PMSTA42,115 Datasheet

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DiGi Electronics Part Number	PMSTA42,115-DG
Manufacturer	Nexperia USA Inc.
Manufacturer Product Number	PMSTA42,115
Description	TRANS NPN 300V 0.1A SOT323
Detailed Description	Bipolar (BJT) Transistor NPN 300 V 100 mA 50MHz 200 mW Surface Mount SOT-323

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
PMSTA42,115	Nexperia USA Inc.
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	100 mA
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
300 V	500mV @ 2mA, 20mA
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
100nA (ICBO)	40 @ 30mA, 10V
Power - Max:	Frequency - Transition:
200 mW	50MHz
Operating Temperature:	Grade:
150°C (TJ)	Automotive
Qualification:	Mounting Type:
AEC-Q101	Surface Mount
Package / Case:	Supplier Device Package:
SC-70, SOT-323	SOT-323
Base Product Number:	
PMSTA42	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

PMSTA42

NPN high-voltage transistor

8 October 2024 Product data sheet

1. General description

NPN high-voltage transistor in a very small SOT323 (SC-70) Surface-Mounted Device (SMD) plastic package.

PNP complements: PMSTA92

2. Features and benefits

- High current (max. 500 mA)
- High voltage (max. 200 V)

3. Applications

- High-voltage switching in telephony applications

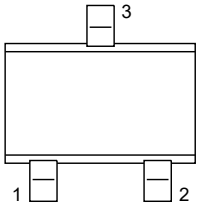
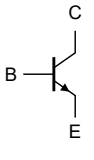
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
V_{CEO}	collector-emitter voltage	open base		-	-	300	V
I_C	collector current			-	-	100	mA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 1 mA; T_{amb} = 25 °C		25	-	-	

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	B	base	 SC-70 (SOT323)	 sym021
2	E	emitter		
3	C	collector		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
PMSTA42	SC-70	plastic, surface-mounted package; 3 leads; 1.3 mm pitch; 2 mm x 1.25 mm x 0.95 mm body	SOT323

7. Marking

Table 4. Marking codes

Type number	Marking code[1]
PMSTA42	%1D

[1] % = placeholder for manufacturing site code

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		-	300	V
V_{CEO}	collector-emitter voltage	open base		-	300	V
V_{EBO}	emitter-base voltage	open collector		-	6	V
I_C	collector current			-	100	mA
I_{CM}	peak collector current			-	200	mA
I_{BM}	peak base current			-	100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25$ °C	[1]	-	200	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 and standard footprint.

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]	-	-	625	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
I_{CBO}	collector-base cut-off current	V_{CB} = 200 V; I_E = 0 A; T_{amb} = 25 °C		-	-	100	nA
I_{EBO}	emitter-base cut-off current	V_{EB} = 6 V; I_C = 0 A; T_{amb} = 25 °C		-	-	100	nA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 1 mA; T_{amb} = 25 °C		25	-	-	
		V_{CE} = 10 V; I_C = 10 mA; T_{amb} = 25 °C		40	-	-	
		V_{CE} = 10 V; I_C = 30 mA; pulsed; $t_p \leq$ 300 µs; $\delta \leq$ 0.02; T_{amb} = 25 °C		40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 20 mA; I_B = 2 mA; T_{amb} = 25 °C		-	-	500	mV
C_{re}	feedback capacitance	V_{CB} = 20 V; I_C = 0 A; i_c = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	3	F
f_T	transition frequency	V_{CE} = 20 V; I_C = 10 mA; f = 100 MHz; T_{amb} = 25 °C		50	-	-	MHz

11. Package outline

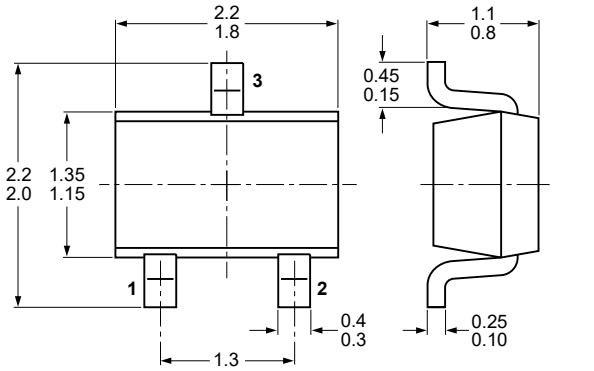


Fig. 1. Package outline SC-70 (SOT323)

