Silicon Diffused Power Transistor

BUX86P
BUX87P

GENERAL DESCRIPTION

High voltage, high speed glass passivated npn power transistors in a SOT82 envelope intended for use in converters, inverters, switching regulators, motor control systems and switching applications.

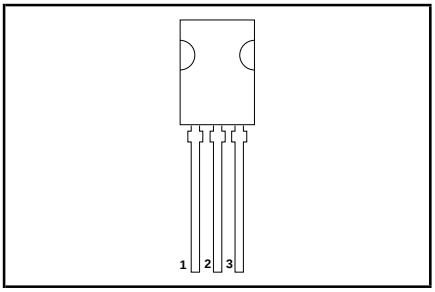
QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.		UNIT
			BUX	86P	87P	
V_{CESM}	Collector-emitter voltage peak value	V_{BE} = 0 V	-	800	1000	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	450	V
V_{CESAT}	Collector-emitter saturation voltage	I_C = 0.2 A; I_B = 20 mA	-	1		V
I_C	Collector current (DC)		-	0.5		A
I_{CM}	Collector current peak value		-	1		A
P_{tot}	Total power dissipation	$T_{mb} \leq 25$ ˚C	-	42		W
t_f	Fall time	I_C = 0.2 A; $I_{B(on)}$ = 20 mA	0.28	-		µs

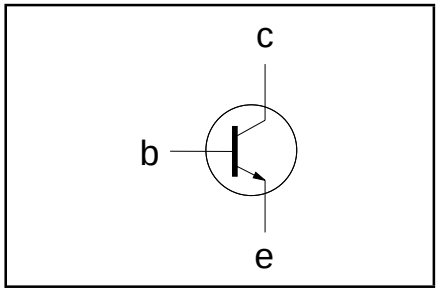
PINNING - SOT82

PIN	DESCRIPTION
1	emitter
2	collector
3	base

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.		UNIT
			BUX	86P	87P	
V_{CESM}	Collector-emitter voltage peak value	V_{BE} = 0 V	-	800	1000	V
V_{CEO}	Collector-emitter voltage (open base)		-	400	450	V
V_{EBO}	Emitter-base voltage (open collector)		-	5		V
I_C	Collector current (DC)		-	0.5		A
I_{CM}	Collector current (peak value) t_p = 2 ms		-	1		A
I_B	Base current (DC)		-	0.2		A
I_{BM}	Base current (peak value)		-	0.3		A
$-I_{BM}$	Reverse base current (peak value)[1]		-	0.3		A
P_{tot}	Total power dissipation	$T_{mb} \leq 25$ ˚C	-	42		W
T_{stg}	Storage temperature		-40	150		˚C
T_j	Junction temperature		-	150		˚C

1 Turn-off current.

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j\text{-}mb}$	Junction to mounting base		-	3	K/W
$R_{th\ j\text{-}a}$	Junction to ambient	in free air	100	-	K/W

STATIC CHARACTERISTICS

T_{mb} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS		MIN.	TYP.	MAX.	UNIT
I_{CES}		V_{BE} = 0 V; V_{CE} = $V_{CESMmax}$		-	-	100	µA
I_{CES}		V_{BE} = 0 V; V_{CE} = $V_{CESMmax}$; T_j = 125 ˚C		-	-	1.0	mA
I_{EBO}	Emitter cut-off current	V_{EB} = 5 V; I_C = 0 A		-	-	1	mA
V_{CEsat}	Collector-emitter saturation voltages	I_C = 0.1 A; I_B = 10 mA		-	-	0.8	V
V_{CEsat}		I_C = 0.2 A; I_B = 20 mA		-	-	1	V
V_{BEsat}	Base-emitter saturation voltage	I_C = 0.2 A; I_B = 20 mA		-	-	1	V
h_{FE}	DC current gain	I_C = 50 mA; V_{CE} = 5 V		26	50	125	
$V_{CEOsust}$	Collector-emitter sustaining voltage	I_C = 100 mA;	**BUX86P**	400	-	-	V
		I_{Boff} = 0; L = 25 mH	**BUX87P**	450	-	-	V

DYNAMIC CHARACTERISTICS

T_{mb} = 25 ˚C unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
	Switching times (resistive load).	I_C = 0.2 A; I_{Bon} = 20 mA; -I_{Boff} = 40 mA; V_{CC} = 250 V			
t_{on}	Turn-on time		0.25	0.5	µs
t_s	Turn-off storage time		2	3.5	µs
t_f	Turn-off fall time		0.28	-	µs
t_f	Turn-off fall time	T_{mb} = 95 ˚C	-	1.3	µs

