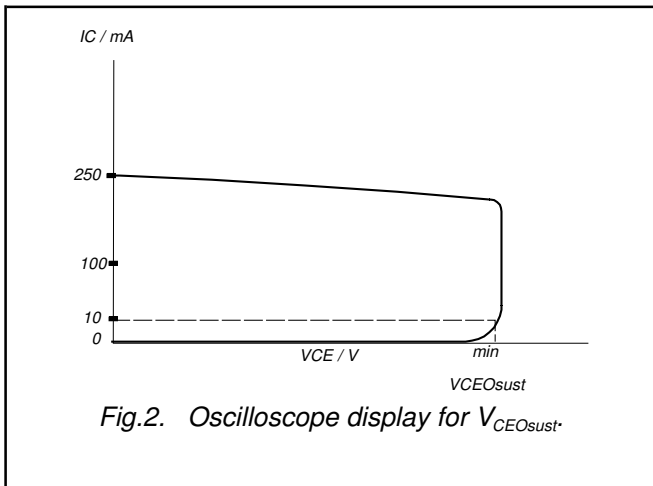
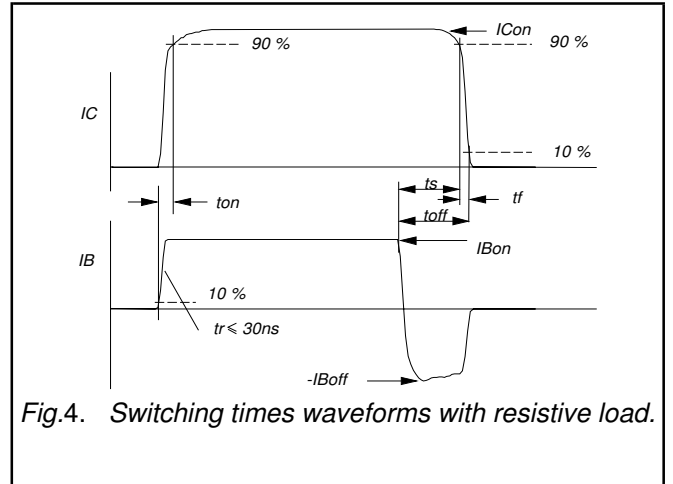
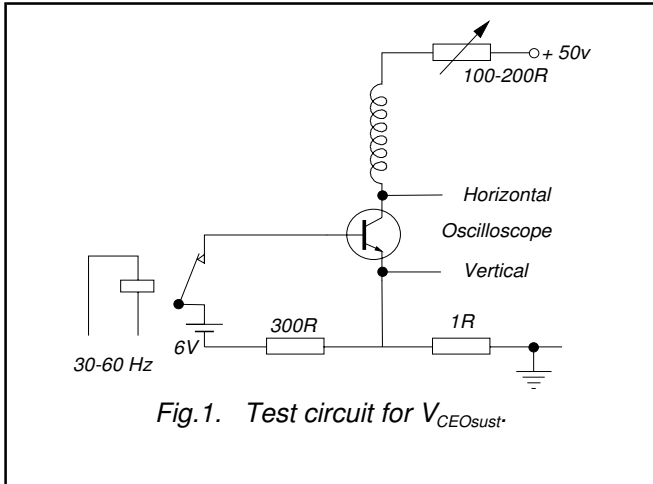
DYNAMIC CHARACTERISTICS $T_{mb} = 25\text{ °C}$ unless otherwise specified

