



## Features

- High voltage rating
- High current rating
- Bidirectional
- Surge protection
- Fast response time
- RoHS compliant\*
- Agency listing: US

## Applications

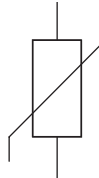
- Power supplies
- Power systems
- Line voltage
- Telecom systems
- White goods / appliances

# MOV-20DxxxK Series - Metal Oxide Varistor

### General Information

The MOV-20DxxxK Series of 20 mm radial leaded varistor devices protects against overvoltage transients such as lightning, power contact and power induction. The metal oxide varistors offer a choice of varistor voltages from 18 V to 1800 V and  $V_{rms}$  voltages from 11 V to 1100 V.

The devices have a high current handling, high energy absorption capability and fast response times to protect against transient faults up to rated limits.



### Industry Standard Compliance

Standard	UL 1449
File Number	E313168

### Absolute Maximum Ratings (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature	$T_{OPR}$	-40	25	+105	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40	25	+125	$^\circ\text{C}$
Rated Wattage	$P_w$			1.00	Watt
Varistor Voltage Temperature Coefficient	$V_{TC}$	0	0.1	0.05	$\% / ^\circ\text{C}$
Response Time	$T_r$		10	25	ns
Varistor Voltage Tolerance	$V_{tol}$	-10	0	10	$\%$

### Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Bourns Part No.	Max. Continuous Voltage (V)		Voltage @ 1 mA DC (V)			Voltage @ Class Current (8/20 $\mu\text{s}$ )		Max. Peak Current (8/20 $\mu\text{s}$ )	Max. Energy (J)	Typ. Cap. (pF)
	r.m.s.	d.c.	Min.	Nom.	Max.	Class Current (A)	Max. Clamping Voltage (V)			
								One Time	8/20 $\mu\text{s}$	1 kHz
MOV-20D180K	11	14	16	18	20	20	36	2000	11.0	34200
MOV-20D220K	14	18	20	22	24	20	43	2000	14.0	24000
MOV-20D270K	17	22	24	27	30	20	53	2000	18.0	21600
MOV-20D330K	20	26	30	33	36	20	65	2000	23.0	19200
MOV-20D390K	25	31	35	39	43	20	77	2000	26.0	18000
MOV-20D470K	30	38	42	47	52	20	93	2000	33.0	16800
MOV-20D560K	35	45	50	56	62	20	110	2000	41.0	13200
MOV-20D680K	40	56	61	68	75	20	135	2000	46.0	10800
MOV-20D820K	50	65	74	82	90	100	135	6500	38.0	6000
MOV-20D101K	60	85	90	100	110	100	165	6500	45.0	5040
MOV-20D121K	75	100	108	120	132	100	200	6500	55.0	4200
MOV-20D151K	95	125	135	150	165	100	250	6500	70.0	3240
MOV-20D181K	115	150	162	180	198	100	300	6500	85.0	2640
MOV-20D201K	130	170	185	200	225	100	340	6500	95.0	2400
MOV-20D221K	140	180	198	220	242	100	360	6500	100.0	2160
MOV-20D241K	150	200	216	240	264	100	395	6500	108.0	1980
MOV-20D271K	175	225	243	270	297	100	455	6500	127.0	1800
MOV-20D301K	190	250	270	300	330	100	500	6500	136.0	1560
MOV-20D331K	210	275	297	330	363	100	550	6500	150.0	1440
MOV-20D361K	230	300	324	360	396	100	595	6500	163.0	1320
MOV-20D391K	250	320	351	390	429	100	650	6500	180.0	1200
MOV-20D431K	275	350	387	430	473	100	710	6500	190.0	1116
MOV-20D471K	300	385	423	470	517	100	775	6500	220.0	1020
MOV-20D511K	320	415	459	510	561	100	845	6500	220.0	936
MOV-20D561K	350	460	504	560	616	100	925	6500	220.0	852
MOV-20D621K	385	505	558	620	682	100	1025	6500	220.0	780
MOV-20D681K	420	560	612	680	748	100	1120	6500	220.0	720
MOV-20D751K	460	615	675	750	825	100	1240	6500	230.0	636
MOV-20D781K	485	640	702	780	858	100	1290	6500	255.0	612
MOV-20D821K	510	670	738	820	902	100	1355	6500	265.0	600
MOV-20D911K	550	745	819	910	1001	100	1500	6500	282.0	528
MOV-20D102K	625	825	900	1000	1100	100	1650	6500	310.0	480
MOV-20D112K	680	895	990	1100	1210	100	1815	6500	342.0	432
MOV-20D152K	940	1200	1350	1500	1650	100	2475	6500	383.0	384
MOV-20D182K	1100	1465	1620	1800	1980	100	2970	6500	625.0	312



