

## HF CABLES WITH SMALL NUMBER OF PAIRS FOR SUBSCRIBER NETWORKS

КМЦПП, КМЦППЭп, КМЦППт, КМЦППЭпт, КМЦПМП, КМЦПМПт, КМЦППЗ,  
KMTsPP, KMTsPPep, KMTsPPt, KMTsPPept, KMTsPmP, KMTsPmPt, KMTsPPZ

КМЦППЗт, КМЦПВ, КМЦПВнг(A)  
KMTsPPZt, KMTsPV, KMTsPVng(A)

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### APPLICATION

The cables are intended for operation in broadband subscriber networks, equipped with xDSL systems (including ADSL, ADSL2+, VDSL, VDSL2) at transfer rate up to 100 MBit/s and in structured cable networks in frequency range up to 100 MHz (acc. to standard ISO/IEC 11801 and GOST R 54429-2011) with remote feed voltage up to 500 VDC.

Climatic version is УХЛ (moderate and cold climate), location categories are 1 and 2 acc. to GOST 15150 – 69.

Cables **КМЦПП** – for laying in telephone conduits, cable galleries and shafts, on buildings' walls and for suspension on poles of aerial communication lines

Cables **КМЦППЭп** – laying in telephone conduits, cable galleries and shafts, on buildings' walls and for suspension on poles of aerial communication lines

Cables **КМЦППт** – for suspension on poles of aerial communication lines

Cables **КМЦППЭпт** – for suspension on poles of aerial communication lines

Cables **КМЦПМП** – for laying in ground, in telephone conduits, cable galleries and shafts, on buildings' walls and for suspension on poles of aerial communication lines

Cables **КМЦПМПт** – for suspension on poles of aerial communication lines

Cables **КМЦППЗ** – for laying in telephone conduits, cable galleries and shafts, on buildings' walls and for suspension on poles of aerial communication lines under conditions of high humidity

Cables **КМЦППЗт** - for suspension on poles of aerial communication lines

Cables **КМЦПВ** – for laying on internal buildings' walls and indoors

Cables **КМЦПВп** – for laying on internal buildings' walls and indoors

Cables **КМЦПВнг(A)** – for bunched laying on internal buildings' walls and indoors

### DESIGN

**1. Conductors** – single-wire conductor of soft round copper wire

**2. Conductor insulation** extruded of solid PE

**3. Pair** – conductors with insulation of different colours are twisted into a pair (unidirectional twisting) with agreed lay length max. 50 mm.

**4. Cable core** – unidirectional twisted pairs are stranded into a cable core with lay length max. 600 mm. In cables КМЦППЗ, КМЦППЗт, core interstices are filled with hydrophobic filling.

**5. Belt wrapping** – in cables КМЦПП, КМЦППЭп, КМЦППт, КМЦППЗ, КМЦППЗт КМЦПВ, КМЦПВнг(A) it is made of synthetic tapes.

**6. Shield** – a shield of Al-polymeric tape is longitudinally applied over belt wrapping, a tinned copper wire is laid under shield.

**7. Sheath:**

- for cable КМЦПВ: PVC compound;

- for cable КМЦПВнг(A): flame-retardant PVC compound;

– for other cables: light-stabilized PE.

In cables КМЦППТ, КМЦППЭпТ, КМЦПМПТ, КМЦППЗТ, the sheath is extruded simultaneously over twisted pairs laid in parallel with cable web and rope of steel wires.

### TECHNICAL PROPERTIES

Property	Frequency, kHz	standard value	
1. Conductor resistance at 20°C, Ohm/km, for conductor diameters:	DC	0,4 mm	139±9
		0,52 mm	84±7
		0,64 mm	55±3
		0,9 mm	26±3
		1,2 mm	13,8±2,0
2. Conductor resistance unbalance in a pair, %, max.	DC	1,0	
3. Conductor resistance unbalance between pairs, %, max.	DC	4,0	
4. Conductor insulation resistance, MOhm*km, max. - for unfilled cables - for filled cables	DC	8000	
		5000	
5. Mutual capacitance, nF/km	0,8 or 1,0	55,0	
6. Attenuation factor at 20°C, dB/1000m, max. - for conductor diameter 0,4 mm	160	12,0	
	512	19,5	
	1024	26,8	
	2048	38,0	
	4096	53,7	
	- for conductor diameters 0,52 mm, 0,64 mm, 0,9 mm, 1,2 mm	1024	2,1
4096		4,1	
10000		6,5	
16000		8,3	
20000		9,3	
31250		11,7	
62500		17,0	
100000	22,0		
7. NEXT between pairs, dB/100m, min. - for conductor diameter 0,4 mm	160	77,0	
	512	69,0	
	1024	65,0	
	2048	60,0	
	4096	56,0	
- for conductor diameters 0,52 mm, 0,64 mm, 0,9 mm, 1,2 mm	1024	65,3	
	4096	56,3	
	10000	50,3	
	16000	47,3	
	20000	45,8	
	31250	42,9	
	62500	38,4	
100000	35,3		
8. NEXT of total effect power at fixed frequencies, dB/100m, min. - for conductor diameters 0,52 mm, 0,64 mm, 0,9 mm, 1,2 mm	1024	62,3	
	4096	53,3	
	10000	47,3	
	16000	44,3	
	20000	42,8	
	31250	39,9	
	62500	35,4	
100000	32,3		

9. ELFEXT between pairs, dB/100m, min. - for conductor diameter 0,4 mm	160	76,0
	512	66,0
	1024	60,0
	2048	54,0
	4096	48,0
- for conductor diameters 0,52 mm, 0,64 mm, 0,9 mm, 1,2 mm	1024	64,0
	4096	52,0
	10000	44,0
	16000	39,9
	20000	38,0
	31250	34,1
	62500	28,0
10. Far-end protection from total effect power at fixed frequencies, dB/100m, min. - for conductor diameters 0,52 mm, 0,64 mm, 0,9 mm, 1,2 mm	1024	61,0
	4096	49,0
	10000	41,0
	16000	36,9
	20000	35,0
	31250	31,1
	62500	25,0
	100000	21,0
11. Signal propagation speed, m/s, min.	4000-100000	180,0
12. Signal delay time difference, max., ns/100m, max.	4000-100000	45,0
13. Test voltage during 1 minute, V - between conductors	0,05	1000
	DC	1500
- between conductors and shield	0,05	2000
	DC	3000

Cable transportation conditions considering climatic factors shall comply with storage conditions 8 acc. to GOST15150-69.

Cable storage conditions considering climatic factors shall comply with conditions 5 acc. to GOST 15150-69.

Laying temperature:

- for unfilled cables in PE sheath: not less than minus 15°C
- for filled cables in PE sheath: not less than minus 10°C
- for cables in PVC sheath: not less than minus 10°C .

Operation temperature for fixed installation:

- for unfilled cables in PE sheath: from minus 50°C to plus 60°C;
- for filled cables in PE sheath: from minus 50°C to plus 50°C;
- for cables in PVC sheath: from minus 40°C to plus 60°C.

Cable bending radius for laying and installation: min. 10 diameters over plastic sheath

Warranty period for cable operation after the commissioning: 3 years.

Service life after the manufacturing date, min.: 20 years.

The cables are delivered on wooden drums acc. to GOST 5151-79 in factory lengths min. 400 m.

The cables can be delivered in coils with inner diameter min. 10 cable diameters.