



55492.
2013/
IEC/PAS 62137-3:2008

3

IEC/PAS 62137-3:2008
Electronics assembly technology — Part 3: Selection guidance of environmental
and endurance test methods for solder joints
(IDT)



2014

55492—201 /PAS 62137-3:2008

1 « - ») « » (« - » (/ 91 , 4 2 , 420 « 3 « , » 3 28 2013 . 37 S- 4 IEC/PAS 62137-3:2008 « - . 3. » (IEC/PAS 62137- 3:2008 «Electronics assembly technology — Part 3: Selection guidance of environmental and endurance test methods for solder joints»).

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1) — « 1.0—2012 () . (« », - « () - « ». , - (gosi.ru).

© .2014

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5.2	7
5.2.1	7
5.2.2	9
6	10
6.1	10
6.2	11
6.2.1	11
6.2.2	11
6.2.3	12
6.3	14
6.3.1	14
6.3.2	14
6.3.3	14
6.4	14
7	15
7.1	15
7.1.1	15
7.1.2	15
7.1.3	16
7.1.4	16
7.1.5	17
7.2	17
7.3	19
7.4	20
7.4.1	20
7.4.2	21
7.5	21
7.5.1	21
7.5.2	22
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55492—201 /PAS 62137-3:2008

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(IEC) 62137-3 91: « -
IEC/PAS 62137-3,
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« ».

55492—2013/IEC/PAS 62137-3:2008

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Electronics assembly technology. Part 3. Selection guidance of environmental and endurance test methods for solder joints

— 2013—12—01

1

1*

(SMD).

2

60134

(Printed board design, manufacture and assembly— Terms and definitions)

61188-5 ()

(Printed boards and printed board assemblies— Design and use)

61249-2-7

2-7.

[Materials for printed boards and other interconnecting structures — Part 2-7: Reinforced base materials clad and unclad — Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad

62137-1-1:2007

1-1.

(Surface mounting technology — Environmental and endurance test methods for surface mount solder joint— Part 1-1: Pull strength test)

62137-1-2:2007

1-2.

(Surface mounting technology — Environmental and endurance test methods for surface mount solder joint— Part 1-2: Shear strength test)

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55492—201 /PAS 62137-3:2008

62137-1-3:2008

1-3. -

(Surface mounting technology — Environmental and endurance test methods for surface mount solder joint — Part 1-3: Cyclic drop test)

62137-1 -4:2009

1-4. -

(Surface mounting technology — Environmental and endurance test methods for surface mount solder joint — Part 1-4: Cyclic bending test)

62137-1-5:2009

1-5. -

(Surface mounting technology — Environmental and endurance test methods for surface mount solder joints — Part 1-5: Mechanical shear fatigue test)

3

60194. -

3.1 (pull strength for SMO): -

« » 45*

[IEC 62137-1-1:2007.]

3.2 (shear strength for SMD):

[IEC 62137-1-1:2007,]

3.3 (torque shear strength for SMO):

3.4 (monotonic bending strength for SMO):

3.5 (cyclic bending strength for SMO):

[IEC 62137-1-4:2009,]

3.6 (mechanical shear fatigue strength for SMO):

()

— »

3.7 (cyclic
drop test for SMD): -
-

3.8 (cyclic steel ball
drop strength for SMD): -
-

3.9 (pull
strength for lead insertion type device): -
-

3.10 (creep strength for lead insertion type device): -
-

3.11 (fillet lifting phenomenon for lead insertion type device): -
-

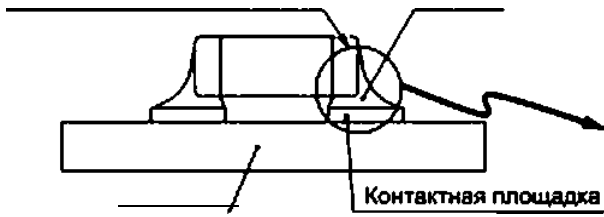
(
3.12 (daisy chain): -
(. . 2).
—

4
1. -
-

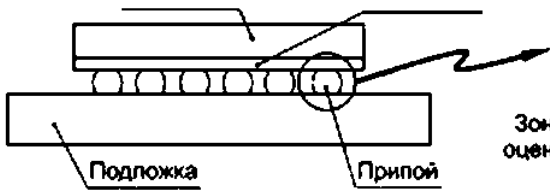
Sn96.5Ag3Cu.5. 2. -
-

55492—201 /PAS 62137-3:2008

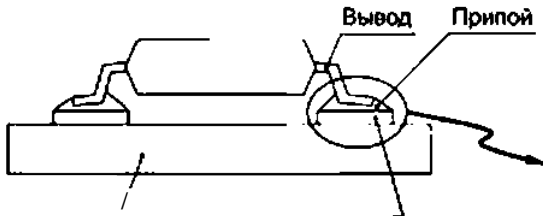
SMD* ()



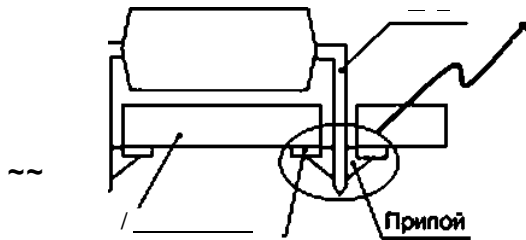
SMD* ()



SMD* (тип с выводами)



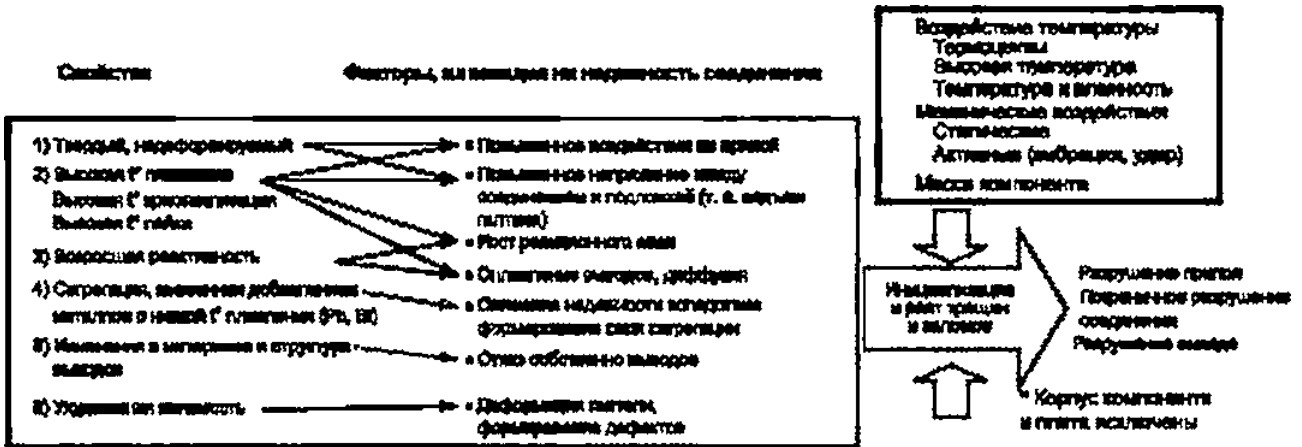
()



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S.

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2 —

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5.1

1.

5.2.