**WARNING Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011. Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications. The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# MOV-20DxxxK Series - Metal Oxide Varistor

**BOURNS®**

## Product Dimensions

This is an RoHS compliant molded radial package with 100 % Sn plating on the terminations.



Part Number	Dim. H (Max.)	Dim. T (Max.)
MOV-20D180K	$\frac{26.0}{(1.024)}$	$\frac{4.2}{(.165)}$
MOV-20D220K	$\frac{26.0}{(1.024)}$	$\frac{4.3}{(.169)}$
MOV-20D270K	$\frac{26.0}{(1.024)}$	$\frac{4.6}{(.181)}$
MOV-20D330K	$\frac{26.0}{(1.024)}$	$\frac{4.2}{(.165)}$
MOV-20D390K	$\frac{26.0}{(1.024)}$	$\frac{4.4}{(.173)}$
MOV-20D470K	$\frac{26.0}{(1.024)}$	$\frac{4.6}{(.181)}$
MOV-20D560K	$\frac{26.0}{(1.024)}$	$\frac{4.7}{(.185)}$
MOV-20D680K	$\frac{26.0}{(1.024)}$	$\frac{4.8}{(.189)}$
MOV-20D820K	$\frac{26.0}{(1.024)}$	$\frac{4.2}{(.165)}$
MOV-20D101K	$\frac{26.0}{(1.024)}$	$\frac{4.4}{(.173)}$
MOV-20D121K	$\frac{26.0}{(1.024)}$	$\frac{4.6}{(.181)}$
MOV-20D151K	$\frac{26.0}{(1.024)}$	$\frac{4.8}{(.189)}$
MOV-20D181K	$\frac{26.0}{(1.024)}$	$\frac{4.0}{(.157)}$
MOV-20D201K	$\frac{26.0}{(1.024)}$	$\frac{4.2}{(.165)}$
MOV-20D221K	$\frac{26.0}{(1.024)}$	$\frac{4.3}{(.169)}$
MOV-20D241K	$\frac{26.0}{(1.024)}$	$\frac{4.4}{(.173)}$
MOV-20D271K	$\frac{26.0}{(1.024)}$	$\frac{4.6}{(.181)}$
MOV-20D301K	$\frac{26.0}{(1.024)}$	$\frac{4.8}{(.189)}$

Part Number	Dim. H (Max.)	Dim. T (Max.)
MOV-20D331K	$\frac{26.0}{(1.024)}$	$\frac{5.0}{(.197)}$
MOV-20D361K	$\frac{26.0}{(1.024)}$	$\frac{5.2}{(.205)}$
MOV-20D391K	$\frac{26.0}{(1.024)}$	$\frac{5.4}{(.213)}$
MOV-20D431K	$\frac{26.0}{(1.024)}$	$\frac{5.6}{(.220)}$
MOV-20D471K	$\frac{26.0}{(1.024)}$	$\frac{5.9}{(.232)}$
MOV-20D511K	$\frac{26.0}{(1.024)}$	$\frac{6.0}{(.236)}$
MOV-20D561K	$\frac{28.0}{(1.102)}$	$\frac{6.5}{(.256)}$
MOV-20D621K	$\frac{28.0}{(1.102)}$	$\frac{6.9}{(.272)}$
MOV-20D681K	$\frac{28.0}{(1.102)}$	$\frac{7.0}{(.276)}$
MOV-20D751K	$\frac{28.0}{(1.102)}$	$\frac{7.2}{(.283)}$
MOV-20D781K	$\frac{28.0}{(1.102)}$	$\frac{7.4}{(.291)}$
MOV-20D821K	$\frac{28.0}{(1.102)}$	$\frac{7.8}{(.307)}$
MOV-20D911K*	$\frac{28.0}{(1.102)}$	$\frac{8.2}{(.323)}$
MOV-20D102K*	$\frac{28.0}{(1.102)}$	$\frac{8.7}{(.343)}$
MOV-20D112K*	$\frac{28.0}{(1.102)}$	$\frac{9.2}{(.362)}$
MOV-20D152K*	$\frac{28.0}{(1.102)}$	$\frac{10.2}{(.402)}$
MOV-20D182K*	$\frac{28.0}{(1.102)}$	$\frac{12.2}{(.480)}$

