PBSS5350D-QX Datasheet

DiGi Electronics Part Number	PBSS5350D-QX-DG
Manufacturer	Nexperia USA Inc.
Manufacturer Product Number	PBSS5350D-QX
Description	PBSS5350D-Q/SOT457/SC-74
Detailed Description	Bipolar (BJT) Transistor PNP 50 V 3 A 100MHz 600 m W Surface Mount 6-TSOP

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
PBSS5350D-QX	Nexperia USA Inc.
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
PNP	3 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
50 V	300mV @ 200mA, 2A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
100nA (ICBO)	200 @ 1A, 2V
Power - Max:	Frequency - Transition:
600 mW	100MHz
Operating Temperature:	Grade:
150°C (TJ)	Automotive
Qualification:	Mounting Type:
AEC-Q101	Surface Mount
Package / Case:	Supplier Device Package:
SC-74, SOT-457	6-TSOP

Environmental & Export classification

RoHS Status:	REACH Status:
ROHS3 Compliant	REACH Unaffected
ECCN:	HTSUS:
EAR99	8541.21.0075

PBSS5350D-Q

50 V, 3 A PNP low VCEsat transistor

10 May 2022 **Product data sheet**

1. General description

PNP low V_{CEsat} transistor in a small SOT457 (SC-74) Surface-Mounted Device (SMD) plastic package.

NPN complement: PBSS4350D-Q

2. Features and benefits

- Low collector-emitter saturation voltage V_{CEsat}
- High current capability
- High efficiency due to less heat generation
- Smaller Printed-Circuit Board (PCB) area than for conventional transistors
- Qualified according to AEC-Q101 and recommended for use in automotive applications

3. Applications

- Supply line switching circuits
- Battery management applications
- DC-to-DC conversion

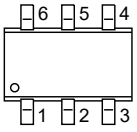
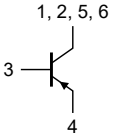
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	-50	V
I_C	collector current			-	-	-3	A
I_{CM}	peak collector current			-	-	-5	A
R_{CEsat}	collector-emitter saturation resistance	I_C = -2 A; I_B = -200 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	120	150	mΩ

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	C	collector	 **SC-74; TSOP6 (SOT457)**	 *sym030*
2	C	collector		
3	B	base		
4	E	emitter		
5	C	collector		
6	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PBSS5350D-Q	SC-74; TSOP6	plastic, surface-mounted package (SC-74; TSOP6); 6 leads	SOT457

7. Marking

Table 4. Marking codes

Type number	Marking code
PBSS5350D-Q	53

8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter		-	-60	V
V_{CEO}	collector-emitter voltage	open base		-	-50	V
V_{EBO}	emitter-base voltage	open collector		-	-6	V
I_C	collector current			-	-3	A
I_{CM}	peak collector current			-	-5	A
I_{BM}	peak base current			-	-1	A
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	600	mW
			[2]	-	750	mW
			[3]	-	1200	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-65	150	°C
T_{stg}	storage temperature			-65	150	°C

[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated, mounting pad for collector 1 cm^2.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm^2.
[3] Device mounted on an FR4 4-layer PCB.

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	208	K/W
			[2]	-	-	160	K/W
		pulsed; $t_p \leq 50$ ms; $\delta \leq 0.5$.; in free air	[2]	-	-	100	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 1 cm^2.
[2] Device mounted on an FR4 PCB, single-sided copper, tin-plated, mounting pad for collector 6 cm^2.

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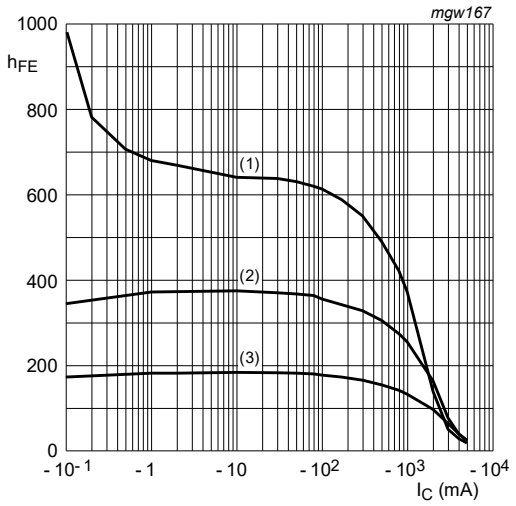
10. Characteristics