1 —

{		/	
8	** *	(SMO)	a)
62137-1-1	**	{SMD}	
*1		(SMO)	b)
62137-1-2	**	(SMD)	c)
**		(SMD)	

55492—201 /PAS 62137-3:2008

1

()		/	
⁴¹ 62137-1-4		(SMD)	
62137-1-5		(SMD)	/
^{**} 62137-1-3		(SMD)	
^{**}		(SMD)	
F	0		/
G			
	4*		/

>

)

1)

2)

3)

|

Sn-Zn. Sn-Bi Sn-tn.

>

BGA LGA.

Sn-2n. Sn-BI Sn-In.

Sn-Zn.
Sn-8i.

2

6
: }
b>)
7
« »
BGA « »

Sn-Ag-Cu. Sn-Zn. Sn-Bi SrHn;

Sn-Zn;
Sn-Bi.

60191.

5.2.2

3.

3 —

				—	—	—
				—	—	—
				—	—	—
				—	—	—
				—	—	—
				—	—	—

1 « » — . « » — , «—» —
2)
>
c) :
d) — —
3 Sn-Ag-Cu Sn-Zn.
4
5

55492—201 /PAS 62137-3:2008

6.1

)

4.

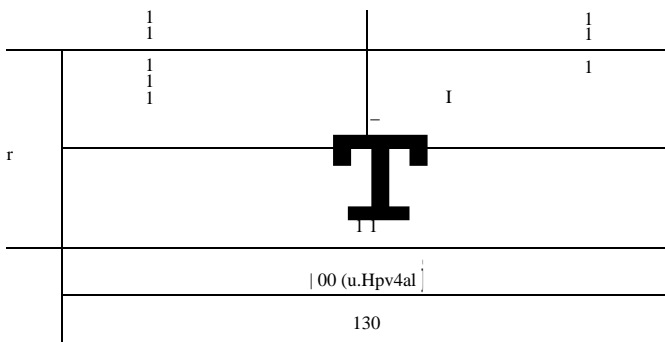
4 —

	()	
Sn-Ag-Cu	Sn96.5Ag3Cu.5(A30C5>	—
Sn-2n	Sn912n9<290)	Sn892n8B 13(280830)
Sn-BI	BI56Sn42(B580)	—
Sn-In	Sn88In8Ag3.5Bi.5(N80A3585)	—
Sn-Cu	Sn99.3Cu.7(C7)	—

b)

61249-2-7

c)



d)

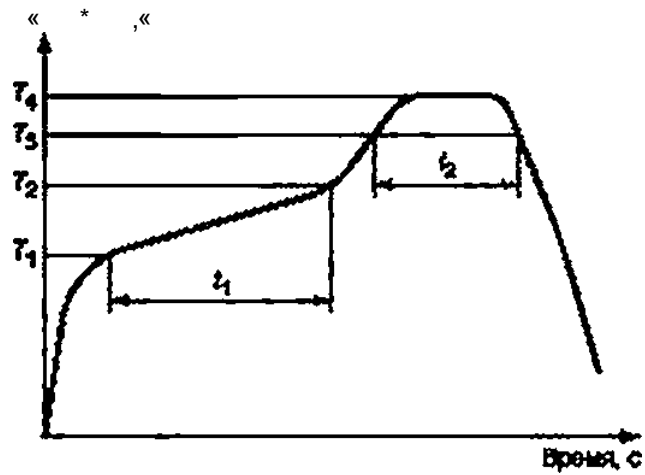
3.

3—

1.6

61168-5.

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		Bn9tZn»*1. Sn89Zn8B»3	BiSeSn42	Sn88tn8Ag3.SBi.S
<i>h</i>		130 X	100 X	140 '
2		150X	120 X	160 X
<i>h</i>		200 X	150 '	206 X
*		220 °Cl5°C	190 X ± 5 X	220 X X 5 X
		90 30	90 1 30	90 1 30
>2		20 60	20 60	20 60
N ₂ .				

5 —

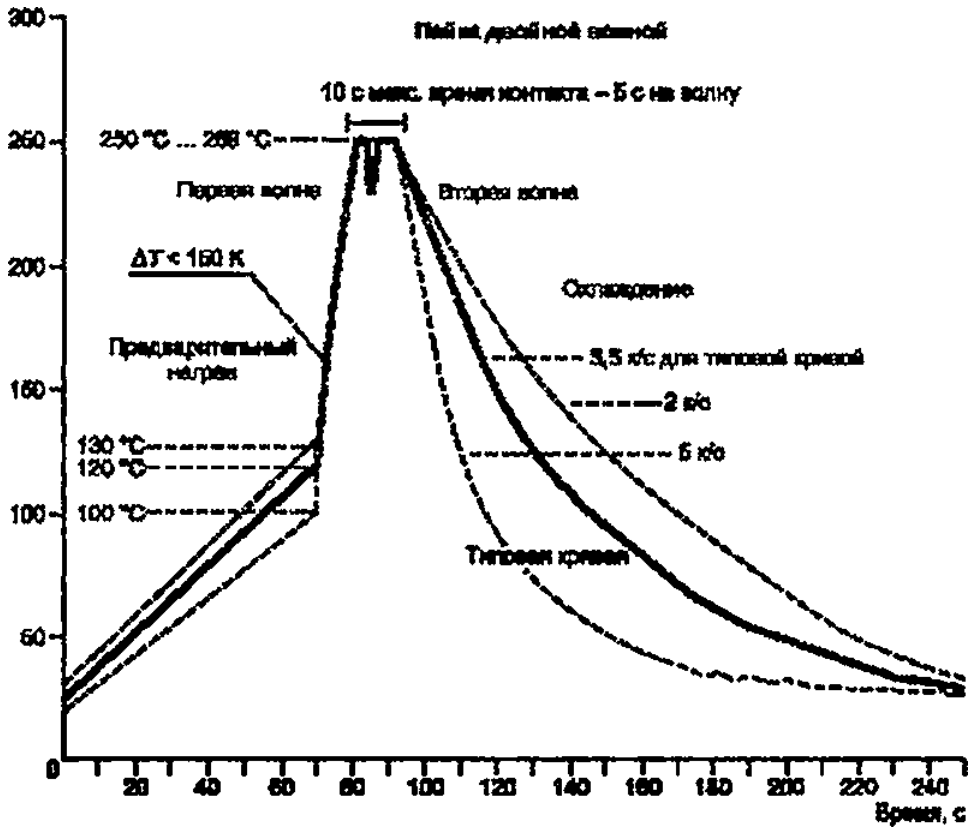
Sn96.5Ag3Cu.5

6.2.3

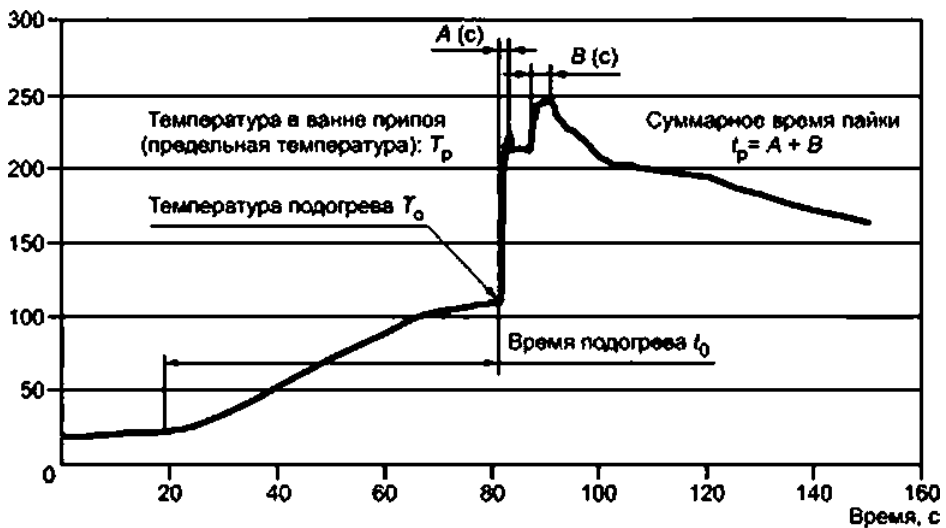
Sn96.5Ag3Cu.5

6

7.



