IMPORTANT NOTICE

10 December 2015

1. Global joint venture starts operations as WeEn Semiconductors

Dear customer,

As from November 9th, 2015 NXP Semiconductors N.V. and Beijing JianGuang Asset Management Co. Ltd established Bipolar Power joint venture (JV), **WeEn Semiconductors**, which will be used in future Bipolar Power documents together with new contact details.

In this document where the previous NXP references remain, please use the new links as shown below.

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If you have any questions related to this document, please contact our nearest sales office via e-mail or phone (details via salesaddresses@ween-semi.com).

Thank you for your cooperation and understanding,

WeEn Semiconductors

founded by NXP

BUJ100LR

NPN power transistor

3 October 2016 **Product data sheet**

1. General description

High voltage, high speed, planar passivated NPN power switching transistor in a SOT54 (TO-92) plastic package.

2. Features and benefits

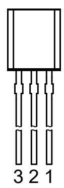
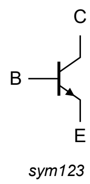
- Fast switching
- High voltage capability
- Very low switching and conduction losses

3. Applications

- Compact fluorescent lamps (CFL)
- Electronic lighting ballasts
- Inverters
- Off-line self-oscillating power supplies

4. Pinning information

Table 1. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 TO-92 (SOT54)	
2	C	collector		
3	E	emitter		

5. Ordering information

Table 2. Ordering information

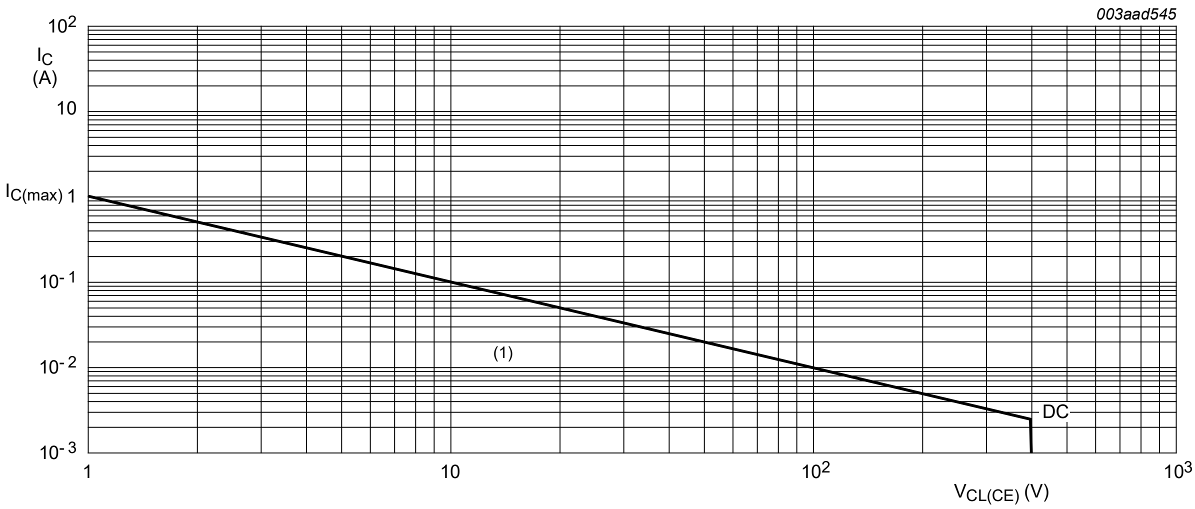
Type number	Package		
	Name	Description	Version
BUJ100LR	TO-92	plastic single-ended leaded (through hole) package; 3 leads	SOT54