12. Soldering

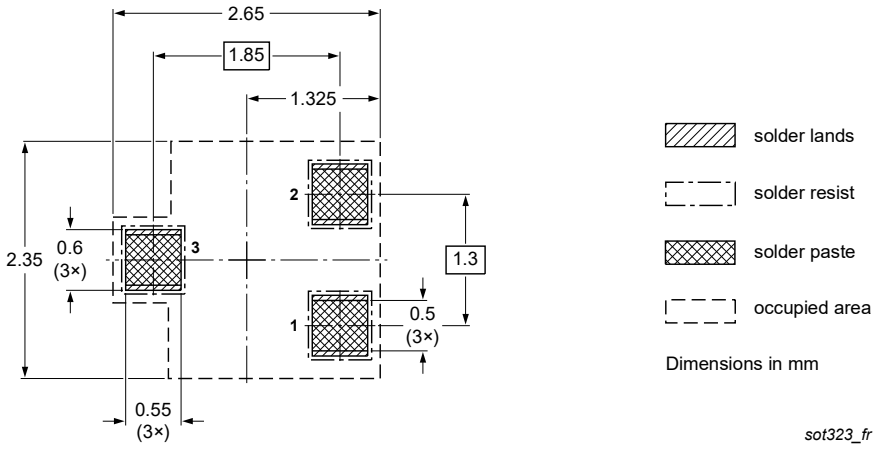


Fig. 2. Reflow soldering footprint for SC-70 (SOT323)

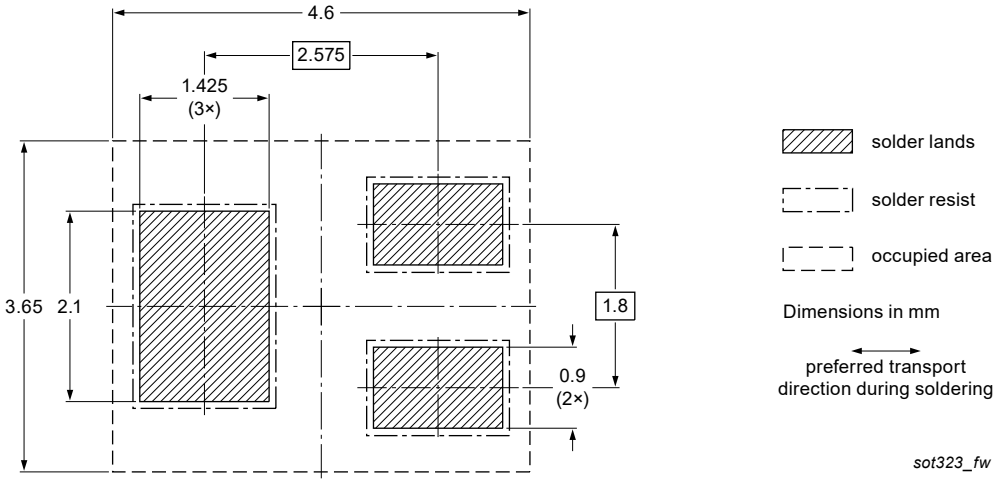


Fig. 3. Wave soldering footprint for SC-70 (SOT323)

13. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
PMSTA42 v.4	20241008	Product data sheet	-	PMSTA42 v.3
Modifications:	• Product(s) changed to non-automotive qualification. Please refer to nexperia.com for automotive (-Q) product alternative(s).			
PMSTA42 v.3	20230629	Product data sheet	-	PMSTA42_43 v.2
PMSTA42_43 v.2	19990521	Product data sheet	-	PMSTA42_43 v.1
PMSTA42_43 v.1	19970619	Product data sheet	-	-

14. 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.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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Date of release: 8 October 2024

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