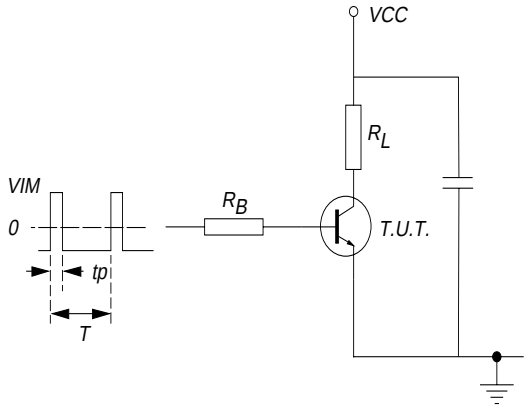


Fig.1. Test circuit resistive load. V_{IM} = -6 to +8 V V_{CC} = 250 V; tp = 20 μs; δ = tp / T = 0.01. R_B and R_L calculated from I_{Con} and I_{Bon} requirements.

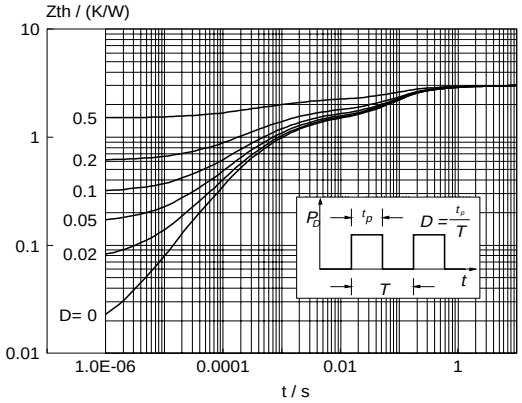


Fig.4. Transient thermal impedance. $Z_{th\ j\text{-}mb}$ = f(t); parameter D = t_p/T

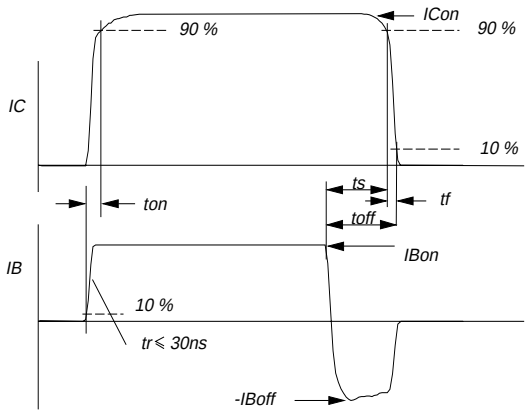


Fig.2. Switching times waveforms with resistive load.

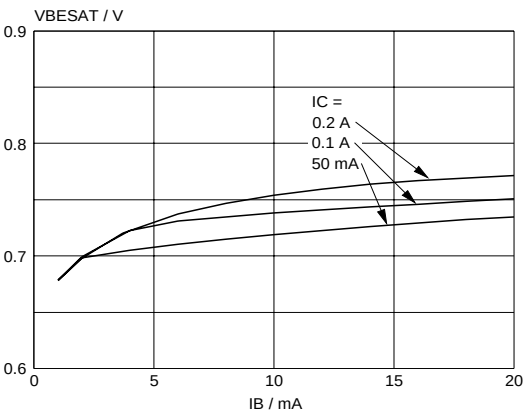


Fig.5. Typical base-emitter saturation voltage. V_{BEsat} = f(I_B); parameter I_C

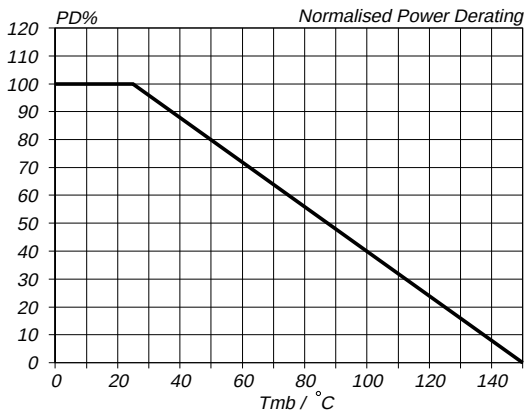


Fig.3. Normalised power dissipation. PD% = 100·PD/PD $_{25\ °C}$ = f (T_{mb})