6. Limiting values

Table 3. Limiting values

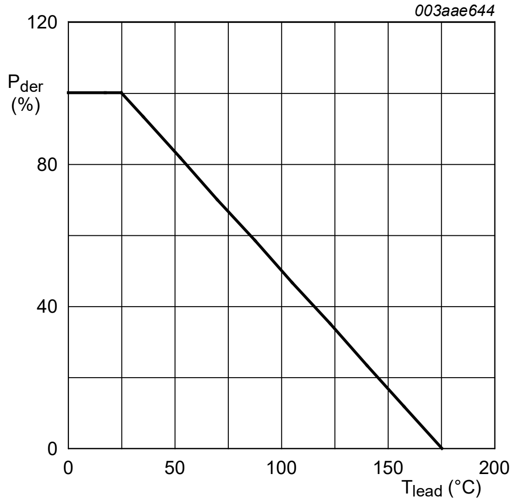
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CESM}	collector-emitter peak voltage	V_{BE} = 0 V		-	700	V
V_{CBO}	collector-base voltage	I_E = 0 A		-	700	V
V_{CEO}	collector-emitter voltage	I_B = 0 A		-	400	V
V_{EBO}	emitter-base voltage	I_C = 0 A; I(Emitter) = 10 mA		-	9	V
I_C	collector current	DC; Fig. 1		-	1	A
I_{CM}	peak collector current			-	2	A
I_B	base current	DC		-	0.5	A
I_{BM}	peak base current			-	1	A
P_{tot}	total power dissipation	$T_{lead} \leq$ 25 °C; Fig. 2		-	2.1	W
T_{stg}	storage temperature			-65	150	°C
T_j	junction temperature			-	150	°C



$T_{lead} \leq 25$ °C (1) Region of permissible DC operation

Fig. 1. Forward bias safe operating area



$$P_{der} = \frac{P_{tot}}{P_{tot(25°C)}} \times 100\,\%$$

Fig. 2. Normalized total power dissipation as a function of lead temperature

7. Thermal characteristics

Table 4. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-lead)}$	thermal resistance from junction to lead	Fig. 3		-	-	60	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	printed circuit board mounted; lead length 4 mm		-	150	-	K/W

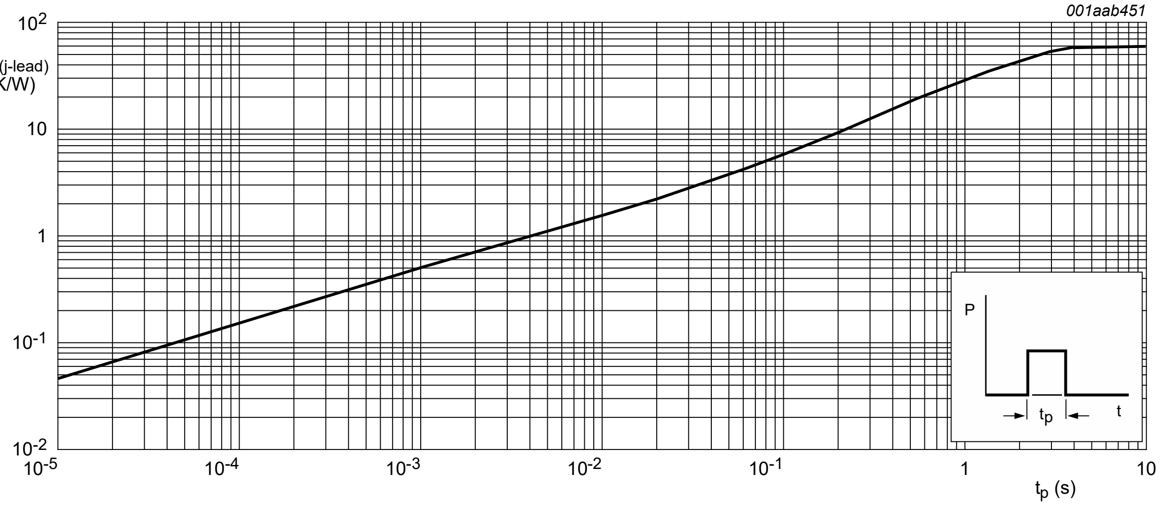


Fig. 3. Transient thermal impedance from junction to lead as a function of pulse width