\* Not available in Tape & Reel packaging.

## How to Order

**MOV - 20D nn (n) K (TR)**



Examples: MOV-20D270K = 27 V, Bulk Pack  
MOV-20D331KTR = 330 V, Tape & Reel

\* Models MOV-20D911K, 102K, 112K, 152K and 182K are not available in Tape & Reel packaging.

## Internal Construction



## Environmental Specifications

Moisture Sensitivity Level..... 1  
ESD Classification (HBM)..... 6

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

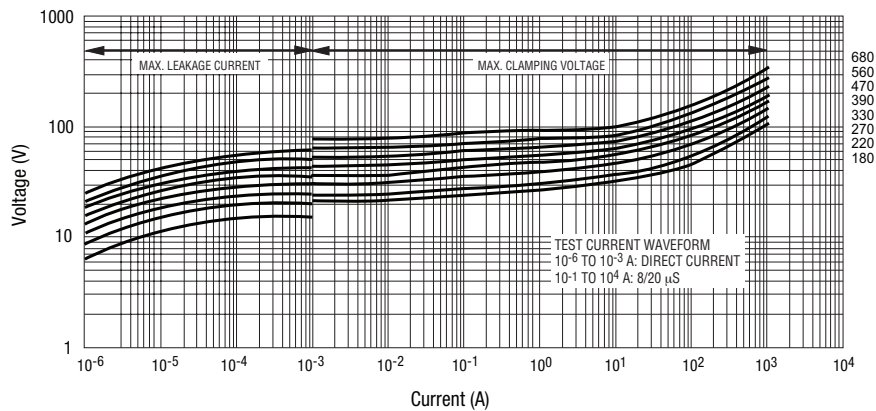
# MOV-20DxxxK Series - Metal Oxide Varistor



