

Silicon Diffused Power Transistor**BUT11APX****GENERAL DESCRIPTION**

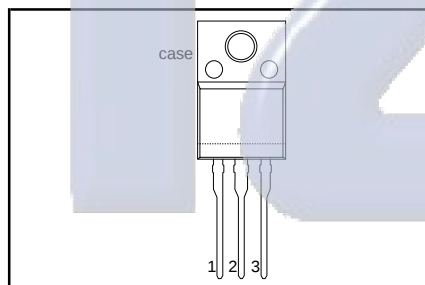
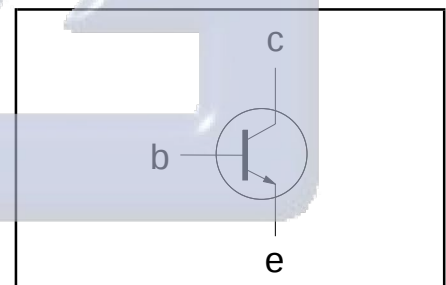
Enhanced performance, new generation, high-voltage, high-speed switching npn transistor in a plastic full-pack envelope intended for use in horizontal deflection circuits of colour television receivers. Features exceptional tolerance to base drive and collector current load variations resulting in a very low worst case dissipation.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
V_{CESM}	Collector-emitter voltage peak value	$V_{BE} = 0\text{ V}$	-	1000	V
V_{CBO}	Collector-Base voltage (open emitter)		-	1000	V
V_{CEO}	Collector-emitter voltage (open base)		-	450	V
I_C	Collector current (DC)		-	5	A
I_{CM}	Collector current peak value		-	10	A
P_{tot}	Total power dissipation	$T_{hs} \leq 25\text{ °C}$	-	32	W
V_{CESat}	Collector-emitter saturation voltage		-	1.5	V
I_{Csat}	Collector saturation current		3.5	-	A
t_f	Fall time	$I_{Csat}=2.5\text{ A}, I_{B1}=0.5\text{ A}, I_{B2}=0.8\text{ A}$	145	160	ns

PINNING - SOT186A

PIN	DESCRIPTION
1	base
2	collector
3	emitter
case	isolated

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	$V_{BE} = 0\text{ V}$	-	1000	V
V_{CEO}	Collector to emitter voltage (open base)		-	450	V
V_{CBO}	Collector to base voltage (open emitter)		-	1000	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	$T_{hs} \leq 25\text{ °C}$	-	32	W
T_{stg}	Storage temperature		-65	150	°C
T_j	Junction temperature		-	150	°C

THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
$R_{th\ j-hs}$	Junction to heatsink	with heatsink compound	-	3.95	K/W
$R_{th\ j-a}$	Junction to ambient	in free air	55	-	K/W

Silicon Diffused Power Transistor

BUT11APX

ISOLATION LIMITING VALUE & CHARACTERISTIC

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{isol}	R.M.S. isolation voltage from all three terminals to external heatsink	$f = 50\text{--}60\text{ Hz}$; sinusoidal waveform; $R.H. \leq 65\%$; clean and dustfree	-		2500	V
C_{isol}	Capacitance from T2 to external heatsink	$f = 1\text{ MHz}$	-	10	-	pF

STATIC CHARACTERISTICS

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CES}	Collector cut-off current ¹	$V_{BE} = 0\text{ V}$; $V_{CE} = V_{CESMmax}$	-	-	1.0	mA
I_{CES}		$V_{BE} = 0\text{ V}$; $V_{CE} = V_{CESMmax}$ $T_j = 125\text{ }^{\circ}\text{C}$	-	-	2.0	mA
I_{EBO}	Emitter cut-off current	$V_{EB} = 9\text{ V}$; $I_C = 0\text{ A}$	-	-	10	mA
$V_{CEOsust}$	Collector-emitter sustaining voltage	$I_B = 0\text{ A}$; $I_C = 100\text{ mA}$; $L = 25\text{ mH}$	450	-	-	V
V_{CEsat}	Collector-emitter saturation voltages	$I_C = 3.0\text{ A}$; $I_B = 0.6\text{ A}$	-	0.25	1.5	V
V_{BEsat}		$I_C = 2.5\text{ A}$; $I_B = 0.33\text{ A}$	-	-	1.3	V
h_{FE}	DC current gain	$I_C = 5\text{ mA}$; $V_{CE} = 5\text{ V}$	10	22	35	
h_{FE}		$I_C = 500\text{ mA}$; $V_{CE} = 5\text{ V}$	14	25	35	
h_{FEsat}		$I_C = 2.5\text{ A}$; $V_{CE} = 5\text{ V}$	10	13.5	17	
h_{FEsat}		$I_C = 3.5\text{ A}$; $V_{CE} = 5\text{ V}$	8	10	12	