8. Characteristics

Table 5. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
I_{CES}	collector-emitter cut-off current (base shorted)	V_{BE} = 0 V; V_{CE} = 700 V; T_j = 125 °C		-	-	5	mA
I_{EBO}	emitter-base cut-off current (collector open)	V_{EB} = 9 V; I_C = 0 A; T_{lead} = 25 °C		-	-	1	mA
V_{CEOsus}	collector-emitter sustaining voltage (base open)	I_B = 0 A; I_C = 1 mA; L_C = 25 mH; T_{lead} = 25 °C; Fig. 4; Fig. 5		400	-	-	V
V_{CEsat}	collector-emitter saturation voltage	I_C = 0.25 A; I_B = 50 mA; T_{lead} = 25 °C; Fig. 6		-	0.2	0.5	V
		I_C = 0.5 A; I_B = 125 mA; T_{lead} = 25 °C; Fig. 6		-	0.3	1	V
		I_C = 0.75 A; I_B = 250 mA; T_{lead} = 25 °C; Fig. 6		-	0.4	1.5	V
V_{BEsat}	base-emitter saturation voltage	I_C = 0.25 A; I_B = 50 mA; T_{lead} = 25 °C; Fig. 7		-	-	1	V
		I_C = 0.5 A; I_B = 125 mA; T_{lead} = 25 °C; Fig. 7		-	-	1.2	V
h_{FE}	DC current gain	I_C = 0.5 mA; V_{CE} = 2 V; T_{lead} = 25 °C		12	-	-	
		I_C = 0.4 A; V_{CE} = 5 V; T_{lead} = 25 °C; Fig. 8; Fig. 9		10	-	30	
		I_C = 0.8 A; V_{CE} = 5 V; T_{lead} = 25 °C; Fig. 8; Fig. 9		5	7.5	20	
Dynamic characteristics							
t_f	fall time	I_C = 1 A; I_{Bon} = 200 mA; V_{BB} = -5 V; L_B = 1 µH; T_{lead} = 25 °C; inductive load; Fig. 10; Fig. 11		-	80	-	ns

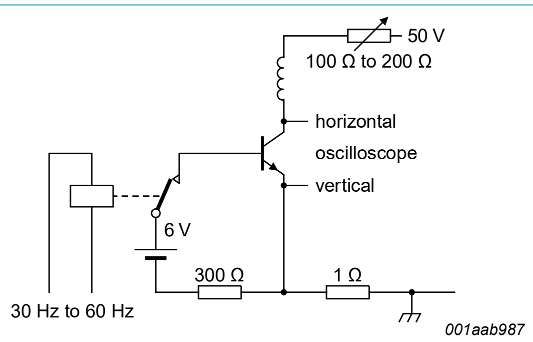


Fig. 4. Test circuit for collector-emitter sustaining voltage

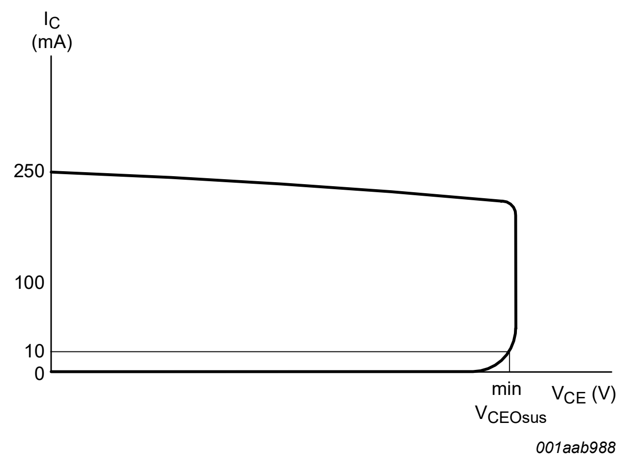
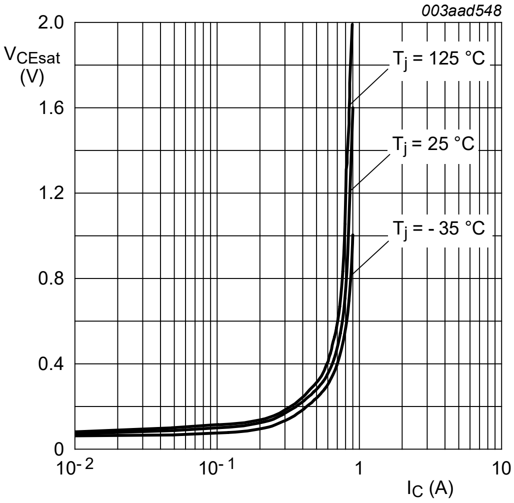
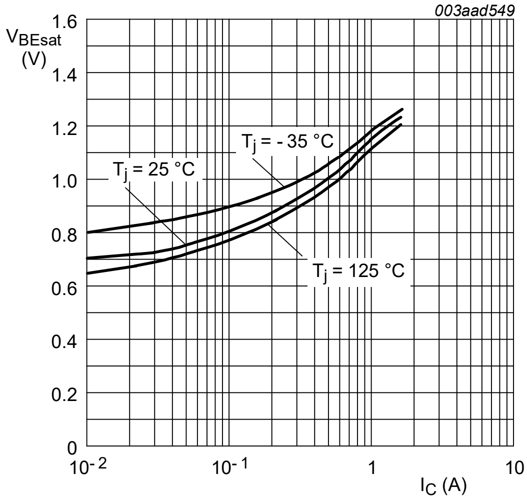