), () {
6 — (Sn96.5Ag3Cu.5)



	T_0				#	
Sn99.3Cu.7(C7)	100*	120*	30	90	250*	2.5*
					3	5

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6.3

6.3.1

)

N (60068-2-14.

6. 500 1000.

6 —

		Sn96. SAgDCu.S	Sn912n9. Sn89Zn8Bi3	Bi58Sn42	Sn881n8Ag3.SBi.5
-		-40 *	-40 *	-40 *	-40 *
		30	30	30	30
-		125 *	125 *	85 *	125 *
		30	30	30	30

6.3.2

(

Bi58Sn42)

60066-2-2,

a) : 85 * .

b) : 500 1000 .

6.3.3

Sn91Zn9 Sn89Zn8Bi3)

60066-2-78,

a) : 65 @ . 85 %.

b) : 500 1000 .

6.4

)

b)

c)

7

7.1

7.1.1

7.1.2

« ».

8.

45°.

0.5

0.0083 / (0,5 /).

(QFP)

62137-1-1.

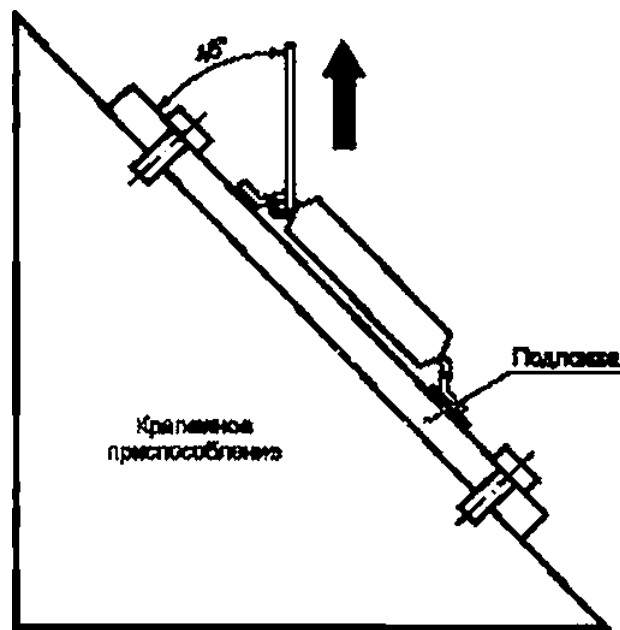
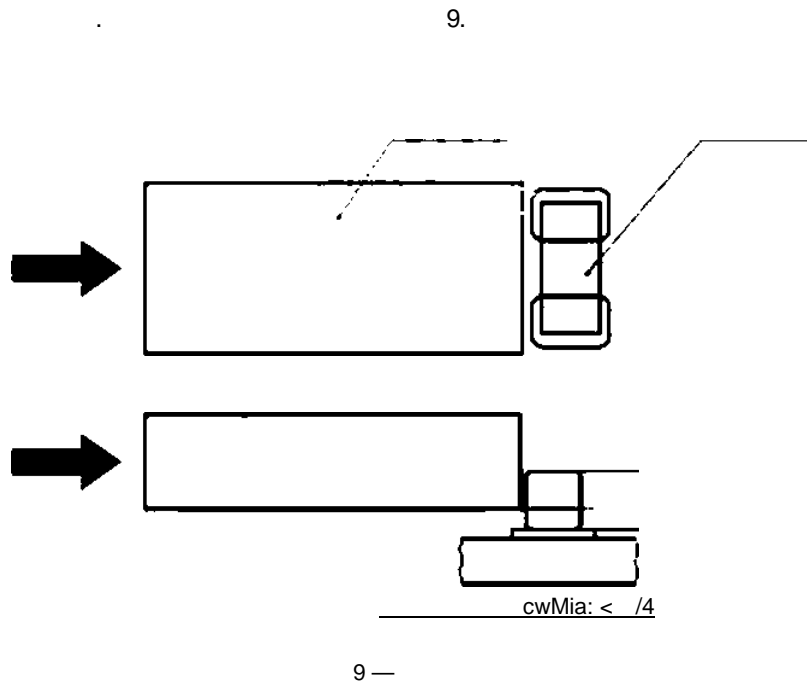


Рисунок 8 — Испытание прочности на отрыв

55492—201 /PAS 62137-3:2008

7.1.3



0.0083 / 0,15 / (0,5 / 9 /).

$*/4$

62137-1-2.

7.1.4

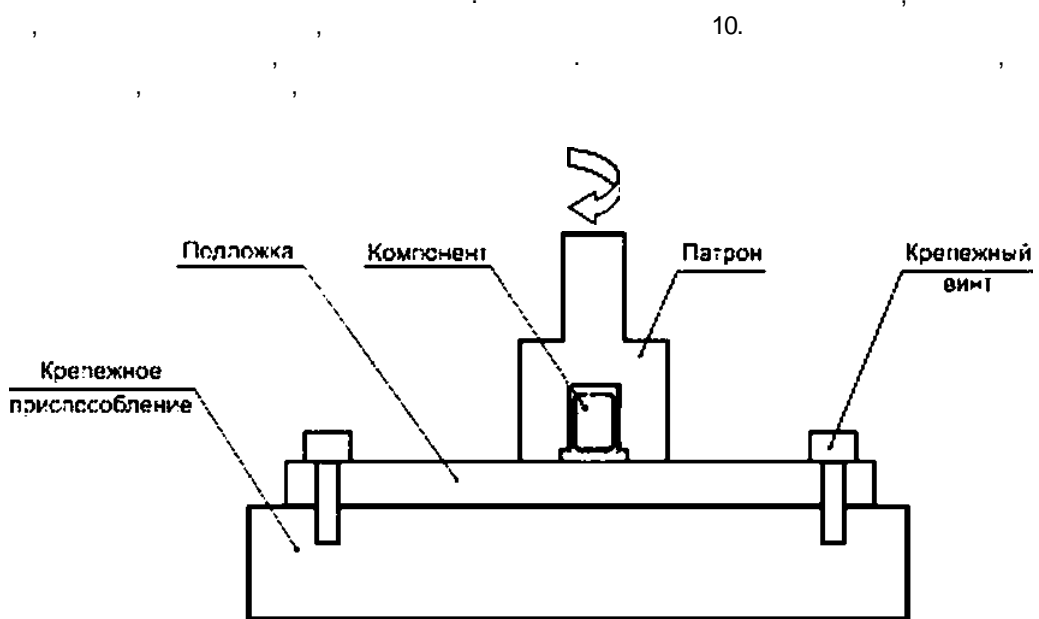
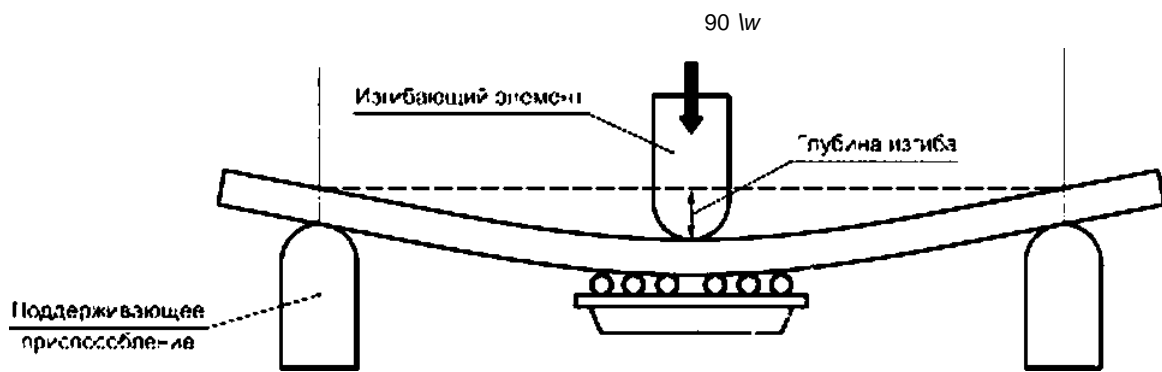


Рисунок 10 — Испытание на прочность при приложении крутящего момента

0.00698 / 0,017 / .