DYNAMIC CHARACTERISTICS

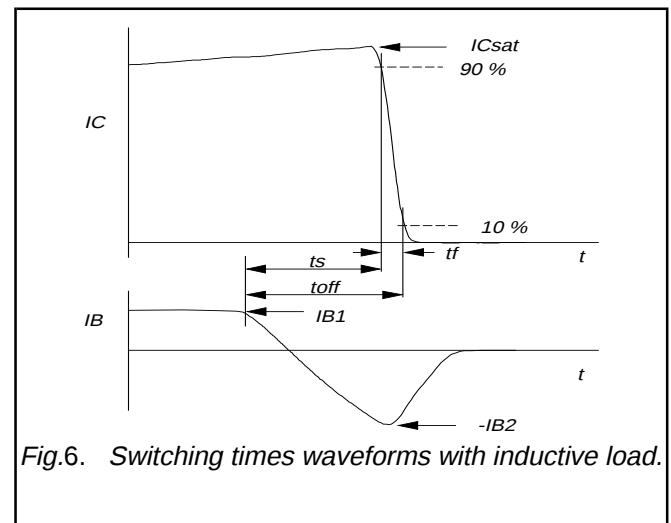
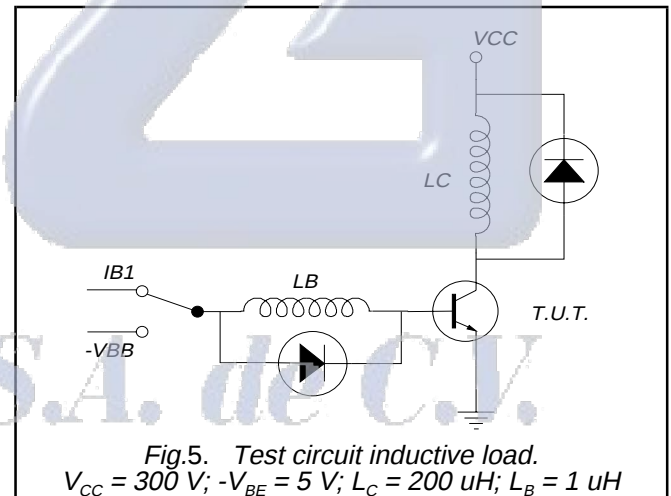
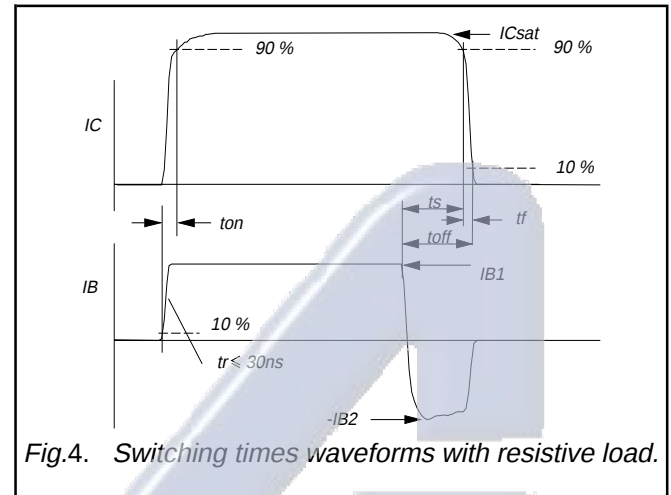
