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.

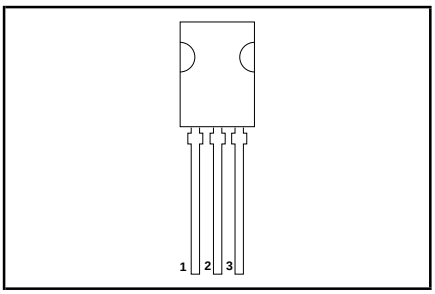
QUICK REFERENCE DATA

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

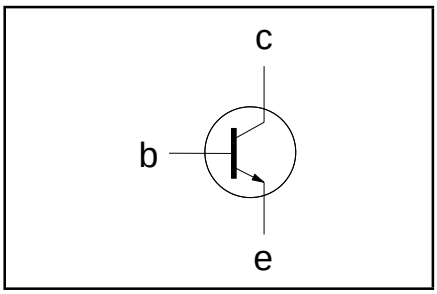
PINNING - SOT82

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

Silicon Diffused Power Transistor

BUX86P
BUX87P

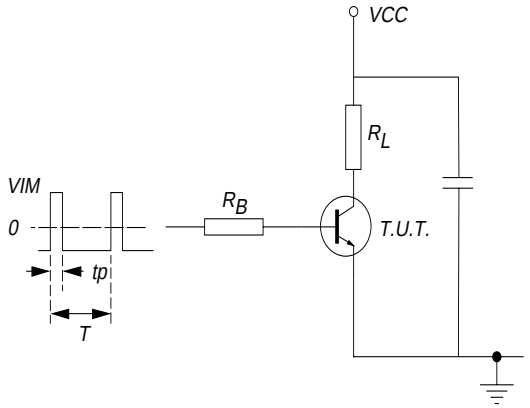


Fig.1. Test circuit resistive load. V_{IM} = -6 to +8 V V_{CC} = 250 V; tp = 20 μs; δ = tp / T = 0.01. R_B and R_L calculated from I_{Con} and I_{Bon} requirements.

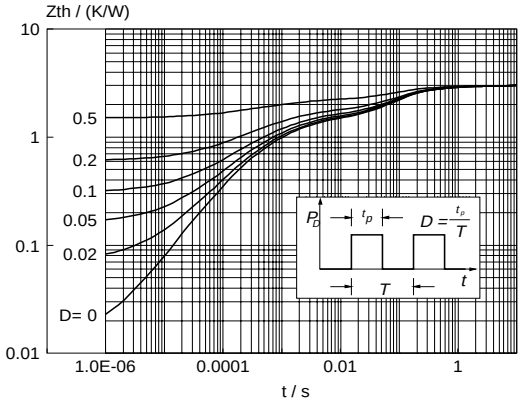


Fig.4. Transient thermal impedance. $Z_{th\ j\text{-}mb}$ = f(t); parameter D = t_p/T

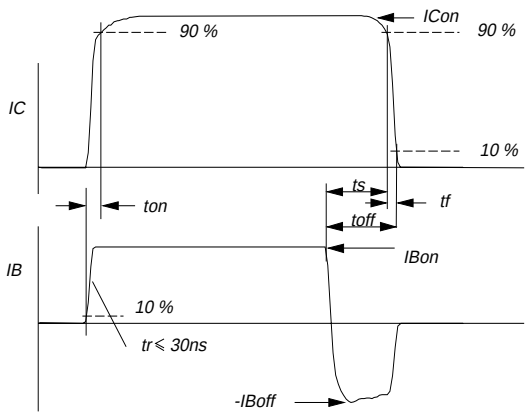


Fig.2. Switching times waveforms with resistive load.

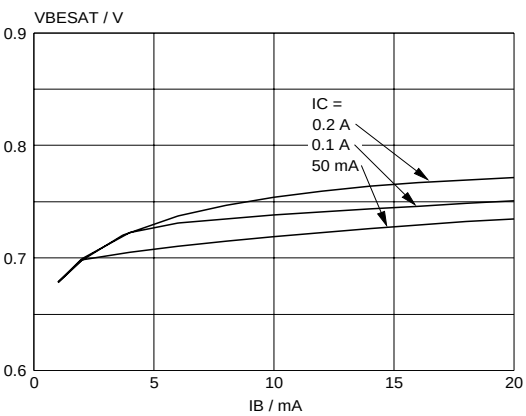


Fig.5. Typical base-emitter saturation voltage. V_{BEsat} = f(I_B); parameter I_C