Fig. 5. Oscilloscope display for collector-emitter sustaining voltage test waveform



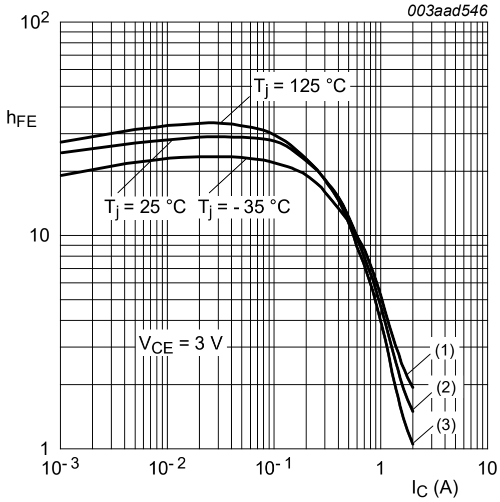
$$\frac{I_C}{I_B} = 5$$

Fig. 6. Collector-emitter saturation voltage as a function of collector current; typical values



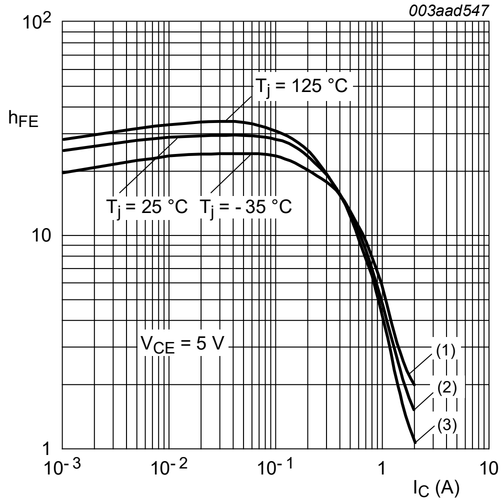
$$\frac{I_C}{I_B} = 5$$

Fig. 7. Base-emitter saturation voltage as a function of collector current; typical values



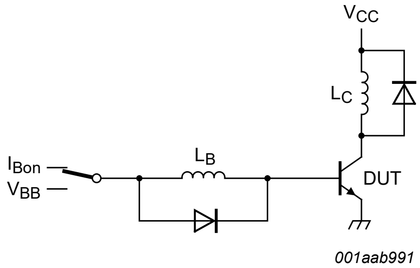
(1) $T_j = -35$ °C(2) $T_j = 25$ °C(3) $T_j = 125$ °C