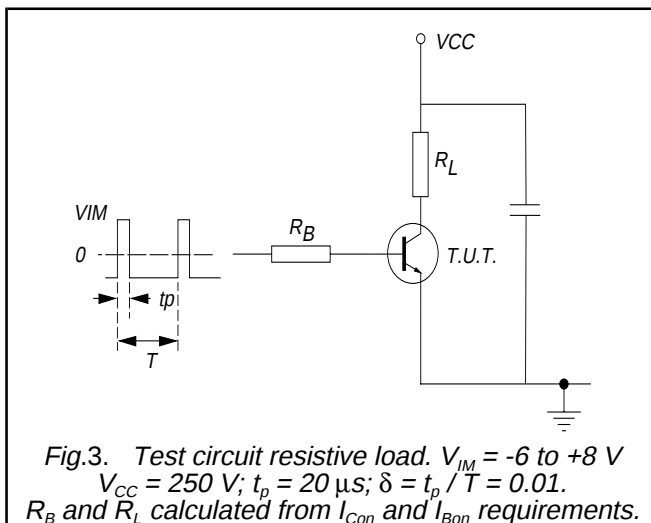
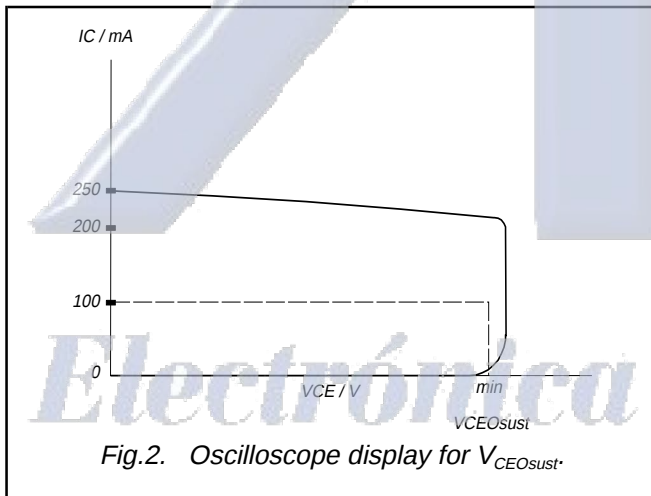
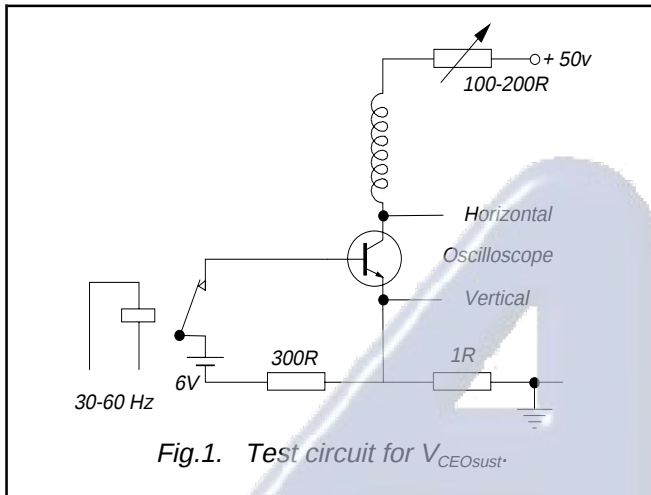
 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