7.1.5

11.



11 —

(. D.2.3).

90

R 2.5

5

1.6

0.0083 / (0.5 /) .

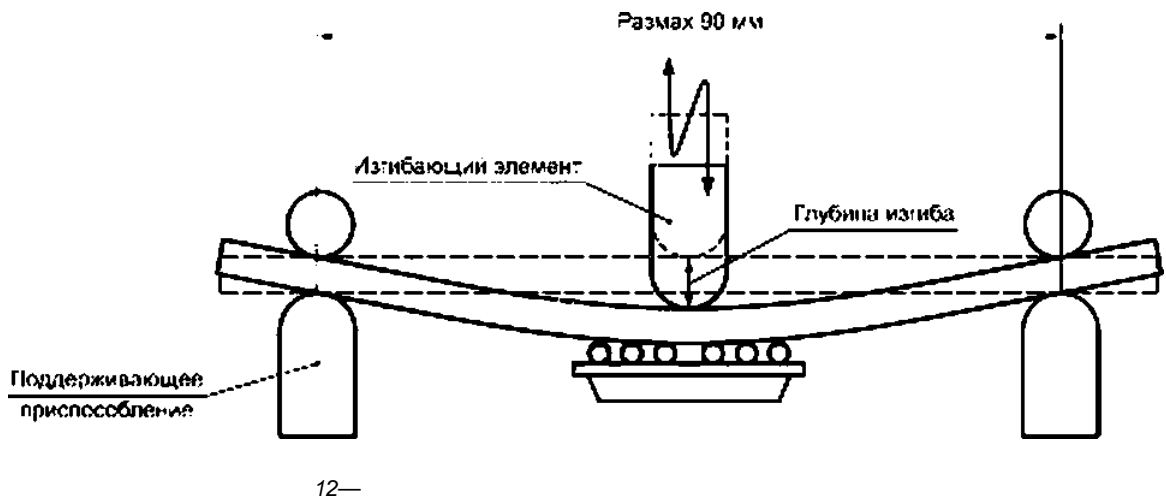
— 10

D.

7.2

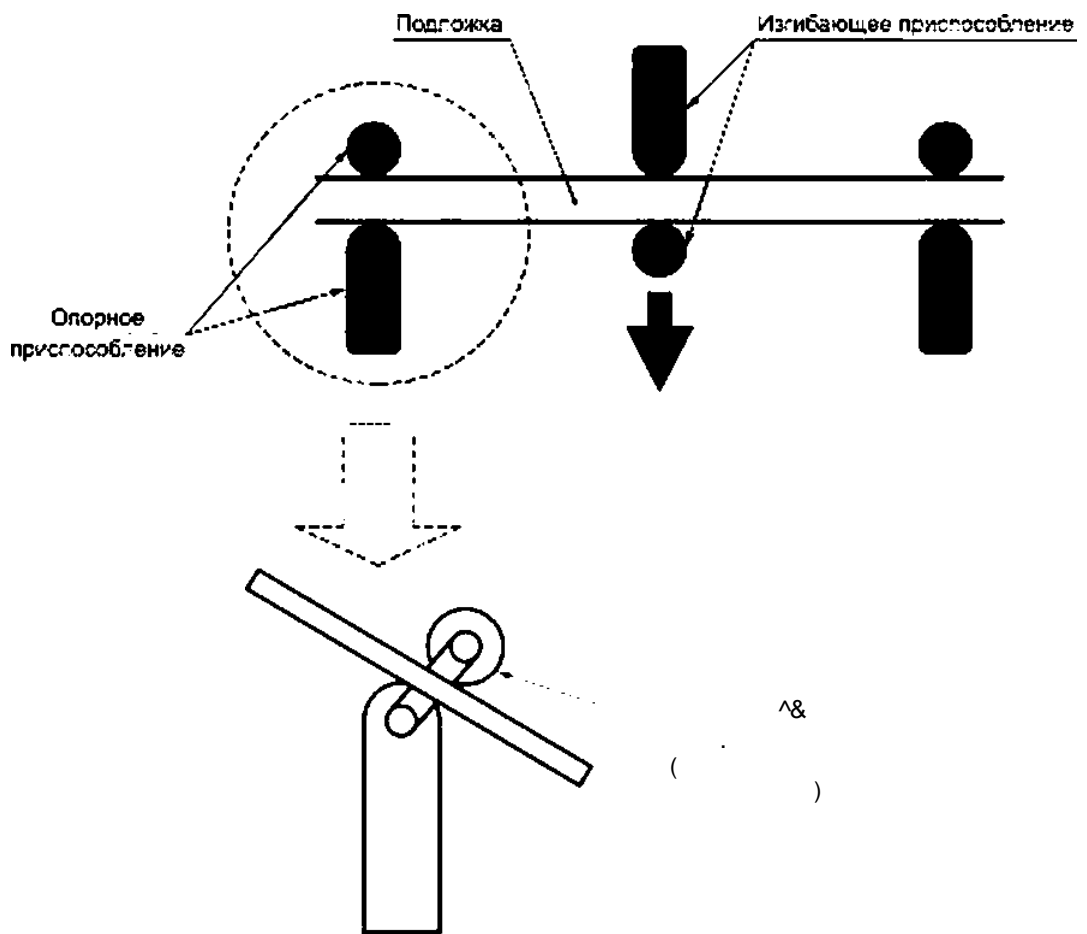
12.

55492—201 /PAS 62137-3:2008



(. . 0.24).

13

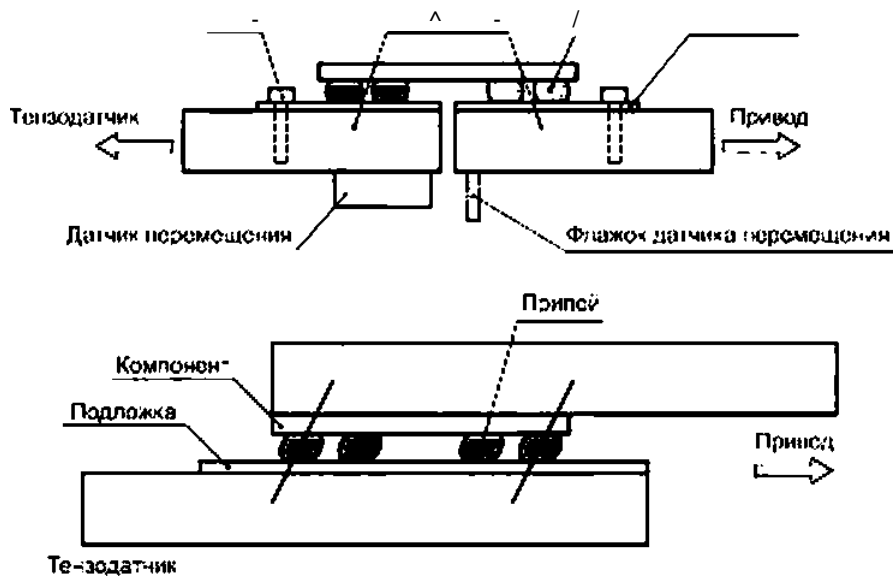


0.5 / (30 /).