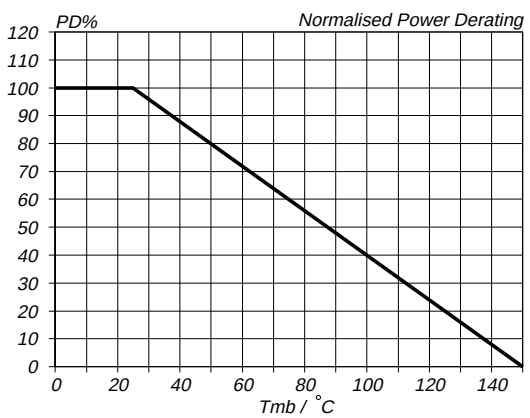


Fig.3. Normalised power dissipation. PD% = 100·PD/PD $_{25\ °C}$ = f (T_{mb})

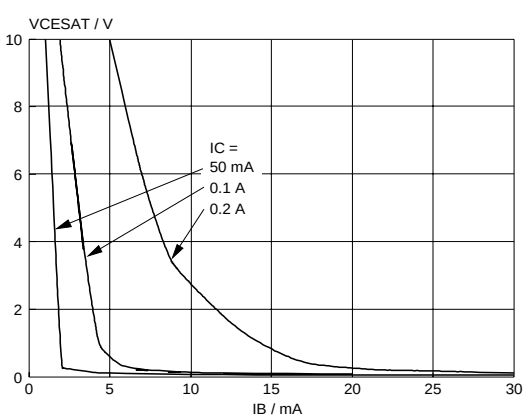


Fig.6. Typical collector-emitter saturation voltage. V_{CEsat} = f(I_B); parameter I_C

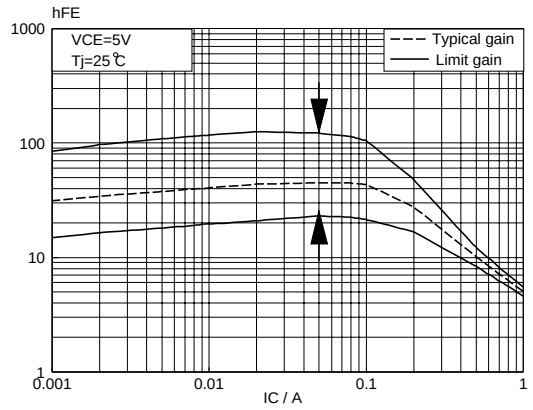


Fig.7. Typical DC current gain.
h_{FE} = f(I_C); parameter V_{CE}.
Arrows indicate conditions protected by 100% test.