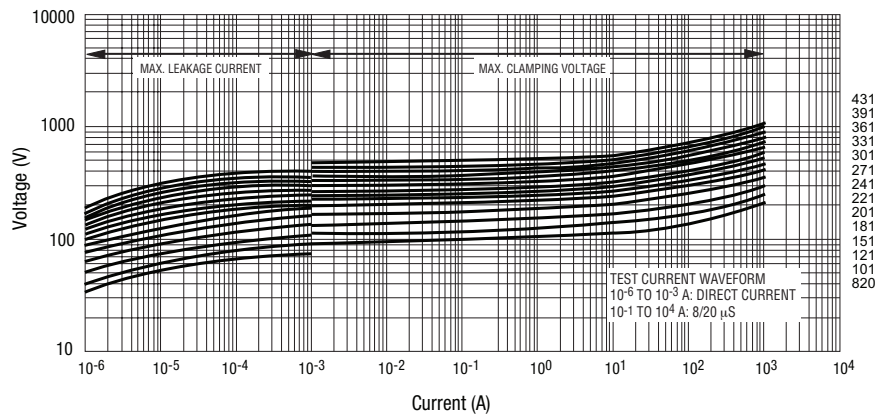
## Performance Graphs

### V-I Characteristics

MOV-20D180K to MOV-20D680K



MOV-20D820K to MOV-20D431K



MOV-20D471K to MOV-20D182K



## Typical Part Marking

Bourns Part Number	Bourns Part Marking
MOV-20D180K	20D180K
MOV-20D220K	20D220K
MOV-20D270K	20D270K
MOV-20D330K	20D330K
MOV-20D390K	20D390K
MOV-20D470K	20D470K
MOV-20D560K	20D560K
MOV-20D680K	20D680K
MOV-20D820K	20D820K
MOV-20D101K	20D101K
MOV-20D121K	20D121K
MOV-20D151K	20D151K
MOV-20D181K	20D181K
MOV-20D201K	20D201K
MOV-20D221K	20D221K
MOV-20D241K	20D241K
MOV-20D271K	20D271K
MOV-20D301K	20D301K
MOV-20D331K	20D331K
MOV-20D361K	20D361K
MOV-20D391K	20D391K
MOV-20D431K	20D431K
MOV-20D471K	20D471K
MOV-20D511K	20D511K
MOV-20D561K	20D561K
MOV-20D621K	20D621K
MOV-20D681K	20D681K
MOV-20D751K	20D751K
MOV-20D781K	20D781K
MOV-20D821K	20D821K
MOV-20D911K	20D821K
MOV-20D102K	20D102K
MOV-20D112K	20D112K
MOV-20D152K	20D152K
MOV-20D182K	20D182K

NOTE: The "5" marking on MOV products is for traceability of production assembly for quality assurance compliance.

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

# MOV-20DxxxK Series - Metal Oxide Varistor

# BOURNS®

## Packaging Information

### TAPE & REEL



DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

NOTE: Models MOV-20D911K, 102K, 112K, 152K and 182K are not available in Tape & Reel packaging.

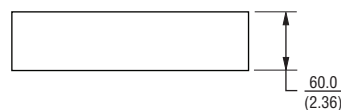
Item	Symbol	20 mm Disc
Reel Outside Diameter	RD	$\frac{355}{(13.98)}$
Reel Inner Diameter	RD1	$\frac{30}{(11.81)}$
Tape Width	RW	$\frac{55}{(2.165)}$
Reel Width	RW1	$\frac{63}{(2.48)}$
Pitch of Component	P	$\frac{25.4 \pm 1.0}{(1.00 \pm 0.04)}$
Feed Hole Pitch	P0	$\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$
Feed Hole Center to Pitch	P1	$\frac{7.7 \pm 0.7}{(0.303 \pm 0.03)}$
Feed Hole Center to Component Center	P2	$\frac{12.7 \pm 1.0}{(0.50 \pm 0.04)}$
Lead to Lead Distance	F	$\frac{10.0 \pm 0.8}{(0.39 \pm 0.03)}$
Component Alignment	$\Delta h$	$\frac{4.0}{(0.157)}$ max.
Tape Width	W	$\frac{18.0 \pm 0.5}{(0.71 \pm 0.02)}$
Hole Down Tape Width	W0	$\frac{12.0 \pm 0.8}{(0.47 \pm 0.03)}$
Hole Position	W1	$\frac{9.0 \pm 0.5}{(0.35 \pm 0.02)}$
Hole Down Tape Position	W2	$\frac{3.0}{(0.12)}$ max.
Height From Center to Component Base	H	$\frac{19.0 \pm 1.0}{(0.75 \pm 0.04)}$
Seating Plane Height	H0	$\frac{16.0 \pm 0.5}{(0.63 \pm 0.02)}$
Component Height	H1	$\frac{47.0}{(1.85)}$ max.
Crimp Length	C	$\frac{2.60}{(0.10)}$ typ.
Feed Hole Diameter	D0	$\frac{4.0 \pm 0.2}{(0.16 \pm 0.08)}$
Total Tape Thickness	t	$\frac{0.6 \pm 0.3}{(0.02 \pm 0.01)}$
Length of Clipped Height	L	$\frac{1.0}{(0.04)}$ max.
Quantity per Reel	-	250

### BULK



#### QUANTITY:

MOV-20D180K – 20D301K = 500 PCS. PER BOX  
 MOV-20D331K – 20D431K = 400 PCS. PER BOX  
 MOV-20D471K – 20D821K = 300 PCS. PER BOX  
 MOV-20D911K – 20D182K = 200 PCS. PER BOX



