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480 « »

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9.12.2013 . 2225- .

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- () (): (Frequency and distance separations);
- P SM.337-6 (2008)
 - SM.1134-1 (2007) (Intermodulation interference calculations in the land-mobile service);
 - F.699-5 (2006)

100 70 (Reference radiation patterns for fixed wireless system antennas for use in coordination studies and interference assessment in the frequency range from 100 MHz to about 70 GHz).

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1.0-2012 (8).
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(gost.ru).

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24375—80

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3 , ,

3.1 , 50397-2011, 23611, 23872-

79, 24375, : ,

3.1.1 :

/ .

3.1.2 : (, .). ,

3.1.3 : ,

3.1.4 : « » ,

« ».

3.1.5 : , .

3.1.6 : ,

3.1.7 : ,

3.1.8 : .

3.1.9 : ,

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3.1.10 :

3.2 .

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4 -

4.1 n- (i = 1, 2,...n);
m- (j = 1, 2,...m).

4.2 :

f , ;

P , ;

B_{T-3} , *B_{T-30}* , *B_{T-X}* , , -3, -30 , ;

A , ;

η_T , ;

G_{0T} , ;
(0 360) (-90 +90);
x, y, h

4.3

;
 f , ;
 f , ;
 f , ;
 P , ;
 A_0 , ;
 B_{-3}, B_{-30}, B_{-} , , -3, -30 , ;
 B_{-3}, B_{-30}, B_{-} , , -3, -30
, ;
 D , ;
 D , ;
 D , ;
 η_R , ;
 G_{OR} , ;
(0 360) (-

90 +90);
x, y, h

, .
- , 1
« - ».

5

5.1 , , ,
 $N = nm$.

5.2

$P = P - A_0 - Z$, (5.1)
 Z , , Z .

5.3

$P = P_T - \eta_T + G_T - \eta_R + G_R - L_0$, (5.2)

G_T f , ;

G_R f , ;

L_0

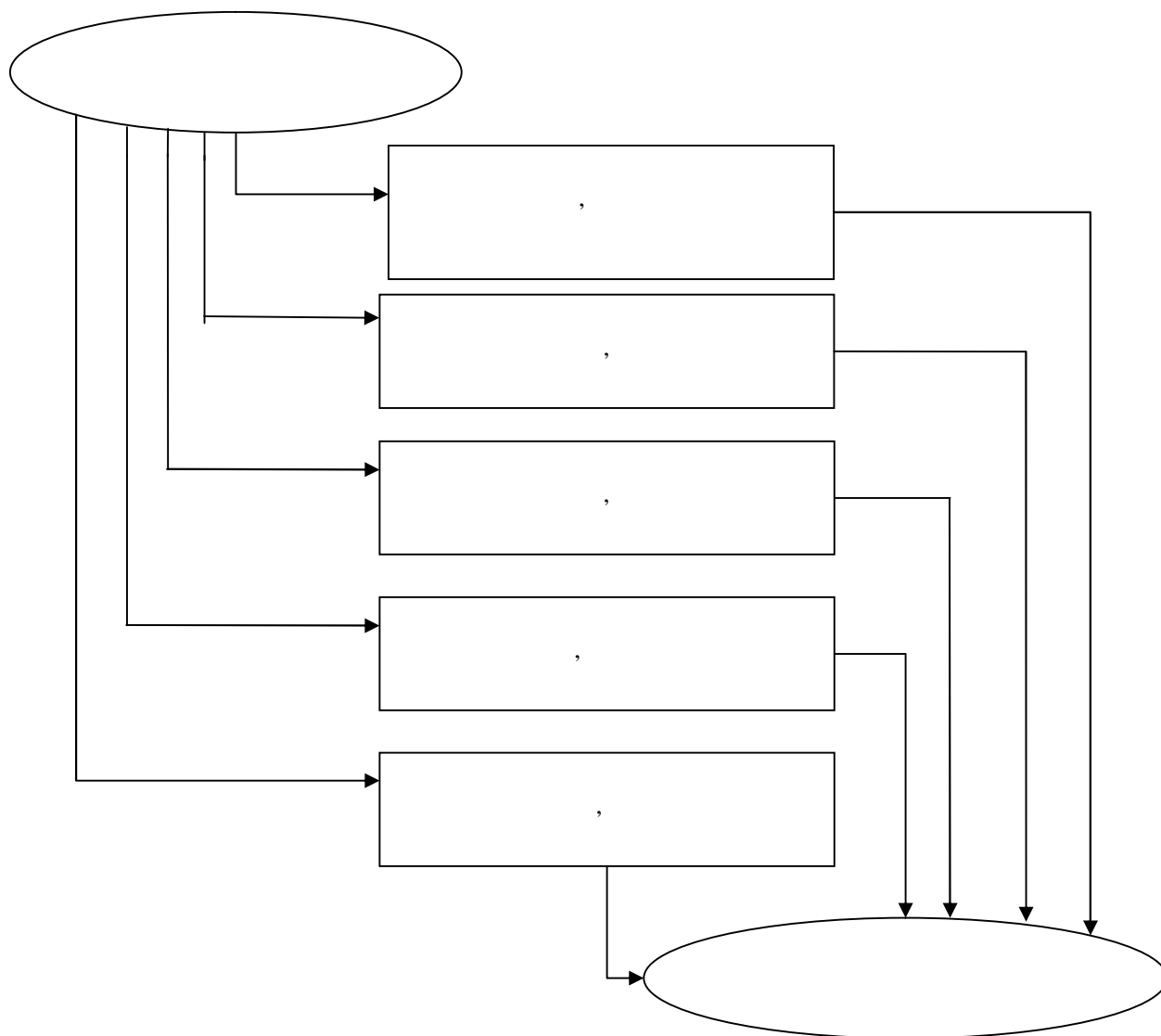
$L_0 = -27,55 + 20 \lg f + 20 \lg R$, (5.3)