SYMBOL	PARAMETER	CONDITIONS	TYP.	MAX.	UNIT
t_{on}	Switching times (resistive load)	$I_{Csat} = 2.5\text{ A}$; $I_{B1} = -I_{B2} = 0.5\text{ A}$; $R_L = 75\text{ ohms}$; $V_{BB2} = 4\text{ V}$;			
t_s	Turn-on time		0.5	0.7	μs
t_f	Turn-off storage time		3.3	4	μs
t_f	Turn-off fall time		0.33	0.45	μs
t_s	Switching times (inductive load)	$I_{Csat} = 2.5\text{ A}$; $I_{B1} = 0.5\text{ A}$; $L_B = 1\text{ }\mu\text{H}$; $-V_{BB} = 5\text{ V}$			
t_s	Turn-off storage time		1.4	1.6	μs
t_f	Turn-off fall time		145	160	ns
t_s	Switching times (inductive load)	$I_{Csat} = 2.5\text{ A}$; $I_{B1} = 0.5\text{ A}$; $L_B = 1\text{ }\mu\text{H}$; $-V_{BB} = 5\text{ V}$; $T_j = 100\text{ }^{\circ}\text{C}$			
t_s	Turn-off storage time		1.7	1.9	μs
t_f	Turn-off fall time		160	200	ns