62137-1-4.

7.3

14.



14 —

55492—201 /PAS 62137-3:2008

6,

(.D.2.4).

62137-1-5.

7.4

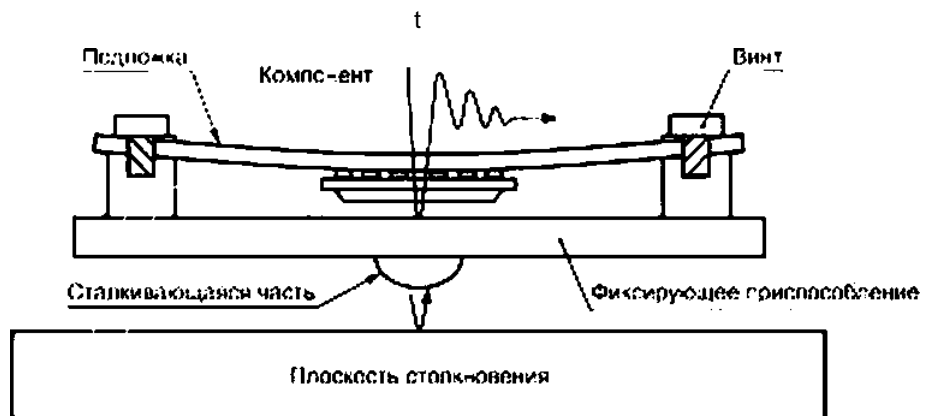
7.4.1

15,

(.D.2.4).



. r, o7it: c: ryjni- y



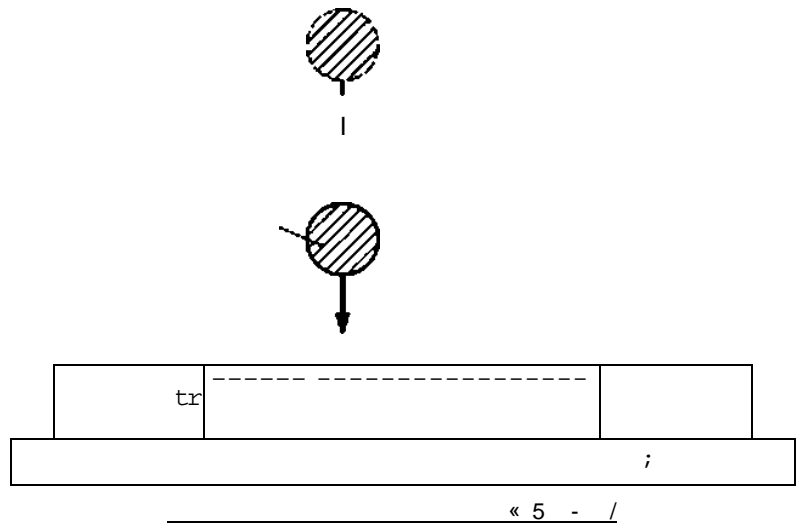
15 —

62137-1-3.

7.4.2

16,

(.D.2.4).

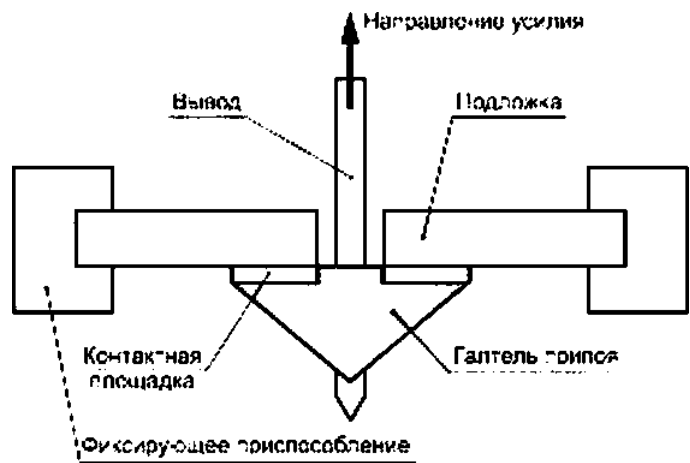


16 —

7.5

7.5.1

17.



17 —

21

55492—201 /PAS 62137-3:2008

20 / . 1 / , 2 / , 5 / , 10 /

7.5.2

F.

18.

{ .D.2.4).

0.4

0.6

50

125 * .

(7).

G.

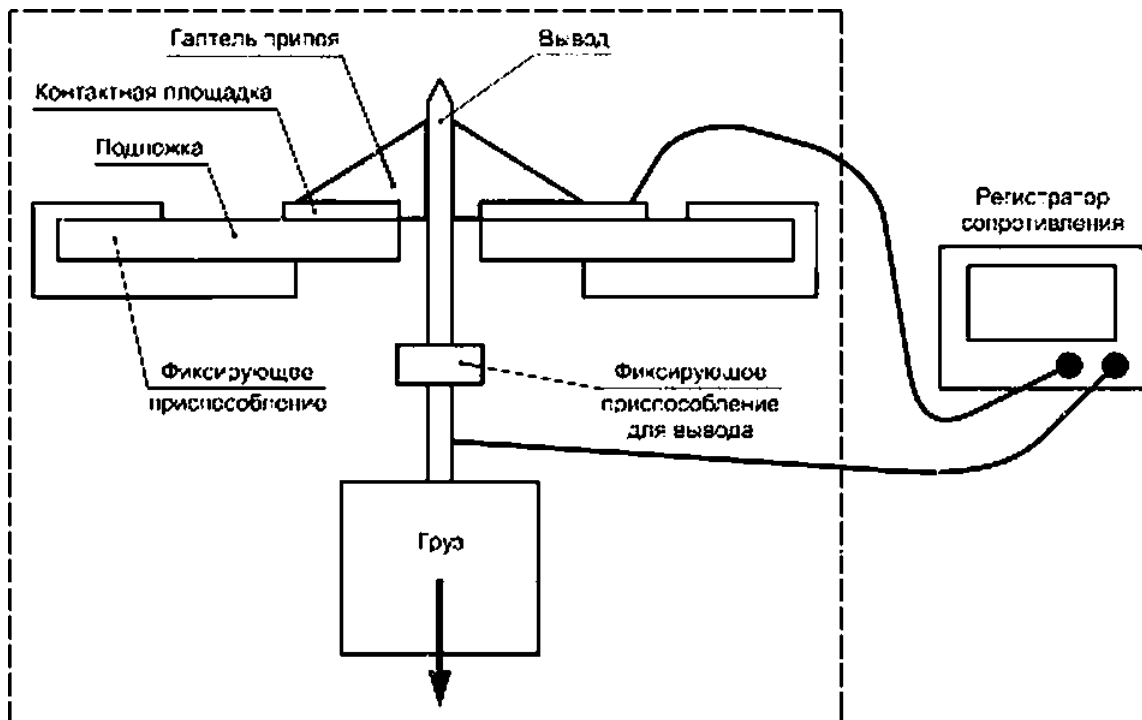


Рисунок 18 — Испытание на сопротивление ползучести

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6.3.1.