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

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

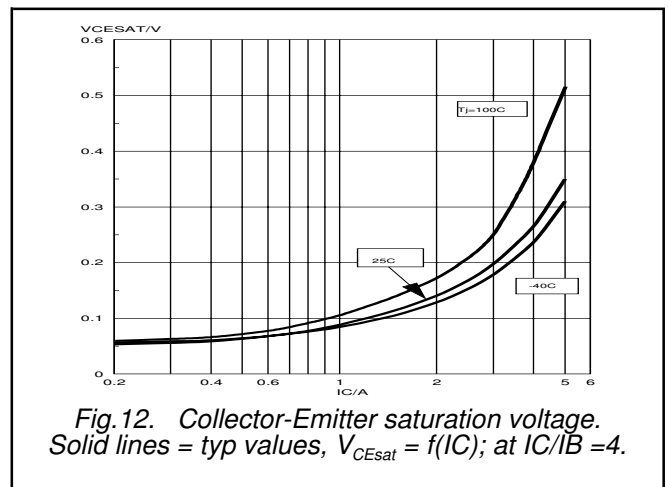
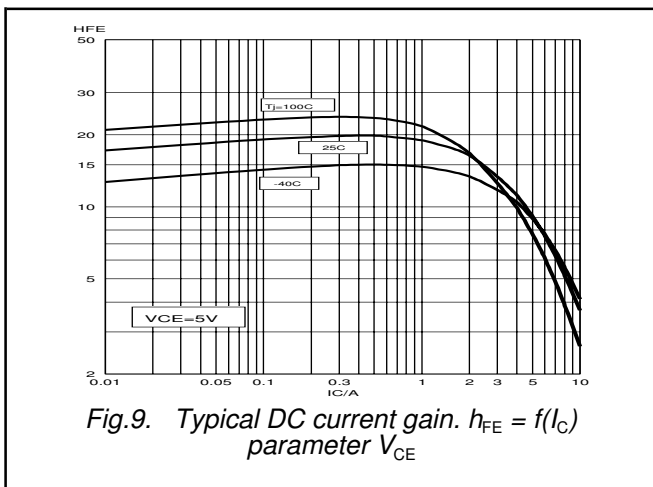
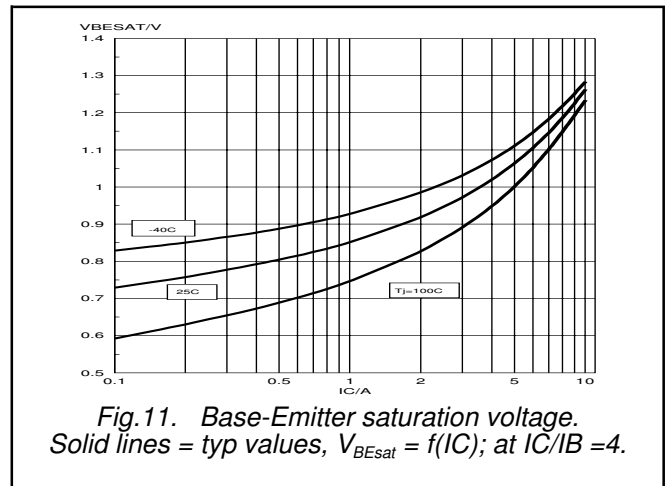
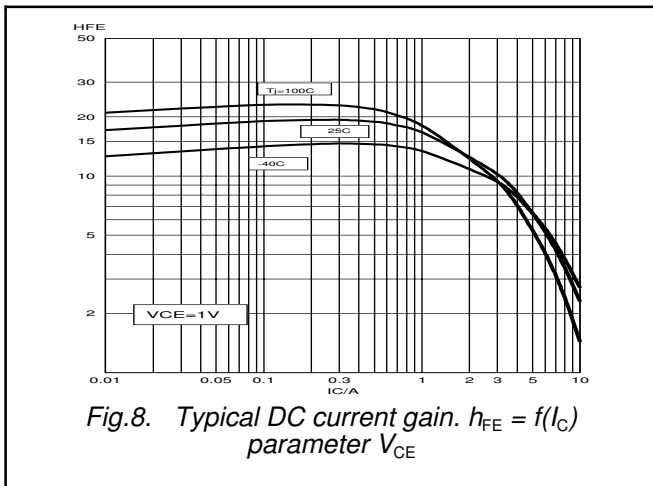
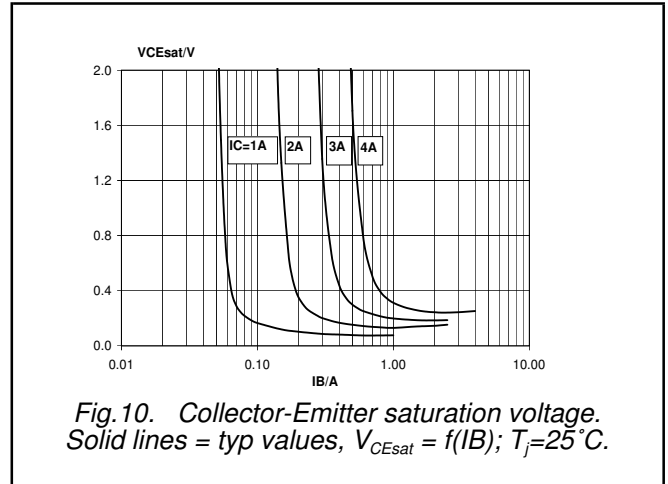
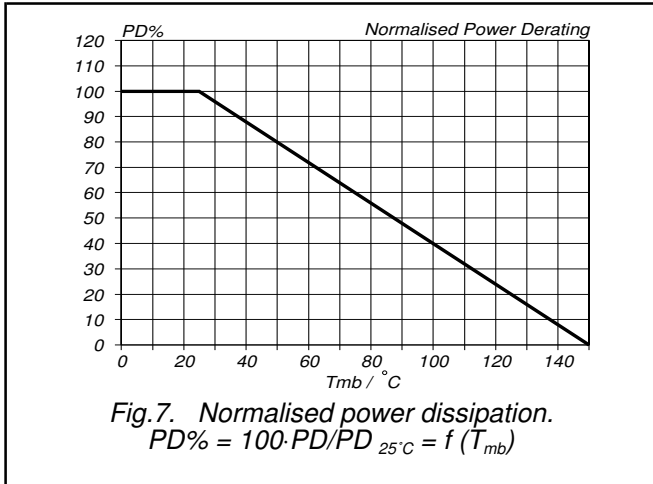
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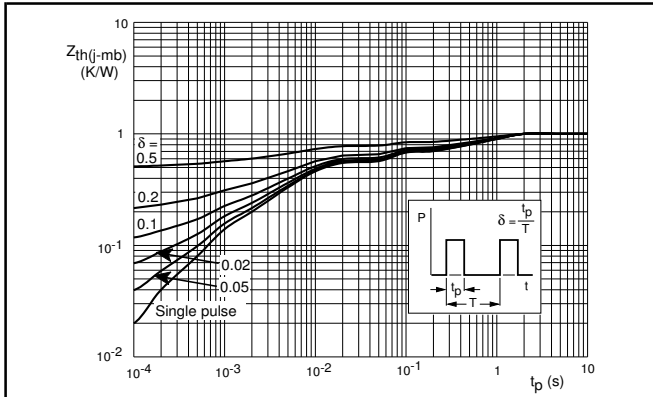