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

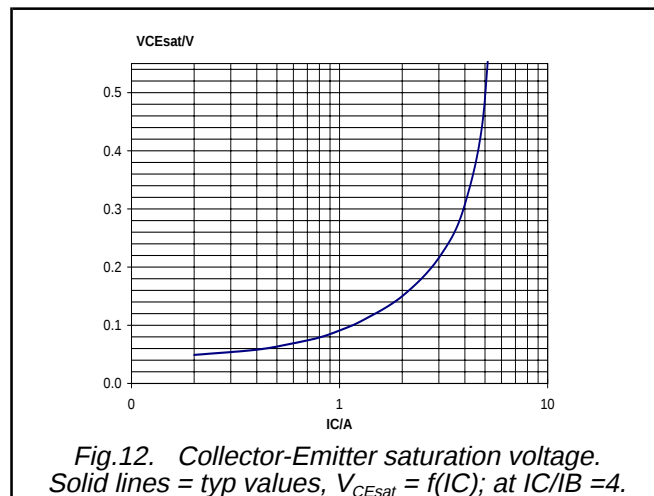
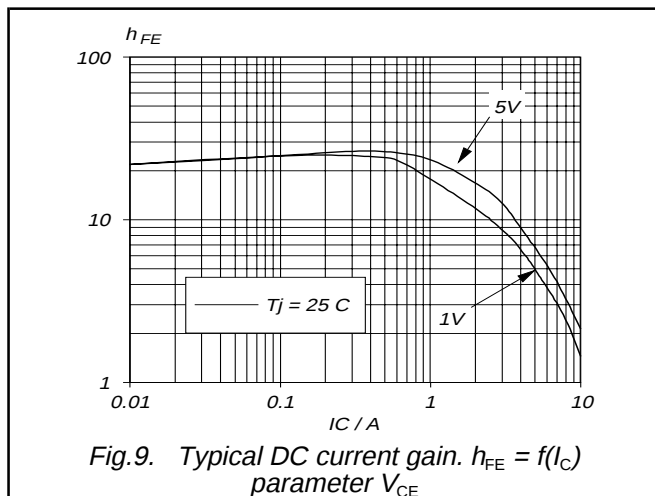
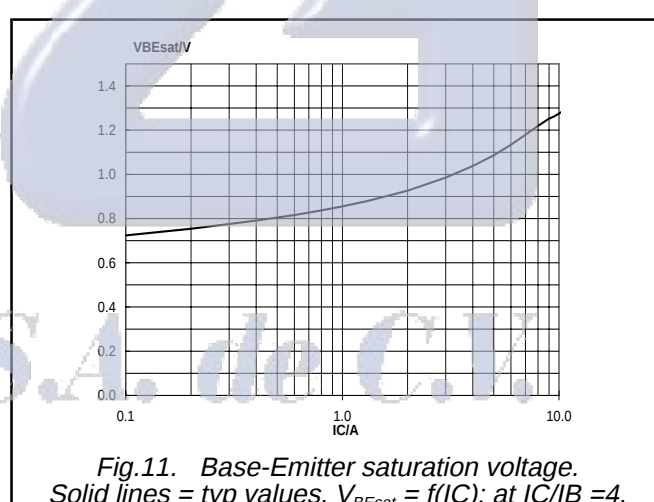
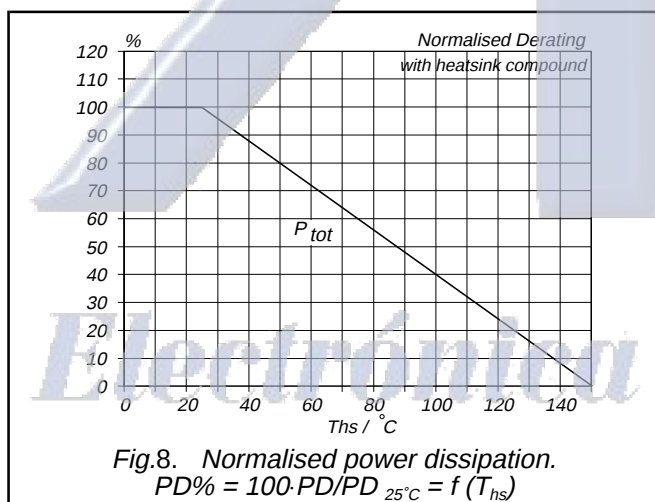
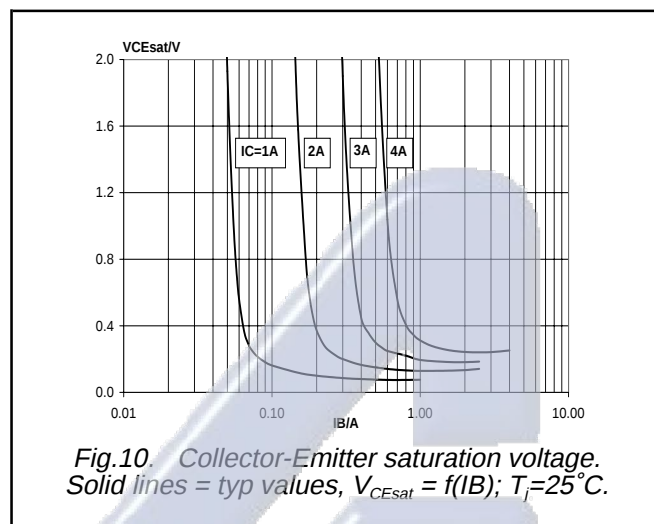
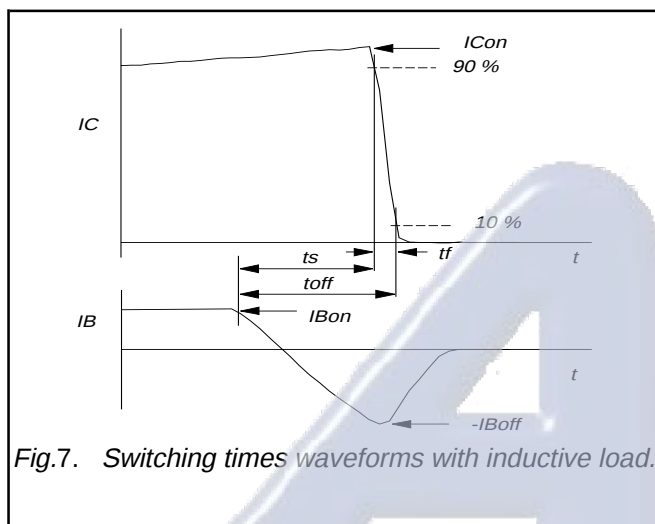
Silicon Diffused Power Transistor