# BOURNS®

#### Asia-Pacific:

Tel: +886-2 2562-4117  
 Email: asiacus@bourns.com

#### Europe:

Tel: +36 88 520 390  
 Email: eurocus@bourns.com

#### The Americas:

Tel: +1-951 781-5500  
 Email: americus@bourns.com

[www.bourns.com](http://www.bourns.com)

REV. 08/17

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at [www.bourns.com/docs/legal/disclaimer.pdf](http://www.bourns.com/docs/legal/disclaimer.pdf).

This legal disclaimer applies to purchasers and users of Bourns® products manufactured by or on behalf of Bourns, Inc. and its affiliates (collectively, “Bourns”).

Unless otherwise expressly indicated in writing, Bourns® products and data sheets relating thereto are subject to change without notice. Users should check for and obtain the latest relevant information and verify that such information is current and complete before placing orders for Bourns® products.

The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain types of applications are based on Bourns’ knowledge of typical requirements in generic applications. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user’s application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Users should always verify the actual performance of the Bourns® product in their specific devices and applications, and make their own independent judgments regarding the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., ISO/TS 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification. Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in nuclear, lifesaving, life-critical or life-sustaining applications, nor in any other applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage. Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any Bourns® products in such unauthorized applications might not be safe and thus is at the user’s sole risk. Life-critical applications include devices identified by the U.S. Food and Drug Administration as Class III devices and generally equivalent classifications outside of the United States.

Bourns expressly identifies those Bourns® standard products that are suitable for use in automotive applications on such products’ data sheets in the section entitled “Applications.” Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard products in an automotive application might not be safe and thus is not recommended, authorized or intended and is at the user’s sole risk. If Bourns expressly identifies a sub-category of automotive application in the data sheet for its standard products (such as infotainment or lighting), such identification means that Bourns has reviewed its standard product and has determined that if such Bourns® standard product is considered for potential use in automotive applications, it should only be used in such sub-category of automotive applications. Any reference to Bourns® standard product in the data sheet as compliant with the AEC-Q standard or “automotive grade” does not by itself mean that Bourns has approved such product for use in an automotive application.

Bourns® standard products are not tested to comply with United States Federal Aviation Administration standards generally or any other generally equivalent governmental organization standard applicable to products designed or manufactured for use in aircraft or space applications. Bourns expressly identifies Bourns® standard products that are suitable for use in aircraft or space applications on such products’ data sheets in the section entitled “Applications.” Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard product in an aircraft or space application might not be safe and thus is not recommended, authorized or intended and is at the user’s sole risk.

The use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

Users shall not sell, transfer, export or re-export any Bourns® products or technology for use in activities which involve the design, development, production, use or stockpiling of nuclear, chemical or biological weapons or missiles, nor shall they use Bourns® products or technology in any facility which engages in activities relating to such devices. The foregoing restrictions apply to all uses and applications that violate national or international prohibitions, including embargos or international regulations. Further, Bourns® products and Bourns technology and technical data may not under any circumstance be exported or re-exported to countries subject to international sanctions or embargoes. Bourns® products may not, without prior authorization from Bourns and/or the U.S. Government, be resold, transferred, or re-exported to any party not eligible to receive U.S. commodities, software, and technical data.

To the maximum extent permitted by applicable law, Bourns disclaims (i) any and all liability for special, punitive, consequential, incidental or indirect damages or lost revenues or lost profits, and (ii) any and all implied warranties, including implied warranties of fitness for particular purpose, non-infringement and merchantability.

*For your convenience, copies of this Legal Disclaimer Notice with German, Spanish, Japanese, Traditional Chinese and Simplified Chinese bilingual versions are available at:*

*Web Page:* <http://www.bourns.com/legal/disclaimers-terms-and-policies>

*PDF:* <http://www.bourns.com/docs/Legal/disclaimer.pdf>

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: [ocean@oceanchips.ru](mailto:ocean@oceanchips.ru)

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А