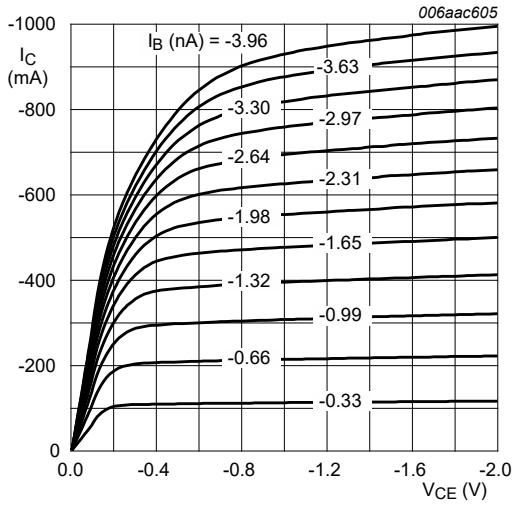
Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = -50 V; I_E = 0 A; T_{amb} = 25 °C		-	-	-100	nA
		V_{CB} = -50 V; I_E = 0 A; T_j = 150 °C		-	-	-50	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	-100	nA
h_{FE}	DC current gain	V_{CE} = -2 V; I_C = -500 mA; T_{amb} = 25 °C		200	-	-	
		V_{CE} = -2 V; I_C = -1 A; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		200	-	-	
		V_{CE} = -2 V; I_C = -2 A; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		100	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -500 mA; I_B = -50 mA; T_{amb} = 25 °C		-	-	-100	mV
		I_C = -1 A; I_B = -50 mA; T_{amb} = 25 °C		-	-	-180	mV
		I_C = -2 A; I_B = -200 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	-300	mV
R_{CEsat}	collector-emitter saturation resistance			-	120	150	mΩ
V_{BEsat}	base-emitter saturation voltage			-	-	-1.2	V
V_{BEon}	base-emitter turn-on voltage	V_{CE} = -2 V; I_C = -1 A; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		-	-	-1.1	V
f_T	transition frequency	V_{CE} = -5 V; I_C = -100 mA; f = 100 MHz; T_{amb} = 25 °C		100	-	-	MHz
C_c	collector capacitance	V_{CB} = -10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	40	pF



V_{CE} = -2 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 1. DC current gain as a function of collector current; typical values



T_{amb} = 25 °C

Fig. 2. Collector current as a function of collector-emitter voltage; typical values

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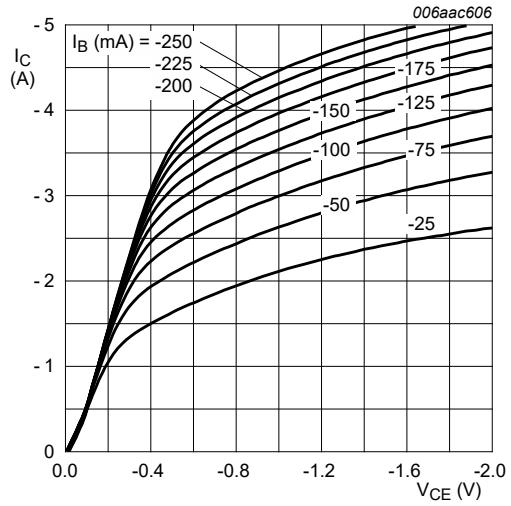
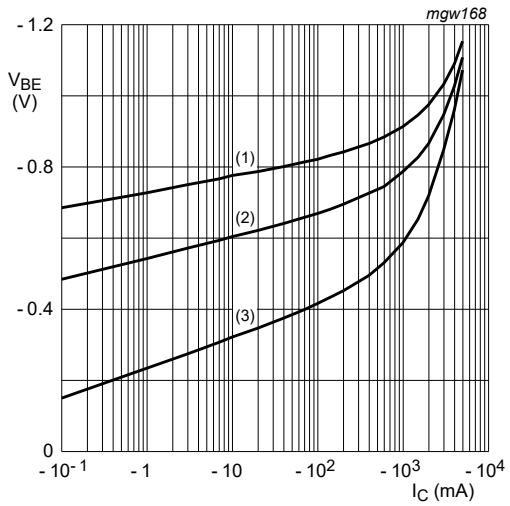