Fig.13. Transient thermal impedance.
 $Z_{th(j-mb)} = f(t)$; parameter $\delta = t_p/T$

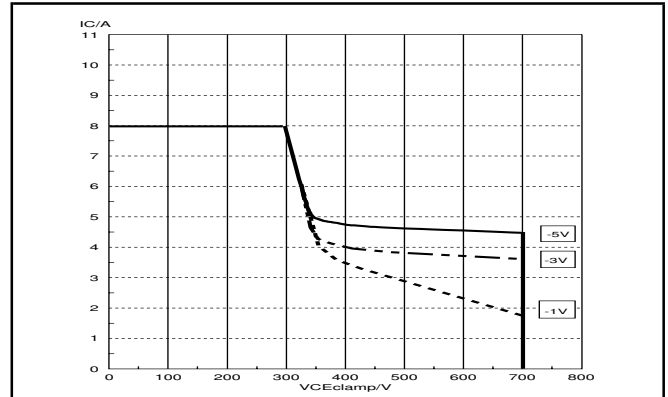


Fig.15. Reverse bias safe operating area ($T_j < T_{jmax}$)
 for $-V_{BE} = 5V, 3V \text{ \& } 1V$.

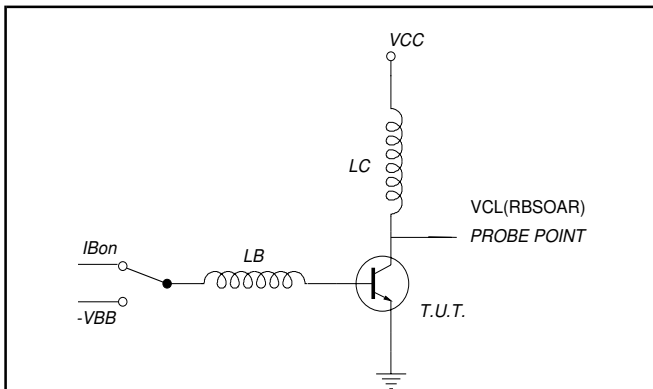


Fig.14. Test circuit for reverse bias safe operating area.

