

Low voltage high performance PNP power transistor

Datasheet — production data

Features

- Very low collector-emitter saturation voltage
- High current gain characteristic
- Small, thin, leadless SMD plastic package with excellent thermal behavior

Applications

- Power management
- DC-DC converters

Description

This device is an PNP transistor manufactured using new low voltage planar technology with double metal process. The result is a transistor which boasts exceptionally high gain performance coupled with very low saturation voltage.

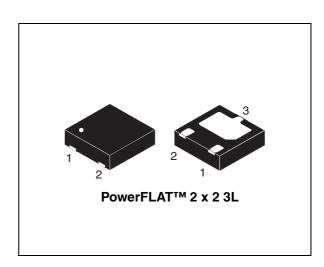


Figure 1. Internal schematic diagram

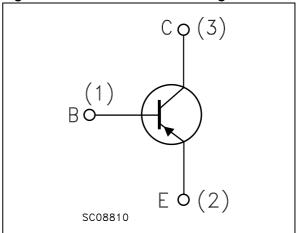


Table 1. Device summary

Order code	Marking	Package	Packaging
3STL2540	L2540	PowerFLAT™ 2 x 2	Tape and reel

1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
V _{CBO}	Collector-base voltage (I _E = 0)	-40	V
V _{CEO}	Collector-emitter voltage (I _B = 0)	-40	V
V _{EBO}	Emitter-base voltage (I _C = 0)	-6	V
I _C	Collector current	-5	Α
I _{CM}	Collector peak current (t _P < 5 ms)	-10	Α
I _B	Base current	-0.5	Α
I _{BM}	Base peak current (t _P < 5 ms)	-1	Α
P _{TOT} ⁽¹⁾	Total dissipation at T _A = 25 °C	1.2	W
T _{STG}	Storage temperature	-65 to 150	°C
T _J	Max. operating junction temperature	150	°C

^{1.} Device mounted on a PCB area of 1 cm²

Table 3. Thermal data

Symbol	Parameter	Value	Unit
R _{thJA} ⁽¹⁾	Thermal resistance junction-ambient max	104	°C/W
R _{thJA} ⁽²⁾	Thermal resistance junction-ambient max	75	°C/W
R _{thJC}	Thermal resistance junction-case max	45	°C/W

^{1.} Device mounted on a PCB area of 1 cm²

^{2.} Device mounted on a PCB area of 6 cm²

2 Electrical characteristics

 T_J = 25 °C; unless otherwise specified.

Table 4. Electrical characteristics

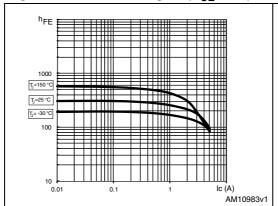
Symbol	Parameter	Test conditions	Min.	Тур.	Max.	Unit
I _{CBO}	Collector cut-off current (I _E = 0)	V _{CB} = - 40 V			-100	nA
I _{EBO}	Emitter cut-off current (I _C = 0)	V _{EB} = - 6 V			-100	nA
V _{BE(on)}	Base-emitter on voltage	$V_{CE} = -2 V$ $I_{C} = -100 \text{ mA}$		-670		mV
V _{CE(sat)}	Collector-emitter saturation voltage			-150 -300	-200	mV
V _{BE(sat)}	Base-emitter saturation voltage	I _C = - 1 A		800		mV
h _{FE} ⁽¹⁾	DC current gain	V _{CE} = -2 V I _C = -0.5 A V _{CE} = -2 V I _C = -2 A V _{CE} = -2 V I _C = -5 A		280 210 100		
		$V_{CE} = -0.2 \div - 2 \text{ V } I_{C} = -1 \text{ A}$ $T_{j} = -30 \text{ °C} \div 150 \text{ °C}$	100		900	
t _d t _r t _s	Resistive load Delay time Rise time Storage time Fall time	I_{C} = -2 A V_{CC} = -10 V $V_{BE(off)}$ = 5 V, $V_{B(on)}$ = $I_{B(off)}$ = 200 mA		25 140 290 60		ns ns ns
f _T	Transition frequency	$I_C = -0.1 \text{ A}$ $V_{CE} = -10 \text{ V}$		130		MHz

^{1.} Pulse test: pulse duration ≤300 µs, duty cycle ≤2 %.