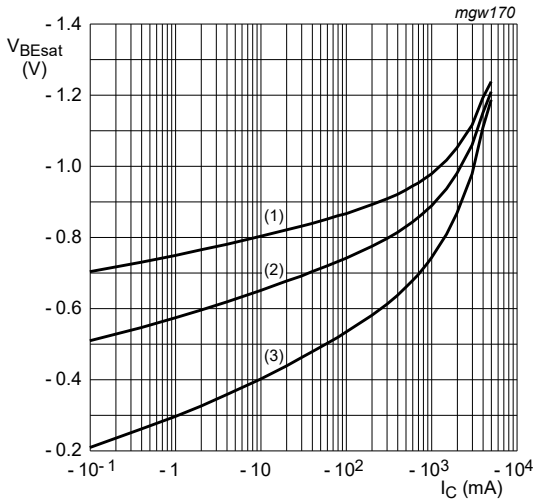
T_{amb} = 25 °C

Fig. 3. Collector current as a function of collector-emitter voltage; typical values



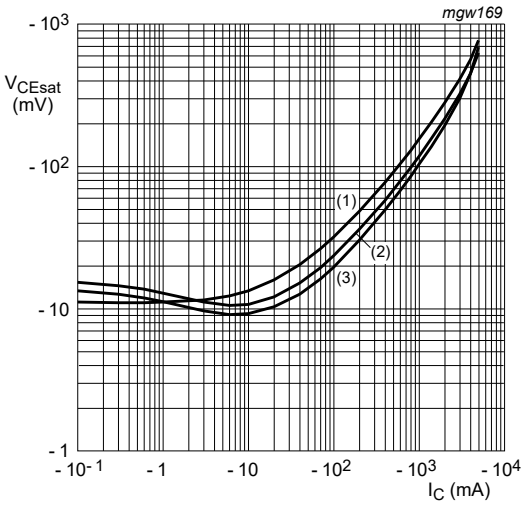
V_{CE} = -2 V
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 4. Base-emitter voltage as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = -55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 5. Base-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 10
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

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

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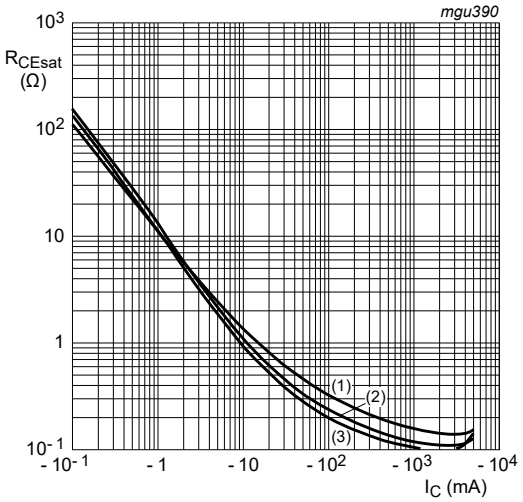

I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = -55 °C

Fig. 7. Collector-emitter saturation resistance as a function of collector current; typical values

11. Test information

Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard Q101 - *Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

12. Package outline

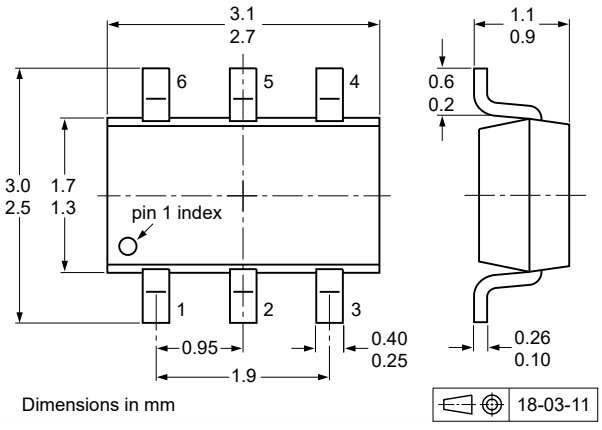

Fig. 8. Package outline SC-74; TSOP6 (SOT457)