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

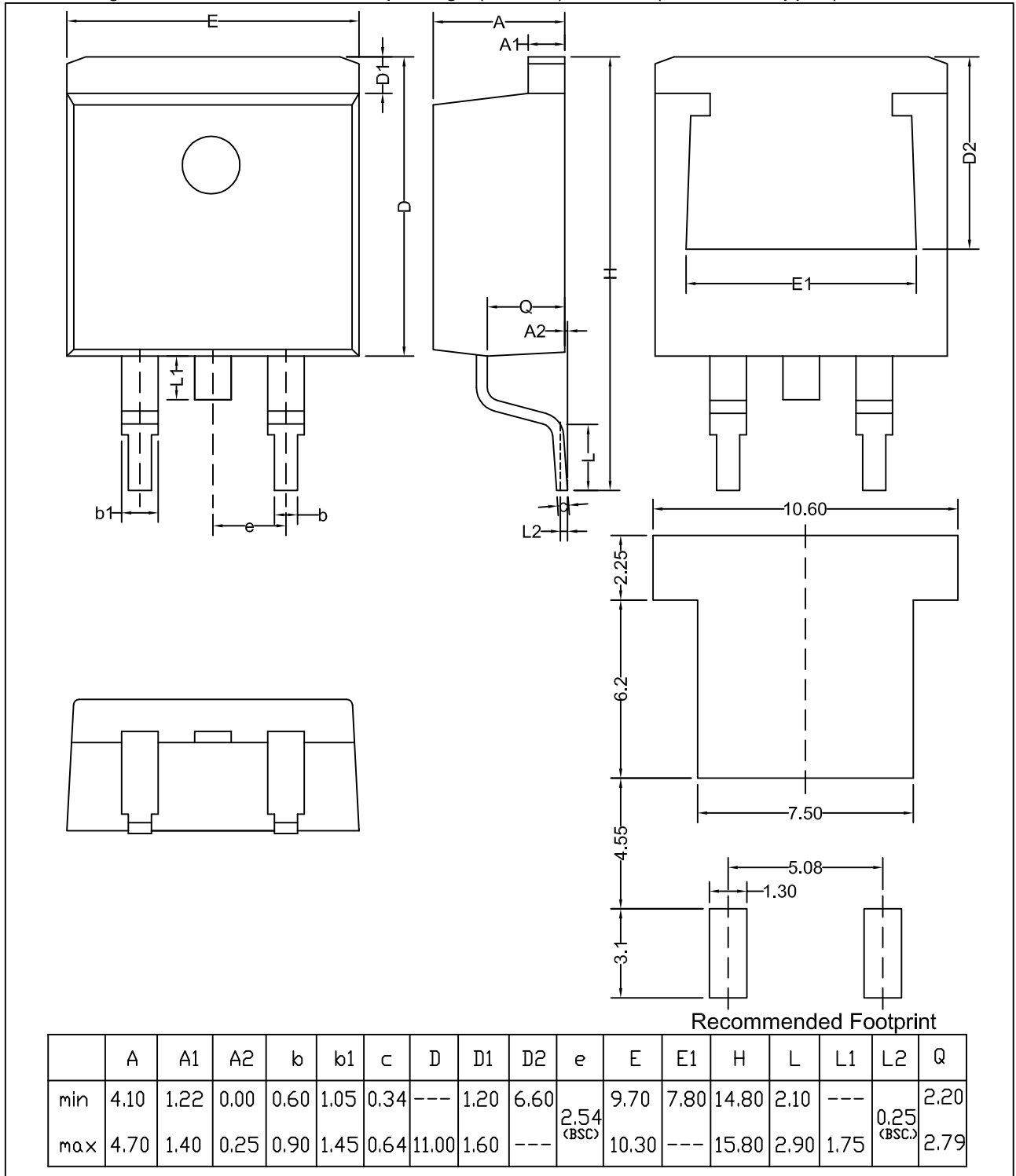
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MECHANICAL DATA

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

TO263



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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.
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