Electrical characteristics 3STL2540

2.1 Electrical characteristics (curves)

Figure 2. DC current gain (V_{CE}=-2 V) Figure 3. DC current gain (V_{CE}=-5 V)



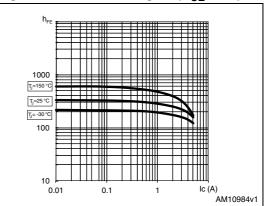
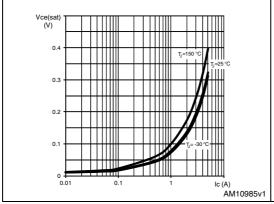


Figure 4. Collector-emitter saturation voltage (V_{CEsat} @ h_{FE}=20)

Figure 5. Collector-emitter saturation voltage (V_{CEsat} @ h_{FE} =100)



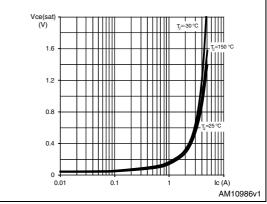
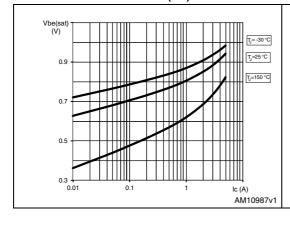


Figure 6. Base-emitter saturation voltage ($V_{be(sat)}$ @ h_{FE} =20)

Figure 7. Base-emitter saturation voltage (V_{be(sat)} @ h_{FE}=100)



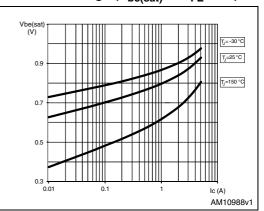
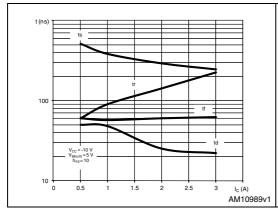
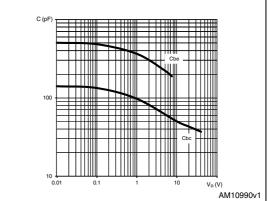


Figure 8. Resistive load switching times

Figure 9. Capacitance curves (f=1 MHz)





3 Package mechanical data

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Table 5. PowerFLAT™ 2 x 2 3L mechanical data

Dim.	mm.			
	Min.	Тур.	Max.	
А	0.55	0.60	0.65	
A1	0.00	0.02	0.05	
А3		0.10		
b	0.25	0.30	0.35	
D	1.90	2.00	2.10	
E	1.90	2.00	2.10	
е	1.20	1.30	1.40	
D2	0.95	1.05	1.15	
E2	1.40	1.50	1.60	
Н	0.20	0.25	0.30	
K	0.20	0.30	0.40	
L	0.35	0.40	0.45	
R	0.15			

BOTTOM VIEW

TOP VIEW

D

(A3)

A

B329590_REV_B

Figure 10. PowerFLAT™ 2 x 2 3L drawing

Packaging mechanical data 4

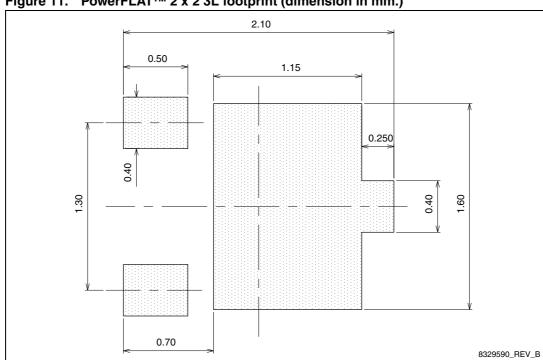


Figure 11. PowerFLAT™ 2 x 2 3L footprint (dimension in mm.)

Revision history 3STL2540

5 Revision history

Table 6. Document revision history

Date	Revision	Changes
07-Dec-2011	1	Initial release
22-May-2012	2	Document status promoted from preliminary data to production data

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