Fig. 8. DC current gain as a function of collector current; typical values



(1) $T_j = -35$ °C(2) $T_j = 25$ °C(3) $T_j = 125$ °C

Fig. 9. DC current gain as a function of collector current; typical values



$V_{CC} = 300\ V;\ V_{BB} = -5\ V; L_C = 200\ \mu H;\ L_B = 1\ \mu H$

Fig. 10. Test circuit for inductive load switching

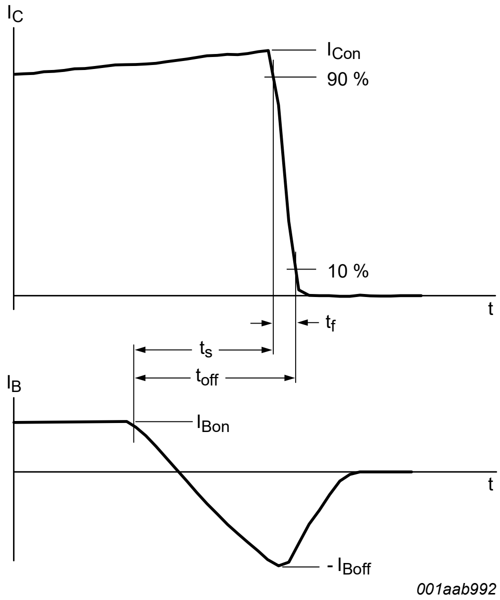


Fig. 11. Switching times waveforms for inductive load

9. Package outline

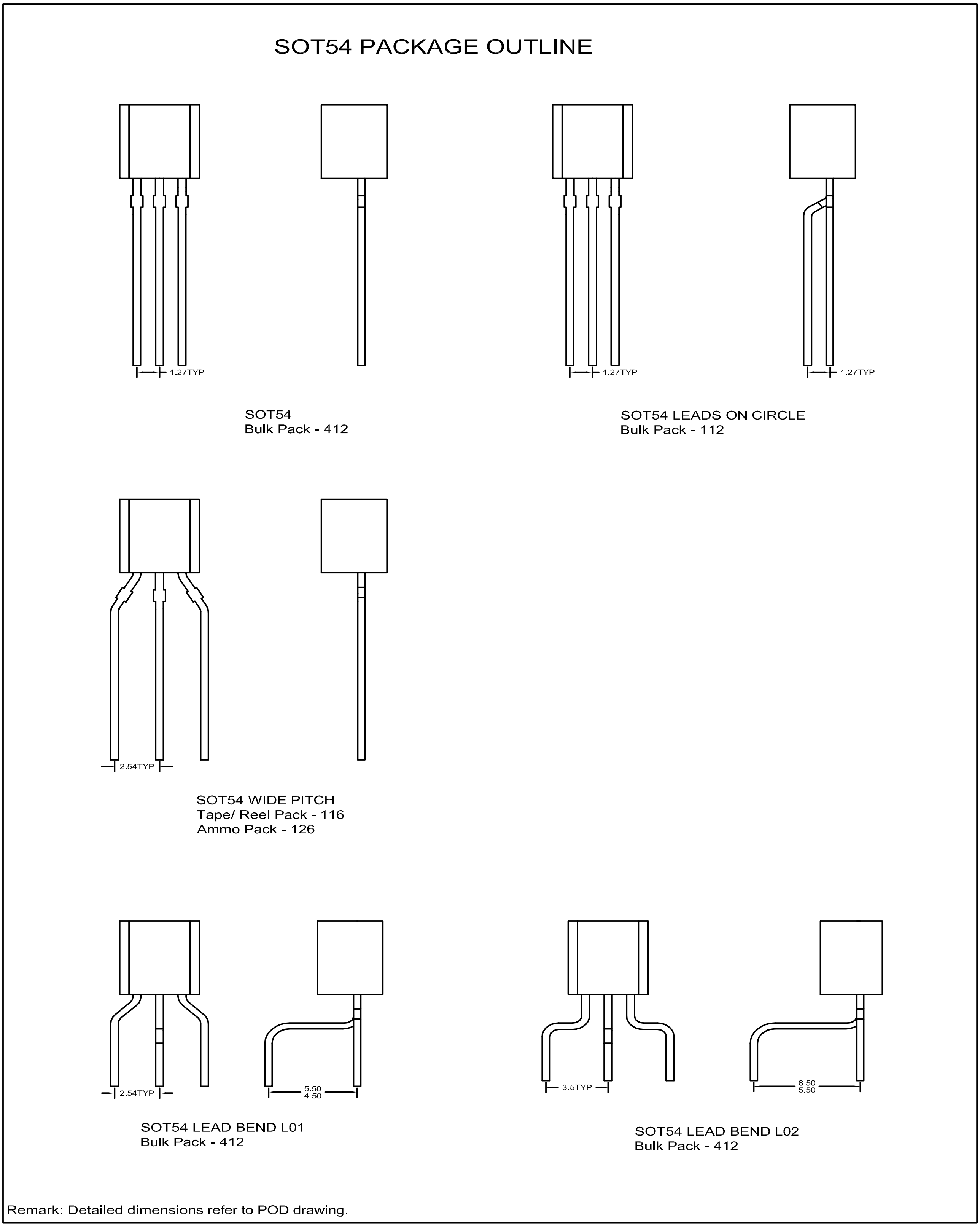


Fig. 12. Package outline TO-92 (SOT54)

10. Legal information

Data sheet status

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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