BUT11APX



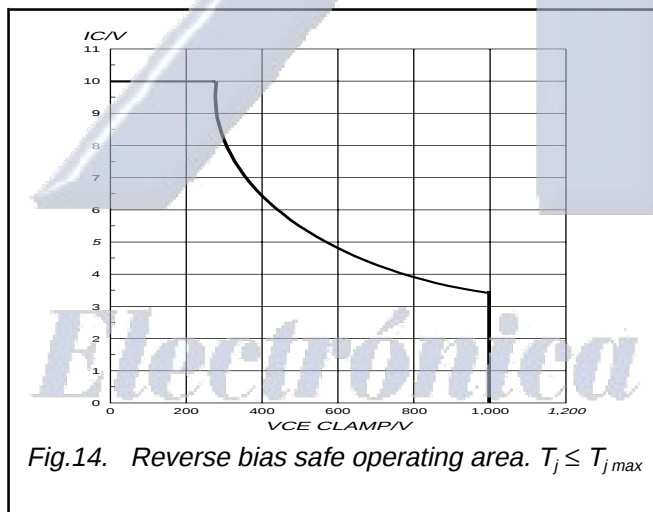
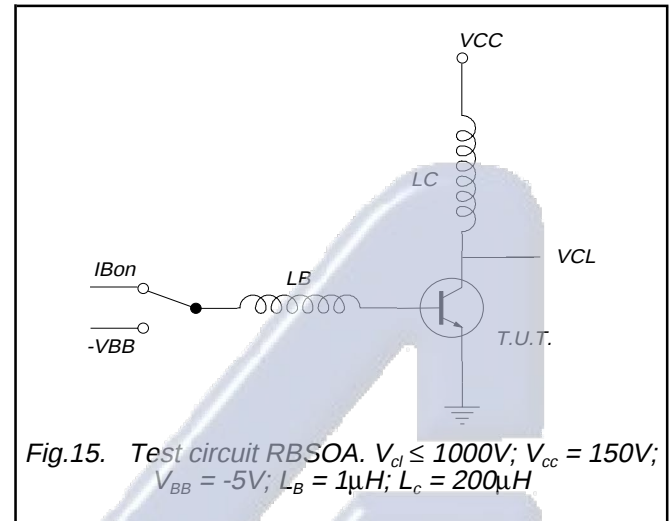
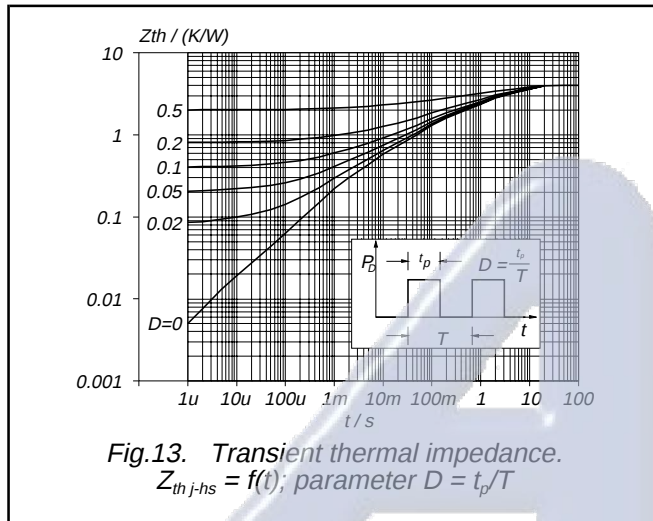
Silicon Diffused Power Transistor