.2

.1.

15

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,Wfi

40

90

90

10

1-----1-----1-----
2000 4000

35°0

125 "

.1—

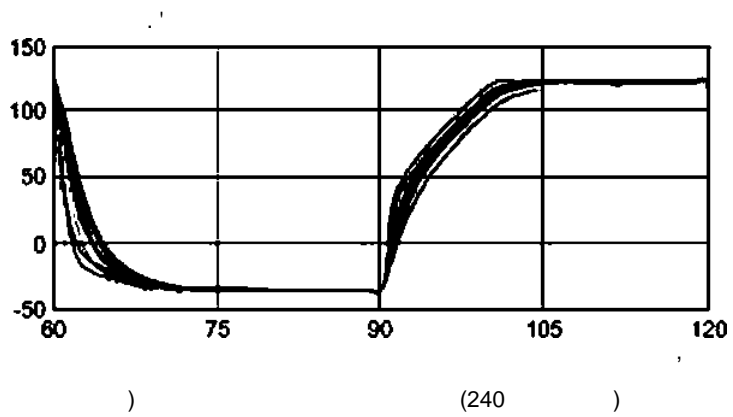
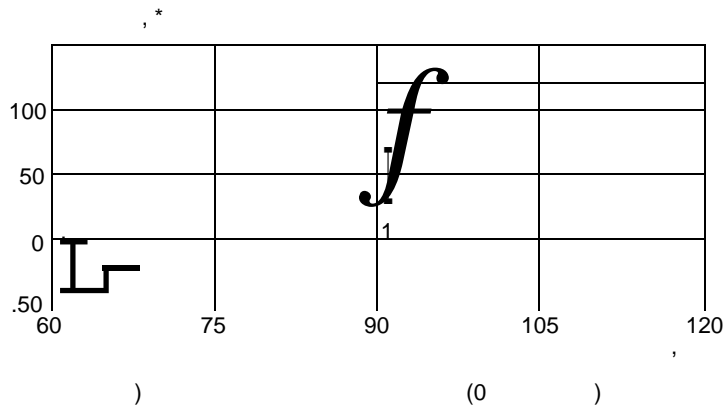
(Sn96.SAg3Cu,5)

.2

15

15

55492—201 /PAS 62137-3:2008



.2 — ,

.4 ' ()

/ (15), 30 ,

(15).

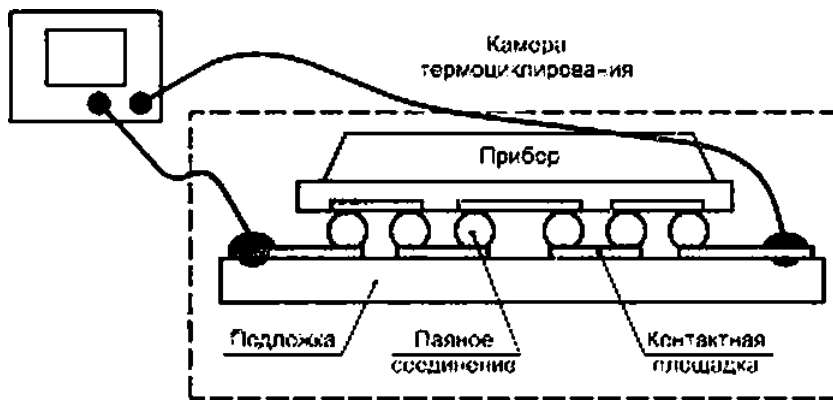
()

.1

BGA. LGA.

.2

.1.



.1—

.6.1.

6.4

62137.

55492—201 /PAS 62137-3:2008

()

.1

7.1.4.

.2

.2.1

.2.3.

.2

.2.2

.1.

.2.3

.2.3.1

.2.3.2

0.00698 / 0.015 / .

.2.3.3

(. .).

.2.3.4

0.00698 / 0.015 / .

.2.4

.2.4.1

.2.4.2

.2.4.3

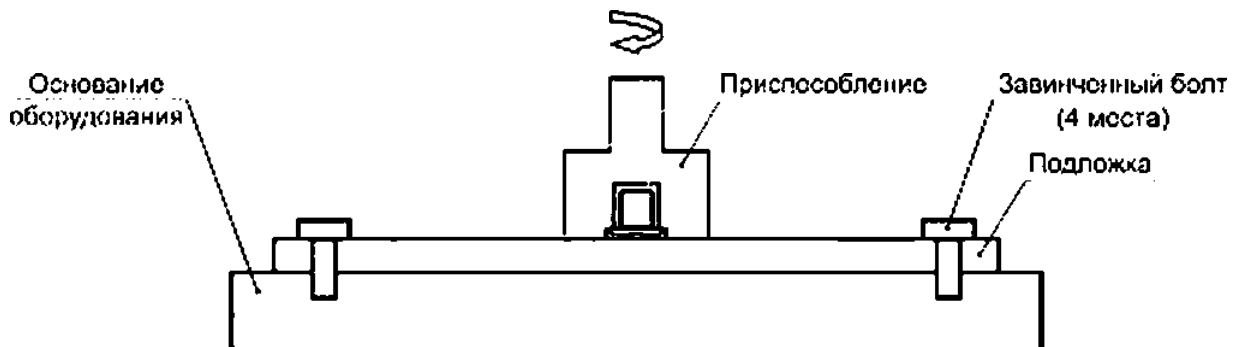
0.00698 / 0.015 / ()

.2.4.4

(. .)

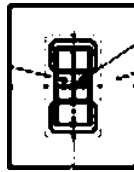
.2.4.5

0.00696 / 0.015 /

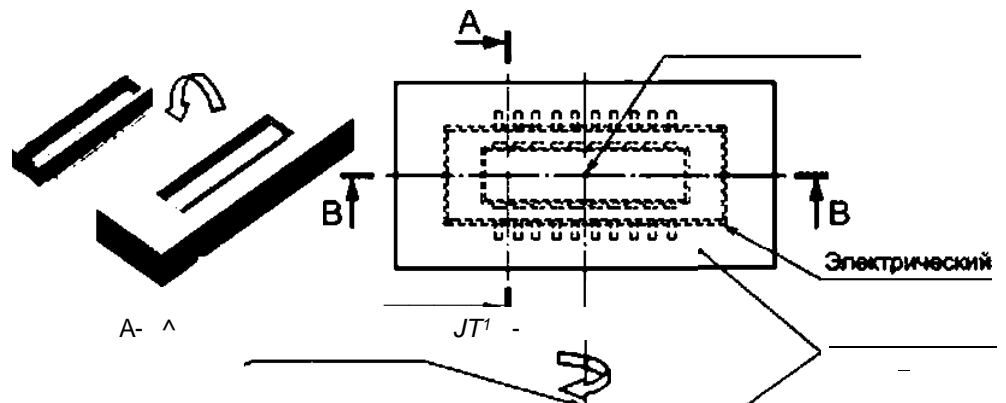


.1—

55492—201 /PAS 62137-3:2008



.2—



1		----- ^ ----- 7^	
		~ , R-	
	11		

()

0.1

7.1.5.

D.2

0.2.1

0.2.2

7.1.5.

a)

(20).