R

$R = \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2 + (h_i - h_j)^2}$. (5.4)

4.4 -

4.1.



4.1 -

5.4

, P , (Δf

):

$$P_{\Delta f} = P + (\Delta f), \quad (5.5)$$

 (Δf)

$$(\Delta f) = -10 \lg \frac{\int_{-\infty}^{+\infty} P(f) |H(f + \Delta f)|^2 df}{\int_{-\infty}^{+\infty} P(f) df}, \quad (5.6)$$

$$\frac{P(f)}{H(f)}$$

(/);

5.5

$$P_{\text{н}} > P_{\text{н}} \quad (5.7)$$

6 ,

6.1 , , $N = nm$.

$$6.2 \quad P_{\text{н}} = D + \quad (6.1)$$

6.3 () $P_{\text{н}}$, :

$$P_{\text{н}} = P_{\text{н}} + H_1, \quad (5.2); \quad (6.2)$$

$P_{\text{н}}$, , f ,
 1 , , ($1 < 0$)

$$6.4 \quad P_{\text{н}} > P_{\text{н}} \quad (6.3)$$

7 ,

7.1 , , :
 1) « - »,
 2) « - ».

$$N_1 = m(C_n^2 + C_n^3), \quad (7.1)$$

C_n^2, C_n^3 $n \quad 2 \quad 3$.

$$7.2 \quad N_1 \quad (7.2),$$

(7.1):

$$\begin{aligned} -F_{\text{н}} &= F_{\text{мин}} \quad F_{\text{н}} = F_{\text{макс}}, \\ -F_{\text{н}} &< F_{\text{мин}} \quad F_{\text{н}} > F_{\text{макс}}, \\ -F_{\text{н}} &> F_{\text{мин}} \quad F_{\text{н}} > F_{\text{макс}}, \\ -F_{\text{н}} &< F_{\text{мин}} \quad F_{\text{н}} = F_{\text{макс}}, \end{aligned} \quad (7.2)$$

$F_{\text{мин}}, F_{\text{макс}}$, ,

$$F_{\text{мин}} = f - \frac{B}{2}^{-30}, \quad F_{\text{макс}} = f + \frac{B}{2}^{-30}; \quad (7.3)$$

$F_{\text{н}}; F_{\text{н}}$, ,

$$F_{\text{н}} = F - \frac{B}{2}, \quad F_{\text{н}} = F + \frac{B}{2};$$

F , ,

$$F = \left| \pm_1 f_{-1} \pm_2 f_{-2} \right| \quad \ll - \gg,$$

$$F = \left| \pm_1 f_{-1} \pm_2 f_{-2} \pm_3 f_{-3} \right| \quad \ll - \gg;$$

f_{-1}, f_{-2}, f_{-3} 1-, 2- 3- , ;