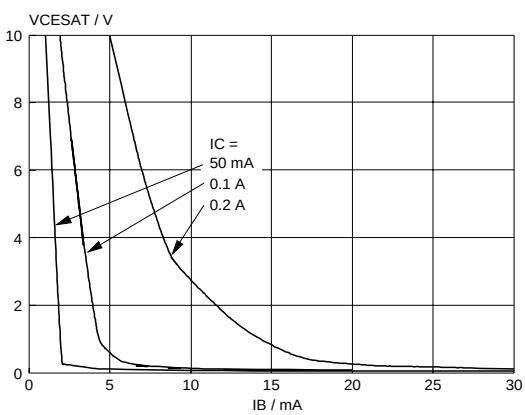


Fig.6. Typical collector-emitter saturation voltage. V_{CEsat} = f(I_B); parameter I_C

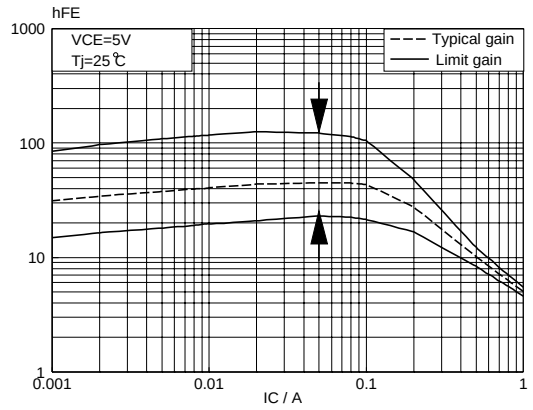


Fig.7. Typical DC current gain.
h_{FE} = f(I_C); parameter V_{CE}.
Arrows indicate conditions protected by 100% test.