*1 %

b)

0.2.3

a)

0.1

b)

5 0.2

c)

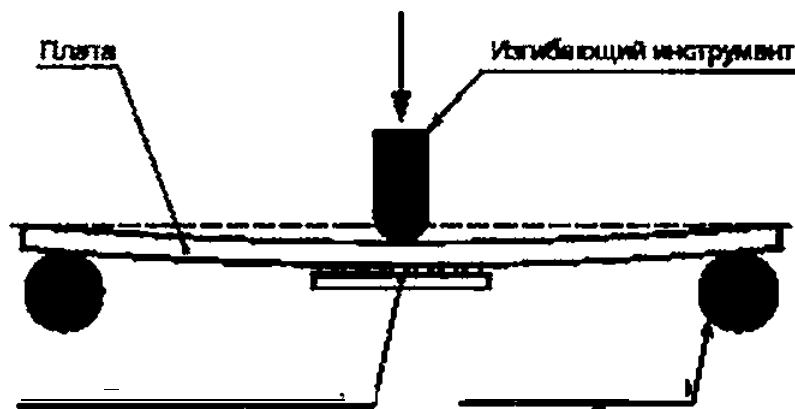
2.5 i

0.2

d)

90 ±

1



D.1 —

0.2.4

1 10 10 100

55492—201 /PAS 62137-3:2008

0.2.5

0.3

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(4S ± 0.5);

0)

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10

0)

0.4

0,0083 / 0.1 / (0.5 / 6 /).

()

.1

7.4.2.

BGA.LGA OFN.

()

.2

6.1.

1.6

7.4.2.

.4

.1.

(.0.2.4).

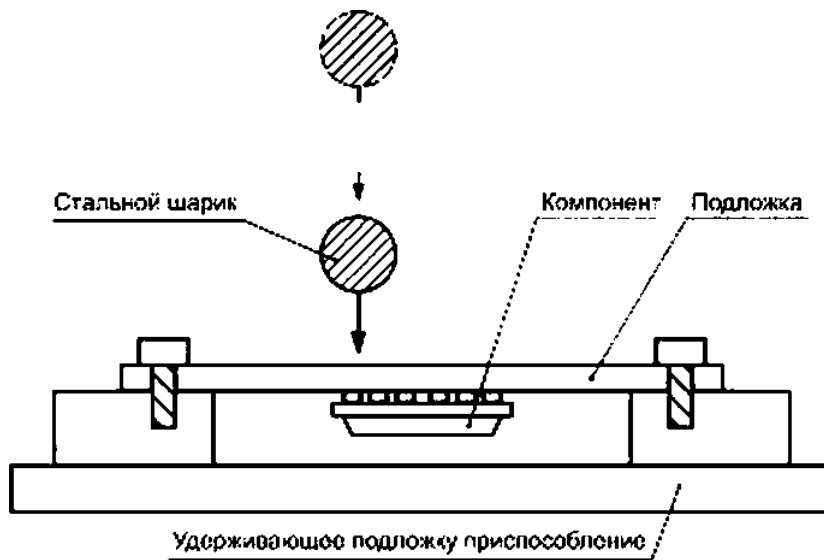


Рисунок Е.1 — Циклическое испытание на падение

55492—201 /PAS 62137-3:2008

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QFN 64

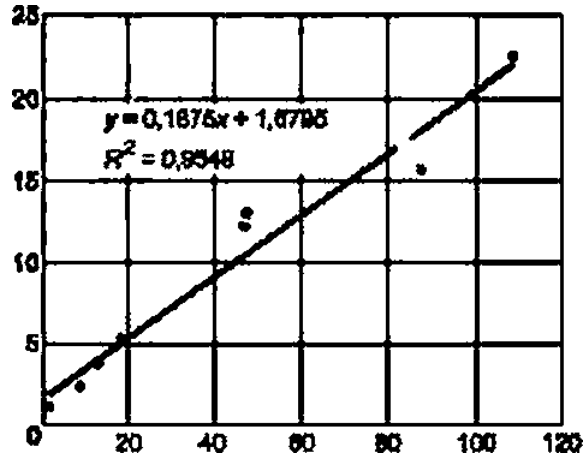
0.5

FR-4.

1.6

.2.

tan* >



»

— 0.75

— 10

— 1.5

.2—

(F)

F.1

7.5.1.

F.2

5.3 a)

60068-1.

4

b)

F.1.

c)

1

2

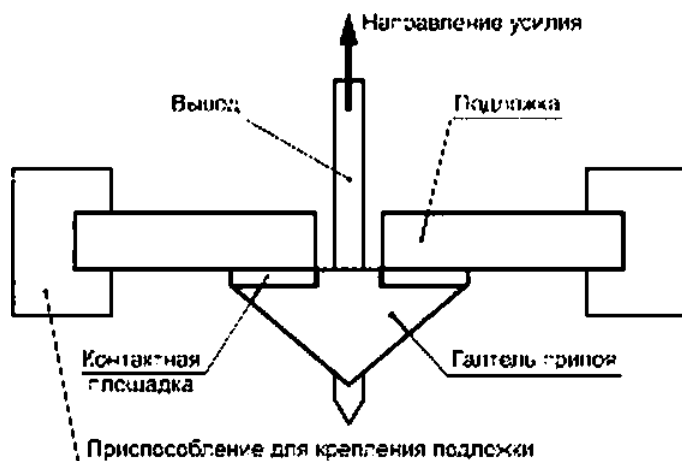
3

d)

: 0,0167 / (1,0 /), 0,033 / (2,0 /). 0,063 / (5,0 /), 0,167 / (10 /).
/ (20 /).

e)

)



F.1 —

55492—201 /PAS 62137-3:2008

()

G.1

7.S.2.

G.2

)
b)

10

c)

1 —

)

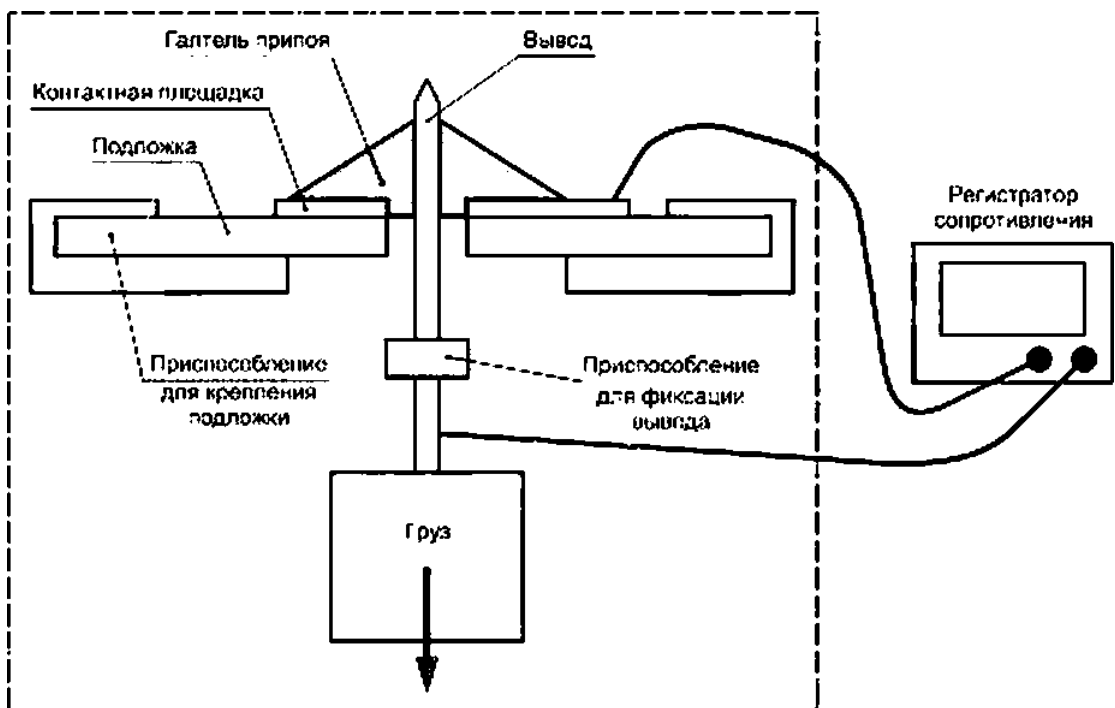
2 —

3 —

4 —

)

G.1.