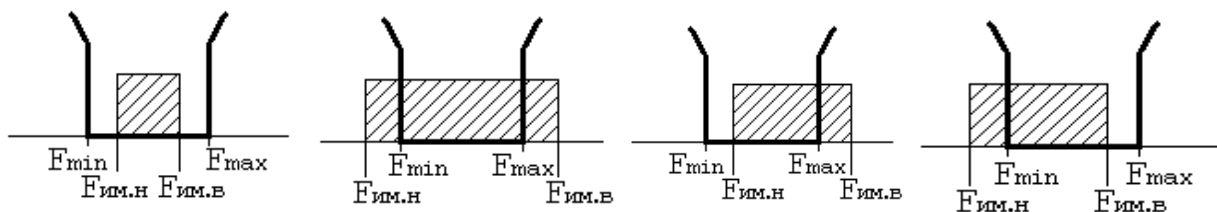
$1, 2, 3$ (1, 2, ...6);

B , ,

$$B = {}_1 B_{\text{T1-30}} + {}_2 B_{\text{T2-30}} \quad \ll \gg,$$

$$B = {}_1B_{T1-30} + {}_2B_{T2-30} + {}_3B_{T3-30} \quad \text{«} \quad \text{»};$$

$$B_{T1-30}, B_{T2-30}, B_{T3-30} \quad 1- \quad 2- \quad 3- \quad -30 \quad ,$$



7.1

$$(7.2)$$

« » ,

7.3.

f_{-1}, f_{-2}, f_{-3} ($H_1 < 0$)

$$f_{-1}, f_{-2}, f_{-3} \quad (\quad) .$$

7.4

$$P_{-1}, P_{-2}, P_{-3}, \quad ,$$

$$f_{-1}, f_{-2}, f_{-3}, \quad :$$

$$P_{-1} = P_{-1} + H_1(f_{-1})$$

$$P_{-2} = P_{-2} + H_1(f_{-2}),$$

$$P_{-3} = P_{-3} + H_1(f_{-3})$$

(7.4)

$$P_{-1(2,3)}, \quad , \quad (5.2).$$

7.5

$$(\quad , \quad), P_{-1}, P_{-2}, P_{-3} \quad :$$

$$P_{-1} = {}_1P_{-1} + {}_2P_{-2} - k \quad \text{«} \quad - \quad \text{»},$$

$$P_{-2} = {}_1P_{-1} + {}_2P_{-2} + {}_3P_{-3} - k \quad \text{«} \quad - \quad \text{»},$$

$$k \quad , \quad ,$$

$$, \quad 4- \quad (7.2), \quad :$$

$$-k = 0,$$

$$-k = 10 \lg \left[\frac{(F_{-1} - F_{-2})}{(F_{\max} - F_{\min})} \right],$$

$$-k = 10 \lg \left[\frac{(F_{-2} - F_{-3})}{(F_{\max} - F_{-1})} \right],$$

$$-k = 10 \lg \left[\frac{(F_{-3} - F_{-1})}{(F_{-2} - F_{\min})} \right].$$

7.6

$$, P_{-0}, \quad ,$$

$$, \quad :$$

$$P_{-0} = ({}_1 + {}_2) \quad \text{«} \quad \text{»},$$

$$P_{-0} = ({}_1 + {}_2 + {}_3) \quad \text{«} \quad \text{»},$$

,

$$= \quad + D \quad . \quad (7.5)$$

7.7

$$P = P_0. \quad (7.6)$$

$$\begin{aligned} -k &= 10\lg\left[\frac{(F_{t_{\max}} - F_{t_{\min}})}{(F_{\max} - F_{\min})}\right], \\ -k &= 10\lg\left[\frac{(F_{t_{\max}} - F_{t_{\min}})}{(F_{\max} - F_{t_{\min}})}\right], \\ -k &= 10\lg\left[\frac{(F_{t_{\max}} - F_{t_{\min}})}{(F_{t_{\max}} - F_{\min})}\right]. \end{aligned}$$