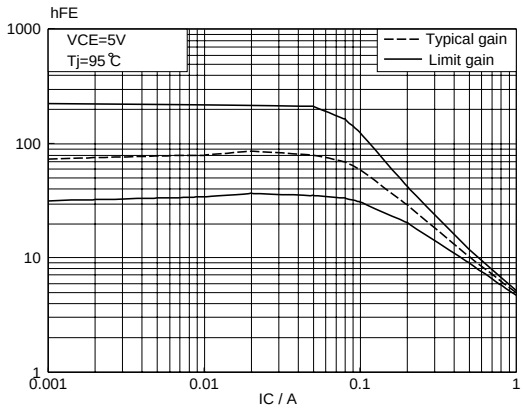


Fig.8. Typical DC current gain.
h_{FE} = f(I_C); parameter V_{CE}

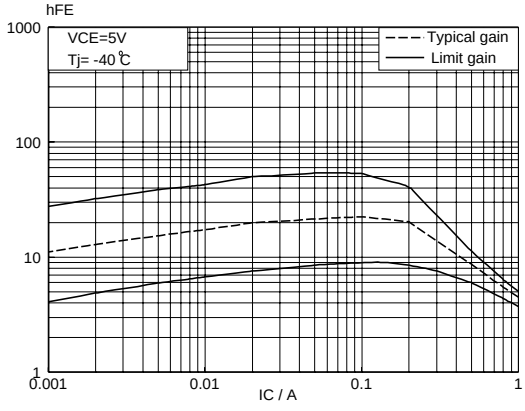


Fig.9. Typical DC current gain.
h_{FE} = f(I_C); parameter V_{CE}

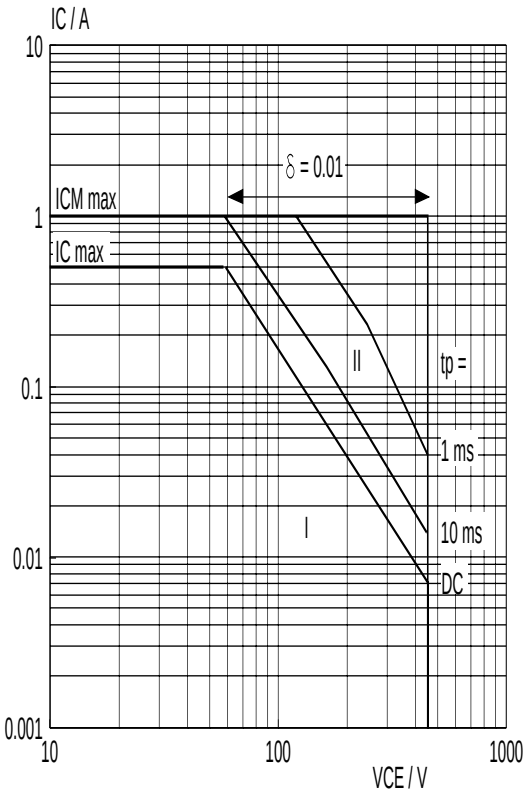


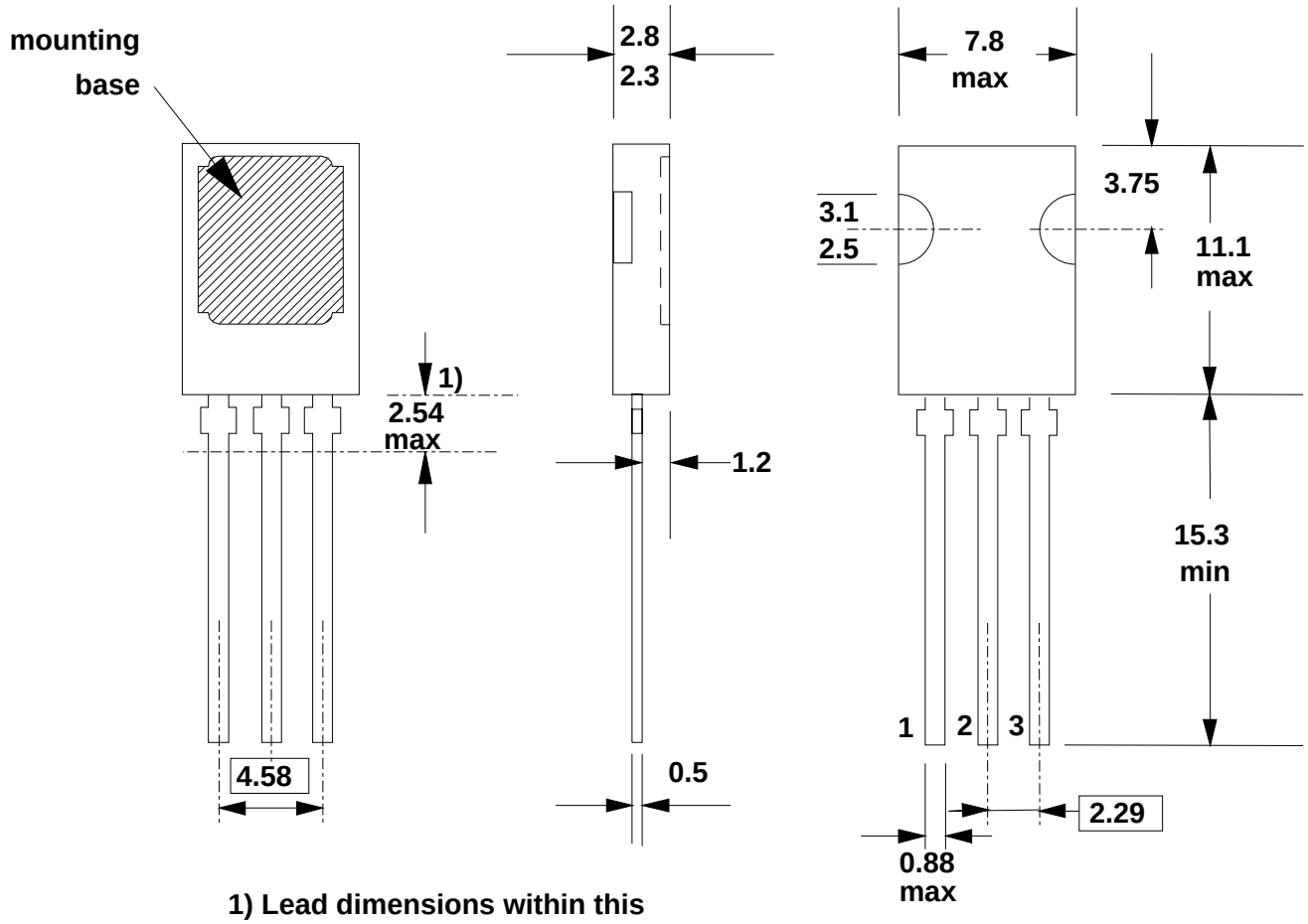
Fig.10. Forward bias safe operating area. T_{mb} = 25 ˚C

I Region of permissible DC operation.
II Extension for repetitive pulse operation.
NB: Mounted with heatsink compound and 30 ± 5 newton force on the centre of the envelope.

MECHANICAL DATA

Dimensions in mm

Net Mass: 0.8 g



1) Lead dimensions within this zone uncontrolled.

Fig.11. SOT82; pin 2 connected to mounting base.

Notes
1. Refer to mounting instructions for SOT82 envelopes.
2. Epoxy meets UL94 V0 at 1/8".