G.1 —

55492—2013/IEC/PAS 62137-3:2008

)				-
		t1 %.		-
	5 —			-
	6 —			-
-	7 —		(. . 90 %)	-
)				-
h)				-
l)				-
	8 —			-

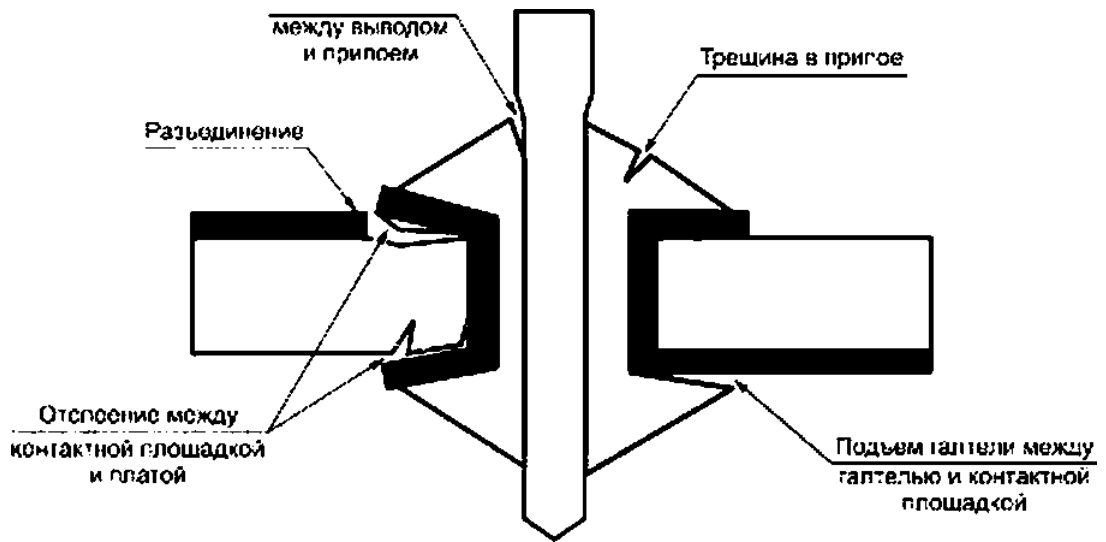
55492—201 /PAS 62137-3:2008

()

.1

.1.

-
-
-



.1 —

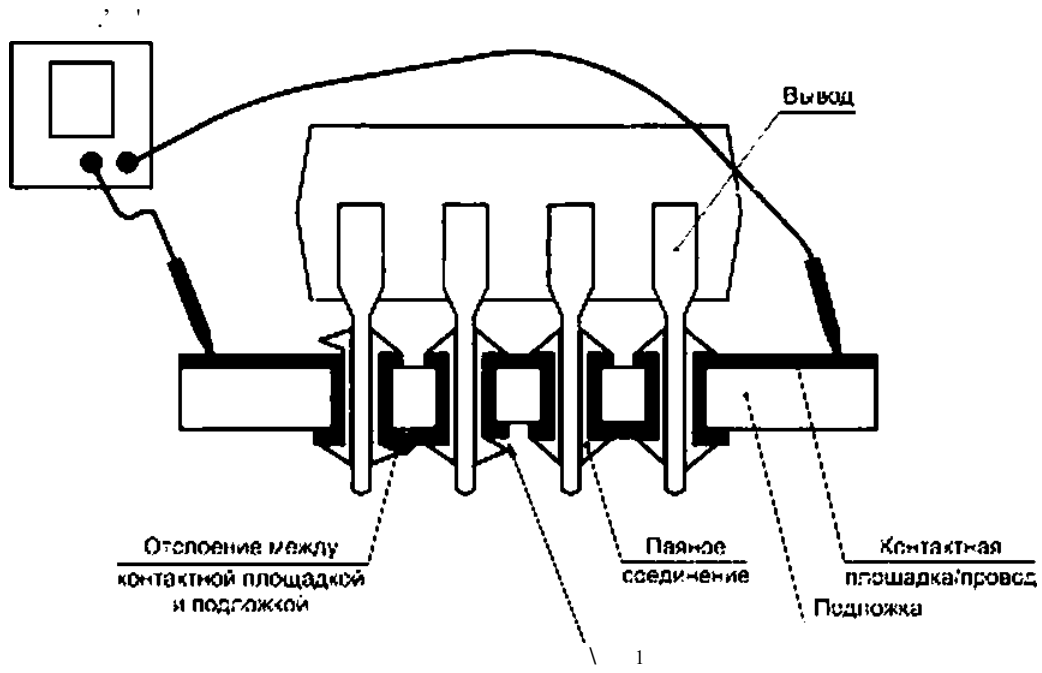
.2

10° — 30°

6.3.

.2.

{ . 0.2.4).



.2—

55492—201 /PAS 62137-3:2008

()

.1

6 >		
60068-1:1908		28198—89 (68-1—88) « 1. »
60068-2-2		60068-2-2—2009 « 2-2. »
60068-2-14		28209-89 (66-2-14—84) « 2. N: »
60068-2-78		60068-2-76—2009 « 2-78. Cab: , - »
60194	NEO	53386—2009 « »
61188-5	—	
61249-2-7		26246.7—89 (249-2-7—87} « () , »
61760-1	—	
62137-1-1:2007	NEO	20.57.406—81 « » , -
62137-1-2:2007	NEO	20.57.406—81 « » , -
62137-1-3:2008	NEO	20.57.406—81 « » , -
62137-1-4:2009	NEO	20.57.406—81 « » , -
62137-1-8:2009	NEO	20.57.406—81 « » , -
<p>* -</p> <p>• —</p> <p>- MOD —</p> <p>• NEQ—</p>		

55492—2013/IEC/PAS 62137-3:2008

IEC 60068-1:1998 1.
 (Environmental testing— Part 1: General and guidance)

IEC 60068-2-2 2.
 (Environmental testing — Part 2-2: Tests — Test 2: Dry heat)

IEC 60066-2-14 2-14. N: -
 (Environmental testing — Part 2-14: Test 2-14: Change of temperature)

IEC 60066-2-78 2-76. Cab.
 (Environmental testing — Part 2-78: Tests — Test 2-78: Damp heat, steady state)

IEC 61760-1 1. -
 (Surface mounting technology — Part 1: Standard method (or the specification of surface mounting components (SMDs)))

IEC 62137:2004 -
 FBGA. BGA. FLGA. LGA. SON OFN (Environmental and endurance testing—Test methods for surface-mount boards of area array type packages FBGA. BGA. FLGA. LGA. SON and OFN)

621.396:69:006.354

OKC 31.190

02

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;

(SMD);

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8.

OJJ-

09.04.2014.

22.05.2014.

60 > 84^

4.05. 4.80. 60 . .2120.

« www.gosbinfo.ru

». 123995 mfo@%sbinfo.ru

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