BUT11APX



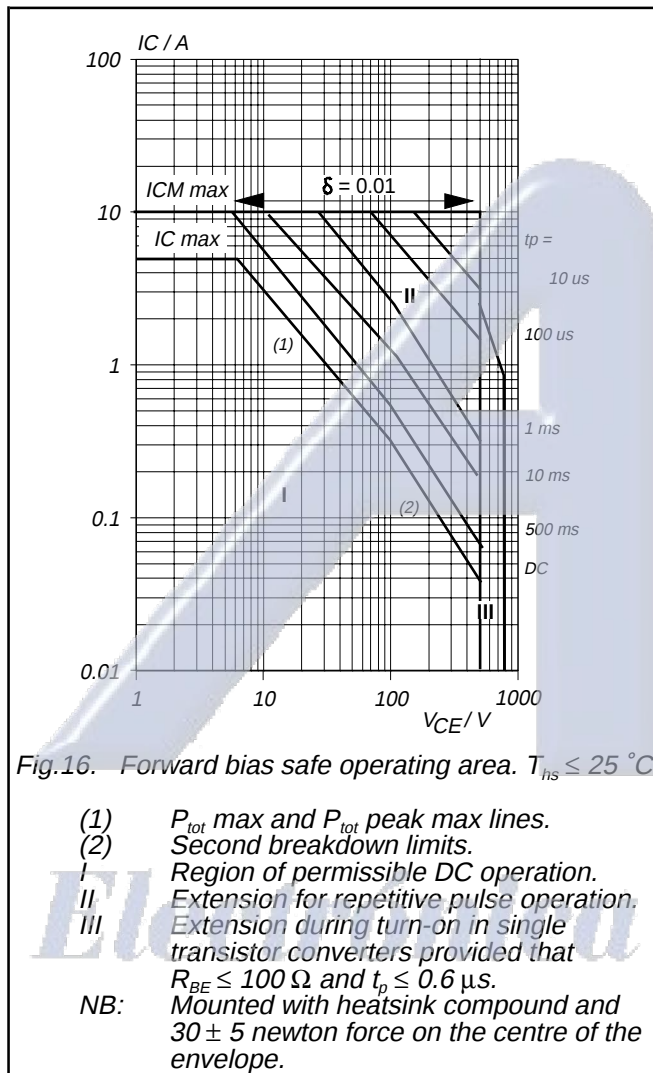
Silicon Diffused Power Transistor

BUT11APX



Silicon Diffused Power Transistor

BUT11APX



Silicon Diffused Power Transistor

BUT11APX

MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

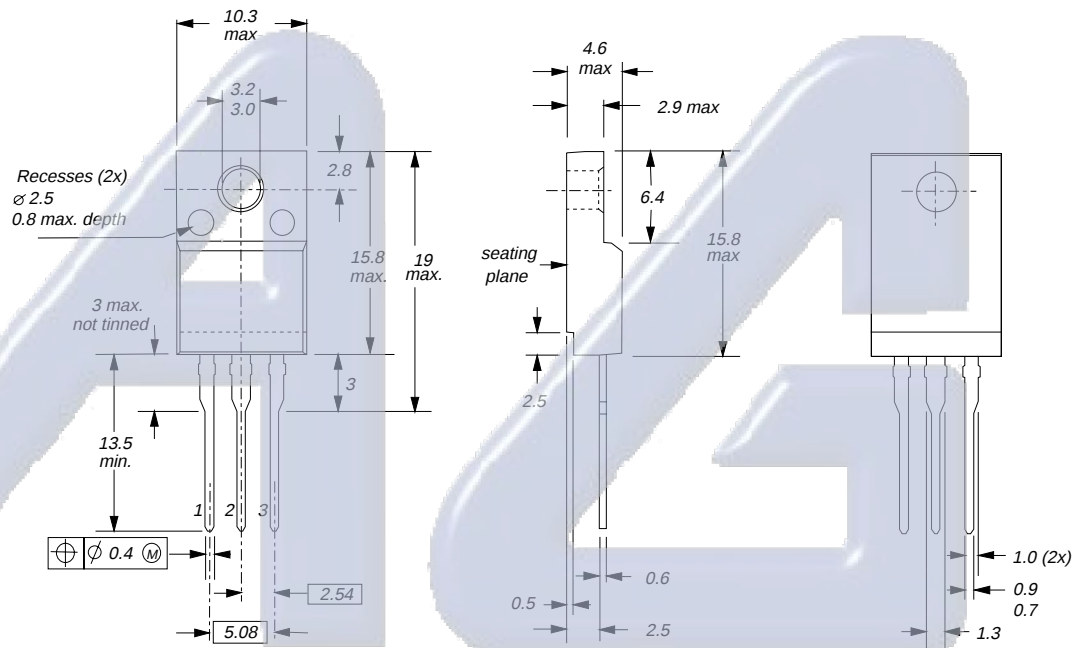


Fig.17. SOT186A; The seating plane is electrically isolated from all terminals.

Notes

1. Refer to mounting instructions for F-pack envelopes.
2. Epoxy meets UL94 V0 at 1/8".