8.5

$$P_{\text{н}} > P_{\text{в}} \quad (8.4)$$

9

9.1

$$N = nm \quad (9.1),$$

(9.1):

$$\begin{aligned} -F_{\text{н}} &\geq F_{\min} \quad F_{\text{в}} \leq F_{\max}, \\ -F_{\text{н}} &< F_{\min} \quad F_{\text{в}} > F_{\max}, \\ -F_{\text{н}} &> F_{\min} \quad F_{\text{в}} > F_{\max}, \\ -F_{\text{н}} &< F_{\min} \quad F_{\text{в}} \leq F_{\max}, \end{aligned} \quad (9.1)$$

$$F_{\min}, F_{\max} \quad (7.3);$$

$$F_{\text{н}}, F_{\text{в}}$$

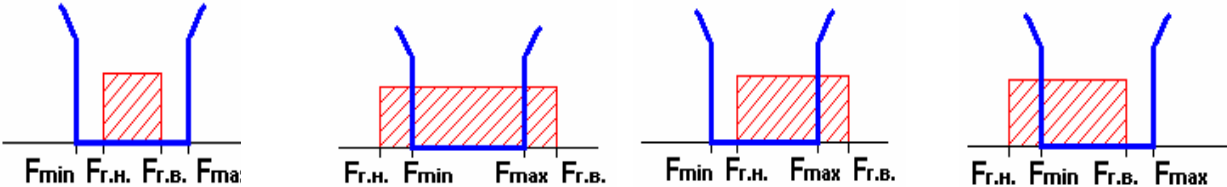
$$F_{\text{н}} = F - \frac{B}{2}, \quad F_{\text{в}} = F + \frac{B}{2}, \quad (9.2)$$

F

$$F = r \cdot f;$$

B

$$r \quad (2, 3..10).$$



9.1

9.3

$$P_{\text{н}} = P_{\text{в}} - A_0 + Z \quad (9.3)$$

Z

9.4

$$P_{\text{н}} = P_{\text{н}} - k - A ,$$

$P_{\text{н}}$, , (5.2);

$$k - ,$$

(9.4)

$$- k = 0 ,$$
$$- k = 10 \lg \left[\frac{(F_{\text{н}} - F_{\text{н}})}{(F_{\text{max}} - F_{\text{min}})} \right] ,$$
$$- k = 10 \lg \left[\frac{(F_{\text{н}} - F_{\text{н}})}{(F_{\text{max}} - F_{\text{н}})} \right] ,$$
$$- k = 10 \lg \left[\frac{(F_{\text{н}} - F_{\text{н}})}{(F_{\text{н}} - F_{\text{min}})} \right] .$$

(9.2), :

9.5 , - ,

$$P_{\text{н}} > P_{\text{н}} .$$

(9.5)

10

10.1 5.7, 6.3, 7.6, 8.4, 9.5

10.2

10.1

10.3 , , , , ,

()

$$\mathbf{Z}$$

.1

$$Z$$

	Z ,
	-6
,	0

()

$G_T (G_R)$

.1.

.1

		$G_T (G_R),$
$G_0 (G_{0R}) > 25$		-10 -10
$10 < G_{0T} (G_{0R}) < 25$		-10 -10
$G_{0T} (G_{0R}) < 10$		0 -3

()

3, 30 .

() $H_1(f)$ f -
 () : -

$$H(f) = \begin{cases} 0 & |\delta - f| < \delta - f_1 \\ H(\delta - f_i) + \frac{H(\delta - f_i) - H(\delta - f_{i+1})}{\lg(\delta - f_i / \delta - f_{i+1})} \lg\left(\frac{|\delta - f|}{\delta - f_i}\right) & \delta - f_i \leq |\delta - f| \leq \delta - f_{i+1}, \\ H(\delta - f_k) & |\delta - f| > \delta - f_k \end{cases}$$

$$H(f) = \begin{cases} 0 & |\delta - f| < \delta - f_1 \\ H(\delta - f_i) + \frac{H(\delta - f_i) - H(\delta - f_{i+1})}{\lg(\delta - f_i / \delta - f_{i+1})} \lg\left(\frac{|\delta - f|}{\delta - f_i}\right) & \delta - f_i \leq |\delta - f| \leq \delta - f_{i+1}, \\ H(\delta - f_k) & |\delta - f| > \delta - f_k \end{cases}$$

$$\delta - f = f - f -$$

$$f;$$

$$H(\delta - f_i) -$$

$$\delta - f_i; \delta - f_i < \delta - f_{i+1};$$

$$i = 1, 2, \dots, k-1; \quad k$$

$$\delta - f = f - f$$

$$f;$$

$$H(\delta - f_i)$$

$$\delta - f_i;$$

$$\delta - f_i < \delta - f_{i+1}.$$

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