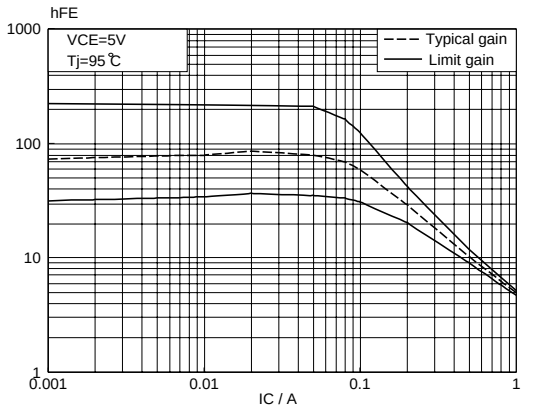


Fig.8. Typical DC current gain.
h_{FE} = f(I_C); parameter V_{CE}

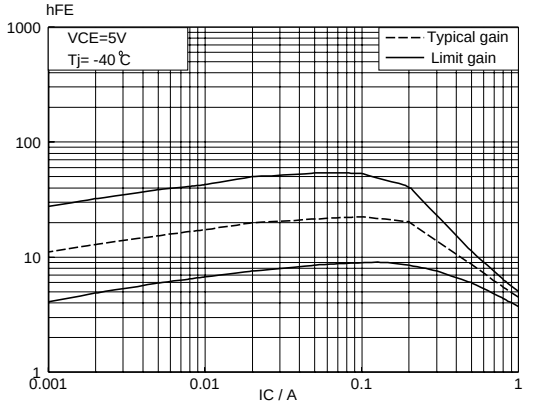


Fig.9. Typical DC current gain.
h_{FE} = f(I_C); parameter V_{CE}

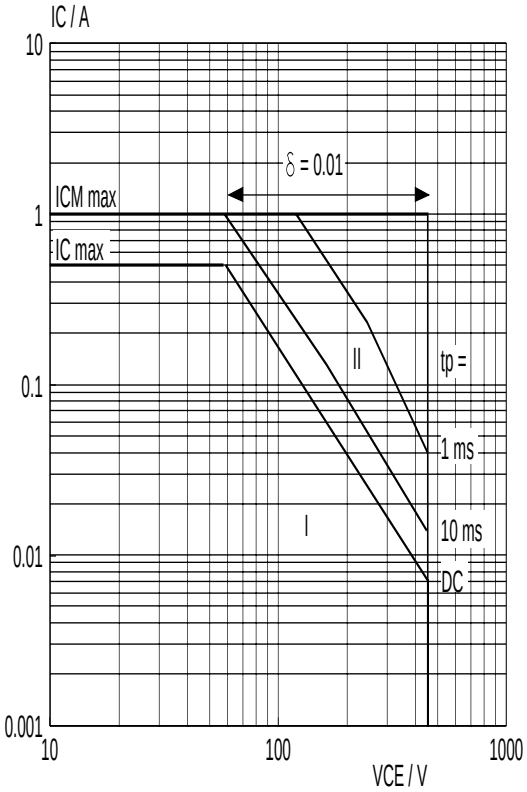


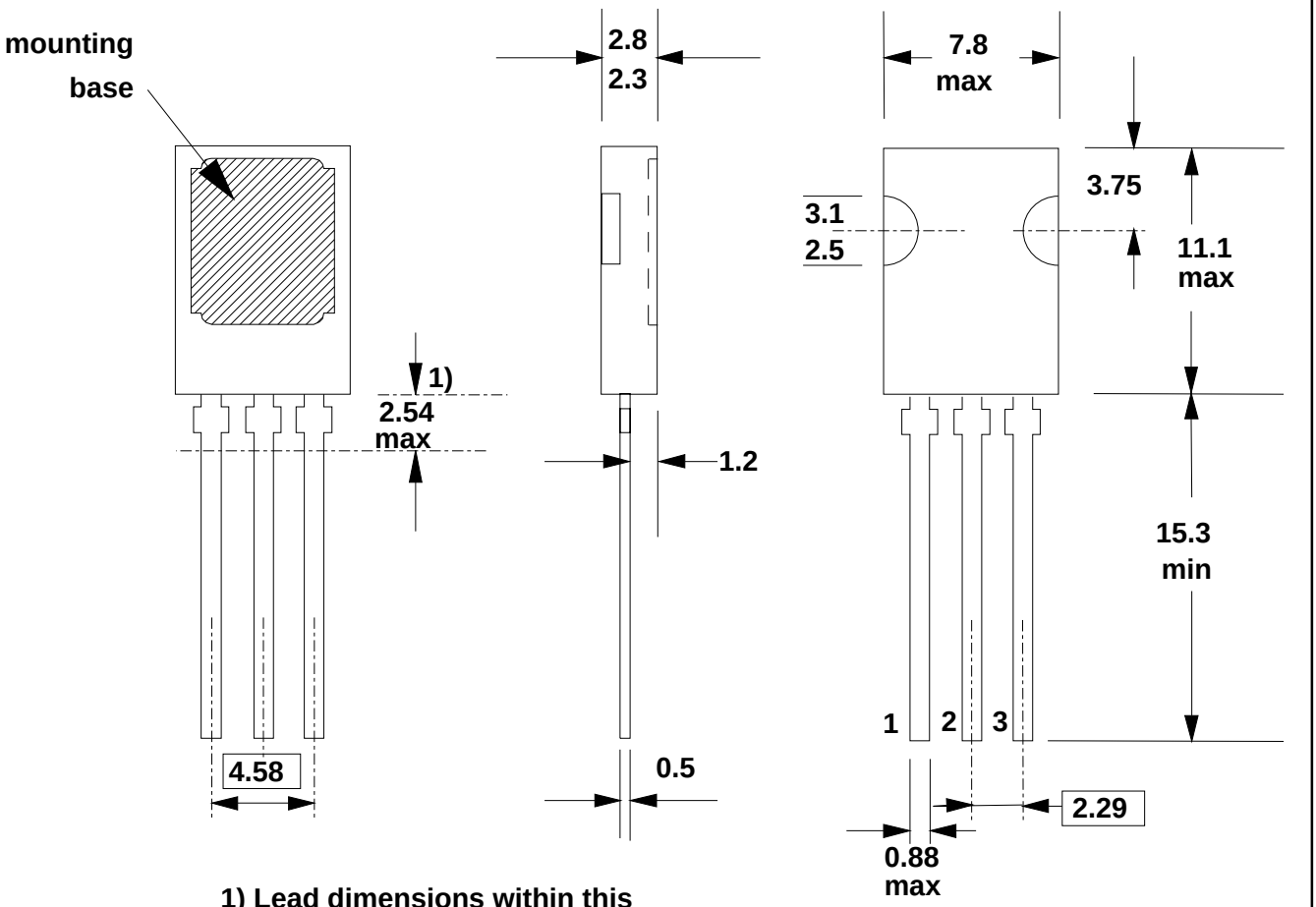
Fig.10. Forward bias safe operating area. T_{mb} = 25 ˚C

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".

DEFINITIONS

Data sheet status	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
Limiting values	
Limiting values are given in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of this specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
Application information	
Where application information is given, it is advisory and does not form part of the specification.	

LIFE SUPPORT APPLICATIONS

These products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Philips customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips for any damages resulting from such improper use or sale.