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13. Soldering

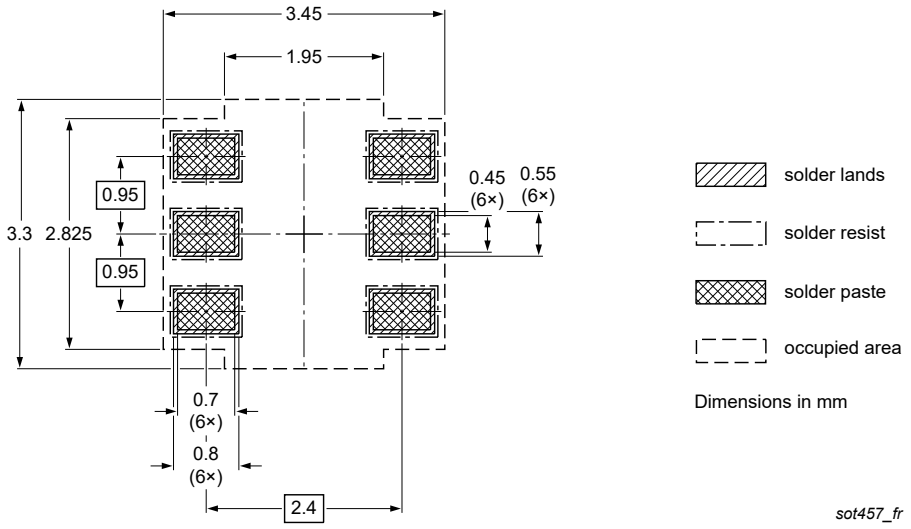

Fig. 9. Reflow soldering footprint for SC-74; TSOP6 (SOT457)

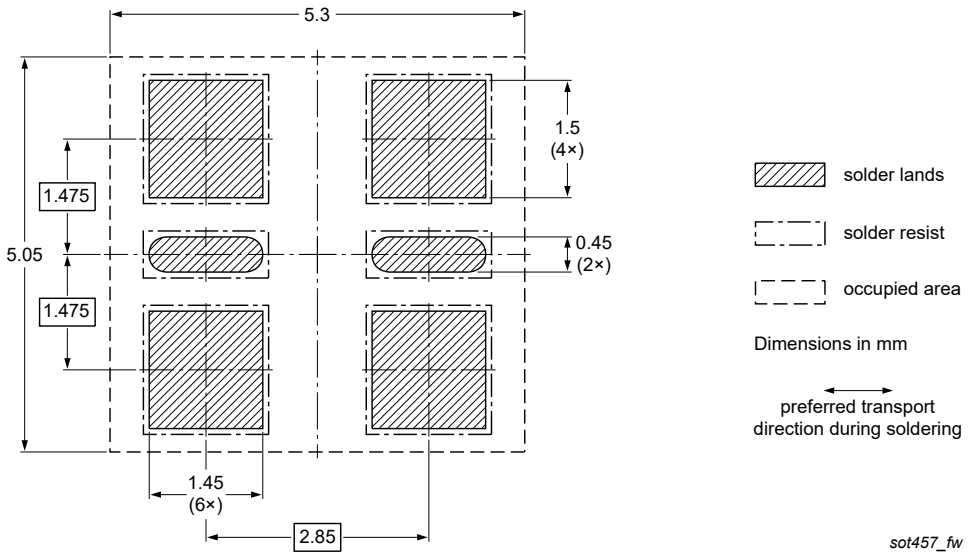

Fig. 10. Wave soldering footprint for SC-74; TSOP6 (SOT457)

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PBSS5350D-QX Nexperia USA Inc. PBSS5350D-Q/SOT457/SC-74

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PBSS5350D-Q v.1	20220510	Product data sheet	-	-

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15. 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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